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TROUBLE SHOOTING CHART
INTRODUCTION

Holley Carburetor Model 4150-G is another addition to the ever increasing Holley family of automotive engine accessories.

As modern truck engine increase in power, the carburetor also must be engineered to meet all the demands of these engines. The Model 4150-G is a high capacity four barrel downdraft carburetor of sturdy and low silhouette construction.

It is recommended that this Service Manual be used as a guide for efficient and profitable service.
1. DESIGN

Holley Carburetor Model 4150-G is a four bore downdraft carburetor with a built in governor. This carburetor can be considered as two dual downdraft carburetors, two bores supplying the fuel-air mixture throughout the entire range of engine operation and the other two bores functioning only when the speed or load requires them. Air flow and venturi vacuum controls the secondary throttle plates.

The two primary barrels have a common choke plate, while each barrel has its own venturi, main fuel discharge nozzle, booster venturi and throttle plate. Each of the secondary barrels have a venturi, main fuel discharge nozzle, a throttle plate and a booster venturi.

There is a fuel bowl for both the primary and secondary barrels, which insures a constant supply of fuel for all the fuel metering systems. The fuel from these bowls flows into the primary main metering body and secondary main metering body where this fuel is correctly mixed with air for all phases of engine operation.

The main metering bodies, introduced in truck carburetors for the first time, provides the metered fuel for all the fuel systems. This type of metering body presents a new conception for easier trouble shooting and servicing.

Additional fuel for acceleration is supplied by a new type cam operated accelerating pump, which is located on the primary fuel bowl. The pump begins to function when the pump lever is activated by the throttle lever assembly. The override spring on the pump lever adjusting screw on the pump lever provides an "over-ride" feature which allows a prolonged discharge of fuel for smoother acceleration.

A fully automatic power enrichment system actuated by manifold vacuum delivers and added supply of fuel for full power or high speed operations. The primary metering body is equipped with a power valve that supplies the system with the additional fuel requirements, when the primary and secondary throttle plates are open. The primary throttle bores supply the fuel-air mixture until the venturi vacuum is strong enough to move the secondary throttle plates, then the secondary throttle bores start supplying the extra fuel needed.

Another introduction is the new fixed compression gaskets, which when compressed form a more positive seal and eliminates leakage due to improper tightening of screws.

This carburetor, like its predecessors, is practically surrounded by the air cleaner, which fully protects the unit against dirt in the air. The filtered air flows vertically downward into the main body and through all four barrels, which results in a truly concentric flow of air.

Hot starting difficulties have been largely minimized by locating the two fuel bowls, so they are exposed to the air stream. This aids in cooling the fuel in the float chambers, and is an effective means of minimizing percolation and hard starting when the engine is hot. Some models of this carburetor also have an external vent, located on the fuel bowls which also assist in minimizing hard starting of heated engines.

2. APPLICATION

Model 4150-G carburetors are used on trucks with 270 cubic inch and larger engines. For complete application data, parts lists, specification and further information, consult the Holley Carburetor Catalog Sheets covering the specific vehicle.

3. MAJOR SUBASSEMBLIES

The Holley Carburetor Model 4150-G is composed of three major subassemblies. They are the fuel bowls and metering bodies assembly, the main body assembly and the throttle body assembly.

The die cast fuel bowl assemblies contain the fuel inlet needle valve assembly, float, float spring and fuel inlet assembly.

The metering body assembly contains the main jets, power valve and all of the fuel metering passages.

The die cast main body assembly contains the choke plate, secondary diaphragm, venturi, booster venturi and various fuel and vacuum passages.

The die cast aluminum throttle body assembly consists of the throttle plates, throttle linkage, various fuel and vacuum passages, and the governor.
OPERATION

As modern truck engines strive for higher compression and horse power, today’s carburetors must be able to provide the correct fuel-air mixture for all the demands placed upon these engines. Holley Carburetor Model 4150-G has been engineered to provide the efficient, yet economical, mixture whenever the engines changing fuel requirements demand them.

This carburetor is equipped with four basic fuel metering systems: the idle system, the accelerating pump system, the main metering system and the power enrichment system. These four systems are calibrated to deliver an economical mixture for normal cruising conditions, a richer mixture when high power output is desired, and a still richer mixture for smooth idle and low speed performance.

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

A fuel inlet system for both primary and secondary barrels provide the various fuel metering systems with a constant supply of fuel. The difference in air pressure within the carburetor causes the proper discharge of fuel for various engine speeds and load conditions. This pressure is actually less than atmospheric, due to the slight restriction of air flow through the air cleaner. However, to simplify the explanation of the functioning of the fuel metering systems, the pressure flowing into the carburetor will be considered as being atmospheric.

1. FUEL INLET SYSTEMS

All fuel enters the carburetor system from either the primary or secondary fuel bowls.

The fuel enters the fuel bowl through a filter screen and into the fuel inlet valve, which is frequently referred to as the fuel inlet needle and seat assembly. 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.

Movement of the needle in relation to the seat is controlled by the float and lever assembly which rises and falls with the fuel level. As the fuel level drops, the float drops, opening the needle valve to allow fuel to enter the float chamber. When the fuel reaches a specified level, the float moves the needle valve to a position in its seat where it restricts the flow of fuel, admitting only enough to replace that being used. Any slight change in the fuel level causes a corresponding movement of the float, opening or closing the fuel inlet needle valve to immediately restore or hold the proper fuel level. The fuel inlet systems must constantly maintain the specified level of fuel as the fuel metering systems are calibrated to deliver the proper mixture only when the fuel is at this level.

A spring loaded pin, inside the hollow fuel inlet needle valve, cushions the needle valve for protection against road shocks and vibrations. A float spring is also incorporated under the float to assist in keeping the float in a stable position. The float chamber is vented internally by the vent tube at all times. On some models, 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.

2. CHOKE

The choke is the method used on this carburetor for enriching the fuel discharge, so that enough vaporized fuel reaches the cylinders to permit the engine to start and run smoothly during the warm-up period. When starting and operating a cold engine, a richer mixture is required. Much of the vaporized fuel from the carburetor condenses to liquid upon contact with the cold surfaces of the intake manifold. This liquid burns slowly in the cylinder, causing loss of power or stalling. Thus, closing of the choke plates confines manifold vacuum within the carburetor. A flow of fuel from the idle system and main metering system is forced into the high differential pressure region of the throttle body. The mixture is enriched sufficiently to run the engine until the manifold is hot enough to complete the vaporization of the fuel.

The choke rod at the carburetor actuates a fast idle cam, which has been designed to increase the idle rpm for smooth running during choking.
3. 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.

