CARTER AFB CARBURETOR

TABLE OF CONTENTS

CARTER AFB CARBURETOR DESCRIPTION

The Carter carburetor Model AFB-2441-SA (See figure 9E-1 and 9E-2), is a four barrel, downdraft carburetor incorporating primary and secondary fuel metering sections. The primary section contains the low speed (idle) system, high speed system, choke, accelerating system, metering rods, and dashpot assembly.

The secondary section, which contains a high speed system, is basically a supplementary carburetor which provides increased engine breathing during high speed operation.

The air horn and the float bowl, which is cast integrally with the throttle body flange, are made of aluminum castings. The model number AFB-2441-SA is stamped on the throttle body flange area of the bowl casting.

OPERATION

Float Systems

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

There are two separate float systems to direct fuel into the two float bowls located respectively on the left and right side of the carburetor. See figure 9E-3. Each float bowl contains a float and a needle and seat assembly. Each float bowl supplies fuel to a primary metering jet and a secondary metering jet. Therefore, each bowl functions in supplying fuel to both the primary and secondary sections.

The intake needle seats are installed at an angle to assure positive seating action of the intake needles by the float assemblies. See figure 9E-4. A fuel bowl baffle is installed in each bowl to prevent excessive fuel aeration, agitation and surging. A stand pipe is provided at both needle seats as an additional trap for foreign material that might prevent the needle valves from seating properly.

All fuel enters the carburetor through a common inlet in the air horn. The fuel is directed through a

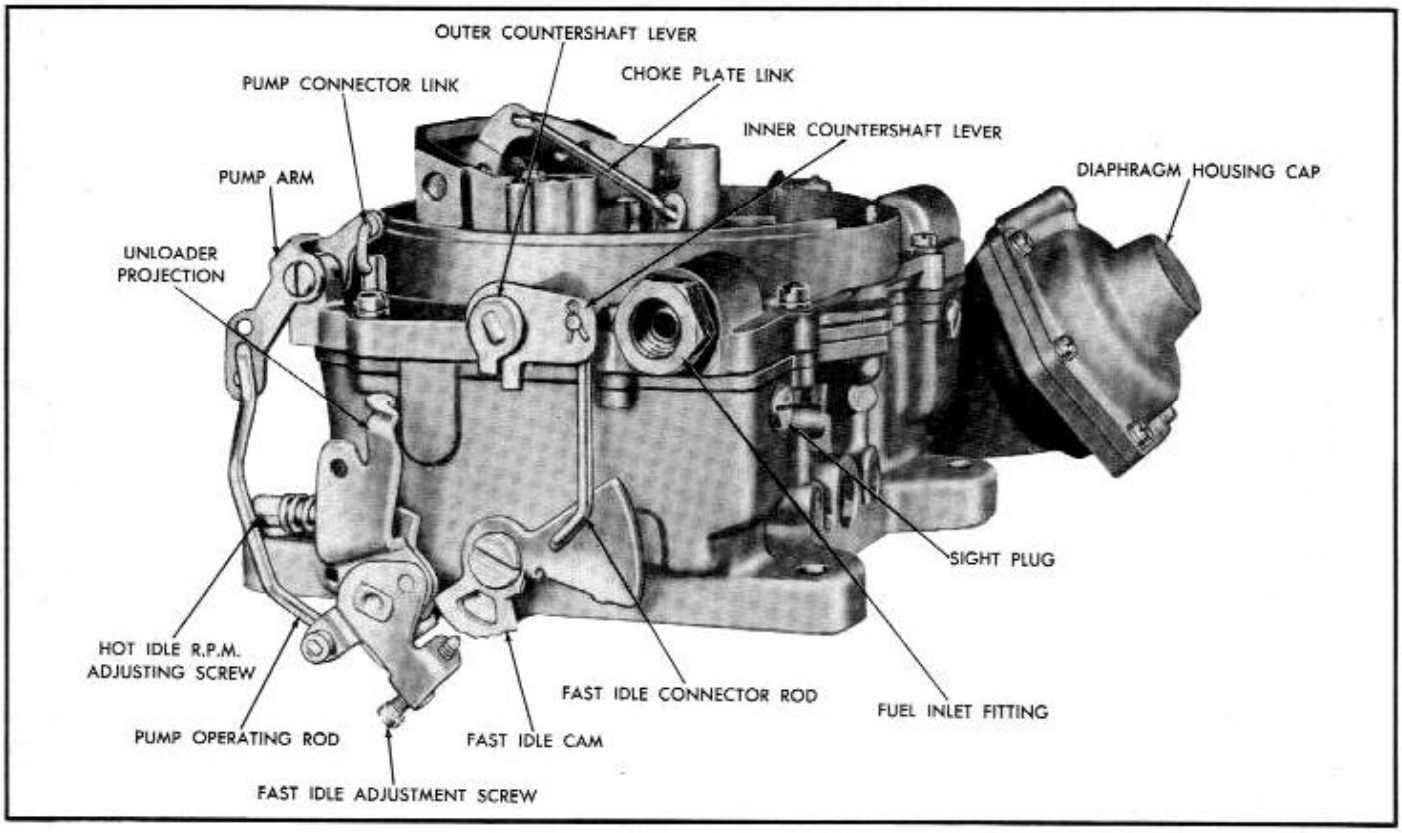

Fig. 9E-1—AFB Carburetor—Left Side

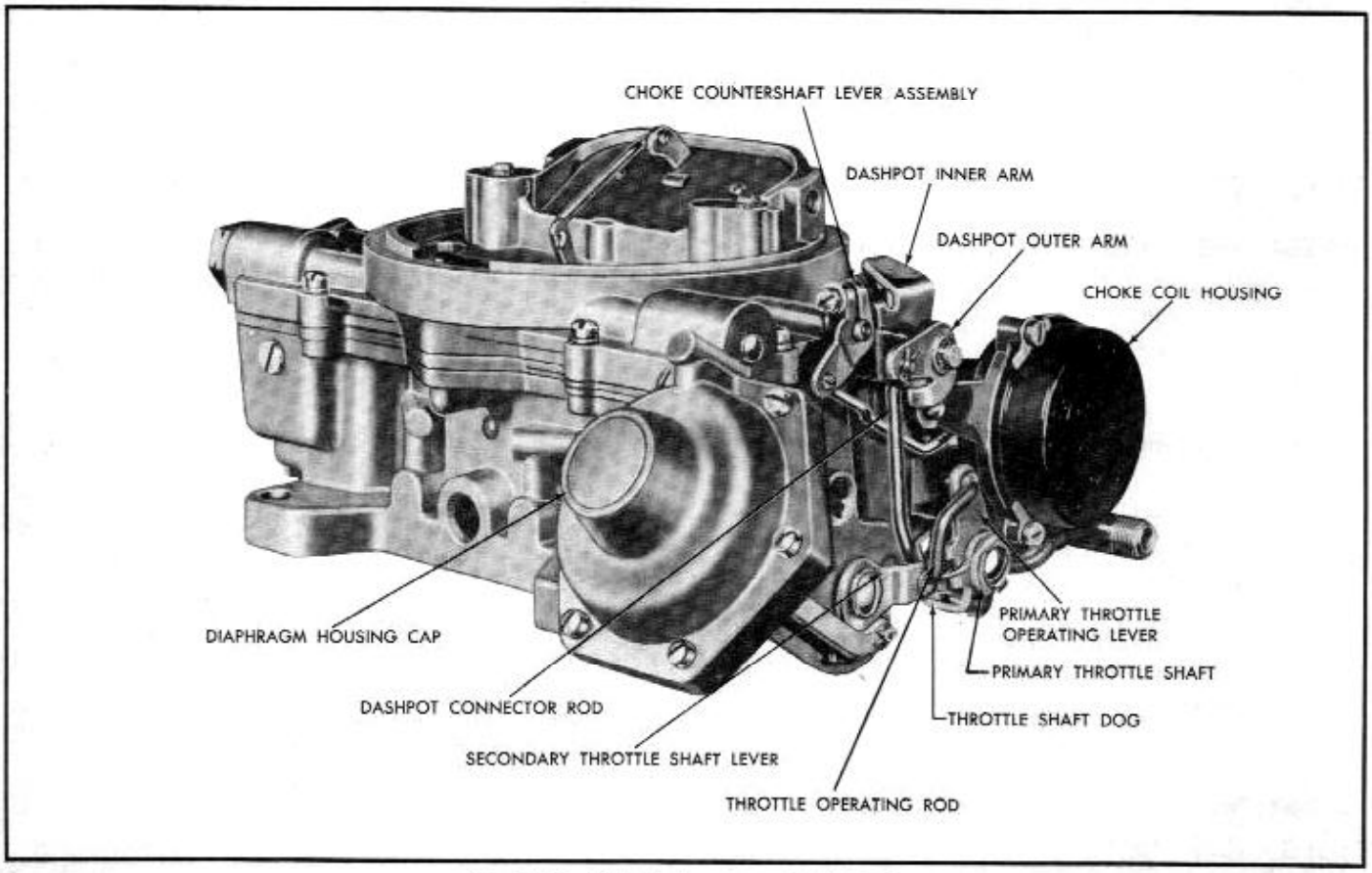

Fig. 9E-2—AFB Carburetor—Right Side

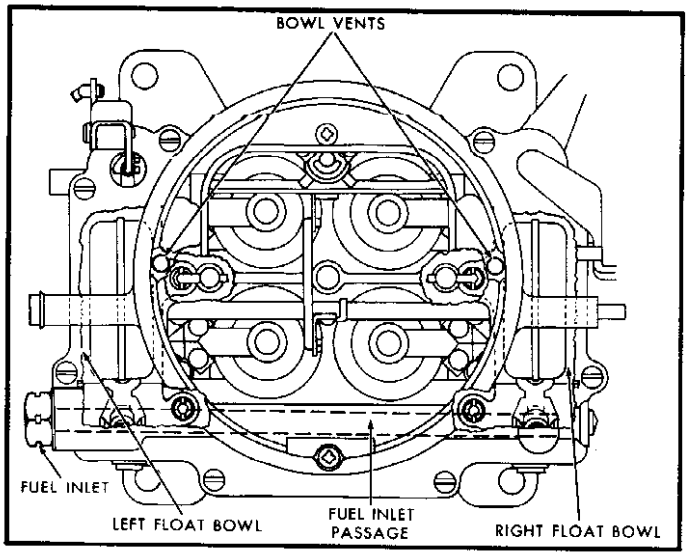

Fig. 9E-3—Fuel Inlet and Float Systems

fuel passage in the air horn casting to the right and left fuel inlet needle valves. As the fuel level in the bowls drops, the floats also drop, allowing the inlet needles to fall away from their seats. Fuel pump pressure then forces fuel through the inlet fitting, strainer screen, past the needles and seats and into the bowls. As the fuel level rises, the floats rise until the needle valves are closed, stopping fuel flow. It is possible for each float and inlet needle to operate independently of the other. The bowls are vented to the air cleaner with a connecting passage between the bowls. This connecting vent passage in the air horn keeps both bowls under the same air pressure. Bowl vents are calibrated to provide proper air pressure above the fuel at all times.

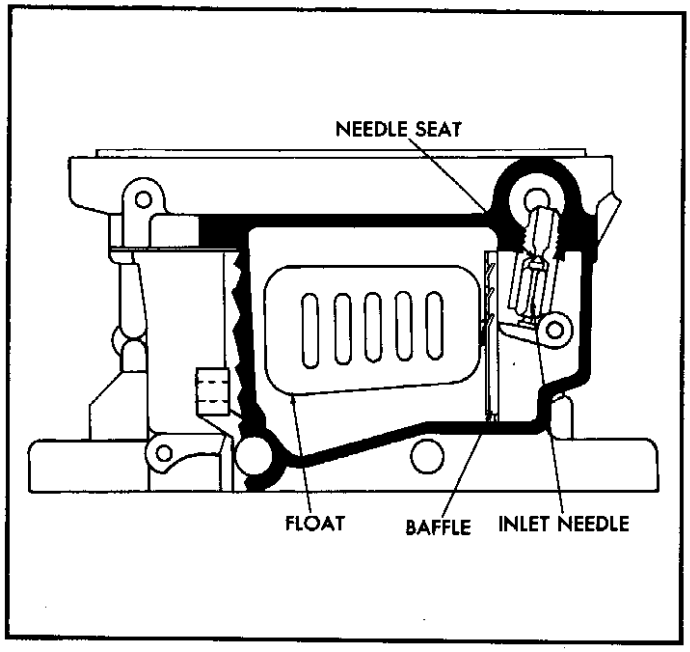

Fig. 9E-4—Fuel Inlet Valve and Seat Assembly

Low Speed System

Fuel for idle and early part throttle operation is metered through the low speed system. The low speed system is located on the primary side only. See figure 9E-5. When the primary throttle plates are in the closed or idle position, manifold vacuum causes fuel to enter the idle wells through the main metering jets. The low speed jets meter the amount of fuel for idle and early part-throttle operation.

