PART TWO—ENGINE AND ELECTRICAL

SECTION VI—FUEL AND EXHAUST SYSTEMS

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1. FUEL TANK

The fuel tank contains a plastic filter through which gasoline passes as it is drawn by the fuel pump. See Figure 1. The filter requires no servicing, since it is self cleaning, due to the surging action of gasoline on the suction surface of the filter. The filter is located 5/8 inch above the bottom of the tank; therefore, approximately three pints of water and sediment can collect below the filter. It is good practice to remove water and sediment which may collect in the bottom of the fuel tank about once a year. Remove the drain plug provided when the fuel level is low, and drain off the accumulated sediment and water.

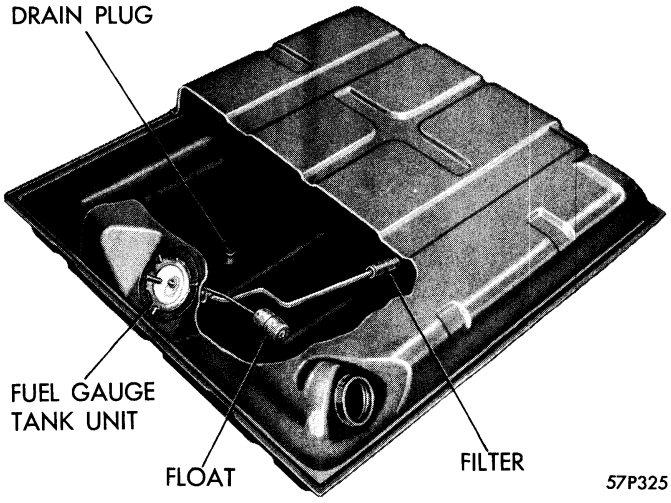

Figure 1—Fuel Tank and Filter

If water or steam is used when cleaning a fuel tank, drain the tank thoroughly. Then, using compressed air, blow air through the filter element, holding the air hose at the fuel line.

2. FUEL PUMP

The fuel pump is operated by an eccentric on the camshaft which actuates the rocker arm. This action lifts the pull rod and diaphragm assembly upwards against the diaphragm spring creating a vacuum in the valve housing which opens the inlet valve. Fuel is then drawn into the valve housing chamber.

On the return stroke of the rocker arm, the diaphragm spring forces the diaphragm down, the inlet valve closes, and fuel is forced through the outlet valve to the carburetor.

TESTING FUEL PUMP

BREATHER VENT—Inspect the pump at the breather vent for evidence of gasoline or oil leakage. Gasoline at the vent indicates a leak through the diaphragm. Oil at the vent indicates a defective oil seal at the top of the pull rod. In either case the diaphragm assembly must be replaced.

PUMP PRESSURE—Insert a "T" fitting into the fuel line at the carburetor. Connect a suitable pressure gauge to the "T" fitting with a connecting not more than 6 inches long. This is to insure accurate testing. Vent in the fuel pump a few seconds by allowing it to pump at full flow into a container before tests are made. When testing pump pressure, engine idle should be set at 500

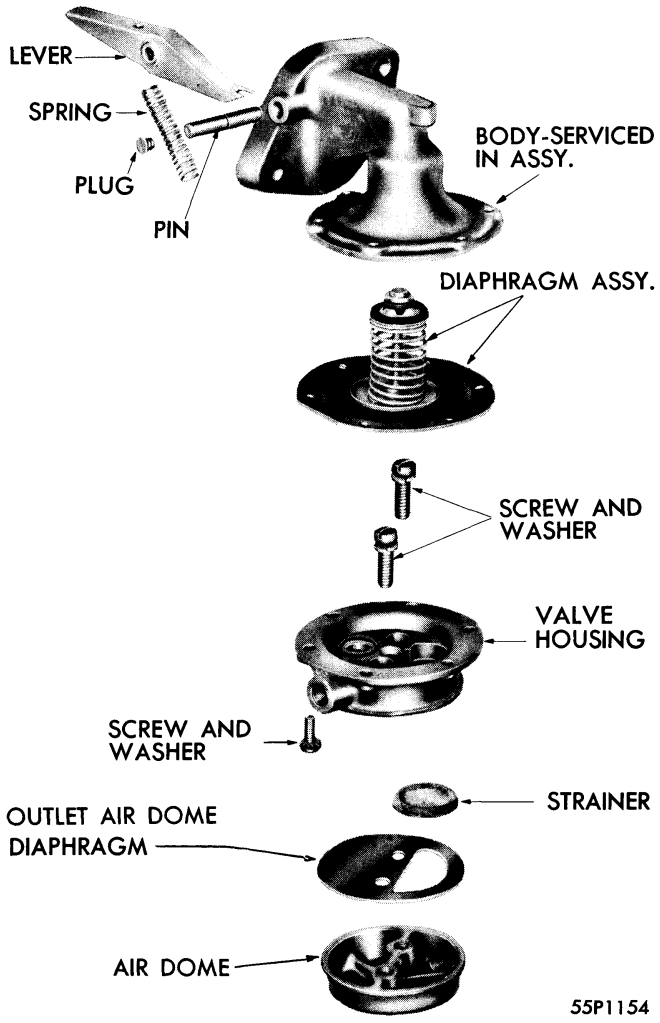

Figure 2—Fuel Pump—Disassembled—6 Cylinder Engine

(Typical of V-8 Engine)

R.P.M. Pressure should be 3½—6 P.S.I. on 6 cylinder engine pumps and 5—7 P.S.I. on V-8 engine pumps, and should remain constant or return very slowly to zero when the engine is turned off. If pressure drops rapidly, outlet valve is faulty. High pressure indicates the diaphragm spring tension is too high. Spring pressure should be 11 pounds when compressed to $1\frac{9}{16}$ inches. Low pressure indicates low diaphragm spring tension.

INLET VALVE—Place a finger over the inlet fitting with fuel line disconnected. Turn engine over with starter motor. There should be constant action. If blow-back is present, the inlet valve is not sealing.

SERVICING FUEL PUMP

All parts of the fuel pump except the diaphragm should be thoroughly cleaned in a suitable solvent. Gum deposits can be removed with denatured alcohol.

Examine diaphragm for cracks, breaks or torn screw holes. Inspect push rod oil seal for wear, deterioration, breaks or tears and examine valve for proper sealing. Replace rocker arm and pivot pin if excessively worn.

DISASSEMBLY AND ASSEMBLY

Before disassembly of the pump, refer to Figure 2. Remove the press fit pivot pin plug and slide out pin. Disengage the rocker arm from the diaphragm push rod. Separate valve body from main body after removing attaching screws. The valves are press fit in the valve body and are not to be removed. To replace the outlet air dome diaphragm, remove the two attaching screws in the valve body. Inspect the diaphragm for cracks or deterioration.

Install the diaphragm with the cut out portion over the inlet valve screen. Install air dome and tighten screws securely. When attaching rocker arm housing assembly to the valve body, hold rocker arm down and then tighten screws.

3. AUTOMATIC CHOKE—INTEGRAL

OPERATION

Manifold vacuum draws outside air through a heat tube in the exhaust manifold where it is heated before being drawn into the thermostatic coil housing. See Figure 3. The heated air acts on the thermostatic coil and gradually opens the choke as the engine warms up. The heat retainer plate stores heat and prevents the coil from cooling too rapidly and closing the choke valve while the engine is still hot. This prevents overchoking if the engine should be re-started while still warm.

The opening of the choke valve is further controlled by the choke piston which is connected by an arm and

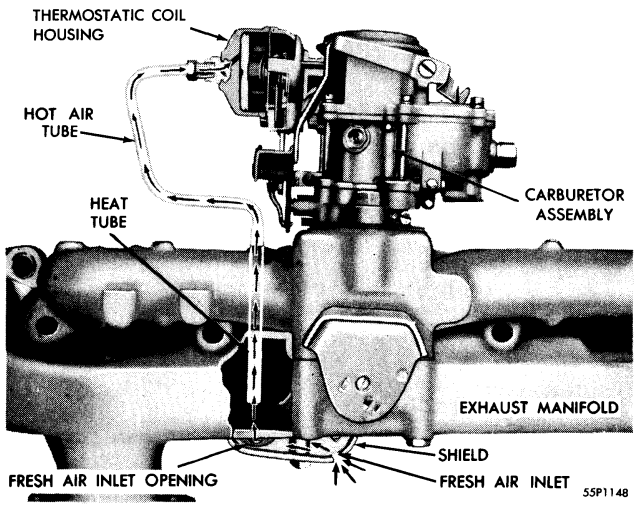

Figure 3—Air-Flow Through Automatic Choke 6 Cylinder Engine

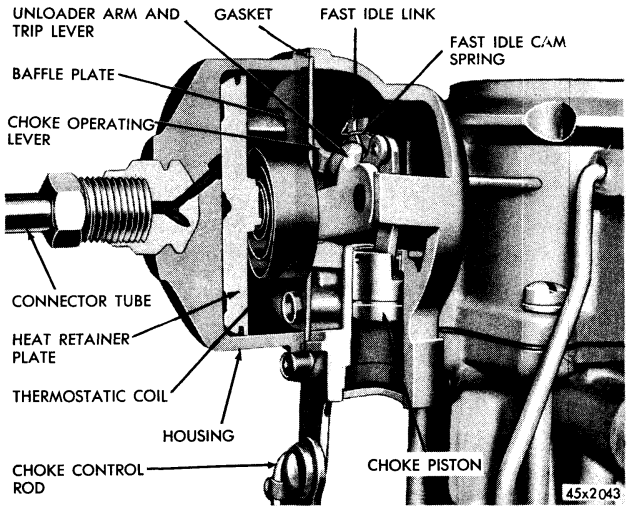

Figure 4—Cutaway of Integral Automatic Choke 6 Cylinder Engine

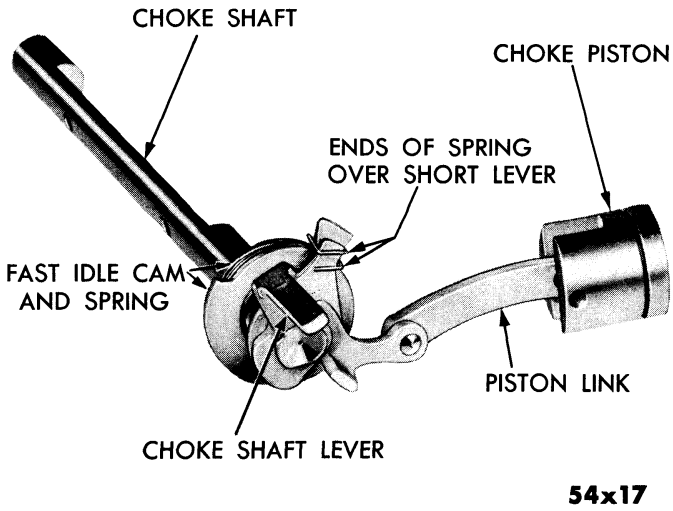

Figure 6—Choke Shaft, Piston, Fast Idle Cam and Spring Assembly—6 Cylinder Engine

link to the choke shaft. See Figure 4. When the engine is started, manifold vacuum pulls the piston down, opening the choke valve enough to provide the correct air-fuel mixture. In addition, the choke valve is offset on the shaft so that, as air enters the carburetor air horn, it tends to position the choke valve, depending on speed and load conditions.

The fast idle cam is connected to the choke shaft by a coil spring. The spring allows the choke valve to move when the fast idle cam is kept from rotating by the pressure of the throttle linkage while the engine is at idle.

The throttle and fast-idle cam are connected through a connector rod and a fast-idle link and trip lever. When the choke is closed, the trip lever rides on the high part of the cam and holds the throttle valve at a greater opening than that provided by the idle speed adjusting screw. The cam lift is graduated so that as the choke valve opens, the throttle valve idle opening decreases. When the choke valve is completely open, the trip lever is completely off the cam lift and the throttle opening is controlled by the idle adjusting screw.

SERVICING AUTOMATIC CHOKE

To remove heat tube from choke housing, hold hex nut at housing with an end wrench while loosening the fitting. This will prevent damaging the housing. Remove the retainer, housing, gasket and baffle plate. Slide out the unloader arm and trip lever. See Figure 5. Remove the choke valve screws and lift out valve. Rotate the choke shaft until piston is out of cylinder and remove the assembly. See Figure 6.

Use a solvent and thoroughly clean all choke parts. Make sure that slots in the cylinder are clean and that

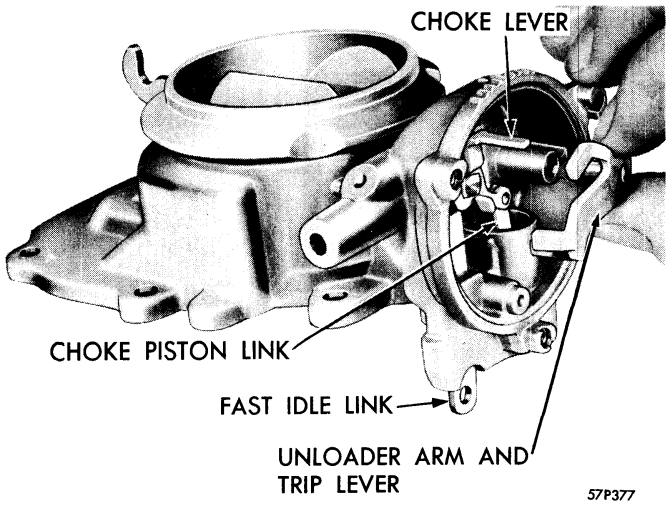

Figure 5—Removing Unloader Arm and Trip Lever 6 Cylinder Engine

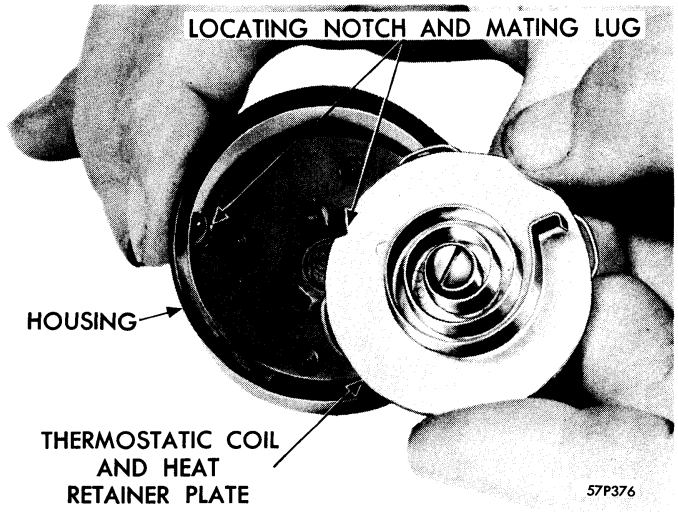

Figure 7—Installing Heat Retainer Plate in Choke Housing—6 Cylinder Engine

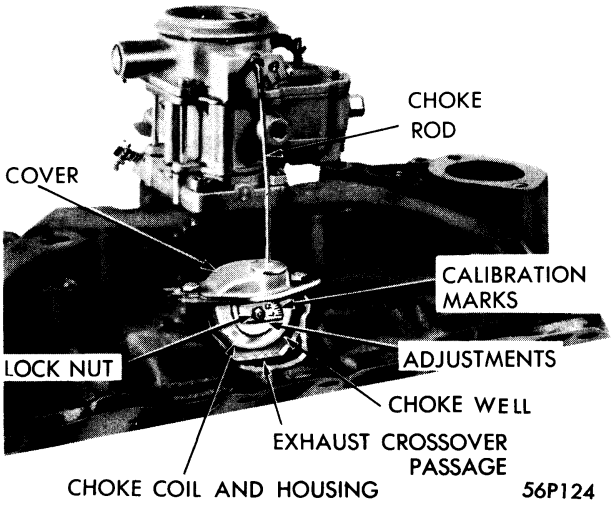

Figure 8—Cutaway Showing Crossover Type Choke V-8 Engine

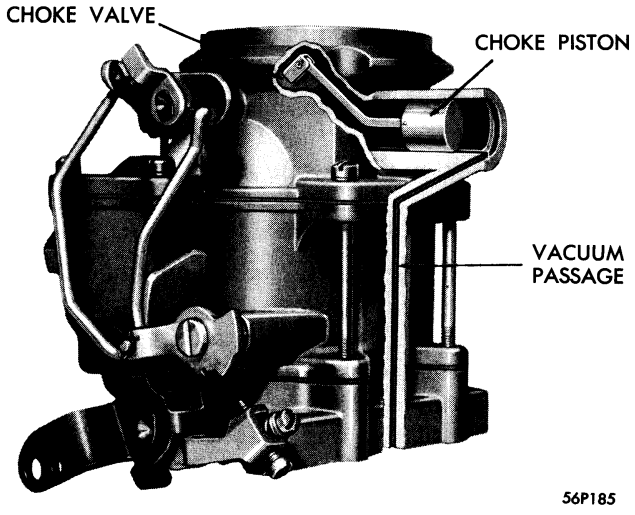

Figure 9—Cutaway Showing Choke Piston Operation V-8 Engine

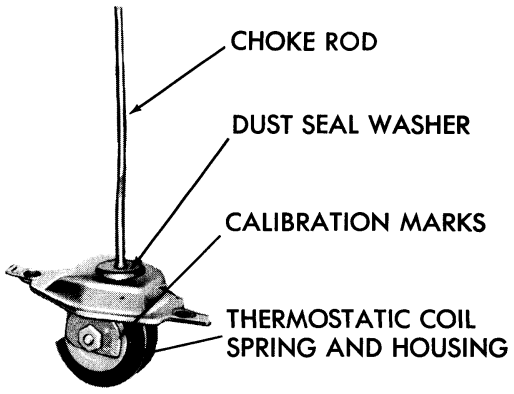

Figure 10—Crossover Type Choke V-8 Engine

air passages are clean. Clean the heat tube and inspect for dents which would obstruct flow of air. Remove the heat tube shield at manifold and clean shield and tube in manifold.

Remove the heat retainer plate from the coil housing by striking the palm of the hand. Clean the air passages in the housing. When assembling the heat retainer plate in the housing, index the notch in the plate with the lug in the housing. See Figure 7.

4. AUTOMATIC CHOKE—CROSSOVER

The crossover type automatic choke used on the V-8 engine is thermostatically operated and mounted on the intake manifold. The choke housing containing the thermostatic coil spring is located in a well at the exhaust crossover passage. See Figure 8.

OPERATION

Operation of the choke valve is controlled by the thermostatic coil spring, the choke piston, and by the offset position of the choke valve on the shaft.

As the thermostatic coil gains heat, it gradually winds and allows the choke to open. At the same time, the vacuum operated choke piston, connected by a rod to the valve, keeps a constant pull on the valve against the tension of the spring. See Figure 9. This is true as long as the engine is running. Thus, the valve opens gradually. In addition, the offset position of the valve also tends to open the valve, depending upon engine speed and load conditions.

SERVICING

Other than an occasional cleaning, if necessary, the automatic choke requires no servicing. It is important that the choke operating rod works freely at the choke shaft and also at the coil housing. Move the choke rod up and down to check for free movement of the coil housing on the shaft. Make certain that the coil housing does not contact the sides of the well. Any contact will cause the choke to open late and may cause the choke to stay open after the engine has cooled—thus causing hard starting. Do not lubricate any parts of the choke since this would cause dirt accumulation and result in binding of the choke mechanism. Check operation of choke piston by working choke valve back and forth. Check the small plug at the end of the choke piston. An air leak at this point would prevent proper operation of the choke blade and result in hard starting and poor fuel mileage.

The choke control unit can be disassembled for service by removing the hairpin clip and nut. See Figure 10. Care should be used when assembling parts so that the coil spring is properly positioned on the shaft. Generally

FUEL SYSTEM
DATA AND SPECIFICATIONS

MODEL			P-30 and LP-1	P-31		LP-2	
			6 Cylinder	V-8 Engine (277 and 301 cu. in.)		V-8 Engine (318 cu. in.)	
Carburetor	Type		Downdraft (single)	Downdraft (Dual)			
			Carter		Stromberg	Carter	Stromberg
	Model No.	Standard	2567S(F)	2512S-SA-SB (A)	WW 15-23(C)	2644S(A)	WW 15-26 (B)
		Overdrive	2568S(F)	2513S-SA-SB (E)	WW 15-24(C)	2645S(A)	WW 15-27 (B)
		PowerFlite	2569S(G)	2514S-SA-SB (E)	WW 15-25(D)	2646S(A)	WW 15-28 (B)
	Main Jet No.	Standard	120-206S	120-213S	—	120-212S	—
		One Size Lean	—	—	—	120-209S	—
Choke Control			Integral Automatic	Crossover Automatic			
Carburetor Adjustments	Float Setting		7/32 in.	9/32 in.	7/32 in.	9/32 in.	7/32 in.
	Accelerator Pump		2 7/32 in.	1 1/32 in.	9/32 in.—5/16 in.	1 1/32 in.	1/4—9/32 in.
	Fast Idle		.016 in.—.020 in.	.014 in.	5 1/2 turns 3/16 in. drill	.015 in.	7 1/2 turns 1/4 in. drill
	Unloader		9/64 in.	3/16 in.	11/64 in. drill	1/4 in.	1/4 in. drill
	Idle Mixture		1/2—1 1/2 turns		3/4—1 1/4 turns		1 1/8 turns
	Overdrive Kickdown Switch		1/64 in.—3/64 in.		—	1/64 in.—3/64 in.	—
	PowerFlite Dashpot		3/32 in.	—	—	—	—
	Vacuum Kick Adjustment		—	—	1/4 in.	—	31/64 in. (WW 15-26) (WW 15-27) 29/64 in. (WW 15-28)
Fuel Pump	Type		Mechanical Diagram				
	Pressure		6-7 P.S.I.				
	Make		Carter				
Fuel Tank Capacity			20 gals. — 22 gals. (Suburban only)				
Fuel Filter			Filter unit in fuel tank	Filter unit in fuel tank Ceramic Filter on Carburetor			
Manifold Heat Control			Thermostatic—Automatic				
Air Cleaner			Paper Element				

Choke Unit
(A) 170-AV-464S
(B) 387806
(C) 387410
(D) 387411
(E) 170-AT-464S
(F) 170-N-312S
(G) 170-X-312S

the choke will function properly if the index mark is set at a point half way between the L and R mark. If need be, set the mark toward rich or lean as required. See Figure 8 or 10.

5. CARBURETOR—(6 CYLINDER AND V-8) CARTER

The 6 cylinder and V-8 engines use a Ball and Ball single throat and a Ball and Ball dual throat carburetor, respectively. Some V-8 engines will be equipped with a dual throat Stromberg carburetor. Refer to Section 6. Carburetor—Stromberg.

Each throat of the dual carburetor supplies an air fuel mixture to four specific cylinders. Thus it is essentially two carburetors in one. Each throat contains its own idle air bleed, high speed air bleed, idle orifice tube, main vent tube, main metering jet, metering port, idle port, idle mixture adjustment and throttle valve. Metering of fuel in the accelerator pump system of the V-8 engine carburetor is accomplished by two accurately drilled orifices, one for each throat, in the discharge cluster. In the case of the 6 cylinder engine carburetor, a replaceable accelerator pump jet is used.

The operation of the float, low speed, high speed and accelerator pump systems as explained in the following paragraphs applies to the 6 cylinder engine carburetor. The V-8 engine dual throat carburetor operating fundamentals are essentially the same.

FLOAT SYSTEM

The float system maintains a fuel supply at a constant level for all operating conditions. The fuel level is kept at a minimum to prevent as little fuel vaporization as possible and to aid in warm engine starting. It is important that floats are properly adjusted, and needle valve assembly is in good condition. Equally important is a good seal between the air horn and main body. A poor gasket at this point causes leakage resulting in inefficient carburetor operation. The bowl is vented to the inside of the carburetor air horn so that the proper air pressure is maintained in the bowl chamber at all times. See Figure 11.

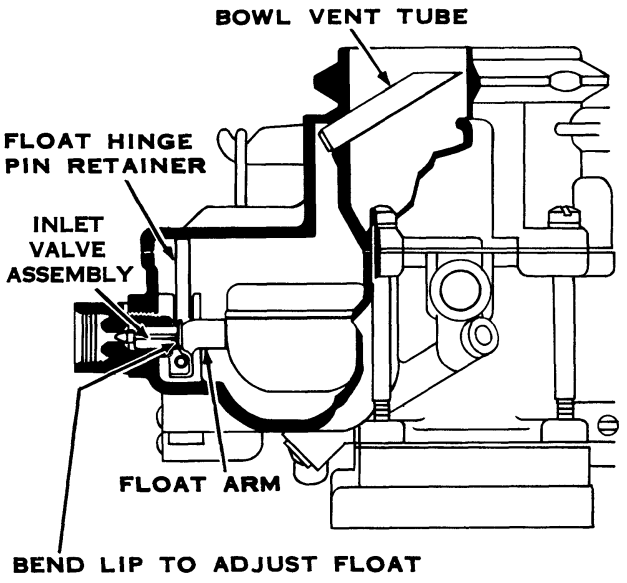

Figure 11—Typical Float System

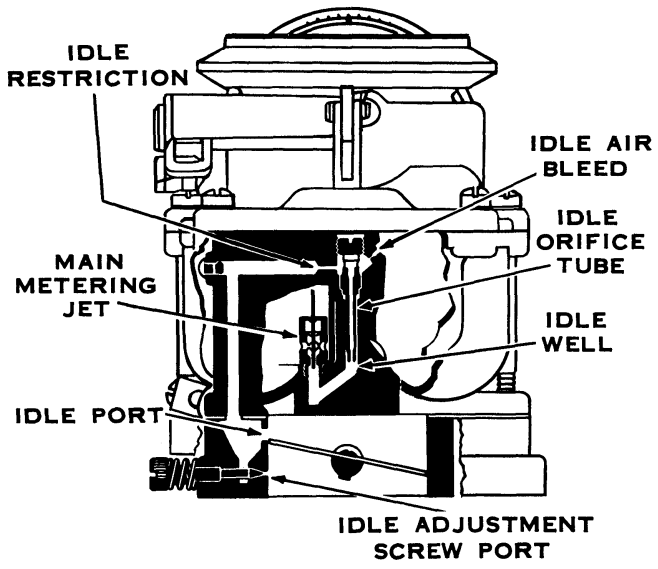

Figure 12—Typical Low Speed System

LOW SPEED SYSTEM

During engine idle or part throttle operation, fuel is supplied to the engine through the low speed system. Fuel enters the main metering jet and is metered through the idle orifice tube where it mixes with air drawn through the idle air bleed. The idle restriction breaks up the fuel as it mixes with air drawn through the idle air bleed. This provides an air-fuel mixture at the idle port and idle bleed adjustment screw port. It is important that the idle air bleed, idle orifice tube, idle restriction, idle passage, idle port, and idle adjustment screw port are kept clean. Any clogging will result in poor low speed operation. Air leakage through the gaskets will also cause poor engine idling or low speed operation. See Figure 12.

HIGH SPEED SYSTEM

During part or full throttle operation, fuel is supplied to the engine through the high speed system.