This carburetor utilizes two identical idle systems, one for each bore. Since, the two passages function identically, only one side will be considered in this explanation.

At curb idle, the normal air pressure in the secondary float chamber causes the fuel to flow through the secondary side of the carburetor to the greatly reduced pressure area below the throttle plates. Fuel flows from the secondary float chamber through the secondary 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 screw which controls the mixture delivered at idle. Turning the screw in toward its seat restricts the flow of fuel, thus providing a leaner idle mixture. Turning the 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 secondary throttle plate.

During off-idle operation when the primary throttle plate is moved slightly, the primary fuel bowl begins supplying the fuel into the primary metering body. Fuel flows from the primary float chamber through the primary 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, 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 into the throttle body passage. As the idle transfer slot is exposed to manifold vacuum, fuel is discharged into the primary 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 system begins discharging fuel. The two systems are engineered to provide smooth gradual transition from idle to cruising speeds.

4. 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.

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.
5. 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.

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 air bleed in the main body and then into the main metering body by interconnecting 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.

6. 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.
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 the 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 condition, 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.

7. 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 within the primary system. 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 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. 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 engine. As the air-flow increases, a greater secondary throttle plate opening will result and the secondary barrels will supply an increasing of the engine's requirements. As top speed is reached, the secondary throttle plates will approach wide open.

The bleed past the ball check valve in the vacuum passage of this carburetor limits the rate at which the secondary throttle plates are allowed to open. Any rapid increase in vacuum which would tend to open the secondary throttle plates too suddenly, merely holds the ball check valve securely against its seat. The opening of the throttle plates is slowed to a rate governed by the amount of air passing through an air bleed in the check valve seat. This allows the vacuum to build up comparatively slowly at the diaphragm which results in a controlled rate of opening for the secondary throttle plates.

As the secondary throttle plates begin to open, a vacuum is created in the secondary barrels, first at the throttle plates, and then, as airflow increases, at the throat of the secondary venturi. This vacuum assists the secondary metering system to operate.

When engine speed is reduced, venturi vacuum in the bores become weaker. The momentarily stronger vacuum at the secondary throttle operating diaphragm moves the ball check valve off its seat in the vacuum passage, permitting an immediate flow of air into the diaphragm chamber. As the vacuum acting on the diaphragm is lessened, the load on the diaphragm spring will commence closing the secondary plates. The diaphragm spring is assisted by the design of the secondary plates. Each secondary plate is slightly offset. When the plates are closing, the combined force of manifold vacuum and the air stream has greater effect on the larger, upstream area of the plates forcing the plates to a closed position. The secondary plates are retained in the closed position when the primary plates are fully closed by the secondary throttle connecting rod. This rod, which is fastened to the primary throttle lever, rides in a slot in the secondary throttle lever.

8. SECONDARY FUEL METERING SYSTEMS

The secondary system is supplied with fuel from 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 two secondary fuel systems are calibrated to deliver the proper mixture only when the fuel is at this level. The two secondary fuel systems are the transfer system and main metering system. The transfer system begins to function when the secondary throttle plates begin to open and the fuel flows from the secondary idle transfer slot. The passages leading to the transfer passage have been previously outlined in the idle system.

When the secondary throttle plates are opened further the pressure differential causes the secondary main metering system to begin functioning. The passages in this system are similar to those in the primary main metering system.

These two fuel systems, engineered in the secondary fuel system, provides a smooth transition of power instead of a sudden surge.
9. SPARK ADVANCE

Some models of this carburetor utilize changes in air pressure within the carburetor to control spark timing to satisfy all engine speed and load conditions.

The spark must be advanced as the engine speed is increased since a definite time is required for the fuel-air mixture to burn and reach its maximum pressure at the point of highest efficiency in the engine cycle. Because the fuel-air mixture induced into the intake manifold at light loads is not as dense as that during high load operation, it burns more slowly, hence the spark under these conditions must be advanced further.

In the Holley pressure-type distributor used in conjunction with some of these carburetors, the spark advance mechanism is controlled by a vacuum-actuated diaphragm, operating against the tension of a diaphragm, operating against the tension of calibrated springs. The degree of spark advance is primarily determined by the strength of the vacuum acting on the diaphragm. This vacuum is transmitted from two interconnected passages within the carburetor through tubing which leads to the distributor diaphragm. One passage in the carburetor is open at the throat of the venturi, and the other passage opens into the throttle bore. The two passages are calibrated to supply vacuum of the proper strength for the required spark advance during operation under all engine speeds and load conditions. Any time the vacuum from the venturi becomes stronger than the vacuum from the throttle bore, the spark ball in the vertical passage from the throttle bore will be drawn up to its seat, closing off the lower passage. This prevents air bleeding from the lower passage and weakening the vacuum from the venturi.

10. ANTI-BACKFIRE VALVE

Some models of these carburetors are equipped with a anti-backfire valve which eliminates popping back on deceleration. This device is located in the middle of the throttle body and can only be removed by separating the main body from the throttle body.

The valve by-passes a certain amount of air through the valve instead of all the air flowing around the throttle plates. On deceleration, when the manifold vacuum reaches approximately 22" Hg, the valve closes and prevents the air from flowing through. This creates a rich mixture in the throttle body thus eliminating popping a deceleration or engine leaking.

NOTE

This valve has been factory adjusted, and must be serviced as a complete assembly.

11. GOVERNOR - INTERNAL VACUUM TYPE

A Holley Centri-Vac vacuum-operated engine speed governor is incorporated in this carburetor model as a positive means of controlling engine speed. The governor contains a throttle actuating mechanism attached to the primary throttle shaft of the carburetor, through an overriding clutch. The throttle actuating mechanism consists of a diaphragm assembly, governor spring, and governor lever assembly.