The fuel passes through the low speed jet, past the economizer into the idle passages in the carburetor body. Air enters the by-pass and air bleeds to mix with and break up the liquid fuel into a combustible mixture. The fuel-air mixture discharges at the idle discharge ports and the idle mixture adjusting screw ports into the carburetor throat. As the throttle plates are opened, the slot-shaped idle ports are uncovered, allowing a greater quantity of the fuel and air mixture to enter the carburetor bores. The secondary throttle plates remain seated at idle.

To assist in quick hot engine starting, fuel vapors accumulated in the primary and secondary bores are vented to the atmosphere through vent passages above the throttle plates.

High Speed Systems

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

Primary Side

As the throttle plates are opened, manifold vacuum at the idle ports drops, diminishing the fuel-air flow through the idle system. However, air flow through the venturi has increased to a point where venturi vacuum causes fuel to flow from the high speed nozzles. The amount of fuel delivered by the high speed circuit is controlled by air flow or throttle plate opening and by the position of the metering rods in the main metering jets. See figure 9E-6. The position of the metering rod is controlled by manifold vacuum applied to the vacuum piston. During part throttle operation, manifold vacuum pulls the vacuum piston and rod assembly down against vacuum piston spring tension, and the large diameter of the metering rod is held in the primary metering jet. Fuel is then metered around the rod in the jet. This is true at all times when the vacuum under the piston is strong enough to overcome the tension of the vacuum piston spring. When the manifold vacuum is decreased due to acceleration or wide open throttle operation, the tension of the spring overcomes the pull of vacuum under the piston, and the metering rod will move up so its smaller diameter or power step is in the jet.

As the vacuum existing in the primary venturi draws

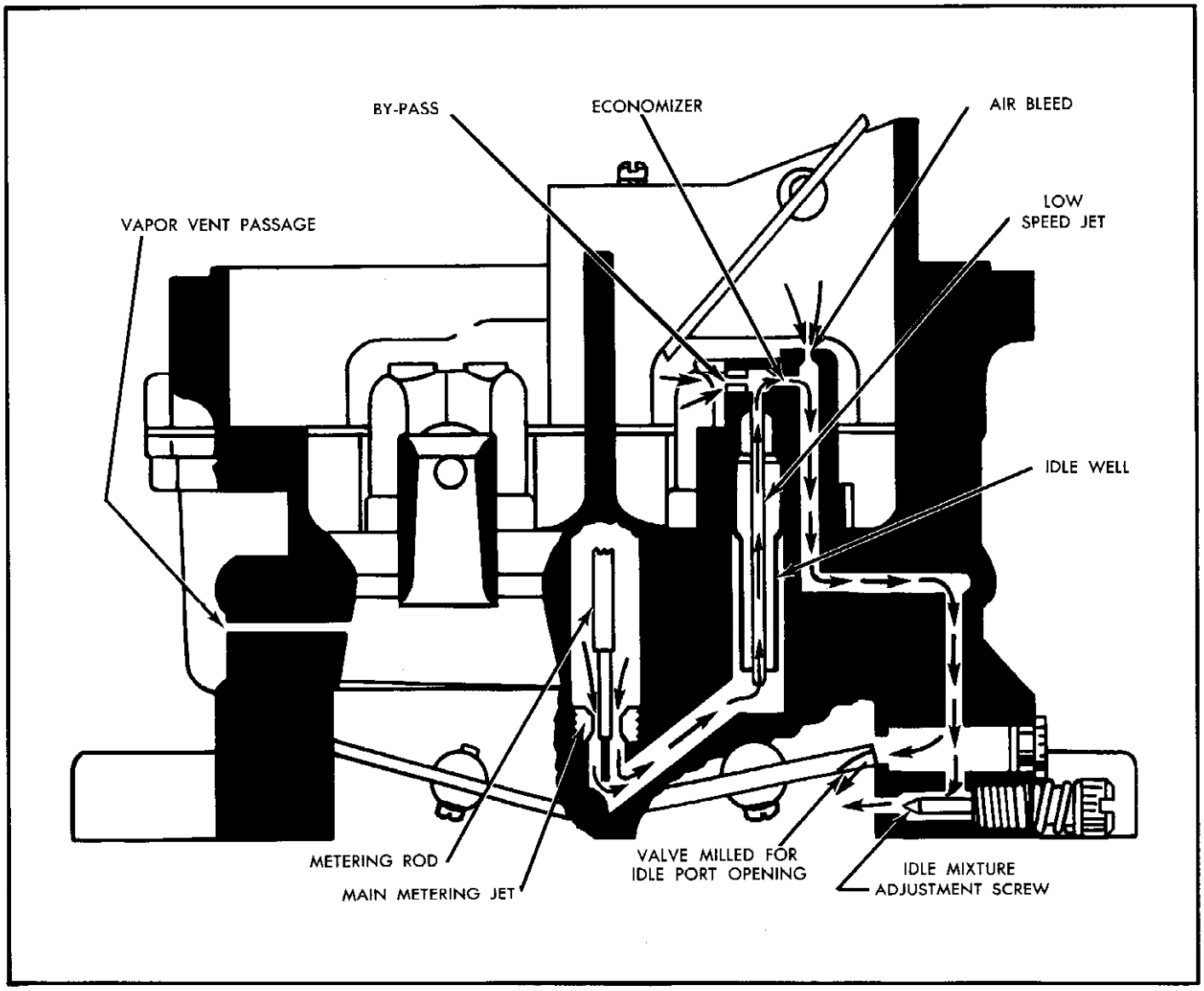

Fig. 9E-5—Low Speed System

fuel from the primary metering jet and main well up to the high speed nozzle, the fuel is drawn through the main well tube (pressed into the primary venturi). See figure 9E-7. The fuel is mixed with air which enters the vent tube through the primary venturi high speed air bleed. The air-fuel mixture is then discharged out of the high speed nozzle.

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

Secondary Side

Fuel for the high speed system of the secondary side is metered through the secondary metering jets. Since the secondary system is supplementary at high speeds only, metering rods are not used to meter fuel through the secondary metering jets.

When the secondary throttle is opened, the vacuum produced at the secondary venturi causes fuel to be drawn from the secondary metering jet and secondary well through the secondary venturi main well. There it is mixed with air from the secondary venturi air bleed and discharged out of the secondary high speed nozzle. See figure 9E-8.

Vacuum Operated Secondary Throttle Plates

The secondary throttle plates are vacuum controlled. This feature provides the added capacity of the secondary system only when the engine is able to make use of this capacity.

When the accelerator is fully depressed, the secondary throttle plates, through linkage with the primary

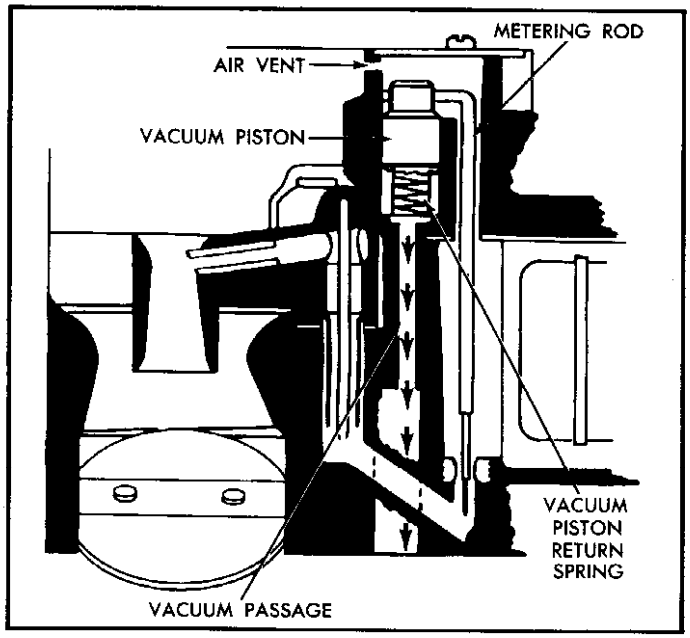

Fig. 9E-6—Vacuum Operated Metering Rod

throttle, are opened a few degrees. Air flow through the primary venturi determines the amount of primary venturi vacuum applied to the secondary throttle operating diaphragm by means of the primary vacuum pick-up port. See figure 9E-9. The secondary venturi vacuum pick-up port bleeds primary vacuum when the secondary throttle plates are closed. The secondary venturi vacuum pick-up port helps hold the secondary throttle plates open after they are opened by venturi vacuum from the primary venturi pick-up port. A mechanical overriding linkage insures that the secondary plates will always close with the primary plates.

Pump System

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

When the throttle is closed, the pump plunger moves upward in its cylinder and fuel is drawn into the pump cylinder through the intake check. See figure 9E-10. The discharge check is seated at this time to prevent air from being drawn into the cylinder. When the throttle is opened, the pump plunger moves downward forcing fuel out through the discharge passage, past the discharge check, and out of the pump jets. As the plunger moves downward, the intake check is closed, preventing fuel from being forced back into the bowl.

At high speed, pump discharge is not necessary to insure smooth acceleration. When the throttle plates are approximately one-third open, the pump plunger bottoms in the cylinder eliminating pump discharge.