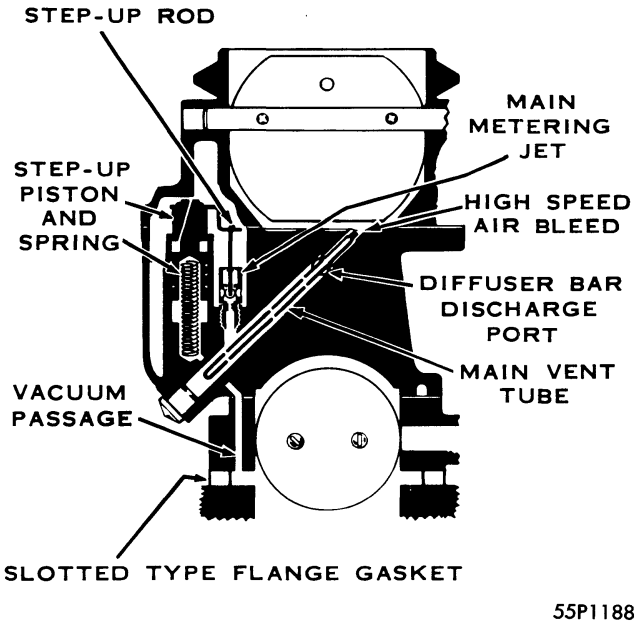

Figure 13—Typical High Speed System

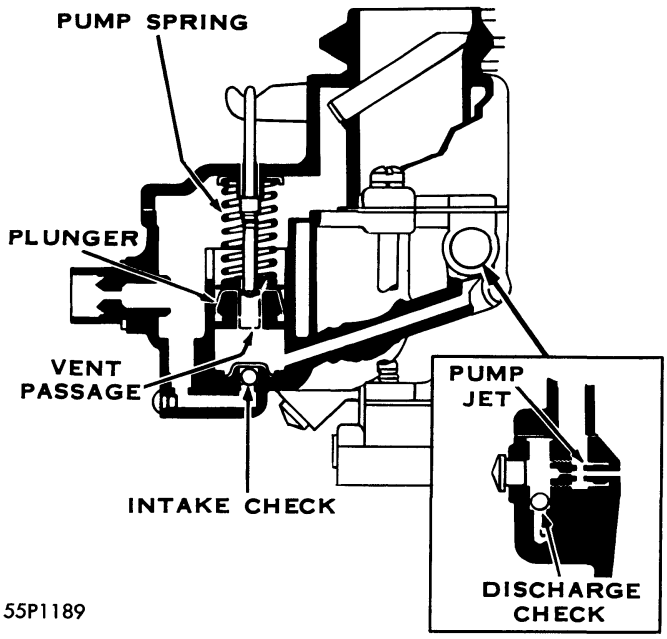

Figure 14—Typical Accelerator Pump System

When the engine is under a heavy load, suddenly accelerated, or operated at very high engine speeds, the step up system supplies additional fuel through the diffuser bar discharge port. See Figure 13. Fuel flow through the fuel passage of the main metering jet is controlled by the movement of the step up rod which in turn is moved by a spring and a vacuum controlled piston. A vacuum passage to the intake manifold is provided for by a drilled passage in the carburetor body and throttle body, and a slotted flange gasket.

Under normal driving conditions, manifold vacuum exerts a strong pull on the vacuum piston. This holds the piston down keeping the step up rod in the fuel passage of the main metering jet. Fuel then flows around the rod, through the jet, and through the diffuser bar discharge port.

When manifold vacuum falls off, due to a heavy load, sudden acceleration, or very high engine speed, the spring moves the piston up, moving the step up rod out of the main metering jet fuel passage. Additional fuel is then supplied to the engine.

Air is drawn through the high speed air bleed and mixes with the fuel surrounding the main vent tube. The mixture is then drawn from the diffuser discharge ports. It is important that the vent tube is clean. A clogged tube may cause excessively rich mixtures. Leakage of air at the gaskets will decrease or destroy the vacuum and the step up piston will remain up resulting in excess fuel consumption.

ACCELERATOR PUMP SYSTEM

The accelerator pump system momentarily supplies an extra charge of fuel to the engine when the throttle is opened. The amount of fuel added is directly proportional to the amount the pedal is depressed. When the accelerator pedal is depressed, the pump plunger spring forces the plunger down and the fuel is discharged past the discharge check ball through the jet and into the air stream. The inlet passage is closed by the inlet check ball as this occurs.

When the accelerator pedal returns, the pump plunger is pulled up drawing a new charge of fuel past the inlet check ball. The discharge check ball is closed, preventing air bleeding into the passage when the pump plunger is pulled up.

When the engine is operated at high speeds, a vacuum exists at the accelerator pump jet. To prevent fuel being drawn out of the pump system, the pump jet air bleed is vented through a passage in the air horn to the float bowl.

A vent is also provided in the plunger to relieve vapor pressure developed by heat in the pump system. See Figure 14.

DISASSEMBLY OF AIR HORN

Remove choke connector rod and accelerator pump operating rod as shown in Figure 16. Remove the air horn attaching screws and carefully lift straight up to remove air horn assembly. Discard gasket.

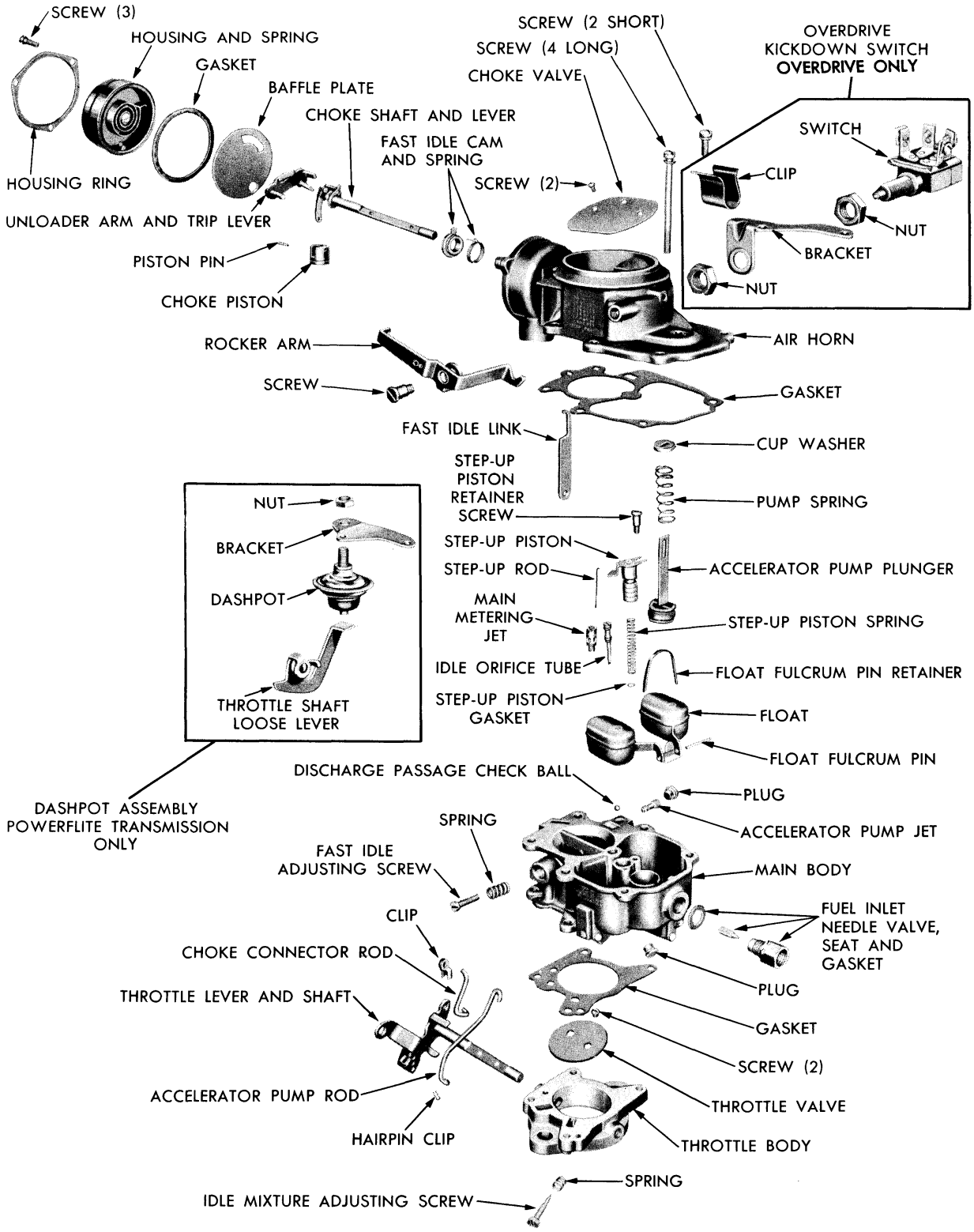

Figure 15—6 Cylinder Carburetor—Disassembled

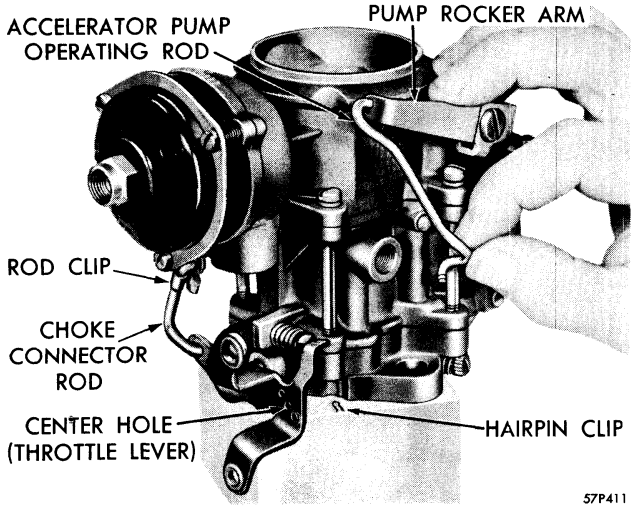

Figure 16—Removing Accelerator Pump Rod 6 Cylinder Engine
(Typical of V-8 Carburetor)

NOTE

Long screws attach throttle body to main body on PowerFlow 6 carburetors. Use care to prevent accidental damage to throttle body.

Disengage the accelerator pump plunger from the rocker arm by pushing up on bottom of plunger and sliding it off the hook. See Figure 17. If the pump plunger leather is hard, worn excessively or cracked, a new plunger should be installed. The leather on the piston must be soft and pliable and the small expansion spring underneath it must be clean. The leather will shrink if the fuel contains a small amount of water. Soak the piston leather in clean gasoline or kerosene for about 10 minutes to make it soft and pliable. Then reflare the leather. To do this, carefully roll the leather back (turn it inside out) and return it to its normal position and reshape by rolling between the thumb and forefinger. This should also be done before installing a new piston.

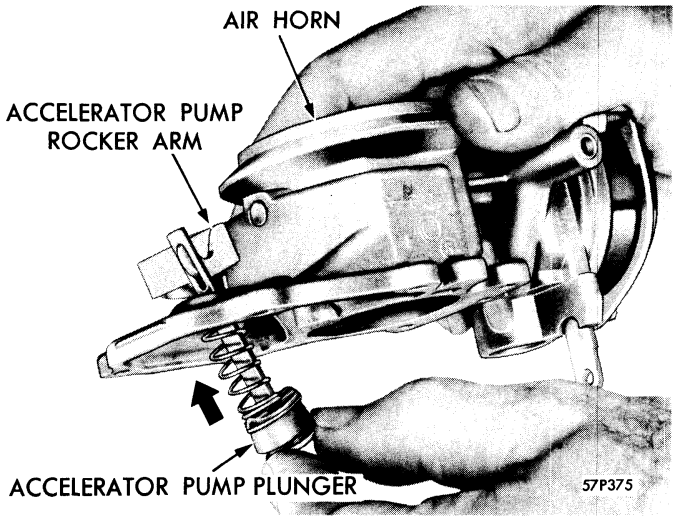

Figure 17—Removing Accelerator Pump Plunger 6 Cylinder Engine
(Typical of V-8 Carburetor)

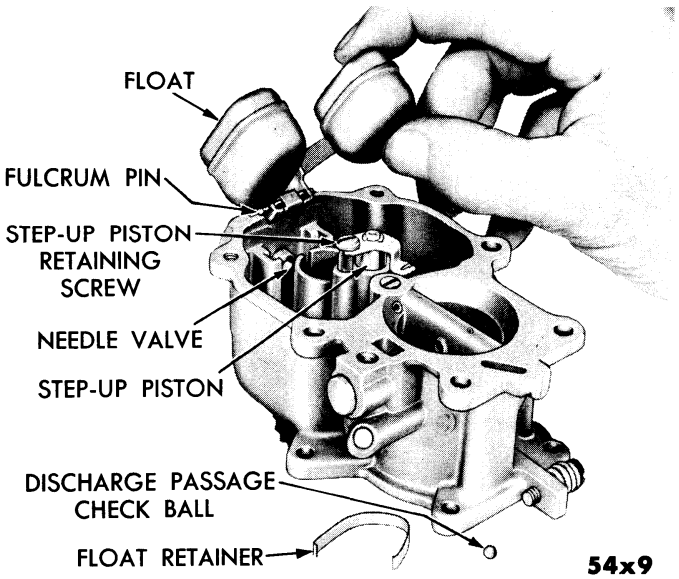

Figure 18—Removing Float Assembly—6 Cylinder Engine
(Typical of V-8 Carburetor)

DISASSEMBLY OF CARBURETOR MAIN BODY

NEEDLE VALVE—Inspect the fuel inlet needle valve, seat and gasket for evidence of grooving, irregular seating, or excessive wear and worn valve assemblies. Remove the float pin retainer, pin and float. Test the floats for leakage and inspect the pivot holes for excessive wear. See Figure 18.

MAIN BODY—6 Cylinder Engine Carburetor—Remove step up piston, spring, step up rod, main metering jet and gasket, and idle orifice tube. See Figure 19. Remove accelerator pump discharge check ball. To remove the pump jet, first remove jet plug.

The main vent tube seldom needs servicing other than cleaning. A special tool is required to replace it. The tube can be cleaned satisfactorily without removing it from the main body. To do this, take out the plug at the end of the tube passage and use a solvent in the passage. Apply air pressure at the high speed air bleed hole. It is important that the tube is free of dirt since a clogged tube may cause excessively rich mixtures. Refer to Figure 16 for tube location.

MAIN BODY—V-8 Engine Carburetor—Two screws at the bottom of the throttle body must be removed to separate the main body from the throttle body. Remove

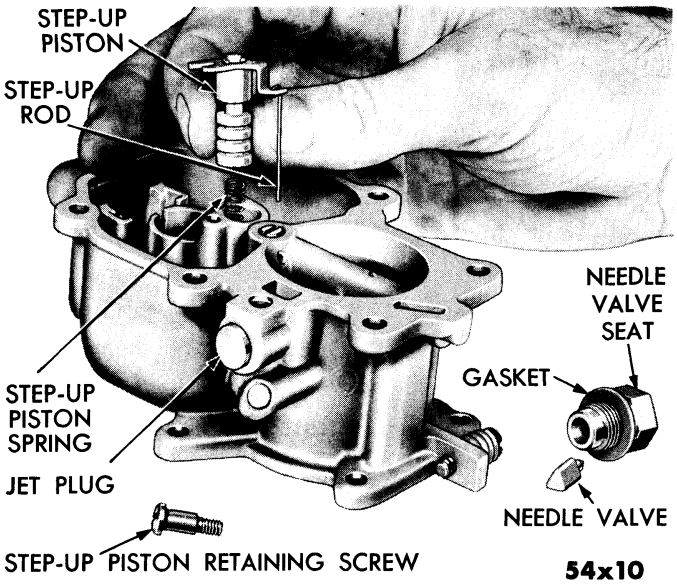

Figure 19—Removing or Installing Step-up Piston 6 Cylinder Engine

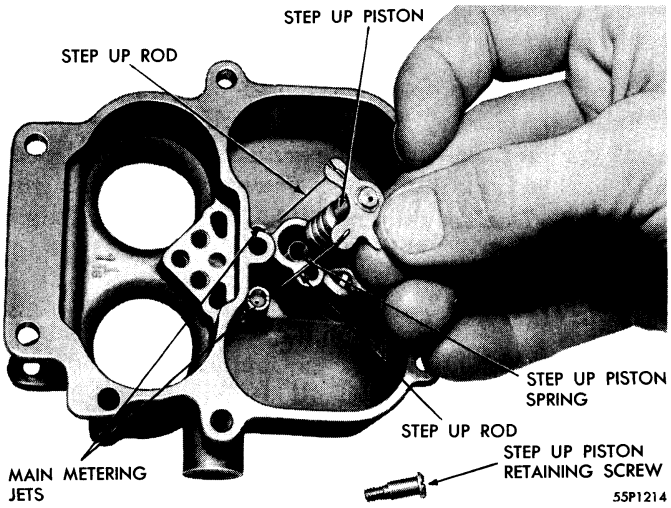

Figure 20—Removing or Installing Step-up Piston V-8 Engine

the step-up piston, spring, both step-up piston rods and main metering jets. See Figure 20. Remove the idle bleed screws and lift off the discharge cluster and venturi assembly. See Figure 21. Discard both gaskets. Remove the discharge check ball. Metering of fuel from the accelerator pump system is accomplished by two carefully drilled holes in the discharge cluster, which must be kept clean. Do not remove idle orifice tubes or main vent tubes from the cluster. They can easily be cleaned with a solvent and dried with compressed air. Replace any parts that show signs of wear or damage. The discharge cluster is serviced only as an assembly.

DISASSEMBLY OF THROTTLE BODY

Remove the idle adjustment screw and spring (two in V-8 carburetor) from the throttle body. Clean and inspect for wear. If there are grooves or evidence of irregular seating, replace the adjusting screws. See Figure 22 or 24.

Inspect the throttle shaft and lever for looseness. Proper idle speed cannot be maintained if lever is loose on shaft. Repair if necessary by brazing or soldering. Do not attempt to peen shaft. This may bend the shaft and cause improper throttle valve operation due to poor seating.

Inspect for looseness of the throttle shaft in the body. In some cases, if wear is not too excessive it is possible to intall a new shaft and lever assembly. Where there is excessive wear and looseness, replace the entire throttle body assembly.

When a new shaft is installed, mark the position of the throttle valve in the bore. It is important that the valve be in the same position when the new shaft is installed for proper engine idle and part throttle operation.

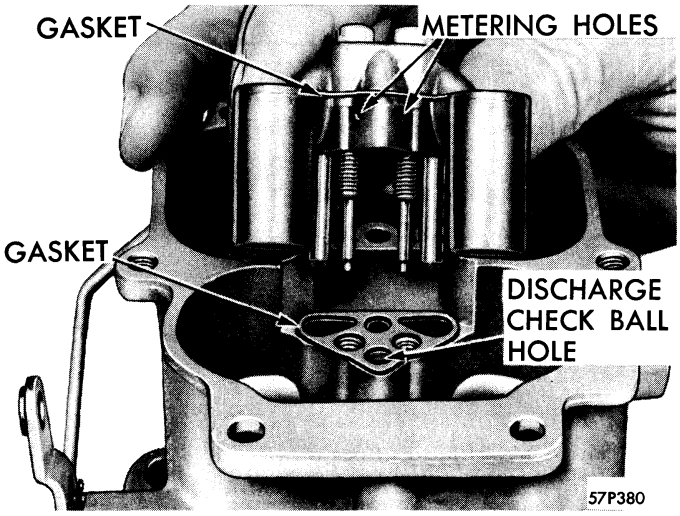

Figure 21—Removing or Installing Venturi Cluster V-8 Engine

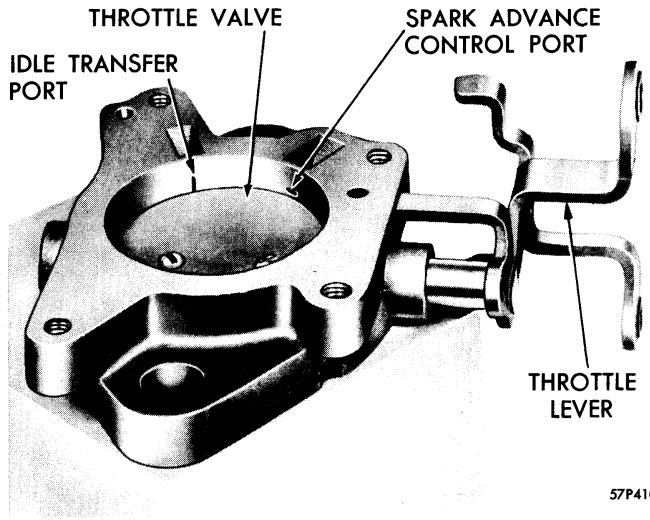

Figure 22—Throttle Body Assembly—6 Cylinder Engine

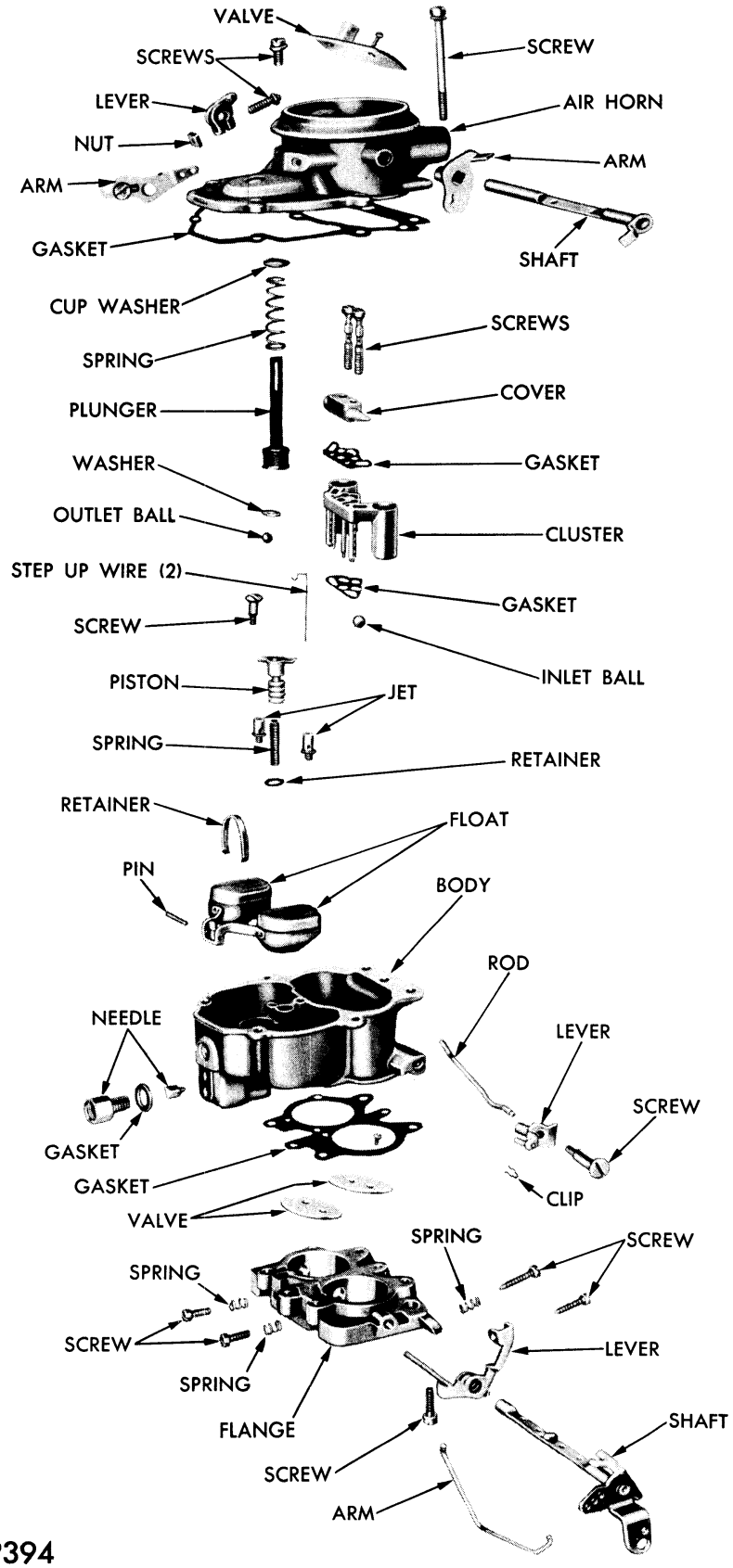

Figure 23—V-8 Engine Carburetor—Disassembled

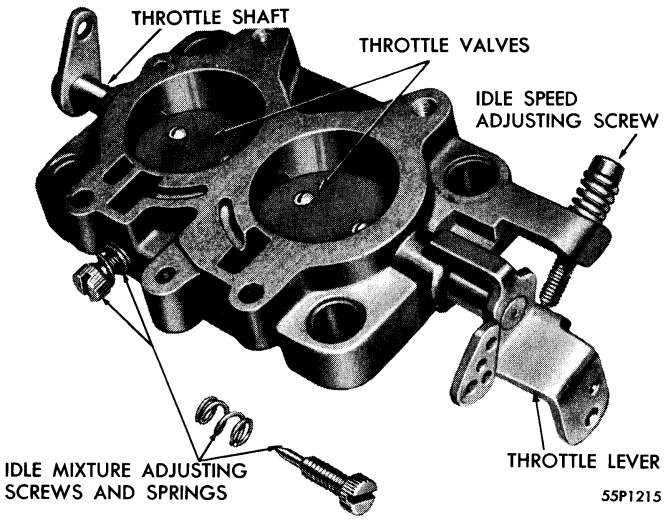

Figure 24—Throttle Body Assembly—V-8 Engine

CLEANING CARBURETOR PARTS

Silt, carbon and gum deposits can collect in the carburetor, decreasing the size of the jet openings and fuel passages and interfering with the operation of the check valves. Fine silt is especially troublesome if gum is present. Even though silt is not apparent, a deposit of varnish or shellac colored gum on any carburetor part, such as the float, indicates that the carburetor needs cleaning and reconditioning.

CAUTION

Never clean jets or orifices with a wire or drill. Jets may become enlarged and damaged beyond use. Always clean out jets and passages with solvent and compressed air.

When cleaning the carburetor, soak all parts in a good commercial cleaning solvent until deposit has softened. Then scrub parts with a stiff bristled brush (not a wire brush) and dry with compressed air. Do not use a lye bath or gasoline. Gasoline will not dissolve carbon and gum. Lye will remove the protective coating on various parts of the carburetor, permitting rapid corrosion to occur.

CAUTION

Acetone, lacquer thinner and denatured alcohol, used for cleaning carburetor parts, are highly inflammable. Handle with care. Do not use near painted surfaces, as such cleaners might be splashed on painted surfaces, causing damage.

After soaking parts in the cleaning solvent, rinse in clean gasoline and clean out all passages with compressed air. If hot water is used, remove all traces of water with kerosene, mineral solvents or gasoline.

Water in the carburetor can cause die cast parts to corrode and form an oatmeal-like mash which will clog the jets. While this corrosion can sometimes be removed, it is advisable to replace the entire carburetor because the "mush" is hard to see and remove and often sticks to the inside of carburetor passages rendering the carburetor inefficient.

INTEGRAL CHOKE—Heavy black carbon deposits indicate the possibility of heat tube leakage in the exhaust manifold. The coil housing, heat retainer plate, and coil are serviced only as an assembly. To clean the passage in the coil housing, remove the heat retainer plate and coil assembly by striking down on the palm of the hand. Clean with a suitable brush and compressed air.

