FUEL—CARBURETION—EXHAUST

FUEL SYSTEM

GENERAL

New service specifications and applications for all model YF, 2100, and 4300 carburetors are presented in this section. The "desired" adjustment setting is now accompanied by a tolerance which may be used when making adjustments on a carburetor not functioning in an acceptable manner.

AIR CLEANER

The air cleaner element assembly consists of a paper cartridge and a polyurethane element (fig. 4-1).

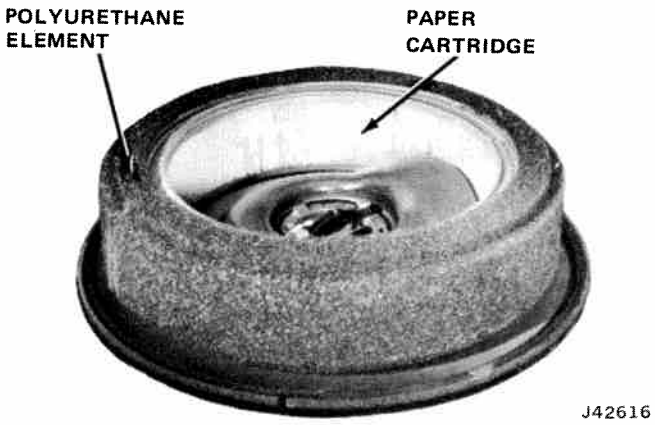


Fig. 4-1 Air Cleaner Element

In order for the air cleaner to function properly, it must be serviced periodically. A dirty element will restrict air flow to the carburetor and create an overly rich mixture condition. It will also cause excessive fuel consumption as well as become unable to filter dust and dirt and thereby cause abnormal wear to the working parts of the engine.

The air cleaner should be serviced in accordance with the instruction decal attached. However, where no decal is present, service the air cleaner as follows:

Clean the air cleaner element assembly every 5,000 miles. If the vehicle is operated under dusty conditions check the condition of the air cleaner element assembly more frequently and service if dirty.

To clean the polyurethane element, first carefully remove it from the paper cartridge and wash it in solvent. Wrap the element in a clean dry cloth and squeeze to remove all possible solvent. Do not wring the element or it may become torn.

To clean the paper cartridge, first shake out accumulated dirt — DO NOT WASH, Use compressed air and carefully blow through the element in the reverse direction of normal air flow.

After cleaning, oil the polyurethane element liberally with engine oil (SAE 10W/30) and squeeze to evenly distribute the oil through the element and to remove excess oil. The element should be damp with oil, not dripping. Install the polyurethane element on the paper cartridge, taking care to have edges of the polyurethane element over the plastic end plates of the paper cartridge.

Replace the air cleaner paper cartridge every 15,000 miles, or more frequently if there is any apparent damage or evidence of plugging. At the same time, inspect the polyurethane element and replace it if torn or otherwise damaged.

FUEL FILTERS

All carburetors are protected against the entry of dirt and other foreign matter through the fuel inlet by a replaceable 15-micron pleated paper filter which is located in the carburetor fuel inlet line secured by two short rubber hoses and clamps. The filter should be replaced every 15,000 miles.

All vehicles use a woven Saran sleeve type filter which is attached to the end of the fuel outlet tube inside the fuel tank. This filter is rated at 65 microns and repels water. Under normal conditions it requires no maintenance or service.

FUEL TANK

The fuel tank on Cherokee, Wagoneer and Truck models is suspended from the frame by a single steel strap. On CJ-5/CJ-6 Models the fuel tank is attached to the frame by brackets and bolts. The brackets are attached to the tank at the seam flange. The various fuel tank and venting arrangements used are illustrated in fig. 4-2,-3,-4, and -5.

The fuel tank is an external expansion type. Fuel tank venting is accomplished by vapor lines which lead to a liquid check valve. The vapor lines are located so that during any inclination of the vehicle, at least one line will be open.

Fuel Tank Filler Tube

The filler tube opening is located at the right rear body panel on CJ-5/CJ-6 models. On all other vehicles, except Trucks, the filler tube opening is located at the left rear quarter panel. On Truck models it is located at the left side of the pickup box.

The filler tube is connected to the fuel tank inlet by a rubber hose and secured with clamps.

All fuel tanks are equipped with a filler tube vent hose which extends from the filler tube to a fitting at the top of the tank. The purpose of this vent is to provide easier filling by relieving the air being displaced as the tank is filled.

Fuel Tank Filler Cap -- All Series

The filler cap incorporates a two-way relief valve which is closed to atmosphere under normal operating conditions. The relief valve is calibrated to open only when a pressure of 0.75 to 1.5 psi or 0.25 to 0.50 Hg vacuum occurs within the tank. When the pressure or vacuum is relieved, the valve returns to the normally closed position. It is normal to occasionally encounter an air pressure release when removing the filler cap.

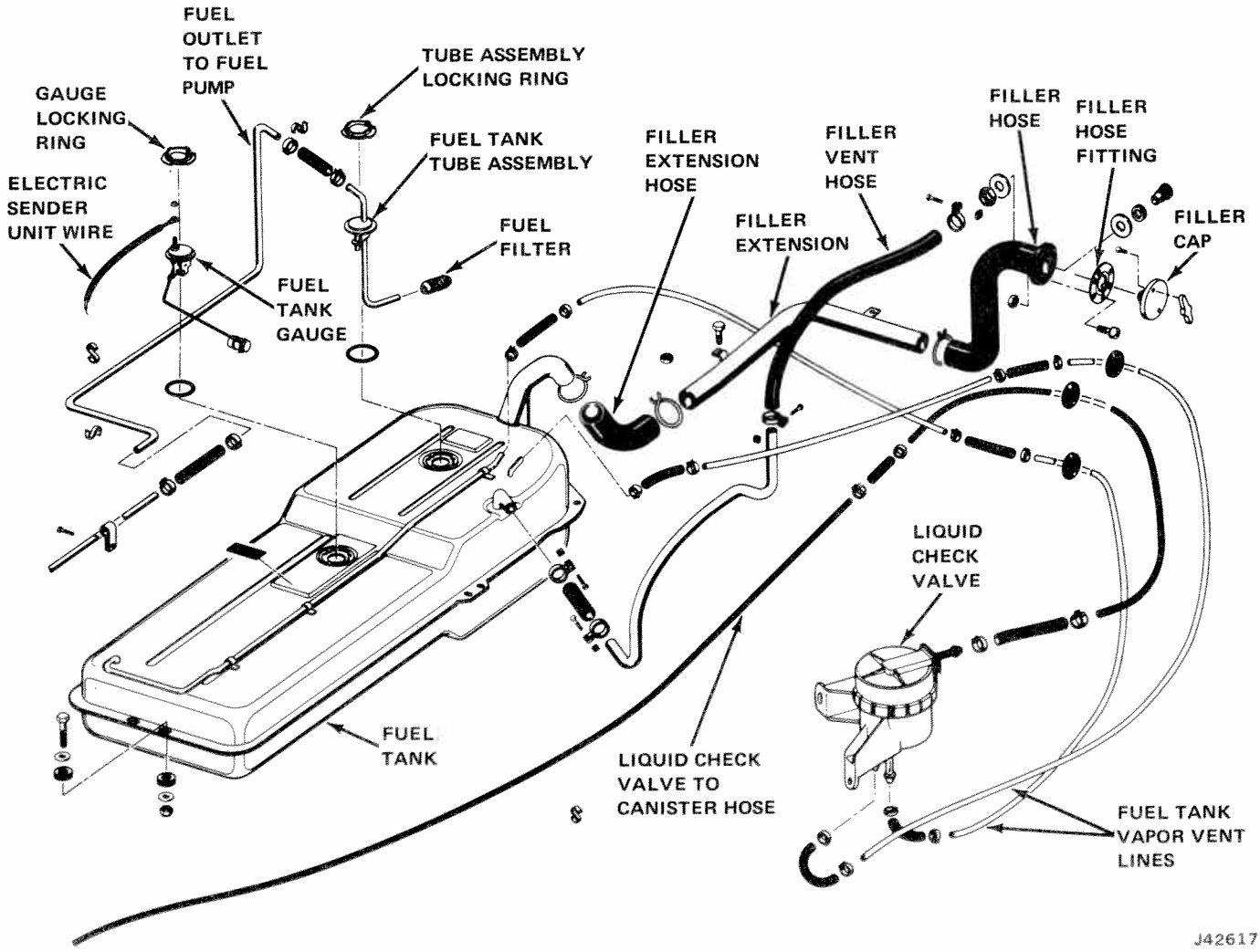


Fig. 4-2 Fuel Tank and Vent Lines - Cherokee and Wagoneer

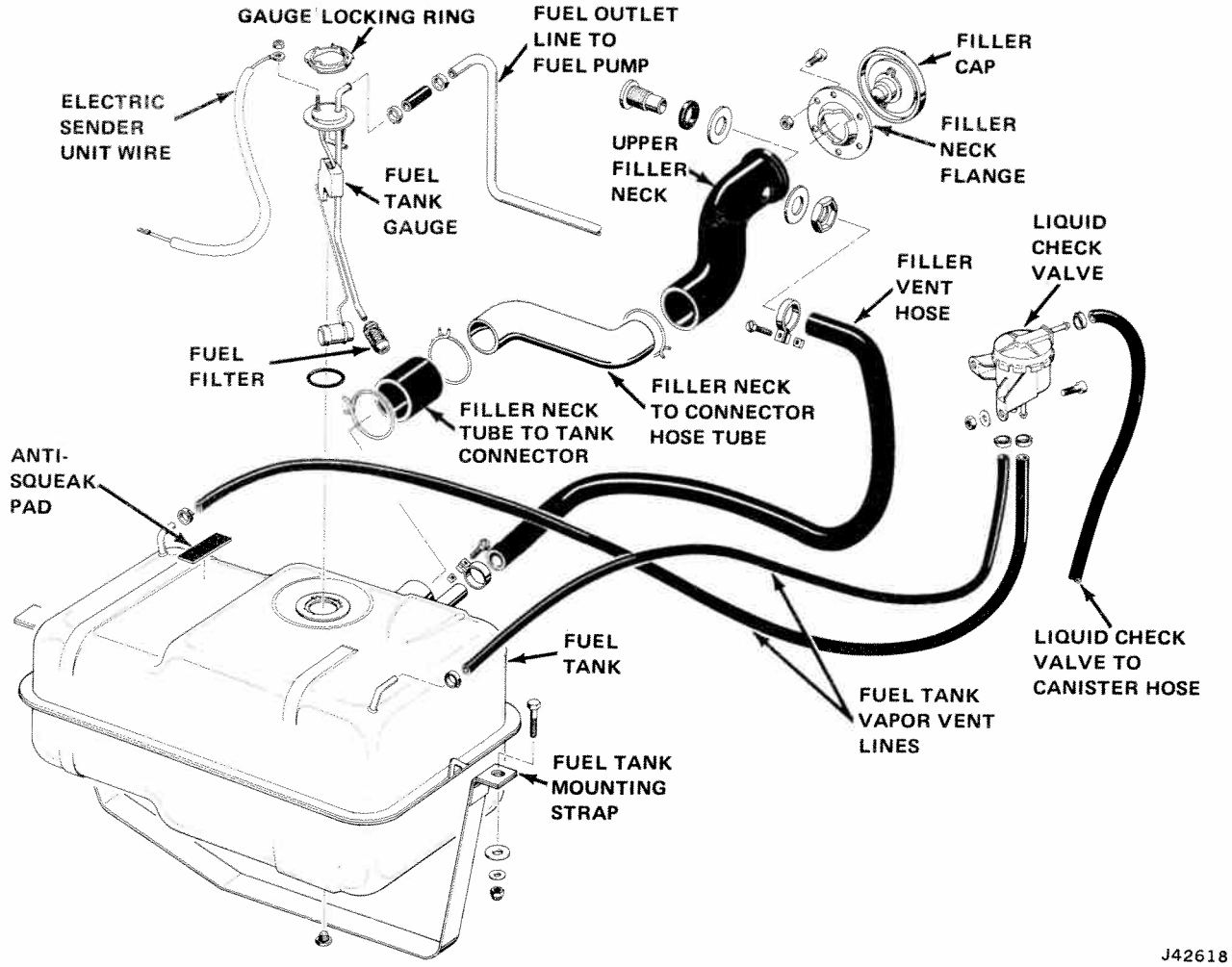


Fig. 4-3 Fuel Tank and Vent Lines - Truck (Townside)

Fuel Tank Vent

A closed fuel tank vent system prevents raw fuel vapor from entering the atmosphere. Fuel vapor from the tank is routed through the vent lines at the top of the tank to a liquid check valve (fig. 4-6).

The liquid check valve incorporates a float and Viton needle assembly. In the event that liquid fuel enters the check valve, the float will rise and force the needle upward to close the vent passage thereby preventing liquid fuel flow through the valve.

After passing through the check valve, the fuel vapor is routed forward through a vent line to a charcoal canister in the engine compartment.

The fuel vapors are then drawn into the air cleaner snorkel and burned along with the fuel-air mixture. Refer to Section 4A-Emission Control for a detailed operation description of the charcoal canister.

FUEL TANK CAPACITIES (GALLONS)

CJ Models	15.5
Wagoneer, Cherokee	22
Truck	19

FUEL PUMP

A single-action, stamped fuel pump is used for all engine applications.

The fuel pump rocker arm is activated by an eccentric on the engine camshaft and provides a steady supply of fuel at a constant pressure to the carburetor.

When the carburetor fuel inlet needle closes, accumulation of fuel in the pump extends the diaphragm compressing the diaphragm spring. This action causes the rocker arm linkage to become inoperative until the pressure on the diaphragm and spring is reduced. The fuel pump discharge pressure is thus controlled by the diaphragm spring.

NOTE: *Fuel pumps are not to be overhauled. Prior to replacement of a fuel pump assembly suspected of being defective, first test for specific requirements as outlined in the following test procedures.*

Fuel Pump Testing

Be sure the in-line fuel filter is not clogged before making tests. The following tests will determine if the fuel pump requires replacement.

Pressure Test

(1)Remove air cleaner assembly.

(2) Disconnect fuel inlet line or fuel filter at the carburetor.

NOTE: *Use care to prevent combustion due to fuel spillage.*

(3) Connect pressure gauge, restrictor, and flexible hose (fig. 4-7) between fuel filter and carburetor.

(4) Position flexible hose and restrictor so fuel can be discharged into suitable graduated container.

(5) Before tanking pressure reading, operate engine at 500 rpm and vent the system into the container by momentarily opening hose restrictor.

(6) Close hose restrictor, allow pressure to stabilize, and note gauge reading. Gauge should indicate 4 to 5 psi for six-cylinder engines, and 5 to 6.5 psi for eight-cylinder engines.

NOTE: *If the pump pressure is not within specification and the fuel lines and filter are in satisfactory condition, the pump is defective and should be replaced. If the pump pressure is within specifications, perform the capacity and vacuum tests.*

Capacity (Volume) Test

If fuel pump pressure is within specification, test the capacity (volume) as follows:

(1) Operate engine at 500 rpm.

(2) Open hose restrictor and allow fuel to discharge into graduated container for 30 seconds, then close restrictor.

NOTE: *At least one pint of fuel should have been discharged. If pump volume is less than one pint, repeat test using an auxiliary fuel supply and a new fuel filter. If the pump volume meets specification while using the auxiliary fuel supply, check for a restriction in the fuel supply from the tank and for proper tank venting.*

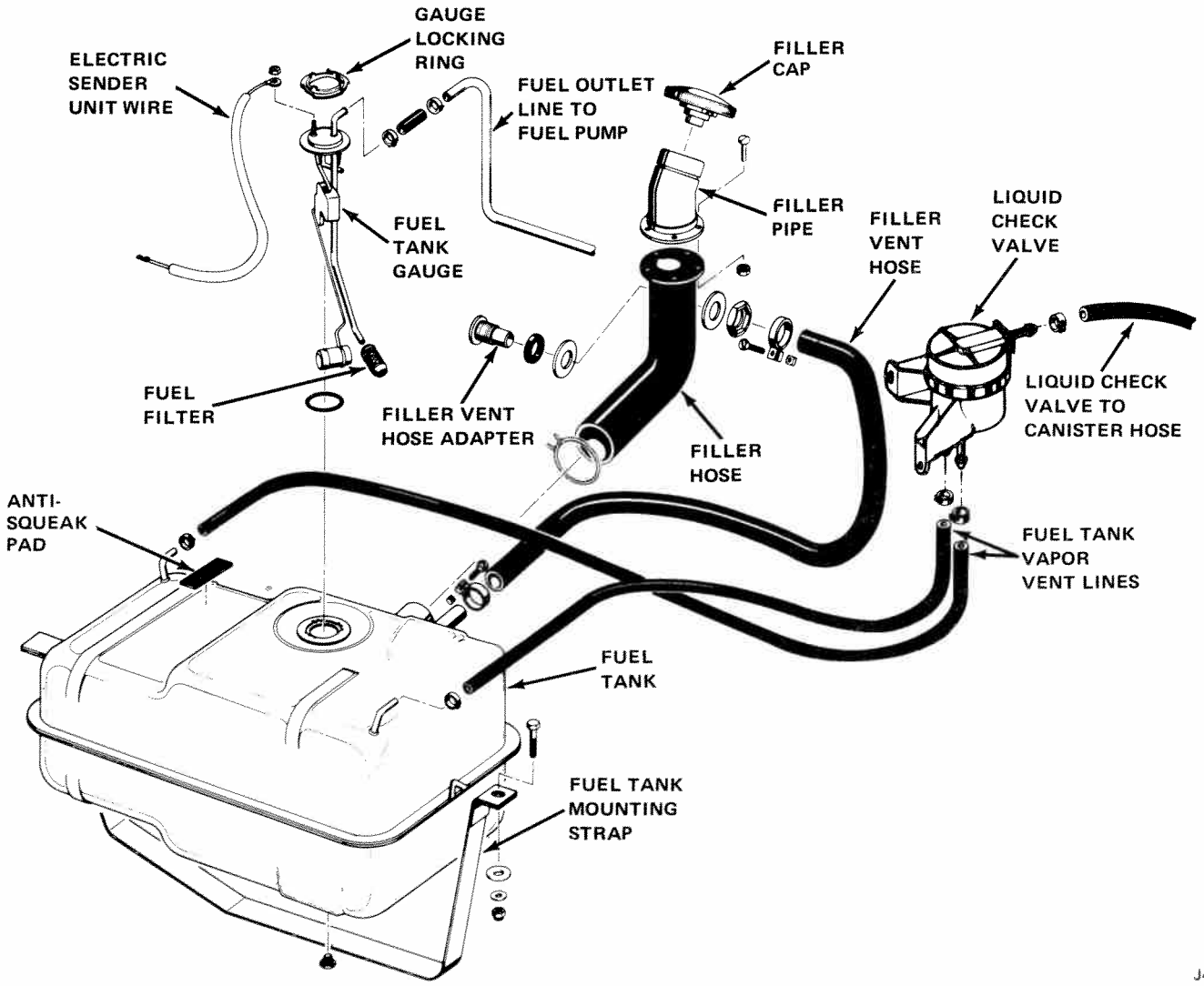


Fig. 4-4 Fuel Tank and Vent Lines-Truck (Thriftside)

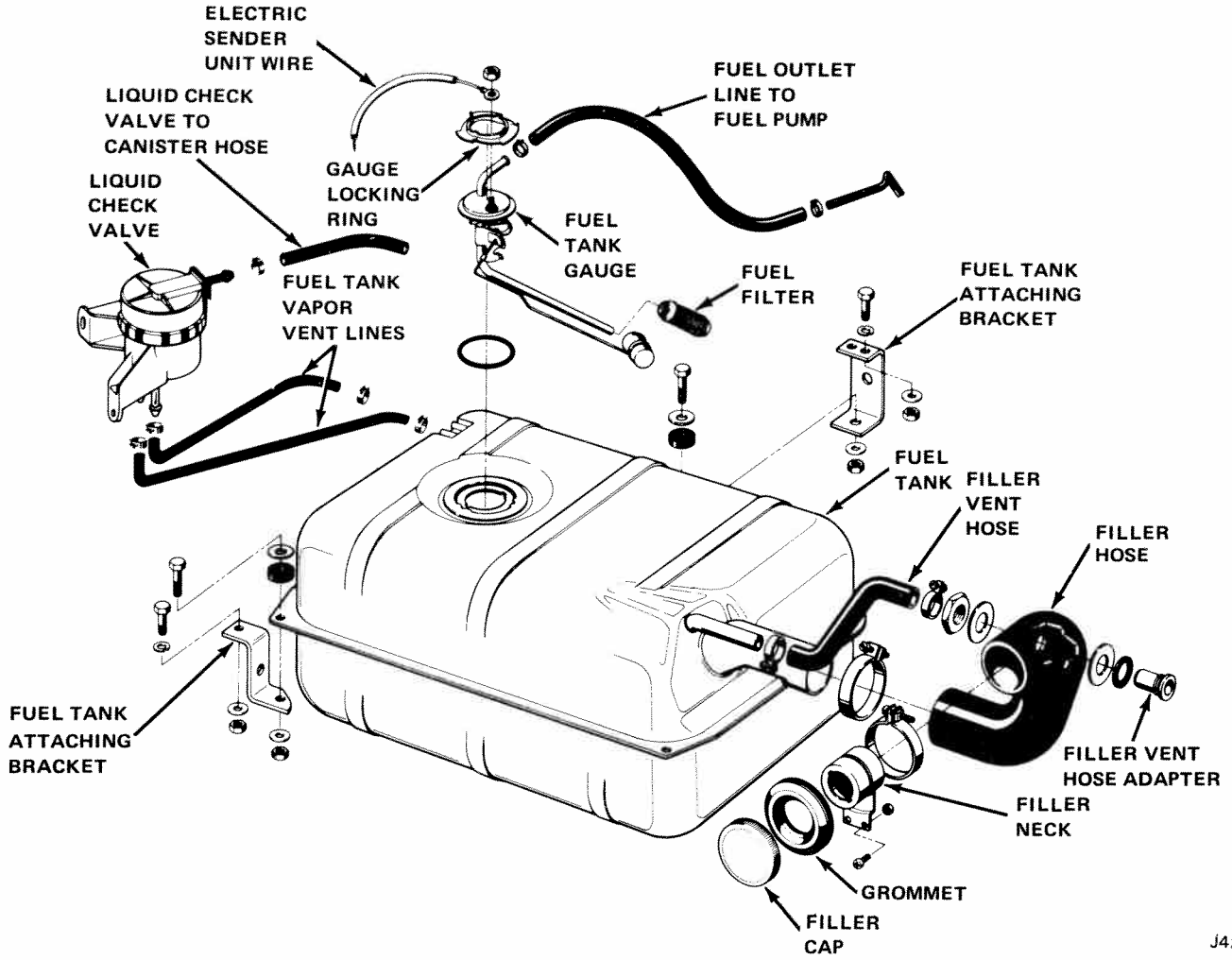


Fig. 4-5 Fuel Tank and Vent Lines CJ-5/CJ-6

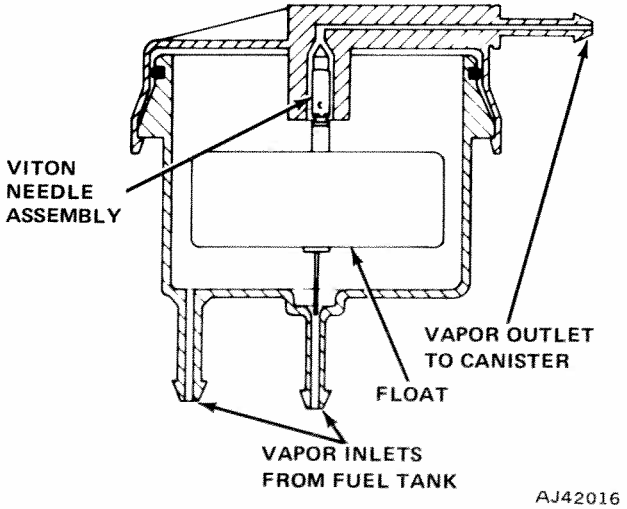


Fig. 4-6 Liquid Check Valve

Vacuum Test

(1) Disconnect fuel inlet line at fuel pump.
(2) Connect vacuum gauge to fuel pump inlet.
(3) Operate engine at 500 rpm and note vacuum gauge reading. Gauge should indicate ten inches of mercury (10 Hg). If the pump vacuum reading is not within specification the pump is defective and should be replaced.

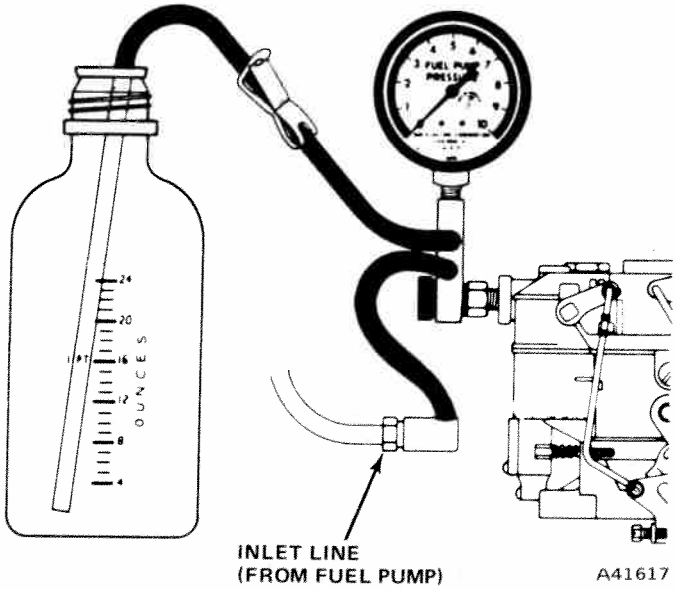


Fig. 4-7 Fuel Pump Testing

NOTE: *Vacuum gauge will not register a reading until fuel in carburetor float bowl has been used and pump begins to operate at full capacity.*

FUEL PUMP SPECIFICATIONS

Volume	1 quart of fuel in 1 minute or less
Vacuum	10 inches mercury (min.)
Pressure	6 Cylinder: 4 to 5 psi 8 Cylinder: 5 to 6.5 psi

CARBURETION
CARBURETOR MODEL YF—1-VENTURI

GENERAL

The Model YF carburetor has some minor design changes. The throttle shaft return spring has been relocated and changed from a tension spring to a coil spring (fig. 4-8). Carburetors on all California vehicles equippped with automatic transmissions have a pressure vented air horn bowl vent. The bowl vent has an aluminum wafer which is normally seated. When fuel bowl pressure becomes excessive, the wafer unseats and pressure is vented. The pressure vent is sealed on all other Model YF carburetors.

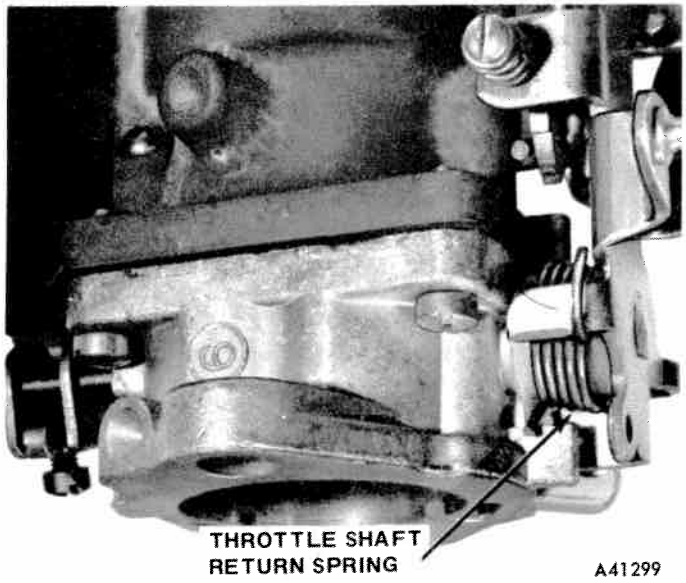


Fig. 4-8 Throttle Shaft Return Spring-Model YF Carburetor

A throttle stop solenoid and bracket assembly is installed on carburetors used on California vehicles with automatic transmissions. The solenoid is used to adjust curb idle speed. Refer to Emission Control Section for adjustment procedure.