Below governing speeds, the operator, through a simple clutch arrangement on the throttle body of the carburetor, controls the throttle plates in the usual manner. When governing speed is reached, a combination of venturi and manifold vacuum acts on the governor diaphragm to close the throttle plates. Two calibrated by-pass jets in the vacuum passages meters the vacuum from the venturi and manifold to provide the correct balance for proper operation of the governor. At speeds below governing rpm, this vacuum is weakened by air bleeding through the governor valve in the governor spinner so that no premature governing action will occur. Filtered air from the carburetor air cleaner enters the governor system through a passage in
the main body and then into the governor vent tube. The air flows through an air line to the housing enclosing the governor rotor or spinner valve. A combination of low pressure from the venturi and manifold transmitted through the governor system passages, draws the air past the governor valve and through another air line to the throttle actuating unit on the carburetor. In the controlling unit, centrifugal force acting on the rotor, which has kept pace with engine speed, overcomes the tension of the valve spring and tends to close the governor valve when governing speed is reached. This greatly restricts the amount of air bleeding through to the diaphragm on the carburetor, thus allowing the combined venturi and manifold pressure differential to operate the diaphragm. As the pressure differential across the diaphragm increases, the diaphragm moves the governor lever against the tension of the governor spring to close the throttle plates. The governed engine speed is held constant by centrifugal force on the valve balanced against the tension of the valve spring. Any slight change in engine speed due to load variation will cause the governor valve to react immediately, either increasing or decreasing the amount of air bleeding through the governor valve orifice. A change in the amount of air bleed will, in turn, cause an instant response from the diaphragm to increase or decrease the throttle plate opening. When the accelerator is released, control is taken from the governor by the external throttle lever and the return spring in the accelerator pedal linkage closes the throttle plates to bring the engine to any desired lower speed.

Although the entire governor system is described, only the throttle actuating mechanism on the carburetor is included in the overhaul procedure presented in this manual. This portion of the governor can be cleaned and serviced readily, also the governor rotor can be serviced independently.

12. GOVERNOR - EXTERNAL VACUUM TYPE

This type of system also incorporates a Holley Centri-Vac vacuum operated engine speed governor. This governor consists of the two units, a throttle limiting mechanism which is attached to the primary throttle shaft of the carburetor and a separate controlling unit. The throttle limiting mechanism consists of a governor spring and a diaphragm which is exposed to external vacuum source. The spring and diaphragm are linked together by the governor lever which is attached to the throttle shaft of the carburetor. The controlling unit consists of a rotor which is driven by the engine and contains a centrifugally operated governor valve.

Below governing speeds, the vehicle operator, through a simple dog clutch arrangement on the throttle body of the carburetor, controls the throttle plate and consequently, engine speed and power output, in the usual manner. When governing speed is reached, the governor valve closes and an external vacuum source acts on the governor diaphragm to close the throttle plates. At speeds below governing speed, this vacuum is weakened by air flowing through the governor valve so that no premature governing action will occur.

The vacuum lines from the external source and the spinner valve are teed together at the governor housing, with the line from the spinner entering the restricted side of the tee fitting.

Filtered air from the carburetor air cleaner enters the governor system through the governor vent tube. The air flows through an air line to the housing enclosing the governor rotor. Governor vacuum draws the air past the governor valve and through another air line to the throttle limiting unit on the carburetor.

When governing speed is reached, centrifugal force acting on the rotor, which has kept pace with engine speed, overcomes the tension of the valve...
spring and tends to close the governor valve. This greatly restricts the amount of air bleeding through to the diaphragm on the carburetor, thus allowing the external vacuum source to operate the diaphragm. As the vacuum acting on the diaphragm increases, the diaphragm moves the governor lever against the tension of the governor spring to close the throttle plate.

The governed engine speed is held constant by centrifugal force on the valve balanced against the tension of the valve spring. Any slight change in engine speed will cause the governor valve to act immediately to either increase or decrease the amount of air bleeding through the governor valve orifice. A change in the amount of air bleed will, in turn, cause an instant response from the diaphragm to increase or decrease the throttle plate opening. When the accelerator is released, control is taken from the governor by the external throttle lever and the return spring in the accelerator pedal linkage closes the throttle plate to bring the engine to any desired lower speed.

OVERHAUL

1. INTRODUCTION

The overhaul procedure which follows can be accomplished with ordinary tools and a reasonable amount of care. However, factory approved tools are available to facilitate overhaul and protect tools. Use of these tools are strongly recommended by the factory engineers.

Proper overhaul of a carburetor can be accomplished only if the unit is completely disassembled and each part is thoroughly cleaned. The clean parts should then be carefully inspected for signs of wear, damage or deterioration. Defective parts must be replaced with genuine Holley replacement parts only. The carburetor must then be carefully rebuilt and accurately adjusted to insure the power, economy and performance which is built into every Holley carburetor.

NOTE

This carburetor has been designed for easy and rapid service on partial or minor repairs. By removing the fuel bowl screws, the fuel bowls and metering bodies are readily available for inspection and repairs.

2. SPECIAL TOOLS

The special tools recommended for use in overhauling these carburetors are listed below:

<table>
<thead>
<tr>
<th>TOOL NAME</th>
<th>KENT-MOORE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Jet Socket</td>
<td>10-174</td>
</tr>
<tr>
<td>Power Valve Socket</td>
<td>10-175</td>
</tr>
<tr>
<td>Fast Idle Cam Wrench</td>
<td>10-176</td>
</tr>
<tr>
<td>Float Gauge</td>
<td>Consult Holley Catalog Sheet for proper size</td>
</tr>
</tbody>
</table>

3. MASTER REPAIR KITS

Certain parts are subject to wear during operation or may be damaged in disassembly. The Holley Master Repair Kit contains replacements for all such parts. The proper Master Repair Kit for the carburetor being overhauled is listed in the Holley Carburetor Catalog Sheets.

4. DISASSEMBLY

A. PREPARATION

A separate container should be used for the component parts and casting of the three major subassemblies: fuel bowls and metering bodies assembly, main body assembly and throttle body assembly. Cleaning, inspection and reassembly will be facilitated by the use of these separate containers.

B. DISASSEMBLY - THREE MAJOR SUBASSEMBLIES

This carburetor consists of three major subassemblies. Separation of these three subassemblies is the first step in the disassembly procedure.

The following list contains the component parts of the carburetor in the order of their removal in separating the three major subassemblies. During disassembly discard all gaskets, also all parts which have replacements in the Master Repair Kit.
**Figure 1. Disassembly - Major Subassemblies**

