CARBURETOR

HOLLEY MODEL 4150C (Optional)

The HOLLEY Model 4150C Four-barrel carburetor is a four bore downdraft carburetor. It can be considered as two dual downdraft carburetors; two primary bores supply the fuel-air mixture throughout the entire range of engine operation while the two secondary bores function only when speed or load requires them.

To effectively provide the correct fuel-air mixture...
during all phases of engine operation, the carburetor is equipped with the following basic fuel metering systems.

**Idle System** — Provides a rich mixture for smooth idle and low speed performance.

**Accelerating Pump System** — Provides additional fuel during acceleration.

**Main Metering System** — Provides an economical mixture for normal cruising conditions.

**Power Enrichment System** — Provides a richer mixture when high power output is desired.

In addition to these four basic systems, there is a secondary system that has a transfer system, secondary main metering system and a by-pass system which only operates when a greater quantity of fuel-air mixture is required.

A fuel inlet system for both the primary and secondary barrels provides the various fuel metering systems with a constant supply of fuel.

The automatic choke system provides a means of temporarily enriching the mixture to aid in the starting and operation of a cold engine.

**Primary Fuel Inlet System**

A fuel inlet enters the primary fuel bowl which supplies the four basic metering systems with the required amount of fuel (Fig. 112).

The fuel enters the fuel bowl through a filter screen and into the fuel inlet valve. The amount of fuel entering the fuel bowl is determined by the space between the top of the movable needle and its seat and also by the pressure from the fuel pump.

This carburetor incorporates Viton tipped fuel inlet needles. This synthetic material provides a better seal and thereby can maintain a more constant...
fuel level in the carburetor bowl. It is not readily affected by small particles of foreign matter.

The fuel inlet system must constantly maintain the specified level of fuel as the basic fuel metering systems are calibrated to deliver the proper mixture only when the fuel is at this level.

A float spring is incorporated under the float to keep the float in a stable position.

The float chamber is vented internally by the vent tube at all times. At curb idle or when the engine is stopped, the chamber is also vented by the external vent on top of the primary fuel bowl. This external vent provides a release of excess fuel vapors from the bowl.

**Choke System**

The automatic choke supplies the richer fuel-air mixture required for starting and operating a cold engine (Fig. 113). Most of the vaporized fuel from the carburetor condenses to a liquid upon contact with the cold surfaces of the intake manifold. This fuel in liquid form burns too slowly and incompletely in the cylinders, causing loss of power and stalling. The choke plate, which is usually closed during the cranking period and partially closed during warm-up, confines the manifold vacuum below the plate. This greater vacuum causes both the main metering and idle system to discharge fuel into the cylinders.

![FIGURE 113 — Automatic Choke](image)

When the engine is cold, the thermostat spring has expanded, holding the choke plate in the closed position. When the engine is started, manifold vacuum acts directly on the choke plate, and a vacuum piston located in the choke housing, immediately moving against the tension of the thermostat spring to partially open the choke plate to prevent stalling. The choke shaft does not pass through the center of the choke plate. Instead, it is offset, thus exposing a much larger area at one side of the closed choke plate to manifold vacuum. When the engine is started or at idle, manifold vacuum is not sufficiently strong to open the choke plate. But the impact of air against the choke plate partially opens the plate. Manifold vacuum channeled through a passage in the choke control mechanism acts to draw the choke vacuum piston downward, thus exerting another opening force upon the choke plate. These two features allow enough air to enter the engine to enable it to run smoothly. As the engine continues to run, the vacuum acting on the choke vacuum piston draws air from the heat tube in the manifold where the air is warmed by the engine heat, and then through the thermostat housing where the air warms the thermostat spring, causing it to contract. This gradually decreases the tension of the thermostat spring as manifold temperature rises, permitting the vacuum acting on the choke vacuum piston to further open the choke plate. The air then flows through the manifold vacuum passage in the carburetor and is exhausted into the air stream in the throttle body.

In the full open position the vacuum piston is in its lowest position in the cylinder. Slots in the cylinder will permit sufficient air to bleed past the piston and into the intake manifold to allow a continual flow of warm air to pass through the thermostat housing. This keeps the thermostat spring warm and the choke plate fully open until the engine is shut down and allowed to cool.

During the warm-up period, the air flow past the partially opened offset choke plate acts upon the plate in much the same manner as manifold vacuum does upon starting. As air flow increases with increased engine speed, the engine requires less choking and the force of the increased air flow holds the choke plate closer to the open position. The offset choke plate, vacuum piston, and thermostat spring are engineered to provide the correct degree of choking for all conditions of engine speed, power output, and temperature.