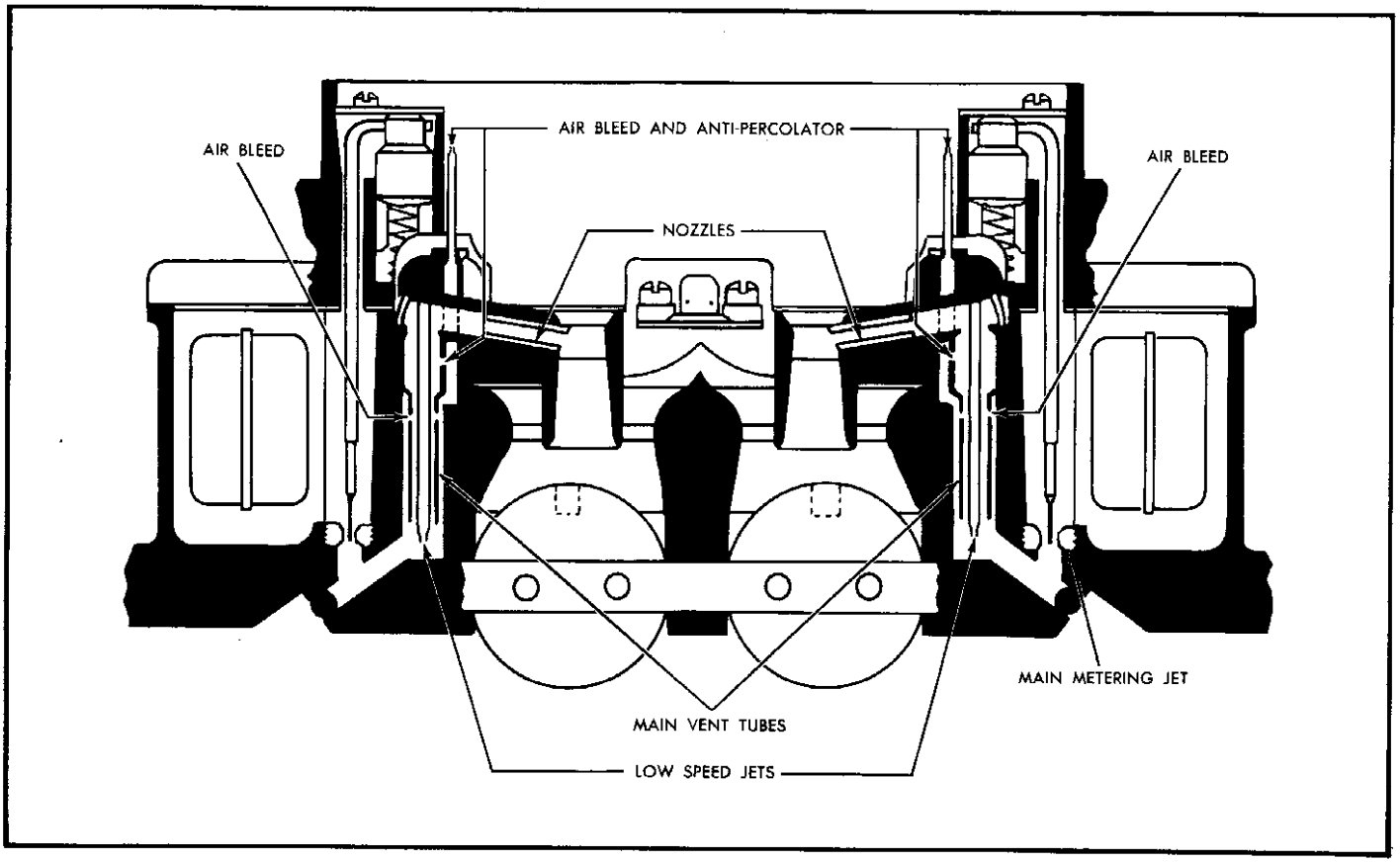

Fig. 9E-7—Primary High Speed System

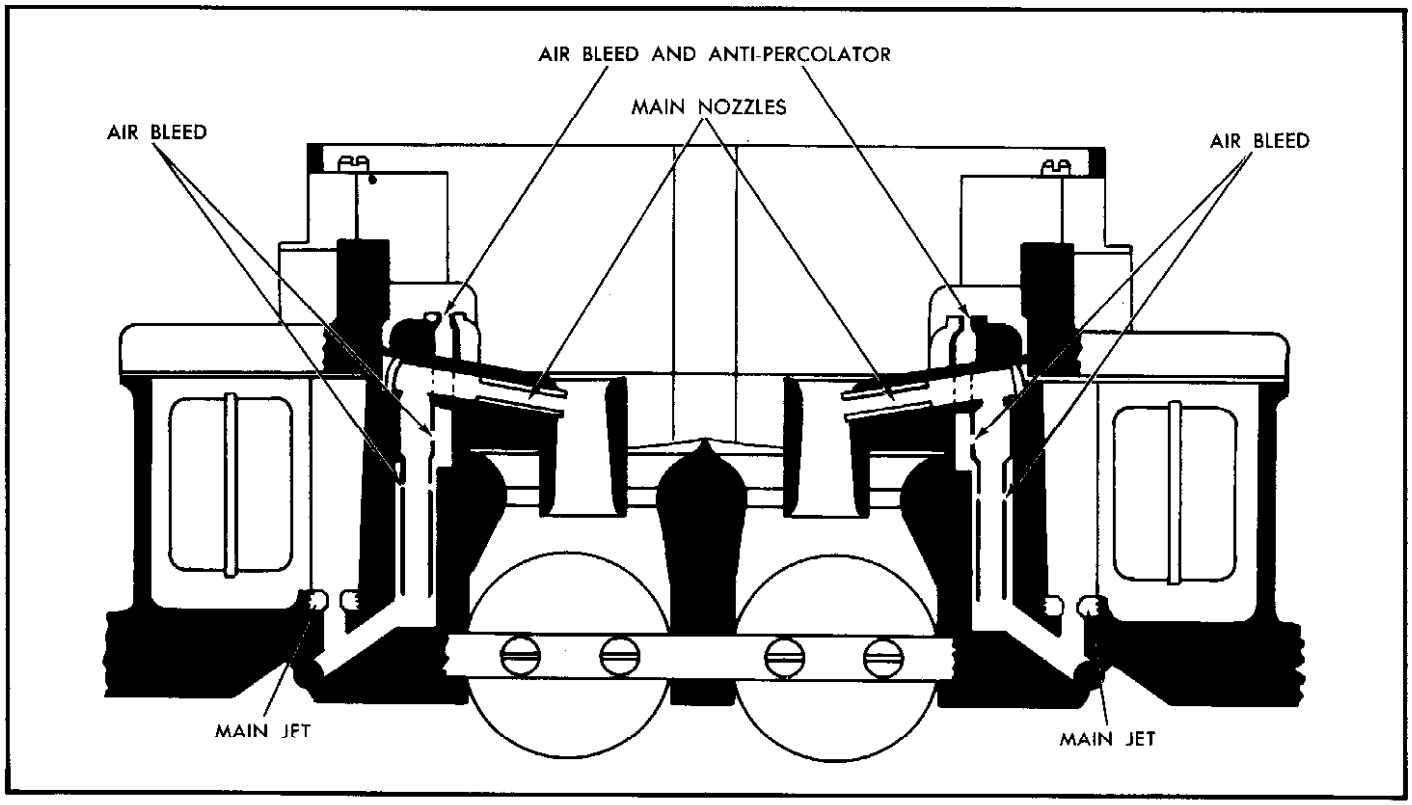

Fig. 9E-8—Secondary High Speed System

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

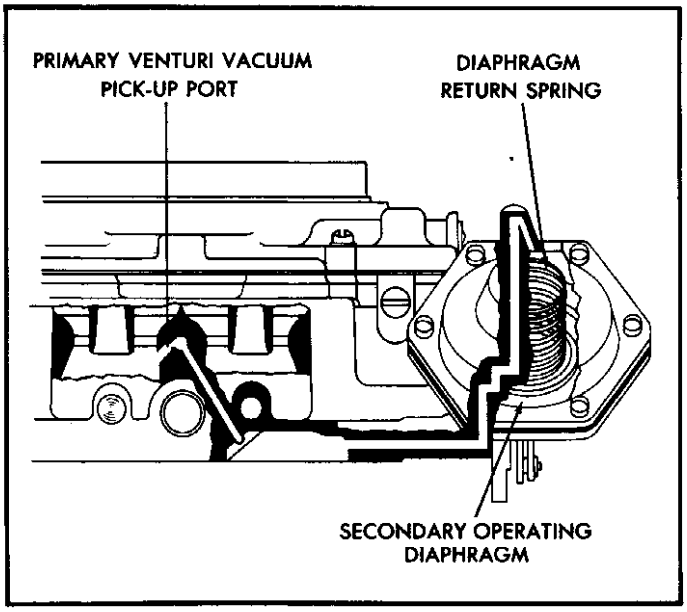

Fig. 9E-9—Venturi Vacuum System—Secondary Throttle Control

Choke System

The choke system located on the primary side provides the correct mixture necessary for quick cold engine starting and warm-up. To permit lower overall height, a choke countershaft over the secondary bores connects the choke linkage to the choke plate.

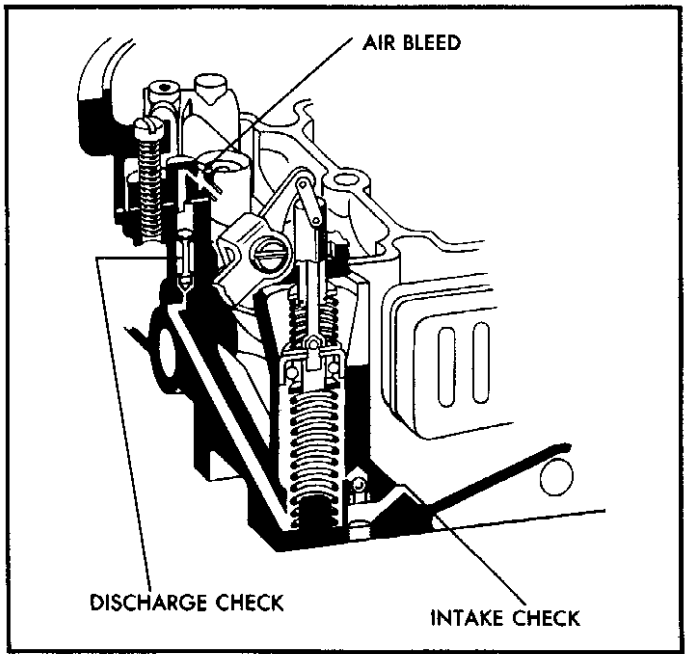

Fig. 9E-10—Pump System

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

When the engine starts, slots located in the sides of the choke piston cylinder are uncovered allowing intake manifold vacuum to draw warm air, heated in a tube running through the exhaust cross-over passage, through the choke mechanism. The flow of warm air heats the thermostatic coil and causes it to lose some of its tension allowing the choke plate to open. The thermostatic coil loses its tension gradually until the choke plate reaches full-open position. If the engine is accelerated during the warm-up period, the corresponding drop in manifold vacuum allows the thermostatic coil to momentarily close the choke plate, providing a richer mixture. To combat engine stalling during warm-up (cool humid days) caused by "carburetor icing", heated air from the choke housing is circulated through the passage in the base of the carburetor body. See figure 9E-11. This heat helps eliminate ice formation at the throttle plate edges and idle ports.

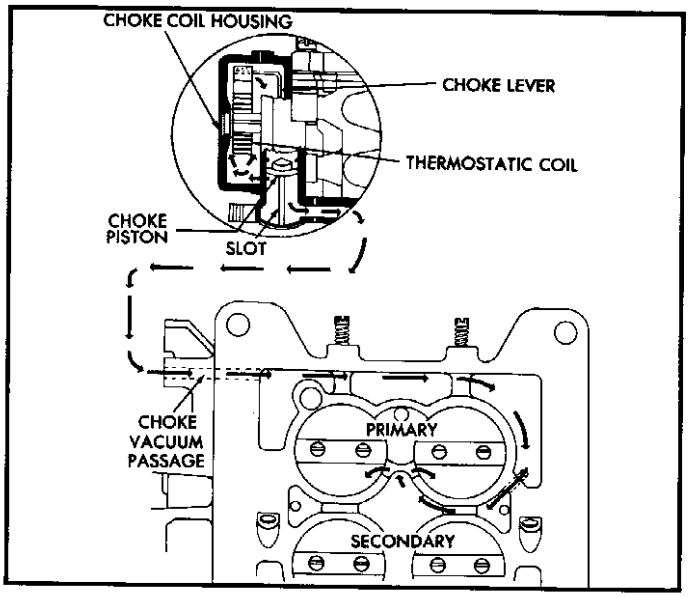

Fig. 9E-11—Choke System Vacuum Passage

Fast Idle

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

Unloader

If, during the starting period, the engine becomes flooded, the choke plate may be opened manually to allow air to enter the intake manifold for unloading of the engine. This is accomplished by depressing and holding the accelerator pedal to the floor while engaging the starter. The unloader projection on the throttle lever contacts the unloader lug on the fast idle cam and in turn partially opens the choke plate.

Dashpot – (Slow Closing Throttle Device)

To slow the closing of the throttle to the idle position, an internal dashpot is incorporated. See figure 9E-12. The dashpot consists of a plunger-type piston with a built-in intake check, and a plunger piston return spring. The piston and spring are located in the dashpot cylinder which is cast into the right float bowl. The dashpot piston is connected to the primary throttles through exterior linkage.