<table>
<thead>
<tr>
<th>Parts No.</th>
<th>Description</th>
<th>PART NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>Fuel Bowl Screws (4) &amp; Gaskets (4) (Primary)</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Primary Fuel Bowl</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>Primary Fuel Bowl Gasket</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>Primary Metering Body</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>Primary Metering Body Gasket</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>Fuel Bowl Screws (4) &amp; Gaskets (4) (Secondary)</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>Secondary Fuel Bowl Gasket</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td>Secondary Metering Body</td>
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<td>10</td>
<td>Secondary Metering Body Gasket</td>
</tr>
<tr>
<td>1</td>
<td>11</td>
<td>Fuel Line Tubing</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>Fuel Line Tubing “O” Rings (2)</td>
</tr>
<tr>
<td>1</td>
<td>13</td>
<td>Choke Control Lever Nut &amp; Lockwasher</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
<td>Choke Control Lever</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>Governor Housing Safety Wire &amp; Seal</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>Governor Housing Cover Screws (4) &amp; Lockwashers (4)</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>Governor Housing Cover</td>
</tr>
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<td>1</td>
<td>18</td>
<td>Governor to Main Body Screws &amp; Lockwashers (3)</td>
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<td>1</td>
<td>19</td>
<td>Secondary Diaphragm Rod “E” Retainer</td>
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<tr>
<td>1</td>
<td>20</td>
<td>Throttle Body to Main Body Screws &amp; Lockwashers (8)</td>
</tr>
<tr>
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<td>Throttle Body to Main Body Gasket</td>
</tr>
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<td>1</td>
<td>22</td>
<td>Governor Housing Gaskets (2)</td>
</tr>
</tbody>
</table>
2. Remove the four secondary fuel bowl screws and gaskets, discard the gaskets. The fuel bowl, fuel bowl gaskets, metering body, and metering body gasket will slide off. Separate these parts and discard the gaskets.

3. Remove the fuel line tubing and discard the two "O" Rings.

4. Remove the choke control rod lever nut and lockwasher. Slide the lever off its position.

5. Remove the safety wire and the four governor housing cover screws and lockwashers. Slide the cover off its position.

6. Remove the three governor to main body screws and lockwashers.

7. Remove the secondary diaphragm rod "E" retainer.
8. Remove the eight (8) throttle body screws and lockwashers. Lift the throttle body off the main body and discard the gasket.

9. Remove and discard the two governor to main body gaskets.

C. DISASSEMBLY - FUEL BOWLS AND METERING BODY ASSEMBLIES

The following list contains all the parts removed in disassembling. Discard all gaskets, also all parts which have replacements in the Master Repair Kit.

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Float and Hinge &quot;E&quot; Retainer &amp; Washer</td>
</tr>
<tr>
<td>20</td>
<td>Float and Hinge Assembly</td>
</tr>
<tr>
<td>20</td>
<td>Float Spring</td>
</tr>
<tr>
<td>20</td>
<td>Fuel Valve and Seat Assembly</td>
</tr>
<tr>
<td>8</td>
<td>Fuel Valve and Seat Assembly Gasket</td>
</tr>
<tr>
<td>8</td>
<td>Sight Plug</td>
</tr>
<tr>
<td>8</td>
<td>Sight Plug Gasket</td>
</tr>
<tr>
<td>8</td>
<td>Secondary Metering Body Main Jets (2)</td>
</tr>
<tr>
<td>21</td>
<td>Idle Adjusting Screws (2)</td>
</tr>
<tr>
<td>8</td>
<td>Idle Adjusting Screw Seals (2)</td>
</tr>
</tbody>
</table>

Figure 7. Removing Throttle Body Screws

Figure 8. Disassembly - Fuel Bowls and Metering Bodies
1. Slide out the primary fuel bowl baffle plate.

2. Remove the primary fuel bowl float and hinge retainer "E" and washer, and slide the float and hinge assembly off its stud. The float spring will come off its boss at the same time.

3. Using an open-end wrench, remove the fuel valve and seat assembly, discard the gasket.
4. Remove the four pump diaphragm cover screws and lockwashers. Lift off the diaphragm assembly and diaphragm return spring.

5. Using a box-end wrench, remove the fuel inlet fitting and discard the gasket. Remove the filter screen assembly.

6. Remove the sight plug and gasket. Discard the gasket.

7. Using Kent-Moore Tool No. 10-174, remove the two main jets from the primary metering body.

8. With Kent-Moore Tool No. 10-175, remove the power valve assembly and gasket. Discard the gasket.

9. Remove the spark fitting, if included.
10. From the secondary fuel bowl, remove the secondary fuel bowl baffle plate.

11. Remove the secondary float and hinge “E” retainer and washer. Slide the float and hinge assembly off its stud. The float spring will come off its boss at the same time.

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

13. Remove the sight plug and gasket. Discard the gasket.

14. From the secondary metering body, remove the two main jets, using Kent-Moore Tool No. 10-174.

D. DISASSEMBLY - MAIN BODY ASSEMBLY

The following list contains all the parts to be removed in disassembling the main body assembly. During disassembly discard all gaskets, also parts which have replacements in the Master Repair Kit.

<table>
<thead>
<tr>
<th>PART NAME</th>
<th>Use Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 1 Choke Rod Hair Pin Retainer (Lower)</td>
<td></td>
</tr>
<tr>
<td>23 2 Choke Rod Lever “E” Retainer</td>
<td></td>
</tr>
<tr>
<td>22 3 Choke Rod Lever</td>
<td></td>
</tr>
<tr>
<td>22 4 Choke Rod Lever Spring</td>
<td></td>
</tr>
<tr>
<td>24 5 Secondary Diaphragm Housing Screws &amp; Lockwashers (3)</td>
<td></td>
</tr>
<tr>
<td>22 6 Diaphragm Housing Gasket</td>
<td></td>
</tr>
<tr>
<td>22 7 Diaphragm Cover Screws &amp; Lockwashers (4)</td>
<td></td>
</tr>
<tr>
<td>25 8 Diaphragm Cover</td>
<td></td>
</tr>
<tr>
<td>25 9 Diaphragm Spring</td>
<td></td>
</tr>
<tr>
<td>25 10 Diaphragm Assembly</td>
<td></td>
</tr>
<tr>
<td>26 11 Diaphragm Check Ball</td>
<td></td>
</tr>
<tr>
<td>22 12 Diaphragm Housing</td>
<td></td>
</tr>
<tr>
<td>22 13 Choke Rod Hair Pin Retainer (Upper)</td>
<td></td>
</tr>
<tr>
<td>22 14 Choke Rod</td>
<td></td>
</tr>
<tr>
<td>22 15 Choke Rod Seal Retainers (2)</td>
<td></td>
</tr>
<tr>
<td>22 16 Choke Rod Felt Seal</td>
<td></td>
</tr>
<tr>
<td>27 17 Choke Plate Retainers (2)</td>
<td></td>
</tr>
<tr>
<td>22 18 Choke Plate</td>
<td></td>
</tr>
<tr>
<td>22 19 Choke Shaft</td>
<td></td>
</tr>
<tr>
<td>28 20 Pump Discharge Nozzle Screw</td>
<td></td>
</tr>
<tr>
<td>22 21 Pump Discharge Nozzle</td>
<td></td>
</tr>
<tr>
<td>22 22 Pump Discharge Nozzle</td>
<td></td>
</tr>
<tr>
<td>29 23 Pump Check Ball Gasket</td>
<td></td>
</tr>
<tr>
<td>29 24 Pump Check Ball</td>
<td></td>
</tr>
<tr>
<td>22 25 Fresh Air Fitting - if included</td>
<td></td>
</tr>
</tbody>
</table>

Figure 21. Removing Idle Adjusting Screws

15. Remove the two idle adjusting screws and their seals. Discard the seals.

Figure 22. Disassembly - Main Body Assembly

CHoke ROd LEVER RETAINER

1. Remove the lower choke rod hair pin retainer and the choke rod lever “E” retainer. Slide the choke rod lever and spring off their stud.
3. 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.