Identification

The carburetor is indentified by a code number and build date which is stamped on the identification tag. Each carburetor build month is coded alphabetically beginning with the letter "A" in January and ending with the letter "M" in December (the letter "I" is not used). The tag is attached to the carburetor and must remain with the carburetor to assure proper identification (fig. 4-9).

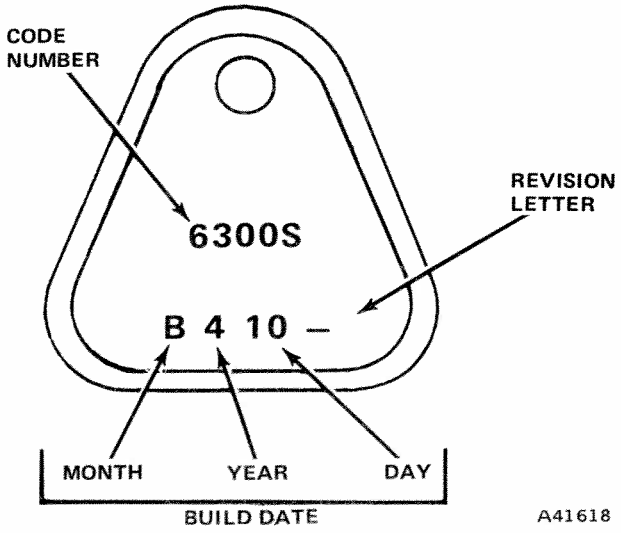


Fig. 4-9 Identification Tag

The Model YF carburetor consists of three main assemblies: air horn, main body and throttle body (fig. 4-10).

The air horn assembly also serves as the fuel bowl cover and contains the automatic choke assembly, choke valve, fuel bowl vent, fuel inlet fitting, float assembly, needle and seat assembly, and dashpot or solenoid assembly (if so equipped).

The main body assembly contains the metering rod and jet, accelerator pump assembly, pump discharge

needle and jet, low speed jet, antiperc bleed, economizer, and main discharge nozzle.

The throttle body assembly contains the throttle shaft and lever assembly, curb idle adjusting screw, idle mixture adjusting screw, idle limiter cap, distributor vacuum fitting, and EGR vacuum fitting.

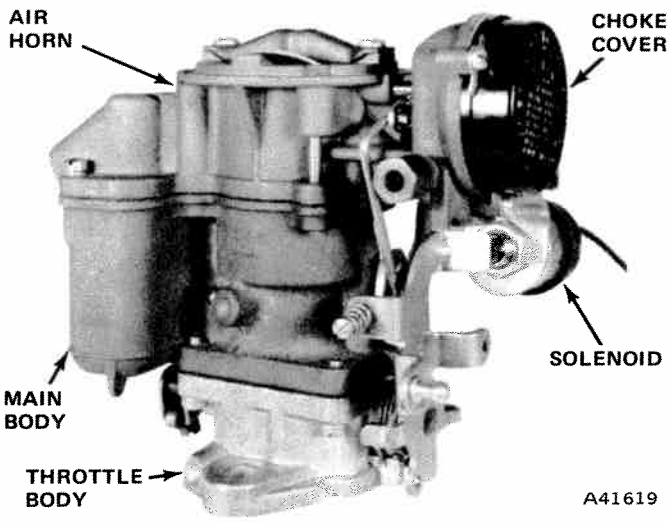


Fig. 4-10 Model YF Carburetor Assembly

CARBURETOR CIRCUITS

Five conventional circuits are used: Float (Fuel Inlet) Circuit, Idle (Low Speed) Circuit, Main Metering (High Speed) Circuit, Pump Circuit, and Choke Circuit.

Float (Fuel Inlet) Circuit

The float circuit maintains the specified fuel level in the bowl to provide an adequate fuel supply to the metering circuits for all engine operating conditions.

A spring-loaded, two-piece needle is used to prevent float vibration from affecting the fuel level. The needle also incorporates a flared tip which is capable of "digesting" small foreign particles, resulting in minimum fuel leakage or flooding under extreme dirt conditions. The flared tip needle also reduces wear to extend the normal life of the needle and seat assembly. Special precautions must be taken when adjusting the float level (refer to Float Level Adjustment).

Fuel enters the carburetor through the needle and seat assembly. When fuel in the bowl reaches the specified level, the float lever pushes the needle toward its seat and restricts the incoming fuel flow to admit only enough fuel to replace that being used (fig. 4-11).

The bowl is vented internally by a tube and a drilled passage, located inside the air horn, to assure correct air pressure above the fuel for all engine operating conditions. The vent automatically compensates for any air cleaner restriction by balancing pressure between the fuel bowl and the incoming air.

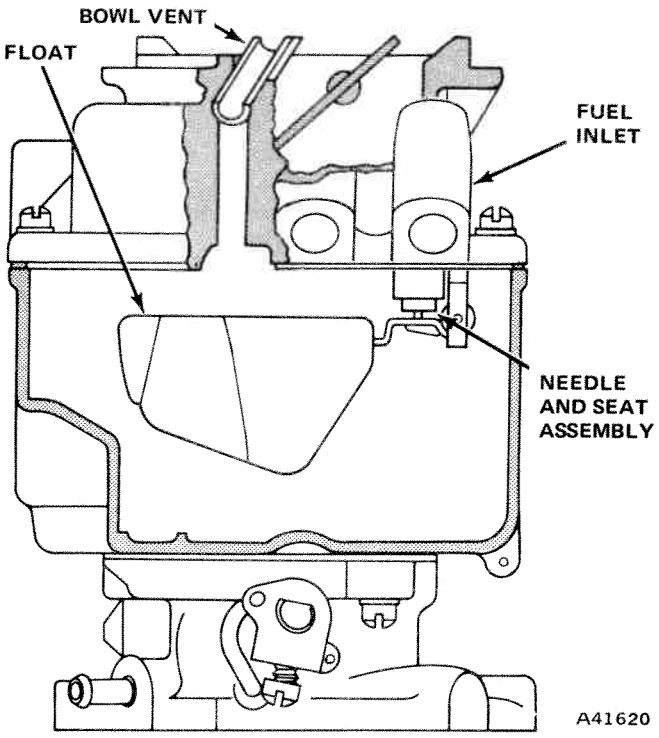


Fig. 4-11 Float Circuit

Idle (Low Speed) Circuit

Fuel for idle and early part-throttle operation is metered through the idle curcuit. The low speed jet is threaded into the low speed well and may be removed for cleaning.

Fuel is metered as it enters the lower end of the low speed jet and flows up through the tube. The fuel is then mixed with air which is metered through the bypass. The fuel-air mixture then travels downward through the economizer and past the idle bleed where additional metered air is introduced. The fuel-air mixture continues downward and is discharged below the throttle valve at the idle port opening and the idle mixture adjustment screw port (fig. 4-12).

The idle mixture adjustment screw controls the amount of mixture discharged into the manifold. Turning the screw inward (clockwise) decreases the amount of fuel-air mixture supplied for idle. The idle limiter cap is designed to regulate the adjustment range of the idle mixture adjusting screw, effectively controlling the exhaust emission level at idle speeds to comply with Federal Emission Standards.

The idle port is slotted and, as the throttle valve is opened, more of the port is exposed to manifold vacuum to allow an increased discharge of the fuel-air mixture for early part-throttle operation.

Main Metering (High Speed) Circuit

Fuel for most part-throttle and full-throttle operation is supplied through the main metering curcuit (fig. 4-13).

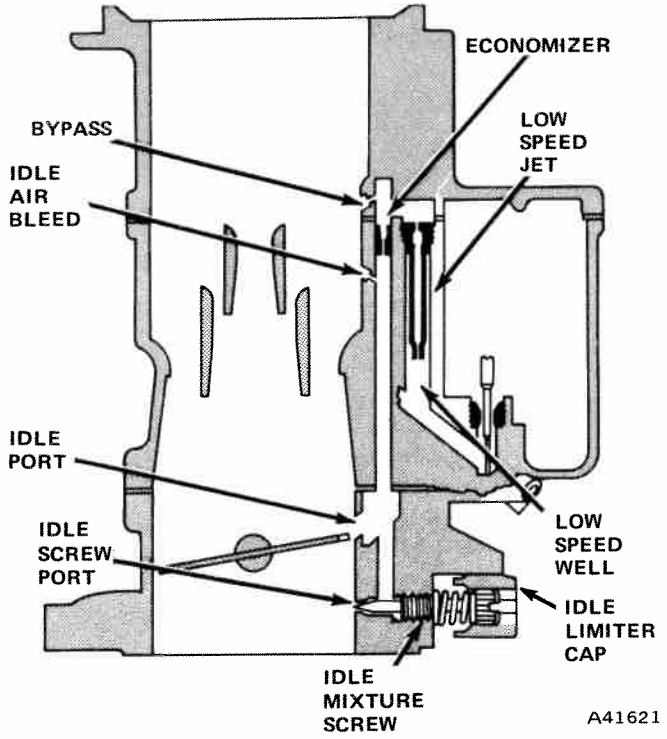


Fig. 4-12 Idle Circuit

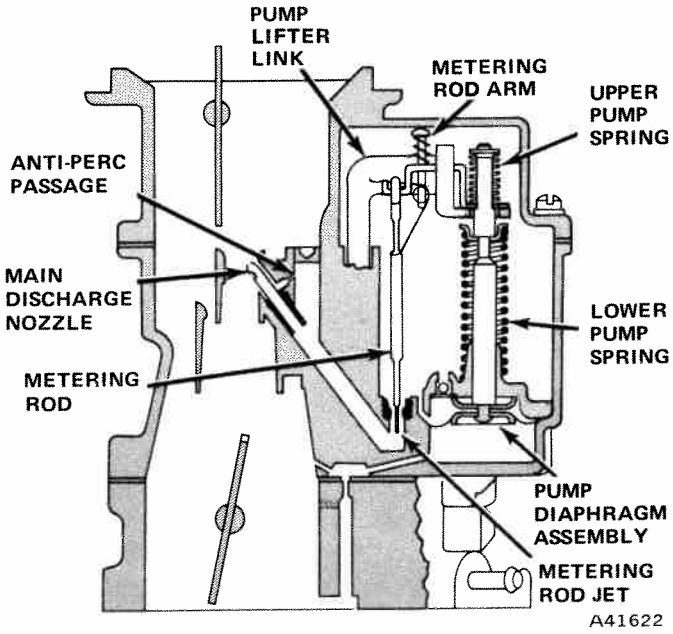


Fig. 4-13 Main Metering Circuit

The position of the metering rod in the metering rod jet regulates the amount of fuel admitted to the main discharge nozzle. The lower end of the metering rod is calibrated in steps to accurately meter the fuel required. As the metering rod is raised or lowered in the jet, the opening is varied in size to provide the correct amount of fuel proportionate to the engine requirements for part-throttle and full-throttle operation. The metering rod is actuated by mechanical linkage and also by changing manifold vacuum.

Mechanical Action

During part-throttle operation, manifold vacuum pulls the pump diaphragm assembly downward, holding the metering rod arm against the pump lifter link which is connected by linkage to the throttle shaft. Therefore, the metering rod is mechanically controlled as long as manifold vacuum is strong enough to overcome the tension of the lower pump diaphragm spring. The upper spring assists the lower pump spring on acceleration.

Vacuum Action

Under any engine operation condition in which the tension of the lower pump diaphragm spring is sufficient to overcome the manifold vacuum applied to the pump diaphragm assembly, the metering rod will move upward toward the wide-open or power enrichment position.

The restriction and air bleeds within the vacuum passage leading to the pump diaphragm vacuum chamber provide a lower and more uniform vacuum.

To prevent percolation in the low speed well or main discharge nozzle, which may occur during hot engine idle or shutdown, an antiperc passage is used. Its purpose is to vent vapors and relieve pressure to prevent fuel being forced out of the nozzle and into the intake manifold.

The main discharge nozzle and the antiperc bushing are permanently installed and are not to be removed in service.

Pump Circuit

The pump circuit provides the increased amount of fuel required during acceleration at lower car speeds to assure satisfactory engine performance (fig. 4-14).

The accelerator pump is actuated in the same manner as the metering rod. When the throttle closes, the pump diaphragm moves downward, both by mechanical linkage and by increased manifold vacuum supplied to the underside of the diaphragm. During the downward movement of the diaphragm, fuel is drawn into the chamber above the diaphragm through the inlet check ball. The discharge check ball is seated during the intake stroke to prevent air entering the pump chamber. When the throttle is opened, manifold vacuum

Decreases at the underside of the diaphragm and tesnion of the lower pump diaphragm spring moves the diaphragm upward. The upward movement of the diaphragm is mechanically assisted by the pump lifter link which is connected by linkage to the throttle shaft. During the upward movement of the diaphragm, fuel under pressure is forced through the pump discharge passage, unseats the discharge check ball, and is discharged through the pump jet. The inlet check ball is seated during the discharge stroke to prevent fuel leakage back

into the bowl. If the throttle is opened suddenly, the upper pump spring is compressed resulting in a smooth pump discharge.

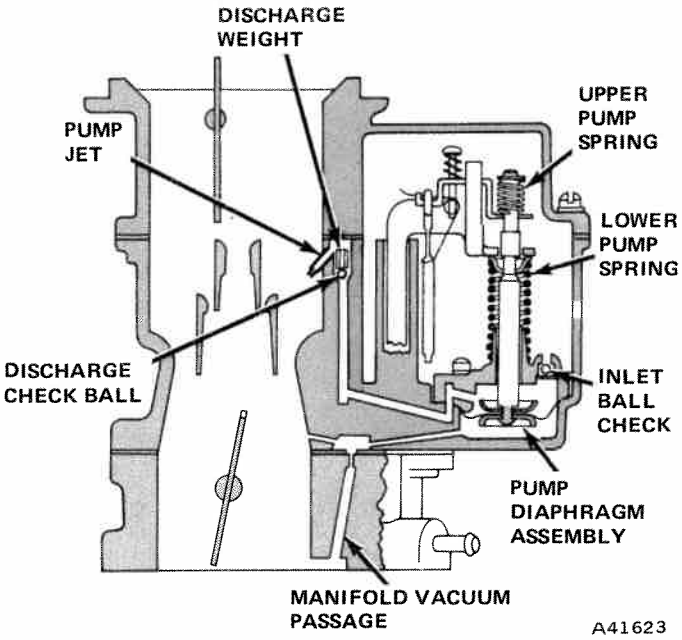


Fig. 4-14 Pump Circuit

A pump relief bushing, located near the top of the pump discharge passage, allows fuel bowl air pressure to enter the passage. The pump relief serves two purposes. One is to prevent fuel being drawn out of the pump circuit during high speed constant throttle operation. The other is to bleed off a calibrated portion of the pump discharge back to the fuel bowl, thereby regulating the amount of discharge through the pump jet.

Choke Circuit

The automatic choke provides the richer mixture necessary for quick cold engine starting and proper warmup performance (fig. 4-15). When the engine is cold, thermostatic coil tension holds the choke valve closed. As the engine is cranked, air pressure 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. When the engine starts, the choke valve assumes a partially open position where thermostatic coil tension is balanced by the pull of vacuum on the piston and force of the air stream against the offset choke valve. This choke valve opening is known as "initial choke valve clearance"

As the choke piston moves down in the cylinder, it exposes slots located in the sides of the cylinder. This allows intake manifold vacuum to draw warm air, heated by the exhaust manifold, through the thermostatic coil housing. This warm air causes the thermostatic spring to gradually lose its tension until the choke valve is in a wide-open position.

If the engine is accelerated during the warmup period, the corresponding drop in manifold vacuum allows the thermostatic coil to momentarily close the choke valve to provide a richer mixture.

To prevent stalling during the warmup period, it is necessary to provide a faster idle speed. The fast idle cam, actuated by the choke shaft through connecting linkage, rotates into position against the fast idle screw. The cam is progressively stepped to provide the correct speed in proportion to the choke valve opening. When the choke valve reaches the fully open position, the fast idle cam rotates free of the fast idle screw, allowing the throttle lever to return to curb idle position.

If the engine floods during starting, 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 and cranking the engine. With the accelerator linkage in this position, a tang on the throttle lever contacts the fast idle cam, causing the choke rod to move upward and open the choke valve a predetermined amount.

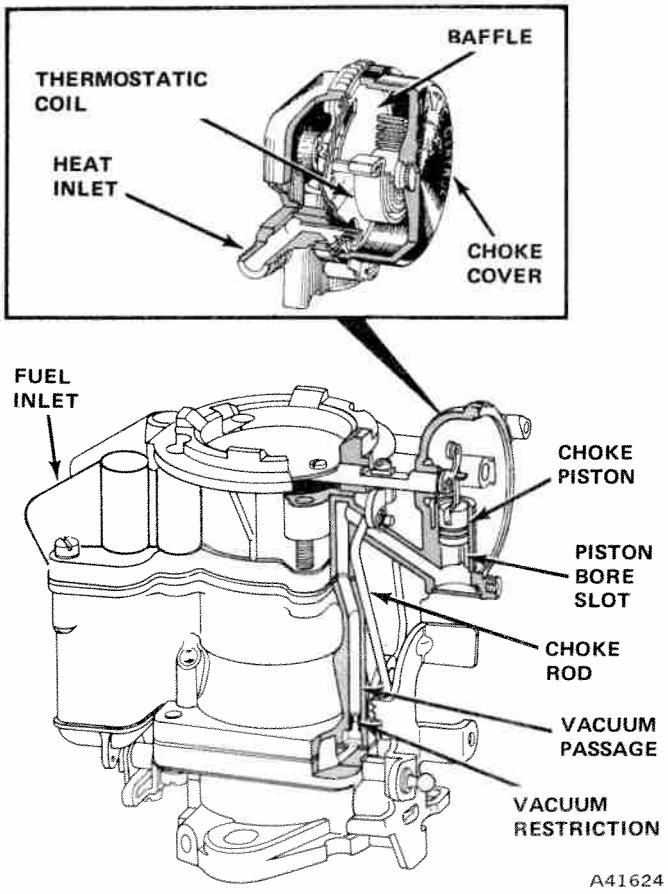


Fig. 4-15 Choke Circuit

REMOVAL

Flooding, stumble on acceleration, and other performance problems are in many instances caused by the presence of dirt, water, or other foreign matter in the carburetor. To aid in diagnosing the problem, the car-

buretor should be carefully removed from the engine without removing the fuel from the bowl. The bowl contents then may be examined for contamination as the carburetor is disassembled.

(1) Remove air cleaner.

(2) Remove throttle rod from throttle lever and disconnect distributor vacuum line, in-line fuel filter, and the choke heat tube at the carburetor.

(3) Remove carburetor retaining nuts and remove carburetor. Remove carburetor mounting gasket, spacer (if equipped), and lower gasket from the intake manifold.

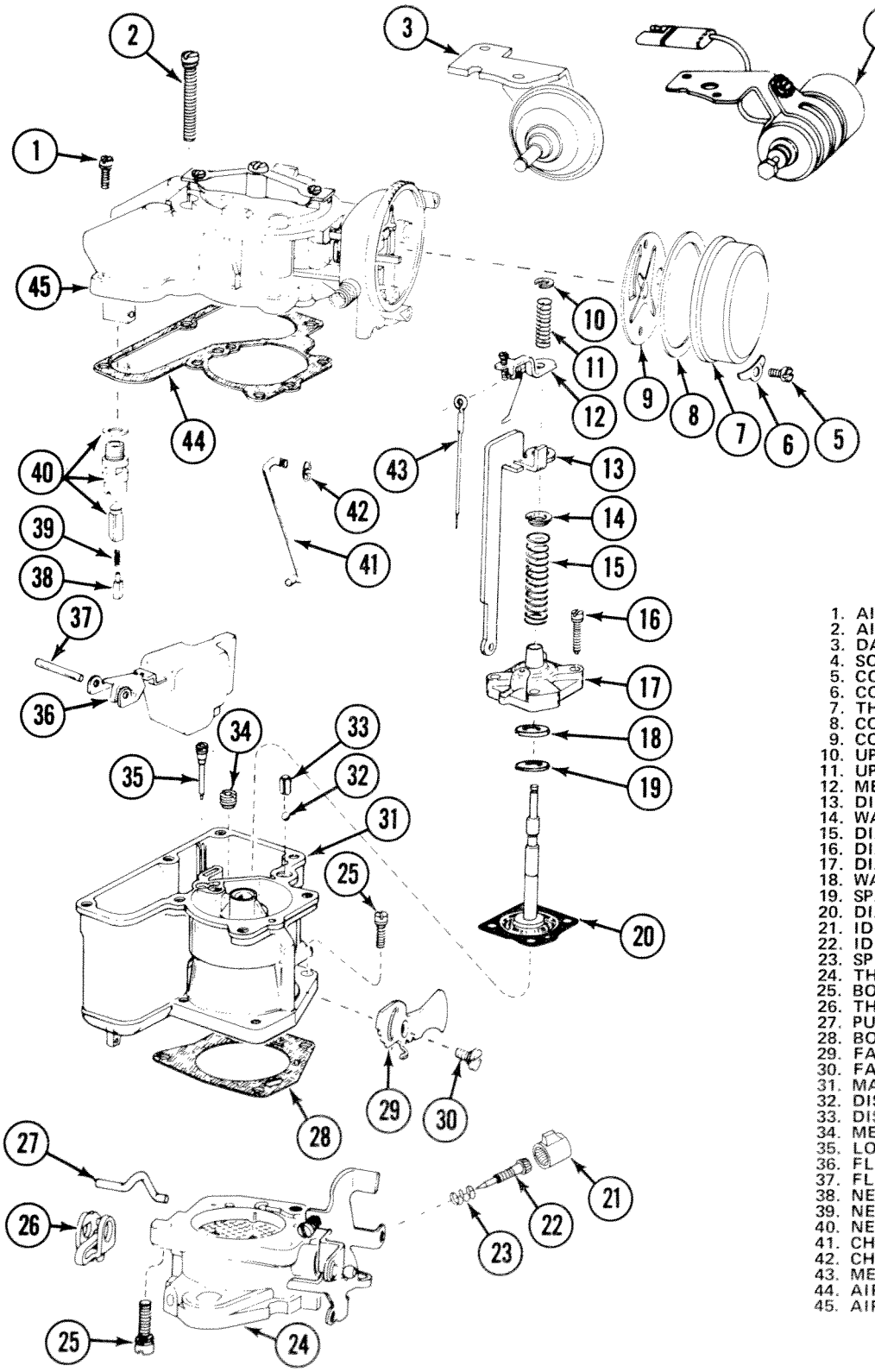


Fig. 4-16 Model YF Carburetor-Exploded View

INSTALLATION

(1) Clean gasket mounting surfaces of spacer and carburetor. Place spacer between two new gaskets and position the spacer and gaskets on the intake manifold. Position carburetor on the spacer and gasket and secure it with retaining nuts. To prevent leakage, distortion, or damage to the carburetor body flange, first snug the nuts and then tighten to 12-15 foot-pounds torque.

(2) Connect in-line fuel filter throttle cable, choke heat tube, and distributor vacuum line.

CARBURETOR OVERHAUL

The following procedure applies to complete overhaul, with the carburetor removed from the engine. A complete disassembly is not necessary when performing adjustments. In most cases, service adjustments of individual systems may be completed without removing the carburetor from the engine (refer to Service Adjustment Procedures).

A complete carburetor overhaul includes disassembly, thorough cleaning, inspection and replacement of all gaskets and worn or damaged parts. Refer to figure 4-16 for parts identification.

NOTE: *When using an overhaul kit, use all parts included in kit.*

Carburetor Disassembly

(1) Remove choke cover attaching screws and retainers, thermostatic spring housing assembly, spring housing gasket, spring housing baffle plate, and fast idle link.

(2) Remove air horn assembly attaching screws, dashpot or solenoid bracket assembly, air horn assembly, and air horn gasket.

(3) Hold air horn assembly bottom side up, and remove float pin, and float lever and lever assembly.Turn the air horn assembly over and catch the needle pin, spring, and needle.

(4) Remove needle seat and gasket (fig. 4-17).

(5) Remove air cleaner bracket. Remove choke plate attaching screws. File staked ends and use new screws upon assembly. Remove the choke plate from air horn assembly, choke link lever, and attaching screw. Rotate the choke shaft and piston assembly counter-clockwise until the choke piston is out of the choke piston cylinder (fig. 4-18). Remove assembly from air horn. Remove piston pin and piston from choke piston lever and link assembly.

(6) Turn pump main body casting upside down and catch accelerating pump check ball and weight.

(7) Loosen throttle shaft arm screw and remove arm and pump connector link (fig. 4-19).

(8) Remove fast idle cam and shoulder screw.

(9) Remove accelerating pump diaphragm housing screws. Lift out the pump diaphragm assembly, pump lifter link, and metering rod as a unit (fig. 4-20).

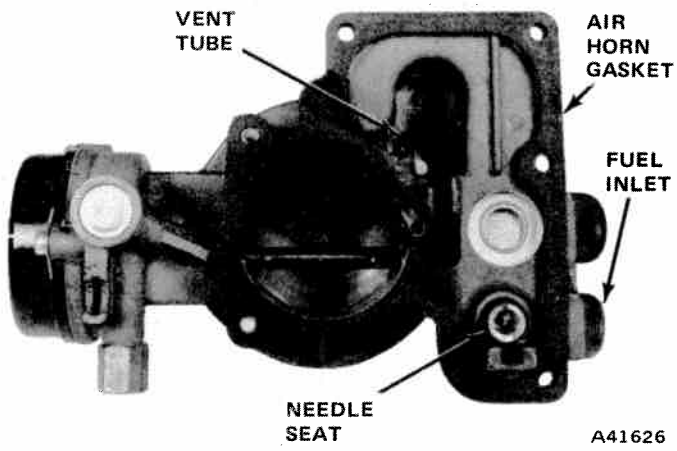


Fig. 4-17 Interior View of Air Horn

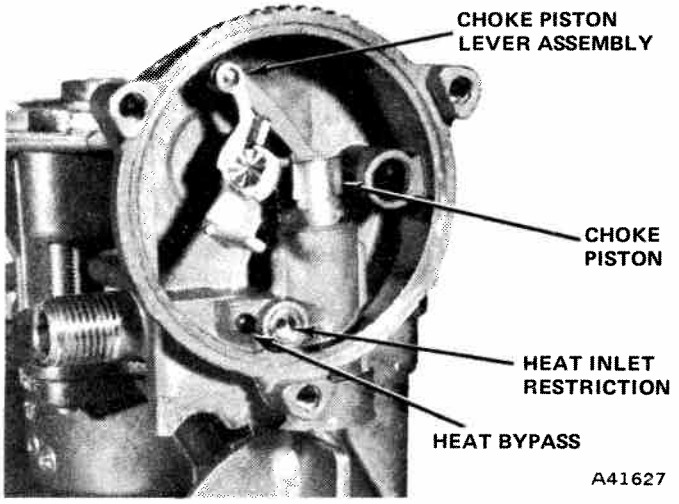


Fig. 4-18 Choke Piston and Lever Assembly

(10) Disengage metering rod arm spring from metering rod, and remove metering rod from metering rod arm assembly. Note the location of any washers shimming either spring for proper assembly. Compress upper pump spring and remove spring retainer. Remove the upper spring, metering rod arm assembly, and pump lifter link from pump diaphragm shaft. Compress pump diaphragm spring and remove pump diaphragm spring retainer, spring, and pump diaphragm assembly from pump diaphragm housing assembly.