The choke rod at the carburetor actuates a fast idle cam during choking. Designed to increase the idle RPM for smoother running when the engine is cold, the fast idle cam has a series of steps on one edge. As the choke rod is moved through its range of travel from the closed position to the open position, the fast idle cam rotates, presenting successive steps to a throttle stop screw. Each step permits a slower idle RPM as engine temperature rises and choking is reduced.

If the engine should approach a stall at any time during the warm-up period, manifold vacuum will drop. The tension of the thermostat spring then overcomes the reduced force acting on the vacuum piston and the choke plate will be moved toward the
closed position, providing a richer mixture to allow the engine to run smoothly again.

Idle System

At idle and low speeds, the air flow through the carburetor is not sufficiently strong enough to draw fuel through the primary barrel venturi for the main metering system. Intake manifold vacuum is high because of the greater restriction to the air flow by the nearly closed throttle plates. This high manifold vacuum is used to provide the pressure differential which operates the idle system.

The carburetor utilizes two idle systems, one for each primary barrel. Since the two passages function identically, only one side will be considered in this explanation (Fig. 114).

At idle, the normal air pressure in the float chamber causes the fuel to flow through the idle system to the greatly reduced pressure area below throttle plate. Fuel flows from the float chamber through the main jet then into the small angular but horizontal passage (idle feed) that leads across to a vertical passage.

The fuel flows up this vertical passage, (idle well) past the idle feed restriction, and then it is mixed with air coming in from the idle air bleed. This fuel-air mixture flows through a short horizontal passage and then down another vertical passage. At the bottom of this vertical passage the fuel-air mixture branches in two directions, one through the idle discharge passage and the other to the idle transfer passage.

The fuel in the idle discharge passage flows past the pointed tip of the idle adjusting needle which controls the mixture delivered at idle. Turning the needle in toward its seat restricts the flow of fuel, thus providing a leaner idle mixture. Turning the

![Idle System Diagram](image-url)
needle out enriches the mixture by allowing a greater flow of fuel.

From the idle adjusting needle chamber, the fuel goes through a short passage, past an aspirating restriction in the main body and down another passage into the throttle body. The fuel is discharged into the throttle bore below the throttle plate.

During off-idle operation when the throttle plate is moved slightly, the fuel flows through the idle transfer passage from the metering body into the main body passage through a restriction and then into the throttle body passage. As the idle transfer slot is exposed to manifold vacuum, fuel is discharged into the throttle bore.

As the throttle plate is opened still wider and engine speed increases, the air flow through the carburetor is also increased. This creates an increased vacuum in the venturi to bring the main metering system into operation. The flow from the idle system tapers off as the main metering systems begin discharging fuel. The two systems are engineered to provide smooth gradual transition from idle to cruising speeds.

**Accelerating Pump System**

Upon acceleration, the air flow through the carburetor responds almost immediately to the increased throttle opening.

Therefore during the brief interval before the fuel, which is heavier than air, can gain speed and maintain the desired balance of fuel and air, the accelerating pump supplies fuel until the other systems can once again provide the proper mixture (Fig. 115).

![DIAGRAM OF ACCELERATING PUMP SYSTEM](image)

**FIGURE 115 — Accelerating Pump System**

The accelerating pump is located in the bottom of the primary fuel bowl. The pump begins to function when the pump operating lever is actuated by throttle movement. When the throttle is opened, the pump linkage, actuated by a cam on the primary throttle shaft, forces the pump diaphragm up. As the diaphragm moves up, the pressure forces the pump inlet check ball on its seat preventing fuel from flowing back into the float chamber. The fuel flows from the short passage in the fuel bowl into the long diagonal passage in the primary metering body. The fuel passes into the main body and then in the pump discharge chamber. The pressure of the fuel causes the discharge ball check and weight to raise and fuel is discharged into the venturi.

As the throttle is moved toward the closed position, the linkage returns to its original position and the diaphragm spring forces the diaphragm down. As the diaphragm returns to its original position the pump inlet check ball is moved off its seat and the diaphragm chamber is filled with fuel from the float bowl.

**Main Metering System**

As the engine is running, the intake stroke of each piston draws the air through the carburetor venturi and booster venturi. The air, passing through the throat of the venturi, creates a low pressure commonly called a vacuum. The strength of this low pressure is determined primarily by the velocity of the air flowing through the venturi. This, in turn, is regulated by the speed and power output of the engine. The difference, between the pressure in the booster venturi and the normal air pressure in the float chamber, causes fuel to flow through the main metering system (Fig. 116).