ASSEMBLY OF CARBURETOR

TESTING ACCELERATOR PUMP SYSTEM — Install the plunger in the cylinder and the discharge check ball on its seat. Pour a small quantity of gasoline in the bowl. Move the plunger up and down slowly several times to expel all air from the pump passage. Hold the ball down firmly with a brass rod and raise the plunger. Refer to Figure 25 when testing the BBS carburetor and Figure 26 when testing the BBD carburetor. Press the plunger down. No fuel should flow from the pump inlet or discharge passage. If gasoline is evident from either

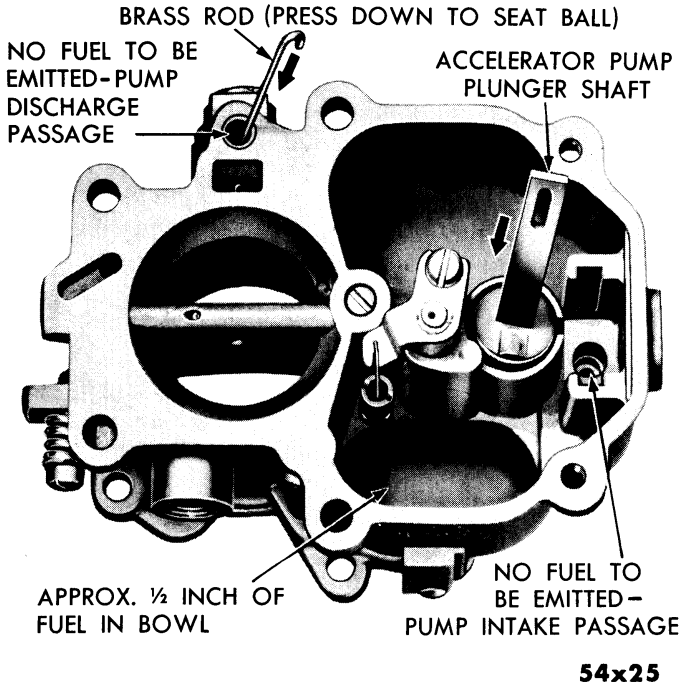

Figure 25—Testing Accelerator Pump System 6 Cylinder Engine

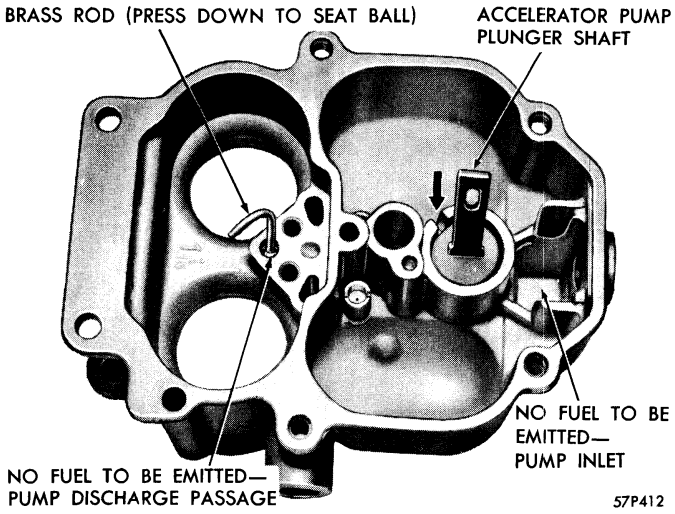

Figure 26—Testing Accelerator Pump System V-8 Engine

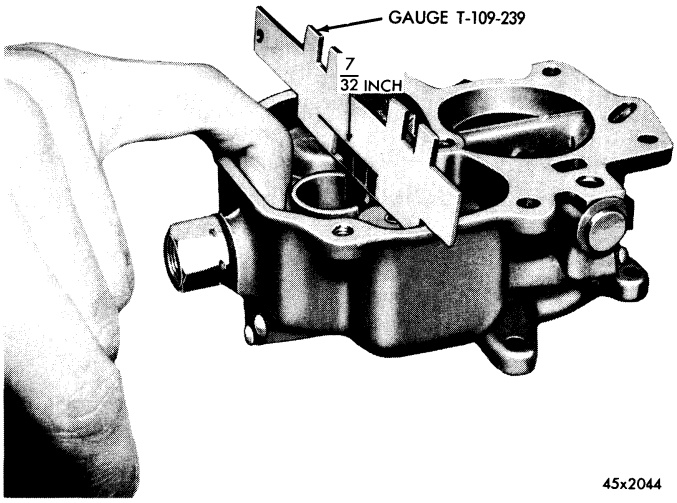

Figure 27—Checking Float Level Height—6 Cylinder Engine
(Typical of V-8 Carburetor)

point, clean the passages again and repeat tests. If leakage is still evident, replace the check ball.

MAIN BODY—6 Cylinder Engine Carburetor—Install accelerator pump jet and plug. Install idle orifice tube and tighten securely. Install main metering jet and gasket. Tighten securely. Install the step-up piston spring and step-up rod. See Figure 19. Carefully guide the step-up rod into the main metering jet. Place the float assembly and inlet needle valve assembly in position.

MAIN BODY—V-8 Engine Carburetor — Place discharge check ball on its seat and position the venturi and discharge cluster in the main body. Use new gaskets. Install the two idle bleed screws and tighten securely. See Figure 22. Install both main metering jets using new gaskets and tighten securely. Install the spring, step-up piston and both step-up rods. Use care when guiding the rods in the main metering jets to prevent damage to the rods and jets. Install float assembly and inlet needle valve assembly.

CHECKING FLOAT LEVEL—The same procedure is used when checking float level on 6 cylinder or V-8 engine carburetors. Install float assembly and needle valve assembly. Check float level height as shown in Figure 27. Seat needle with finger pressed against float lip. There should be $\frac{7}{32}$ inch from top of the crown of each float to the top of the main body. Each float must be adjusted to this setting. It is important that the floats do not touch the sides of the bowl.

AIR HORN AND THROTTLE BODY—6 Cylinder Engine Carburetor—Place a new gasket on throttle body and position main body making sure they are aligned. Assemble pump plunger, spring, and cup washer and insert through air horn, engaging pump arm. Place a new gasket on body and position air horn. Install the attaching screws and tighten securely. Attach the choke connector rod and accelerator pump operating rod.

AIR HORN AND THROTTLE BODY—V-8 Engine Carburetor—Position main body on throttle body using a new gasket. Install the two screws at bottom of the throttle body and tighten securely. Place a new gasket on main body. Assemble pump plunger pump arm in air horn and place assembly on main body. Make sure pump plunger leather enters cylinder evenly and does not flop over as it enters cylinder. Install air horn to body screws and tighten them evenly.

ADJUSTMENTS

ACCELERATOR PUMP—6 Cylinder and V-8 Engine Carburetors—Back out the throttle adjusting screw and open the choke valve so that the throttle valve can be completely seated in the carburetor bore. The adjustment is made with the pump connector rod in the center hole of the throttle lever. With the throttle valve closed,

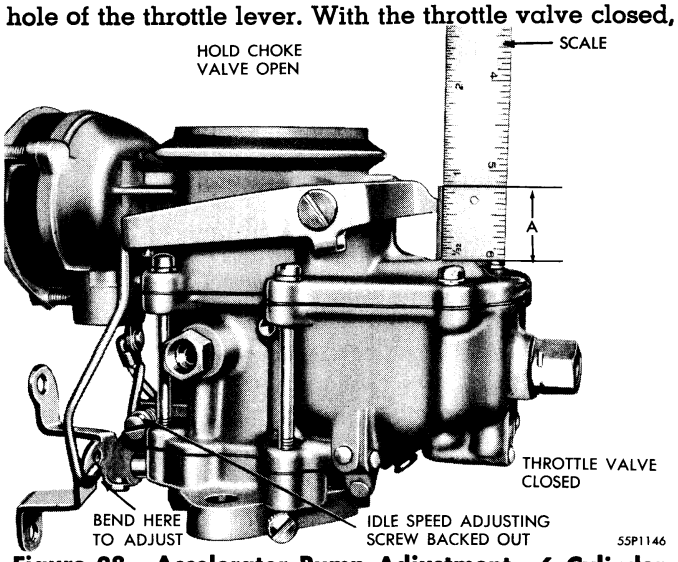

Figure 28—Accelerator Pump Adjustment—6 Cylinder Engine
(Typical of V-8 Carburetor)

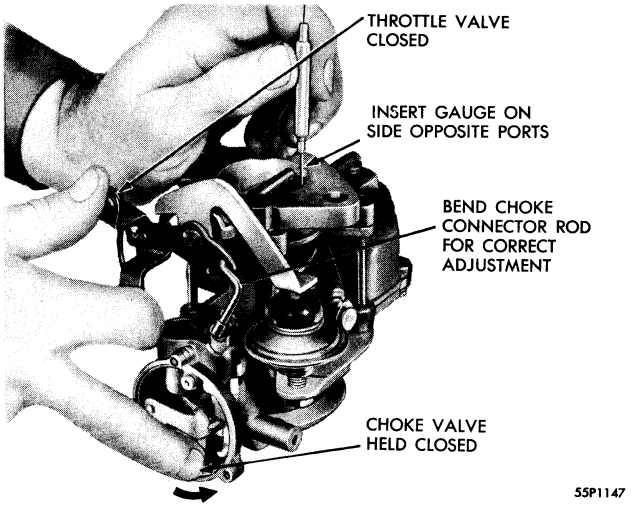

Figure 29—Fast Idle Adjustment—6 Cylinder Engine

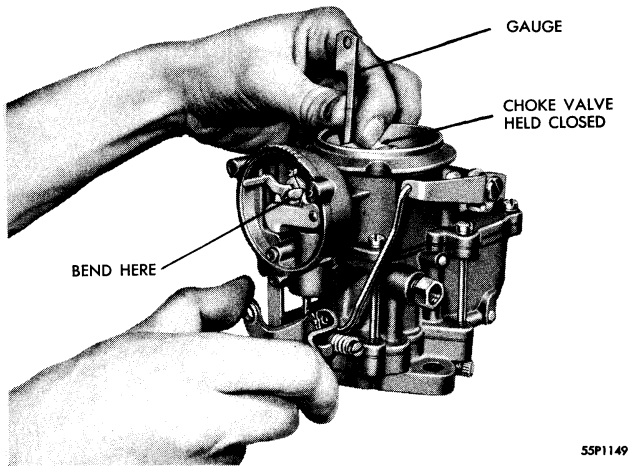

Figure 30—Unloader Adjustment—6 Cylinder Engine

measure the distance between the top of the float bowl cover to the end of the plunger shaft, marked "A" in Figure 28. Refer to Data and Specifications for dimension of particular carburetor used. If necessary, carefully bend the connector rod at the lower angle to obtain adjustment. Use Tool T109-213.

FAST IDLE AND UNLOADER—6 Cylinder Engine Carburetor—Remove the thermostatic coil housing assembly, gasket, and baffle plate. Back out throttle adjusting screw. Open throttle valve partially and hold choke valve in fully closed position. Then close throttle valve. This procedure will allow fast-idle cam to revolve to fast-idle position. Measure the clearance between the throttle valve and bore of carburetor on the side opposite the idle port. Refer to Figure 29. For clearance measurement see Data and Specifications for particular carburetor that is checked. This clearance can be adjusted by bending the choke connector rod at the lower angle using Tool T109-213.

The unloader adjustment must be made after the fast-idle adjustment is performed. Hold the throttle valve wide open and close the choke valve as far as possible without forcing. Clearance is measured between the upper edge of the choke valve and the inner wall of the carburetor air horn. See Figure 30. For clearance dimension refer to Data and Specifications for particular carburetor used. To obtain the correct adjustment bend the arm or choke trip lever with Tool T109-214.

FAST IDLE AND UNLOADER—V-8 Engine Carburetor—Back off idle speed adjusting screw. With choke valve closed and lip on inner choke shaft lever contacting lug on outer lever, align index mark with adjusting screw. To adjust, bend lip on inner choke shaft lever. See Figure 31. With the fast idle screw on the highest part of the fast idle cam, turn the screw in until there is .014 inch clearance between the edge of the throttle valve and the carburetor bore on the side opposite the ports. See Figure 32.

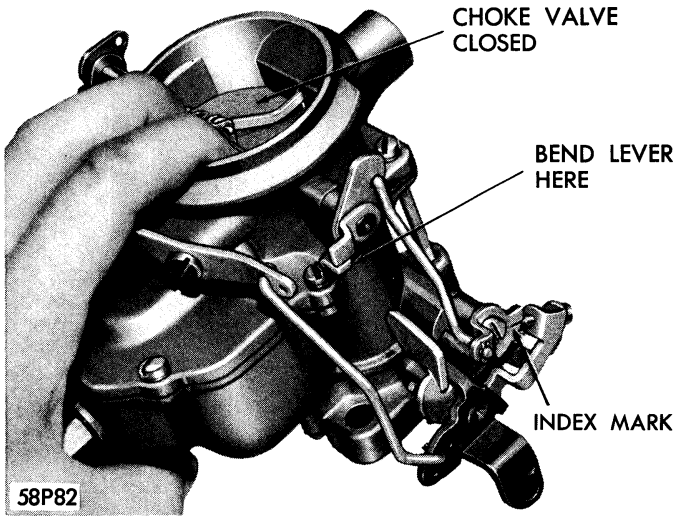

Figure 31—Fast Idle Adjustment—V-8 Engine

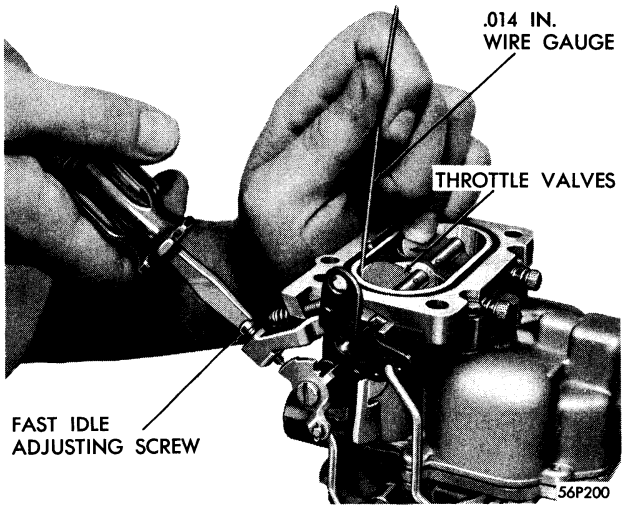

Figure 32—Fast Idle Adjustment—V-8 Engine

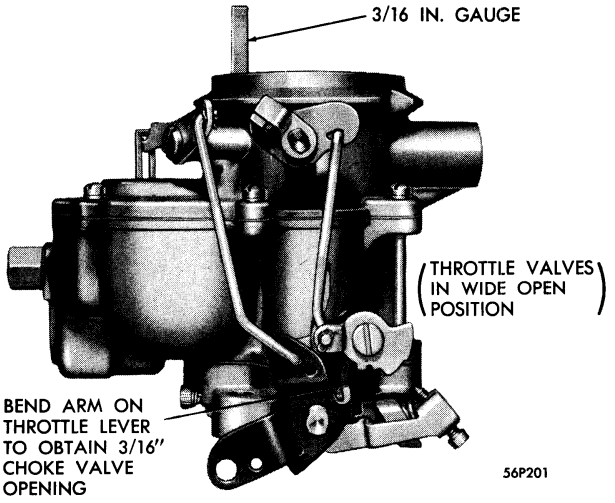

Figure 33—Unloader Adjustment—V-8 Engine

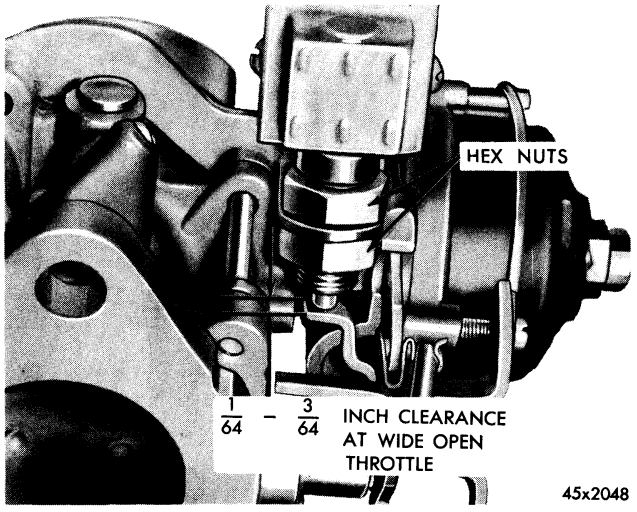

Figure 34—Overdrive Kickdown Switch—6 Cylinder Engine

To make the unloader adjustment bend the arm on the throttle lever to give the choke valve the correct opening with the throttle valves wide open. See Figure 33 and refer to Data and Specifications.

OVERDRIVE KICKDOWN SWITCH—6 Cylinder and V-8 Engine Carburetors—Open the throttle valve to wide open position and adjust the hex nuts on the switch to have 1/64 to 3/64 inch clearance between the kickdown lever and switch stem guide. See Figure 34. The kickdown switch is serviced only as an assembly.

POWERFLITE DASH POT—6 Cylinder Engine Carburetor—The Dash Pot is a device which retards the closing of the throttle when the accelerator pedal is suddenly released thus preventing engine stalling. Maximum dash pot action is obtained by loosening the lock nut and adjusting the unit so that the dash pot plunger shaft can be moved inwardly approximately 3/32 inch, when the throttle valve is tightly closed. After adjustment is made, retighten lock nut. See Figure 35. The dash pot unit is serviced only as an assembly.

IDLE SPEED AND MIXTURE—6 Cylinder and V-8 Engine Carburetors—Adjust the engine idle speed at about 450 to 500 revolutions per minute with the engine at normal operating temperature. Turn the idle mixture adjusting screw (two on V-8 Engine Carburetors) until engine operates smoothly. Adjustment will be somewhere between ½ and 1½ turns open.

6. CARBURETOR—STROMBERG

A two barrel Stromberg carburetor will be used as well as the Ball and Ball dual, on V-8 engines.

Five basic systems are incorporated in the carburetor, namely, a float system, idle system, main metering system, high speed system, and an accelerator pump system.

FLOAT SYSTEM

Fuel enters the carburetor at the fuel inlet through the needle and seat and is maintained at a constant level by the floats. The vent tube connects the air horn with the float chamber, thus, a balanced air pressure is maintained. See Figure 36.

IDLE SYSTEM

With the throttle valves closed, and the engine running at slow idle speed, fuel from the float chamber is metered into the idle tubes through an orifice at the base of each idle tube. The air taken in through the idle air bleed holes mixes with the fuel as it leaves the top of the idle tubes. This mixture of air and fuel flows down the channel where it is mixed with additional air entering through the secondary idle air bleeds before being

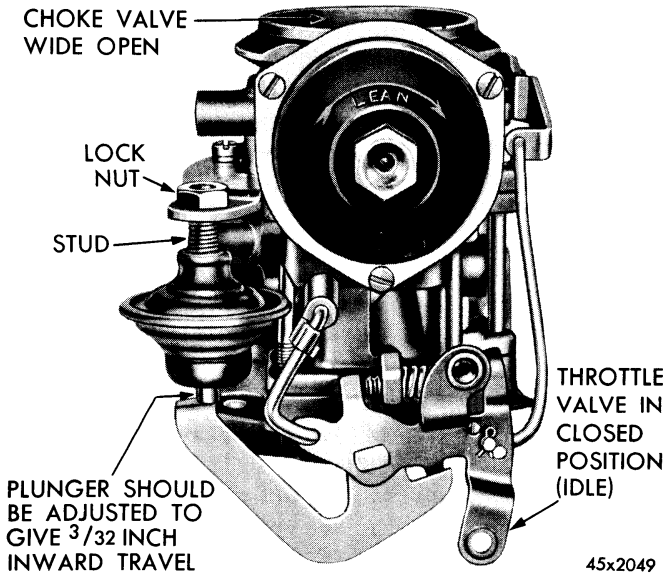

Figure 35—Dash Pot Adjustment—6 Cylinder Engine

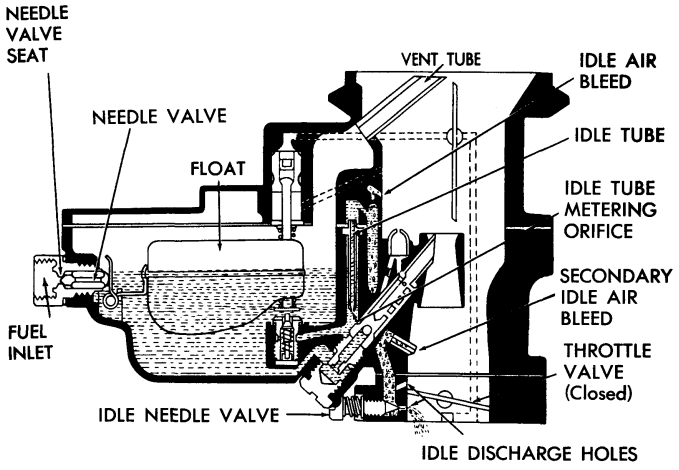

Figure 36—Float System and First Stage of Idle

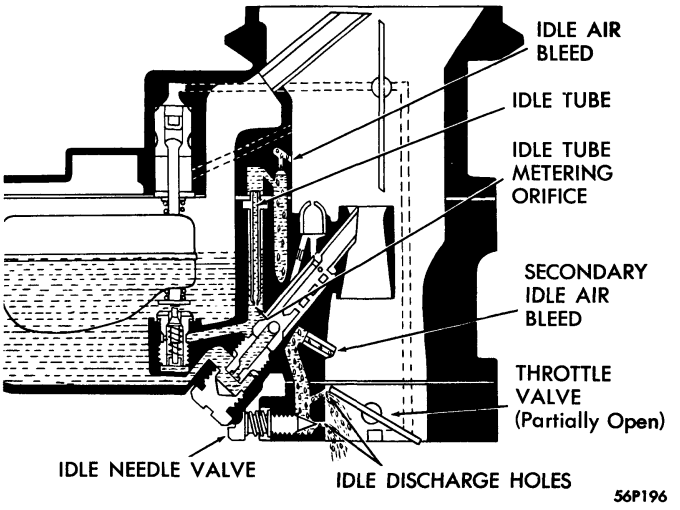

Figure 37—Idle System and Second Stage of Idle

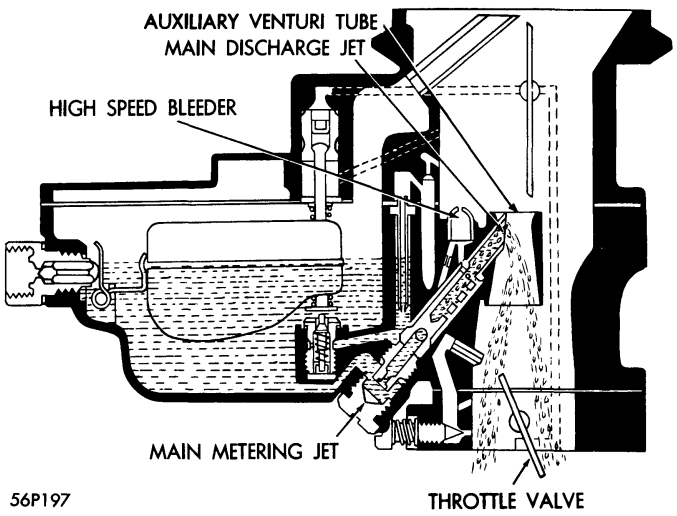

Figure 38—Main Metering System

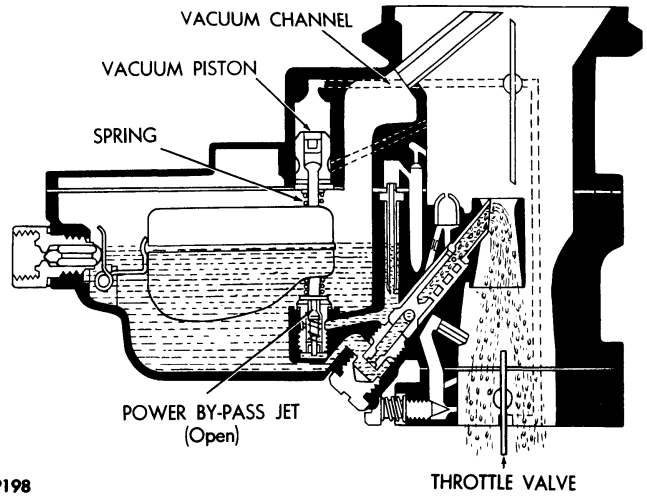

Figure 39—High Speed System

discharged at the lower idle discharge holes. The quantity of fuel discharged at holes is controlled by the adjustable idle mixture screws. See Figure 36. As the throttle valves are opened slightly, the mixture of fuel and air is also discharged from the upper idle discharge holes supplying additional fuel for increased engine speed. See Figure 37.

MAIN METERING SYSTEM

The main metering system controls the flow of fuel during the intermediate or part throttle range of operation. With the throttle valves in the partially open position, fuel flows from the float chamber through the main metering jets and into the main discharge jets. Here the air bled through the high speed air bleeders into the main discharge tubes is mixed with the fuel. This mixture of air and fuel is then discharged into the air stream through the auxiliary venturi tubes. The main body and main discharge jets are designed to prevent percolation. Should vapor bubbles form in the fuel entering the main discharge system, due to high temperatures, the vapor bubbles will collect in the outside channels surrounding the main discharge jets, rise into the dome shaped high speed air bleeders where they are vaporized. See Figure 38.

HIGH SPEED SYSTEM

The power system is incorporated in the carburetor to provide the richer mixture required for maximum power or high speed operation. The extra fuel is supplied by the vacuum power system which is connected directly to the main metering system. A vacuum controlled piston automatically operates the power by-pass jet in accordance with the throttle opening. Intake manifold vacuum is maintained above the vacuum piston through a channel which connects the vacuum piston with the mounting flange of the carburetor. During partial throttle operations, the vacuum above the piston is sufficient

to overrule the compression spring and holds the power piston in its "up" position. When the throttle valve is opened to a point where manifold vacuum drops to approximately 5 inches Hg., the compression spring then moves the vacuum piston "down" to the power by-pass jet and meters additional fuel into the main metering system. See Figure 39.

ACCELERATOR PUMP SYSTEM

As the throttle valves are opened, the accelerating pump piston moves down to close the inlet ball check valve and force a metered quantity of extra fuel through the outlet ball check valve and pump discharge nozzle into the air stream. See Figure 40.