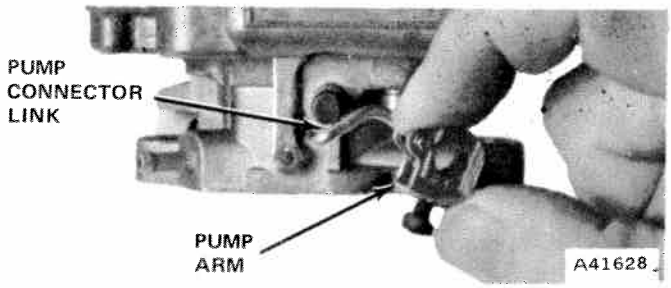


Fig. 4-19 Replacement of Pump Arm and Link

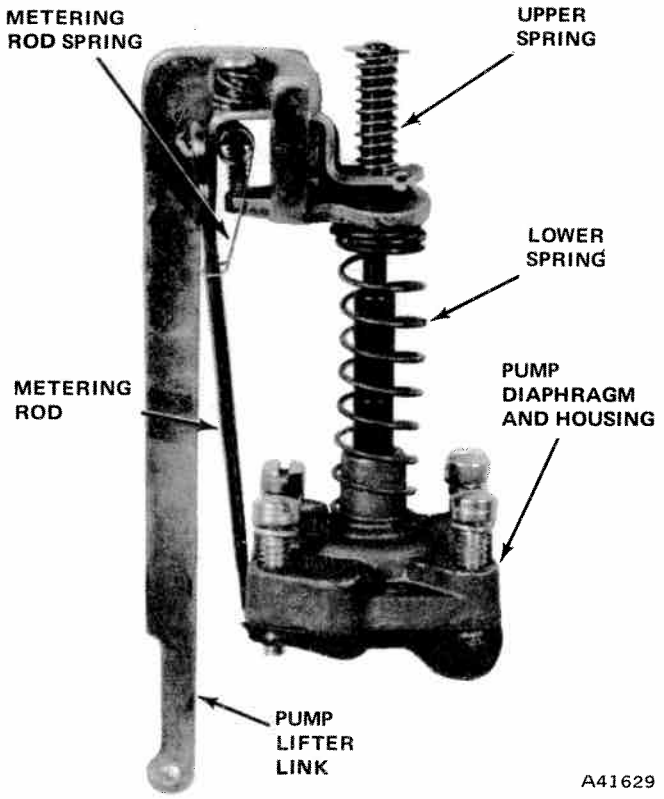


Fig. 4-20 Accelerator Pump and Metering Rod Assembly

(11) Remove metering rod jet and low speed jet.

(12) Remove retaining screws and separate throttle body flange assembly from main body casting. Remove body flange gasket.

(13) Remove throttle plate retaining screws. File staked ends and use new screws upon reassembly. Slide throttle shaft and lever assembly out of throttle body flange assembly. Note the location of the ends of the torsion spring on the throttle shaft for proper assembly. When removing the idle mixture limiter cap, be sure to note the position of the tab. After removing the limiter cap, count the number of turns to lightly seat the needle. This information will be used in assembly.

Cleaning and Inspection

Dirt, gum, water or carbon contamination in the carburetor or the exterior moving parts of the carburetor are often responsible for unsatisfactory performance. For this reason, efficient carburetion depends upon careful cleaning and inspection.

The cleaning and inspection of only those parts not included in the carburetor overhaul repair kit are covered here. All gaskets and parts included in the repair kit should be installed when the carburetor is assembled and the old gaskets and parts should be discarded.

Wash all the carburetor parts (except the accelerating pump diaphragm and the antistall dashpot assembly) in clean commercial carburetor cleaning solvent. If a commercial solvent is not available, lacquer thinner or denatured alcohol may be used.

Rinse the parts in kerosene to remove all traces of the cleaning solvent, then dry them with compressed air. Wipe all parts that cannot be immersed in solvent with a clean, soft, dry cloth. Be sure all dirt, gum, carbon, and other foreign matter are removed from all parts.

Force compressed air through all passages of the carburetor.

CAUTION: *Do not use a wire brush to clean any parts or a drill or wire to clean out any openings or passages in the carburetor. A drill or wire may enlarge the hole or passage, changing the calibration of the carburetor.*

Check the choke shaft for grooves, wear, and excessive looseness or binding. Inspect the choke plate for nicked edges and for ease of operation and free it if necessary. Make sure all carbon and foreign material have been removed from the automatic choke housing and the piston. Check the operation of the choke piston in the choke housing to make certain it has free movement. Check the throttle shafts in the bores for excessive looseness or binding and check the throttle plates for burrs which prevent proper closure. Inspect the main body, throttle body, air horn, choke housing, and thermostatic spring housing for cracks.

Replace the float if the arm needle contact surface is grooved. If the float is serviceable, polish the needle contact surface of the arm with crocus cloth or steel wool. Replace the float shaft if worn. Replace all screws and nuts that have stripped threads. Replace all distorted or broken springs. Inspect all gasket mating surfaces for nicks and burrs. Repair or replace any parts that have a damaged gasket surface. Inspect the rubber boot of the antistall dashpot for proper installation in the groove of the stem bushing. Check the stem movement for smooth operation. Do not lubricate the stem. Replace the assembly if it is damaged.

Assembly

(1) Install throttle shaft and lever assembly with torsion throttle return spring and bushing in the throttle body flange.

(2) Position throttle plate on throttle shaft with notch in plate aligned with slotted idle port (fig. 4-21) in the throttle body flange.

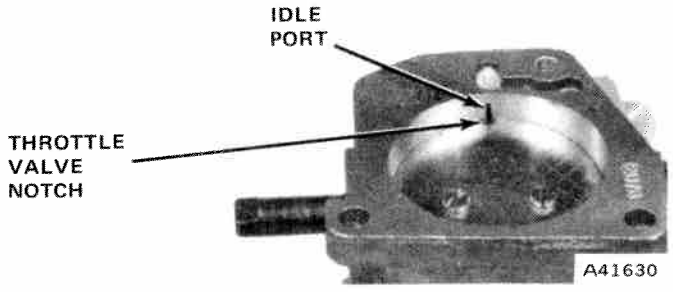


Fig. 4-21 Throttle Valve Alignment

(3) Install throttle plate attaching screws, but do not tighten. Move the shaft back and forth and rotate it to be sure the throttle plate does not bind in the flange bore.

NOTE: *It is necessary that the throttle plate should close tightly in the bore; therefore, idle speed screw should be backed out sufficiently to be sure it does not contact the throttle stop.*

(4) Reposition plate if necessary and tighten and stake (or peen) screws in place.

(5) Place new body flange gasket and main body casting on throttle body flange and install attaching screws and tighten evenly.

(6) Install low speed jet and metering rod jet (fig. 4-22).

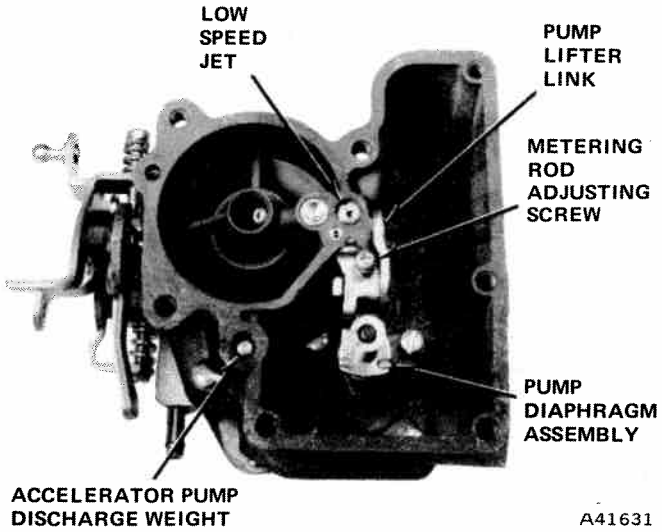


Fig. 4-22 Interior View of Fuel Bowl

(7) Install pump diaphragm in pump diaphragm housing.

(a) Position pump diaphragm spring on diaphragm shaft and housing assembly.

(b) Install spring shim washers.

(c) Install spring retainer, pump lifter link, metering rod arm and spring assembly, and upper pump spring on diaphragm shaft.

(d) Depress spring and install upper pump spring retainer.

(8) Install metering rod on the metering rod arm and place looped end of metering rod arm spring on metering rod (fig. 4-20).

(9) Align pump diaphragm with diaphragm housing (make sure the holes are aligned) and install housing attaching screws.

(10) Align pump housing, pump lifter link, metering rod and baffle plate with main body casting.

(11) Install assembly in main body casting, being careful to engage pump lifter link with main body and to insert metering rod in metering rod jet.

(12) Install the pump housing attaching screws but do not tighten. Push down on the diaphragm shaft to compress diaphragm and tighten attaching screws.

(13) Adjust the metering rod, following procedure under Metering Rod Adjustment.

(14) Install fast idle cam and shoulder screw. Install throttle shaft arm and pump connector link on throttle shaft and pump lifter link. Tighten lock screw.

(15) Assemble choke piston and pin to choke piston lever and link assembly. Install choke shaft assembly in the air horn and position piston (fig. 4-18).

(16) Align piston with cylinder and rotate shaft assembly clockwise until piston pin is inside piston cylinder.

(17) Position choke plate on choke shaft and install screws. Do not tighten screws.

(a) Check choke plate movement to be sure it does not bind.

(b) Tighten and peen or stake screws to prevent loosening.

(c) Install choke link lever and tighten attaching screw.

(18) Install needle seat and gasket in air horn. With air horn inverted, install needle, pin spring, needle pin, float and lever assembly, and float pin. Adjust float level to specifications.

(19) Place pump check ball and weight in main body casting.

(a) Position new air horn gasket, air horn assembly, and dashpot or solenoid bracket on main body.

(b) Install and tighten attaching screws.

(20) Install thermostatic coil housing, gasket and baffle plate, identification mark facing outward, with gasket between baffle and coil housing.

NOTE: *Be sure the thermostatic spring engages choke lever tang.*

(21) Install retainers and housing screws. Set coil housing index to specifications and tighten screws.

(22) Install air cleaner bracket and fast idle link.

SERVICE ADJUSTMENT PROCEDURES

Float Level Adjustment

(1) Remove carburetor air horn and gasket from carburetor.

(2) Invert air horn assembly, and check clearance from top of float to bottom of air horn with float level gauge (fig. 4-23). Hold air horn at eye level when gauging float level. The float arm (lever) should be resting on the needle pin.

CAUTION: *Do not load the needle when adjusting the float. Bend float arm as necessary to adjust the float level (refer to Carburetor Service Specifications for proper clearance).*

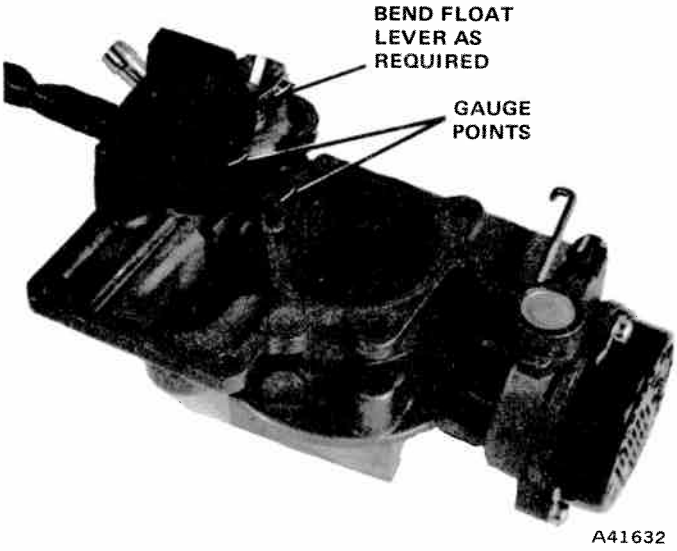


Fig. 4-23 Float Level Adjustment

NOTE: *Do not bend the tab at the end of the float arm. It prevents the float from striking to bottom of the fuel bowl when empty.*

(3) Install carburetor air horn and a new gasket on the carburetor.

Float Drop Adjustment

(1) Remove carburetor air horn and gasket from carburetor.

(2) Hold air horn upright and let float hang free. Measure the maximum clearance from top of float to bottom of air horn with float drop gauge. (Refer to Carburetor Service Specifications for proper clearance.) Hold air horn at eye level when gauging dimension (fig. 4-24).

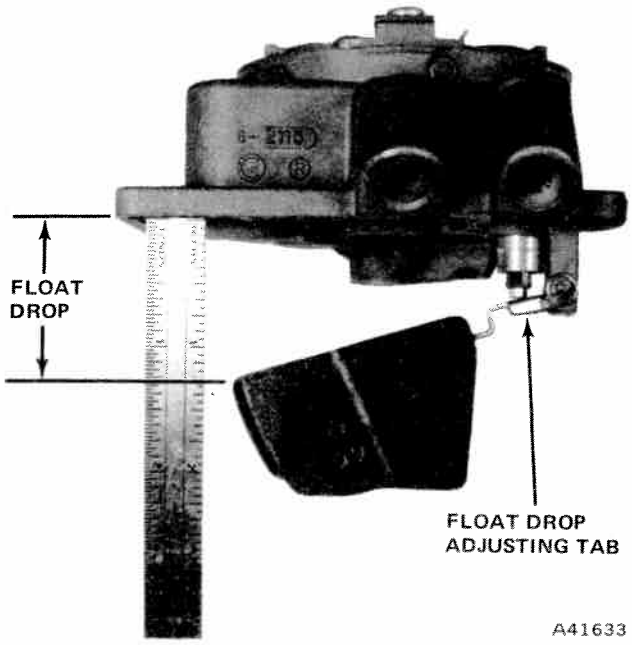


Fig. 4-24 Float Drop Adjustment

(3) Bend tab at end of float arm to obtain specified setting.

(4) Install carburetor air horn and new gasket on carburetor.

Metering Rod Adjustment

(1) Remove carburetor air horn and gasket from carburetor.

(2) Back out idle speed adjusting screw until throttle plate is closed tight in throttle bore.

(3) Press down on end of pump diaphragm shaft until assembly bottoms.

(4) To adjust metering rod, hold diaphragm assembly as in step (3), then turn rod adjustment screw (fig. 4-25) until metering rod just bottoms in body casting.

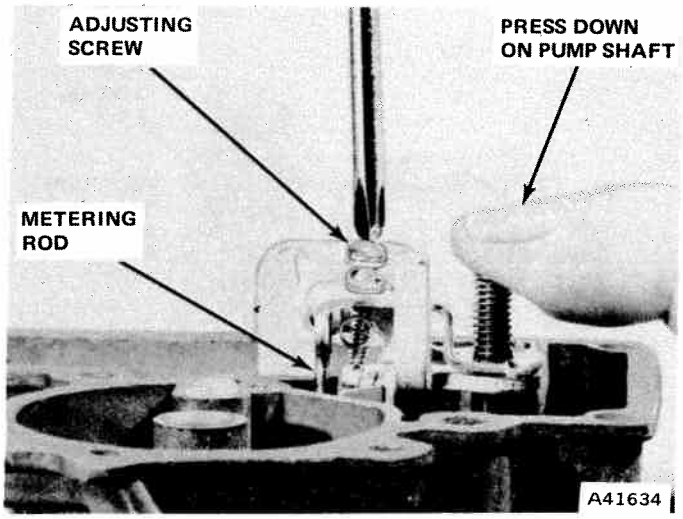


Fig. 4-25 Metering Rod Adjustment

(5) Turn metering rod adjustment screw in (clockwise) one addition turn for final adjustment.

(6) Install carburetor air horn and new gasket on carburetor.

Initial Choke Valve Clearance Adjustment

(1) Bend a 0.025-inch wire gauge at a 90-degree angle approximately ⅛ inch from end. Partially open throttle and close choke valve to position choke piston at top of its bore.

(2) Holding choke valve fully closed, release throttle and insert wire gauge into piston slot and against outboard side (right side of choke shaft) of piston bore. Push piston downward with gauge until bent end of gauge enters slot in piston bore. With gauge in place, push on choke shaft bimetal lever in counterclockwise direction to move piston upward, locking gauge in place (fig. 4-26).

(3) Measure clearance between lower edge of choke valve and air horn wall (refer to Carburetor Service Specifications for the correct setting).

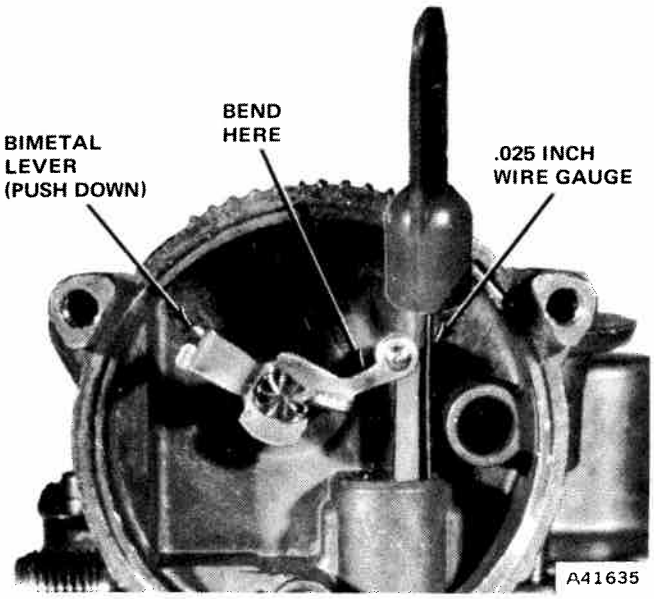


Fig. 4-26 Initial Choke Valve Clearance Adjustment

(4) Adjust clearance by carefully bending choke piston lever with a pair of needlenose pliers.

NOTE: *Decrease clearance by bending toward piston and increase clearance by bending away from piston.*

(5) Install choke baffle plate (embossed cross outward), choke cover gasket, and choke cover. Be sure that the thermostatic coil properly engages the bimetal lever.

(6) Install choke cover retainers and retaining screws, but do not tighten. Adjust choke as outlined under Automatic Choke Adjustment.

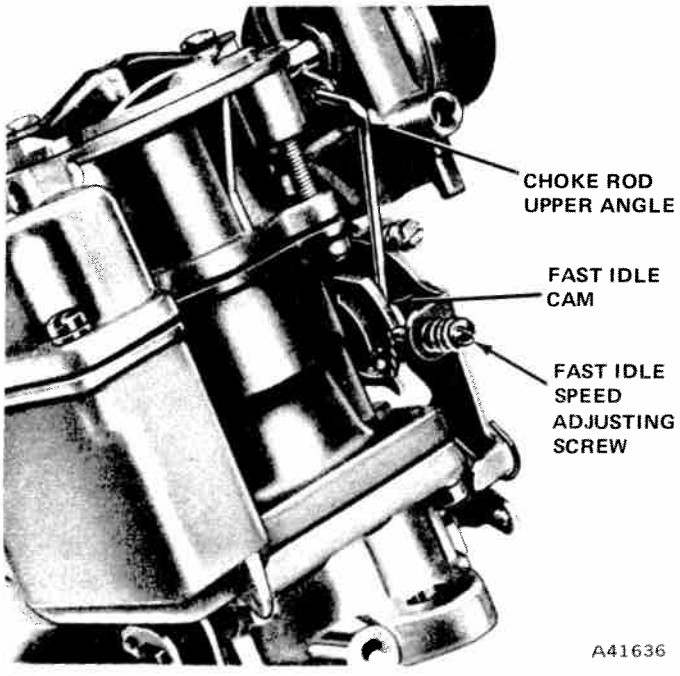


Fig. 4-27 Fast Idle Cam Linkage Adjustment

Fast Idle Cam Linkage Adjustment

(1) Position fast idle screw on second step of fast idle cam against shoulder of high step.

(3) Adjust by bending choke plate connecting rod to obtain specified clearance between lower edge of choke plate and air horn wall. (Refer to Carburetor Service Specifications for proper clearance.)

Choke Unloader Adjustment

(1) Hold throttle fully open and apply pressure on choke valve toward closed position.

(2) Measure clearance between lower edge of choke valve and air horn wall. (Refer to Carburetor Service Specifications for correct setting.)

(3) Adjust by bending unloader tang which contacts the fast idle cam as shown in figure 4-28.

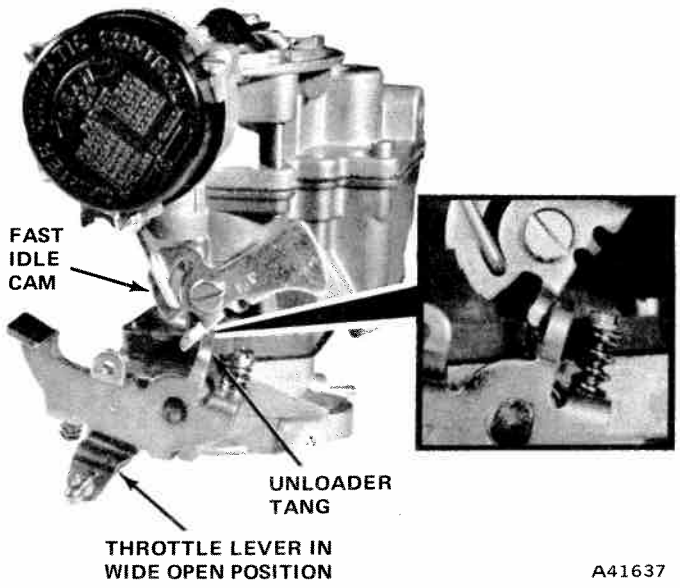


Fig. 4-28 Choke Unloader Adjustment

NOTE: *Bend toward cam to increase clearance and away from cam to decrease clearance.*

CAUTION: *Do not bend the unloader tang downward from a horizontal plane. After making the adjustment, be sure that the unloader tang has at least 0.070-inch clearance from the main body flange when the throttle is fully open (fig. 4-29).*

(4) Operate throttle and check unloader tang to be sure it does not bind, contact, or stick on any part of carburetor casting or linkage. After carburetor installation, check for full throttle opening when throttle is operated from **inside** the vehicle.

NOTE: *If full throttle opening is not obtainable, it may be necessary to remove excess padding under floor mat or reposition throttle cable bracket located on the engine.*

MODEL YF CARBURETOR CALIBRATIONS

List No.	6431	6511	7001	7029
Throttle Bore Size	1.6870	1.6870	1.6870	1.6870
Main Venturi Size	1.3120	1.3120	1.3120	1.3120
Fuel Inlet Diameter	0.0935	0.0935	0.0935	0.0935
Low Speed Jet	0.0330	0.0330	0.0330	0.0330
Bypass Air Bleed	0.0465	0.0465	0.0465	0.0465
Economizer	0.0595	0.0595	0.0595	0.0635
Idle Air Bleed	0.0465	0.0465	0.0465	0.0465
Metering Rod Jet Number	120-401	120-401	120-401	120-401
Metering Rod Jet Size	0.1010	0.1010	0.1010	0.1010
Metering Rod Number	75-1990	75-1990	75-1990	75-1990
Economy Step	0.0770	0.0770	0.0770	0.0770
Intermediate Step	0.0655	0.0655	0.0655	0.0655
Power Step	0.0500	0.0500	0.0500	0.0500
Step Up Limiter Shim	None	None	None	None
Nozzle Bleed	0.0635	0.0635	0.0635	0.0635
Anti-Perc Bleed	0.0280	0.0280	0.0280	0.0280
Pump Discharge Nozzle (Jet)	0.0280	0.0280	0.0280	0.0280
Vacuum Spark Port	0.0520	0.0520	0.0520	0.0520
Spark Port Location Above Closed Throttle	0.0220	0.0220	0.0220	0.0220
Choke Heat Bypass (Drilled)	0.1250	0.1250	0.1250	0.1250
Choke Heat Inlet (Brass Restriction)	0.0700	0.0700	0.0700	0.0700
Choke Vacuum Restriction	0.0890	0.0890	0.0890	0.0890

Automatic Choke Adjustment (On or Off Car)

The automatic choke setting is made by loosening the choke cover retaining screws and rotating the cover in the desired direction as indicated by an arrow on the face of the cover (refer to Carburetor Service Specifications for the correct setting). The specified setting will be satisfactory for most driving conditions. In the event that stumbles or stall occur on acceleration during engine warmup, the choke may be set richer or leaner, using the tolerance provided, to meet individual engine requirements.

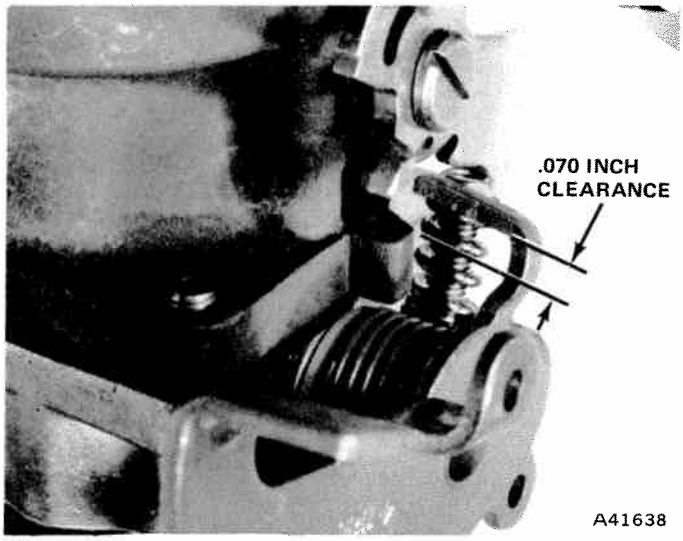


Fig. 4-29 Unloader-to-Body Clearance

Idle Speed and Mixture Adjustment (On Car)

Refer to Engine Idle Setting Procedures in the Emission Control section.

Dashpot Adjustment (On Car)

With the throtte set at curb idle position, fully depress the dashpot stem and measure the clearance between the stem and the throttle lever (fig. 4-30). Refer to Carburetor Service Specifications for the correct setting. Adjust by loosening the locknut and turning the dashpot.

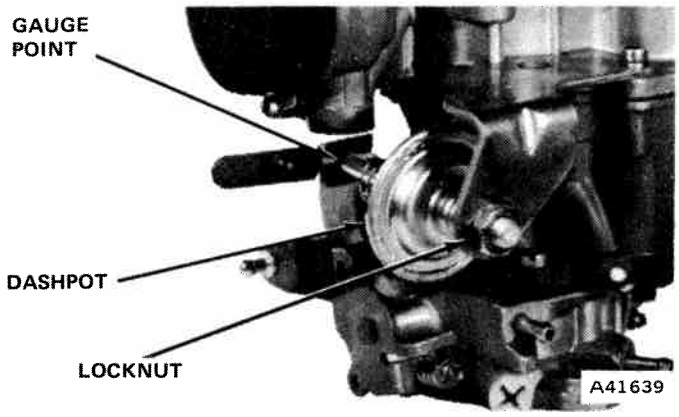


Fig. 4-30 Dashpot Adjustment

Fast Idle Speed Adjustment (On Car)

Set the fast idle speed with the engine at operating temperature and the fast idle adjusting screw in contact with the second step and against the shoulder of the high step of the fast idle cam (refer to Carburetor Service Specifications for the correct setting). Adjust by turning the fast idle adjustment screw.

NOTE: *When adjusting fast idle speed, disconnect and plug vacuum hose at EGR valve and disconnect electrical connector from TCS solenoid vaccum valve.*

CARBURETOR MODEL 2100
2-VENTURI

GENERAL

The Model 2100 carburetor is a two-venturi carburetor which incorporates two lightweight aluminum assemblies, the air horn and the main body.

The air horn assembly serves as the main body cover and also contains the choke assembly and fuel bowl vents.

The throttle shaft assembly and all units of the fuel metering systems are contained in the main body assembly. The automatic choke assembly and the dashpot are attached to the main body (fig. 4-31).

Identification

The carburetor is identified by a code number and build date which is stamped on the identification tag. Each carburetor build month is coded alphabetically beginning with the letter "A" in January and ending with the letter "M" in December (the letter "I" is not used). The tag is attached to the carburetor and must remain with the carburetor to assure proper identification (fig. 4-32).

CARBURETOR CIRCUITS

The Model 2100 carburetor utilizes four basic fuel metering circuits: the idle (low speed) circuit provides a fuel-air mixture for idle and low speed performance; the main metering (high speed) circuit provides an economical mixture for normal cruising speeds; the pump circuit provides additional fuel during low speed acceleration; and the power enrichment circuit provides a very rich mixture when high power output is needed.

In addition to these four basic metering circuits, the carburetor contains a float (fuel inlet) and choke circuit.