When the throttle is opened, the plunger spring raises the plunger. The intake check opens, allowing fuel above the plunger to fill the cylinder below the plunger. When the throttle is closed, the plunger is pushed downward; the intake check is closed and fuel below the plunger is forced through a small restriction in the plunger stem. The closing of the throttle plates is delayed by the hydraulic action of

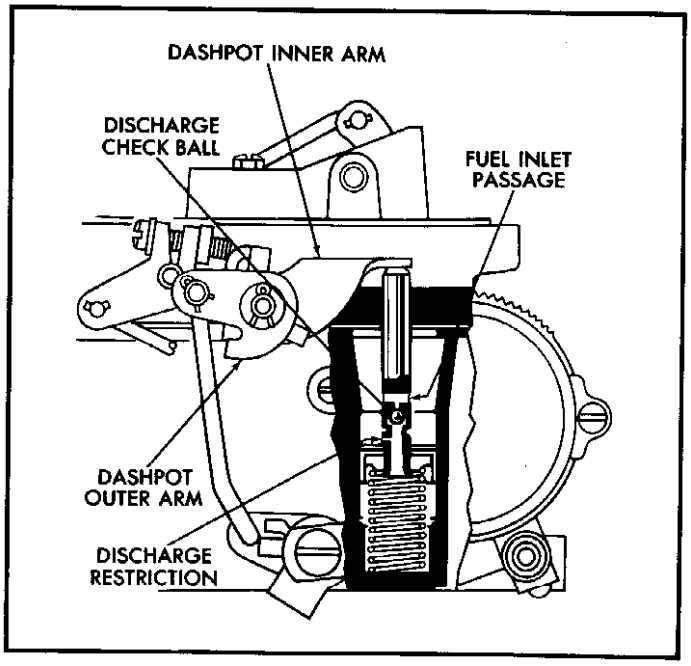

Fig. 9E-12—Dashpot

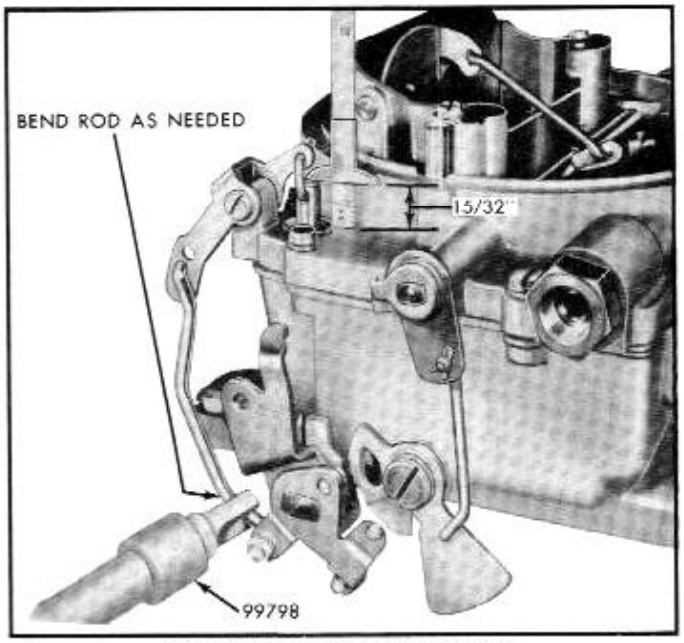

Fig. 9E-13—Pump Adjustment

the dashpot plunger and the fuel in the dashpot cylinder.

ADJUSTMENTS ON CAR

Refer to "Assembly of Air Horn" for float adjustments. All other adjustments except Bench Fast Idle Adjustment may be made on the car.

Pump Adjustment

1. Back out idle adjustment screw until throttle plates seat in bores of carburetor.

NOTE: Be sure choke is wide open so fast idle cam does not hold throttle plates open.

2. With pump operating rod in center hole (medium stroke) of pump arm, the distance from the top of the air horn to the top of the plunger shaft should be 15/32". See figure 9E-13.
3. Adjust by bending accelerator pump operating rod at lower angle with Tool 99798 (T109-213).

Choke Countershaft Linkage Adjustment

1. Remove choke coil housing if it is installed.
2. Loosen countershaft lever clamp screw. Hold choke plate tightly closed. Place .086" gauge of Tool 9581-A (T109-215) between choke lever and stop in piston housing. See figure 9E-14. With gauge in place take slack out of linkage by pressing countershaft lever toward closed choke position. Hold in place and tighten clamp screw.
3. Install coil housing and gasket with three retainers and screws. Rotate choke coil housing until scribe mark on coil housing lines up with the first digit from center mark (rich side) on choke piston housing.
4. Hold choke plate tightly closed; press up on countershaft inner lever until fast idle cam stop touches boss on casting. The clearance between lug on outer countershaft lever and stop on inner countershaft lever should be .010". Use .010" gauge of Tool 9545-A (T109-200) to check clearance. See figure 9E-15. To adjust, bend lug on countershaft outer lever with Tool 9581 (T109-214).

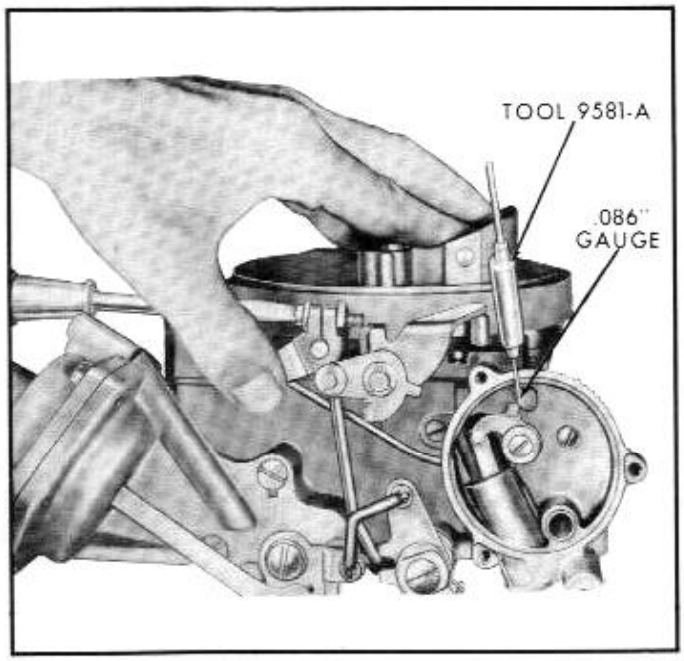

Fig. 9E-14—Choke Countershaft Linkage Adjustment

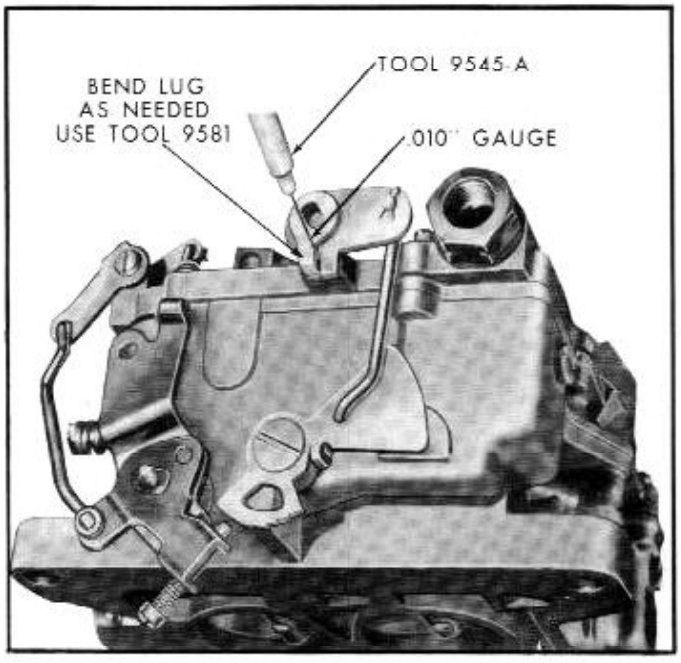

Fig. 9E-15—Choke Countershaft Lever Clearance

Unloader Adjustment

With throttle wide open there should be a clearance of .067″ between upper edge of choke plate and wall of air horn. Use .067″ gauge of Tool 9545-B (T109-234) to check clearance. See figure 9E-16. To adjust, bend unloader lip on primary throttle shaft lever with Tool 9581 (T109-214).

Primary Throttle Shaft Dog Adjustment

1. With primary throttle plates in wide open position there should be a clearance of .015″ between edge of secondary throttle plates and bore of carburetor adjacent to primary throttle plates. Use .015″ gauge of Tool 9597-A (T109-44) to check clearance. See figure 9E-17. To adjust, bend the rear tang (closest to diaphragm housing) on primary throttle shaft dog. To decrease clearance, bend tang toward end of spring. To increase clearance, bend tang away from end of spring. Use bending Tool 9581 (T109-214).
2. With primary and secondary throttle plates in tightly closed position there should be a clearance of .067″ between primary throttle shaft flex spring and front (closest to choke housing) tang of primary throttle shaft dog. See figure 9E-18. Use .067″ gauge of Tool 9545-B (T109-234) to check clearance. To adjust, bend tang with Tool 9581 (T109-214).

Dashpot Adjustment

With primary throttle plates in wide open position there should be a distance of 7/16″ between the top surface of the bowl cover and the bottom of dashpot arm lever. See figure 9E-19. To adjust, bend dashpot inner arm tang with Tool 9564-A (T109-22).

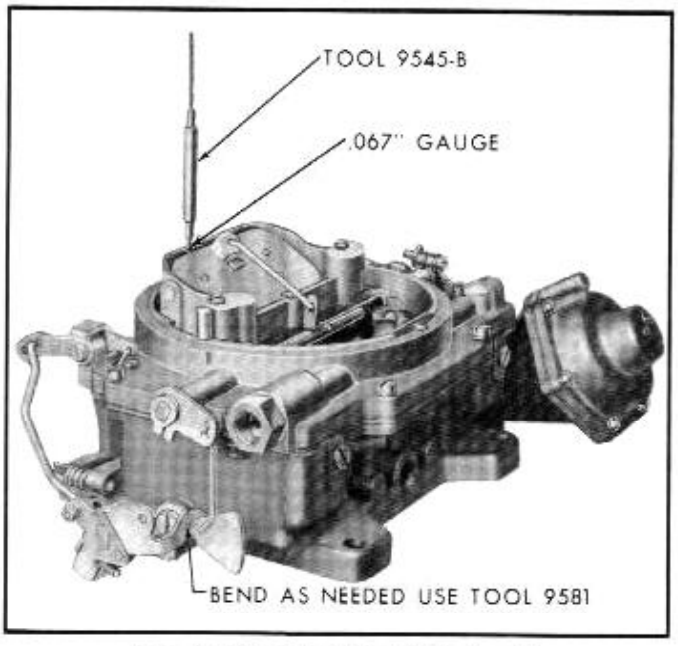

Fig. 9E-16—Unloader Adjustment

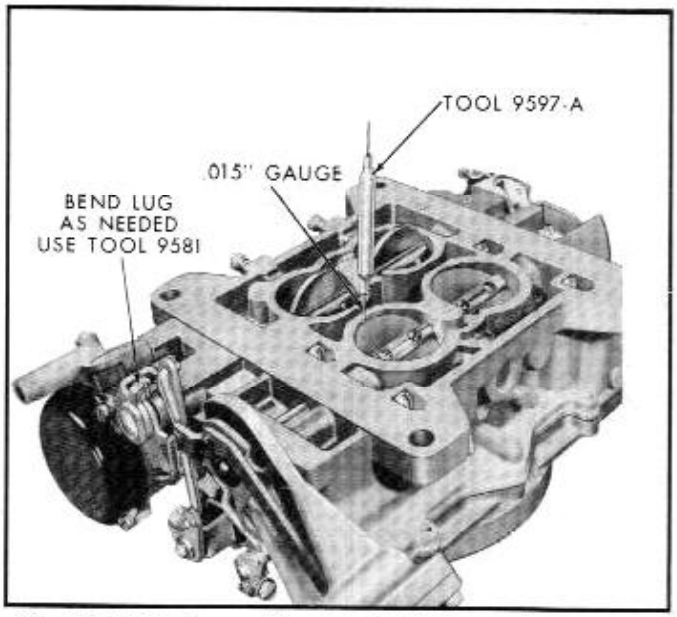

Fig. 9E-17—Primary Throttle Shaft Dog Adjustment — Rear Tang

Idle Adjustments

If one of the idle adjustments is changed, the other idle adjustments may also be affected. It is, therefore, necessary that the adjustments be made in the exact order listed below and that all of the idle adjustments following the one being made are checked:

1. IDLE MIXTURE ADJUSTMENT.
2. HOT IDLE R.P.M. ADJUSTMENT.
3. FAST IDLE R.P.M. ADJUSTMENT.

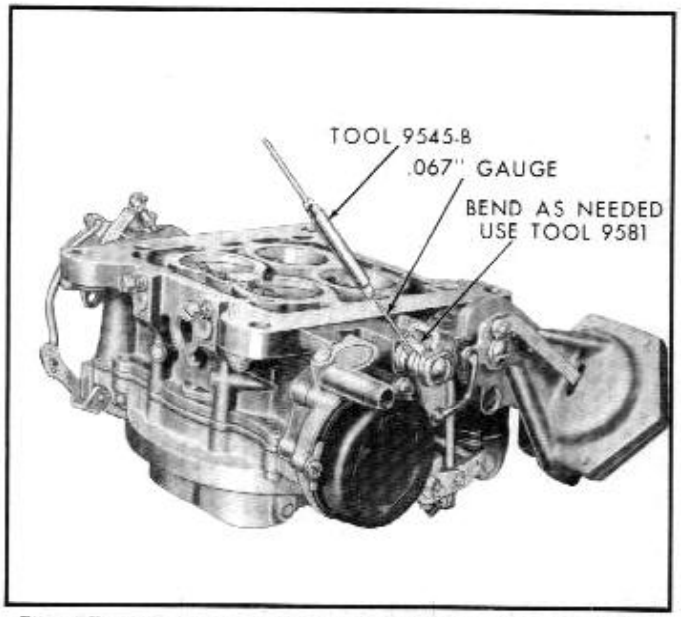

Fig. 9E-18—Primary Throttle Shaft Dog Adjustment — Front Tang

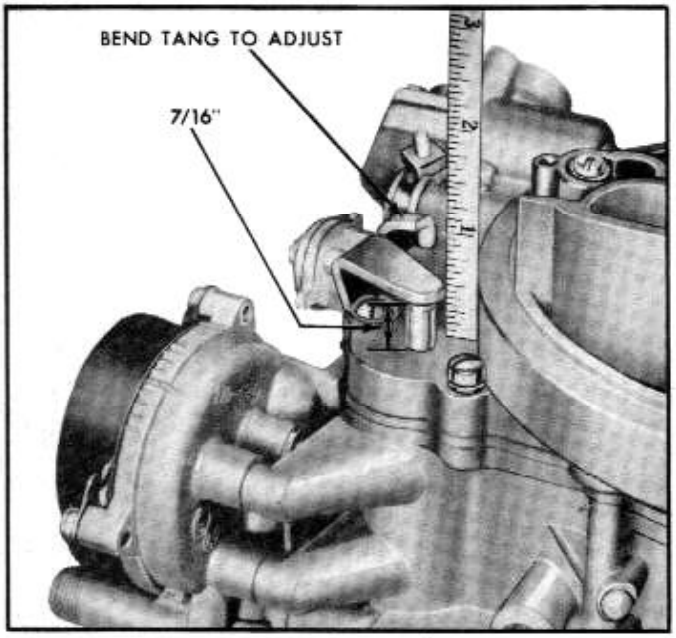

Fig. 9E-19—Dashpot Adjustment

Idle Mixture Adjustment

1. Run engine until it reaches normal operating temperature.
   NOTE: If engine is cold it must be run for approximately one-half hour at 1200 R.P.M. to stabilize temperature.
2. Turn hot idle R.P.M. adjustment screw in or out to obtain 475 to 500 engine R.P.M. with transmission selector in NEUTRAL position.
3. Turn one idle mixture adjustment screw in until engine begins to run rough.
4. Back the mixture screw out until the engine begins to "roll" indicating a rich mixture.
5. Turn the mixture screw in just enough to provide the smoothest engine idle.
   NOTE: Final adjustment of the idle fuel mixture should favor the "rich" side of the mixture range to insure the smoothest engine idle throughout the extremes of engine operating temperatures.
6. Repeat this procedure with the other mixture screw.
7. If engine idle R.P.M. has changed, reset to 475 to 500 R.P.M. using hot idle R.P.M. adjusting screw.
8. Re-adjust idle mixture screws 1/8 of a turn in either direction for smoothest idle. After final adjustment, screws should be within one-half turn of each other.
9. Repeat step 7 if necessary. Perform hot idle R.P.M. adjustment.

Hot Idle R.P.M. Adjustment

1. Adjust idle mixture as described.
2. Set parking brake and place transmission selector in DRIVE POSITION, if equipped with automatic transmission.
3. Momentarily open throttle slightly, and allow throttle to close. Engine idle should be from 425 to 450 R.P.M. If R.P.M. is not correct, adjust idle adjustment.
   CAUTION: *To prevent possible damage or injury be sure parking brake is applied firmly before cracking throttle.*

Fast Idle Adjustment

This final adjustment is made only after the carburetor has been installed on the engine and the engine has been run for approximately 30 minutes at 1200 R.P.M.

1. Position fast idle cam so fast idle adjustment screw is against the lowest (slowest) step.
2. Start engine and adjust fast idle adjusting screw until 550 R.P.M. is obtained.

OVERHAUL AND ADJUSTMENTS

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

CAUTION: *Whenever the carburetor is removed from the engine, care must be exercised to avoid damaging the throttle plates, as the lower edges of the throttle plates project below the throttle flange when the plates are in the open position.*

REMOVING CARBURETOR FROM ENGINE

1. Carefully remove air cleaner from the engine.
2. Unhook clip that secures carburetor control shaft rod to throttle lever. Remove rod from hole in throttle lever.
3. Disconnect distributor vacuum advance line connection at the carburetor.
4. Disconnect choke heat tube at choke housing.
5. Disconnect fuel line connection at carburetor.
6. Remove four nuts and lockwashers securing carburetor to intake manifold. Carefully remove carburetor from engine.
   NOTE: Do not invert carburetor upon removal. To provide a more accurate inspection of fuel condition, or inspection for dirt in the carburetor, keep fuel in carburetor at its normal level until air horn is removed.

DISASSEMBLY

Following is a step-by-step sequence by which the carburetor may be completely disassembled and reassembled. See figure 9E-20, for parts identification. However, certain adjustments may be made and various parts of the carburetor may be serviced without completely disassembling the entire unit.

Disassembly of Air Horn Assembly

1. Remove inlet fitting, gasket, and screen.
2. Remove fast idle connector rod (remove spring retainer using Tool 9550-AAA (T109-56).
3. Remove accelerator pump operating rod.
4. Remove dashpot connector rod.
5. Remove choke countershaft lever by loosening choke countershaft lock screw; slide lever off choke countershaft; rotate lever and remove from rod.
6. Remove dashpot inner and outer arms.
7. Remove vacuum piston cover plates by removing attaching screw and lockwasher assembly, and plate from each side of the air horn.
8. Remove two metering rods and pistons.
9. Remove two vacuum piston return springs.
10. If desired, the vacuum piston and metering rods may be disassembled by disengaging the metering rod from the retaining spring.
11. Remove 10 air horn attaching screws.
12. Carefully remove air horn assembly with gasket and attached parts by lifting straight up from carburetor body assembly.
    NOTE: To avoid bending floats, be sure bowl cover gasket is not sticking to body casting.
13. Remove left float hinge pin, float assembly, intake needle, and needle seat and gasket (pump side).
    IMPORTANT: Mark and group float assembly with needle and needle seat as units. Do not intermix left and right floats, and needle valves and seats.
14. Remove right float hinge pin, float assembly, intake needle valve, and needle seat and gasket.
15. Remove air horn to bowl gasket.
16. Remove spring retainer on pump connector link and remove pump connector link.
17. Remove pump plunger assembly.
    NOTE: Under normal service, the carburetor air horn may be cleaned without further disassembly. If complete disassembly is necessary, proceed with steps 18 through 24.
18. Remove pump arm attaching screw and remove pump arm.
19. File off staked ends of choke plate attaching screws.
20. Remove countershaft lever attaching screw and countershaft lever.
21. Remove countershaft assembly and inner countershaft lever.
22. Remove choke plate connector link.
23. Remove two choke plate to choke shaft attaching screws.
24. Remove choke plate and choke shaft.

Disassembly of Carburetor Body

1. Remove dashpot plunger assembly and dashpot return spring.
2. Remove pump plunger return spring.
   NOTE: Check the fuel in the bowl for contamiation by dirt, water, gum or other foreign matter. A magnet swept around bottom of bowl while fuel is still present will pick up iron oxide dust which may have contributed to float needle leaks. Drain fuel from bowl.
3. Remove three choke thermostat coil housing attaching screws and retainers; remove choke coil housing and gasket.
4. Remove choke piston lever attaching screw, and retaining washer. Remove choke piston, lever, link and pin assembly.
5. Remove two idle mixture adjusting screws and springs.
6. Remove two primary metering jets located midway between ends of fuel bowl. Use Tool 9510-G.
   NOTE: Primary metering jets have larger openings than secondary jets. NEVER mix these parts.
7. Remove two secondary metering jets. Use Tool 9510-G.
8. Remove two screw and lockwasher assemblies and remove pump jet housing assembly and gasket.
9. Remove pump discharge check needle by inverting carburetor body.
10. Remove the two primary venturi attaching screw and lockwasher assemblies from each primary venturi, then remove the two primary venturi assemblies and gaskets. Do not attempt to disassemble the venturis. See figure 9E-21.
11. Remove the two secondary attaching screw and lockwasher assemblies from each secondary venturi, then remove two secondary venturi assemblies and gaskets. Do not attempt to disassemble the venturis.
12. Remove six screw and lockwasher assemblies attaching secondary throttle diaphragm housing cap; remove cap and spring.
13. Remove spring retainer from secondary throttle diaphragm rod.
14. Remove diaphragm assembly and gasket.
15. Remove secondary throttle shaft screw and washer. Remove secondary throttle shaft lever.

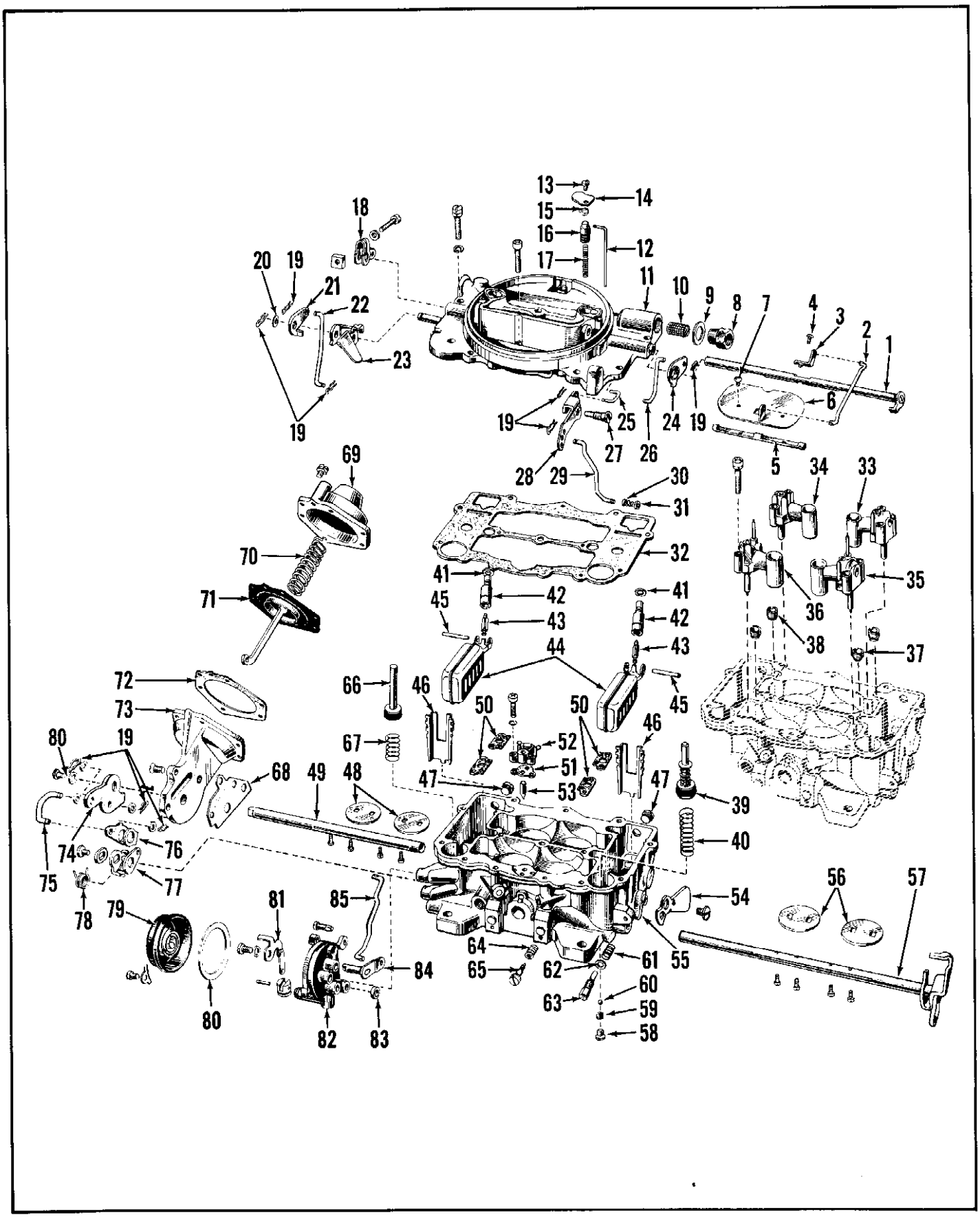

Fig. 9E-20—AFB Carburetor—Disassembled

CARTER AFB2441-SA CARBURETOR NOMENCLATURE

(See figure 9E-20.)