4. 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.

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

6. 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.

7. Using a Phillips screwdriver, remove the pump discharge nozzle screw. Remove the pump discharge nozzle and gasket. Discard the gasket.

8. Invert the main body and shake out the pump check ball weight and check ball.

9. Remove the governor air fitting, if included.
E. DISASSEMBLY - THROTTLE BODY ASSEMBLY

The following list contains all parts to be removed in disassembling the throttle body assembly. During disassembly discard all gaskets, also all parts which have replacements in the Master Repair Kit.
2. Using an open-end wrench, remove the governor lever nut and lockwasher. Lift the governor housing off the throttle shaft. Remove and discard the governor body seal.

3. Remove the diaphragm rod retainer and governor lever. Remove the governor line fitting.
4. Remove the governor diaphragm cover safety wire and seal.

5. Remove the four governor diaphragm cover screws and lockwashers. Lift off the diaphragm cover and slide the diaphragm assembly out of the housing.

6. Remove the two governor by-pass jets - if included.

7. Only if necessary, remove the fast idle cam shaft retainer and slide the fast idle cam and shaft assembly out of the governor housing. The cam plunger and plunger spring will fall out. Remove the fast idle cam set screw and fast idle pin.

NOTE
Do not remove the governor spring pin, unless damaged or cleaning is necessary. If removed note correct position. Check Holley Catalog sheets for correct position.

8. Remove the secondary diaphragm lever screw and lockwasher, the lever will come off.

9. Remove the accelerating pump lever retainer and slide the lever off its stud.

10. Remove the two throttle operating housing screws and lockwashers. Slide the housing off its position.
11. Remove the throttle stop screw and spring.

12. Only if necessary, remove the throttle shaft driver screw and lockwasher. Remove the throttle shaft driver, pick-up lever and throttle lever.

13. Remove the two throttle connecting rod retainers and washers. Slide the connecting rod out of its position and remove the spacer.

14. Using an open-end wrench, remove the anti-backfire valve and gasket. Discard the gasket, if included.

15. 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.

16. Remove the four primary throttle plate screws. Slide the plates out of the shaft.

17. Using a drift pin, remove the primary throttle shaft pin.
18. Slide the primary throttle shaft out of the throttle body and remove the three Teflon bushings.

19. Remove the four secondary throttle plate screws and slide the plates out of the shaft.

20. Slide the secondary throttle shaft out of the throttle body and remove the three Teflon bushings.

5. CLEANING AND INSPECTION

A. CLEANING

1. It is recommended that all castings and metal parts except bearings be placed in a metal basket and immersed in a standard carburetor cleaner. If a commercial cleaning solvent is not available, lacquer thinner or denatured alcohol may be used. Avoid lowering the basket into the sediment which collects in the bottom of the container. Agitating the parts while in the solution will insure a more thorough cleaning. After the parts have been sufficiently soaked, they are to be rinsed in hot water to remove all traces of the cleaning solution. Scrub away all remaining foreign matter with a stiff bristle brush (not wire) while rinsing the parts and castings.

2. Dry all parts with compressed air. Compressed air should also be directed through all passages in the castings and through all jets and tubes.

3. Always discard the diaphragm whenever a carburetor is overhauled. Reuse of old diaphragms may cause unsatisfactory carburetor performance.

CAUTION

Carburetor jets and passages should never be cleaned with a drill, wire or similar object. This method of cleaning may distort jets and passages, and effect carburetor performance. A buffing wheel, wire brush, file, or other sharp instrument should not be used to remove carbon deposits, as the protective plating on the part might be removed by scratching or filing.

NOTE

Parts such as the “O” rings, gaskets, diaphragms and felt seals, should never be exposed to the cleaning solvent. Most commercial solvents will deteriorate these parts.

B. INSPECTION

1. MAJOR CASTINGS

Check major castings for cracks, warp-age, stripped threads, damaged gasket mating surfaces, and other damages. The passages in the
13. Remove the two throttle connecting rod retainers and washers. Slide the connecting rod out of its position and remove the spacer.

14. Using an open-end wrench, remove the anti-backfire valve and gasket. Discard the gasket. If included.

15. 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.

16. Remove the four primary throttle plate screws. Slide the plates out of the shaft.

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NOTE

Parts such as the “O” rings, gaskets, diaphragms and felt seals, should never be exposed to the cleaning solvent. Most commercial solvents will deteriorate these parts.

B. INSPECTION

1. MAJOR CASTINGS

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. (Refer to “Operation” for location of passages in the castings.) If any irregularities are found, replace the castings with a new one.

2. FLOAT ASSEMBLIES

Discard and replace the float assemblies if the floats leak, or if the assemblies are corroded or damaged in any way. Shake floats to determine if fuel has leaked into them.

3. CHOKE PLATE AND THROTTLE PLATES

The plates should be discarded if edges are nicked or if the protective plating has been damaged, exposing bare metal to corrosion.

4. CHOKE SHAFT AND THROTTLE SHAFTS

Carefully check the shaft for bending, or nicks. Shafts should be replaced if any irregularities appear on them.

5. CHOKE AND THROTTLE LINKAGE

Discard and replace if any of the linkages are bent or worn. Check all linkages for worn surfaces.

6. SPRINGS

Distorted or broken springs must be replaced.

7. GOVEROR

Check for cracks in the housing and stripped threads. If any irregularities appear, the governor should be replaced.

8. SCREWS, LOCKWASHERS AND NUTS

If stripped threads, distortion, or other damage is found in the screws, lockwashers, and nuts, discard and replace with new parts.

6. REBUILDING

A. REASSEMBLY - THROTTLE BODY ASSEMBLY

1. Place the throttle operating housing plate in position on the throttle body and insert screw and lockwasher.

2. Slide the secondary throttle body with the three Teflon bushings.

NOTE

For easier installing, roll the Teflon bushing between the thumb and first finger. Place the first bushing on the shaft nearest the lever, then slide the shaft almost in position. On the opposite end place another bushing and ease the shaft further in place, then install the middle bushing.