When the throttle is closed, the piston is raised against the compression of the duration spring. When the throttle is opened, the pump lever moves down and permits the compression spring above the piston to move the piston down. With the release of the accelerator pedal

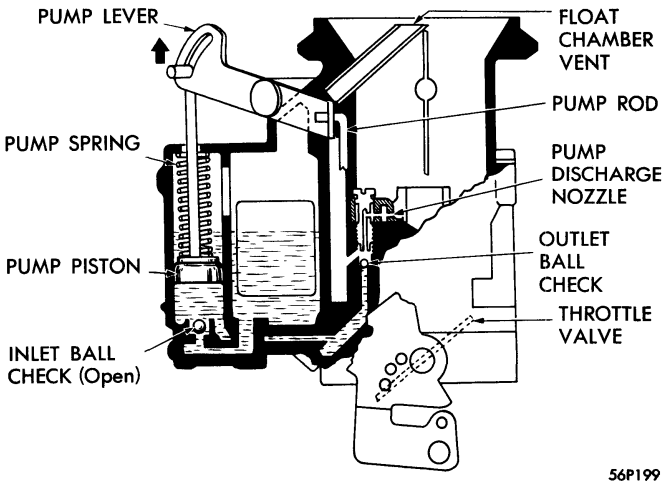

Figure 40—Accelerator Pump System

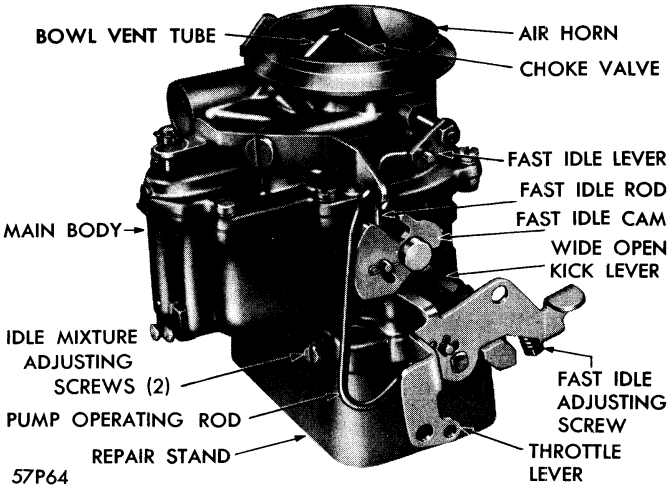

Figure 41—Carburetor Assembly

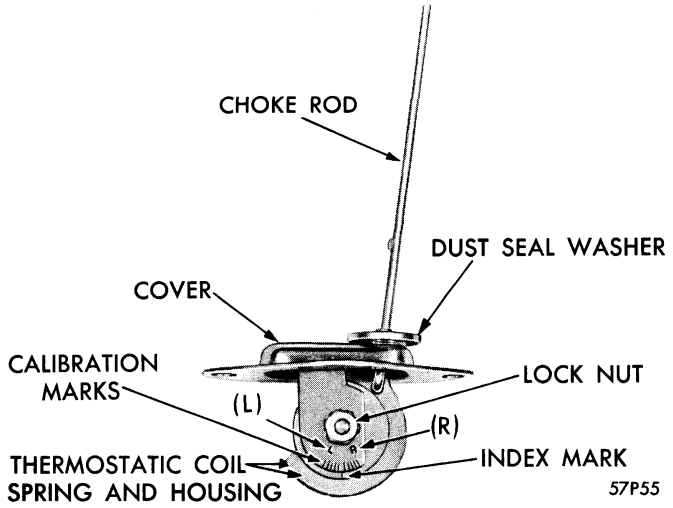

Figure 42—Cross-over Choke Assembly

and the return of the accelerating pump to the release position, the outlet ball check valve "closes" while the inlet ball check valve "reopens," thus permitting fuel from the float chamber to enter and refill the accelerating pump cylinder.

AUTOMATIC CHOKE

The Stromberg crossover choke assembly, Figure 42, used with the Stromberg carburetor, functions in the same manner as the Carter choke control. For operation and service procedure, refer to Section 4. Automatic Choke—Crossover.

DISASSEMBLY OF AIR HORN

Remove the fast idle rod and the pump operating rod. Remove all air horn attaching screws and carefully lift off vertically the air horn assembly. Disengage the pump plunger rod and remove the pump plunger.

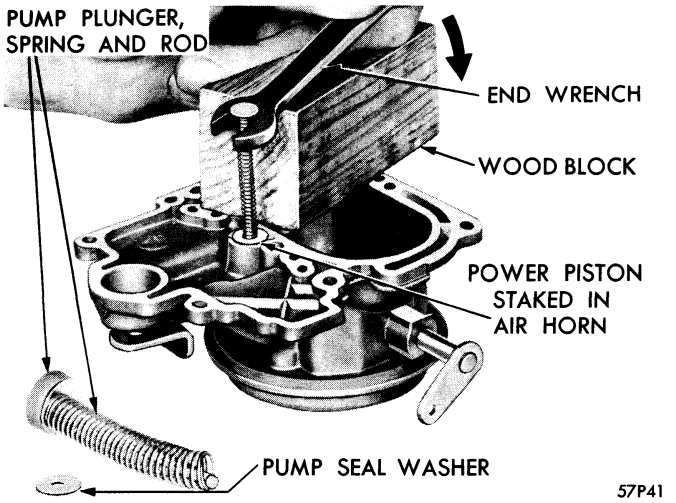

Figure 43—Removing Vacuum Piston from Carburetor Air Horn

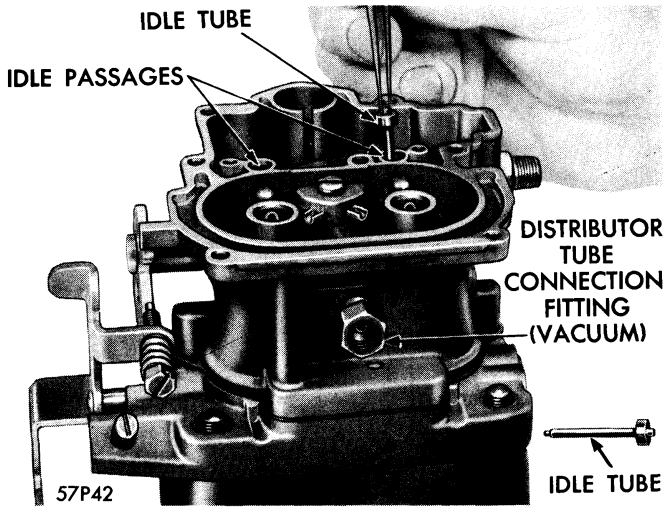

Figure 44—Removing or Installing Idle Tubes from Main Body

To remove the vacuum power piston, use an open end wrench and wood block as shown in Figure 43. Use care as pressure is applied since the assembly is staked in position. The choke plate and shaft can be removed if necessary. Care should be exercised when removing screws to prevent breaking them off in the shaft.

MAIN BODY DISASSEMBLY

Remove idle tubes as shown in Figure 44. Invert carburetor and remove accelerator pump inlet check ball. Do not remove the two dome shaped high speed bleeders in the main discharge strut of the main body. Remove the accelerator pump discharge cluster and invert the body to drop out the accelerator pump discharge check ball. See Figure 45.

Remove the float inlet needle and seat. Inspect for grooving. Use a small screwdriver to pry out the float fulcrum retaining spring. Cover the float chamber, to prevent spring flying out. Then lift out float.

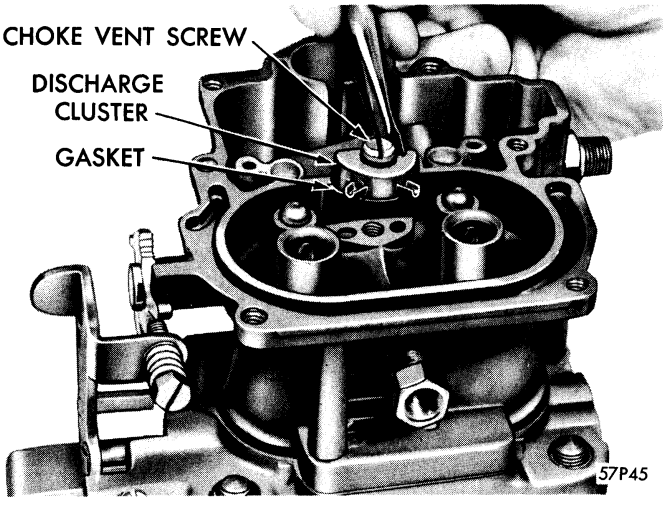

Figure 45—Removing or Installing Accelerator Pump Discharge Cluster

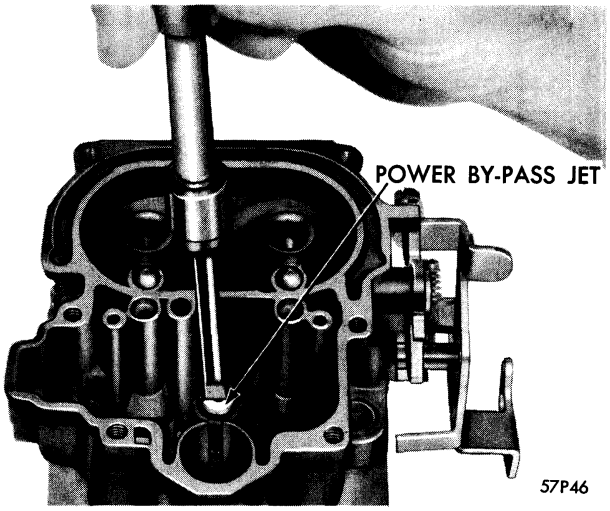

Figure 46—Removing or Installing Power By-Pass Jet

Remove the power by-pass jet and gasket. See Figure 46. Test plunger action of by-pass jet. Invert the main body and remove main metering jet plugs. Use Tool T-24924 to remove the jets. See Figure 47. Then use Tool T-24967 to remove the main discharge jets or tubes. The tool has a tapered right hand thread and should be screwed into the jet. See Figure 51. The threads formed by the tool will not damage the jets. The main body is attached to the throttle body by four screws in the bottom of the throttle body. If separated always use a new gasket.

THROTTLE BODY

A new throttle shaft can be installed but if clearance between shaft and bore is excessive enough to cause poor idling, the assembly should be replaced.

To remove the shaft, first remove the lock nut located in the choke housing. Then remove throttle valve retain-

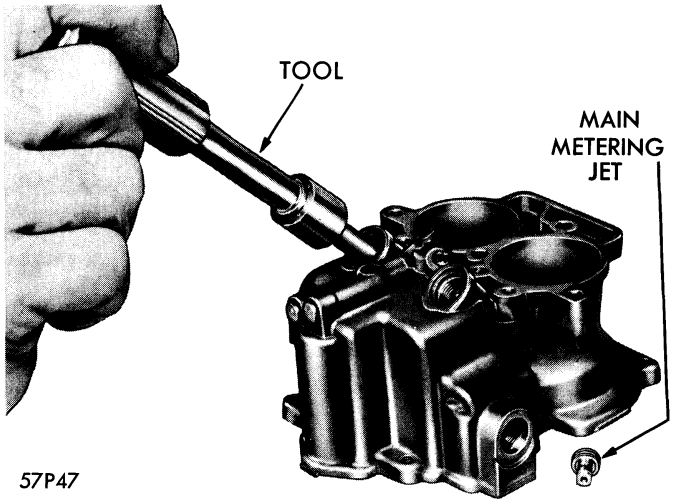

Figure 47—Removing or Installing Main Metering Jets

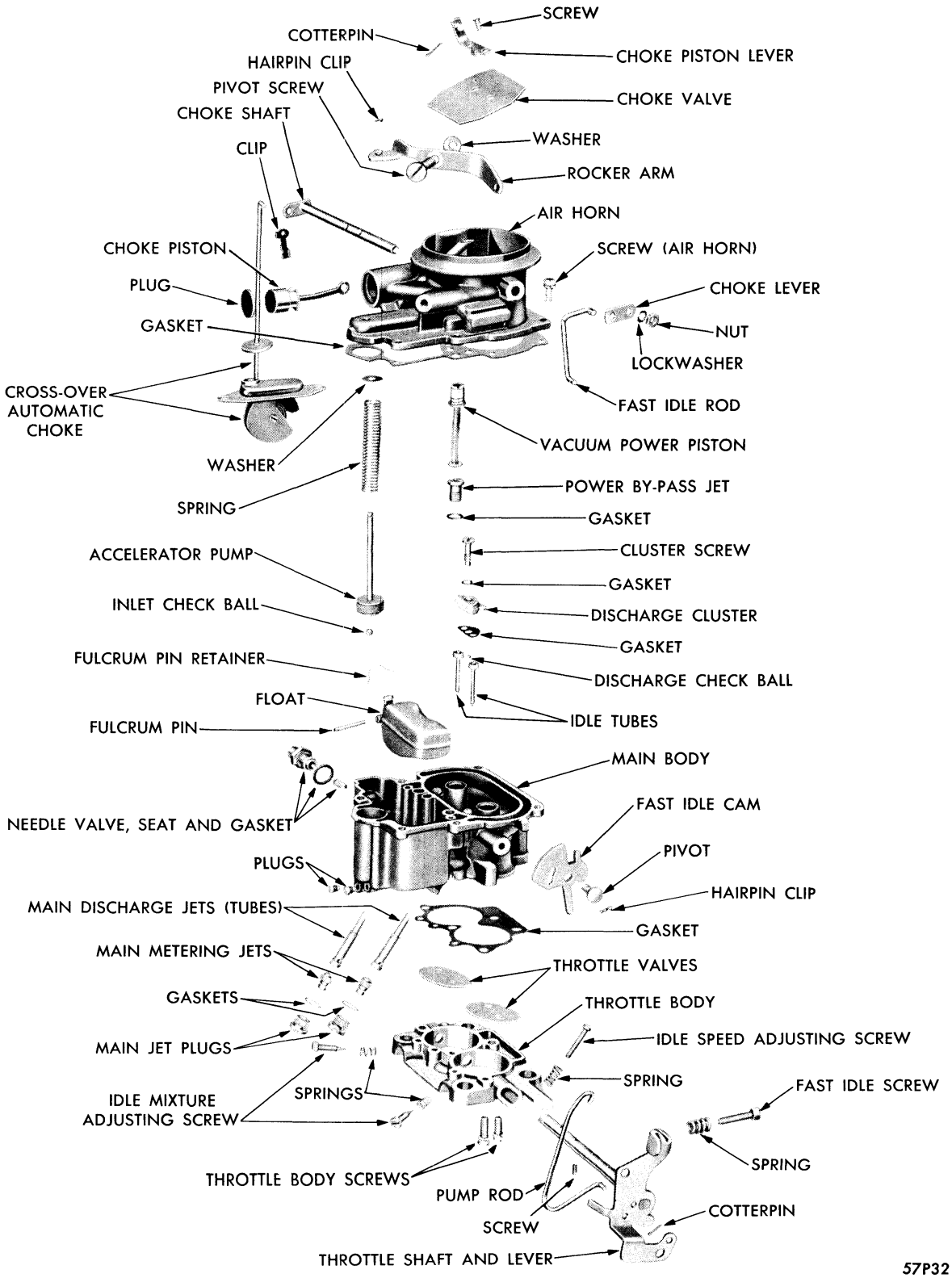

Figure 48—Carburetor—Disassembled

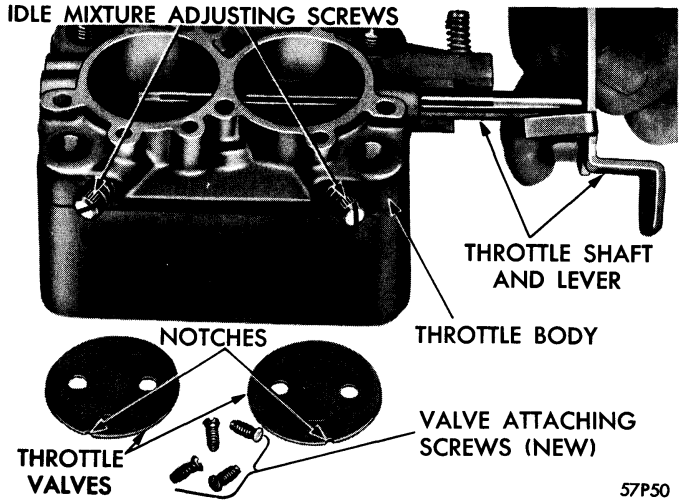

Figure 49—Removing or Installing Throttle Shaft and Valves

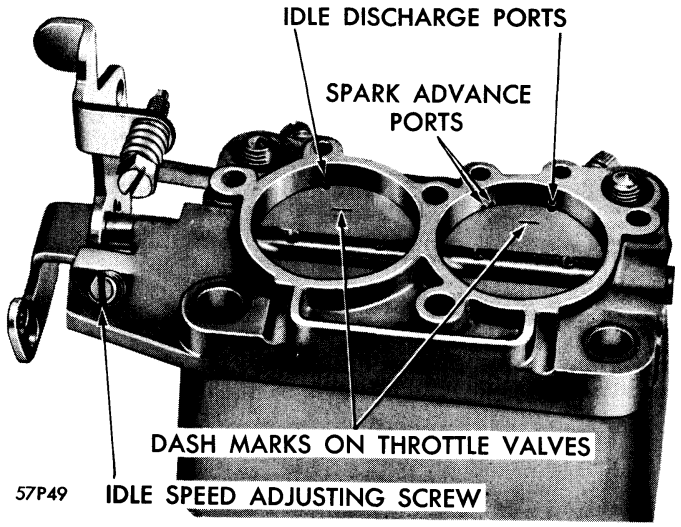

Figure 50—Ports in Relation to Throttle Valves

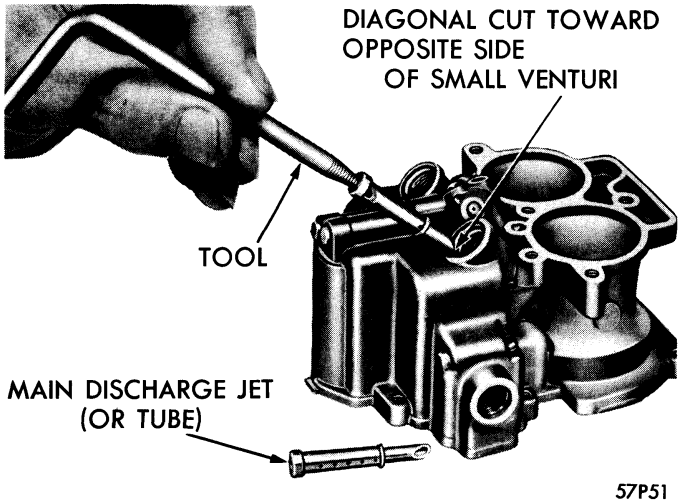

Figure 51—Installing or Removing Main Discharge Jets

ing screws. These should be removed with care to prevent screws being broken in the shaft. Mark valves so that they are installed in their respective bores. See Figure 49. When valves are installed make sure that the small cut in the valve is toward the idle port.

CARBURETOR ASSEMBLY

Assemble throttle body to main body using a new gasket. Place main discharge jets on Tool T-24967 and install into position. See Figure 51.Make sure the opening in end of tube (diagonal cut end) is facing opposite side of small venturi. Insert main metering jets over discharge jets and tighten with Tool T-24924. See Figure 47. Then install gasket and plug. Install power by-pass jet and gasket.

TESTING ACCELERATOR PUMP

Install the accelerator pump inlet check ball ($^3/_{16}$ inch diameter) in the check ball seat at the bottom of the pump cylinder. Install the accelerator pump discharge check ball (⅛ inch diameter) in the orifice in the center passage of the discharge strut section of the main body.

Pour clean gasoline into the carburetor bowl, approximately ½ inch deep. Raise the plunger and press lightly on the plunger shaft to expel the air from the pump passage. Using a small, clean brass rod, hold the discharge check ball firmly down on its seat. See Figure 52.

Again raise the plunger and press downward. No fuel should be emitted from either the intake or discharge passages. Install the discharge cluster gasket, cluster and screw. Tighten securely.

FLOAT LEVEL

Check the float for leaks or damage. If satisfactory for further service, install in position in the carburetor bowl.

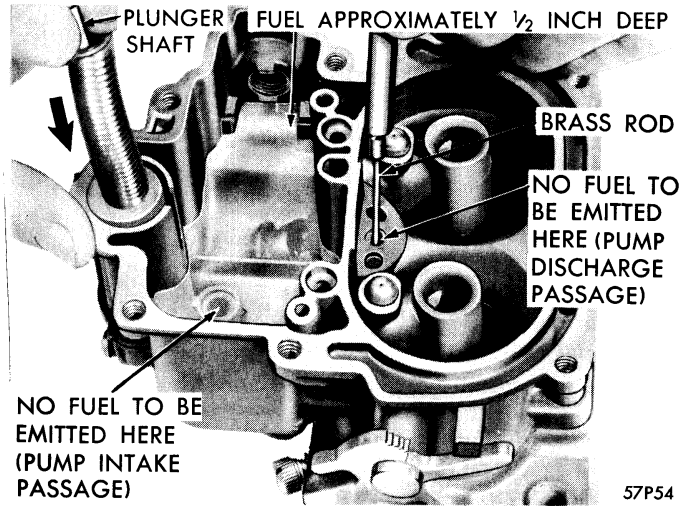

Figure 52—Testing Accelerator Pump Intake and Discharge Check Balls

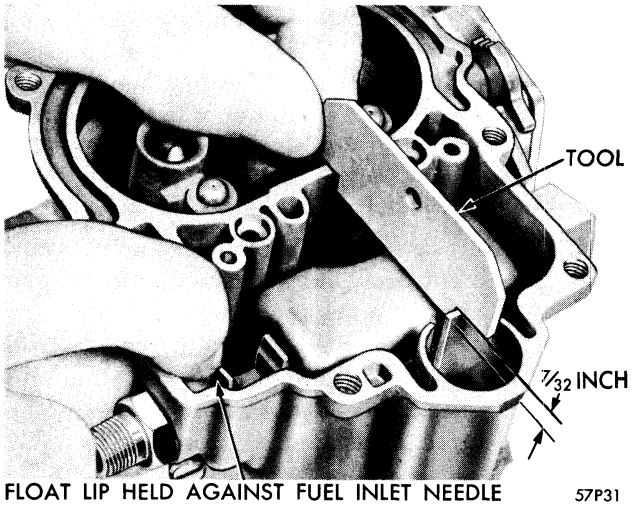

Figure 53—Checking Float Setting

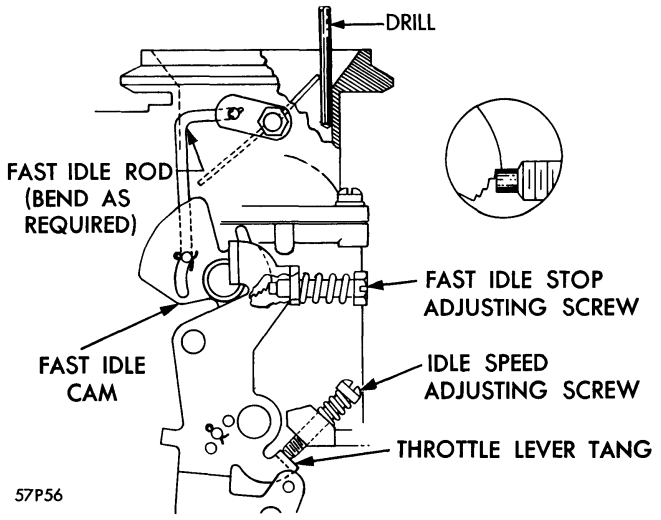

Figure 55—Fast Idle Adjustment

Assemble the fuel inlet needle valve, seat and gasket, then insert in position in the main body. Tighten securely. (If the needle is ridged or badly worn, install a new needle valve and seat assembly.) Install the float fulcrum pin retaining spring in position and force under lip of boss to keep fulcrum pin in position.

Using a "T" scale or Tool T-25569, check the float setting, as shown in Figure 53. The top of float must be $\frac{7}{32}$ inch from the top of main body (gasket removed) with the gauge at the center of float and the float lip held firmly against the fuel inlet needle. To change the float setting, bend the float lip toward the needle to lower, and away from needle to raise the float. See Figure 54.

MAIN BODY ASSEMBLY

Install the idle tubes in the main body. These tubes are interchangeable. Install the vacuum power piston and plunger in the air horn. Lock in position by prick punching on the retaining rim. Compress the piston plunger to be sure no binding exists. If the piston sticks or binds enough to hinder smooth operation, install a new piston assembly. Slide a new air horn gasket over accelerator pump plunger, and down against air horn. Lower air horn straight down on main body, with the accelerator pump plunger sliding into its well. (Be sure the leather on the pump does not curl or fold back.) Install air horn retaining screws and lockwashers, then tighten screws and lockwashers, then tighten securely. Work the accelerator pump plunger several times, to be sure it operates freely.

FAST IDLE AND CAM POSITION ADJUSTMENT

Turn the idle speed adjustment screw out far enough to clear the throttle lever tang when the throttle valves are closed. Hold the valves closed and turn out the fast idle adjustment screw until the fast idle cam can be positioned. From the point of initial contact with the step of the cam, turn screw in 5½ or 7½ turns. See Data and

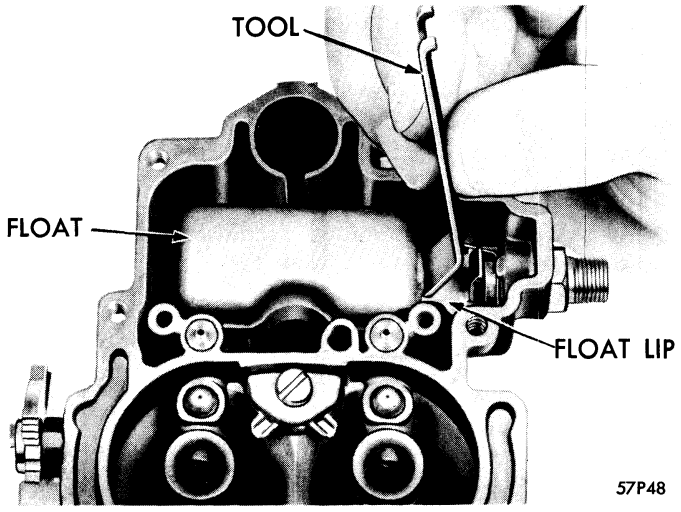

Figure 54—Bending Float Lip to Obtain Correct Setting

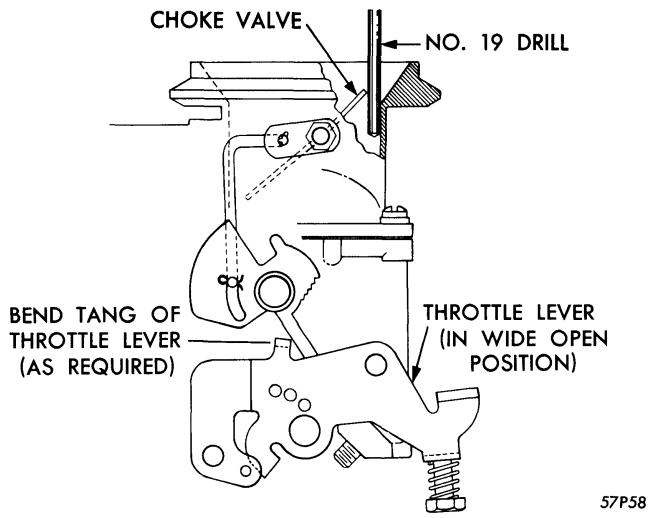

Figure 56—Unloader Adjustment

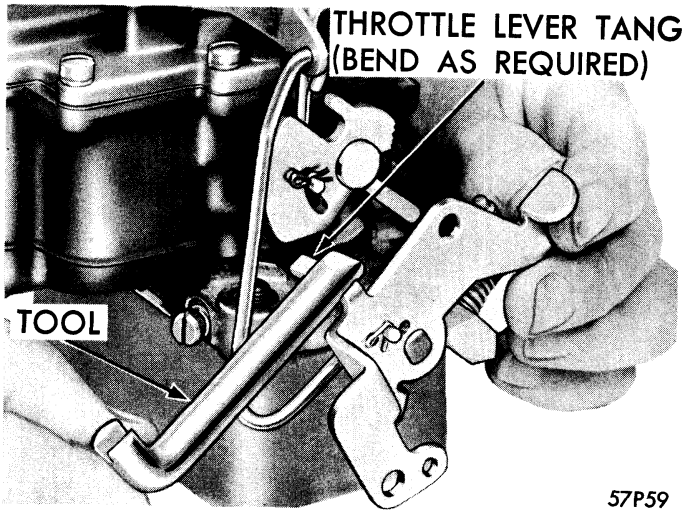

Figure 57—Bending Tang on Throttle Lever

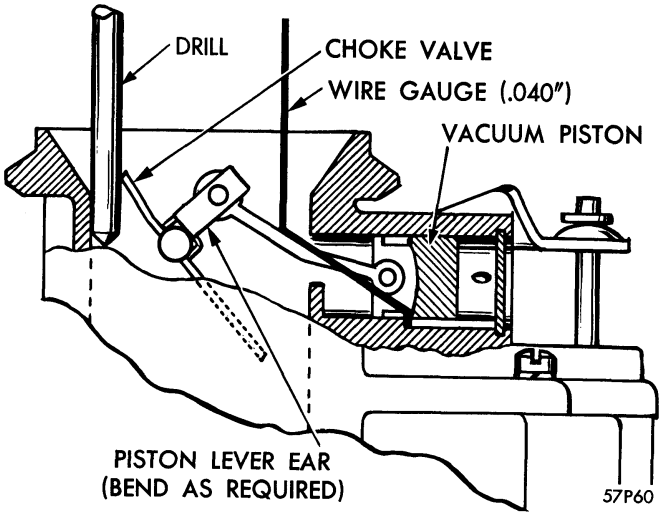

Figure 58—Vacuum Kick Adjustment

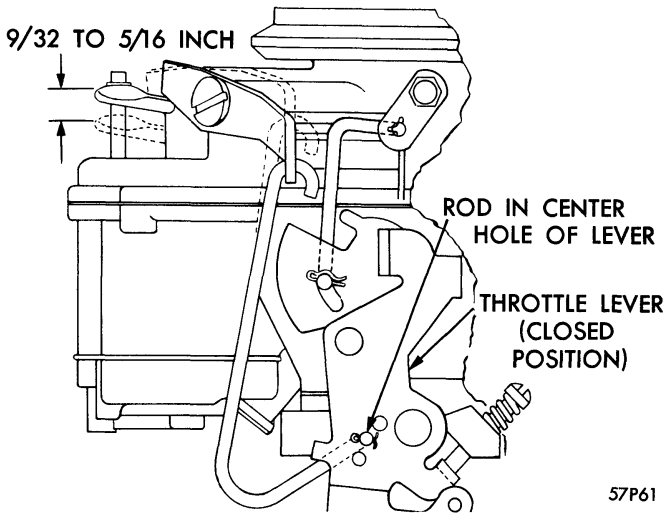

Figure 59—Accelerator Pump Adjustment

Specifications. With the fast idle cam held in position, close the choke valve and insert the correct size drill between the choke valve and the wall of the air horn. See Data and Specifications. Bend the fast idle rod as required. See Figure 55.