1. Choke Countershaft
2. Choke Plate Link
3. Countershaft Lever
4. Countershaft Lever Screw
5. Choke Shaft
6. Choke Plate
7. Choke Plate Attaching Screw
8. Fuel Inlet Fitting
9. Gasket
10. Fuel Inlet Screen
11. Air Horn
12. Metering Rod
13. Cover Plate Screw
14. Metering Rod Vacuum Piston Cover Plate
15. Metering Rod Retaining Spring
16. Metering Rod Vacuum Piston
17. Metering Rod Vacuum Piston Spring
18. Choke Countershaft Lever Assembly
19. Spring Retainer
20. Washer
21. Dashpot Outer Arm
22. Dashpot Connector Rod
23. Dashpot Inner Arm
24. Inner Countershaft Lever
25. Pump Connector Link
26. Fast Idle Connector Rod
27. Pump Arm Screw
28. Pump Arm
29. Pump Operating Rod
30. Spring
31. Retainer
32. Gasket
33. Secondary Venturi Cluster – Left Side
34. Secondary Venturi Cluster – Right Side
35. Primary Venturi Cluster – Left Side
36. Primary Venturi Cluster – Right Side
37. Main Metering Jet (Primary)
38. Main Jet (Secondary)
39. Pump Plunger Assembly
40. Pump Plunger Return Spring
41. Inlet Needle Seat Gasket
42. Inlet Needle Seat
43. Inlet Needle Valve
44. Float
45. Float Hinge Pin
46. Baffle
47. Sight Plug
48. Secondary Throttle Plate
49. Secondary Throttle Shaft
50. Venturi Cluster Gasket
51. Pump Jet Housing Gasket
52. Pump Jet Housing Assembly
53. Pump Discharge Check Needle
54. Fast Idle Cam
55. Carburetor Body
56. Primary Throttle Plate
57. Primary Throttle Shaft and Lever Assembly
58. Pump Intake Screw Plug
59. Pump Intake Check Ball Seat
60. Pump Intake Check Ball
61. Spring
62. Washer
63. Hot Idle R.P.M. Adjusting Screw
64. Spring
65. Idle Mixture Adjustment Screw
66. Dashpot Plunger Assembly
67. Dashpot Return Spring
68. Secondary Diaphragm Housing to Body Gasket
69. Secondary Diaphragm Housing Cap
70. Secondary Diaphragm Return Spring
71. Secondary Diaphragm Assembly
72. Gasket
73. Secondary Diaphragm Housing
74. Secondary Throttle Shaft Lever
75. Throttle Operating Rod
76. Primary Throttle Operating Lever
77. Throttle Shaft Dog
78. Flex Spring
79. Choke Thermostatic Coil Housing
80. Gasket
81. Choke Piston and Link Assembly
82. Choke Piston Housing
83. Gasket
84. Choke Lever and Shaft Assembly
85. Choke Connector Rod

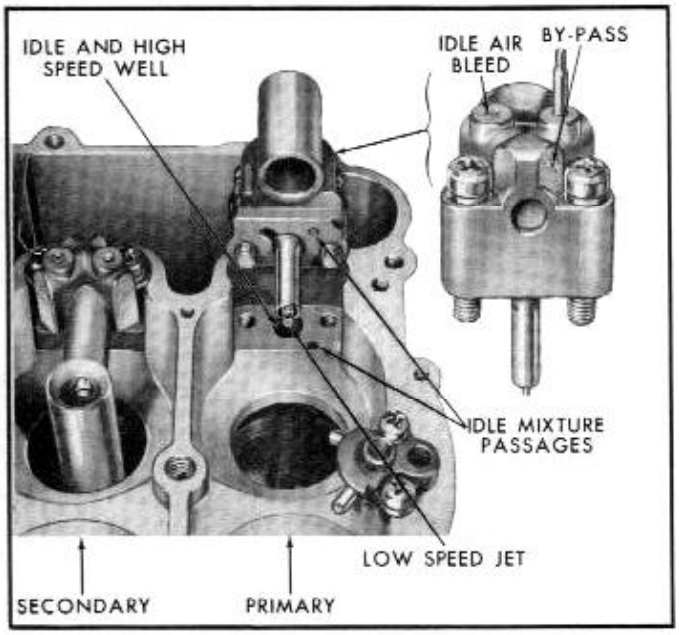

Fig. 9E-21—Venturi Cluster

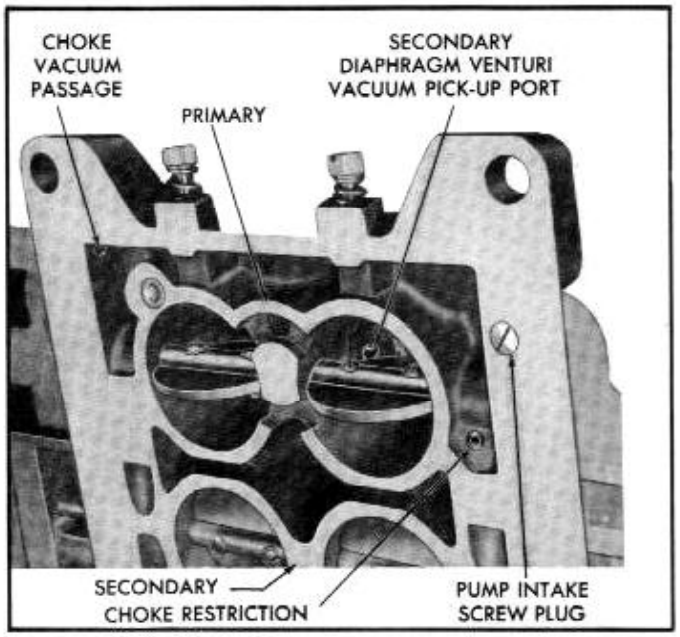

Fig. 9E-22—Pump Inlet Screw Plug

16. Remove three diaphragm housing to carburetor body attaching screws.
17. Remove diaphragm housing and gasket.
18. Turn body upside down and remove accelerator pump intake screw plug from underside of carburetor body. See figure 9E-22.
19. Loosen pump intake check ball seat with Tool 9510-F.
20. Turn body right side up and remove check ball seat and intake check ball.
21. Remove two fuel bowl baffles.
22. Remove three choke piston housing self-tapping attaching screws and remove choke piston housing, choke lever and shaft assembly, and choke connector rod. Separate these three parts. Remove piston housing gasket from back of piston housing.
    NOTE: Under normal service, the carburetor body assembly may be cleaned without further disassembly. If complete disassembly is necessary, perform the remaining operations.
23. Remove two spring retainers and four washers securing throttle operating rod to secondary throttle lever and primary throttle operating lever. Remove rod and secondary throttle lever.
24. Remove primary throttle shaft attaching screw and washer.
25. Remove primary throttle operating lever, throttle flex spring, and primary throttle shaft dog.
26. Remove hot idle R.P.M. adjusting screw and spring.
27. Remove fast idle cam attaching screw and fast idle cam.
28. Remove fast idle adjustment screw.
29. File off staked ends of primary and secondary throttle plate to shaft attaching screws; remove screws and throttle plates from the four bores. Mark valves for reassembly.
    CAUTION: *Do not scratch edge of plates or walls of bore.*
30. Remove primary and secondary throttle shafts.

CLEANING AND INSPECTION OF PARTS

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

Cleaning

1. Thoroughly clean carburetor castings and all metal parts in clean carburetor cleaning solution.
   NOTE: Always use a reputable commercial carburetor cleaning solution following the manufacturer's cleaning instructions.
   CAUTION: *Composition and plastic parts such as thermostatic coil housing, pump and dashpot plungers, gaskets, etc. should not be immersed in cleaner.*
2. Scrub all major castings with a stiff bristle brush.
3. Blow out all passages with compressed air.
   CAUTION: *Do not use drills or wire to clean out jets, air bleeds or ports as this may enlarge the openings and affect carburetor operation.*
4. Wipe accelerator pump and dashpot pistons, secondary throttle operating diaphragm assembly,

and choke thermostat housing with a kerosene soaked cloth.
CAUTION: *Do not use air blast to dry these parts.*

Assembly of Carburetor Body

If carburetor body was completely disassembled, perform steps 1 through 14.

1. Install secondary throttle shaft (small shaft).
2. Install the two secondary throttle plates with the "C" (in circle) away from the center of the carburetor when viewed from the manifold side. Use new screws. Stake screws with side cutting pliers. Plates should be centered and seated by tapping, before screws are tightened.
3. Install primary throttle shaft from the pump well side of the body (large shaft).
4. Install the two primary throttle plates with the "C" (in circle) away from the center of the carburetor when viewed from the manifold side. The notch in each throttle plate should face toward the idle port on the bottom or manifold side. Use new screws. Plates should be centered and seated by tapping before screws are tightened. Stake screws with side cutting pliers.
5. Install fast idle adjustment screw.
6. Install fast idle cam and attaching screw with counterweight away from primary throttle lever and stop lug in toward carburetor body.
7. Install primary throttle operating lever, throttle shaft dog and flex spring on primary throttle shaft.
8. Install primary throttle shaft washer and screw.
9. Install choke lever and shaft assembly in choke piston housing.
10. Install curved end of choke connector rod into choke lever with lever pointing down (choke connector rod has retaining lugs on both ends).
11. Install new choke piston housing gasket in recess in piston housing. Secure piston housing assembly to carburetor body with three self-tapping screws.
12. Connect throttle operating rod to primary operating lever with two flat washers (one on each side of lever) and one spring retainer.
13. Connect throttle operating rod to secondary throttle operating lever with two flat washers (one on each side of lever) and spring retainer.
14. Install hot idle R.P.M. adjusting screw, washer and spring.
15. Invert carburetor body and install pump intake check ball, ball seat and screw plug.
16. Using new diaphragm housing to body gasket, install secondary throttle diaphragm housing with three screws. Stake screws into indentations in casting with prick punch.
17. Install secondary throttle operating lever and attached operating rod, secondary throttle shaft washer and screw.
18. Install secondary diaphragm and gasket in diaphragm housing.
19. Temporarily attach diaphragm rod to secondary throttle lever pin.
20. Install diaphragm return spring and housing cap with vacuum passage in cap indexing with vacuum passage in housing. Install six screw and lockwasher assemblies.
    NOTE: Diaphragm must be positioned so it is not under tension as the attaching screws are tightened finger tight. Disengage diaphragm rod and tighten six screws. Reinstall diaphragm rod and retain with spring retainer.
21. Install choke piston, lever, link and pin as an assembly in choke piston housing. Secure to choke lever and shaft assembly with washer and screw.
22. Install two fuel bowl baffles with notched opening to the top and the retaining ears toward the sight plugs.
23. Install two idle mixture adjustment screws and springs. Lightly seat screws by hand and back each screw out 1½ turns as a preliminary adjustment.
24. Install two primary metering jets (large holes) in primary side of carburetor body (side nearest dashpot and pump plungers). Use Tool 9510-G.
25. Install two secondary metering jets (small holes) in secondary side of carburetor body. Use Tool 9510-G.
26. Install primary venturi assemblies and gaskets with two cross head screw and lockwasher assemblies.
    NOTE: Cut-out notches on primary venturi clusters match notches in carburetor body for location of venturi clusters. Venturi clusters are not interchangeable side to side or primary to secondary.
27. Install secondary venturi assemblies and gaskets with two cross head screw and lockwasher assemblies. Be sure the bleed passage in venturi lines up with drilled passage in body.
    NOTE: The two secondary venturis are interchangeable.
28. Install pump discharge check needle (point downward) in pump discharge passage in carburetor body.
29. Install pump discharge jet housing with two cross head screw and lockwasher assemblies.
30. Install dashpot return spring (smaller than pump plunger return spring), and dashpot plunger assembly in dashpot bore in body.