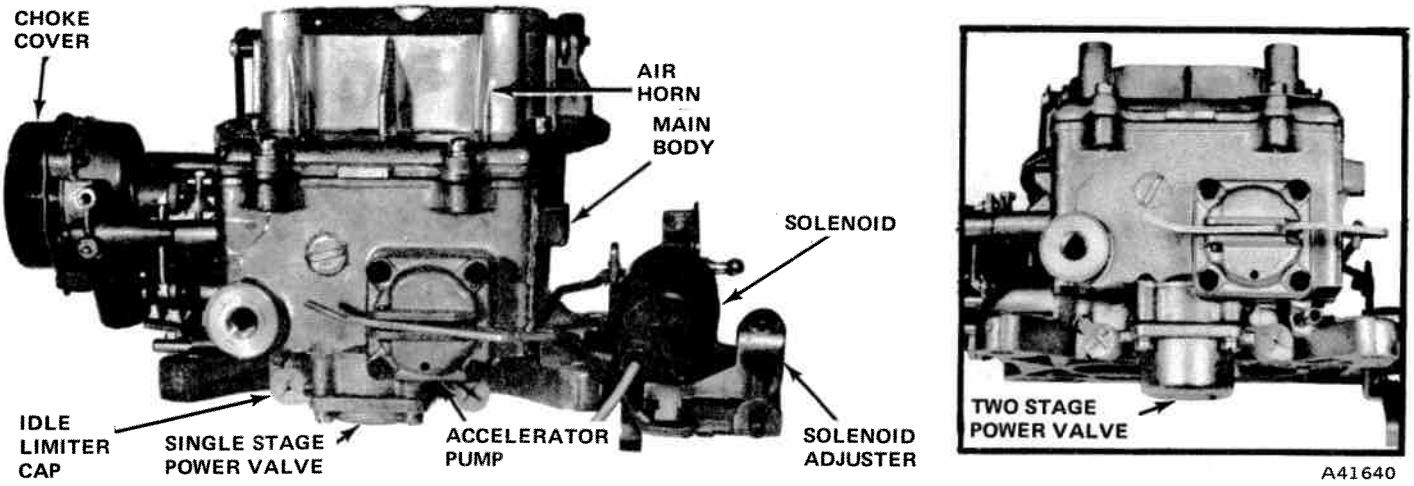


Fig. 4-31 Carburetor Model 2100

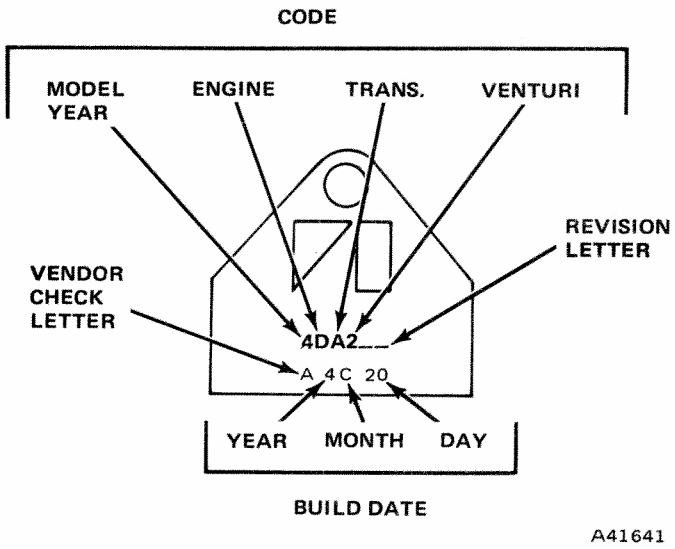


Fig. 4-32 Identification Tag

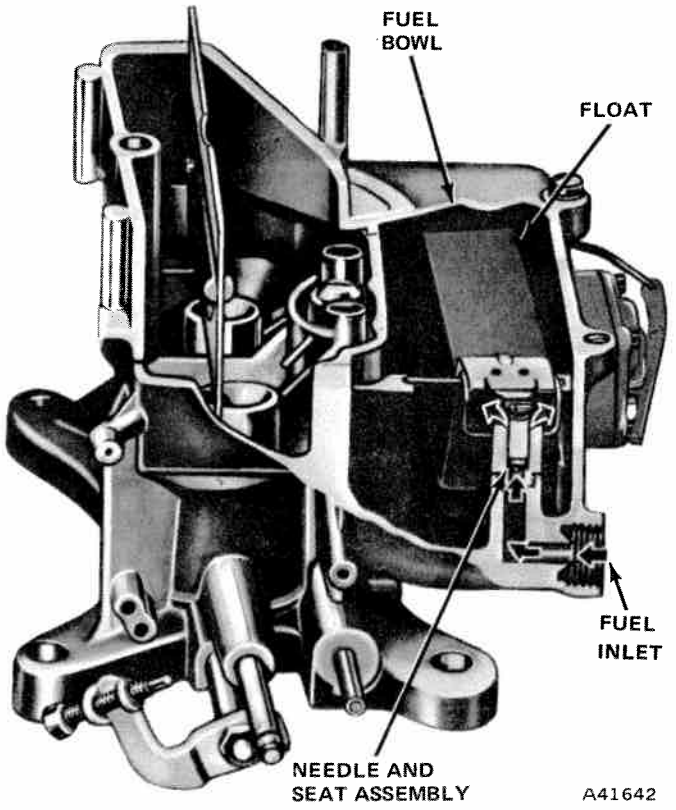


Fig. 4-33 Float Circuit

Float (Fuel Inlet) Circuit

Fuel under pressure enters the fuel bowl through the fuel inlet fitting in the main body.

The Viton-tipped fuel inlet needle is controlled by the float and lever assembly which is hinged on a float shaft. A wire retainer is hooked over grooves on opposite ends of the float shaft and into a groove behind the fuel inlet needle seat. The reatiner holds the float shaft firmly in the buel bowl guides and also centers the float assembly in the fuel bowl.

An integral retaining clip is hooked over the end of the float lever and attached to the fuel inlet needle. This assures reaction of the fuel inlet needle during downward movement of the float (fig. 4-33).

The float circuit maintains a specified fuel level in the bowl, enabling the basic fuel metering circuits to deliver the proper mixture to the engine. The amount of fuel entering the bowl is regulated by the distance the fuel inlet needle is raised off its seat. The float drops as the fuel level drops and raises the fuel inlet needle off its seat. This permits additional fuel to enter the bowl past the fuel inlet needle. When the fuel reaches a preset level, the fuel inlet needle is lowered to a position at which only enough fuel is admitted to replace that being used.

Idle (Low Speed) Circuit

Fuel for idle and low speed operation flows from the fuel bowl through the main jets into the main wells. From the main wells, the fuel is metered as it passes through calibrated restrictions at the lower end of the idle tubes. After flowing through the idle tubes, the fuel enters diagonal passages above the tubes. The fuel is metered again as it flows downward through restric-

tions at the lower end of the diagonal passages and then enters the idle passages in the main body (fig. 4-34).

Air enters the idle system through air bleeds which are located in the main body directly below the booster venturi. The air bleeds serve as anti-siphon vents during off-idle, high speed operation, and when the engine is stopped.

The fuel-air mixture moves down the idle passages past the idle transfer slots which serve as additional air bleeds during curb idle opeartion. The fuel-air mixture then moves past the idle mixture adjusting screw tips which control the amount of discharge. From the adjusting screw ports, the fuel-air mixture moves through short horizontal passages and is discharged below the throttle valves.

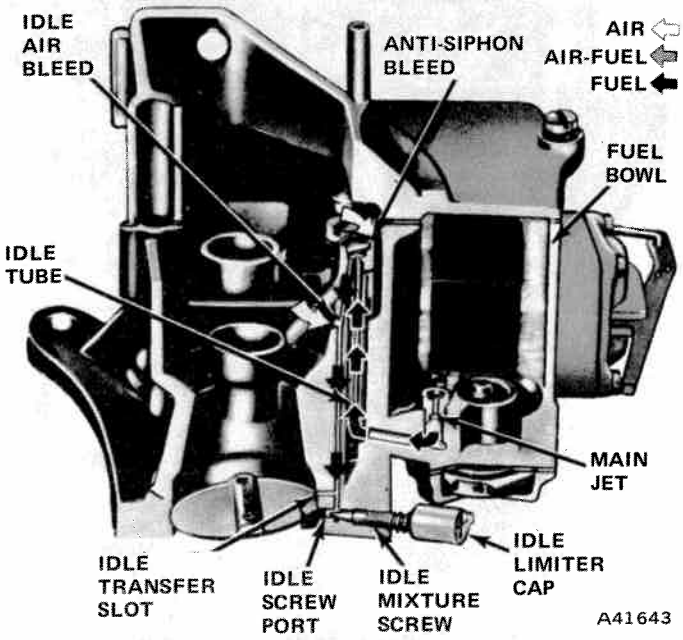


Fig. 4-34 Idle Circuit

At speeds slightly above idle, the idle transfer slots begin discharging the fuel-air mixture as the throttle valves expose them to manifold vacuum as the throttle valves continue opening and engine speed increases, the airflow through the carburetor increases proportionately. This increased airflow creates a vacuum in the venturi and the main metering system begins discharging a fuel-air mixture. The discharge from the idle circuit tapers off as the main metering circuit begins discharging.

Main Metering (High Speed) Circuit

As engine speed increases, the air velocity through the booster venturi creates a vacuum (low pressure area). Fuel begins to flow through the main metering circuit due to atmospheric pressure in the fuel bowl and low pressure at the main discharge ports. Fuel flows from the fuel bowl, through the main jets, and into the main wells. The fuel then moves up the main well tubes where it is mixed with air. The air, supplied through the main air bleeds, mixes with the fuel through small holes in the sides of the main well tubes. The main air bleeds meter an increasing amount of air, whenever venturi vacuum increases, to maintain the proper fuel-air ratio. The mixture of fuel and air, being lighter than raw fuel, responds quickly to changes in venturi vacuum. It also atomizes more readily than raw fuel.

The fuel-air mixture moves from the main well tubes to the discharge ports and is discharged into the booster venturi (fig. 4-35).

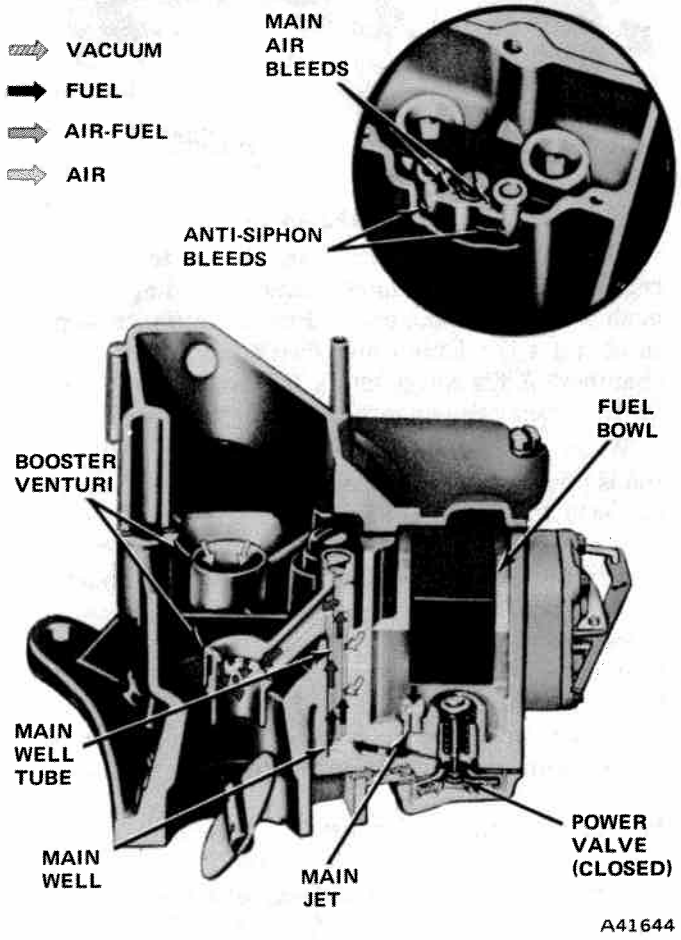


Fig. 4-35 Main Metering Circuit

Anti-siphon air bleeds, located near the top of the main well tubes, prevent siphoning of fuel from the main well when decelerating.

Pump Circuit

When the throttle valves are opened quickly, the airflow through the carburetor responds almost immediately. Since the flowing fuel is heavier than air, there is a brief lag in time before the fuel flow can gain sufficient speed to maintain the proper fuel-air ratio. During this lag, the pump circuit supplies the required fuel until the proper fuel-air ratio can be maintained by the other metering circuits (fig. 4-36).

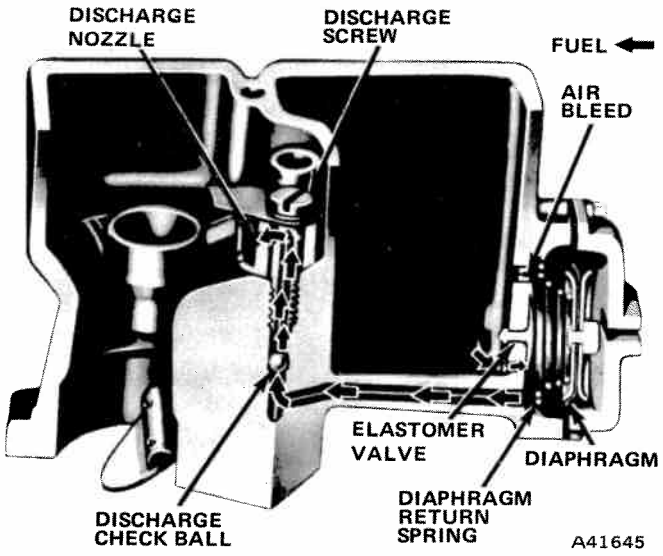


Fig. 4-36 Pump Circuit

When the throttle valves are closed, the diaphragm return spring exerts force against the diaphragm and pushes it against the cover. Fuel is drawn through the inlet, past the Elastomer valve, and into the pump chamber. A discharge check ball and weight prevents air from being drawn into the pump chamber.

When the throttle valves are opened, the diaphragm rod is pushed inward, forcing fuel from the pump chamber into the discharge passages. The Elastomer valve seals the inlet hole during pump operation preventing fuel from returning to the fuel bowl. Fuel under pressure unseats the discharge check ball and weight and is forced through the pump discharge screw. The fuel is then sprayed into the main venturi through discharge ports.

An air bleed is provided in the pump chamber to prevent vapor accumulation and pressure buildup.

Power Enrichment Circuit

During heavy load conditions or high speed operation, the fuel-air ratio must be increased for higher engine output. The power enrichment circuit supplies extra fuel during this period and is controlled by intake manifold vacuum (fig. 4-37).

Manifold vacuum is applied to the power valve diaphragm from an opening in the base of the main body, through a passage in the main body and power valve chamber to the power valve diaphragm. During idle and normal driving conditions, manifold vacuum is high enough to overcome the power valve spring tension and hold the valve closed. When higher engine output is required, the increased load on the engine results in decreased manifold vacuum. The power valve spring opens the first stage of the power valve when manifold vacuum drops below a predetermined value and a small amount of fuel flows through the valve.

When manifold vacuum drops to a lower value, the power valve spring opens the second stage of the power valve and allows a greater amount of fuel to flow through the valve.

The fuel which flows through the power valve is added to the fuel in the main metering circuit to enrich the mixture. As engine load requirements decrease, manifold vacuum increases and overcomes the tension of the power valve spring, closing the power valve.

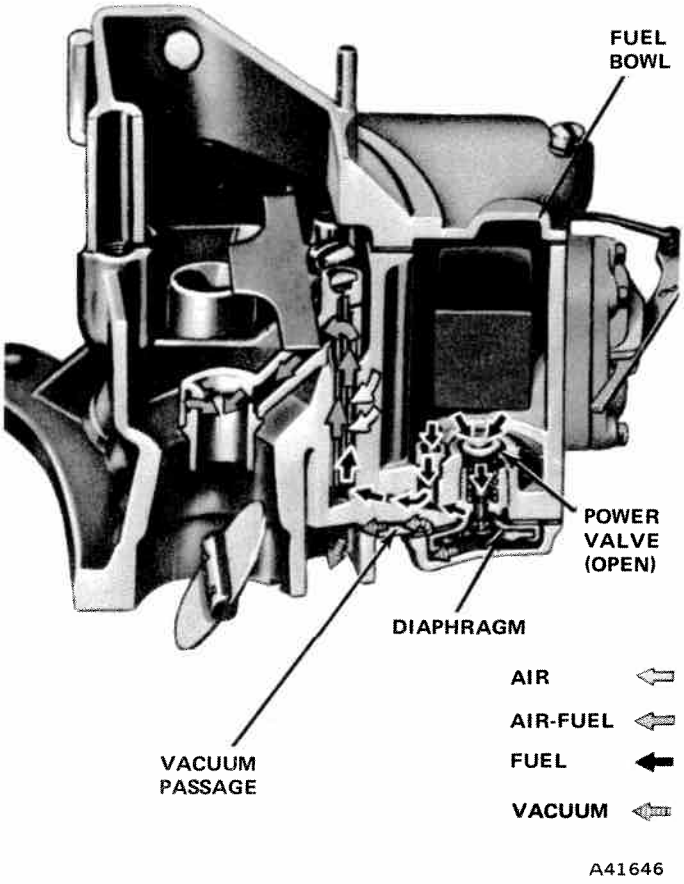


Fig. 4-37 Power Enrichment Circuit

Choke Circuit

The choke valve, located in the air horn assembly, provides a high vacuum above as well as below the throttle valves when closed. During cranking, vacuum above the throttle valves causes fuel to flow from the main metering and idle circuits. This provides the richer fuel-air mixture required for cold engine starting.

The choke shaft is connected by linkage to a thermostatic coil which winds up when cold and unwinds when warm.

The position of the choke valve is controlled by the action of a two-stage vacuum modulator exerting force againt the tension of the thermostatic coil (fig. 4-38).

When the engine is cold, tension of the thermostatic coil holds the choke valve closed. When the engine is started, manifold vacuum is channeled through an opening at the base of the carburetor through a passage at the bottom side of the modulator diaphragm assembly, moving the diaphragm downward against the stop screw.

At the same time, the modulator arm contacts a tang on the choke shaft. The downward movement of the diaphragm assembly compresses the piston spring and exerts a pulling force on the modulator arm, causing the choke valve to open slightly. This first stage of the vacuum modulator is known as initial choke valve clearance.

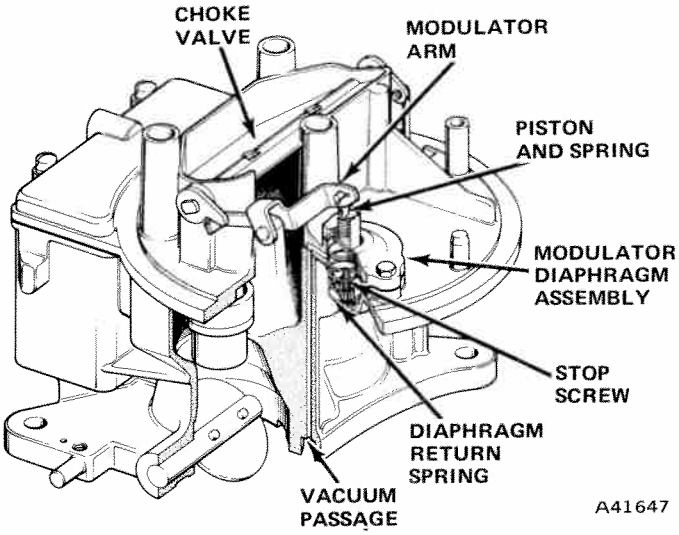


Fig. 4-38 Choke Circuit

As the engine begins to warm up, heated air from the exhaust crossover is routed through a heat tube to the choke housing. A thermostatic bypass valve, which is integral with the choke heat tube, helps prevent premature choke valve opening during the early part of the warmup period. The valve regulates the temperature of the hot airflow to the choke housing by allowing outside unheated air to enter the heat tube. A thermostatic disc is incorporated in the valve which is calibrated to close the valve at 75° F and open it at 55° F.

The heated air entering the choke housing causes the thermostatic coil to begin unwinding and decreases the closing force exerted against the choke valve. The second stage of the vacuum modulator takes place at this time. The tension of the compressed piston spring causes the modulator arm to push against the tang on the choke shaft and further increases the choke valve opening.

As the engine continues to warm up, the heated air rises in temperature. The coil gradually loses its tension and allows the choke valve to open. The heated air is exhausted into the intake manifold.

When the engine reaches operating temperature, the thermostatic coil continues unwinding and exerts pressure against the choke linkage, forcing the choke valve fully open. A continual flow of warm air passes through the choke housing. The thermostatic coil remains heated and the choke valve remains fully open until the engine is stopped and allowed to cool.

During the warmup period, a fast idle must be provided to prevent engine stalling. The fast idle cam, actuated by the choke rod, contacts the fast idle speed adjustment screw and increases engine speed in proportion to the choke valve opening. When the choke valve reaches the fully open position, the fast idle cam rotates free of the fast idle speed adjusting screw, allowing the throttle lever to return to curb idle.

If the engine is accelerated during the warmup period, the resulting drop in manifold vacuum allows the thermostatic coil to momentarily close the choke valve. This provides a richer mixture to prevent engine stalling.

Should the engine become flooded during the starting period, the unloader tang on the fast idle lever contacts the fast idle cam when the accelerator is fully depressed. The choke valve is partially opened by attaching linkage and permits unloading of a flooded engine.

REMOVAL

Flooding, stumble on acceleration, and other performance problems are, in many instances, caused by the presence of dirt, water, or other foreign matter in the carburetor. To aid in diagnosing the cause of the problem, the carburetor should be carefully removed from the engine without removing the fuel from the bowl. The contents of the bowl may be examined for contamination as the carburetor is disassembled.

(1) Remove air cleaner.

(2) Remove throttle cable from throttle lever and disconnect distributor vacuum line, PCV hose, in-line fuel filter, and choke heat tube at carburetor.

(3) Remove carburetor retaining nuts, them remove carburetor. Remove carburetor mounting gasket, spacer, and lower gasket from intake manifold.

INSTALLATION

(1) Clean gasket mounting surfaces of spacer and carburetor. Place spacer between two new gaskets and position spacer and gaskets on the intake manifold. Position carburetor on spacer and gasket and secure it with retaining lockwashers and nuts. To prevent leakage, distortion, or damage to the carburetor body flange, snug the nuts; then, alternately tighten each nut in a criss-cross pattern to 12-15 foot-pounds torque.

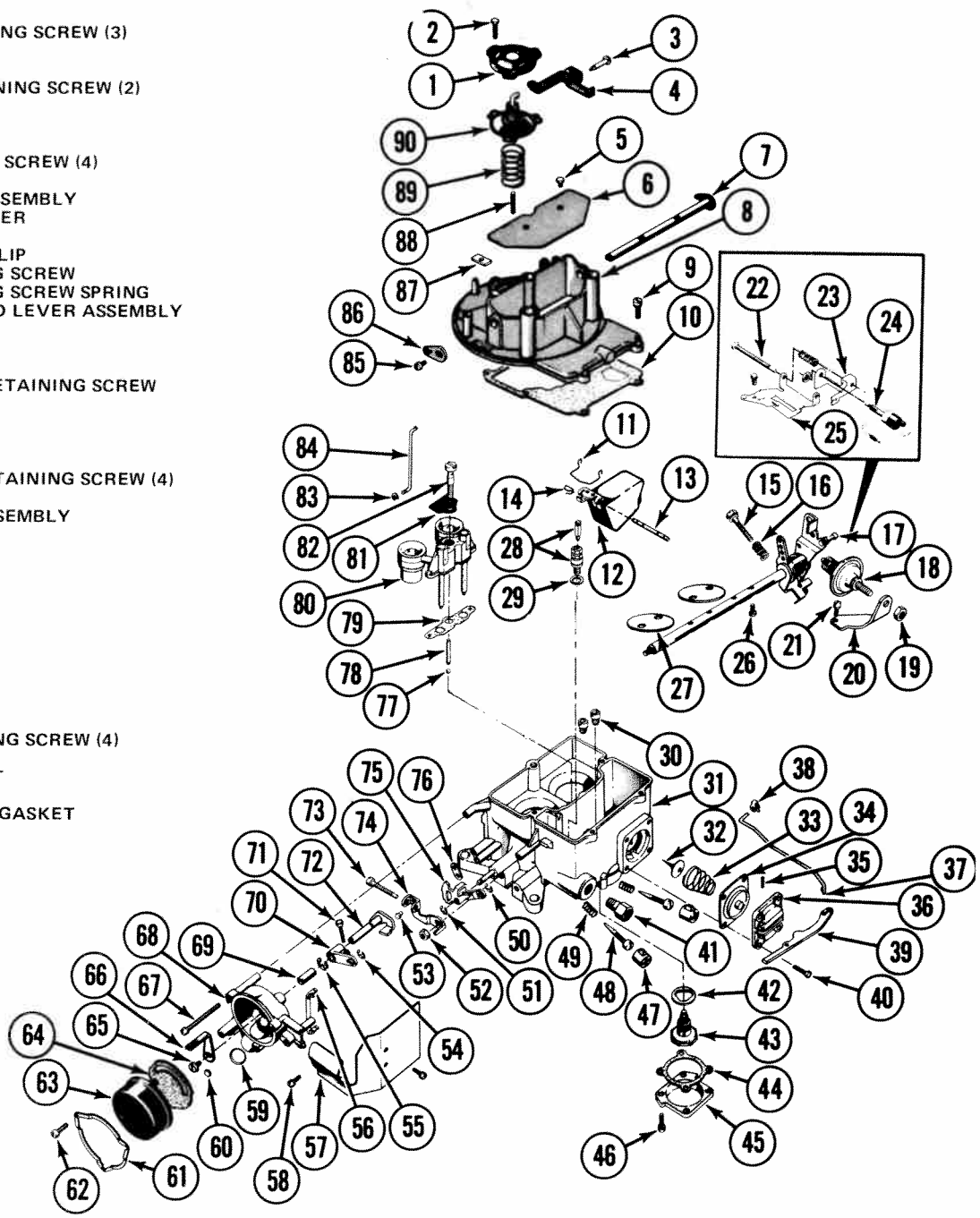
(2) Connect in-line fuel filter, throttle cable, choke heat tube, PCV hose, and distributor vacuum line.

(3) Adjust engine idle speed, idle fuel mixture, and antistall dashpot if equipped. Install air cleaner.

OVERHAUL

The following procedure applies to complete overhaul, with the carburetor removed from the engine.

A complete disassembly is not necessary when performing adjustments. In most cases, service adjustments of individual systems may be completed without removing the carburetor from the engine (refer to Service Adjustment Procedures).



1. MODULATOR COVER
2. MODULATOR RETAINING SCREW (3)
3. PIVOT PIN
4. MODULATOR ARM
5. CHOKE VALVE RETAINING SCREW (2)
6. CHOKE VALVE
7. CHOKE SHAFT
8. AIR HORN
9. AIR HORN RETAINING SCREW (4)
10. AIR HORN GASKET
11. FLOAT AND LEVER ASSEMBLY
12. FLOAT SHAFT RETAINER
13. FLOAT SHAFT
14. NEEDLE RETAINING CLIP
15. CURB IDLE ADJUSTING SCREW
16. CURB IDLE ADJUSTING SCREW SPRING
17. THROTTLE SHAFT AND LEVER ASSEMBLY
18. DASHPOT
19. DASHPOT LOCKNUT
20. DASHPOT BRACKET
21. DASHPOT BRACKET RETAINING SCREW
22. ADJUSTING SCREW
23. CARRIAGE
24. ELECTRIC SOLENOID
25. MOUNTING BRACKET
26. THROTTLE VALVE RETAINING SCREW (4)
27. THROTTLE VALVE (2)
28. NEEDLE AND SEAT ASSEMBLY
29. NEEDLE SEAT GASKET
30. MAIN JET (2)
31. MAIN BODY
32. ELASTOMER VALVE
33. PUMP RETURN SPRING
34. PUMP DIAPHRAGM
35. PUMP LEVER PIN
36. PUMP COVER
37. PUMP ROD
38. PUMP ROD RETAINER
39. PUMP LEVER
40. PUMP COVER RETAINING SCREW (4)
41. FUEL INLET FITTING
42. POWER VALVE GASKET
43. POWER VALVE
44. POWER VALVE COVER GASKET
45. POWER VALVE COVER
46. POWER VALVE COVER RETAINING SCREW (4)
47. IDLE LIMITER CAP (2)
48. IDLE MIXTURE SCREW (2)
49. IDLE MIXTURE SCREW SPRING (2)
50. RETAINER
51. RETAINER
52. FAST IDLE LEVER RETAINING NUT
53. FAST IDLE LEVER PIN
54. RETAINER
55. RETAINER
56. FAST IDLE CAM ROD
57. CHOKE SHIELD
58. CHOKE SHIELD RETAINING SCREW (2)
59. PISTON PASSAGE PLUG
60. HEAT PASSAGE PLUG
61. CHOKE COVER RETAINING CLAMP
62. CHOKE COVER RETAINING SCREW (3)
63. CHOKE COVER
64. CHOKE COVER GASKET
65. THERMOSTAT LEVER RETAINING SCREW
66. THERMOSTAT LEVER
67. CHOKE HOUSING RETAINING SCREW (3)
68. CHOKE HOUSING
69. CHOKE SHAFT BUSHING
70. FAST IDLE CAM LEVER
71. FAST IDLE CAM LEVER ADJUSTING SCREW
72. THERMOSTATIC CHOKE SHAFT
73. FAST IDLE SPEED ADJUSTING SCREW
74. FAST IDLE LEVER
75. FAST IDLE CAM
76. CHOKE HOUSING GASKET
77. PUMP DISCHARGE CHECK BALL
78. PUMP DISCHARGE WEIGHT
79. BOOSTER VENTURI GASKET
80. BOOSTER VENTURI ASSEMBLY
81. AIR DISTRIBUTION PLATE
82. PUMP DISCHARGE SCREW
83. RETAINER
84. CHOKE ROD
85. CHOKE LEVER RETAINING SCREW
86. CHOKE PLATE LEVER
87. CHOKE ROD SEAL
88. STOP SCREW
89. MODULATOR RETURN SPRING
90. MODULATOR DIAPHRAGM ASSEMBLY

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Fig. 4-39 Model 2100 Carburetor-Exploded View

A complete carburetor overhaul includes disassembly, thorough cleaning, inspection and replacement of all gaskets and worn or damaged parts. Refer to figure 4-39 for parts identification.