UNLOADER ADJUSTMENT

Apply a light closing pressure to the choke valve and open throttle valves to the wide open position. The choke valve should open just enough so that the correct size drill can be inserted between the choke valve and wall of the carburetor as shown in Figure 56. See Data and Specifications. If necessary bend the tang of the throttle lever to obtain correct adjustment as shown in Figure 57.

VACUUM KICK ADJUSTMENT

Bend a suitable length of .040 in. diameter wire as shown in Figure 58. Place the end in the slot at the bottom of the piston cylinder bore and apply a light closing pressure on the choke valve. It should be possible to insert the correct size drill between the choke valve and wall of the carburetor. See Data and Specifications. See Figure 58. Bend the piston lever ear if necessary.

ACCELERATOR PUMP SETTING

Hold carburetor in vertical position and operate pump to permit the check ball to take its normal position on the seat. With the choke held open and the pump rod in the center hold of the throttle lever. Measure pump travel as throttle valves are moved from the fully closed to the fully open position. Bend pump rod as required. See Figure 59 and refer to Data and Specifications for correct adjustment.

7. CARBURETOR—FOUR BARREL

The four barrel carburetor supplied as special equipment on V-8 engines is essentially two dual carburetors combined. The primary side of the carburetor contains the metering rods, accelerator pump and integral automatic choke system. The secondary side contains the velocity valves which allow the secondary side to supply fuel only under certain operating conditions, thus preventing waste of fuel. See Figure 60 and 61.

The carburetor contains two float circuits, two low speed circuits, two high speed circuits, one accelerator pump circuit.

HIGH SPEED SYSTEM

The high speed system provides fuel through the carburetor for part or full throttle operation.

Primary Side—The metering rods are controlled mechanically by throttle linkage and also by the vacuum piston and provide the proper amount of fuel according to the demand.

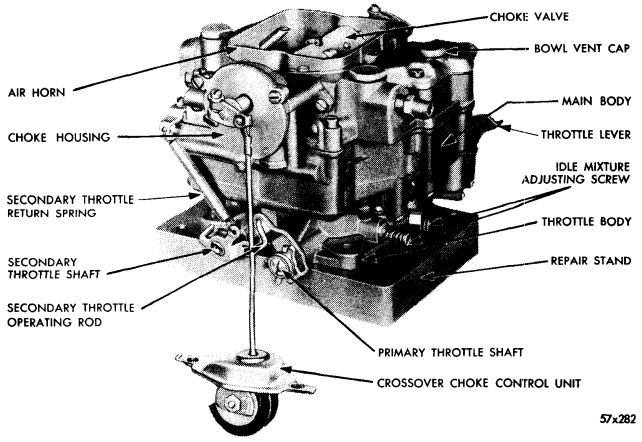

Figure 60—Four Barrel Carburetor with Cross-over Type Choke

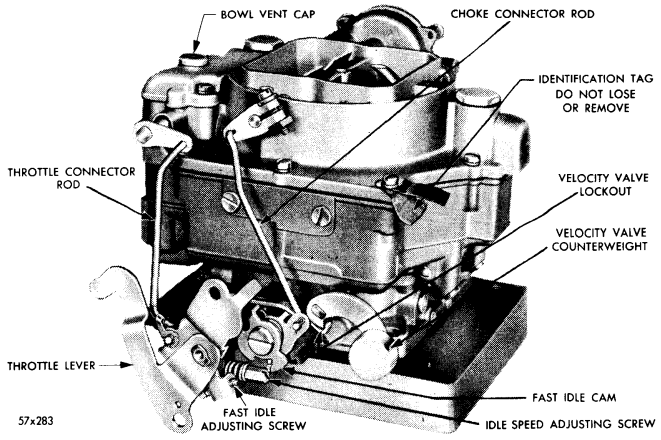

Figure 61—Four Barrel Carburetor with Cross-over Type Choke

DATA AND SPECIFICATIONS

FOUR BARREL CARBURETOR

Model		P-31 POWER-PAK	P-31 "FURY"	P-31 and LP-2 "FURY"
Carburetor	Type	Downdraft, Four Barrel		
	Model Number	2530S	2631 (Front) 2632 (Rear)	2761 (Front) 2762 (Rear)
	Choke Control	Cross-over Type—Automatic Set at Center Index Mark	Integral-Automatic Set 1 mark lean	
Carburetor Adjustments	Accelerator Pump Adjustment	Top of pump plunger arm parallel to dust cover boss.		
	Metering Rod Adjustment	Lift part of metering rod arm should just contact vacuumeter link when primary valves are fully closed and metering rods are bottomed.		
	Choke Rod	.020 in.	.018 in.	
	Velocity Valves	$^{27}/_{64}$ in. $\pm$ $^{1}/_{64}$ in.	— —	
	Choke Unloader	$^{11}/_{64}$ in.	$^{1}/_{8}$ in.	
	Fast Idle	.010 in.	.018 in.	
	Velocity Valve Lockout	Bend the tang on fast idle cam to permit velocity valves to open slightly before choke valves are fully open.	With choke valve closed Lock-out on auxiliary throttle shaft should freely engage in notch of lock-out arm.	
	Idle Mixture	$^{1}/_{2}$ to 1 $^{1}/_{2}$ turns open	$^{3}/_{4}$ to 1 $^{3}/_{4}$ turns open	
	Idle Speed	450-500 R.P.M.	650 R.P.M.	
	Primary Floats	$^{7}/_{32}$ in.		
	Secondary Floats	$^{9}/_{32}$ in.	$^{11}/_{32}$ in.	
	Float Drop	$^{23}/_{32}$ in. (Primary) $^{25}/_{32}$ in. (Secondary)	$^{23}/_{32}$ in. (Primary) $^{27}/_{32}$ in. (Secondary)	

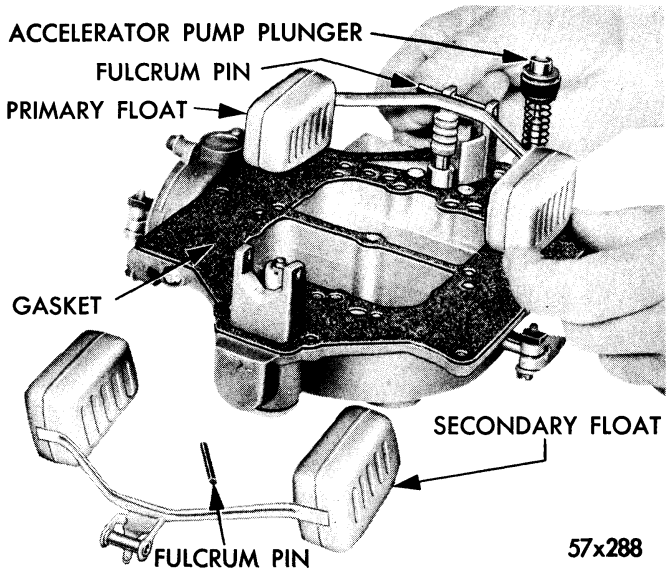

Figure 62—Removing or Installing Primary and Secondary Floats

Secondary Side—Fuel at high speed is metered in the secondary side by main metering jets when the velocity valves open. The velocity valves, controlled by the choke and speed of air through the carburetor, are locked in the closed position until the choke is almost fully opened. When the choke valve is fully open and the throttle is opened for more power or speed, the air through the carburetor opens the velocity valves and additional fuel is provided through the secondary nozzles to the engine for high speed operation.

Anti-Percolation—The nozzle passage is vented by calibrated plugs or bushings to prevent fuel being forced from the discharge nozzles because of heat build up in the carburetor. These are not to be removed.

LOW SPEED SYSTEM

Fuel for idle or port throttle operation is metered through the low speed system located in the primary side. The low speed jets meter the required amount of fuel during engine idle operation. Turning the idle mixture adjusting screws in reduces the air-fuel mixture delivered by the low speed system. No idle mixture adjusting screws are used in the secondary side of the carburetor as its operation is blocked off by the closed velocity valves.

ACCELERATOR PUMP SYSTEM

The accelerator pump system is contained only in the primary side of the carburetor. During high speed engine operation, a vacuum exists at the discharge cluster tubes. To prevent fuel being drawn from the tubes, the passage is vented to the float bowl chamber. A discharge check needle is used below the discharge cluster tubes which prevents air being drawn into the pump system when the pump plunger is raised.

FLOAT SYSTEMS

The float systems maintain an adequate supply of fuel at the proper level for use by the fuel systems. The primary and secondary bowls are separated by a partition. A passage in the side of the bowl connects the two bowl chambers which balances air pressure in the float bowl.

DISASSEMBLY OF CARBURETOR

Refer to Figure 60, 61, and 78 before disassembly of carburetor. Remove the choke connector rod and throttle operating rod. Remove metering rod dust cover and carefully unhook the metering rods from the vacuumeter link. Then lift out rods. Take out all air horn to main body screws and carefully lift off the air horn assembly to prevent damage to the floats.

IMPORTANT

When the carburetor is disassembled for service, it is important that parts from the primary side be separated from those of the secondary side.

Air Horn—Remove both float assemblies from air horn. Float pivot pins can be pushed out with a small drill. See Figure 62. Remove vacuum piston by rotating 90 degrees in either direction and slide out vacuum piston link. Discard the air horn gasket. Remove both needle valve assemblies from the air horn. Remove the fuel inlet plug, gasket, and screen. Loosen metering arm lock screw and accelerator pump arm lock screw. Slide out shaft.

Automatic Choke—Remove retainer, and baffle plate. To service the piston it will be necessary to remove the choke valve and choke lever clamp. Screws attaching choke valve are staked and care must be exercised when removing to prevent breaking them in shaft.

Rotate shaft until piston is out of cylinder and slide assembly out. See Figure 63. Remove the three choke

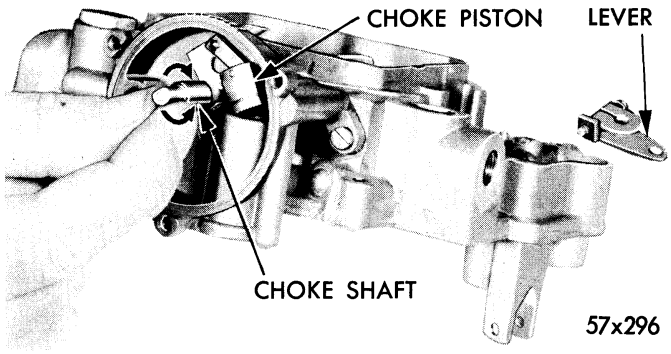

Figure 63—Removing or Installing Choke Piston

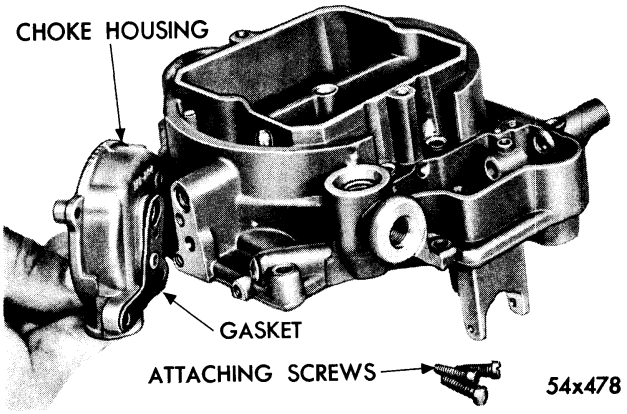

Figure 64—Removing or Installing Choke Piston Housing

housing to air horn screws and remove the housing. See Figure 64. Discard gasket.

Main Body—Remove discharge cluster as shown in Figure 65. Invert main body and remove the pump discharge check needle. Remove main metering jets primary side, as shown in Figure 66. Then remove the secondary side main metering jets. Primary main metering jets are not interchangeable with secondary jets.

Remove the idle jets, primary side, as shown in Figure 66. Then take out the secondary idle jets on secondary side. Primary idle jets are not interchangeable with secondary idle jets. Invert carburetor and remove the four throttle body to main body screws which are located in the bottom of the throttle body. Discard the gasket.

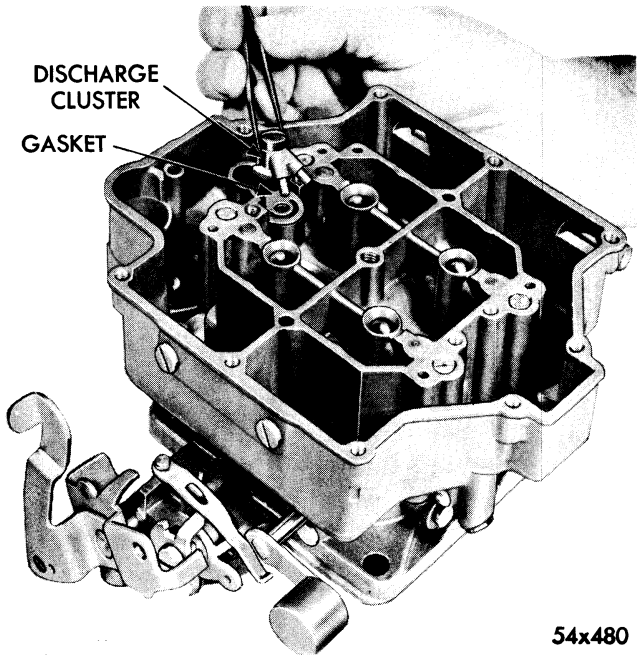

Figure 65—Removing or Installing Accelerator Pump Discharge Cluster

Throttle Body—Remove the throttle operating rod. See Figure 67. Remove screw holding throttle shaft washer, throttle shaft dog. Then slide off washer, dog and lever.

Remove screw attaching fast idle cam assembly to throttle body boss, and lift off cam assembly, cam trip lever and screw as shown in Figure 68. Note position of cam spring tangs on the trip lever.

It is not advisable to remove the throttle shafts or valves unless absolutely necessary. The position of each throttle valve in relation to the idle ports is very important to proper engine operation. If wear in the throttle body is excessive it is advisable to install a new

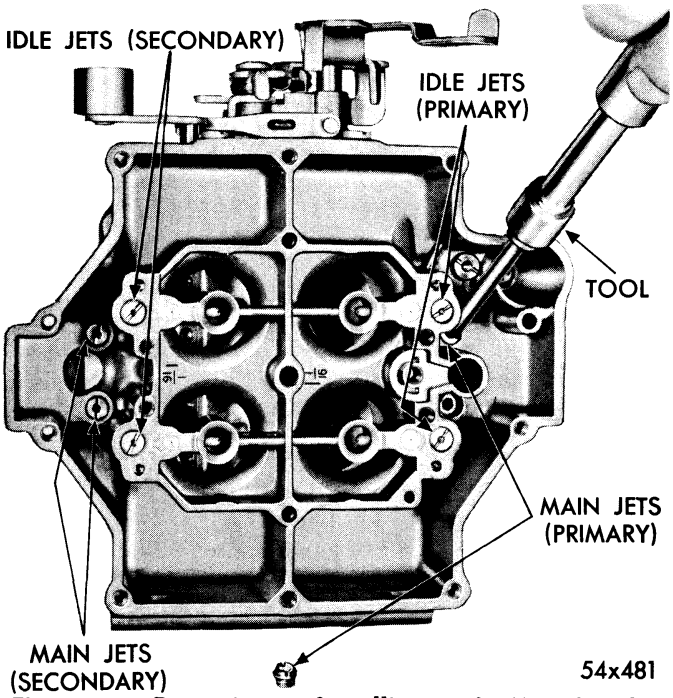

Figure 66—Removing or Installing Main Metering Jets

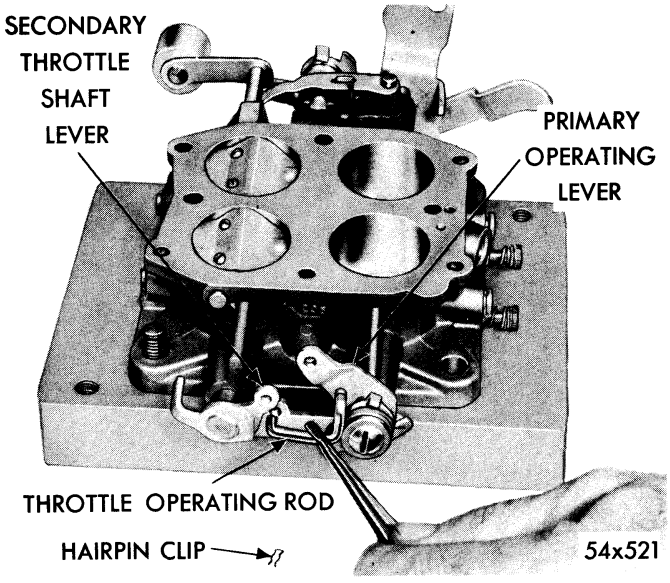

Figure 67—Removing or Installing Throttle Operating Rod

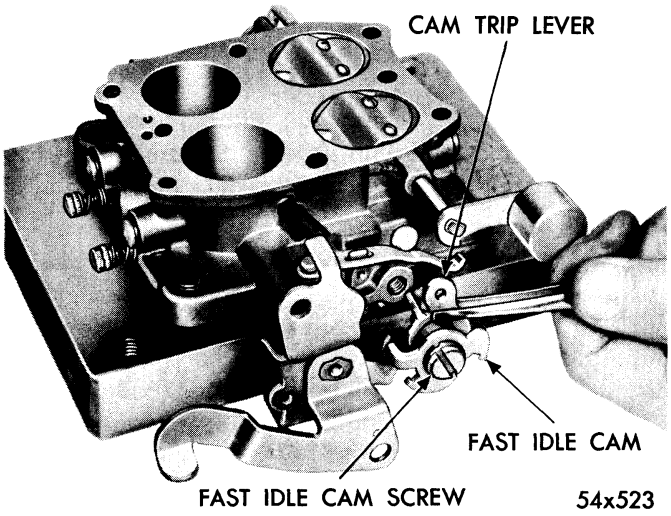

Figure 68—Removing or Installing Fast Idle Cam Assembly

throttle body assembly. When a new shaft is installed, mark the throttle valve position in the bore before removing them from the old shaft. Each valve should be installed in its respective bore. Use care when removing the valve attaching screws to prevent breaking them in the shaft. Remove both idle mixture adjusting screws and springs from the throttle body.

INSPECTION AND REASSEMBLY OF CARBURETOR

Throttle Body—Inspect the idle adjustment screws for grooves or irregular seating at the taper of the needle and replace if required. Install the screws and springs. Do not use a screwdriver. Turn them in by hand and seat lightly. Then back off one full turn for an approximate adjustment. Refer to Figure 69.

Slide the fast idle cam screw through fast idle cam with threaded shank on spring side. See Figure 80. Then slide the fast idle cam trip lever over the shoulder on screw, guiding the tang between the fast idle spring and cam. Install pivot screw and tighten. Make sure all parts operate freely.

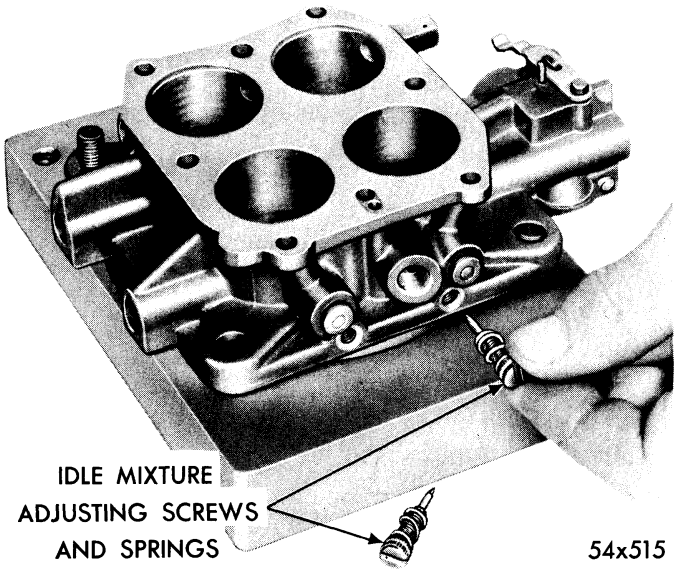

Figure 69—Idle Mixture Adjustment Screws

CLEANING CARBURETOR PARTS
See page 372

Slide the primary operating lever on primary shaft with tangs facing away from body. Then install throttle shaft dog. Offset part of dog should be facing up, with long ear pointing away from throttle shaft as shown in Figure 70. Install the washer and screw and tighten securely. Install the throttle shaft connector rod.

Place a new throttle body to main body gasket in position on the main body. Line up throttle body on main

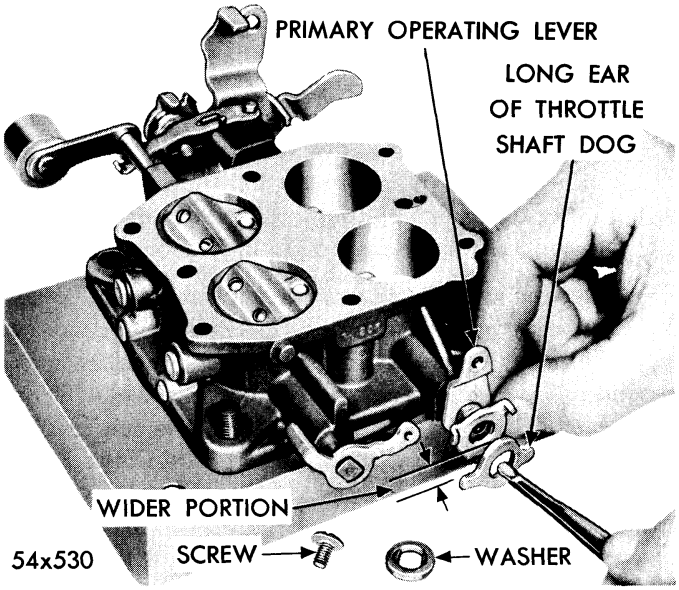

Figure 70—Installing Primary Operating Lever and Throttle Shaft Dog

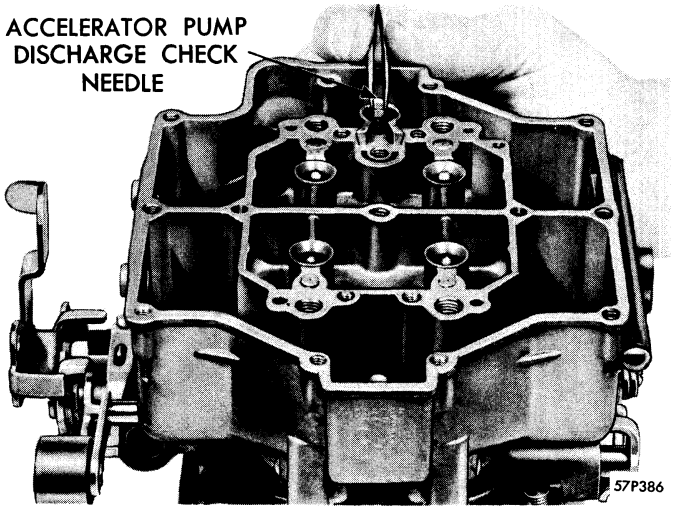

Figure 71—Installing Accelerator Pump Discharge Check Needle

body and install the four attaching screws and tighten securely.

Testing Accelerator Pump System—Install the discharge needle valve and pump plunger in main body. See Figure 71. Pour a small amount of gasoline into the primary side of the float chamber in main body. Work plunger slowly up and down to expel all air from the pump passage. Hold the discharge needle valve down with a suitable rod and apply pressure at the plunger. If leakage is evident at either the needle valve or the inlet ball check, clean the passage again and repeat test. If leakage still occurs replace the needle valve or inlet check ball as required.

Main Body—Install the primary and secondary idle jets and tighten securely. Install the primary and secondary main metering jets. See Figure 66. Tighten securely. Install the vacuumeter piston spring in the piston cylinder.

Air Horn—Assemble choke housing to air horn using a new gasket. Tighten screws securely. Assemble the choke piston to the choke link. Slide choke shaft and piston assembly into air horn. See Figure 63. Position the choke valve on the choke shaft and partially install new screws. Hold valve in closed position and tap gently to center the valve. Tighten screws securely. Stake screws to lock them in place. Rotate choke shaft to make sure it works freely. Do not lubricate choke parts.

Install the baffle plate and gasket, thermostatic coil housing and retainer ring. Install retaining screws. Position the index mark of the coil housing to match the center index mark of the choke housing. Do not tighten retaining screws excessively.