![DIAGRAM OF MAIN METERING SYSTEM](image)

**FIGURE 116 — Main Metering System**
At cruising speed, the fuel flows from the float chamber through the main jet, which measures or meters the fuel flow, into the bottom of the main well. The fuel moves up the main well past the main well air bleed hole in the side of the well. Filtered air, enters through the main metering air bleed in the main body and then into the main metering body by inter-connecting passages. This mixture of fuel and air, being lighter than raw fuel, responds faster to any change in venturi vacuum and vaporizes more readily when discharged into the air stream of the venturi. The mixture of fuel and air moves up the main well and passes into the short horizontal passage leading to the main body, then through the horizontal channel of the discharge nozzle. This fuel is discharged into the booster venturi and then in the air stream of the carburetor venturi.

The throttle plate controls the amount of fuel-air mixture admitted to the intake manifold, regulating the speed and power output of the engine in accordance with accelerator pedal movement.

**Power Enrichment System**

During high power operation, the carburetor must provide a mixture richer than is needed when the engine is running at cruising speed under no great power requirements. The added fuel for power operation is supplied by the power enrichment system (Fig. 117).

![Power Enrichment System Diagram](image)

**FIGURE 117 — Power Enrichment System**

This system is controlled by manifold vacuum which gives an accurate indication of the power demands placed upon the engine. Manifold vacuum is strongest at idle and decreases as the load on the engine increases. As the load on the engine is increased, the throttle plate must be opened wider to maintain a given speed. Manifold vacuum is thus reduced because the opened throttle plate offers less restriction to air entering the intake manifold.

A vacuum passage in the throttle body transmits manifold vacuum to the power valve chamber in the main body. The power valve which is located in the main metering body is effected by this manifold vacuum. The manifold vacuum, acting on the diaphragm at idle or normal load conditions, is strong enough to hold the diaphragm closed, and overcomes the tension of the power valve spring. When high power demands place a greater load on the engine and manifold vacuum drops below a predetermined point, the power valve spring overcomes the reduced vacuum opening the power valve. Fuel flows from the float chamber, through the valve and out the small holes in the side of the valve through the diagonal restrictions in the main metering body and then into the main well. In the main well, the fuel joins the fuel flow in the main metering system, enriching the mixture.

As engine power demands are reduced, manifold vacuum increases. The increased vacuum acts on the diaphragm, overcoming the tension of the power valve spring. This closes the power valve and shuts off the added supply of fuel which is no longer required.

**Secondary Throttle Operating System**

At lower speeds, the secondary throttle plates remain nearly closed, allowing the engine to maintain satisfactory fuel-air velocities and distribution. When engine speed increases to a point where additional breathing capacity is needed, the vacuum controlled secondary throttle plates open automatically.

Vacuum taken from one of the primary barrels and one of the secondary barrels acts upon a diaphragm which controls the secondary throttle plates. At high speeds when engine requirements approach the capacity of the two primary bores, the increased primary venturi vacuum moves the diaphragm, compressing the diaphragm spring. The diaphragm, acting through the diaphragm link and lever, will commence to open the secondary throttle plates (Fig. 118). The position of the secondary throttle plates depends on the strength of the vacuum. This in turn, is determined by the air-flow through the bores to the engine. As the air-flow increases, a greater secondary throttle plate opening will result and the secondary barrels will supply a greater portion of the engine’s requirements. As top speed is reached, the secondary throttle plates will approach wide open.
the secondary fuel bowl, which receives its fuel through a connecting tube, at the primary fuel inlet. The secondary fuel bowl is equipped with a fuel inlet valve assembly which regulates the flow of fuel into the bowl, the same as the primary fuel bowl. The secondary fuel inlet system must maintain a specified level of fuel as the three secondary fuel systems are calibrated to deliver the proper mixture only when the fuel is at this level. The three secondary fuel systems are the transfer system, main metering system and by-pass system.

The transfer system begins to function when the secondary throttle plates begin to open. As the plates begin to open the fuel flows through the secondary main jets into the idle passages which are similar to those in the primary metering body (Fig. 119). A secondary fixed curb idle passage as shown in Figure 119 supplies fuel directly to the intake manifold, thus allowing a smoother idle.

**Secondary Fuel Metering Systems**

The secondary system is supplied with fuel from
Spark Advance

The distributor utilizes changes in air pressure with the carburetor to control spark timing to satisfy all engine speed and load conditions.

In order to obtain a vacuum to operate the spark advance as dictated by the engine speed and load conditions, a port is located in the throttle bore just above the full closed position of the throttle plates, as the throttle is opened, this port is subject to manifold vacuum, which varies with changes in engine load. This port in the throttle body is connected to the main body by a short vertical passage, and then to a passage in the main metering body. This passage leads to an outlet on the side of the main metering body which connects to a single line to the distributor.

Disassembly

Major Subassemblies

The carburetor consists of three major subassemblies (Fig. 120). Separation of these three subassemblies is the first step in the disassembly procedure.