NOTE: *When using an overhaul kit, use all parts included in kit.*

Disassembly

(1) Remove air cleaner anchor screw.
(2) Remove automatic choke control rod retainer.
(3) Remove air horn attaching screws, lockwashers and carburetor identification tag. Remove air horn and air horn gasket.
(4) Remove choke rod by loosening screw that secures choke shaft lever to choke shaft. Remove rod from air horn. Slide plastic dust seal out of air horn.
(5) Remove choke diaphragm assembly (fig. 4-39).

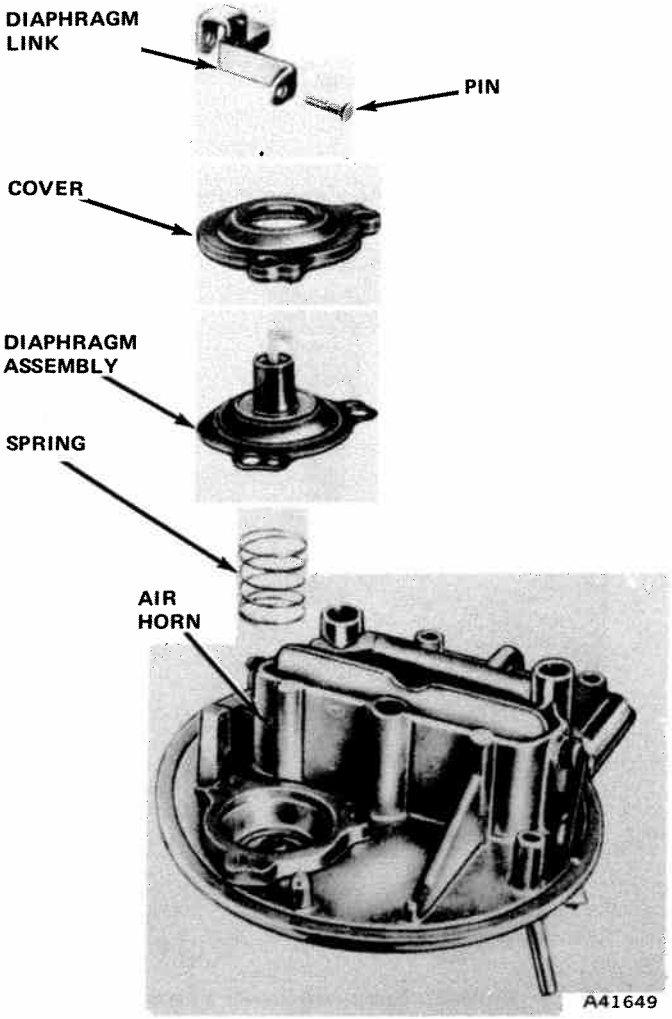


Fig. 4-40 Choke Modulator Assembly

(6) If it is necessary to remove choke plate, remove staking marks on choke plate attaching screws and remove screws. Remove choke plate by sliding it out of the shaft from top of air horn. Slide choke shaft out of air horn.

NOTE: *File off flared portion of choke plate screws to prevent damage to the threads in the shaft.*

(7) Remove fast idle cam reatiner (fig. 4-41).
(8) Remove thermostatic choke spring housing retaining screws and clamp, housing, and gasket.

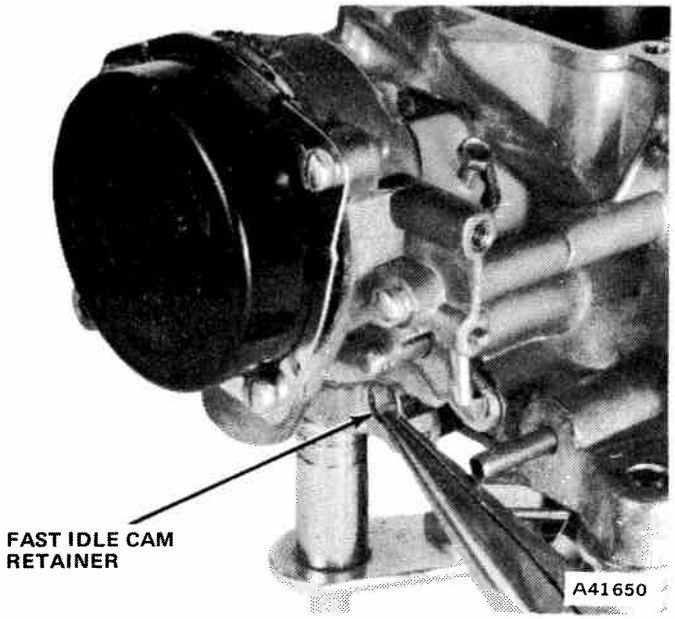


Fig. 4-41 Removing Fast Idle Cam Retainer

(9) Remove choke housing assembly retaining screws, housing assembly, gasket, and fast idle cam and rod from fast idle cam lever.
(10) Remove thermostat lever retaining screw and washer. Disconnect choke control rod from fast idle lever. Remove fast idle lever and fast idle cam lever from the choke housing.
(11) Pry float shaft retainer from fuel inlet seat (fig. 4-42). Remove float, float shaft retainer, and fuel inlet needle assembly. Remove retainer and float shaft from float lever.

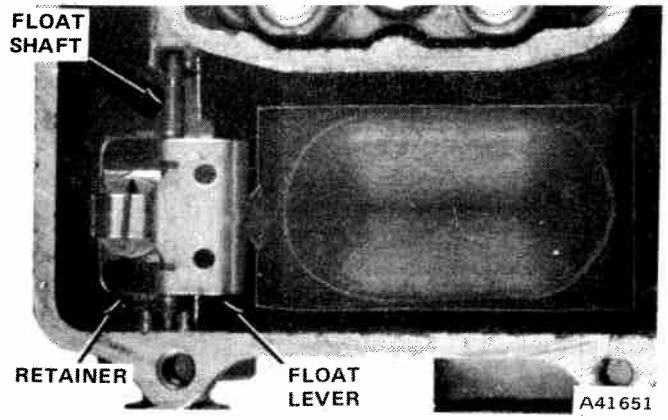


Fig. 4-42 Float Assembly

(12) Remove fuel inlet needle seat and gasket. Remove main jets with Main Metering Jet Wrench J-10174-01 (fig. 4-43).

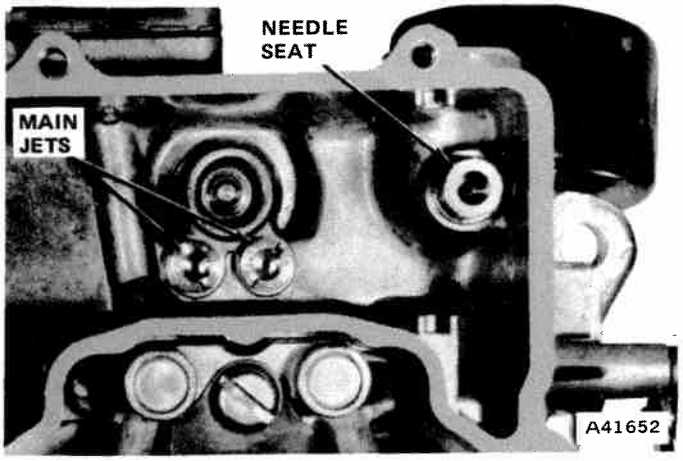


Fig. 4-43 Interior View of Fuel Bowl.

(13) Remove accelerator pump discharge screw, air distribution plate, booster venturi and gasket (fig. 4-44). Invert main body and let accelerating pump discharge weight and ball fall into hand.

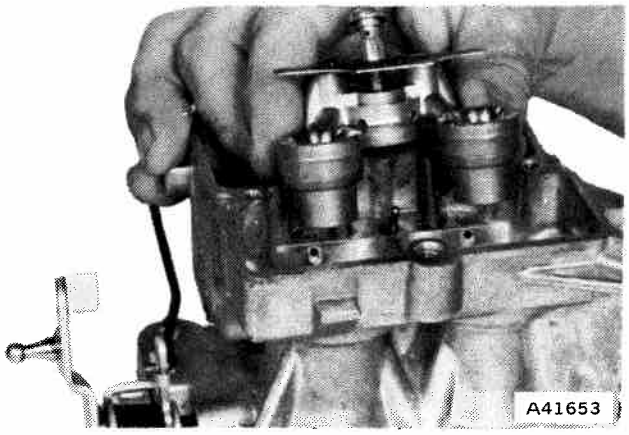


Fig. 4-44 Removing Booster Venturi Assembly

(14) Remove accelerator pump operating rod and retainer from overtravel lever.

NOTE: *To release operating rod from overtravel lever retainer, press ends of retainer together, and at the same time, press rod away from retainer until it is disengaged. Remove rod and retainer.*

(15) Remove accelerating pump cover attaching screws. Remove accelerating pump cover, diaphragm assembly, and spring (fig. 4-45).

(16) Remove Elastomer valve, by grasping firmly and pulling out.

NOTE: *If the Elastomer valve tip broke off during removal, be sure to remove the tip from the fuel bowl. Elastomer valve must be replaced whenever it has been removed from the carburetor.*

(17) Invert main body and remove power valve cover, gasket, and power valve with Power Valve Socket Tool J-10175 (fig. 4-46). Remove and discard the power valve gasket.

(18) Remove idle mixture adjusting screws and springs. Remove limiter caps from adjusting screws.

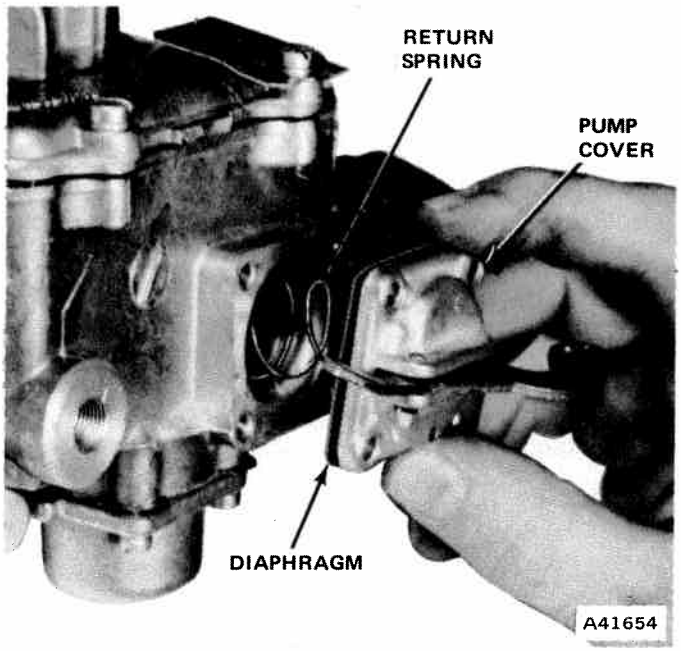


Fig. 4-45 Removing Accelerator Pump Assembly

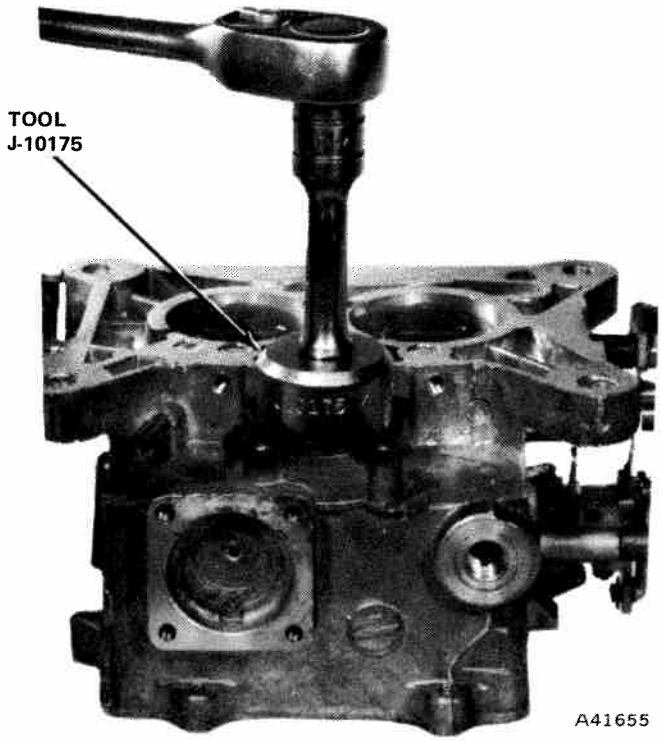


Fig. 4-46 Removing Power Valve

(19) Remove nut and washer securing fast idle lever assembly to throttle shaft and remove lever assembly. Remove fast idle speed adjusting screw and retainer from fast idle lever.

(20) Remove antistall dashpot or solenoid (if so equipped).

(21) If it is necessary to remove the throttle plates, lightly scribe a line on the throttle plates along throttle shaft, and mark each plate and its corresponding bore with a number or letter for proper installation.

(22) Slide the throttle shaft out of the main body.

Cleaning and Inspection

Dirt, gum, water, or carbon contamination in the carburetor or the exterior moving parts of the carburetor are often responsible for unsatisfactory performance. For this reason, efficient carburetion depends upon careful cleaning and inspection.

The cleaning and inspection of only those parts not included in the carburetor overhaul repair kit are covered here. All gaskets and parts included in the repair kit should be installed when the carburetor is assembled and the old gaskets and parts should be discarded.

Wash all the carburetor parts (except accelerating pump diaphragm, power valve, modulator diaphragm, and the antistall dashpot assembly) in clean commercial carburetor cleaning solvent. If a commercial solvent is not available, lacquer thinner or denatured alcohol may be used. Rinse the parts in kerosene to remove all traces of the cleaning solvent, then dry them with compressed air. Wipe all parts that cannot be immersed in solvent with a clean, soft, dry cloth. Be sure all dirt, gum carbon, and other foreign matter are removed from all parts.

Force compressed air through all passages of the carburetor.

CAUTION: *Do not use a wire brush to clean any parts or a drill or wire to clean out any openings or passages in the carburetor. A drill or wire may enlarge the hole or passage, changing the calibration of the carburetor.*

Check the choke shaft for grooves, wear and excessive looseness or binding. Inspect the choke plate for nicked edges and for ease of operation and free it if necessary. Be sure all carbon and foreign material has been removed from the automatic choke housing. Check the throttle shafts in the bores for excessive looseness or binding and check the throttle plates for burrs which prevent proper closure. Inspect the main body, air horn, booster venturi assemblies, choke housing and thermostatic spring housing, power valve cover and accelerating pump cover for cracks. Replace the float if the arm needle contact surface is grooved. If the float is serviceable, polish the needle contact surface of the arm with crocus cloth or steel wool. Replace float shaft if worn. Replace all screws and nuts that have stripped threads. Replace all distorted or broken springs. Inspect all gasket mating surfaces for nicks and burrs. Repair or replace any parts that have a damaged gasket surface.

Assembly

Be sure all holes in the new gaskets have been properly punched and that no foreign material has adhered to the gaskets. Inspect accelerating pump diaphragm for tears or cuts.

(1) Slide throttle shaft assembly into main body.

(2) Refer to lines scribed on throttle plates and install throttle plates in their proper location with the screws snug, but not tightened.

(3) Close throttle plates.

(4) Invert the main body, and hold it up to the light.

NOTE: *Little or no light should show between the throttle plates and the throttle bores.*

(5) Tap the plates lightly with a screwdriver handle to seat them. Hold the throttle plates closed and tighten attaching screws.

(6) Install fast idle speed adjusting screw on fast idle lever.

(7) Install the antistall dashpot, if so equipped.

(8) Place the fast idle lever assembly on throttle shaft and install retaining washer and nut.

(9) Lubricate tip of new Elastomer valve and insert tip into accelerator pump cavity center hole.

(a) Using a pair of needlenose pliers, reach into fuel bowl and grasp valve tip.

(b) Pull valve in until it seats in pump cavity wall and cut off tip forward of the retaining shoulder.

(c) Remove tip from bowl.

(10) Install accelerating pump diaphragm return spring on boss in chamber. Insert the diaphragm assembly in cover, place cover and diaphragm assembly into position on main body and install cover screws.

(11) Insert accelerating pump operating rod into inboard hole of accelerating pump actuating lever.

(12) Position accelerating pump operating rod retainer over hole 3 (three) in the overtravel lever. Press ends of retainer together and at the same time, insert operating rod through retainer and hole in the overtravel lever. Release ends of retainer to secure rod.

(13) Invert main body and install power valve and new gasket. Tighten the valve securely.

(14) Install idle mixture adjusting screws and springs. Turn needles in gently with fingers until they just touch seat, then back them off two turns for a preliminary idle fuel mixture adjustment.

NOTE: *Do not install idle mixture limiters at this time.*

(15) Install power valve cover and new gasket.

NOTE: *The power valve cover must be installed with the limiter stops on the cover in position to provide a positive stop for the tabs on the idle adjusting limiters.*

(16) Install main jets, fuel inlet seat, and new gasket.

NOTE: *Be sure the correct jets are installed.*

(17) Install fuel inlet needle assembly in fuel inlet seat.

NOTE: *Fuel inlet needles and seats are matched assemblies. Be sure the correct needle and seat are assembled together.*

(18) Slide float shaft into float lever. Position float shaft retainer on float shaft.

(19) Insert float assembly into fuel bowl and hook float lever tab under fuel inlet needle assembly. Insert float shaft into its guides at sides of fuel bowl.

(20) Press float shaft retainer in groove on fuel inlet needle seat and check float setting.

(21) Drop accelerating pump discharge ball into passage in main body.

(a) Drop accelerating pump discharge weight on top of ball.

(b) Position new booster venturi gasket and booster venturi in main body.

(c) Install air distribution plate and accelerator pump discharge screw and tighten screw.

(22) Position fast idle cam lever on thermostatic choke shaft and lever assembly.

NOTE: *The bottom of the fast idle cam lever adjusting screw must rest against the tang on the choke lever.*

(a) Insert choke lever into the rear of choke housing.

(b) Position choke lever so that hole in lever is to left side of choke housing.

(23) Install fast idle cam rod on fast idle cam lever, the fast idle cam on fast idle cam rod, and install retainer.

(24) Place choke housing vacuum pickup port to main body gasket on choke housing flange.

(25) Position choke housing on main body and at the same time, install the fast idle cam on the hub on main body.

(26) Position gasket and install choke housing attaching screws.

(27) Install fast idle cam retainer and choke cover.

(28) If the choke plate shaft was removed, position shaft in air horn, then install choke plate rod on end of choke shaft.

(29) If choke plate was removed, insert choke plate into choke plate shaft.

(a) Install choke plate screws but do not tighten.

(b) Check for proper plate fit, binding in air horn and free rotation of shaft by moving plate from closed to open position. If necessary, remove choke plate and grind or file plate edge where it is binding or scraping on air horn wall. If choke plate and shaft moves freely, tighten choke plate screws while holding choke in fully closed position.

(30) Position main body gasket and choke rod plastic seal on main body.

(31) Position air horn on main body and gasket so that choke plate rod fits through the seal and opening in the main body.

(32) Insert end of choke plate rod into automatic choke lever.

(33) Install the air horn attaching screws and carburetor identification tag, and tighten attaching screws.

(34) Install the choke plate rod retainer.

(35) Install the air cleaner anchor screw. Tighten to 7-12 foot-pounds torque.

(36) Install modulator diaphragm return spring in recess of air horn. Position modulator cover over diaphragm assembly and engage piston rod with keyed slot of modulator arm. Place diaphragm and cover over return spring and install cover retaining screws.

SERVICE ADJUSTMENT PROCEDURES

Float Level Adjustment — Dry

(1) Remove air horn assembly gasket. Raise float by pressing down on float tab until fuel inlet needle is lightly seated.

(2) Using a T-scale, measure distance from the fuel bowl machined surface to the flat surface of either corner of the float, at the free end (refer to Carburetor Service Specifications for the correct setting).

(3) Bend float tab to adjust and hold fuel inlet needle off its seat while adjusting, to prevent damage to the Viton tipped needle (fig. 4-47).

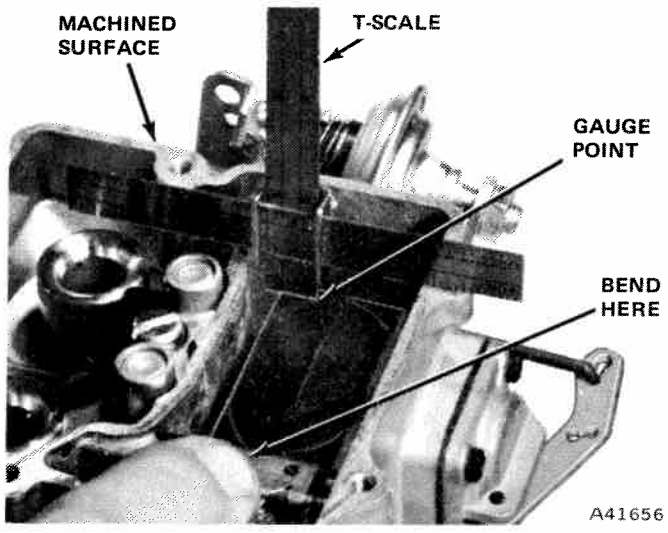


Fig. 4-47 Dry Float Adjustment

Float Level Adjustment - Wet

(1) With vehicle on a flat, level surface and engine at normal operating temperature, remove carburetor air cleaner assembly and anchor screws.

(2) Remove air horn attaching screws and carburetor identification tag. Temporarily place air horn and gas-

ket in position on carburetor main body and start engine. Let engine idle for a few minutes, then rotate air horn out of way and remove air horn gasket to provide access to the float assembly.

(3) While the engine is idling, use a T-scale to measure the vertical distance from the top machined surface of the carburetor main body to the level of the fuel in the fuel bowl (fig. 4-48). The measurement must be at least 1/4 inch away from any vertical surface to assure an accurate reading, because the surface of the fuel is concave (higher at the edges than in the center). Care must be exercised to measure the fuel level at the point of contact with the float with the fuel (refer to Carburetor Service Specifications for the correct fuel level (wer) setting).

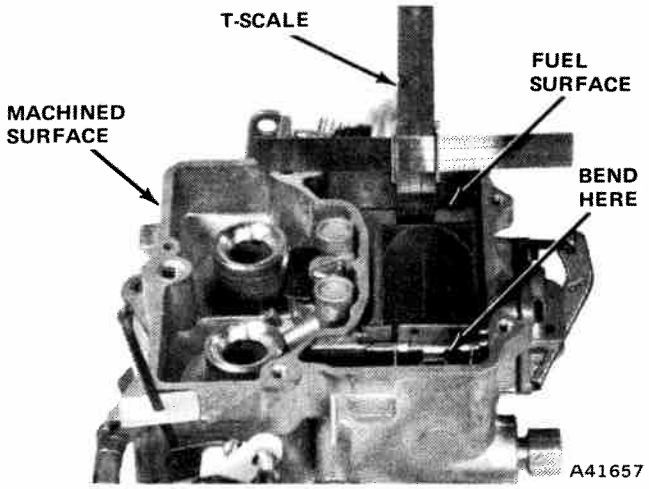


Fig. 4-48 Wet Float Level Adjustment

(4) If any adjustment is required, stop engine to minimize hazard of fire due to fuel spray when float setting is bistributed. To adjust the fuel level, bend the float tab (contacting the fuel inlet valve) upward in relation to the original position to raise the fuel level, and downward to lower it. Each time an adjustment is made to the float tab to alter the fuel level, the engine must be started and permitted to idle for a few minutes to stabilize the fuel level. Check the fuel level after each adjustment until the specified level is obtained.

5) Install a new air horn gasket, the air horn assembly, carburetor identification tag and the attaching screws. Be sure plastic dust seal on choke operating rod is positioned correctly and does not cause rod to bind. Tighten the screws. Install the air cleaner anchor screw and tighten to 7-12 foot-pounds torque.

(6) Check the idle fuel mixture, idle speed adjustments and the carburetor dashpot adjustment (if so equipped). Adjust the carburetor as required (refer to Carburetor Service Specifications).

(7) Install the air cleaner.

Initial Choke Valve Clearance Adjustment

(1) Loosen choke cover retaining screws to allow movement of cover. Rotate choke cover ¼ turn counterclockwise (rich) from index and tighten the retaining screws.

(2) Disconnect choke heat inlet tube. Align fast idle speed adjusting screw with the second step (index) of the fast idle cam.

(3) Start engine without moving acclerator linkage. Turn fast idle cam lever adjusting screw out (counterclockwise) 3 full turns. Measure clearance between the lower edge of choke valve and air horn wall (refer to Carburetor Service Specifications for correct setting).

(4) Adjust by grasping modulator arm securely with a pair of pliers at point A and twisting the arm at point B with a second pair of pliers. Twist toward the front of the carburetor to increase clearance and toward the rear of the carburetor to decrease clearance (fig. 4-49).

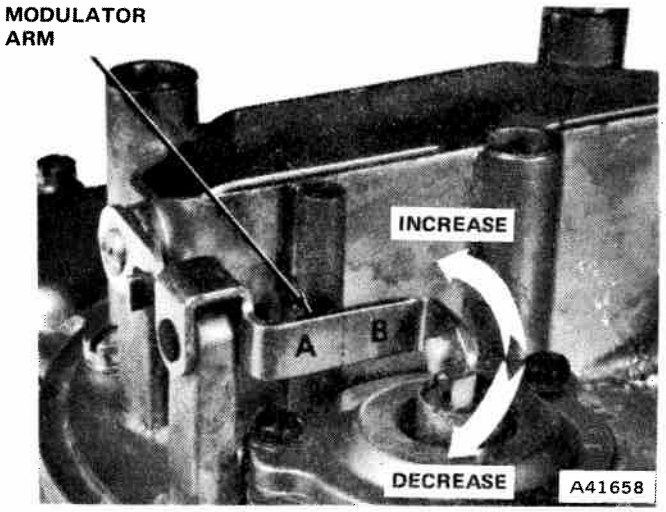


Fig. 4-49 Initial Choke Valve Clearance Adjustment

CAUTION: *Use extreme care while twisting the modulator arm to avoid damaging the nylon piston rod of the modulator assembly.*

(5) After completing adjustment, stop engine and connect choke heat tube. Turn the fast idle cam lever adjusting screw in (clockwise) 3 full turns. Do not reset the choke cover until the fast idle cam linkage adjustment has been performed.

Fast Idle Cam Linkage Adjustment

(1) Push down on fast idle cam lever until fast idle speed adjusting screw is in contact with the second step (index) and against the shoulder of the high step.

(2) Measure clearance between the lower edge of choke valve and air horn wall (fig. 4-50). Refer to Carburetor Service Specifications for the correct setting.

(3) Adjust by turning the fast idle cam lever screw.

(4) Loosen the choke cover retaining screws and adjust the choke as outlined under Automatic Choke Adjustment.

(5) Install choke shield clamp and retaining screws.