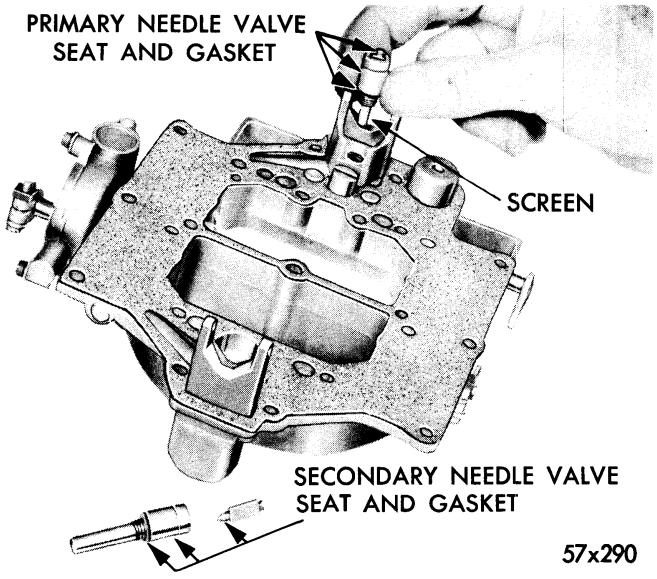

Figure 72—Installing Needle Valve, Seat and Gasket

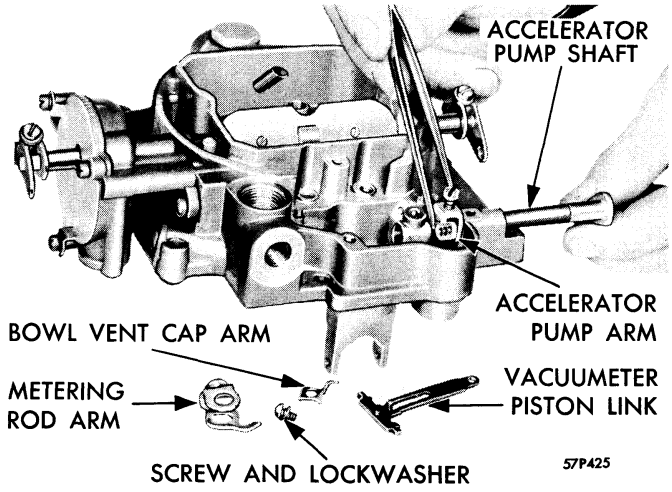

Figure 73—Installing Accelerator Pump Arm

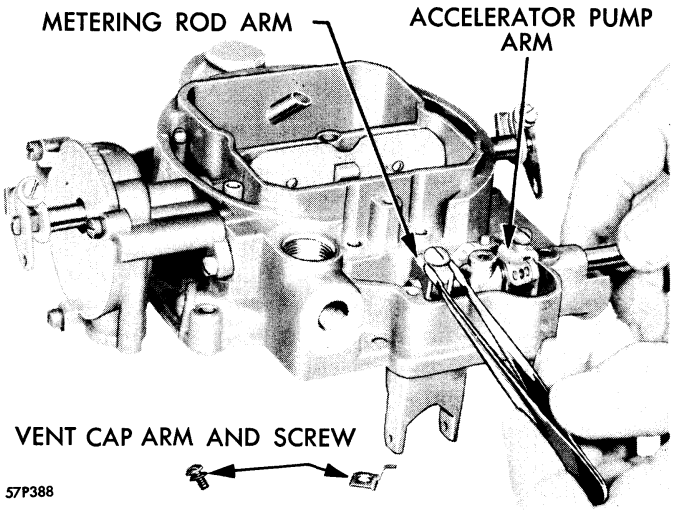

Figure 74—Installing Metering Rod Arm

If original primary and secondary needle valve assemblies are in good condition, install them in their respective positions using new gaskets. See Figure 72. Assemble the float assemblies to the air horn and make float level and float drop adjustment.

Install accelerator pump shaft, pump arm, spacer and metering rod arm. See Figures 73 and 74. Make sure lift part of metering arm lines up with the center of the vacuumeter link slot. Install the vacuumeter link with the tang at the upper port of the slot pointing toward the carburetor. Then connect vacuumeter piston to link. Install the fuel inlet filter screen and plug using a new gasket.

Float Level Adjustment—Position gauge in position as shown in Figure 75. Refer to Data and Specifications for float setting. Both floats should just clear horizontal part of gauge. Bend float arm to obtain correct adjustment.

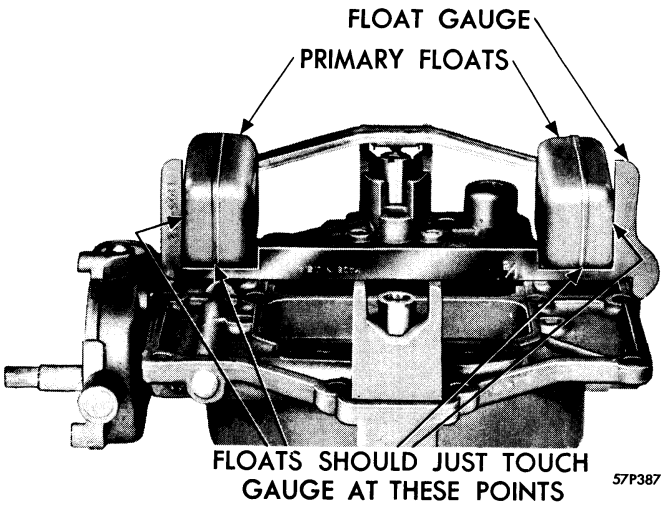

Figure 75—Checking Primary Float Level

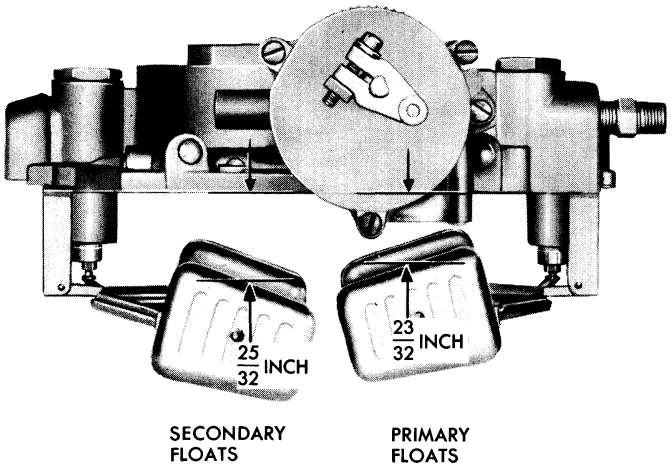

Figure 76—Checking Float Drop

Floats should just barely touch the vertical part of gauge. They can be bent inward for correct adjustment. Adjust the secondary float in same manner.

Float Drop Adjustment—After performing the float lever adjustment, invert air horn assembly and note distance that floats drop. Refer to Data and Specifications for the correct settings for a particular carburetor. See Figure 76. Bend the tang that contacts the needle valve seat to obtain the correct adjustment.

After adjustments are made, remove the floats carefully and install a new air horn gasket. Then reinstall floats. Assemble spring, cap, and pump plunger and install in air horn and engage the pump connector link. Secure with hairpin clip. See Figure 77.

Carefully lower air horn assembly into main body. Be sure pump plunger enters the pump cylinder evenly. Install attaching screws and tighten securely. Engage the loop ends of the vacuumeter link spring and carefully install the metering rods. Use extra care so as not to bend the metering rods. Work the vacuumeter link up and down slowly to make sure rods operate freely. Attach choke connector rod and throttle operating rod. Make the adjustments after carburetor has been completely assembled.

CARBURETOR ADJUSTMENTS

Accelerator Pump Adjustments—Install pump connector link in center hole (medium stroke) of pump arm, with ends extending toward countershaft arm. Back out throttle lever set screw until throttle valves seat in bores of carburetor.Hold straight edge across top of dust cover boss at pump arm. The flat on top of pump arm should

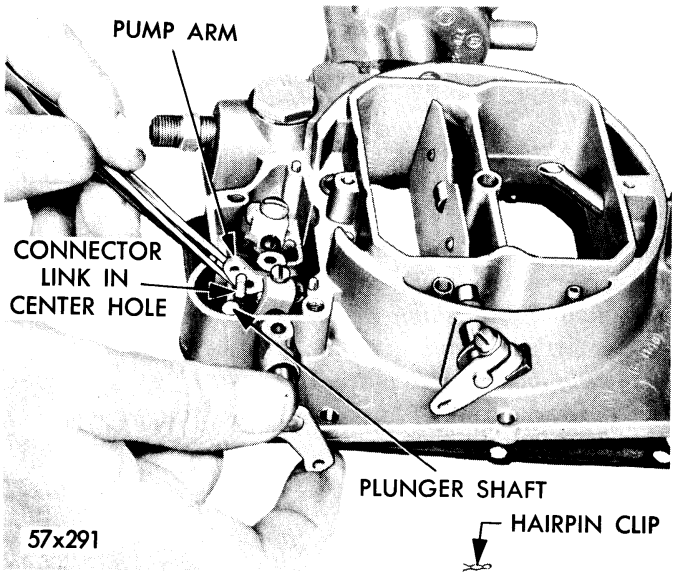

Figure 77—Installing Pump Connector Link

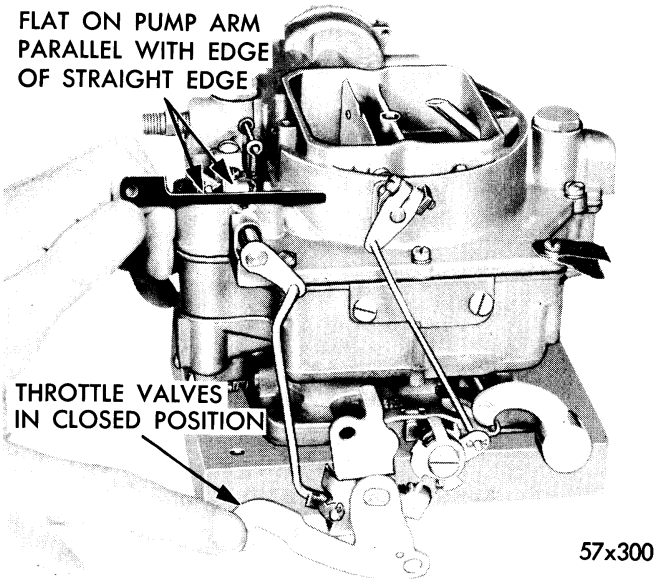

Figure 78—Checking Accelerator Pump Adjustment

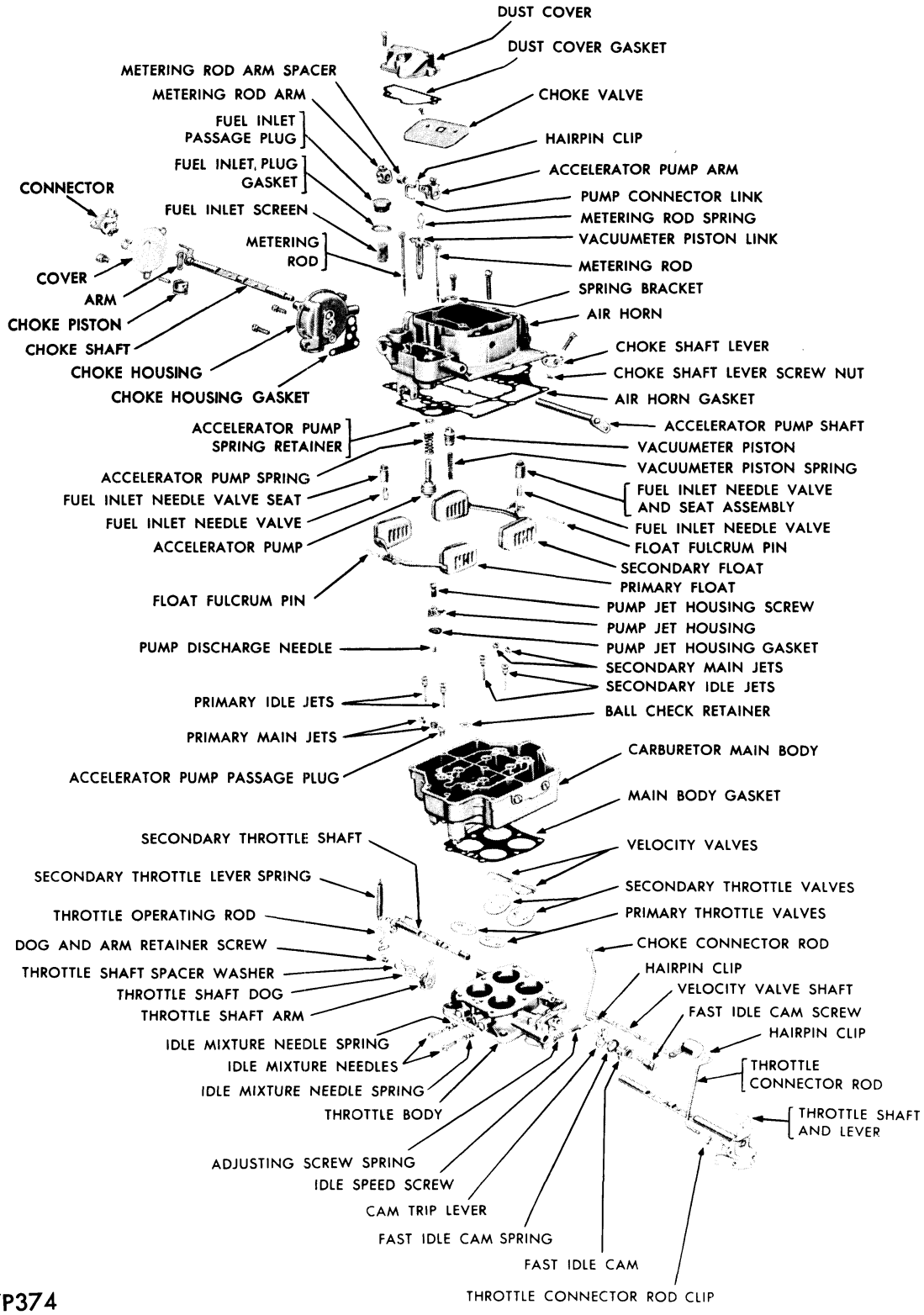

Figure 79—Four Barrel Carburetor Disassembled

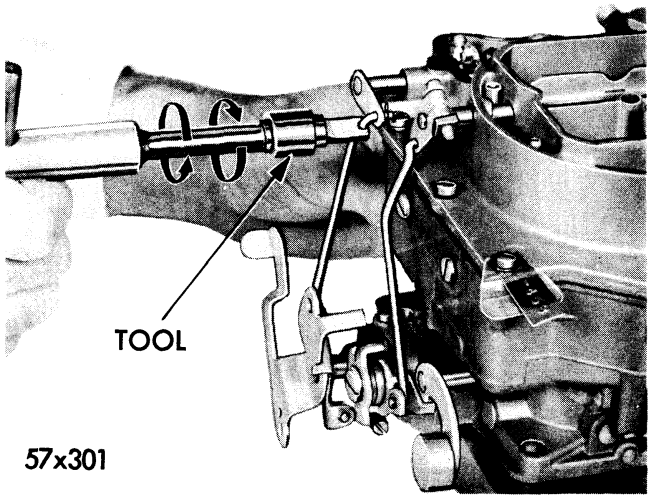

Figure 80—Bending Throttle Connector Link

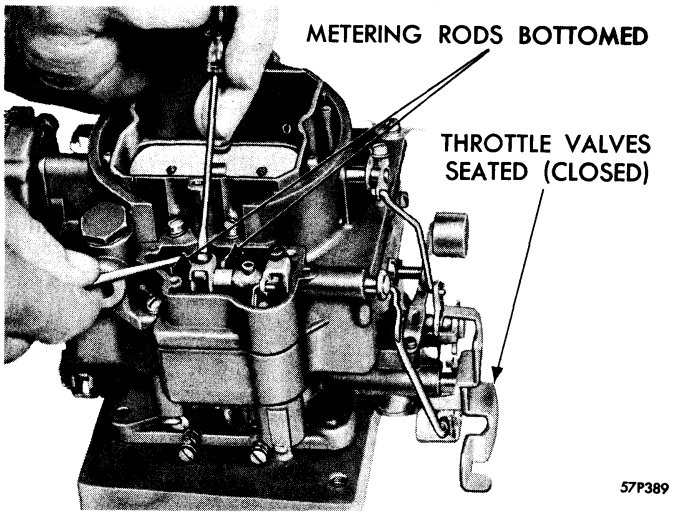

Figure 81—Metering Rod Adjustment

be parallel to straight edge. See Figure 78. Adjust by bending throttle connector rod at upper angle. (Use Tool T109-213.)

Metering Rod Adjustment—Loosen metering rod arm just enough to provide a slight drag on the shaft. Lift lever slightly. With the primary throttle valves seated in the bores, depress the vacuumeter link until the metering rods bottom. See Figure 81. Hold lift part of metering rod arm in contact with vacuumeter link and tighten the set screw securely.

Choke Rod Adjustment — Loosen the choke lever clamp screw. Insert a .020 inch wire gauge Tool T-109-29 between the tang on the fast idle cam and the boss on the throttle body casting. Hold gauge in place by pressure applied to choke lever clamp and tighten screw. See Figure 82.

Fast Idle Adjustment—Insert a wire gauge between the primary throttle valves and side of bore opposite the idle ports. Refer to Data and Specifications for correct size wire gauge. Hold choke in fully closed position and adjust the fast idle screw in until it is resting on the high step of the fast idle cam and a slight drag can be felt on the tool as it is withdrawn from the bore. See Figure 83.

Choke Unloader Adjustment — Hold the primary throttle valves in the wide open position and insert drill between the upper edge of choke valve and inner dividing wall of air horn. Refer to Data and Specification for correct size. See Figure 84. Apply light finger pressure to the upper part of the choke valve. A slight drag should be felt on the gauge as it is withdrawn. If too little or

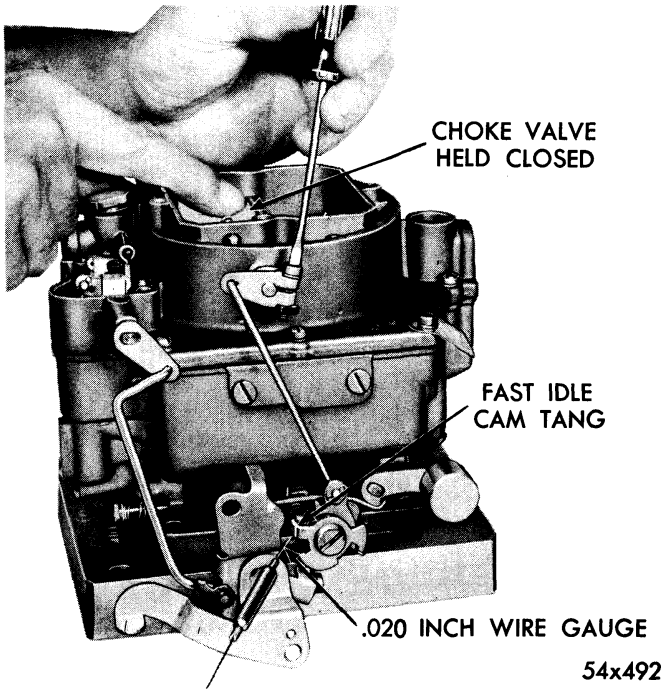

Figure 82—Choke Rod Adjustment

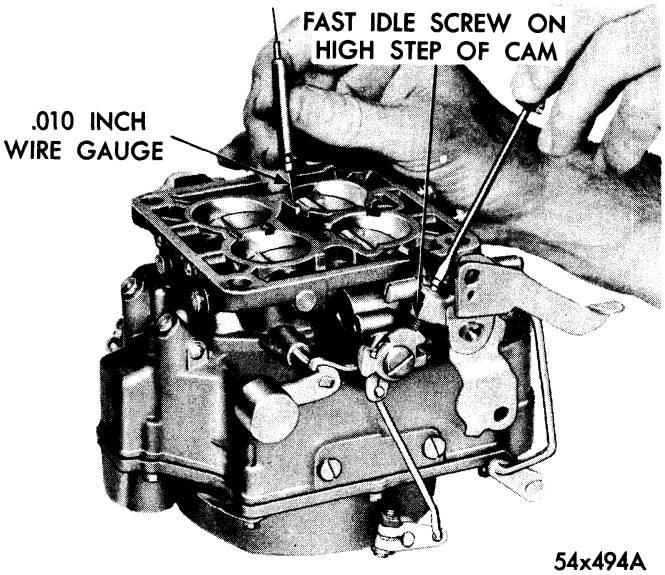

Figure 83—Fast Idle Adjustment

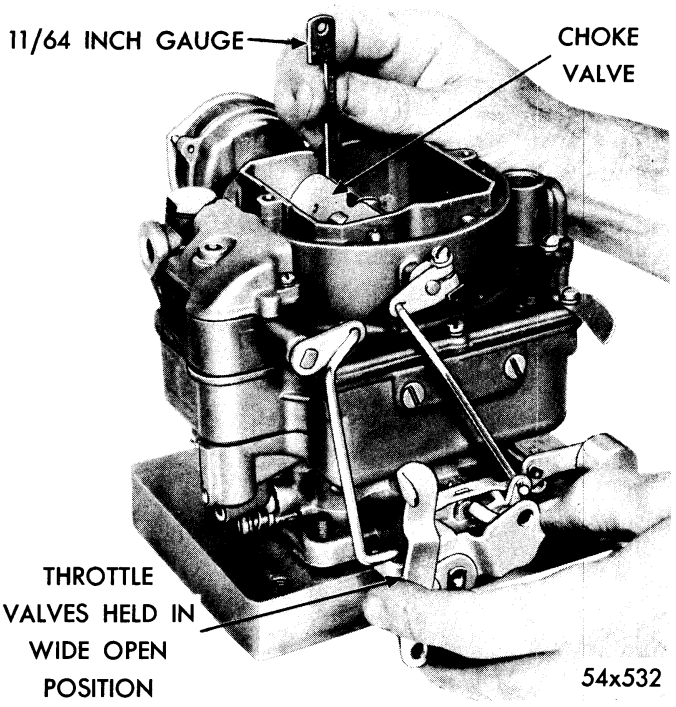

Figure 84—Checking Choke Unloader Adjustment

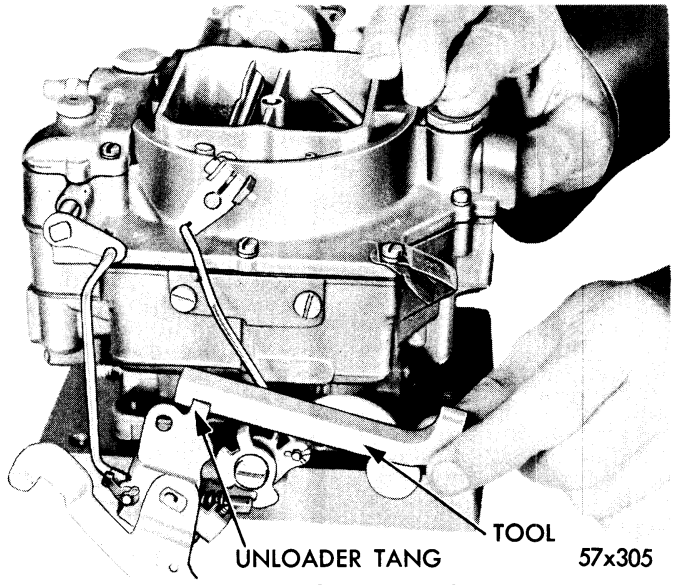

Figure 85—Bending Unloader Tang

too great a drag is noted, bend the unloader tang on the throttle lever as shown in Figure 85 to obtain the correct adjustment.

Velocity Valve Adjustment—Disconnect secondary throttle operating rod from the primary throttle lever. Insert gauge in throttle bore between the lower edge of the velocity valve and the bore as shown in Figure 86. The tang of the throttle lever should just touch its stop on the throttle body. To adjust position, bend the tang on the lever to obtain the adjustment required between the lower end of the velocity valve and throttle bore. Refer to Data and Specifications for correct setting. Reconnect secondary throttle operating rod.

Secondary Throttle Lever Adjustment—The stop lug on both primary and secondary throttle levers should contact boss on flange at the same time. To adjust bend secondary throttle operating rod at angle (use bending Tool T109-213).

Velocity Valve Lock-Out Adjustment—This adjustment must be made after the fast idle adjustment. When the choke valve is completely closed, the hook end of the lockout arm should make maximum contact of the velocity lever locking step. Open the choke valve. The

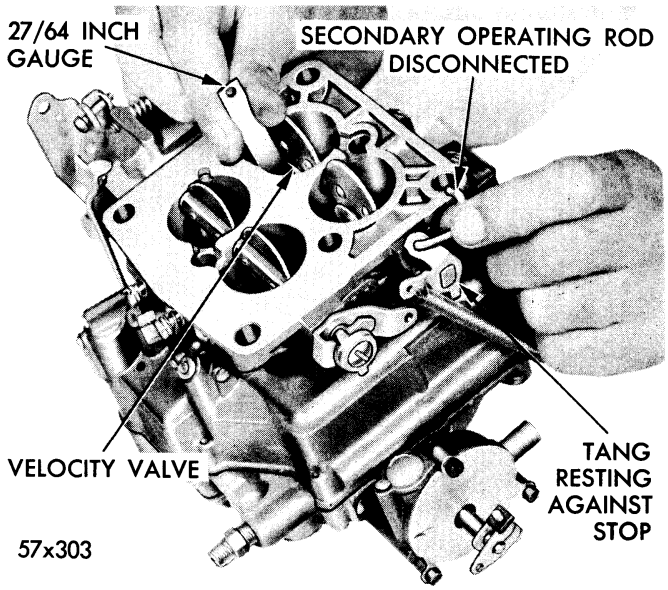

Figure 86—Velocity Valve Adjustment

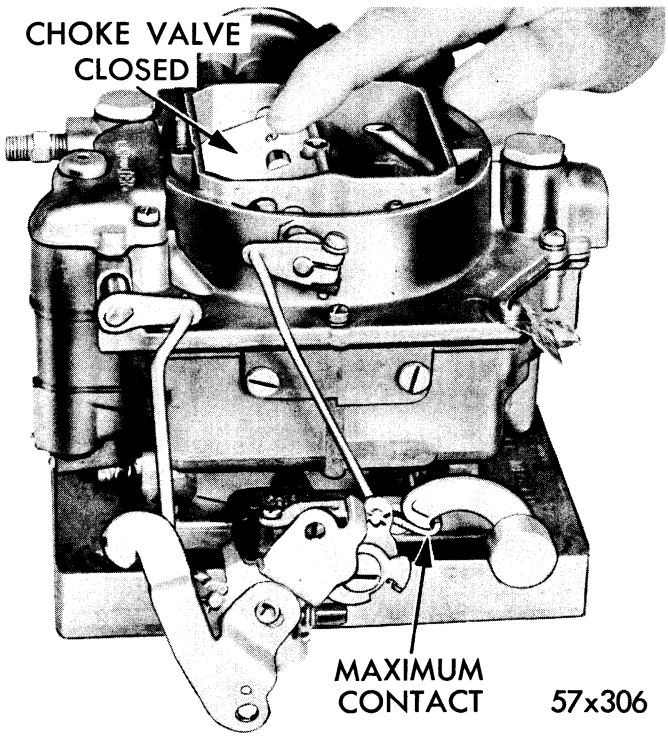

Figure 87—Checking Velocity Valve Lockout Adjustment

velocity valves should become unlocked a few degrees before the choke reaches the wide open position. Adjust by bending the velocity valve lockout arm. See Figure 87.