NOTE

See Figure 46 for correct position of throttle shaft levers.

Figure 45. Installing Throttle Shaft

3. Referring to the lines 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.

4. Slide the primary throttle shaft into the throttle body with the three Teflon bushing, using the procedure mentioned in note above.

5. Referring to the lines or figures scribed on the throttle plates during disassembly, install the primary throttle plates. (See Figure 46.) 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 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.

**Figure 46. Correct Position of Throttle Shaft Levers**

**NOTE**

If throttle plates are installed properly they will pivot towards the center of the throttle body, as you look at the top of the throttle body.

6. Install the primary throttle shaft pin with protruding portion of pin extending toward secondary shaft. With primary plate closed the groove in the pin should be facing the base of the throttle body. If pin is not installed in this position it will interfere with governor operation.

7. Place the throttle connecting rod spacer on the connecting rod and with the throttle plates closed install the connecting rod. The spacer will be on the primary throttle shaft side. Install the two washers and retainers.

8. If used, install the anti-backfire valve and new gasket.

9. Position 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. (See Figure 35.)

10. If the secondary diaphragm adjusting screw was removed, install. Check the Holley Catalog sheets for the proper specifications.

11. Install the spark check ball, spring and retainer, if included.

12. Reassemble the governor. Install the fast idle cam set screw and fast idle pin. Install the plunger spring and plunger.

13. Slide the fast idle cam and shaft assembly into the governor housing and install the retainer. With fast idle cam plunger in the fast idle cam recess, the set screw should just clear the fast idle cam.

14. Install the two governor by-pass jets (if included) and the governor fitting.

15. Slide the governor diaphragm into the governor housing. Place the cover in position and install the four cover screws and lockwashers.

**CAUTION**

Be sure diaphragm assembly is aligned with the screw holes in the housing.

16. Place the governor lever in the housing and insert the diaphragm rod on the shorter stud of the lever. Install the diaphragm rod retainer.

17. Place the governor body seal on the governor housing. Slide governor housing on the primary throttle shaft.

18. Insert the end of the throttle shaft into the governor lever and install the governor lever lockwasher and nut.

19. Install the governor spring pin in the same hole it was removed from. Install the governor spring, one end on the spring pin and the other on the larger governor lever stud.

**NOTE**

See Holley Catalog Sheets for proper location of spring pin.

20. Reassemble the throttle operating housing assembly. Install the throttle stop screw and spring. Rotate the screw in until spring tension is felt and then turn 2 additional turns.

21. Position the pick-up lever on the throttle housing with the arm pointed out. Place the throttle lever shaft through the pick-up lever with the throttle lever on the clockwise side of the pickup lever. Place the throttle shaft driver inside the housing and install the screw and lockwasher.

22. Place the throttle operating housing on the throttle body, make certain the throttle lever arm is against the stop on the housing. Install the two screws and lockwashers. Close the primary throttle plates before installing housing.
B. REASSEMBLY - MAIN BODY ASSEMBLY

1. Install the governor air fitting, if included.

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

![Screw
Pump Discharge Nozzle
Gasket
Weight
Check Ball](image)

Figure 47. Pump Discharge Nozzle Assembly

3. Install the pump discharge nozzle and new gasket. Secure with pump discharge nozzle screw.

4. 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.

5. 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 choke upper retainer. Check choke plate for freedom of movement.

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

**NOTE**

When reassembling the secondary diaphragm a new diaphragm assembly must be used. See Holley Catalog sheets for correct main jets and power valve.

7. Place the diaphragm cover on the housing, check to make certain the holes in the cover are aligned with the holes in the diaphragm assembly. Install the four screws and lockwashers.

**CAUTION**

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

8. Place the secondary diaphragm housing in position on the main body, using a new gasket. Install the three screw and lockwashers into the main body.

9. Place the larger "J" shaped hook of the choke rod lever spring on the small arm of the choke rod lever. Slide the spring and choke rod lever on its stud, aligning the choke rod with the hole in the choke rod lever. The smaller "L" shaped hook of the spring should be rotated clockwise to position in the boss. Install the choke rod lever "E" ring retainer and the lower choke rod hairpin retainer.

10. Place the throttle body to main body gasket on the main body and lower the throttle body assembly in position. Install the 8 screws and lockwashers.

**NOTE**

Before lowering throttle body in position check that all passages are aligned with the gasket openings. Also make certain the idle cam arm is under the choke rod lever mating arm.

11. Tilt the governor housing slightly and insert the two new gaskets in the recesses.

12. Place the secondary diaphragm rod on the lever and install the "E" retainer.

13. Install the three governor to main body screws and lockwashers.
4. With an open-end wrench, install the fuel valve and seat assembly, using a new gasket.

![Figure 49. Fuel Valve & Seat Assembly](image)

5. Install the baffle plate.

6. 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 washer and retainer.

7. Consult the Holley Catalog Sheets for the correct float gauge, then with the float bowl inverted, which allows the float to drop to the closed position, check the setting on the gauge. The leg of the gauge with the step should just lightly contact the float. The level of the float may be adjusted by bending the small tab in the float lever which contacts the head of the fuel inlet needle pin. Use a needle-nosed plier or screwdriver for this correction and recheck the float setting after adjustments have been made.

8. 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. Position the fuel bowl and metering body assemblies on the main body and tighten the screws.

NOTE

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

---

14. Position the governor housing cover and install the four screws and lockwashers, also safety wire and seal.

15. Install the choke control lever with the arm upright, and install the lockwasher and nut.

16. Place the accelerating pump lever on its stud and install the "E" retainer.

C. REASSEMBLY - FUEL BOWLS AND METERING BODY ASSEMBLIES

1. Install the two idle adjusting needles and new seals in the secondary metering body.

2. Using Kent-Moore Tool No. 10-174 install the two main jets.

NOTE

See Holley Catalog sheets for correct size main jets.

3. On the secondary fuel bowl, install the sight plug and new gasket.
9. In the primary fuel bowl, install the power valve assembly with a new gasket, on the primary fuel bowl, using Kent-Moore Tool No. 10-175.

10. With Kent-Moore Tool No. 10-174, install the two main jets.

NOTE

See Holley Catalog Sheets for correct main jets and power valve.

11. Install the spark fitting, if included.

12. On the primary fuel bowl, install the sight plug and new gasket.

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

14. On the primary bowl, position the pump diaphragm return spring in the recess and install the diaphragm assembly centered with flat 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 and while holding the lever against the diaphragm to prevent the diaphragm from wrinkling.