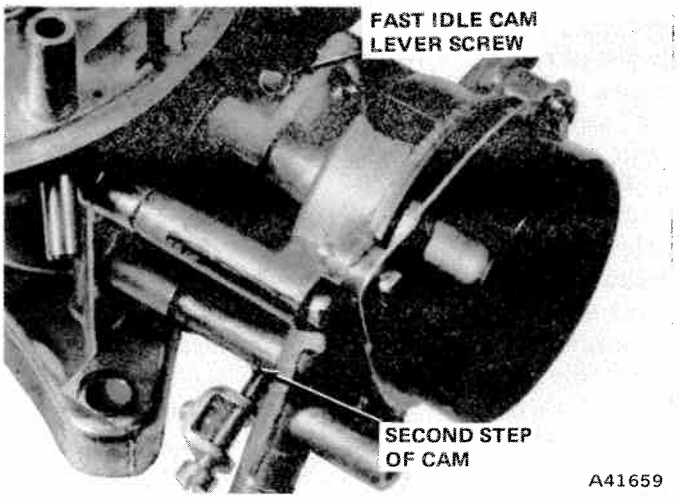


Fig. 4-50 Fast Idle Cam Linkage Adjustment

Choke Unloader Adjustment

(1) Hold throttle fully open and apply pressure on the choke valve toward the close position.

(2) Measure the clearance between the lower edge of choke valve and air horn wall. Refer to Carburetor Service Specifications for correct setting.

(3) Adjust by bending the unloader tang which contacts the fast idle cam, as shown in figure 4-51. **Bend toward the cam to increase the clearance and away from the cam to decrease the clearance.**

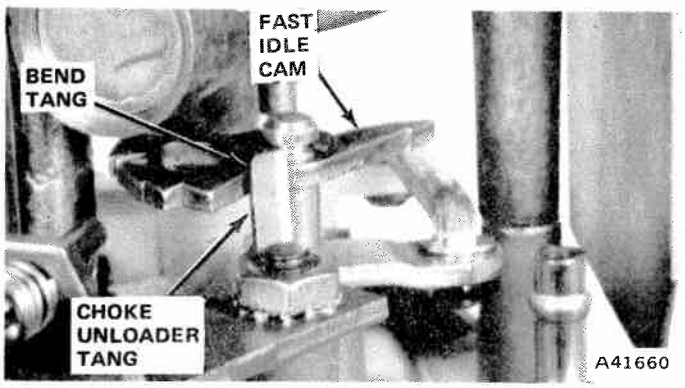


Fig. 4-51 Unloader Adjustment

CAUTION: Do not bend the unloader tang downward from a horizontal plane. *After making the adjustment, open the throttle until the unloader tang is directly below the fast idle cam pivot. There must be exactly 0.070-inch clearance between the unloader tang and the edge of the fast idle cam (fig. 4-52).*

(4) Operate the throttle and check unloader tang to make sure it does not bind, contact, or stick on any part of carburetor casting or linkage. After carburetor installation, check for full throttle opening when the throttle is operated from inside the vehicle. If full throttle opening is not obtainable, it may be necessary to remove excess padding under the floor mat or reposition the throttle cable bracket located on the engine.

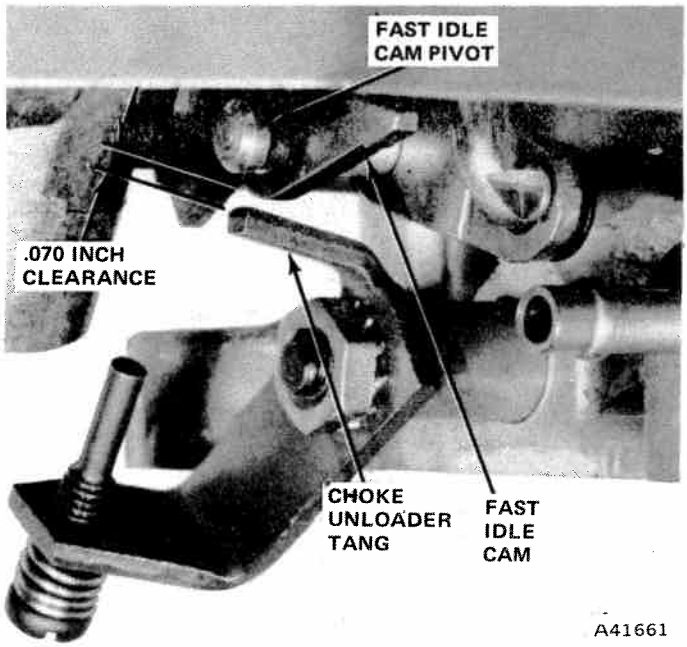


Fig. 4-52 Unloader to Fast Idle Cam Clearance

Automatic Choke Adjustment

Loosen choke cover retaining screws and rotate cover in the desired direction as indicated by an arrow on the face of the cover (refer to Carburetor Service Specifications for the correct setting). The specified setting will be satisfactory for most driving conditions. However, in the event that stumbles or stalls occur on acceleration during engine warmup, the choke may be set richer or leaner using the tolerance provided to meet individual engine requirements.

Acclerating Pump Stroke Adjustment

The accelerating pump stroke has been set to help keep the exhaust emission level of the engine within the specified limits. The additional holes provided for pump stroke adjustment are for adjusting the stroke for specific engine applications. **The stroke should not be changed from the specified setting.** If the pump stroke has been changed from the specified setting refer to Carburetor Service Specifications for correct setting and use the following instructions to correct the stroke to specifications. The primary throttle shaft lever (overtravel lever) has 4 holes and the accelerating pump link has 2 holes (fig. 4-53) to control the accelerating pump stroke.

The accelerating pump operating rod should be in the specified hole in the overtravel lever and the inboard hole (hole closest to the pump plunger) in the accelerating pump link.

(1) Release rod from retaining clip by pressing the tab end of the clip toward the rod and at the same time, press the rod away from the clip until it is disengaged.

(2) Position clip over the specified hole in overtravel lever. Press ends of clip together and insert operating

rod through clip and overtravel lever. Release clip to engage rod.

Idle Speed and Mixture Adjustment

Refer to Engine Idle Setting Procedures in Emission Control Section.

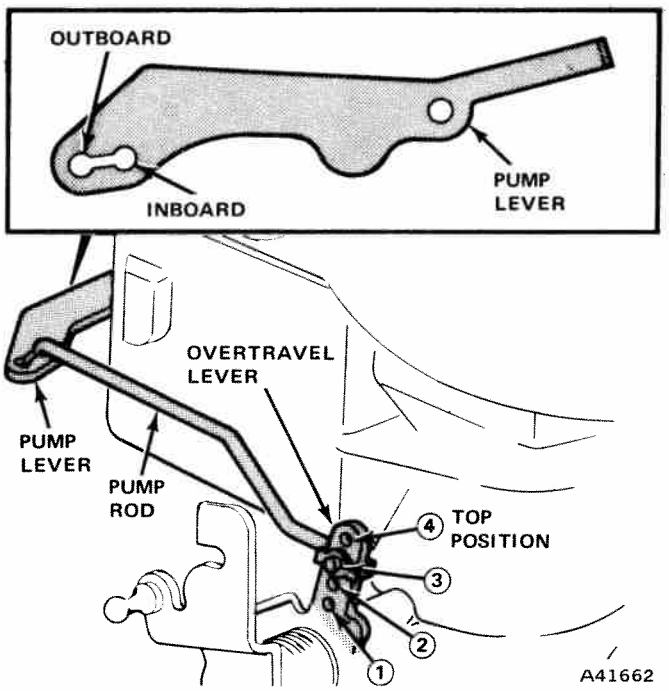


Fig. 4-53 Accelerating Pump Sroke Adjustment

Dashpot Adjustment (On Car)

With the throttle set at curb idle position, fully depress the dashpot stem and measure the clearance between the stem and the throttle lever (fig. 4-54).

Refer to Carburetor Service Specifications for correct setting. Adjust by loosening the locknut and turning the dashpot.

Fast Idle Speed Adjustment (On Car)

Set the fast idle speed with the engine at operating temperature and the fast idle speed adjusting screw against the index mark (second step) of the fast idle cam (refer to Carburetor Service Specifications for the correct rpm setting). Adjust by turning the fast idle speed adjusting screw.

NOTE: *When adjusting fast idle speed, disconnect electrical connector from TCS solenoid vacuum valve.*

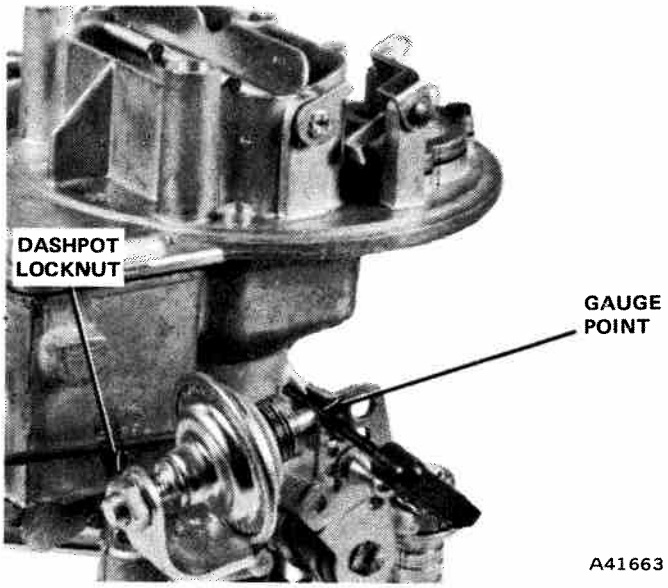


Fig. 4-54. Dashpot Adjustment

MODEL 2100 CARBURETOR CALIBRATIONS

List No.	4DMJ2	4DM2	4RA2	4RHD2
Throttle Bore Size	1.562	1.562	1.562	1.562
Main Venturi Size	1.080	1.080	1.080	1.080
Fuel Inlet Diameter	0.101	0.101	0.101	0.101
Low Speed Jet (Tube)	0.035	0.035	0.035	0.038
Economizer	0.046	0.046	0.046	0.055
Idle Air Bleed	0.101	0.101	0.099	0.106
Main Jet Number	48	48	47	47

(Continued)

MODEL 2100 CARBURETOR CALIBRATIONS (Continued)

	List No.	4DMJ2	4DM2	4RA2	4RHD2
High Speed Bleed		0.052	0.052	0.052	0.052
Power Valve Timing (inches of Hg)					
First Stage		9.500	9.500	9.500	4.500
Second Stage		5.500	5.500	5.500	
Accelerator Pump Jet		0.032	0.032	0.024	0.024
Vacuum Spark Port					
Height		0.050	0.050	0.050	0.050
Width		0.085	0.085	0.086	.085
Spark Port Location Above Closed Throttle		0.025	0.025	0.057	..042
Choke Heat Bypass		0.114	0.114	0.114	0.114
Choke Heat Inlet Restriction		0.076	0.076	0.076	0.076
Choke Vacuum Restriction		0.082	0.082	0.089	.082

CARBURETOR MODEL 4300 — 4-VENTURI

GENERAL

The Model 4300 carburetor consists of three main assemblies: horn, main body, and throttle body (fig. 4-55).

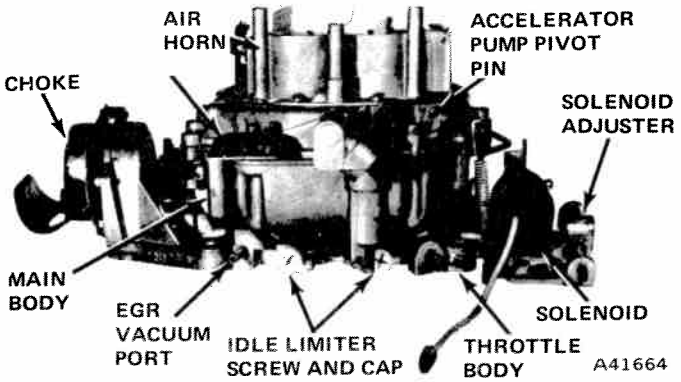


Fig. 4-55 Model 4300 Carburetor Assembly

The air horn assembly also serves as the fuel bowl cover and contains the choke valve and shaft, accelerator pump linkage, fuel inlet needle and seat, auxiliary fuel inlet valve, float and lever, power valve piston, secondary air valve, booster venturi and internal fuel bowl vents.

The main body assembly contains fuel passages for the metering systems, main metering jets, accelerator pump, accelerator pump inlet, discharge check valves, secondary air valve dampener piston, and power valve.

The throttle body assembly contains the primary and secondary throttle shaft and lever assemblies, curb idle adjusting screws, fast idle adjusting screw, idle mixture adjusting screws, and the automatic choke assembly.

Identification

The carburetor is identified by a code number and build date which is stamped on the identification tag. Each carburetor build month is coded alphabetically beginning with the letter "A" in January and ending with the letter "M" in December (the letter "I" is not used). The tag is attached to the carburetor and must remain with the carburetor to assure proper identification (fig. 4-56).

CARBURETOR CIRCUITS

The Model 4300 carburetor incorporates five basic fuel metering circuits: idle (low speed), primary main metering, secondary main metering, pump, and power enrichment circuit. In addition to the basic fuel metering circuits, the float (fuel inlet) and choke circuits are used.

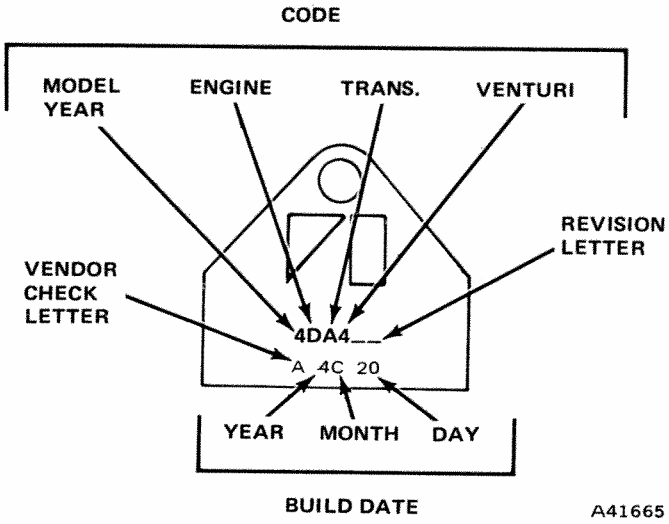


Fig. 4-56 Identification Tag

Float (Fuel Inlet) Circuit

Fuel under pressure enters the carbuertor through the fuel inlet passage located in the air horn assembly. The amount of fuel entering the fuel bowl is regulated by the distance the fuel inlet needle is moved off its seat. A dual float and lever assembly controls the movement of the fuel inlet needle and reacts to any change in the fuel level. When the fuel level drops, the fuel inlet needle, which rests against the float lever, drops away from its seat and admits the proper amount of fuel to maintain the specified level (fig. 4-57).

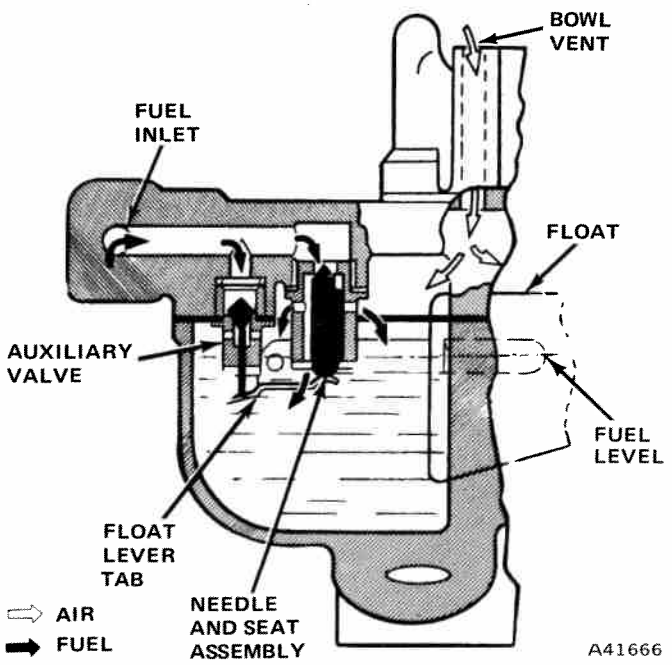


Fig. 4-57 Float Circuit

An auxiliary fuel inlet valve is provided to supplement the normal fuel supply during heavy road load or high speed operation. When the float drops to a certain level, the float lever presses against the auxiliary valve plunger and opens the valve to provide an additional fuel supply to the bowl.

The auxiliary valve also helps to improve hot engine restarts. The large combined opening of the auxiliary and fuel inlet valve purges fuel vapors from the carburetor-to fuel pump line, which form after a hot engine shutdown.

Idle (Low Speed) Circuit

Fuel for idle and low speed operation is supplied through the idle circuit. When the throttle valves are in the curb idle or early part-throttle position, manifold vacuum, or low pressure, is applied to the idle discharge ports and idle transfer slots. The pressure difference between atmospheric pressure in the fuel bowl and manifold vacuum causes fuel to flow through the idle circuit.

Fuel is forced from the fuel bowl through the main jets into the main wells. From the main wells the fuel passes through the idle tubes which are located inside of the main well tubes. The fuel is metered as it flows through restrictions at the lower end of the idle tubes. The fuel then flows upward through the idle tubes and is routed through short diagonal passages to the downward idle channels which terminate at the idle transfer slots and idle discharge ports (fig. 4-58).

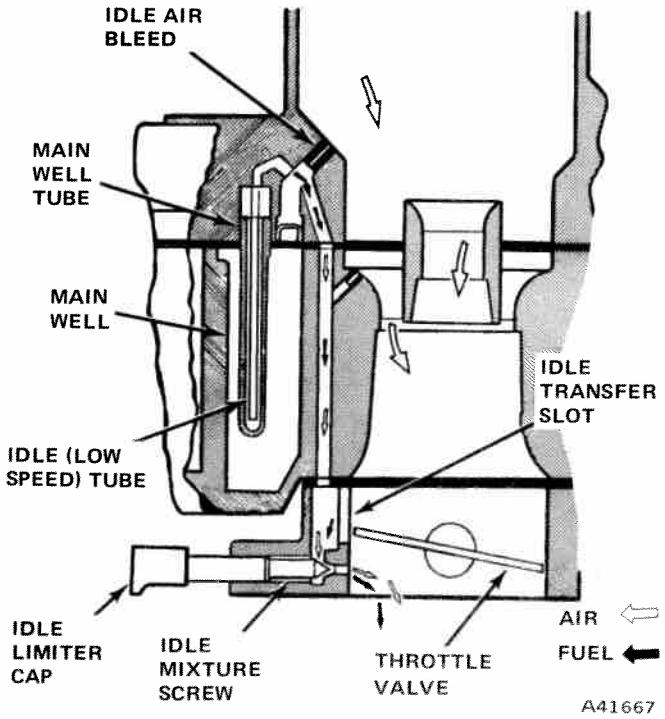


Fig. 4-58 Idle Circuit

Filtered air enters through calibrated idle air bleeds and mixes with the fuel as it flows downward through the idle channels. The idle air bleeds also prevent siphoning through the idle system during high speed operation or engine shutdown.

The fuel-air mixture is discharged through the idle discharg e ports and the bottom of the idle transfer slots when the throttle vales are in the curb idle position. The top of the idle transfer slots serve as additional air bleeds at this time to further atomize the idle fuel-air mixture. As the throttle valves are opened slightly above the curb idle position, the entire idle transfer slots are exposed to manifold vacuum. This provides a richer fuel-air mixture and prevents a flat-spot during the transition from idle to primary main metering circuit.

Primary Main Metering Circuit

Fuel for part throttle or cruising speeds is provided by the primary main metering circuit in response to the primary throttle opening.

As the primary throttle opening is increased, manifold vacuum decreases at the idle discharge ports and transfer slots causing the idle circuit discharge to diminish. However, the increased throttle opening develops an airflow through the main and booster venturi and creates a vacuum or pressure drop at the main discharge nozzle openings, which are located within the booster venturi. Fuel flows through the main metering circuit due to pressure being higher in the fuel bowl than the discharge nozzles. The pressure drop at the booster venturi is proportionately greater as the throttle opening is increased, resulting in an increased fuel flow for higher engine speeds.

Fuel is forced from the fuel bowl through the main metering jets and into the main wells. The fuel then flows through the main well tubes. As the fuel flows upward through the main well tubes, it is mixed with air supplied by the high speed air bleeds. The air enters through small holes in the sides of the main well tubes. The fuel-air mixture flows from the main well tubes to the main discharge nozzles and is discharged into the air stream within the booster venturi (fig. 4-59).

The high speed air bleeds meter an increasing amount of air as booster venturi vacuum (pressure drop) increases, therby maintaining the proper fuel-air ratio. The high speed air bleeds serve as anti-siphon vents at reduced speeds and also act as vents for the main wells to help reduce percolation during a hot engine shutdown.

Secondary Main Metering Circuit

When maximum power demands are made on the engine, an additional volume of fuel-air mixture is supplied by the secondary main metering circuit to supplement the primary main metering circuit discharge.

The secondary throttle is mechanically linked to the primary throttle and begins to open when the primary throttle is ¾ open. Both throttles reach wide open position at the same time. During the engine warmup period (choke on), the secondary throttles are prevented from opening by the secondary throttle lockout lever to avoid an excessive load on a cold engine.

Offset air valves are located in the secondary openings below the booster venturi and are linked to a dampener piston. A spring located under the dampener piston is calibrated to hold the air valve closed until air velocity is sufficient to overcome the spring tension. The dampener spring also counteracts sudden movements of the air valves to provide smoother engine operation.

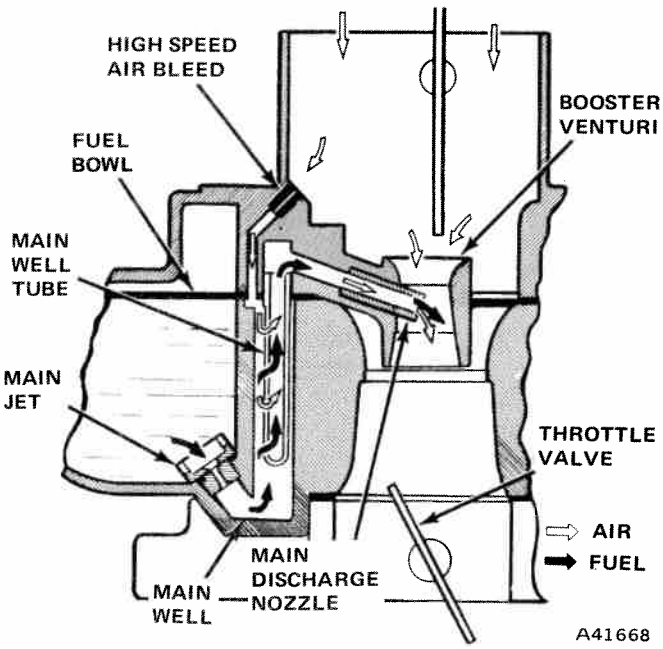


Fig. 4-59 Primary Main Metering Circuit

When the secondary throttle valves are opened slightly, manifold vacuum is introduced into the entire secondary openings below the air valves. The enrichment discharge tube openings, located below the air valves, are exposed to manifold vacuum. Fuel is forced through the discharge tubes by atmospheric pressure in the fuel bowl.

As the airflow increases during continued opening of the secondary throttle, the air valves are forced open by the velocity of air acting against the offset portion of the valves and by manifold vacuum applied at the lower side of the valves. The amount of opening is controlled by the dampener piston spring.

The increased airflow through the secondary booster venturi results in a lower pressure at the main discharge nozzles than at the enrichment discharge tubes. The discharge diminishes at the enrichment discharge tubes and the fuel-air mixture begins to flow through the main discharge nozzles.

Fuel in the secondary main wells is maintained at the same level as the primary main wells by a small constant feed passage located at the rear of the fuel bowl. When the secondary throttle valves are opened, additional fuel flows through a large opening at the rear of the fuel bowl into a well containing the second

ary main jet tube. The fuel is metered as it flows through the main jet tube to the secondary channel (fig. 4-60). An initial amount of air is introduced through an anti-siphon bleed located at the top of the secondary channel. The fuel-air mixture is then routed through a diagonal passage in the main body to separate passages leading to each secondary main well. An additional amount of air is introduced as the fuel-air mixture flows up the secondary main wells. The mixture is then discharged through the enrichment discharge tubes or the main discharge nozzles, depending on throttle opening.

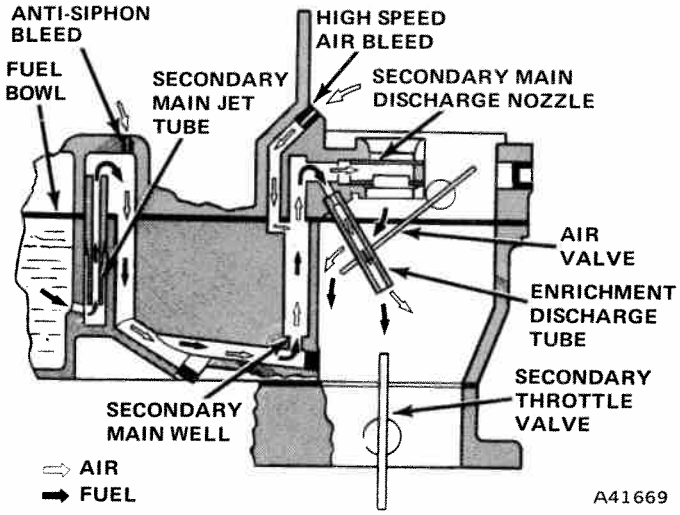


Fig. 4-60 Secondary Main Metering Circuit

The anti-siphon and high speed air bleeds also act as vents for the secondary main wells during curb idle and hot engine shutdown to help reduce percolation.

Pump Circuit

When accelerating rapidly from low speeds, a momentary fuel lag occurs in the idle and primary main metering circuits. The increased air velocity resulting from the rapid opening of the throttle tends to lean out the fuel-air mixture. To compensate for this leanness, the pump circuit delivers an additional quantity of fuel which is discharged into the air stream to maintain the proper fuel-air ratio.

When the throttle is closed, the accelerator pump plunger is pulled upward by the pump link and compresses the pump spring. Fuel is drawn from the fuel bowl past the inlet check valve and into the pump chamber. The pump discharge needle is seated at this time to prevent air from entering the pump chamber (fig. 4-61).

When the throttle is opened, the pump plunger is moved downward by spring action, causing the inlet check valve to seat, and forcing fuel into the discharge passage. The seating of the inlet check valve prevents fuel escaping back to the fuel bowl. The pressure of the fuel in the discharge passage lifts the discharge needle off its seat and sprays the fuel out of the discharge nozzles. When the pump plunger has completed its travel downward, the discharge needle seats to prevent air entering the discharge passage, assuring a solid fuel supply for the next pump stroke.

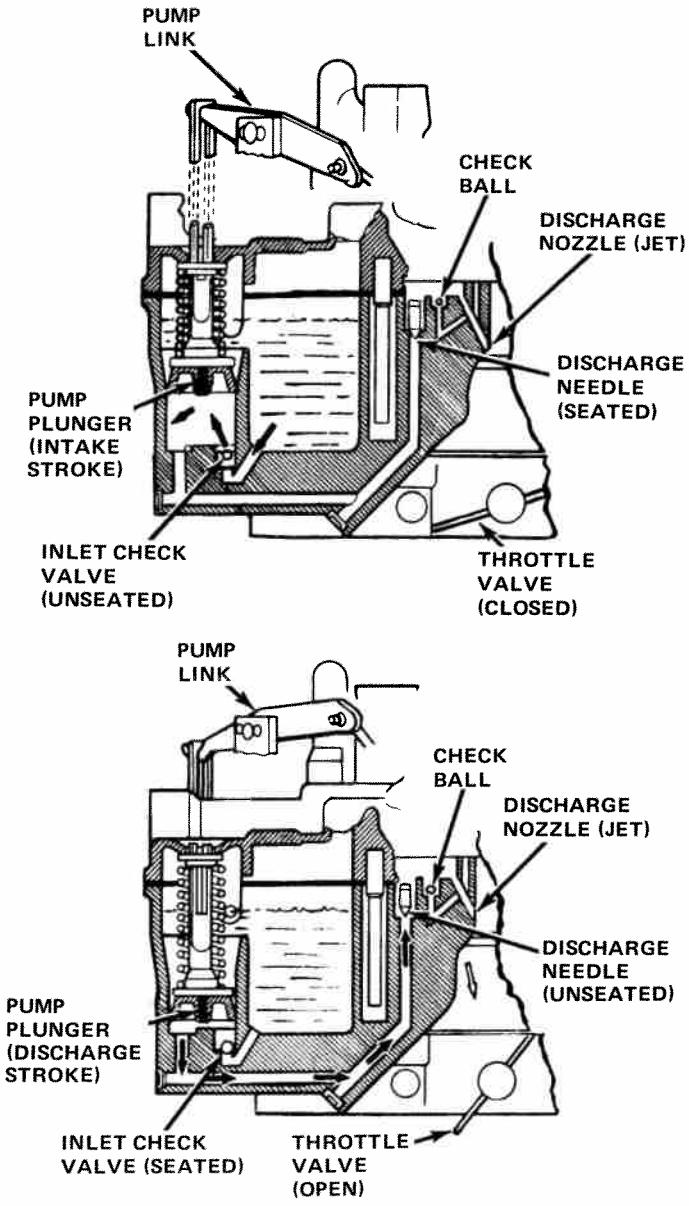


Fig. 4-61 Pump Circuit

At high speeds a vacuum develops at the pump discharge nozzles. The pump air bleed (check ball) provides a vent to the discharge nozzles and prevents siphoning of fuel from the discharge passage. The air bleed is sealed by fuel pressure during the discharge stroke.