Bowl Vapor Vent Adjustment—Make the bowl vent adjustment after completing the accelerator pump and metering rod adjustments. Install the dust cover gasket and dust cover. Back out the throttle adjusting screw and completely close the throttle in their bores. When throttle valves are seated the vent should lift approximately $\frac{1}{16}$ inch. If adjustment is necessary, remove dust cover and bend vent arm.

Idle Speed and Idle Mixture Adjustments—Idle speed and idle mixture adjustments must be made after the engine has reached operating temperature and choke is off the fast idle cam. Adjust engine speed between 450-500 R.P.M. at the idle speed adjusting screw. Then proceed to adjust the idle mixture screws to obtain a smooth idling engine. Changing the idle mixture may change the idle speed.

Secondary Throttle Lever Adjustments—Dual Four Barrel—The primary and secondary throttle valves should reach the extreme wide open position at the same time. Adjustment to synchronize the opening of the throttle valves is made by bending throttle operating rod at angle (Use bending tool T109-213). With primary and throttle valves in the closed position a clearance of .017-.022 in. must be between the positive closing shoes on primary and secondary throttle levers, See Figure 89. This adjustment is made by bending shoe on primary lever.

Interconnecting Rod—Dual Four Barrel—The elongated slot of the inter connecting rod is connected to the lower hole of the throttle lever on the front carburetor. The end with locknut is connected at the upper hole of the throttle lever on rear carburetor, Figure 88. To adjust, loosen locknut on connecting rod, hold throttle in the wide open position on rear carburetor and adjust rod until throttle on front carburetor is also in the wide open position.

Idle Adjustment—Dual Four Barrel—Bottom the idle by-pass air screws on both front and rear carburetors. Adjust engine idle speed at 600-650 rpm (in neutral) by screwing in idle speed screw on front carburetor only.

For best idle mixtures back-off all four idle mixture screws one complete turn. Smooth idle can then be obtained by further adjustment of idle mixture screws on the front carburetor only. Small adjustment of mixture screws on rear carburetor may in some cases become necessary.

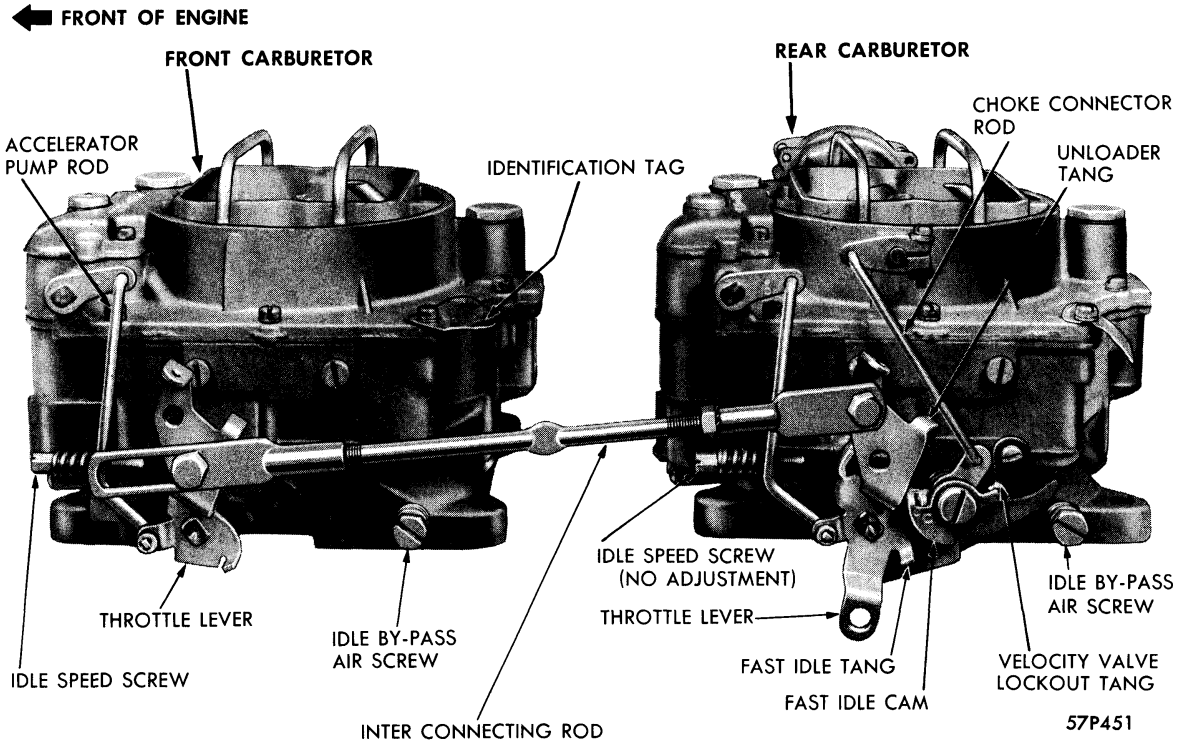

Figure 88—Dual Four Barrel Carburetors—Left Side (WCFB Models)

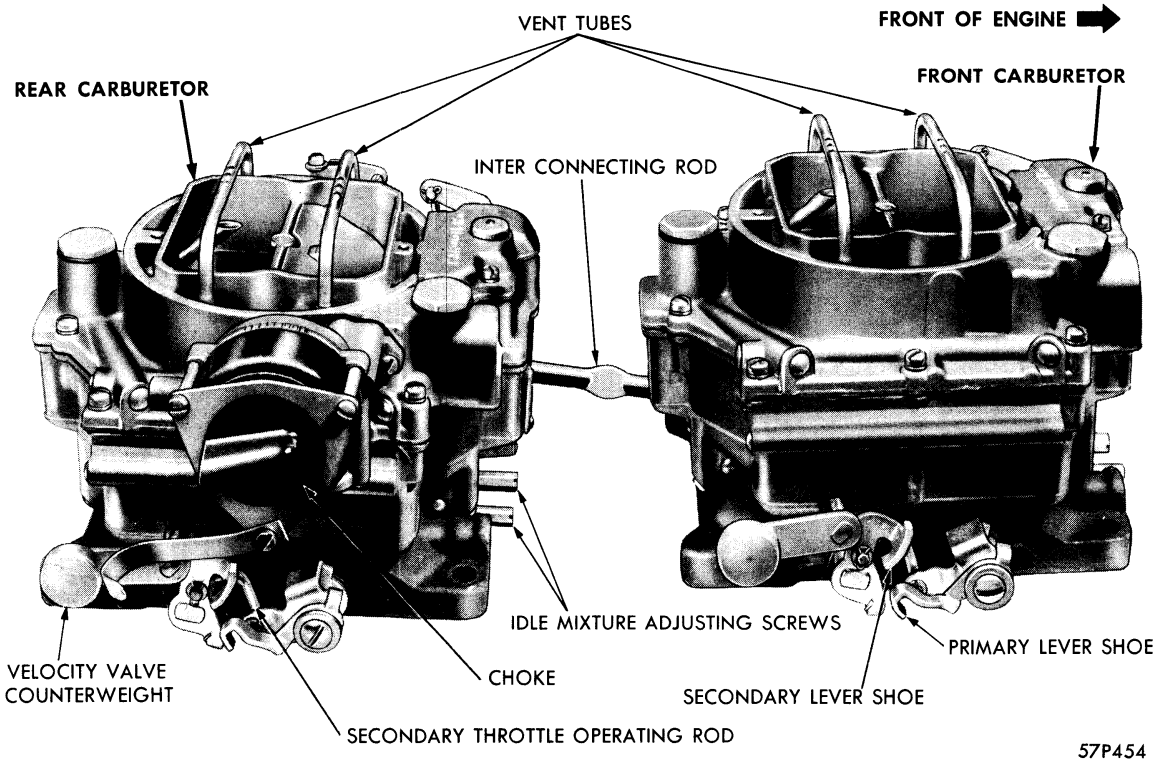

Figure 89—Dual Four Barrel Carburetors—Right Side (WCFB Models)

8. CARBURETOR—FOUR BARREL—AFB CARTER

DISASSEMBLY

Before disassembly of carburetor for servicing, refer to Figure 90 and 91. Disconnect connector rods, remove air horn attaching screws and carefully lift off air horn assembly to prevent possible damage to the vent tubes, main metering rods or floats.

Air Horn—Remove the step-up rods, pistons and springs. Remove float assemblies and inlet needle and seat assemblies. If the inlet needle shows evidence of grooving, replace assembly. Place accelerator pump plunger in gasoline to prevent drying out.

IMPORTANT

When the carburetor is disassembled for service, it is important that parts from the primary side be separated from those of the secondary side.

Main Body—Remove the accelerator pump jet housing and invert carburetor to remove discharge check needle. Remove primary and secondary main metering jets. Refer to Figure 92. Primary jets are not interchangeable with secondary jets.

Remove the primary and secondary venturi assemblies. Refer to Figure 93. The primary venturies are not interchangeable with each other nor are the secondary venturies interchangeable with each other. Due to constructural differences each venturi must be replaced in its original position.

Clear out all passages with a suitable solvent and dry with compressed air. Do not use wires to clear out the vent tubes or mixture tubes.

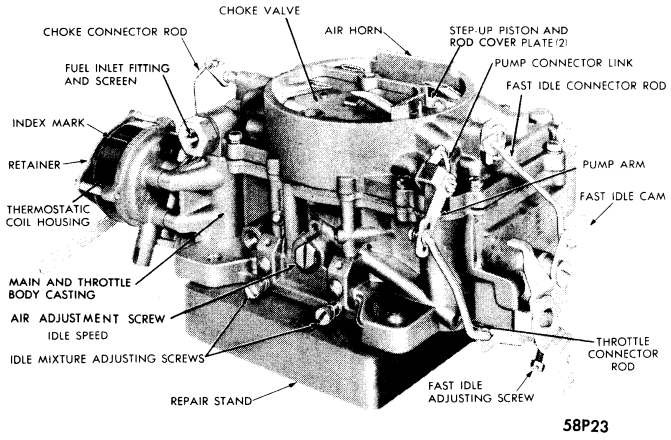

Figure 90—Carburetor Assembly—Front View 2653 Shown—Typical of AFB Models

DATA AND SPECIFICATIONS

AFB FOUR BARREL CARBURETORS

	Model	LP-2 SUPER-PAK	LP-2 GOLDEN COMMANDO
Carburetor	Type	Downdraft, Four Barrel	
	Model Number	2744S (Std.) 2641S (Auto.)	2652S (Front) 2653S (Rear)
	Choke Control	Cross Over Type	Integral
Carburetor Adjustments	Accelerator Pump Adjustment	7/16 in. from top of the bowl cover to the top of plunger shaft rod in center hole of pump arm.	
	Fast Idle Throttle Valve Clearance	.012 in.	.012 in. (2653S only)
	Choke Unloader	1/4 in.	1/4 in. (2653S only)
	Secondary Throttle Lever Adjustment	When lower edge of primary valve is 3/8 in. from bore (opposite idle port) secondary valves begin to open. .010-.030 in. between closing shoes when primary and secondary valves are closed.	
	Idle Mixture	1/4-1 1/2 turns open	
	Idle Speed	450-500 R.P.M.	
	Float Level Setting	Carburetor / Float / Setting 2641S / 21-179S / 7/32 in. 2641S / 21-188S / 5/16 in. 2744S / 21-179S / 7/32 in. 2744S / 21-188S / 1/4 in.	Carburetor / Float / Setting 2652S / 21-179S / 9/32 in. 2652S / 21-188S / 3/8 in. 2653S / 21-179S / 7/32 in. 2653S / 21-188S / 5/16 in.
	Float Drop	23/32 in.	23/64 in.
	Fast Idle on Car	1400 R.P.M.	1450 R.P.M. (2653S only)

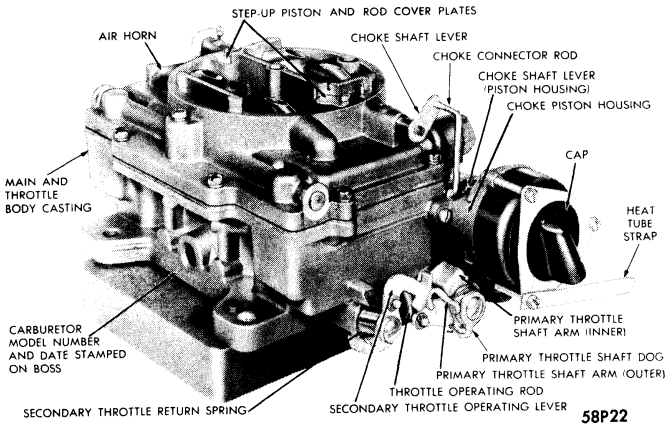

Figure 91—Carburetor Assembly—Rear View 2653S Shown—Typical of AFB Models

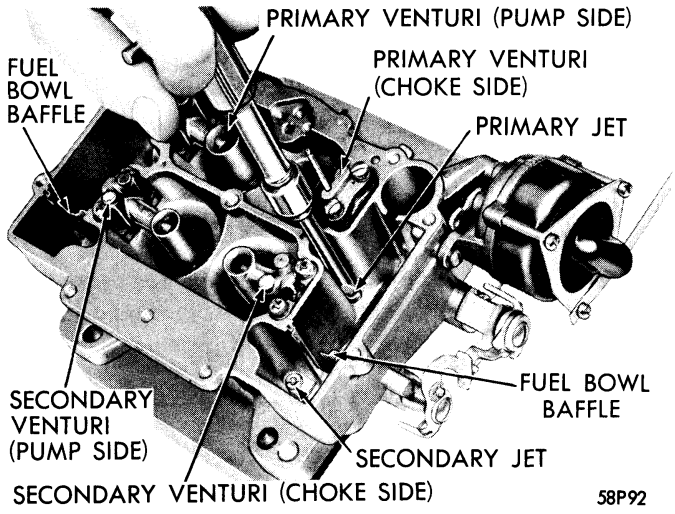

Figure 92—Removing or Installing Main Metering Jets

Invert the main and throttle body casting, then remove the accelerator pump intake check ball plug. Using screw driver bit, Tool T109-59, remove the check ball seat, as shown in Figure 94. Again invert the body casting and drop out the intake check ball. Remove the two idle mixture adjusting screws and springs.

If working on the rear carburetor of a dual four barrel installation, remove the screws that attach the thermostatic coil spring housing retainer, cap, gasket, housing, gasket and baffle plate from the choke housing. Remove the screws that attach the choke piston housing to the main body casting. Remove choke piston housing and discard the vacuum passage gasket. Remove the choke piston arm attaching screw and washer, then slide the choke piston out of its cylinder.

It is not advisable to remove the throttle shafts or valves unless absolutely necessary. The position of each throttle valve in relation to the idle ports is very important to proper engine operation. Refer to Figure 95. If wear in the throttle body is excessive it is advisable to install a new throttle body assembly. When a new shaft is installed, mark the throttle valve position in the bore before removing them from the old shaft. Each valve should be installed in its respective bore. Use care when removing the valve attaching screws to prevent breaking them in the shaft.

CLEANING CARBURETOR PARTS
(See page 372)

REASSEMBLY OF CARBURETOR

Main Body—Install the two idle mixture adjusting screws and springs in the throttle body portion of the casting. The tapered portion must be straight and smooth. If the tapered portion is grooved or ridged, a new idle mixture adjusting screw should be installed to insure correct idle mixture control. The adjustment should be made with the fingers. Turn the idle mixture adjusting screws lightly against their seats, then back off one full turn for an approximate adjustment.

If working on the rear carburetor of a dual four barrel installation, position the choke shaft lever (piston housing) so that it is pointing toward the piston cylinder, as shown in Figure 96. Slide the choke piston into the cylinder, and at the same time position the piston arm over the flats on the shaft. Install retaining washer and screw. Snug down, but do not tighten. This is to be adjusted during the choke piston lever adjustment. Slide a new vacuum passage gasket into position, then install the piston housing on the body casting. Install screws and tighten securely.

Install venturie assemblies using new gaskets. When installing the secondary venturies note the small vent

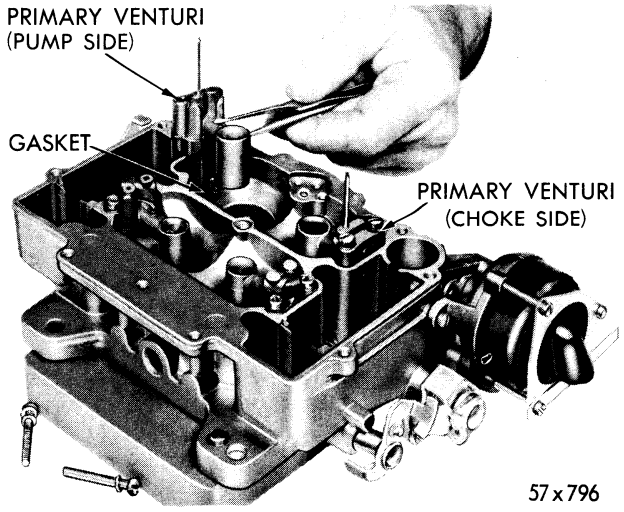

Figure 93—Removing or Installing Venturi

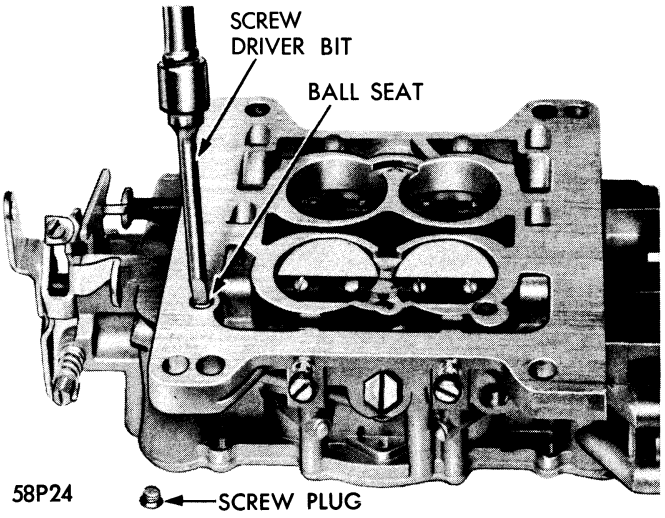

Figure 94—Removing Intake Check Ball Seat

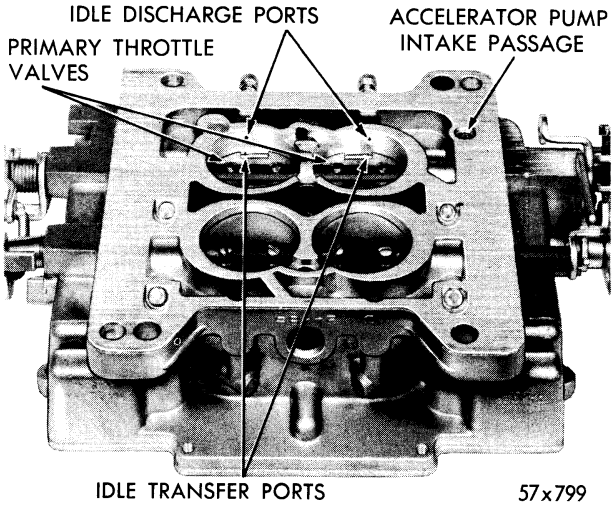

Figure 95—Ports in Relation to Throttle Valves

hole at the top of venturie casting. Install the venturies with the vent hole next to the dividing wall of the carburetor. Refer to Figure 92 for location of vent hole. Install the primary venturies, with the vent tube next to the center of the dividing wall.

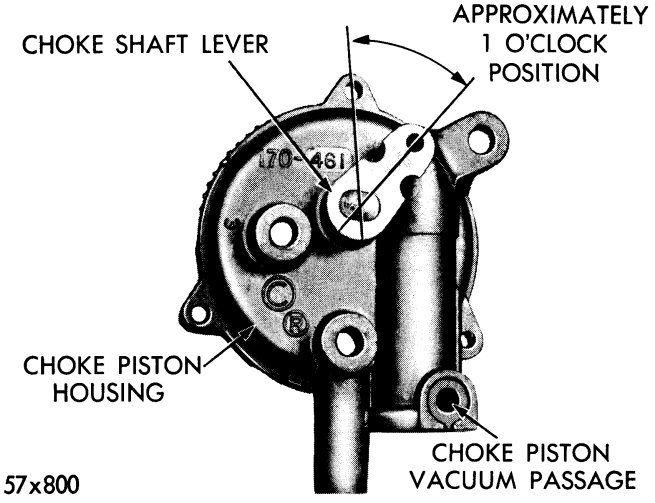

Figure 96—Positioning Choke Shaft Lever

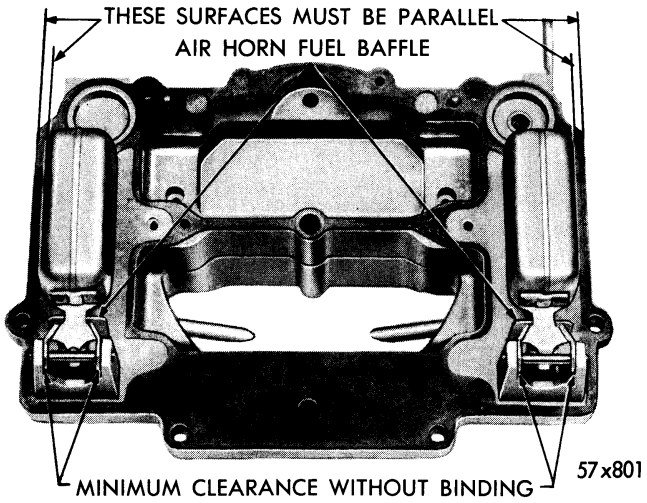

Figure 97—Checking Float Alignment

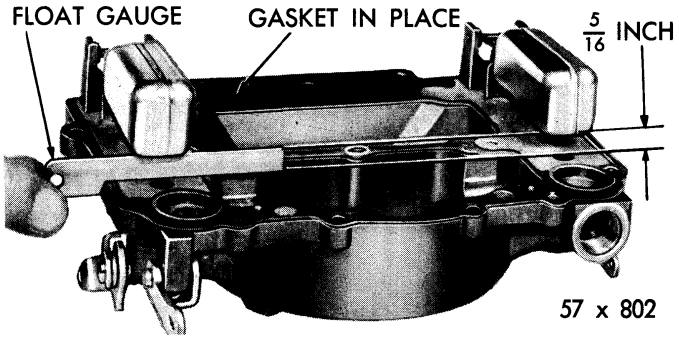

Figure 98—Checking Float Height

Install the primary and secondary main metering jets and tighten. See Figure 92. Install intake check ball and tighten seat. Install plug and tighten. Make certain no burr exists and plug is flush or below surface of the machined surface. Refer to Figure 94.

Accelerator Pump Test—Pour clean gasoline into the carburetor bowl approximately ½ inch deep. Remove the accelerator pump plunger from the jar of gasoline. Flex the leather several times, and install into the pump cylinder. Install the accelerator pump discharge check needle in the discharge passage. Raise the pump plunger and press lightly on the plunger shaft to expel air from the pump passages. Using a small clean brass rod, hold the discharge check needle firmly on its seat. Again raise the plunger and press downward. No fuel should be emitted from either the intake or discharge passage.

If fuel emits from the intake passage, it will be necessary to reclean the passage or install a new check ball. Fuel leakage at the discharge check needle indicates the presence of dirt or a damaged check needle. Clean again and then install a new check needle. Retest for leakage. If discharge check needle leaks after above test, form a new seat by tapping the needle down using a small brass drift. Install a new check needle and repeat test.

Install the accelerator pump jet housing using a new gasket. Test fuel flow through jet. If the jet streams are not identical or clear and straight, replace the jet housing.

Air Horn Assembly—Slide the accelerator plunger into air horn and install the accelerator pump link. Install the retaining hairpin clip. Place a new air horn to main body gasket in position on the air horn, then install the float needle valve seats. Be sure each needle seat and needle is reinstalled in its original position. Slide the right and left floats into position in the air horn, then install the float fulcrum pins. After the floats have been installed, check the float alignment, level and float drop settings.

Float Alignment Setting—Sight down the side of each float shell to determine if the side of the float is parallel to the outer edge of the air horn casting, as shown in Figure 97. If the sides of the float are not in alignment with the edge of casting, carefully bend the float lever.

After aligning the floats, remove as much clearance as possible between the arms of the float and the lugs on the air horn. The arms of the float lever should be as parallel as possible to the inner surfaces of the lugs on the casting. Make certain floats operate freely on their pivots.

Float Level Setting—With the air horn inverted, gasket in place, and the float needle seated, slide the float gauge or correct size drill between the top of the float, at the outer end, and the air horn gasket. See Figure 98. If an adjustment is required, bend the float arm. The float should just touch the gauge. Before float settings can be made, floats must be identified. Floats with smooth sides are part number 21-188S and floats with ribbed sides are part number 21-179S. Refer to Data and Specifications for specified settings according to carburetor number and float used.

Float Drop Setting—Holding the air horn in an upright position, measure the distance from the top of the floats (outer end) to the air horn gasket, as shown in Figure 99. Refer to Data and Specification for float drop distance. If an adjustment is necessary, bend the stop tabs on the float levers until the correct drop setting has been obtained. Bend the tab towards the needle seat to lessen the drop, or away from the seat to increase the drop.

After setting floats, assemble the pump plunger to the air horn. Install the accelerator pump spring in the carburetor. Carefully lower the air horn assembly into the main body. Make certain that the fuel baffles on the air horn slide in front (float side) of the fuel baffles of the main body.

Install the attaching screws and tighten securely. Install the step up springs, pistons, rods and cover plates. Connect throttle connector rod, fast idle connector rod and choke connector rod if so equipped.

Fast Idle Adjustment—With the choke valve held tightly closed, tighten the fast idle adjusting screw (on the high step of the fast idle cam), until wire gauge can be inserted between the primary throttle valve and the bore, side opposite idle port, as shown in Figure 100. The index mark on the fast idle cam should be in direct line with the fast idle screw. Refer to Data and Specifications for wire size.

Choke Shaft Lever Adjustment—Invert the carburetor and open the throttle valves to wide open position. Close the choke valve tightly and then close the throttle valves. Release the choke valve. This will position the fast idle cam to fast idle. The index mark on the cam should line up with the fast idle adjusting screw, as shown in Figure 101. If an adjustment is necessary, bend the fast idle connector rod at the angle, using Tool T109-213, until the index mark on the cam indexes the fast idle adjusting screw.