Remove the four primary fuel bowl screws and gaskets; discard the gaskets. The fuel bowl, fuel bowl gasket, metering body, and metering body gasket will slide off. Separate these parts and discard the gaskets (Fig. 121).

FIGURE 120 — Disassembly of Three Major Subassemblies

1. Fuel Bowl Screws and Gaskets (4) (Primary)
2. Primary Fuel Bowl
3. Primary Fuel Bowl Gasket
4. Primary Metering Body
5. Primary Metering Body Gasket
6. Fuel Line Tubing
7. Fuel Line Tubing “O” Rings (2)
8. Fuel Bowl Screws and Gaskets (4) (Secondary)
9. Secondary Fuel Bowl
10. Secondary Fuel Bowl Gasket
11. Secondary Metering Body
12. Secondary Metering Body Gasket
13. Bowl Vent (Secondary)
14. Secondary Diaphragm Rod Retainer
15. Throttle Body to Main Body Screws and Lockwashers (8)
16. Throttle Body to Main Body Gasket

Remove the fuel line tubing and discard the two “O” rings.

Remove the four secondary fuel bowl screws and washers, discard the washers. The fuel bowl, fuel bowl gasket, metering body, and metering body gas-
FIGURE 121 — Separating Fuel Bowl and Metering Body

Ket will slide off. Separate these parts and discard all gaskets.

Remove the bowl vent assembly from the top of the metering body, as it will fall out and be lost.

Remove the secondary diaphragm rod retainer (Fig. 122).

FIGURE 122 — Removing Diaphragm Rod Retainer

Remove the eight (8) throttle body to main body screws and lockwashers (Fig. 123). Lift the throttle body off the main body. Remove and discard the gasket.

FIGURE 123 — Removing Throttle Body Screws

Fuel Bowls and Metering Bodies

Remove the primary float and hinge retainer (Fig. 124) and slide the float and hinge assembly off its stud. The float spring will come off its boss at the same time.

FIGURE 124 — Interior of Fuel Bowl

Slide the baffle plate out of its position.

Using an open-end wrench, remove the fuel valve and seat assembly; discard the gasket.

Remove the four pump diaphragm cover screws and lockwashers. Lift the diaphragm cover and remove the diaphragm assembly and diaphragm return spring (Fig. 125).
Using a box-end wrench, remove the fuel inlet fitting and discard the gasket. Remove the filter screen assembly (Fig. 126).

Remove the air vent retainer and the air vent rod spring retainer (Fig. 127). Slide the spring off the rod and remove the air vent push rod from the fuel bowl. Lift off the air vent valve.

Using Tool J-10174, remove the two main jets from the primary metering body (Fig. 128).

With Tool J-10175, remove the power valve assembly and gasket. Discard the gasket seals (Fig. 129).

Remove the two idle adjusting needles and their seals (Fig. 130). Discard the seals.
From the secondary fuel bowl, remove the secondary float and hinge retainer. Slide the float and hinge assembly off its stud. The float spring will come off its boss at the same time.

Slide the baffle plate out of its position.

Using an open-end wrench, remove the fuel valve and seat assembly, discard the gasket.

Remove the two main jets from the secondary metering body, using Tool J-10174.

Using socket, remove the power valve assembly and gasket. Discard the gasket.

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**FIGURE 131 — Disassembly — Fuel Bowl and Metering Bodies**

1. Fuel Bowl Screw
2. Fuel Bowl Screw Gasket
3. Fuel Bowl Assembly
4. Fuel Inlet Fitting
5. Fuel Inlet Fitting Gasket
6. Filter Screen
7. Fuel Level Sight Plug
8. Fuel Level Sight Plug Gasket
9. Fuel Pump Cover Screw and Lockwasher
10. Fuel Pump Cover Assembly
11. Diaphragm Assembly
12. Diaphragm Return Spring
13. Air Vent Rod Spring Retainer
14. Air Vent Rod Spring
15. Air Vent Valve Retainer
16. Air Vent Rod
17. Air Vent Valve
18. Fuel Valve Seat Lock Screw
19. Fuel Valve Seat Lock Screw Gasket
20. Fuel Valve Seat Adjusting Nut
21. Fuel Valve Seat Adjusting Nut Gasket
22. Fuel Inlet Valve and Seat Assembly
23. Fuel Valve Seat "O" Ring Seal
24. Baffle Plate
25. Float Retainer
26. Float and Lever Assembly
27. Float Spring
28. Fuel Bowl Gasket
29. Main Metering Body Assembly
30. Idle Adjusting Needle
31. Idle Adjusting Needle Seal
32. Main Jet
33. Power Valve Assembly
34. Power Valve Gasket
Main Body Assembly

Remove the three thermostat housing cover screws and clamp. Lift the thermostat housing cover and gasket off the choke housing.