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

16. Slide the baffle plate in position.

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

18. Using the correct float gauge, and with the float bowl inverted, this allows the float to drop to the closed position; check the setting on the gauge. The leg of the gauge with the step should just lightly contact the float. The level of the float may be adjusted by bending the small tab in the float lever which contacts the head of the fuel inlet needle pin. Use needle-nosed pliers or screwdriver for this adjustment and recheck the float setting after adjustments have been made.

19. 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 or lubriplate) on the "O" rings and end of the tube, for easier installations.

20. 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.
1. PREPARATION

Make a visual inspection of the exterior of the carburetor before installation. Check to make sure the unit has not been damaged or dirty due to improper storage or mishandling.

2. INSTALLATION ON VEHICLE

Be sure the carburetor mating surface of the intake manifold is clean and free from burrs or damage. Using a new flange gasket, secure the carburetor to the intake manifold with the mounting nuts and lockwashers. Connect the fuel line, distributor vacuum line, choke wire and throttle linkage. Tighten the mounting nuts alternately in a criss cross pattern, a little at a time, to evenly compress the flange gasket. The nuts must be drawn down tightly to prevent leakage between the carburetor and the intake manifold. Check carefully for loose connections. Check for full throttle travel, also complete closing and opening of choke plate.

3. ADJUSTMENTS
   A. ADJUSTING FAST IDLE CAM SET SCREW

   With the fast idle cam plunger in the fast idle cam recess, the set screw should just clear the cam, (using Kent-Moore Tool No. 10-176). This adjustment should be made before adjusting the idle adjusting needles.

   Figure 52. Adjusting Fast Idle Cam Set Screw

   FAST IDLE CAM WRENCH
   KENT-MOORE TOOL NO. 10-176

4. ADJUSTING THE IDLE

   1. Adjustments, to be precise and accurate, must be made when the vehicle is on level ground.

   2. Seat the idle adjusting needles lightly and back each off a full turn if there is any doubt about this not having been done during reassembly.

   NOTE

   Care must be taken when seating the idle adjusting needle not to turn the screw against the seat, grooving the tips of the needle. If the needle becomes grooved, a smooth idle cannot be obtained.

   3. Start the engine and allow the operating temperature to reach normal.

   4. After the engine reaches its normal operating temperature, adjust the throttle stop adjusting screw to idle the engine at the specified rpm.

   5. First set one of the two idle adjusting needles for the highest steady manifold vacuum reading. If a vacuum gage is not available, obtain the smoothest running, maximum idle speed by turning the idle adjusting needle in until the rpm begins to drop off, then backing the needle off over the “high spot” until the rpm again drops off. Set the idle adjusting needle halfway between these two points for a satisfactory idle mixture setting. Then repeat the procedure with the other needle. Final fine adjustment may vary slightly from this setting but should not exceed 1/2 turn difference.

   Figure 53. Carburetor Adjustments
between the screws. Should these adjustments show an increase in idle rpm, reset the throttle stop screw to obtain the specified idle rpm and adjust the idle adjusting needle again.

C. PUMP STROKE ADJUSTMENT

The two holes in the primary throttle shaft lever permit adjustment of the accelerating pump discharge. The lower hole (number 2) provides a maximum pump discharge for extreme cold weather operation. However, for most driving conditions, the upper hole (number 1) should be used.

SERVICE HINTS

Carburetor service should be performed only with the proper equipment. This equipment should include (float setting gages) and special carburetor tools. In addition, the proper specification sheet for the proper engine and carburetor specifications relative to the carburetor being overhauled.

1. INSPECTING THE VEHICLE

Road check the vehicle, if possible, before making any adjustments on the carburetor. Dragging brakes, poor wheel alignment, low tire pressures, and other causes of undue friction should be remedied. Evidence of leakage, dents or clogging in the exhaust system should be corrected. Check for black color of the exhaust for indications of an over rich mixture.

2. INSPECTING THE ENGINE

Many faults may be detected by a visual inspection of the engine in operation. Remedy loose or disconnected wiring, leaking water connections, possible short circuits, slipping fan belts and other faults. Check and correct the following in compliance with the manufacturer’s specifications: distributor breaker points, spark plug gap, ignition timing, condenser capacity, valve setting, compression, and inlet fuel pressure. Check all gaskets and intake manifold for leakage.

3. INSPECTING THE FUEL SYSTEM

The fuel system should be thoroughly inspected. Examine all lines for collapsed sections and for other signs of damage. Make a manual check of fuel lines and connections for looseness or leakage. Check the fuel tank vent to insure that it is unobstructed. Even a partially clogged vent may cause the engine to cut out after a few minutes of high-speed operation. Clean the fuel pump sediment chamber and the fuel filter. With a vacuum gage connected to a “T” in the fuel line leading to the fuel pump, check for air leaks at all ranges of speed. A vacuum reading less than normal at all engine speeds indicates an air leak or a faulty fuel pump. Low pressure leads to a lean mixture and poor performance. Excessive fuel pump pressure may lead to the engine being flooded and will result in poor fuel economy.

4. INSPECTING THE CARBURETOR

Remove the air intake system and then make a preliminary inspection of the carburetor. Check position of the choke plate. With engine running, throttle the engine down to idle and completely close both idle adjusting needles. If the engine continues to run even a short interval after this is done, it may be an indication of several faults. The tips of the idle adjusting needles or their seats are damaged, or there may be carbon deposits in the throttle plates, or else the idle speed is too high.

Stop the engine and check all carburetor connections and linkages. Check the throttle lever for the accelerating pump discharge hole to see that it is correctly positioned for the prevailing climatic conditions.

If it is apparent that the above items are not at fault and the trouble is in the carburetor, remove the carburetor from the engine and disassemble.

Thoroughly clean and inspect each part, using the service manual procedure. The accompanying chart lists specific carburetor complaints and discusses the various parts which may be at fault. A rigorous cleaning and inspection, coupled with the replacement of faulty parts and care in reassembly, should correct the complaint.