Choke Piston Lever Adjustment (2653S only)—Move the choke valve to the fully closed position. It should then be possible to insert a .040 inch drill shank or wire gauge, Tool T109-193, between the choke lever and the stop lug in the piston housing. Hold in this position and install heat tube cap and gasket. Be sure

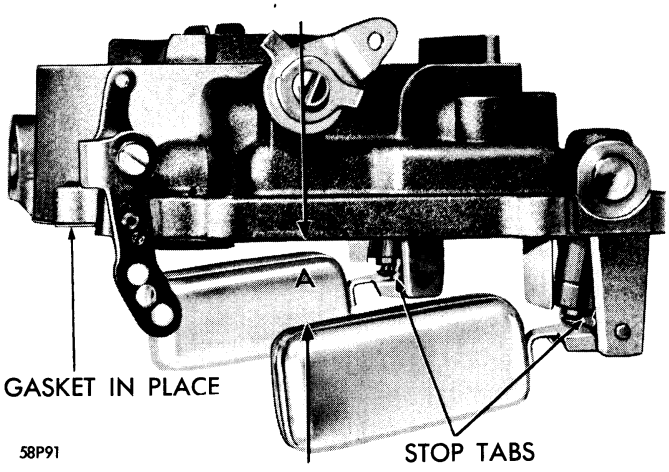

Figure 99—Checking Float Drop

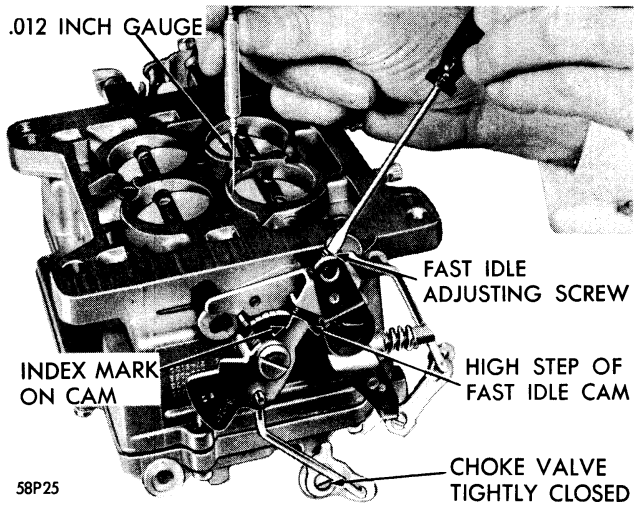

Figure 100—Checking Fast Idle Adjustment

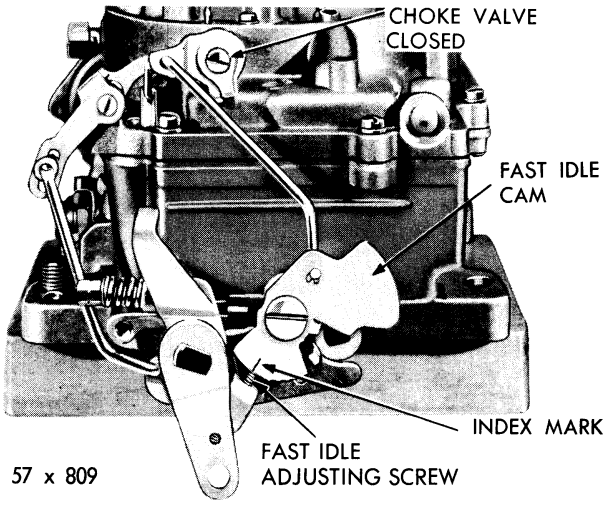

Figure 101—Checking Fast Idle Indexing

the heat tube opening in cap is pointing down and toward the front. (Approximately 5 o'clock position.) Install retaining ring, strap and attaching screws. Tighten securely.

Choke Unloader Adjustment—With the throttle valves in the wide open position, it should be possible to insert gauge Tool T109-31 (¼ inch) between the upper edge of the choke valve and the inner wall of the air horn, as shown in Figure 103.

If an adjustment is necessary, bend the unloader lip on the throttle lever, using Tool T109-214, until correct opening has been obtained.

Accelerator Pump Adjustment—Move the choke valve to wide open position, to release the fast idle cam. Back off the idle speed adjusting screw until the throttle valves are seated in the bores. Measure the distance from the top of the air horn to the top of the plunger shaft, using a "T" scale, as shown in Figure 104. This distance should be 7/16 inch. If an adjustment is necessary, bend the throttle connector rod at the lower angle, using Tool T109-213, until correct distance has been obtained.

Secondary Throttle Lever Adjustment—To check the secondary throttle lever adjustment, block the choke valve in the wide open position and invert the carburetor. Slowly open the primary throttle valves until it is possible to measure between the lower edge of the primary valve and the bore (opposite idle port), as shown in Figure 105. At this measurement, the secondary throttle levers should contact the bosses on the flange at the same time.

If an adjustment is necessary, bend the secondary throttle operating rod at the angle, using Tool T109-213, until correct adjustment has been obtained. At wide open throttle, the primary and secondary throttle valves should reach the full vertical position.

With the primary and secondary throttle valves in the tightly closed position, it should be possible to insert wire gauge, Tool T109-29 (.010 to .030 inch), between the positive closing shoes on the secondary throttle levers, as shown in Figure 106.

If an adjustment is necessary, bend the shoe on the primary throttle lever, using Tool T109-22, until correct clearance has been obtained.

Secondary Throttle Lock-Out Adjustment—Crack the throttle valves, then manually open and close the choke valve. The tang on the secondary throttle lever should freely engage in the notch of the lock-out dog. If an adjustment is necessary, bend the tang on the secondary throttle lever, until engagement has been made. Use Tool T109-22 for this operation. After adjustments have been made, reinstall carburetor on engine, using a new gasket.

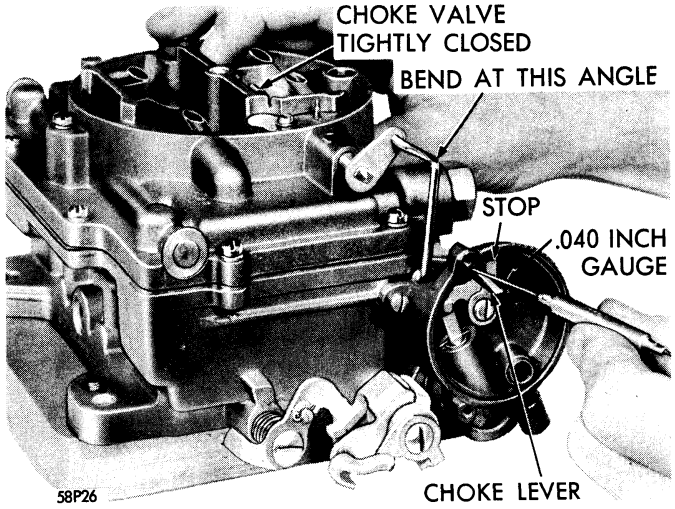

Figure 102—Checking Piston Lever Adjustment

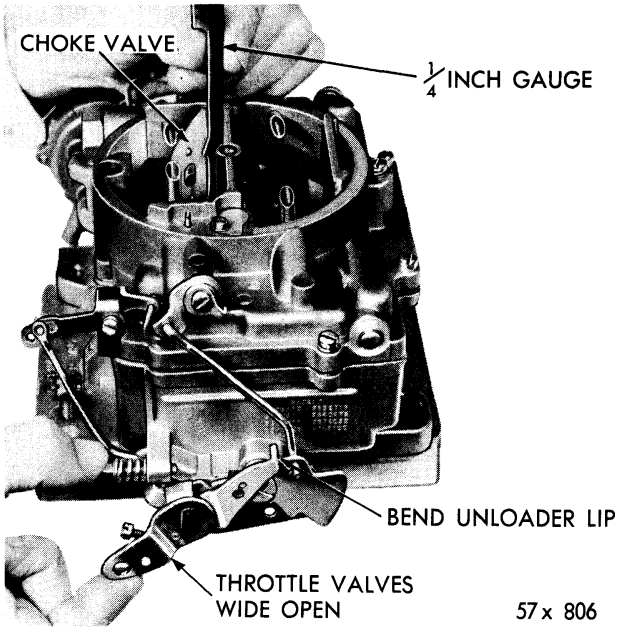

Figure 103—Checking Choke Unloader Adjustment

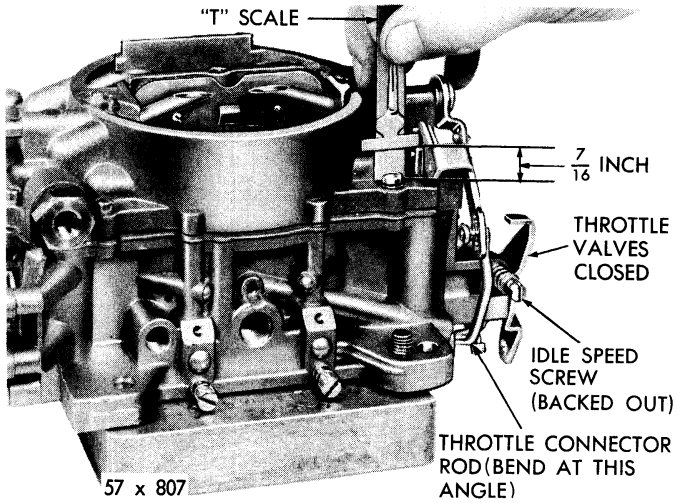

Figure 104—Checking Accelerator Pump Travel

Choke Adjustment (Cross Over Type) — (2641S or 2744S)—Loosen mounting post lock nut and turn mounting post with screw driver until index mark on disk is positioned half way between R and L. Hold in this position with screwdriver and tighten lock nut. After adjustment is completed and coil housing and rod assembly and carburetor is installed on engine lift cover disk and open and close choke valve manually to see if connector rod clears sides of hole in housing cover. If rod does not clear hole in housing cover without binding replace with a new unit since connector rod cannot be bent without affecting calibration.

Engine Idle Adjustment (2744S and 2641S) — Set idle mixture screws ¼ to 1¾ turns open. Then adjust idle speed screw to idle engine at not less than 500 R.P.M. with transmission in neutral.

Engine Idle Adjustment (2652S and 2653S)—Set the idle (2) mixture screws on each carburetor ¼ to 1½ turns open. Adjust the air mixture screw on each carburetor approximately 4 turns open. It may be necessary to change the air mixture screws to obtain the specified 650 R.P.M. Adjustment is made with transmission in neutral.

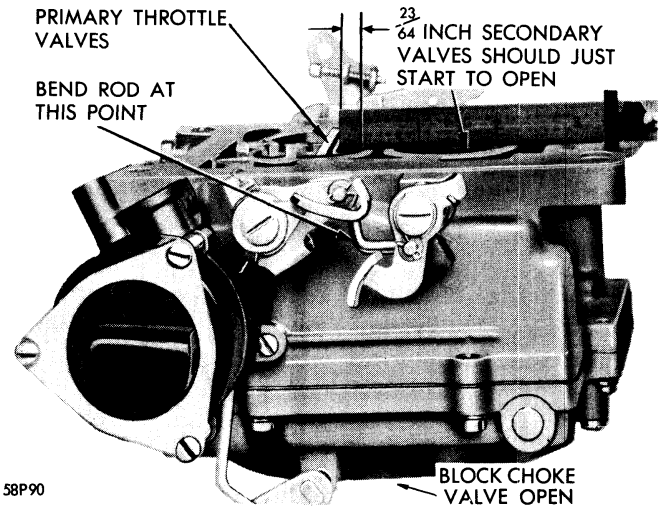

Figure 105—Checking Secondary Throttle Opening

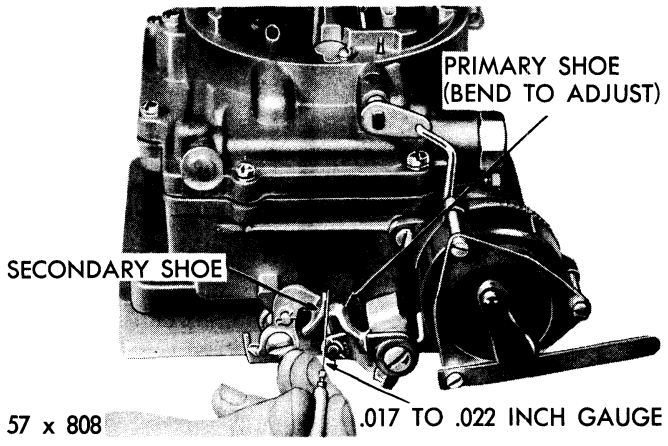

Figure 106—Checking Clearance Between Closing Shoes

Interconnecting Rod (2652S and 2653S)—Open throttle of rear carburetor to wide open position. Adjust interconnecting rod so that front carburetor is in wide open position. Then tighten lock nut.

9. MANIFOLD HEAT CONTROL

The purpose of the manifold heat control is to direct hot exhaust gas to a heat chamber in the intake manifold and preheat the fuel droplets. Thus the fuel is vaporized to a greater degree before entering into the combustion chambers, providing easier starting of cold engines.

V-8 Engine—When a cold engine is started the thermostatic coil exerts enough tension to keep the valve closed. Thus, exhaust gases from the right manifold pass through the exhaust crossover branch in the intake manifold and into the left exhaust manifold. See Figure 107.

When the spring heats up, it loses tension and the valve opens, permitting exhaust gas from the right exhaust manifold to pass directly to the exhaust pipe.

6 Cylinder Engine—When the engine is cold the exhaust gases are deflected to the heat chamber of the intake manifold and then circulate to the exhaust manifold. See Figure 108. As the thermostatic coil heats it loses tension and the valve closes the heat chamber permitting exhaust gas to flow directly through the exhaust manifold.

SERVICING HEAT CONTROL

The operation of the manifold heat control valve is fully automatic. No adjustments are required. It is good practice to periodically check its operation for free movement.

With the engine idling, accelerate engine momentarily to wide open throttle. The counterweight should

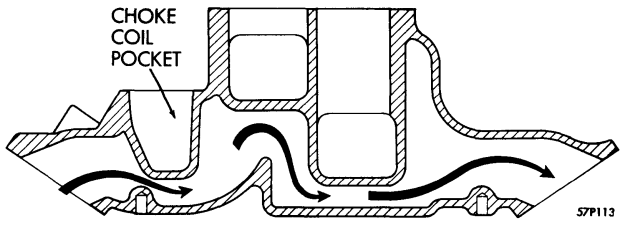

Figure 107—Cold Engine Exhaust Gas Flow V-8 Engine

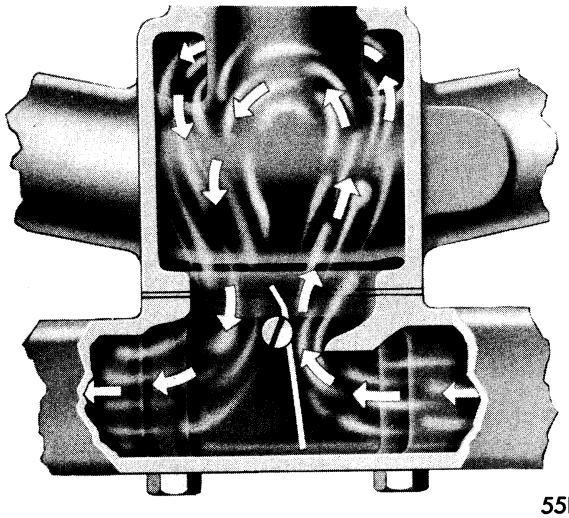

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Figure 108—Cold Engine Exhaust Gas Flow 6 Cylinder Engine

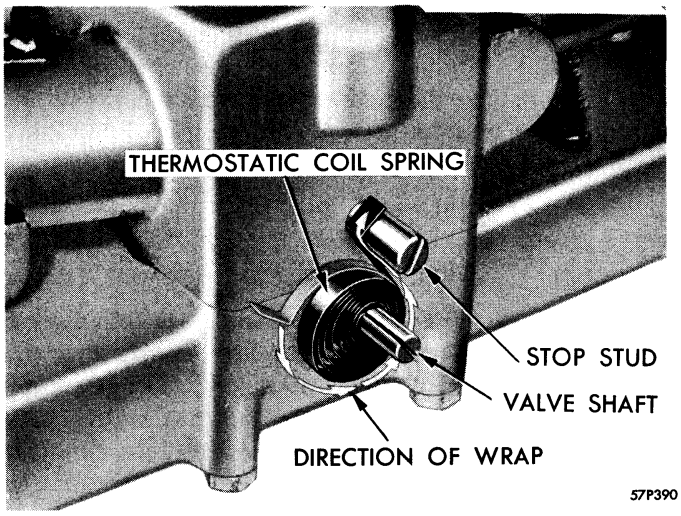

Figure 109—Thermostatic Coil Spring—6 Cylinder Engine

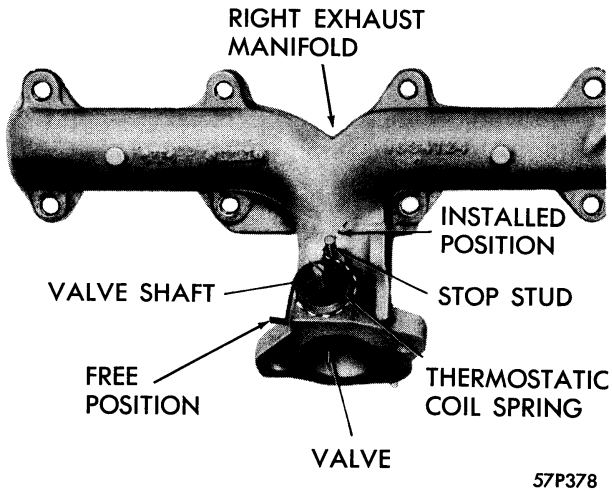

Figure 110—Thermostatic Coil Spring—V-8 Engine

respond by moving clockwise ½ inch and return to its normal position. If there is no movement, the shaft is frozen or the spring is weak or broken. To free a frozen shaft, lubricate both ends with a good penetrating oil and allow to stand for several minutes. Then work rotate shaft back and forth until it operates freely. Apply a small quantity of graphite paste at the bearing surfaces.

To replace a weak or broken thermostat spring, loosen counterweight lock nut and slide counterweight off shaft. Then remove spring. It is important that coil spring be installed in its proper location on the shaft and with the correct number of degrees of wrap. See Figure 109 and 110.

It is equally important that the counterweight be correctly indexed on the shaft for proper heat control operation.

10. INTAKE AND EXHAUST MANIFOLD

The accumulation of carbon in the exhaust manifold ports should be removed by using a stiff wire brush or by sand blasting. Thoroughly wash and dry with compressed air.

V-8 Engine—Before removing the intake manifold, drain the cooling system. Carefully inspect the exhaust manifolds for evidence of cracks or distortion.

Inspect the exhaust crossover passage in the intake manifold and in the cylinder heads. See Figure 113. If engine performance is poor, pressure check the intake manifold to make sure that leakage exists from the exhaust crossover passage into any of the intake passages. Check mating surfaces for parallelism with a quality straight edge. Always use new gaskets when servicing manifolds.

Layers of carbon act as a heat insulator and retard the heating action of the exhaust gases in the heat chamber of the intake manifold. Thus, fuel will not vaporize as much as it could, causing poor engine performance.

6 Cylinder Engine—Before servicing manifolds it is necessary to drain the cooling system since the two long cap screws adjacent to the heat riser section extend into the cylinder block water passage. See Figure 114. Clean the manifolds and inspect for cracks or distortion. Remove carbon build-up from exhaust passages and pay particular attention to the heat riser chamber of the intake manifold.

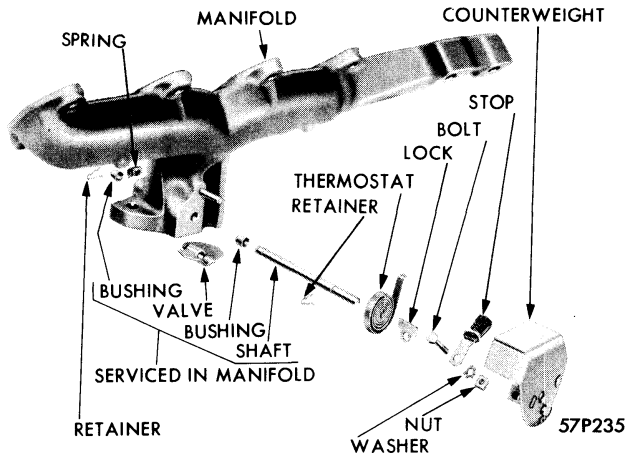

Figure 111—Manifold and Heat Control Valve V-8 Engine

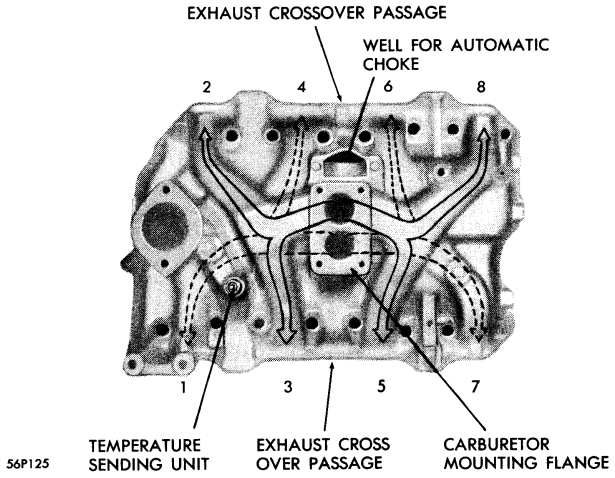

Figure 113—Intake Manifold—V-8 Engine Typical of 277, 301, and 318 cubic inch engine

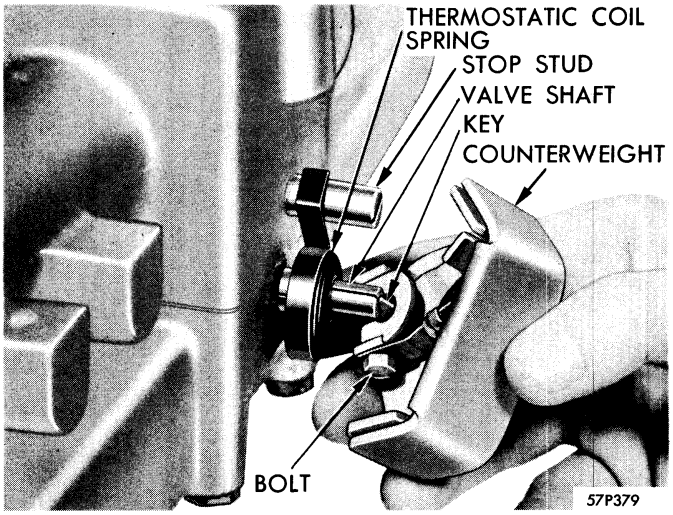

Figure 112—Installing Counterweight—6 Cylinder Engine

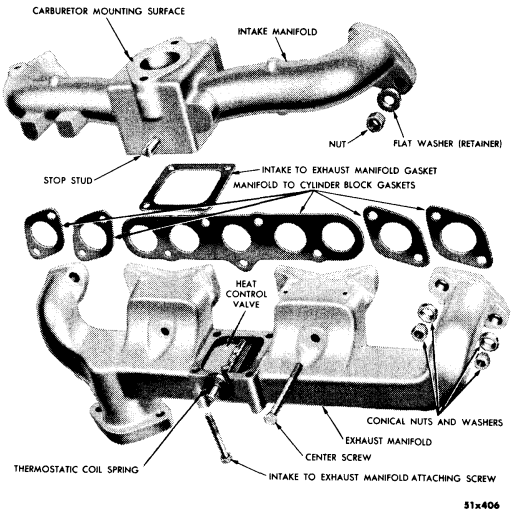

Figure 114—Intake and Exhaust Manifold—6 Cylinder Engine

Assemble the intake and exhaust manifolds using a new gasket. Apply sealer to the long cap screws leading into the water passage to prevent leakage. It is important that the conical washers at the flange ends of the exhaust manifold be installed. These washers allow the manifold to expand and contract without loosening. Tighten intake and exhaust manifold bolts alternately to insure correct seating.

11. EXHAUST PIPE, MUFFLER AND TAIL PIPE

The exhaust pipe and muffler are welded together, forming a complete assembly. To replace the muffler, the exhaust pipe should be cut off as close to the front of the muffler as possible. Then, loosen the tail pipe clamps and slide the tail pipe to the rear.

ALIGNMENT OF EXHAUST SYSTEM PARTS

Whenever any part of the exhaust system has been replaced, leave the attaching bolts and clamps loose and run engine to allow all parts of the system to align themselves. Then, tighten all bolts and clamps securely, making sure there is no interference.

12. DIAGNOSIS PROCEDURES

Diagnosis procedures concerning units of the fuel and exhaust systems are included in the various procedures described in the Engine Section of this manual.

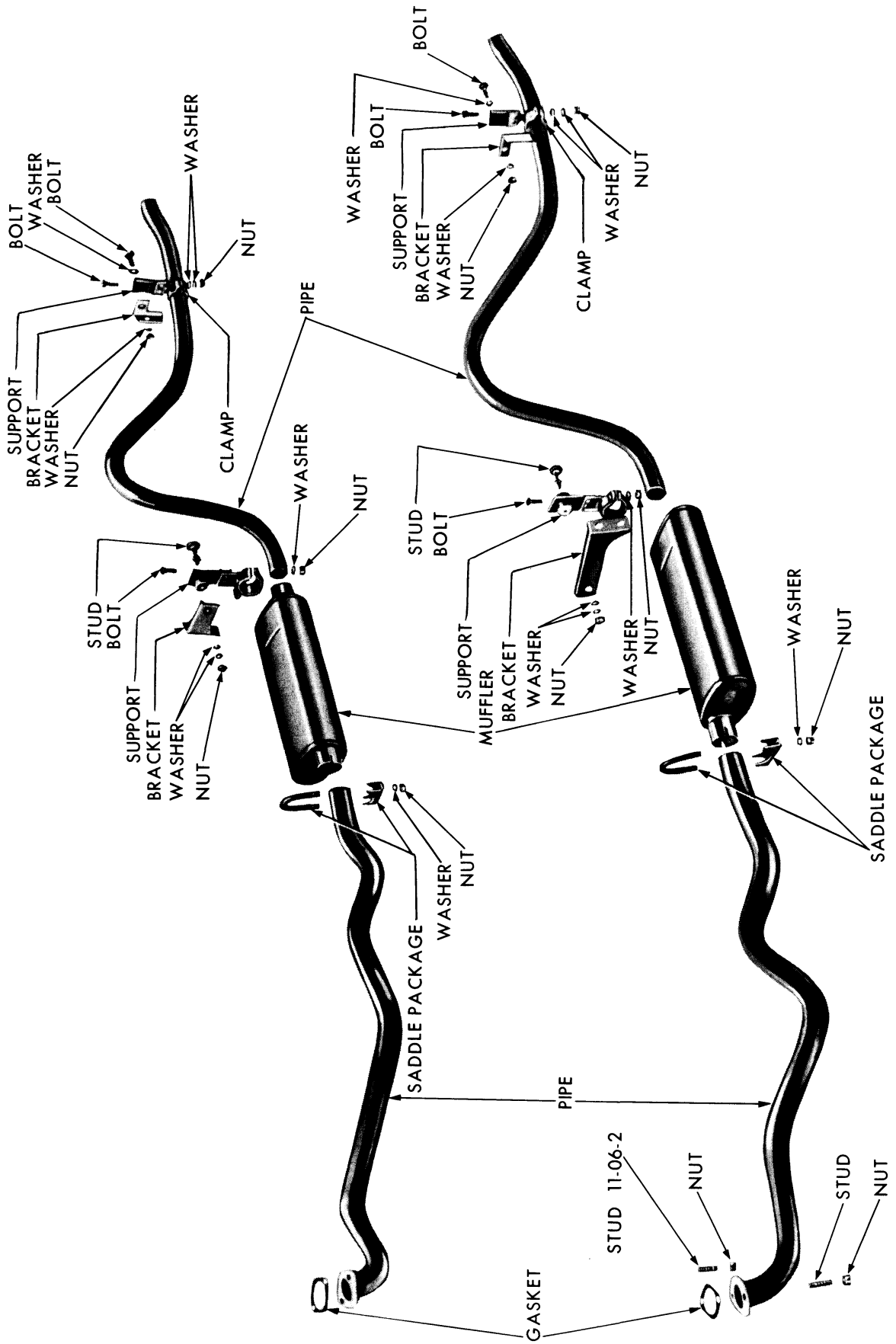

Figure 115—Dual Exhaust System