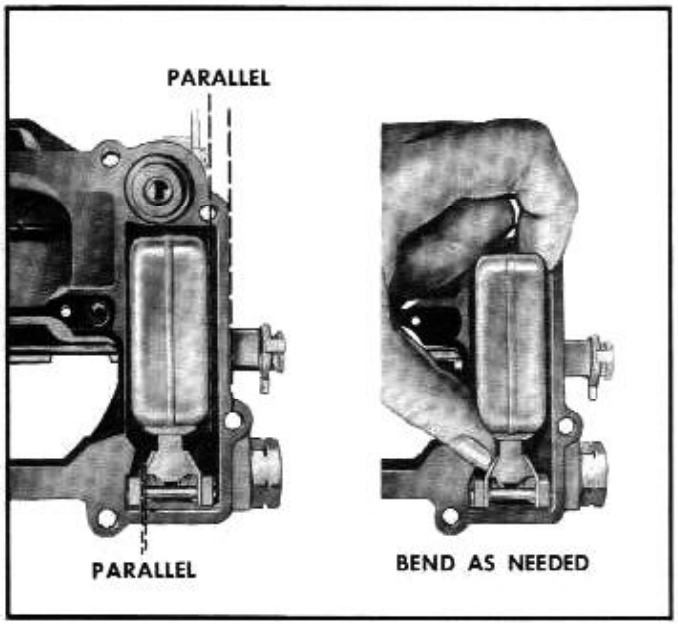

Fig. 9E-23—Checking Float Alignment

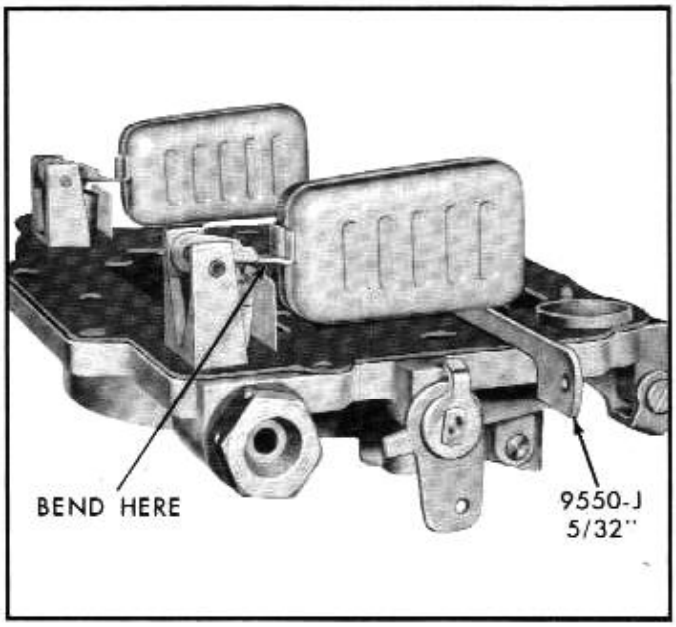

Fig. 9E-24—Float Level Adjustment

31. Install pump plunger return spring in pump plunger bore in body.

Assembly of Air Horn

NOTE: If complete disassembly was made, perform steps 1 through 4.

1. Install choke shaft in air horn. Secure choke plate to choke shaft with two new screws. Stake screws with Tool 9586 (staking pliers).
   CAUTION: *The "C" (in circle) on plate should be visible from the top of the carburetor. Choke plate must be centered and both shaft and plate free of bind in any position. Choke plate must fall free of its own weight from closed position.*
2. Install countershaft inner lever and countershaft, as an assembly, in air horn.
3. Install choke plate connector link in hole in choke plate. Install countershaft lever on connector link. Secure lever to choke countershaft with a new screw and washer.
   CAUTION: *Position connector link so it will clear air cleaner stud hole.*
4. Install pump arm to air horn using shouldered attaching screw.
5. Install intake needle seats and gaskets.
   CAUTION: *If new seats are not used, reinstall in same location from which they were removed. Use proper size screwdriver. Tighten securely.*
6. Install open end of screen into fuel inlet fitting and install fitting, screen and gasket as an assembly in air horn.
7. Position new air horn to body gasket on air horn.
8. Install inlet needles in seats (same side from which removed if new parts are not used).
9. Install floats and hinge pins (same sides from which floats were removed) with float tang facing air horn. This procedure eliminates unnecessary bending.
10. FLOAT ADJUSTMENTS:
    (a) Sight down the side of each float to determine if the outside of the float is parallel to outer edge of the air horn casting. See figure 9E-23. TO ADJUST: Bend float lever by applying pressure to the end of the float shell with the fingers while supporting the float lever with the thumb. To avoid damaging the float, apply only enough pressure to bend float lever.
    (b) After aligning floats, remove as much clearance as possible between arms of float lever and lugs on air horn by bending the float lever. Arms of float lever should be as parallel to inner surfaces of lugs on air horn as possible. Floats must operate freely without excess clearance between float levers and lugs on air horn.
    (c) FLOAT LEVEL ADJUSTMENT: With air horn inverted, air horn gasket in place and needle seated, there should be 5/32" clearance between outer end of each float and air horn gasket. Use gauge 9550-J (T109-154). See figure 9E-24.
    CAUTION: *Press gauge firmly against gasket. To adjust, bend float arm with Tool 9564 (T109-22) adjust both floats. Recheck float alignment.*

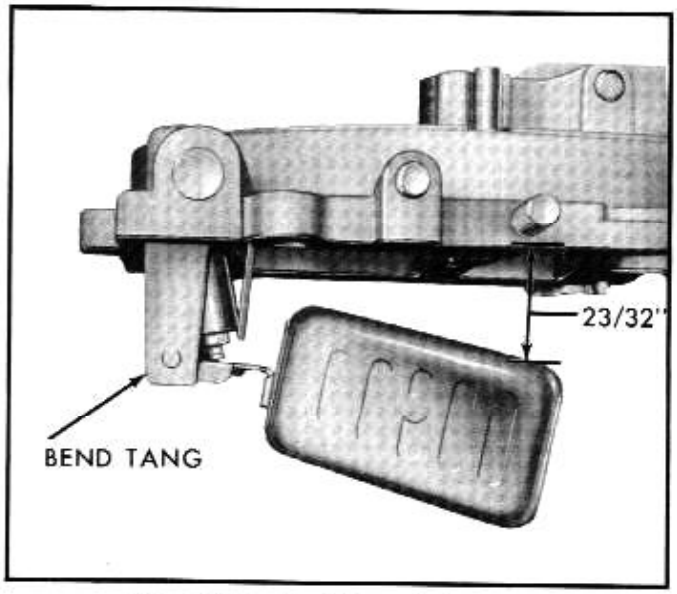

Fig. 9E-25—Float Drop Adjustment

(d) FLOAT DROP ADJUSTMENT: With air horn held in upright position and measuring from outer end of each float, the distance between top of floats and air horn gasket should be 21/32" - 23/32". See figure 9E-25. To adjust, bend stop tangs on float brackets.

11. Install pump plunger assembly in air horn with open ends of pump connector link facing center of carburetor with retainer groove to the top. Install spring retainer.
12. Install air horn to carburetor body; use eight slot head screw and lockwasher assemblies around the outside edge of air horn; use two cross head screw and lockwasher assemblies in respective holes in air cleaner shoulder of air horn. Tighten cross head screws in air cleaner shoulder, then tighten remaining eight screws evenly around perimeter of air horn.
13. Assemble metering rods, pistons, and retaining springs if disassembled. Insert vacuum piston springs in bores in air horn. Insert metering rod and piston assemblies; retain with cover plates, screw and lockwasher assemblies.
14. Install inner and outer dashpot arm, flat washer and spring retainer.
15. Install dashpot connector rod as follows:
    (a) Connect lower (bent) end of dashpot connector rod to primary throttle operating lever with end of rod facing toward carburetor body. Secure with spring retainer.
    (b) Connect upper (straight) end of connector dashpot rod to dashpot outer arm. Secure with spring retainer.

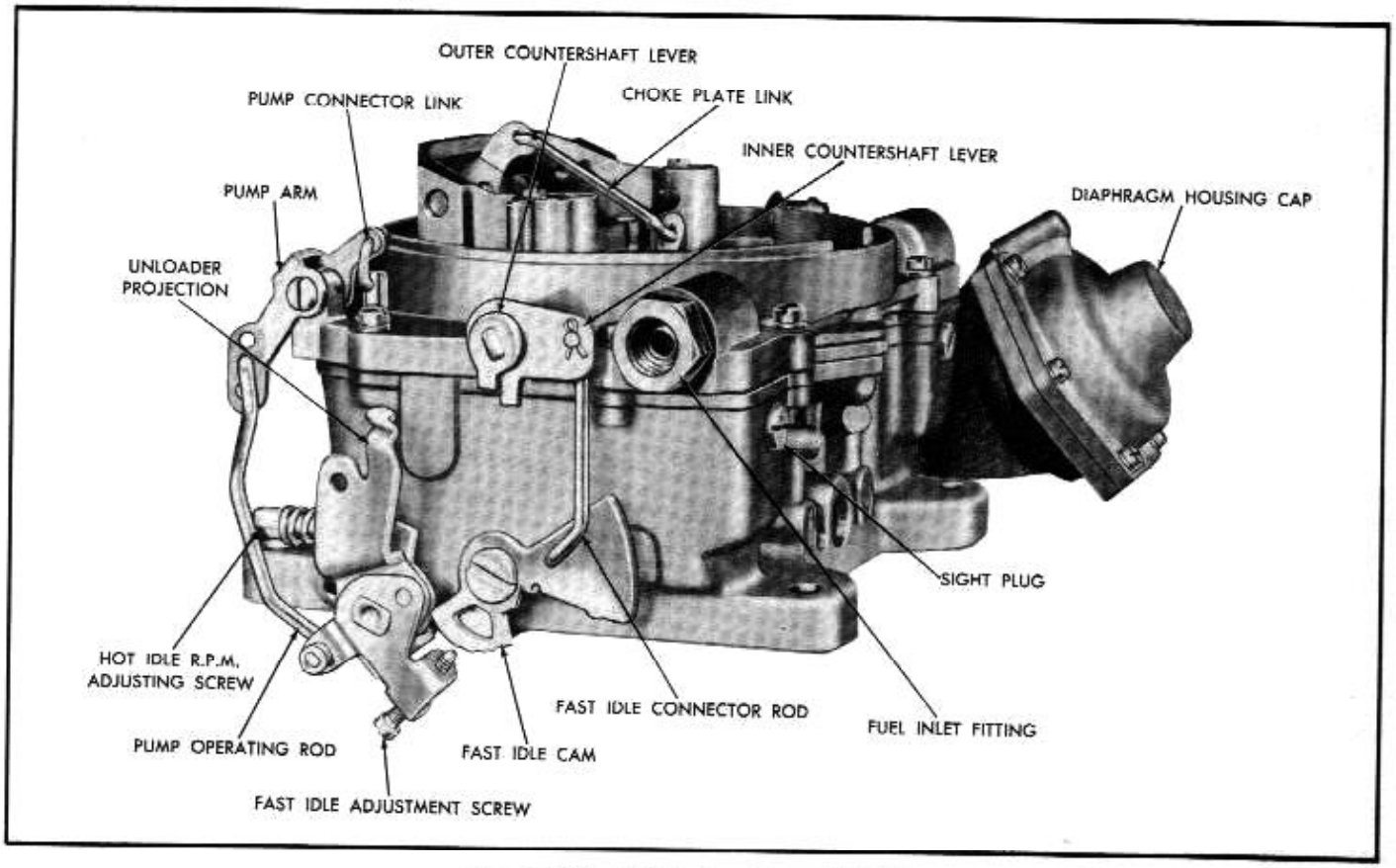

Fig. 9E-26—AFB Carburetor — Left Side

NOTE: When rod is properly installed, the bend in the connector rod should be adjacent to the secondary diaphragm housing.

16. Install countershaft lever assembly on choke connector rod. Install lever assembly with attached rod on choke countershaft. Hold choke plate closed; rotate lever assembly on countershaft so that long arm of lever faces diaphragm housing. NOTE: Position inner and outer lever (opposite end of countershaft) as shown in figure 9E-26. Remove end play. Tighten clamp screw until slight tension is obtained on countershaft.
17. Install flat washer on lower end of accelerator pump operating rod; install rod in primary throttle lever. Install spring and retainer.
18. Install upper end of accelerator pump operating rod in center hole of pump arm and install spring retainer.
19. Install fast idle connector rod as follows:
    (a) Install lower (bent) end of connector rod to fast idle cam with end of rod facing toward carburetor body.
    (b) Connect upper (straight) end of rod to countershaft inner lever. Secure with spring retainer.