Power Enrichment Circuit

During heavy road load or high speed operation, the fuel-air ratio must be richened to provide increased en-

gine power. The power enrichment circuit supplies additional fuel during this period and is controlled by decreasing intake manifold vacuum.

The power piston assembly is spring loaded downward and is aligned with the power valve stem, which is spring loaded closed in the opposite direction.

Manifold vacuum is applied to the top of the power piston through connecting passages in the air horn, main body and throttle body.

During light road load operation, the relatively high manifold vacuum pulls the power piston upward in its chamber. At this time, the power piston does not contact the power valve stem and the valve is closed.

When high power demands are placed on the engine, a corresponding drop in manifold vacuum takes place.

The power piston assembly, being held upward by manifold vacuum, moves downward when the vacuum drops to a predetermined value and contacts the stem of the two-stage power valve. The power valve stem moves downward to the first-stage position and allows a small amount of fuel to flow through the valve.

When manifold vacuum drops to a lower value, the power valve stem moves further downward to the second stage position and allows a greater amount of fuel to flow through the valve.

The fuel which flows through the power valve is metered as it passes through restrictions (jets) to each main well and supplies the additional fuel required to meet engine power demands (fig. 4-62).

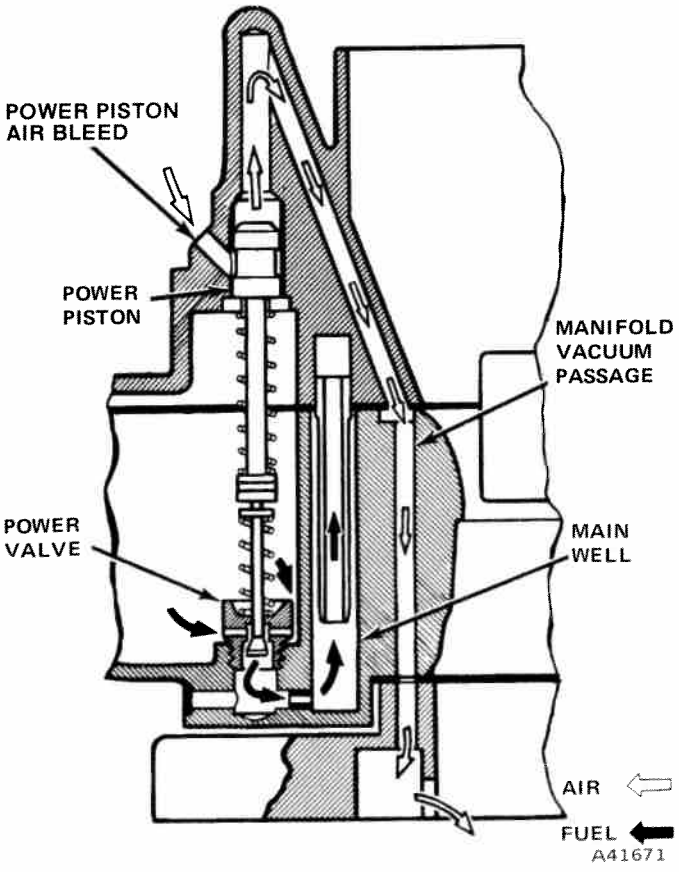


Fig. 4-62 Power Enrichment Circuit

As the power demands decrease, manifold vacuum increases and the power piston is pulled upward which allows the power valve to return to the closed position, cutting off the additional fuel supply to the main wells.

Choke Circuit

A cold engine requires a richer fuel-air mixture for quick starting and satisfactory performance during the warmup period. The choke circuit automatically regulates the position of the choke valve in the air horn to provide the proper mixture throughout the entire cold engine operation.

When the engine is cold, the thermostatic coil in the choke cover exerts force against the choke piston lever and rotates the thermostatic choke shaft. This action causes the choke valve to close and also pulls the choke piston upward in its passage (fig. 4-63).

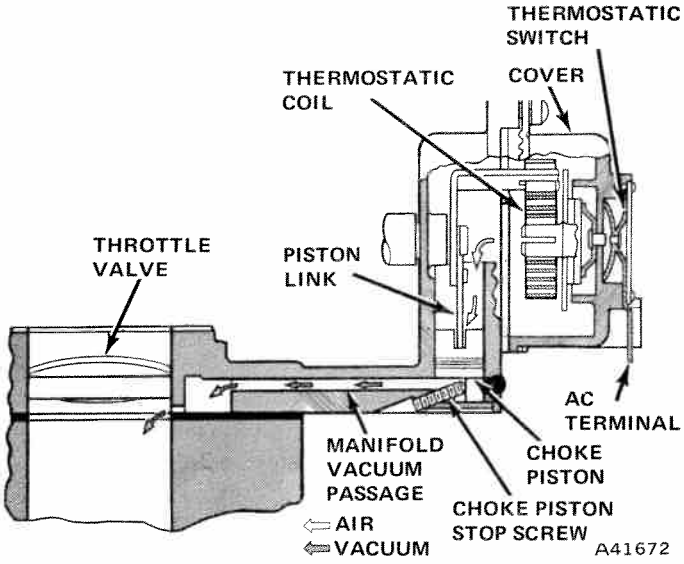


Fig. 4-63 Electric Assist Choke

During cranking, manifold vacuum is applied to the primary openings below the choke valve and causes fuel to flow through the idle and primary main metering circuits to start the engine.

When the engine starts, manifold vacuum is channeled through a passage in the throttle body to the choke piston passage and pulls the choke piston downward until the slot of the piston aligns with slots in the piston passage. The action of the choke piston, combined with atmospheric pressure against the offset choke valve, opposes the tension of the thermostatic coil and causes the choke valve to open slightly to prevent flooding of the engine. This opening of the choke valve is referred to as the "initial choke valve clearance."

As the engine warms up, a chamber in the exhaust manifold crossover passage heats filtered air being drawn through the choke heat tube to the choke housing by manifold vacuum. A thermostatic bypass valve, which is integral with the choke heat tube, helps prev-

ent premature choke valve opening during the early part of the warmup period. The valve regulates the temperature of the hot airflow to the choke housing by allowing outside unheated air to enter the heat tube. A thermostatic disc is incorprated in the valve which is calibrated to close the valve at 75 ° F and open it at 55° F. The volume of air entering the choke housing is controlled by calibrated restrictions in the carburetor. The heated air entering the choke housing causes the thermostatic coil to gradually lose its tension and unwind. As the coil unwinds, the choke piston moves downward in its bore and bottoms against a stop screw.

NOTE: *The choke piston stop screw position is preset at time of manufacture and normally will not require further adjustment.*

The choke piston lever is slotted to allow the choke linkage to operate idependently after the choke piston bottoms against the stop screw, thereby reducing the possibility of lean stalls on acceleration during the early part of the warmup period.

An electric assist choke is used on all 4V carburetors to more accurately match choke operations to engine requirements. It provides supplemental heat to the choke bimetal spring to speed up choke valve opening after the choke cover interior reaches modulating temperature (refer to Thermostatic Switch Choke Modulation chart on page 4A-16). The purpose of the electric assist is to reduce emission of carbon monoxide (CO) during engine warmup. A special ac terminal is provided at the alternator to supply a 7-volt power source for the electric assist. A thermostatic switch (bimetallic disc) within the choke cover closes when the choke cover interior reaches modulating temperature, allowing current to flow to the heating element (fig. 4-63). The circuit is completed through the choke cover ground strap and choke housing to engine. As the heating element warms up, heat is absorbed by an attached metal plate which heats the choke bimetal spring.

After engine shutdown, the thermostatic switch remains closed until the choke cover interior modulating temperature is reached. If the engine is restarted before modulating temperature is reached, current flow will immediately begin warming up the heating element to open the screw, allowing the engine to return to curb idle.

Once the choke cover interior temperature falls below the modulating temperature, the thermostatic switch opens and current flow to the heating element is shut off. If the engine is restarted at this time the electric assist will not operate until the choke cover interior reaches its modulating temperature.

When the engine reaches operating temperature, the thermostatic coil, due to continued unwinding, exerts pressure against the choke piston lever and holds the choke valve fully open. At this time, the choke piston is in the full downward position and sufficient heated air bypasses through the slots of the piston passage to keep the thermostatic coil heated and the choke valve open during continued engine operations. The heated air is exhausted below the throttle valves.

During the warmup period, a fast idle must be provided to prevent engine stalling. The fast idle cam is rotated into position against the fast idle screw by the thermostatic choke shaft and lever assembly and results in increased engine speed in proportion to the choke valve opening. When the choke valve is fully open, the fast idle cam rotates free of the fast idle screw, allowing the engine to return to curb idle.

If the engine is accelerated during the warmup period, the resulting drop in manifold vacuum decreases the pull of the choke piston against the tension of the thermostatic coil and allows the choke valve to move toward the closed position. This provides the richer mixture required to prevent engine stalling.

Should the engine become flooded during the starting period, the choke can be mechanically opened a specified distance by depressing the accelerator pedal to the floor. A tang on the primary throttle lever will then contact the fast idle cam and partially open the choke valve through connecting linkage. This is referred to as the "unloader."

To avoid overloading a cold engine, a secondary lockout lever engages a tang on the secondary throttle stop lever and prevents secondary throttle operation during the warmup period. The lockout lever releases the secondary throttle only after the choke is fully open.

CARBURETOR REMOVAL

Flooding, stumble on acceleration and other performance complaints are, in many instances, caused by the presence of dirt, water or other foreign matter in the carburetor. To aid in diagnosing the cause of complaint, the carburetor should be carefully removed from the engine without removing the fuel from the bowl. The contents of the bowl may then be examined for contamination as the carburetor is disassembled.

(1) Remove air cleaner.

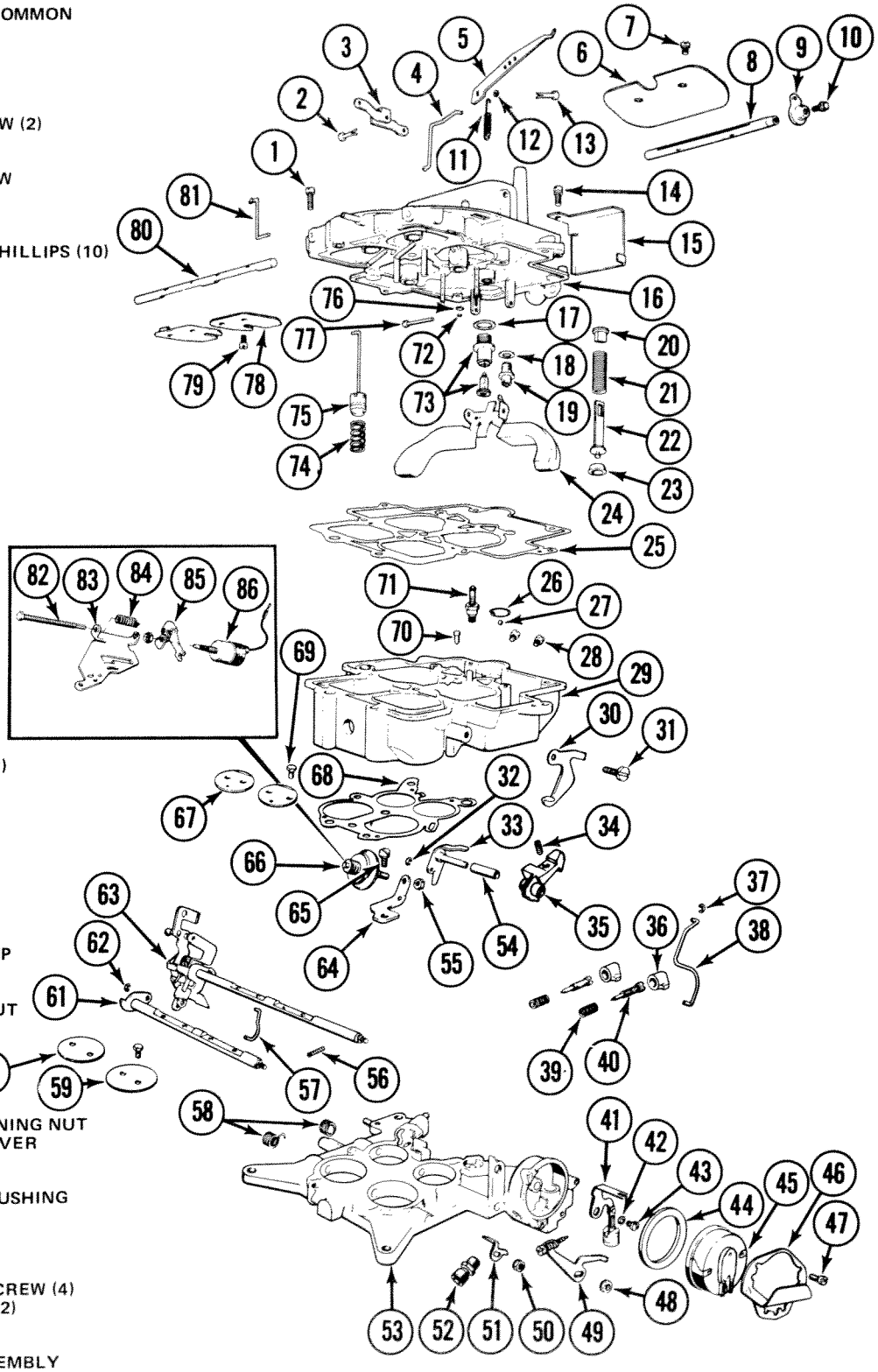
(2) Remove throttle cable from throttle lever. Disconnect distributor vacuum line, PCV hose, in-line fuel filter and choke heat tube at the carburetor.

(3) Disconnect choke clean air line from air horn.

(4) Remove carburetor retaining nuts and remove carburetor. Remove carburetor mounting gasket, spacer, and lower gasket from intake manifold.

CARBURETOR INSTALLATION

(1) Clean gasket mounting surfaces of the spacer and carburetor. Place spacer between two new gaskets and position spacer and gaskets on intake manifold. Position carburetor on spacer and gasket and secure it with retaining lockwashers and nuts. To prevent leakage, distortion or damage to the carburetor body flange,



1. AIR HORN RETAINING SCREW - COMMON
2. PIVOT PIN
3. AIR VALVE LEVER
4. PUMP ROD
5. PUMP LEVER
6. CHOKE VALVE
7. CHOKE VALVE RETAINING SCREW (2)
8. CHOKE SHAFT
9. CHOKE LEVER
10. CHOKE LEVER RETAINING SCREW
11. PUMP RETURN SPRING
12. PUMP ROD WASHER
13. PIVOT PIN
14. AIR HORN RETAINING SCREW - PHILLIPS (10)
15. CHOKE SHIELD
16. AIR HORN
17. NEEDLE SEAT GASKET
18. AUXILIARY VALVE GASKET
19. AUXILIARY VALVE
20. PUMP SPRING RETAINER
21. PUMP SPRING
22. PUMP PISTON
23. PUMP RUBBER CUP
24. FLOAT AND LEVER ASSEMBLY
25. AIR HORN GASKET
26. INLET CHECK VALVE RETAINER
27. INLET CHECK VALVE
28. MAIN JET (2)
29. MAIN BODY
30. SECONDARY THROTTLE LOCKOUT LEVER
31. LOCKOUT LEVER RETAINING SCREW
32. CHOKE ROD LOWER RETAINER
33. THERMOSTATIC CHOKE SHAFT
34. FAST IDLE CAM ADJUSTING SCREW
35. FAST IDLE CAM
36. IDLE LIMITER CAP (2)
37. CHOKE ROD UPPER RETAINER
38. CHOKE ROD
39. IDLE MIXTURE SCREW SPRING (2)
40. IDLE MIXTURE SCREW (2)
41. CHOKE PISTON AND LEVER ASSEMBLY
42. CHOKE PISTON LEVER RETAINING WASHER
43. CHOKE PISTON LEVER RETAINING SCREW
44. CHOKE COVER GASKET
45. CHOKE COVER (ELECTRIC)
46. CHOKE COVER RETAINING CLAMP
47. CHOKE COVER RETAINING SCREW (3)
48. FAST IDLE LEVER RETAINING NUT
49. FAST IDLE LEVER
50. SECONDARY STOP LEVER RETAINING NUT
51. SECONDARY THROTTLE STOP LEVER
52. CHOKE HEAT INLET FITTING
53. THROTTLE BODY
54. THERMOSTATIC CHOKE SHAFT BUSHING
55. DASHPOT LOCKNUT
56. CURB IDLE ADJUSTING SCREW
57. SECONDARY THROTTLE LINK
58. THROTTLE RETURN SPRING
59. THROTTLE VALVE RETAINING SCREW (4)
60. SECONDARY THROTTLE VALVE (2)
61. SECONDARY THROTTLE SHAFT
62. SECONDARY LINK RETAINER
63. PRIMARY THROTTLE SHAFT ASSEMBLY
64. DASHPOT BRACKET
65. DASHPOT BRACKET RETAINING SCREW
66. DASHPOT
67. PRIMARY THROTTLE VALVE (2)
68. THROTTLE BODY GASKET
69. THROTTLE VALVE RETAINING SCREW (4)
70. PUMP DISCHARGE NEEDLE
71. POWER VALVE
72. PUMP AIR BLEED RETAINER
73. NEEDLE AND SEAT ASSEMBLY
74. DAMPENER SPRING
75. DAMPENER PISTON
76. PUMP AIR BLEED (VITON DISC)
77. FLOAT PIN
78. AIR VALVE (2)
79. AIR VALVE RETAINING SCREW (4)
80. AIR VALVE SHAFT
81. AIR VALVE LINK
82. ADJUSTING SCREW
83. MOUNTING BRACKET
84. ADJUSTING SCREW SPRING
85. CARRIAGE
86. ELECTRIC SOLENOID

A41673

Fig. 4-64 Carburetor Model 4300 - Exploded View

snug the nuts, and then alternately tighten each nut in a criss-cross pattern to 12-15 foot-pounds torque.

(2) Connect in-line fuel filter throttle cable, choke heat tube, distributor vacuum line, and PCV hose.

(3) Connect the choke clean air line to the air horn.

(4) Adjust engine idle speed, idle fuel mixture, and antistall dashpot (if so equipped). Install air cleaner.

CARBURETOR OVERHAUL

The following procedure applies to complete overhaul, with the carburetor removed from the engine.

A complete disassembly is not necessary when performing adjustments. In most cases, service adjustments of individual systems may be completed without removing the carburetor from the engine (refer to Service Adjustment Procedures).

A complete carburetor overhaul includes disassemby, thorough cleaning, inspecion and replacement of all gaskets and worn or damaged parts. Refer to figure 4-64 for parts identification.

NOTE: *When using an overhaul kit, use all parts included in kit.*

Diassembly

(1) Remove fuel inlet line from fuel filter.

(2) Remove choke clean-air pickup connecting tube from air horn.

(3) Remove choke control rod retainer from automatic choke lever. Separate rod from lever.

(4) Remove accelerator pump spring and washer from pump rod. Separate rod from lever.

(5) Remove air cleaner anchor screw and remove air-horn-to-fuel-bowl attaching screws (fig. 4-65).

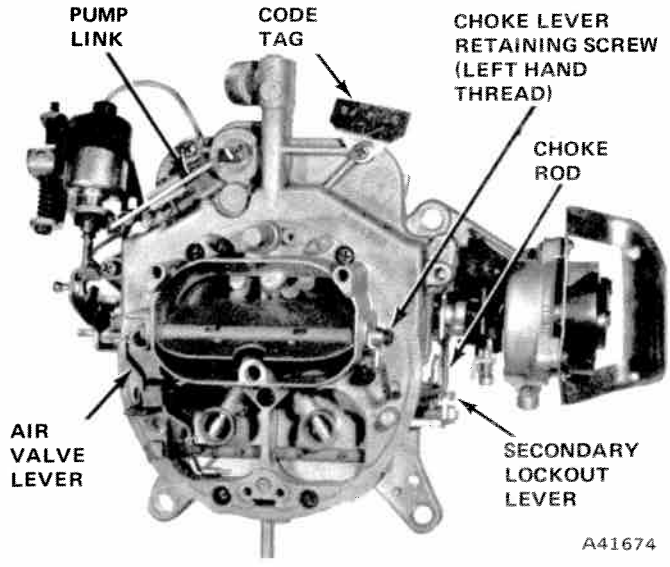


Fig. 4-65 Model 4300 Carburetor - Top View

(6) Lift air horn off main body.

(7) Pull float pivot pin and remove float assembly.

(8) Remove auxiliary fuel inlet valve with Tool J-10185 and fuel inlet needle seat with a 1/2-12 point socket (fig. 4-66).

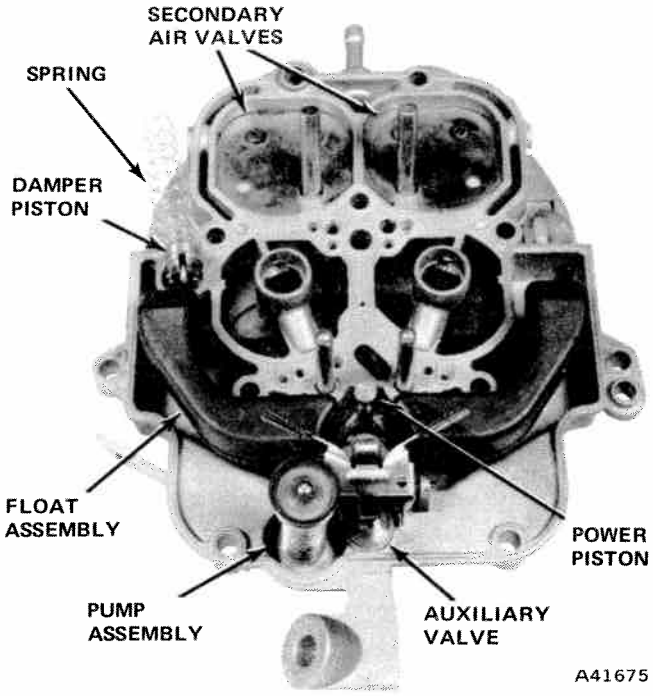


Fig. 4-66 Air Horn - Bottom View

(9) Remove secondary air valve lever pivot pin and rod from dampener piston assembly and air valve plate, then remove air valve dampener piston rod and spring.

(10) If it is necessary to remove secondary air valve plates or shaft, remove the air valve plate(s) attaching screws. Remove plates, then slide shaft out of the air horn.

(11) Remove attaching screws if it is necessary to remove choke plate or choke shaft.

(12) Remove choke plate, then slide choke shaft and lever out of air horn.

NOTE: *Choke lever is attached to shaft with a left-hand thread screw.*

CAUTION: *Do not remove power valve vacuum piston assembly unless it is to be replaced. It is staked in place in the air horn, and care must be used to avoid damage to the air horn casting when relieving the staked areas.*

(13) Turn main body upside down and catch accelerating pump discharge needle (fig. 4-67).

(14) Remove the power valve from the floor of the main body fuel bowl using a 3/8-inch deep socket.

(15) Remove main metering jets from the fuel bowl with Tool J-10185.

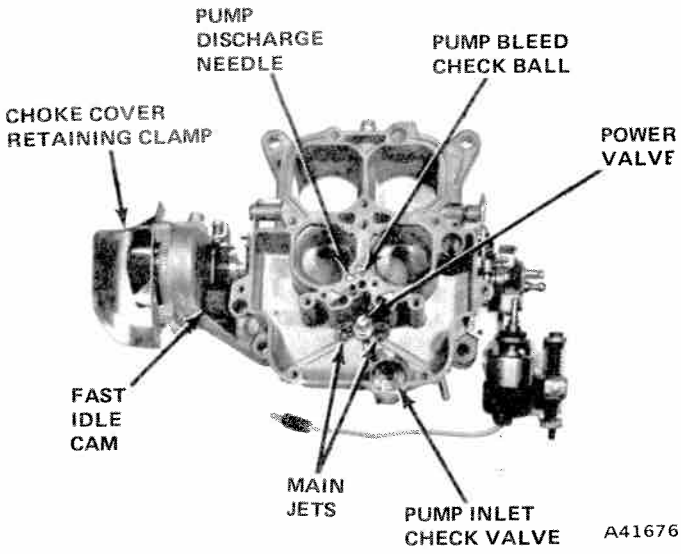


Fig. 4-67 Fuel Bowl Interior

(16) Remove accelerating pump inlet check ball reatiner, then turn main body over and catch ball from pump well.

(17) Remove throttle body to main body screws from bottom of throttle body (fig. 4-68) and separate the two castings.

(18) Remove choke housing cover screws, cover, gasket, and thermostatic spring.

(19) Remove choke piston lever retaining screw, and remove piston assembly (fig. 4-69).

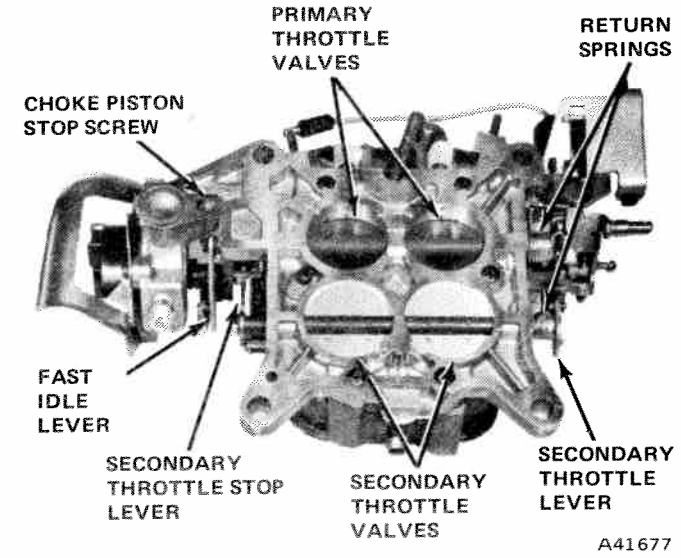


Fig. 4-68 Throttle Body - Bottom View

(20) Remove retainers from secondary throttle-lever-to-primary-throttle connecting link, remove link.

(21) If it is necessary to remove throttle plates or shafts from throttle body, remove throttle plate attaching screws and plates.

(22) Remove nut from secondary throttle shaft, then remove lockout lever and slide shaft and return spring out of throttle body.

(23) Remove screw from primary throttle shaft and remove fast idle lever and adjusting screw. Slide throttle shaft and primary throttle shaft and lever assembly out of throttle plate.

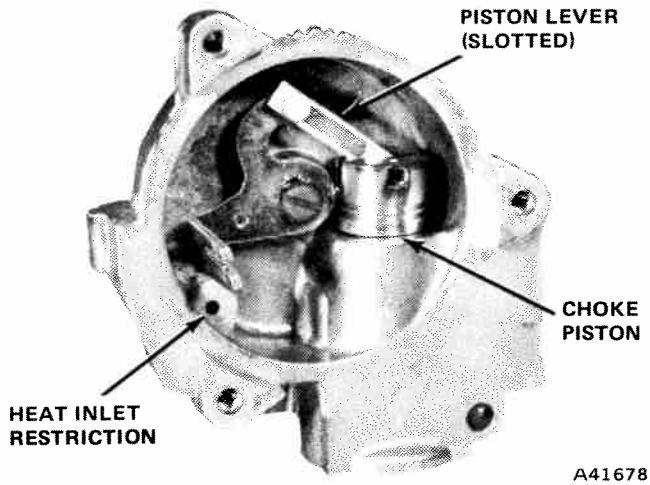


Fig. 4-69 Choke Housing

(24) Remove primary throttle lever assembly retainer, then slide lever and springs off shaft.