NOTE

Many performance complaints attributed to the carburetor may be the result of poor driving habits, topography and/or weather conditions.
# TROUBLE SHOOTING CHART

<table>
<thead>
<tr>
<th>TROUBLE</th>
<th>PROBABLE CAUSE</th>
<th>CORRECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Hard starting.</td>
<td>(a) Incorrect idle adjustments.</td>
<td>(a) Perform all idle adjustments.</td>
</tr>
<tr>
<td></td>
<td>(b) Binding linkage, or choke plate.</td>
<td>(b) Repair or replace defective parts.</td>
</tr>
<tr>
<td></td>
<td>(c) Improper fuel level.</td>
<td>(c) Adjust fuel level.</td>
</tr>
<tr>
<td>(2) Stalling when accelerator is released suddenly.</td>
<td>(a) Binding choke linkage.</td>
<td>(a) Repair or replace defective parts.</td>
</tr>
<tr>
<td></td>
<td>(b) Incorrect idle adjustment.</td>
<td>(b) Perform all idle adjustments.</td>
</tr>
<tr>
<td></td>
<td>(a) Improper idle adjustments.</td>
<td>(a) Perform all idle adjustments.</td>
</tr>
<tr>
<td></td>
<td>(b) Damaged tip on idle mixture screws.</td>
<td>(b) Replace screws.</td>
</tr>
<tr>
<td></td>
<td>(c) Clogged air bleeds or idle passages.</td>
<td>(c) Clean with solvent and compressed air.</td>
</tr>
<tr>
<td></td>
<td>(d) Leaking intake manifold and carburetor gaskets.</td>
<td>(d) Replace leaking gaskets.</td>
</tr>
<tr>
<td></td>
<td>(e) Throttle plates not closing.</td>
<td>(e) Position throttle plates correctly. Remove carbon in throttle bore.</td>
</tr>
<tr>
<td></td>
<td>(f) Improper throttle stop adjustment.</td>
<td>(f) Adjust throttle stop screw.</td>
</tr>
<tr>
<td></td>
<td>(g) Improper fuel level.</td>
<td>(g) Adjust fuel level.</td>
</tr>
<tr>
<td></td>
<td>(h) Improper fast idle cam adjustment.</td>
<td>(h) Perform all idle adjustments.</td>
</tr>
<tr>
<td></td>
<td>(i) Leak around governor diaphragm.</td>
<td>(i) Check complete governor.</td>
</tr>
<tr>
<td>(4) Poor low-speed operation.</td>
<td>(a) Idle adjusting screws unequally adjusted.</td>
<td>(a) Perform all idle adjustments.</td>
</tr>
<tr>
<td></td>
<td>(b) Clogged idle transfer slots.</td>
<td>(b) Remove and clean carburetor with solvent and blow out holes with compressed air.</td>
</tr>
<tr>
<td></td>
<td>(c) Restricted idle air bleeds and passages.</td>
<td>(c) Remove and clean carburetor with solvent. Blow out passages with compressed air.</td>
</tr>
<tr>
<td>(5) Faulty acceleration.</td>
<td>(a) Improper accelerator pump stroke.</td>
<td>(a) Adjust accelerator pump stroke.</td>
</tr>
<tr>
<td></td>
<td>(b) Inoperative pump discharge check ball.</td>
<td>(b) Clean or replace.</td>
</tr>
<tr>
<td></td>
<td>(c) Worn or damaged accelerator pump diaphragm.</td>
<td>(c) Replace diaphragm.</td>
</tr>
<tr>
<td></td>
<td>(d) Leaking main body gasket.</td>
<td>(d) Replace gasket.</td>
</tr>
<tr>
<td>TROUBLE</td>
<td>PROBABLE CAUSE</td>
<td>CORRECTION</td>
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<td>---------------------------------------------</td>
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<td>--------------------------------------------------</td>
</tr>
<tr>
<td>(6) Surging (Cruising speeds to top speeds.)</td>
<td>(a) Clogged main jets.</td>
<td>(a) Clean main jets with solvent and blow out jets with compressed air.</td>
</tr>
<tr>
<td></td>
<td>(b) Undersized main jets.</td>
<td>(b) Replace main jets.</td>
</tr>
<tr>
<td></td>
<td>(c) Low fuel level.</td>
<td>(c) Adjust fuel level.</td>
</tr>
<tr>
<td></td>
<td>(d) Low fuel pump pressure or volume.</td>
<td>(d) Test fuel pump.</td>
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<tr>
<td></td>
<td>(e) Blocked air bleeds.</td>
<td>(e) Clean with solvent and blow out bleeds with compressed air.</td>
</tr>
<tr>
<td></td>
<td>(f) Clogged filter screen.</td>
<td>(f) Clean with solvent and blow out with compressed air.</td>
</tr>
<tr>
<td>(7) Reduced top speed.</td>
<td>(a) Clogged secondary metering passages.</td>
<td>(a) Clean with solvent and blow out with compressed air.</td>
</tr>
<tr>
<td></td>
<td>(b) Leaking secondary throttle operating diaphragm or housing gasket.</td>
<td>(b) Replace diaphragm or gasket.</td>
</tr>
<tr>
<td></td>
<td>(c) Low fuel pump volume.</td>
<td>(c) Test fuel pump.</td>
</tr>
<tr>
<td></td>
<td>(d) Secondary linkage, throttle plates or shaft binding.</td>
<td>(d) Free up linkage and position throttle plates.</td>
</tr>
<tr>
<td></td>
<td>(e) Clogged vacuum passage to venturi.</td>
<td>(e) Clean with solvent and blow out passage with compressed air.</td>
</tr>
<tr>
<td></td>
<td>(f) Air leak at secondary metering body gasket.</td>
<td>(f) Replace gasket.</td>
</tr>
<tr>
<td></td>
<td>(g) Power valve stuck.</td>
<td>(g) Clean or replace.</td>
</tr>
<tr>
<td></td>
<td>(h) Improper size, or obstructed main jets.</td>
<td>(h) Clean or replace.</td>
</tr>
<tr>
<td></td>
<td>(i) Faulty choke operation.</td>
<td>(i) Check choke operation.</td>
</tr>
<tr>
<td>(8) No governor action.</td>
<td>(a) Damaged or leaky diaphragm.</td>
<td>(a) Replace diaphragm.</td>
</tr>
<tr>
<td></td>
<td>(b) Damaged or leaky vacuum lines.</td>
<td>(b) Replace defective parts.</td>
</tr>
<tr>
<td></td>
<td>(c) External vacuum source line and spinner line interchanged.</td>
<td>(c) Change lines with Tee restriction on external source line.</td>
</tr>
<tr>
<td>(9) Excessive engine speed.</td>
<td>(a) Spinner valve set too high.</td>
<td>(a) Check specification for proper size.</td>
</tr>
<tr>
<td></td>
<td>(b) Plugged vacuum lines or leak in spinner line.</td>
<td>(b) Check all lines and by-pass jets.</td>
</tr>
</tbody>
</table>