Remove the lower choke rod retainer and washer.

Remove the three choke housing screws and lockwashers and lift the housing, fast idle cam and choke housing shaft off the main body (Fig. 132). Remove and discard the two choke housing gaskets.

FIGURE 132 — Removing Choke Housing

Disassemble the choke. Remove the choke shaft nut, lockwasher and spacer. Remove the choke housing shaft and fast idle cam. Slide the choke lever, link and piston assembly out of chamber.

Remove the three secondary diaphragm housing screws and lockwashers (Fig. 133). Lift the secondary diaphragm housing off the main body. Discard the housing gasket.

FIGURE 133 — Removing Secondary Diaphragm Housing Screws

Disassemble the secondary diaphragm. Remove the four diaphragm cover screws and lockwashers. Lift the cover off the housing and remove the diaphragm spring, diaphragm assembly and the diaphragm check ball (Figs. 134 and 135).

FIGURE 134 — Removing Secondary Diaphragm Cover

FIGURE 135 — Secondary Diaphragm Check Ball Location

Remove the upper choke rod retainer. Slide the choke rod out of its position, also remove the two choke rod seal retainers and seal. Discard the seal.

Lightly scribe a mark along the choke shaft to insure proper positioning of the choke plate for assembly.

Remove the two choke plate screws and slide the choke plate out of the choke shaft. Slide the choke shaft out of its position in the main body.

Using a Phillips head screwdriver, remove the
pump discharge nozzle screw. Remove the pump discharge nozzle and gasket. Discard the gasket.
Invert the main body and shake out the pump check needle (Fig. 136).

**Throttle Body Assembly**
Remove the pump lever retainer (Fig. 137) and slide the lever off its stud.

**FIGURE 136 — Removing Pump Check Needle**

**FIGURE 137 — Removing Pump Lever Retainer**

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**FIGURE 138 — Disassembly — Main Body Assembly**

1. Thermostat Housing Cover Screws (3)
2. Thermostat Housing Cover Clamp
3. Thermostat Housing Cover
4. Thermostat Housing Cover Gasket
5. Lower Choke Rod Retainer and Washer
6. Choke Housing Screws and Lockwashers (3)
7. Choke Housing
8. Choke Housing Gaskets (2)
9. Choke Shaft Nut, Lockwasher and Spacer
10. Choke Shaft
11. Fast Idle Cam
12. Choke Lever, Link and Piston Assembly
13. Secondary Diaphragm Housing Screws and Lock washers (3)
14. Diaphragm Housing Assembly
15. Diaphragm Housing Gasket
16. Diaphragm Cover Screw and Lockwashers (4)
17. Diaphragm Cover
18. Diaphragm Spring
19. Diaphragm Assembly
20. Diaphragm Check Ball
21. Choke Rod Retainer (upper)
22. Choke Rod
23. Choke Rod Seal Retainers (2)
24. Choke Rod Felt Seal
25. Choke Plate Screws (2)
26. Choke Plate
27. Choke Shaft
28. Pump Discharge Nozzle Screw
29. Pump Discharge Nozzle
30. Pump Discharge Nozzle Gaskets (2)
31. Pump Check Weight
32. Pump Check Ball
Remove the throttle stop screw and spring.
Remove the secondary diaphragm lever screw and lockwasher (Fig. 139); the lever will fall off.

**FIGURE 139 — Removing Secondary Diaphragm Lever Screw**

Remove the fast idle cam lever screw and lockwasher (Fig. 142). Slide the fast idle pick up lever, fast idle cam lever, and spring off its position.
Lightly scribe all four throttle plates along the throttle shaft and mark each throttle plate and its corresponding bore with a number or letter to insure proper replacement (Fig. 141).

**FIGURE 140 — Removing Fast Idle Cam Lever Screw**

**FIGURE 141 — Scribing Marks and Lines**

1. Fast Idle Cam Lever
2. Fast Idle Cam Lever Spring
3. Fast Idle Pick-Up Lever
4. Fast Idle Cam Lever Screw and Lockwasher
5. Secondary Diaphragm Lever Screw and Lockwasher
6. Secondary Diaphragm Lever
7. Throttle Stop Screw
8. Throttle Stop Screw Spring
9. Secondary Throttle Shaft Assembly
10. Secondary Throttle Plate Screws (4)
11. Secondary Throttle Plates
12. Throttle Shaft Sleeves (4)
13. Throttle Connecting Rod Retainers (2) and Washer
14. Primary Throttle Shaft Assembly
15. Throttle Connecting Rod
16. Primary Throttle Plate Screws (4)
17. Throttle Shaft Return Spring
18. Primary Throttle Plates (2)
19. Pump Lever Assembly
20. Pump Lever Retainer

**FIGURE 142 — Disassembly — Throttle Body Assembly**
Remove the four primary throttle plate screws. Remove the throttle plates. Remove the two throttle connecting rod retainers and the washer (Fig. 143).