(25) If it is necessary to remove fast idle cam or bushing, carefully press bushing out of choke housing and bushing column.

NOTE: *The column may bend out of alignment or break without proper support to the column during bushing removal or installation. Make sure all holes in new gaskets have been properly punched and that no foreign material has adhered to gaskets. Gasket surfaces must be clean and flat and free of nicks or burrs.*

Cleaning and Inspection

Dirt, gum, water or carbon contamination in the carburetor or the exterior moving parts of the carburetor are often responsible for unsatisfactory performance. For this reason, efficient carburetion depends upon careful cleaning and inspection.

The cleaning and inspection of only those parts not included in the carburetor overhaul repair kit are covered here. All gaskets and parts included in the repair kit should be installed when the carburetor is assembled and the old gaskets and parts should be discarded.

Wash all carburetor parts (except accelerating pump piston, power valve, and antistall dashpot assembly) in clean commercial carburetor cleaning solvent. If a commercial solvent is not available, lacquer thinner or denatured alcohol may be used.

Rinse the parts in kerosene to remove all traces of the cleaning solvent, then dry them with compressed air. Wipe all parts that cannot be immersed in solvent with a clean, soft, dry cloth. Be sure all dirt, gum, carbon, and other foreign matter are removed from all

parts. Force compressed air through all passages of the carburetor.

CAUTION: *Do not use a wire brush to clean any parts or a drill or wire to clean out any openings or passages in the carburetor. A drill or wire may enlarge the hole or passage, changing the calibration of the carburetor.*

Check the choke shaft for grooves, wear, and excessive looseness or binding. Inspect the choke plate for nicked edges and ease of operation and free it if necessary. Make sure all carbon and foreign material has been removed from the automatic choke housing and the piston. Check operation of choke piston in choke housing to make certain it has free movement. Check the throttle shafts in the bores for excessive looseness or binding and check the throttle plates for burrs which prevent proper closure. Inspect the main body, throttle body, air horn, choke housing, and thermostatic spring housing for cracks. Replace the float if the arm needle contact surface is grooved. If the floats are serviceable, polish the needle contact and surface of the arm with crocus cloth or steel wool. Replace float shafts if worn. Replace all screws and nuts that have stripped threads. Replace all distorted or broken springs. Inspect all gasket mating surfaces for nicks and burrs. Repair or replace any parts that have a damaged gasket surface.

Assembly

(1) If throttle plates and shafts are removed, slide primary throttle return spring (coiled clockwise) on primary throttle shaft (flat milled) and slide shaft into primary shaft holes (mixture needle side of body).

(2) Position primary throttle plates (smaller diameter) in primary bores with ground flat edge of plates facing up and towards idle mixture needles. Install plate attaching screws snug but not tight.

(3) Rotate throttle shaft to closed position and tap plates lightly with screwdriver handle or similar tool, so that plates are properly and fully seated in throttle bores (when viewed with a light behind the plates, little or no light should be observed). Tighten throttle plate screws.

(4) Install secondary throttle lockout lever.

(5) Install fast idle speed lever and adjusting screw.

(6) If the fast idle cam and bushing were removed, insert automatic choke shaft bushing through choke housing. Position fast idle cam between choke housing and bushing column. Slide bushing through fast idle cam. Press bushing in choke housing and into column. Clean bushing with 1/4-inch reamer.

(7) Insert automatic choke shaft and lever in bushing.

(8) Position automatic choke piston in choke cylinder and lever on automatic choke shaft. Install attaching screw.

(9) Insert secondary throttle to primary throttle connecting rod into throttle levers and install retainers.

(10) Position main body on a working surface with fuel bowl down.

(11) Position main body to throttle body gasket on main body.

(12) Position throttle body on main body and install attaching screws.

(13) Invert main body and throttle body so fuel bowl is upward.

(14) Install power valve and main jets in main body.

(15) Install choke-to-throttle lockout lever.

(16) Place accelerator pump ball check in pump inlet hole of pump chamber. Install ball check retaining ring.

(17) Place accelerator pump discharge needle into pump discharge cavity.

(18) Install components removed from air horn in the following order:

(a) Fuel inlet needle seat with a ½-12 point socket.

(b) Auxiliary fuel inlet valve and gasket using Tool J-10185.

(19) Assemble accelerator pump plunger and insert into air horn.

(20) Compress pump plunger and insert accelerator pump arm into plunger stem. Insert the split pivot pin through the specified hole in the lever and the air horn casting (refer to Carburetor Service Specifications).

(21) If choke plate and shaft were removed, slide choke shaft through holes in air horn. Install choke shaft lever on end of shaft on automatic choke side.

NOTE: *The lever and shaft are tapered and the attaching screw has a left-hand thread. Insert choke plate into slot in choke shaft and install plate attaching screws snug but not tight.*

(22) Close choke plate and gently tap the plate to position plate in air horn. Tighten attaching screws.

(23) If air valve plates and shaft were removed, slide shaft through holes on secondary side of air horn with slotted end of shaft in air valve spring chamber.

(24) Position air valve plate in air horn opening on underside of air horn and adjacent to spring chamber.

(25) Install plate attaching screws snug but not tight. Position other air valve plate in the air horn opening with the eye retainer for air valve control rod facing upward. Install plate attaching screws snug but not tight.

(26) Close air valves plates and lightly tap plates to properly position them in air horn. Tighten attaching screws.

NOTE: *Be sure plates and shaft turn freely after assembly.*

(27) Insert fuel inlet needle into fuel inlet seat.

(28) Position float and lever assembly between hinge post and over fuel inlet valves. Insert float hinge pin through the post and float lever.

NOTE: *The pin must be inserted from the pump plunger side for self-retention.*

(29) Insert key end of air valve dampener rod into keyed hole in air valve lever. Slide other end of rod into eye on air valve plate. Position the air valve dampener lever on the air horn and install split pivot pin.

(30) Insert air valve dashpot piston rod through air horn and attach rod end to air valve lever.

(31) Insert accelerating pump bleed disc into pump bleed cavity.

(32) Set the float level (refer to Float Adjustment).

(33) Position main body to air horn gasket on main body.

(34) Carefully position air horn assembly over main body. Guide accelerator pump plunger and secondary throttle dashpot piston into their chambers as air horn is gently lowered into position.

(35) Install other air horn attaching screws.

(36) Insert key end of accelerator pump control rod into keyed hole in primary throttle lever. Insert other end of the rod into the pump lever and install washer and spring.

(37) Insert choke control rod end into automatic choke lever. With long nose pliers, install retaining clip.

(38) Check choke gasket cover clearance.

(39) Install choke gasket and cover retainer.

SERVICE ADJUSTMENT PROCEDURES

Float Adjustment

(1) Invert the air horn assembly and remove gasket.

(2) Measure distance from float pontoons to air horn casting using a T-scale (fig. 4-70).

IMPORTANT: *Do not allow the end of the vertical scale to come in contact with any gasket sealing ridge while measuring the float setting.*

(3) Refer to Carburetor Service Specifications for correct setting. The free end of each float pontoon should just touch the horizontal scale. If one pontoon is lower than the other, twist the float and lever assembly slightly to align.

(4) Adjust the float level by bending the tab which contacts the fuel inlet needle.

Auxiliary Inlet Valve Adjustment

(1) Turn air horn assembly upright, allowing the float to hang freely. Push up on the float until the primary fuel inlet needle lightly contacts its seat.

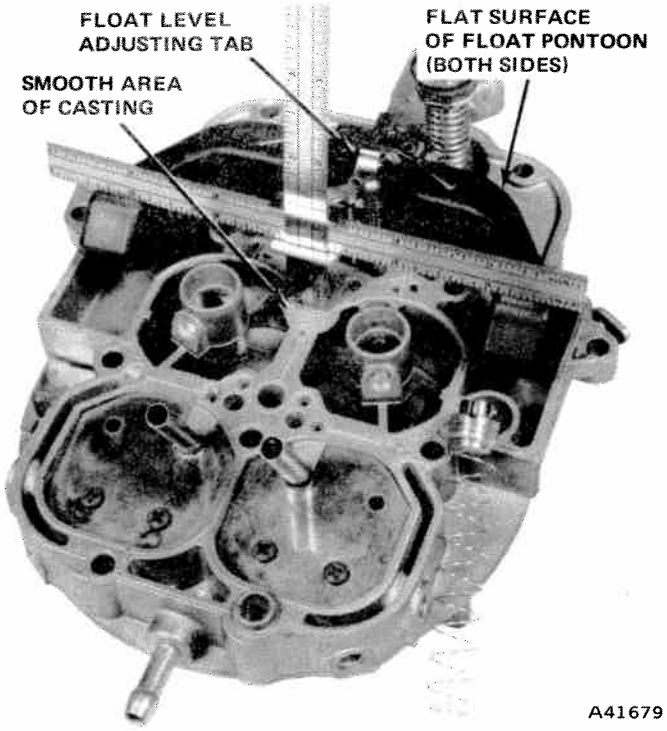


Fig. 4-70 Float Adjustment

(2) While holding float in this position, measure clearance between float level auxiliary tab and auxiliary inlet valve plunger. Bend tab as required (fig. 4-71)

(3) Refer to Carburetor Service Specifications for correct setting.

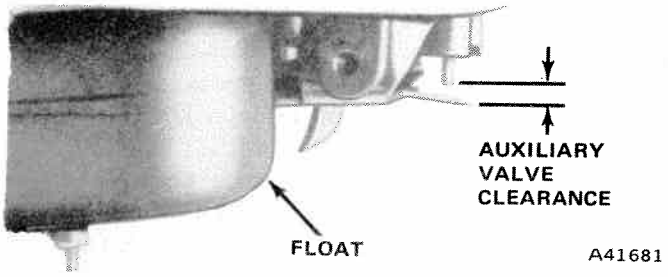


Fig. 4-71 Auxiliary Inlet Valve Adjustment

Initial Choke Valve Clearance (On or Off Car)

(1) Bend a 0.035-inch wire gauge at a 90-degree angle approximately 1/8 inch from the end.

(2) Partially open the throttle and close the choke valve to move the fast idle cam and choke piston into the cold start position.

(3) While holding the choke valve fully closed, release the throttle. Release the choke valve and insert the wire gauge into the slot at the front of the choke piston passage.

(4) Pull the choke piston lever counterclockwise until the choke locks the wire gauge in place. While holding the choke piston in this position, check the clearance between the lower edge of the choke valve and the air

horn wall (fig. 4-72). Refer to Carburetor Service Specifications for the correct setting.

(5) Adjust by loosening the choke lever retaining screw and rotating the choke shaft. The retaining screw has a left-hand thread and must be turned clockwise to loosen.

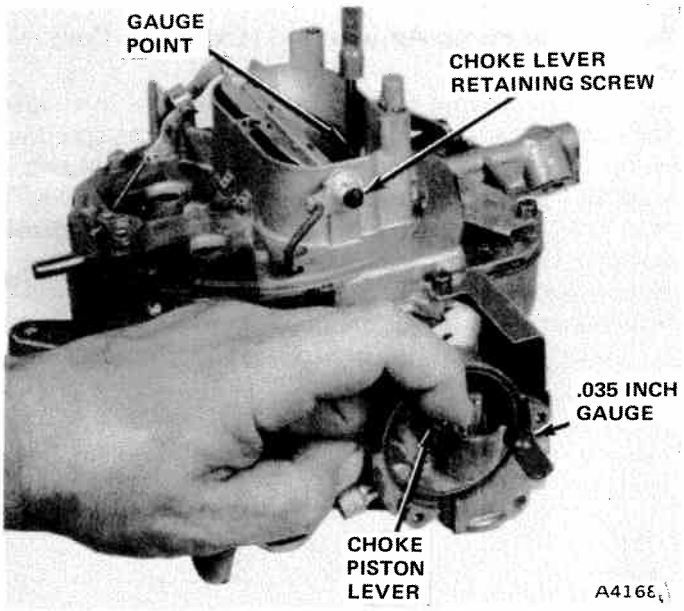


Fig. 4-72 Initial Choke Valve Clearance Adjustment

(6) Install the choke cover gasket, choke cover, choke clamp, and retaining screws. Make certain the hooked end of the thermostatic spring engages the slot of the choke piston lever. Do not adjust the choke cover until the fast idle cam linkage adjustment has been completed.

Fast Idle Cam Linkage Adjustment (On or Off Car)

(1) Rotate the choke cover 1/4-turn counterclockwise (rich) and tighten the retaining screws.

(2) Operate the throttle to allow the choke valve to close completely.

(3) Push down on the fast idle cam counterweight until the screw is in contact with the second step (index) and against the shoulder of the high step.

(4) Measure the clearance between the lower edge of the choke valve and the air horn wall (fig. 4-73). Refer to Carburetor Service Specifications for the correct setting.

(5) Adjust by turning the fast idle cam adjusting screw.

(6) Loosen the choke cover retaining screws and adjust the choke as outlined under Automatic Choke Adjustment.

Choke Unloader Adjustment

(1) Hold throttle fully open and apply pressure on the choke valve toward the closed position.

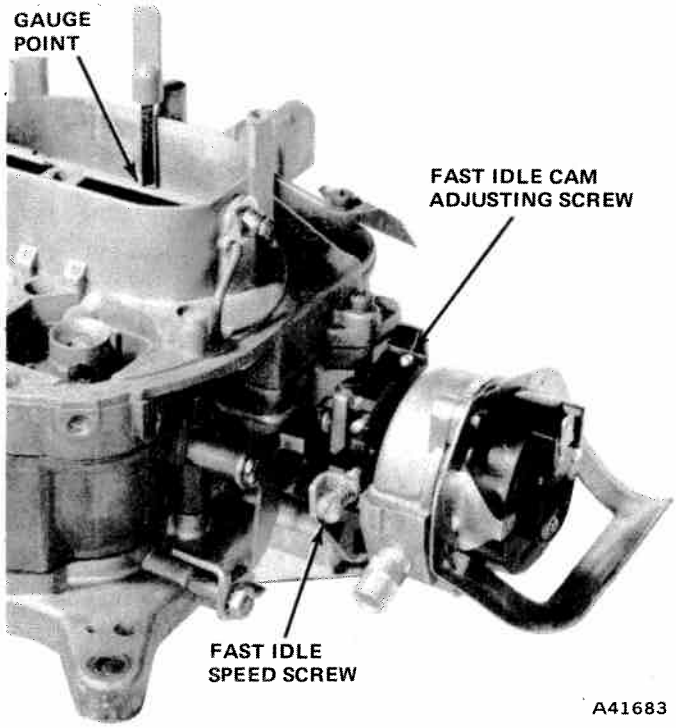


Fig. 4-73 Fast Idle Cam Linkage Adjustment

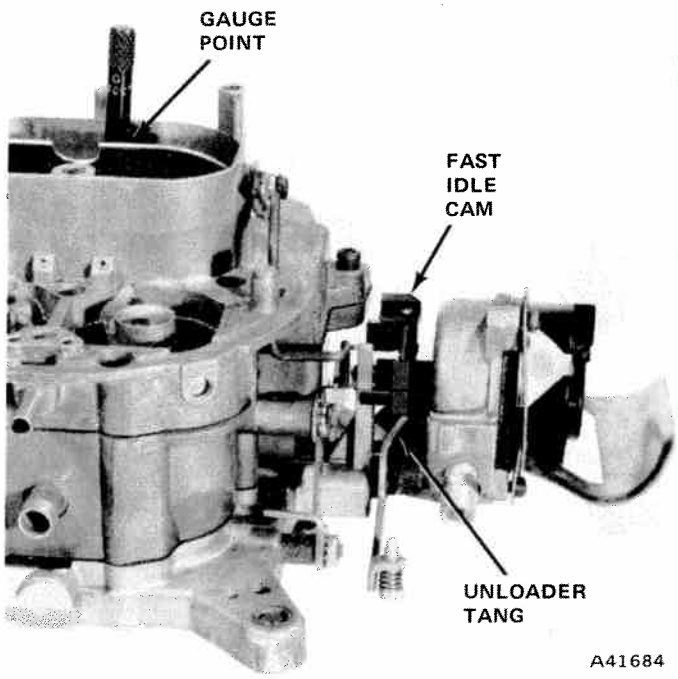


Fig. 4-74 Unloader Adjustment

(2) Measure the clearance between the lower edge of choke valve and air horn wall. Refer to Carburetor Service Specifications for correct setting.

(3) Adjust by bending the unloader tang which contacts the fast idle cam as shown in figure 4-74. Bend toward the cam to increase the clearance and away from the cam to decrease the clearance.

(4) Operate the throttle and check unloader tang to make sure it does not bind, contact, or stick on any part of carburetor casting or linkage. After carburetor in-

stallation, check for full throttle opening when the throttle is operated from inside the vehicle. If full throttle opening is not obtainable, it may be necessary to remove excess padding under the floor mat or reposition the throttle cable bracket located on the engine.

CAUTION: *Do not bend the unloader tang downward from a horizontal plane. After making the adjustment make certain the unloader tang has at least 0.070-inch clearance from the choke housing when the throttle is fully open. Refer to figure 4-75.*

Cleaning Automatic Choke Assembly

The automatic choke assembly may require periodic cleaning. The choke piston should be checked for free movement in the housing. If the piston is sticking, remove piston assembly from choke housing and clean with a carburetor cleaning solvent. The piston bore should also be cleaned to remove any gum, dirt, or carbon. Blow passages out with compressed air, install piston assembly and check for free piston movement. Install choke cover assembly and adjust choke.

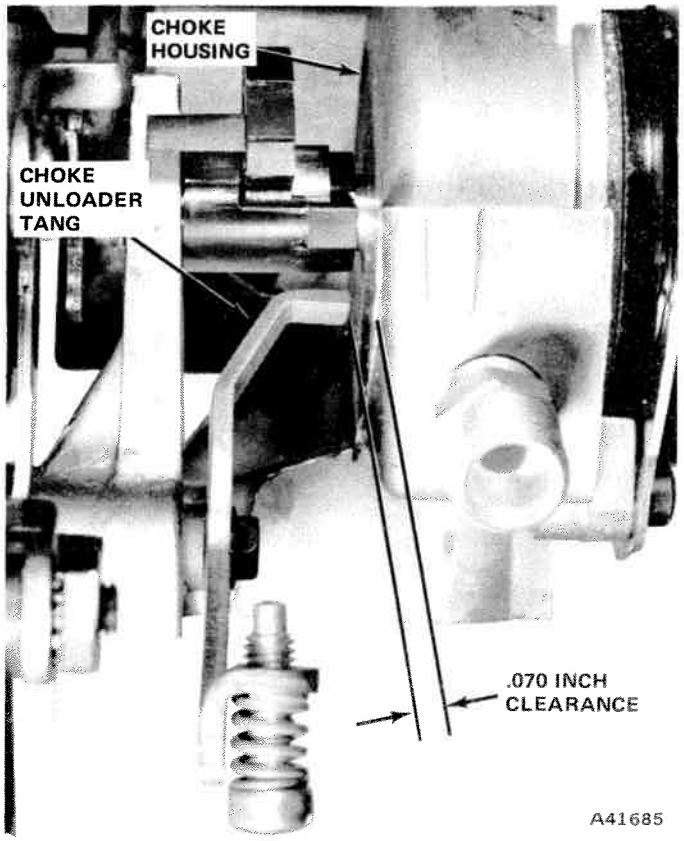


Fig. 4-75 Unloader-to-Choke Housing Clearance

Automatic Choke Adjustment (On or Off Car)

(1) Loosen the choke cover retaining screws and rotate the cover in the desired direction as indicated by arrow on face of cover. Refer to Carburetor Service Specifications for the correct setting. The specified setting will be satisfactory for most driving conditions. However, in the event that stumbles or stalls occur on acceleration during engine warmup period, the choke may be set richer or leaner using the tolerance provided to meet individual engine requirements.

Accelerator Pump Adjustment (On or Off Car)

For most driving conditions, the pump will operate satisfactorily with the pivot pin located in the specified pump link and pivot support holes. However, additional holes are provided for "tailoring" the pump stroke, if required, to correct acceleration stumble (fig. 4-76). Refer to Carburetor Service Specifications for the correct pivot location.

The shortest stroke is obtained by installing the pivot pin in the hole closest to the accelerator pump.

NOTE: *The three holes in the pump link must always remain aligned with the three holes in the pivot support.*

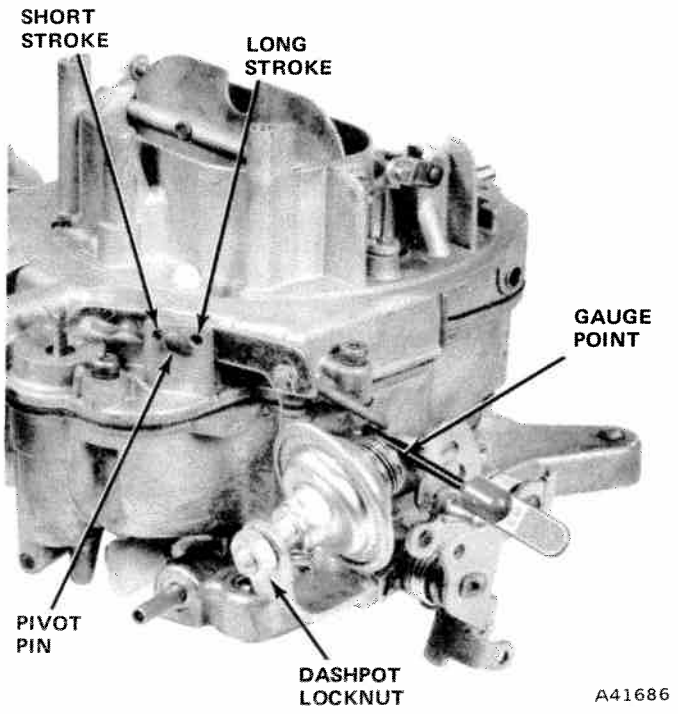


Fig. 4-76 Accelerator Pump and Dashpot Adjustment

Idle Speed and Mixture Adjustment (On Car)

Refer to Engine Idle Setting Procedures in the Emission Control Section.

Dashpot Adjustment (On Car)

(1) Set throttle at curb idle position.

(2) Fully depress the dashpot stem and measure the clearance between the stem and the throttle lever as shown in figure 4-76. Refer to Carburetor Service Specifications for the correct setting.

(3) Adjust by loosening the locknut and turning the dashpot.

Fast Idle Speed Adjustment (On Car)

Set the fast idle speed with the engine at operating temperature and the fast idle screw against the first kickdown step (middle step) of the fast idle cam. Refer to Carburetor Service Specifications for the correct rpm setting. Adjust by turning the fast idle screw.

NOTE: *When adjusting fast idle speed, disconnect and plug vacuum hose at EGR valve and disconnect electrical connector from TCS solenoid vacuum valve.*

MODEL 4300 CARBURETOR CALIBRATIONS

List No.	4TA4	4THD4
Primary Throttle Bore Size	1.5620	1.5620
Main Venturi Size	1.2500	1.2500
Secondary Throttle Bore Size	1.6870	1.6870
Fuel Inlet Diameter	0.0980	0.0980
Low Speed Jet	0.0310	0.0310
Idle Air Bleed (First)	0.0260	0.0260
Idle Air Bleed (Second)	0.0730	0.0730
Primary Metering Jet Number	62	62
Secondary Metering Tube Restriction	0.0960	0.1100
Secondary Fuel Feed	0.0520	0.0520
Primary High Speed Bleed	0.0360	0.0360
Secondary High Speed Bleed	0.0225	0.0225
Secondary Anti-Siphon Bleed	0.0225	0.0225
Power Valve Timing-Two Stage (inches of Hg)		
First Stage	10.000	10.000
Second Stage	6.1000	7.3000
Accelerator Pump Jet	0.0310	0.0310
Vacuum Spark Port	0.0520	0.0520
Spark Port Location Above Closed Throttle	0.0700	0.0700
Choke Heat Inlet Restriction	0.0890	0.0890
Choke Vacuum Restriction	0.0760	0.0760

CARBURETOR SERVICE SPECIFICATIONS

CARBURETOR MODEL	APPLICATION	FLOAT LEVEL	FLOAT DROP	INITIAL CHOKE VALVE CLEARANCE	FAST IDLE CAM SETTING	AUTOMATIC CHOKE COVER SETTING	DASHPOT	CHOKE UNLOADER	FAST IDLE SPEED	CHOKE COVER ID
CARTER YF		DESIRED TOLERANCE		DESIRED TOLERANCE	DESIRED TOLERANCE	DESIRED TOLERANCE	DESIRED TOLERANCE			
6431	258 J-10, CKE, WAG MANUAL	.476 ±.032	1.38	.215 ±.020	.190 +.021 −.011	1 NOTCH RICH ± 1/2 NOTCH	.095 ±.032	.275 MIN	1600 ON 2ND STEP (HOT WITH TCS SOLENOID AND EGR DISCON-NECTED) ±50 RPM	AZ
6431	232/258 (CALIF) ② CJ5/6	.476 ±.032	1.38	.215 ±.020	.190 +.021 −.011	1 NOTCH RICH ± 1/2 NOTCH		.275 MIN		AZ
6511	258 (CALIF) ② MANUAL CJ5/6	.476 ±.032	1.38	.215 ±.020	.190 +.021 −.011	1 NOTCH RICH ± 1/2 NOTCH	.095 ±.032	.275 MIN		AE
7001	258 CHEROKEE, J-10 AUTOMATIC	.476 ±.032	1.38	.215 ±.020	.190 +.021 −.011	1 NOTCH RICH ± 1/2 NOTCH		.275 MIN		AZ
7029 ①	232/258 (CALIF) ② MANUAL CJ5/6	.476 ±.032	1.38	.215 ±.020	.190 +.021 −.011	1 NOTCH RICH ± 1/2 NOTCH	.095 ±.032	.275 MIN		AE
MOTORCRAFT 2100		FLOAT LEVEL								
4DMJ2	304/360 (CALIF) CKE, CJ5/6, J-10 MANUAL	.400 +.069 −.055	DRY	.140 +.011 −.019	.130 +.012 −.020	2 NOTCHES RICH ± 1/2 NOTCH		.250 MIN	1600 ON 2ND STEP (HOT WITH TCS SOLENOID AND EGR DISCON-NECTED) ±50 RPM	TFA
		.78 ±.062	WET							
4RHD2	360 J-20 AUTOMATIC	.375 +.062	DRY	.140 +.011 −.019	.130 +.012 −.020	2 NOTCHES RICH ± 1/2 NOTCH		.250 MIN		TFA
	MANUAL	.75 ±.062	WET							
4DM2	304/360 CKE, WAG, J-10 CJ5/6 MANUAL	.400 +.069 −.055	DRY	.130 +.017 −.023	.130 +.012 −.020	2 NOTCHES RICH ± 1/2 NOTCH	.140 ±.032	.250 MIN		TFA
		.78 ±.062	WET							
4RA2	360 CKE, WAG, J-10 AUTOMATIC	.400 +.069 −.055	DRY	.140 +.011 −.019	.130 +.012 −.020	1 NOTCH RICH ± 1/2 NOTCH		.250 MIN		TFA
		.78 ±.062	WET							
MOTORCRAFT 4300		FLOAT LEVEL	AUX-ILIARY INLET							
4TA4	360/401 CKE, WAG, J-10 AUTOMATIC	.82 ±.052	.050	.170 +.031 −.023	.160 +.021 −.031	2 NOTCHES RICH ±1/2 NOTCH	.140 ±.043	.325 MIN	1600 ON 2ND STEP (HOT WITH TCS SOLENOID AND EGR DISCON-NECTED) ±50 RPM	4AOB
4THD4	401 J-20 MANUAL/AUTO	.82 ±.052	.050	.170 +.031 −.023	.160 +.021 −.031	2 NOTCHES RICH ± 1/2 NOTCH		.325 MIN		4TOB

1 – FOR ENGINES WITH EXHAUST VALVE ROTATORS
2 – WITHOUT AIR GUARD

NOTE: FOR IDLE SPEED REFER TO EMISSION CONTROL SECTION

J42616