FAST IDLE THROTTLE PLATE CLEARANCE ADJUSTMENT (BENCH ONLY)

With choke plate tightly closed, tighten fast idle adjusting screw on high step of cam until there is a clearance of .023" between primary throttle plate and bore of carburetor, side opposite idle port. Use .023" gauge of Tool 9597 (T109-189) to check clearance. See figure 9E-27.

TEST BEFORE INSTALLATION ON ENGINE

It is good shop practice to fill the carburetor bowl before installing the carburetor. This reduces the load on the starting motor and battery and reduces the possibility of backfiring while attempting to start the engine with a dry carburetor. After filling carburetor bowl, operate the throttle lever and check accelerating pump discharge.

Before installing the carburetor, hold the choke plate open and turn the idle speed screw in until it just touches the throttle lever. One-half to one turn additional should be sufficient to keep the engine running until final idle mixture and R.P.M. settings can be made.

INSTALLATION OF CARBURETOR

1. Clean manifold spacer, manifold flange and carburetor of any old gasket material. Check manifold and spacer for any damage or nicks.

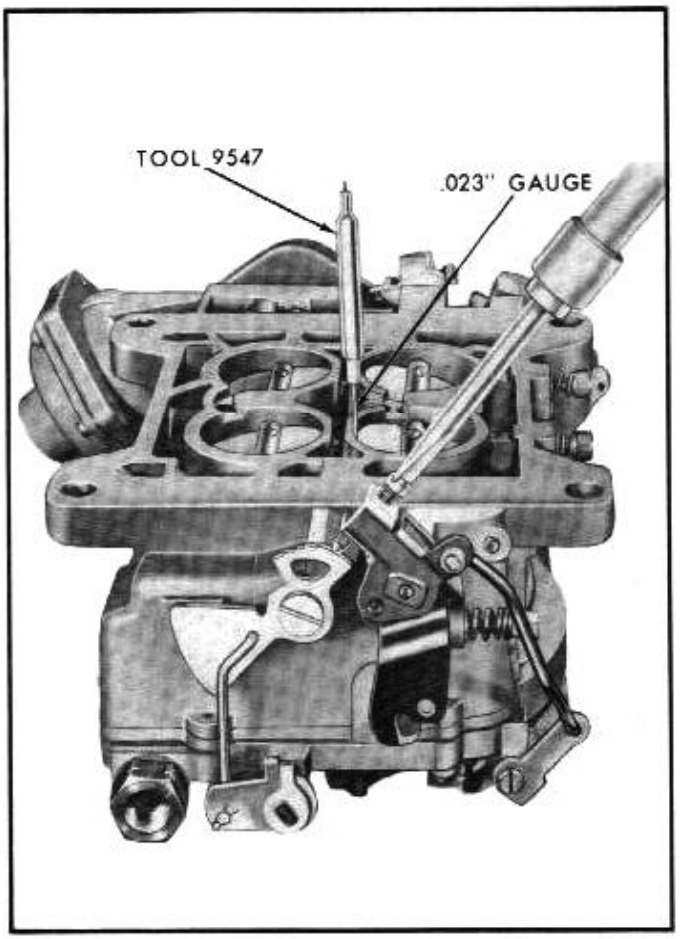

Fig. 9E-27—Fast Idle Throttle Clearance

2. Install spacer and two gaskets (one gasket on each side of spacer) on intake manifold.
   NOTE: Do not use a gasket sealer or any form of sealing compound on these gaskets.
3. Position carburetor on manifold. Start fuel line, distributor vacuum advance line and choke heat tube connections.
4. Secure carburetor to manifold with four nuts and lockwashers, observing the following procedure to prevent distortion and possible damage to the carburetor body flange: Snug down and then alternately tighten each mounting nut in a crisscross pattern. Torque each nut 12-15 lbs. ft.
5. Tighten fuel line, distributor vacuum advance line and choke heat tube connections on carburetor.
6. Attach carburetor control shaft rod to throttle lever and secure with clip.
7. Start engine. Run engine sufficiently to fill bowl in carburetor.
8. Refer to carburetor adjustments in this section of the manual and make choke thermostat, idle mixture, hot idle R.P.M., fast idle R.P.M. and dashpot adjustments.
9. Install air cleaner assembly.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
(1) Hard Starting.	(a) Incorrect choke thermostat adjustment.	(a) Adjust choke thermostat.
	(b) Incorrect idle adjustments.	(b) Perform all idle adjustments.
	(c) Binding linkage, choke plates or choke piston.	(c) Repair or replace parts if necessary.
	(d) Restricted choke vacuum and hot air passages.	(d) Clean carburetor with solvent and blow out passages with compressed air.
	(e) Air leaks into vacuum and hot air passages.	(e) Replace gaskets.
	(f) Improper fuel level.	(f) Adjust fuel level.
(2) Stalling when accelerator is released suddenly.	(a) Improperly adjusted dashpot.	(a) Adjust dashpot.
	(b) Inoperative dashpot.	(b) Replace dashpot.
	(c) Incorrect idle adjustment.	(c) Perform all idle adjustments.
(3) Rough idle and stalling.	(a) Improper idle adjustments.	(a) Perform all idle adjustments.
	(b) Damaged tip on idle mixture screws.	(b) Replace screws.
	(c) Clogged air bleeds or idle passages.	(c) Clean with solvent and compressed air.
	(d) Leaking intake manifold and carburetor gaskets.	(d) Replace leaking gaskets.
	(e) Defective automatic choke.	(e) Inspect automatic choke for proper operation and adjustment.
	(f) Secondary plates not closing.	(f) Position throttle plates correctly. Remove carbon in throttle bore.
	(g) Wrong idle mixture screws.	(g) Install correct screws.
	(h) Improper fuel level.	(h) Adjust floats.
	(i) Improper fast idle adjustment.	(i) Perform all idle adjustments.
	(j) Exhaust thermostat valve not operating correctly.	(j) Repair or replace.
(4) Poor low-speed operation.	(a) Idle mixture screws unequally adjusted.	(a) Perform all idle adjustments.
	(b) Clogged idle ports.	(b) Remove and clean carburetor with solvent and blow out holes with compressed air.
	(c) Restricted idle air bleeds and passages.	(c) Remove and clean carburetor with solvent and blow out passages with compressed air.

TROUBLE SHOOTING CHART

TROUBLE	CAUSE	REMEDY
(5) Faulty acceleration.	(a) Improper pump stroke.	(a) Adjust pump link.
	(b) Leaking pump inlet check ball.	(b) Clean or replace.
	(c) Inoperative pump discharge needle.	(c) Clean or replace.
	(d) Worn or damaged pump piston.	(d) Replace pump piston.
	(e) Blocked or bent discharge nozzle.	(e) Clean, straighten or replace.
	(f) Leaking main body cover gasket.	(f) Replace gasket.
	(g) Exhaust thermostat valve stuck in heat "off" position.	(g) Repair or replace.
(6) Surging (cruising speeds to top speed).	(a) Clogged main jets.	(a) Clean main jets with solvent and blow out jets with compressed air.
	(b) Undersize main jets.	(b) Replace main jets.
	(c) Low fuel level.	(c) Adjust floats.
	(d) Low fuel pump pressure or volume.	(d) Test fuel pump.
	(e) Blocked air bleeds.	(e) Clean with solvent and blow out bleeds with compressed air.
	(f) Clogged fuel inlet filter screen.	(f) Clean with solvent and compressed air.
(7) Low top speed.	(a) Clogged secondary jets.	(a) Clean with solvent and blow out jets with compressed air.
	(b) Undersize secondary jets.	(b) Replace with correct size jets.
	(c) Leaking secondary throttle operating diaphragm or housing gasket.	(c) Replace diaphragm or gasket.
	(d) Low fuel pump volume.	(d) Test fuel pump.
	(e) Secondary linkage, throttle plates or shaft binding.	(e) Free up linkage and position throttle plates.
	(f) Clogged vacuum passage to venturi.	(f) Clean with solvent and blow out passage with compressed air.
	(g) Improper size, worn or obstructed main jets.	(g) Clean or replace.
	(h) Leaking accelerator pump discharge needle.	(h) Clean or replace.
	(i) Faulty choke operation.	(i) Check choke operation.

AFB CARBURETOR SPECIFICATIONS

(312 cu. in. Engine)

Type	Quadruple Down Draft
Venturi Size:	
Primary	1-1/16"
Secondary	1-1/16"
Float Setting – Dry:	
Float Level Adjustment	5/32" clearance between cover gasket and top of float – air horn inverted.
Float Drop Adjustment	21/32"-23/32" clearance between cover gasket and top of float – air horn in upright position.
Choke Setting	1 notch rich.
Dashpot Adjustment	7/16" between top surface of bowl cover and top of plunger – throttle wide open position.
Pump Adjustment	15/32" from top of air horn to top of plunger shaft with pump operating rod in center hole.
Initial Setting Idle Mixture Screws	1½ turns open.
Fast Idle Adjustment:	
Bench Adjustment	With fast idle screw on high step of cam, adjust screw to obtain .023" clearance between throttle plate and bore on side opposite idle passage.
On The Vehicle	550 R.P.M., idle adjustment screw on the first (lowest) step of fast idle cam.

Metering Rods Identification:

Number Ft. Alt.	
0-5,000	16-28
5,000-10,000	16-21
10,000-15,000	16-22

Main Metering Jet Identification:

Number Ft. Alt.	
0-15,000	166

Secondary Metering Jet Identification:

Number Ft. Alt.	
0-5,000	176
5,000-10,000	176
10,000-15,000	186

Engine Idle R.P.M.:	
Std. and O/Drive Transmission	475-500
Auto. Transmission (Neutral)	475-500
Auto. Transmission (Drive Range)	425-450
Engine Idle Manifold Vacuum (Hg. Inches)	
Specified Idle R.P.M. (Sea Level)	19-20

Torque Specifications – Carter AFB Carburetor:	
Pump Inlet Screw Plug	15-20 Lbs. In.
Needle and Seat Assembly	4-5 Lbs. Ft.
Choke Valve Attaching Screw	3-6 Lbs. In.
Pump Arm Clamp Screw	15-20 Lbs. In.
Choke Housing Choke Shaft Lever Attaching Screw	10-15 Lbs. In.
Throttle Shaft Arm Attaching Screw	20-25 Lbs. In.
Choke Housing Cover Attaching Screw	15-20 Lbs. In.
Diaphragm Housing Attaching Screw	25-35 Lbs. In.
Choke Housing Attaching Screw	4-5 Lbs. Ft.
Pump Jet Housing Attaching Screw	15-20 Lbs. In.
Air Horn Attaching Screw and Washer Assembly	25-30 Lbs. In.
Fast Idle Cam Attaching Screw	4-5 Lbs. Ft.
Throttle Valve Attaching Screw	8-15 Lbs. In.
Counter Shaft Lever Attaching Screw	4-7 Lbs. In.
Diaphragm Housing Cover Attaching Screw and Washer Assembly	25-35 Lbs. In.
Primary Metering Rod Jet	30-40 Lbs. In.
Secondary Metering Jet	30-40 Lbs. In.
Secondary Throttle Valve Attaching Screw	8-15 Lbs. In.
Primary Throttle Valve Attaching Screw	8-15 Lbs. In.
Venturi Screw and Washer Assembly	15-20 Lbs. In.
Step Up Piston Cover Plate Screw	10-15 Lbs. In.
Fuel Inlet Fitting	15-18 Lbs. Ft.
Flange Nuts	12-15 Lbs. Ft.

CARTER CARBURETOR SPECIAL TOOLS

9510-F	3/16″ Wide Screwdriver, 1/4″ Square Drive Socket
9510-G	1/4″ Wide Screwdriver, 1/4″ Square Drive Socket
9545-A	Wire Gauge – .010″ Dia.
9545-B	Wire Gauge – .067″ Dia.
9550-AAA	Retainer Ring Remover
9550-J	Float Gauge, 5/32″
9564	Wrench, Float Valve Seat
9564-A	Float Bending Tool
9581	Primary Throttle Shaft Bending Tool
9581-A	Wire Gauge, .076″-.086″
9586	Staking Tool
9597	Wire Gauge, .023″-.026″
99798	Throttle Connecting Link Bending Tool