**FIGURE 143 — Removing Throttle Connecting Rod Retainer**

Slide the primary throttle shaft out of the throttle body (Fig. 144), remove the throttle connecting rod and throttle return spring.

**FIGURE 144 — Removing Primary Throttle Shaft**

Remove the four secondary throttle plate screws. Remove the plates. Slide the secondary throttle shaft out of the throttle body. Remove four Teflon sleeves from shaft (Fig. 142, Item 12).

**Inspection**

Check major castings for cracks, warpage, stripped threads, damaged gasket mating surfaces, and other damages. The passages in the castings should be checked with compressed air to make certain they are free of obstructions.

**CAUTION:** Carburetor jets and passages should never be cleaned with a drill, wire, or similar object. This method may distort jets and passages and affect carburetor performance.

Inspect the floats. The choke plate and throttle plates must be discarded if edges are nicked or if the protective plating has been damaged exposing the bare metal to corrosion.

Carefully check the choke shaft and throttle shafts for bending or nicks. Inspect all linkages for bends or worn surfaces. Replace distorted or broken springs.

Check the choke thermostat lever, link, and piston assembly for nicks or scores which might cause the piston to bind.

**NOTE:** Parts such as “O” rings, gaskets, diaphragms, and felt seals, should never be exposed to cleaning solvents and should always be replaced at time of overhaul.

**Assembly**

**Throttle Body**

Slide the secondary throttle shaft assembly into the throttle body with four Teflon sleeves in position on the shaft.

Referring to the lines or figures scribed on the throttle plates during disassembly, install the secondary throttle plates. Install the four throttle plate screws and run them down until they are snug but not tight. Close the throttle plates and hold the throttle body up to the light. Little or no light should show between the throttle plates and the walls of the throttle bores. If the throttle plates are properly installed and there is no binding when the throttle shaft is rotated, tighten the throttle plate screws. Stake the throttle plate screws using a suitable staking tool.

Place the primary throttle return spring in the throttle shaft, also place the smallest bend of the throttle connecting rod in position in the throttle lever. Slide the throttle shaft in position into the throttle body, guiding the connecting rod so that the largest bend will be in place in the secondary throttle shaft lever. The correct position of the return spring is with the small hook fitting into the slot alongside the throttle lever adjusting screw, while the other end rests against the boss which houses the throttle stop screw.

Referring to the lines or figures scribed on the throttle plates during disassembly, install the primary throttle plates. Install the four throttle plate screws and run them down until they are snug but not tight. Close the throttle plates and hold the throttle body up to the light. Little or no light should show between the throttle plates and the walls of the throttle bores. If the throttle plates are
properly installed and there is no binding when the throttle shaft is rotated, tighten the throttle plate screws. Stake the throttle plate screws using a suitable staking tool.

Install the two throttle connecting rod retainers and the washer. The washer should be located on the secondary throttle shaft lever.

Place the fast idle cam lever spring inside the fast idle cam lever and position the lever on its stud. Place the fast idle cam pick-up lever on the stud and line up with the longest end of the spring should be resting on the longest arm of the pick-up lever. Install the screw and lockwasher.

Position the secondary diaphragm lever on the secondary throttle shaft, the round stud should be on the bottom and pointing away from the throttle body. Install the screw and lockwasher.

Install the throttle stop screw and spring, turn the screw in until slight spring tension is obtained.

Slide the pump lever assembly on its stud and install the retainer.

**NOTE:** The two holes in the throttle lever permit adjustment of the accelerating pump discharge. The accelerator pump cam retaining screw should be in the Number 2 position for all normal driving. For operation under extreme hot temperatures the Number 1 position can be used to obtain a leaner pump discharge.

**Main Body Assembly**

Before installing new pump discharge needle, check seat of pump discharge needle. If the seat is rough, using the old discharge needle, place a small brass rod on the needle and tap lightly with a fiber mallet to insure proper seating of the needle. Check to see that no damage has been inflicted on the seat during this operation. Discard old needle and install new needle, see if new needle moves freely.

Install the pump discharge nozzle and new gaskets. Secure with pump discharge nozzle screw.

Slide the choke shaft in position, referring to the marks scribed during disassembly. Install the choke plate. Install the two choke plate screws and stake with an approved staking tool. Check plate for freedom of movement.

Insert a new felt seal between the two choke rod seal retainers and slide them in position in the main body. Slide the choke rod through the hole in the main body and insert the upper end of the rod into the choke shaft lever. Install the upper retainer. Check choke plate for freedom of movement.

Assemble the secondary diaphragm assembly. Install the diaphragm check ball in position. Insert the diaphragm assembly in the diaphragm housing. Place the small end of the diaphragm return spring on the boss on the cover.

Insert the four diaphragm cover screws and lockwashers in the diaphragm cover. Then after aligning the screws with the holes in the diaphragm and housing, lower the cover and spring in position and tighten the screws.

**CAUTION:** Relieve spring tension from diaphragm before installing cover. If pressure is not released, diaphragm assembly will become wrinkled and leak.

Place the secondary diaphragm in position on the main body, using a new gasket (Fig. 145). Install the three screws and lockwasher into the main body.

**FIGURE 145 — Gasket Recesses**

Assemble the automatic choke. Slide the choke lever, link and piston assembly into its chamber. Place the fast idle cam on the housing and insert the choke housing shaft through it, into the choke housing. Install the choke shaft spacer, lockwasher and nut.

**NOTE:** The fast idle cam weight should be pointed away from the secondary diaphragm housing.

Using two new gaskets (Fig. 145), position the choke housing in the main body and engage the choke rod into the choke housing shaft lever. Install the three choke housing to main body screws.

Install the lower choke rod washer and retainer.

Place the thermostat housing cover gasket in place and install cover. Position the cover clamp with the ears of the clamp away from the cover, install the three screws. Be sure the thermostat spring picks up the tang on the choke cover.

Align the index marks in the rim of the thermostat with the indicator on the choke housing (Fig. 146). Set on one notch lean.

Place the throttle body on main body gasket on the main body. Lower the throttle body in position and insert the eight screws and lockwashers.
**FIGURE 146 — Choke Adjustment**

*NOTE: Before lowering throttle body in position, check that all passages are aligned with gasket openings.*

Install secondary diaphragm rod in position and install retainer.

**Fuel Bowls and Metering Bodies**

Using Tool J-10175, install the power valve assembly and new gasket on the secondary metering body. Install the two main jets using Tool J-10174.

With an open end wrench, install the fuel valve and seat assembly in the secondary bowl, using a new gasket.

*NOTE: Fuel valve needles and seats are matched assemblies. Factory tested to insure proper operation, their component parts are not interchangeable.*

Slide the baffle plate over the fuel valve and seat assembly.

Place the conical spring in position on the locator on the float. Slide the float and hinge assembly and spring into the bowl and install retainer.

Invert the fuel bowl to allow the float to drop to the closed position. Rotate the fuel needle and seat assembly until the float is parallel with the fuel bowl (Fig. 147). This initial dry float setting must be rechecked with the carburetor on the engine to obtain the proper wet fuel level.

Insert the four secondary fuel bowl screws with new gaskets into the fuel bowl and place the new fuel bowl gasket in the recess. Slide the secondary metering body on the screws, then place the new gasket on the metering body. Insert the bowl vent assembly. Position the fuel bowl and metering body assemblies on the main body and tighten the screws.

**FIGURE 147 — Dry Float Setting**

Make certain the holes in the gasket are aligned with the passages on the metering body.

Install the power valve assembly with a new gasket on the primary fuel bowl using Tool J-10-175.

With Tool J-10-174, install the two main jets.

Install the two idle adjusting needles with their new seals in the primary metering body. Turn the needles in gently, until they seat then back off one turn.

*NOTE: Do not force the needles against their seat, as this will groove the tips of the needles making it impossible to correctly adjust the idle mixture.*

Install the air vent valve on the push rod and secure with the retainer. Slide into its position on the fuel bowl. Place the air vent rod spring on the lower end of the rod and install the retainer.

Install the fuel filter screen assembly, new inlet fitting gasket and fuel inlet fitting on the primary fuel bowl assembly.

On the primary bowl, position the pump diaphragm return spring in the recess and install the diaphragm assembly with head of rivet facing lever. Place the pump diaphragm cover in position (centered), making sure the holes are aligned. Tighten the four screws alternately to evenly compress the diaphragm while holding the lever against the diaphragm to prevent the diaphragm from wrinkling.

Install the fuel and seat assembly, using a new gasket.

Slide the baffle plate over the fuel valve and seat assembly.

Install the conical float spring on the locator on the float. Slide the float and hinge assembly and spring on its shaft and install retainer.

Invert the fuel bowl to allow the float to drop to the closed position. Rotate the fuel needle and seat assembly until the float is parallel with the fuel bowl (Fig. 147). This initial dry float setting must be rechecked with the carburetor on the engine to obtain the proper wet fuel level.

Install two new “O” rings on the fuel line tubing.
Insert one end of the tubing in position in the secondary fuel bowl.

**NOTE:** Place a light film of lubricant (vaseline) on the "O" rings and end of the tube, for easier installations.

Insert the four primary fuel bowl screws with new gaskets into the fuel bowl, and place the new fuel bowl gasket in the recess. Slide the primary metering body on the screws, then place the new gasket on the metering body.

**CAUTION:** Make certain the accelerating pump hole in the gasket is in the correct position.

**NOTE:** When positioning the fuel bowl, the accelerating pump lever must be depressed in order to clear the diaphragm pump lever and the air vent push rod.

**Adjustments**

**Holley Model 4150C**

All adjustments essential for proper operation of this carburetor can be made on the car without removing any of the carburetor's component parts.

**Idle Adjustment**

The initial idle mixture adjustment can be made both on or off the car. Turn the idle mixture screws in (clockwise) until they seat lightly. Caution must be exercised not to seat the idle mixture needles too tightly as this will groove the tips of the needles and prevent a smooth idle. Then back the idle needles out one full turn. This initial idle setting must be tailored with carburetor on the car and engine running at normal operating temperature. Adjust the throttle stop screw to idle the engine at 475 RPM with automatic transmission in neutral or 550 RPM with standard and overdrive transmissions or 500 RPM when equipped with air conditioning turned on.

**Accelerator Pump Adjustment**

The pump cam screw should be in the number two position on the throttle lever for all normal driving. The number one position can be used to provide leaner pump discharge.

With the throttle plates held in the wide open position there should be .015" clearance between the pump diaphragm actuating lever and the lower portion of the pump override spring screw (Fig. 150). Adjust by turning the adjusting screw.

This adjustment MUST be rechecked with the throttle plates closed at curb idle to make certain there is no lag between the throttle linkage and the pump lever. The slightest movement of the throttle lever must correspondingly actuate the accelerator pump lever. Should there be any lag between the movement of the throttle plates and the actuating of the accelerator pump a tip in stumble or flat spot will result. To adjust, lengthen the adjusting screw (Fig. 148).

**Exterior Bowl Vent**

The exterior bowl vent opening is .050" to .070" at idle (Fig. 148). Adjust by bending the operating lever.

**Fast Idle Adjustment**

The fast idle setting with carburetor off the car is made by turning the fast idle adjusting screw to obtain .025" clearance between the throttle valve and the carburetor bore on the side opposite the idle port with the fast idle adjusting screw on the high step of the cam.

The fast idle setting can be altered with the carburetor on the car to suit individual requests, however, the aforementioned bench setting is most desirable for best overall operation.

On the car fast idle adjustments should be made with a tachometer connected to observe RPM changes. Turning the fast idle adjusting screw in clockwise, will increase RPM while turning the screw out counterclockwise, will decrease RPM (Fig. 149). The normal fast idle RPM on the high step of the cam and engine at normal operating temperature is approximately 1700 RPM.

**Automatic Choke Adjustment**

The automatic choke setting is one notch lean for all normal driving. If for some reason a richer or
leaner mixture is desired during the warm-up period, it can be obtained by rotating the thermostat cover. Never set the index mark on the cover more than two graduations off the specified setting.

**Choke Unloader**

The choke unloader dimension is measured at the opening in the choke air horn from the top edge of the choke plate to the forward top edge of the choke air horn with the throttle plates in the wide open position. This dimension should be approximately 3/4". The unloader opening is designed into the linkage at time of manufacture and therefore provisions for adjustment are not readily accessible, however in the event the unloader opening is inadequate, bending the tab on the throttle shaft lever (Fig. 149), where it contacts the fast idle cam will change the unloader opening.

**Wet Fuel Level Adjustment**

This carburetor incorporates an externally adjustable needle and seat assembly which allows the fuel level to be checked and adjusted without removing the carburetor from the engine.

With the engine running remove the sight plug from the carburetor bowl on the side opposite the fuel inlet. If fuel level is too high, excessive fuel will drain through the sight plug opening. For proper operation fuel level should be on line with threads at bottom of sight port.

To adjust, loosen top lock screw on needle and seat assembly and adjust with lower nut (Fig. 152), until float maintains fuel at the desired level. Tighten the top lock screw. This procedure applies to both primary and secondary sides.

**Dash-Pot Adjustment**

To restrict the throttle from closing too rapidly and causing the engine to stall, a dash-pot is provided on cars equipped with automatic transmission. The dash-pot adjustment is made with the throttle set at curb idle (not fast idle). Depress the dash-pot stem until it bottoms. Adjust by turning the dash-pot assembly in or out to obtain a clearance of 3/4" between the stem and the throttle lever (Fig. 151).

**INTAKE MANIFOLD**

**10 Series**

The intake manifold is cast as an integral part of the engine. A "hot spot" is not required for this