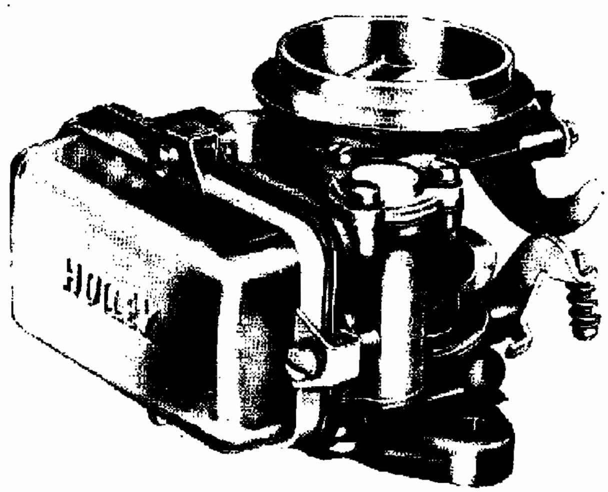
CARBURETOR

MODEL NO. 1904

FOR

INTERNATIONAL HARVESTER CO.



DOWNDRAFT CARBURETOR

AUGUST 1953

HOLLEY Carburetor Co.

SERVICE MANUAL

VAN DYKE, MICHIGAN U.S.A. . . . PUBLICATIONS DEPARTMENT

CARBURETOR MODEL 1904

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INTRODUCTION

The Holley Carburetor Model 1904 is a notable advance in carburetion engineering. It combines the time-proved Holley characteristics of efficiency, dependability, and effective performance in a compact unit of outstanding simplicity.

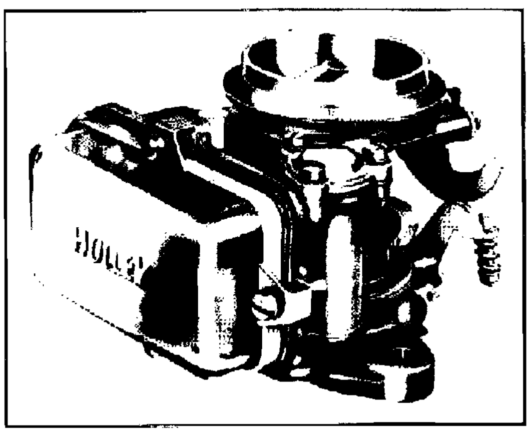
The elimination of the conventional air horn has resulted in a carburetor less than two thirds the height, but having a capacity comparable to units of standard design. By locating the choke plate in the venturi, the elimination of the air horn has been accomplished with no loss in efficiency or performance. In addition, the arrangement of the mixture discharging components in relation to the choke plate when open, aids in the distribution and vaporization of the fuel discharged into the airstream passing through the venturi.

In line with the advanced engineering conception of this carburetor is the transparent fuel bowl of most versions of this carburetor model. This transparent fuel bowl greatly simplifies trouble shooting and carburetor servicing. Overhaul procedure also has been simplified by combining most of the fuel metering elements of the carburetor in a single, easily replaceable assembly.

Close attention to design details has resulted in the improvement of various other parts. A spring arrangement is incorporated in the fuel inlet needle to cushion float movement and act as a vibration dampener to stabilize the fuel level on rough roads. The conventional economizer piston and accelerating pump piston have been replaced by neoprene diaphragms to insure more positive action and increased service life.

This manual includes a full factory-approved overhaul procedure together with much valuable information on the description, operation, and adjustment of the Carburetor Model 1904. Careful adherence to the procedures given in overhauling this carburetor will insure the retention of the high standard of economical, efficient, and dependable performance, characteristic of all Holley products, which is delivered by this carburetor.

DESCRIPTION



HOLLEY CARBURETOR MODEL 1904 STANDARD ENGINE

1. DESIGN

The Holley Carburetor Model 1904 is a single-barrel downdraft unit of advanced design. This carburetor is a model of noteworthy compactness and simplicity with its many new features assur

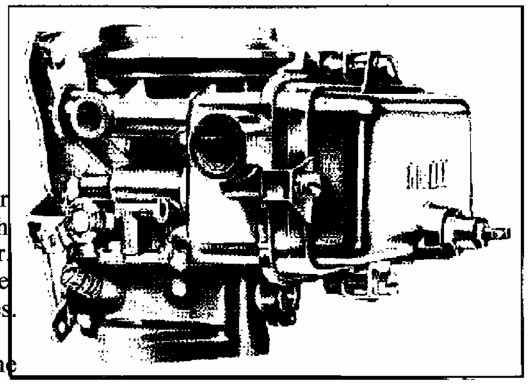
ing lasting, effective, and dependable service.

Most versions of this carburetor model contain a tempered glass fuel bowl which permits visual inspection of the float chamber. The action of the float and of the economizer stem during operation can be readily observed. Fuel level is clearly visible and the presence of water or sediment in the float chamber is readily detected.

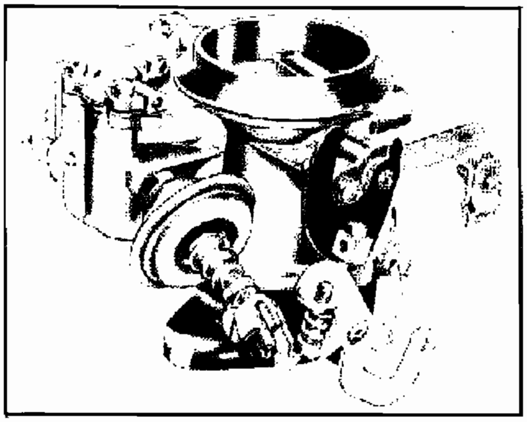
Fuel from the carburetor fuel inlet discharges below the fuel level in the float chamber to prevent foaming or splashing, assuring a constant, uninterrupted fuel flow to the metering components of the carburetor. Fuel in the float chamber circulates completely around the easily removable main well and economizer body which contains most of the fuel metering elements and passages. This circulation has a cooling effect on the fuel being metered through the passages in the main well and economizer body. In addition to that factor, the high-lift design of the carburetor main well gives this carburetor excellent hot operation and anti-percolation qualities.

Improved control of the power enrichment system is assured by a unique diaphragm-type economizer. This type of economizer, which may be removed without disassembling the remainder of the carburetor, insures accurate response to variations in engine load conditions.

These new features have been incorporated in this carburetor in conjunction with many of the time-proved engineering refinements found in other Holley carburetor models. The carburetor is fully sealed and balanced, with all air bleeds and vents being open only to the air cleaner. This filtered air supply gives added protection against the accumulation of foreign matter in the carburetor passages. The main jet and other fuel metering components are individually flow tested to insure proper calibration of the carburetor. Smoother acceleration is assured by the prolonged discharge of fuel provided by the spring overriding feature of the diaphragm type accelerating pump. The fully-automatic vacuum-actuated power enrichment system of improved design provides the enriched mixture required for high power operation.



HOLLEY CARBURETOR MODEL 1904
WITH ALTITUDE ADJUSTMENT



HOLLEY CARBURETOR MODEL 1904 FOR AUTOMATIC TRANSMISSION ENGINE

2. APPLICATION

This carburetor model is used on the International Harvester Company 220 SD, 240 SD, 269 BD, 282 BD (C. O. E.), and 282 BD truck engines.

NOTE

Carburetor part numbers and other information applicable to specific I.H.C. vehicles may be obtained from the current Holley Carburetor Parts Catalog Sheets for these carburetors.

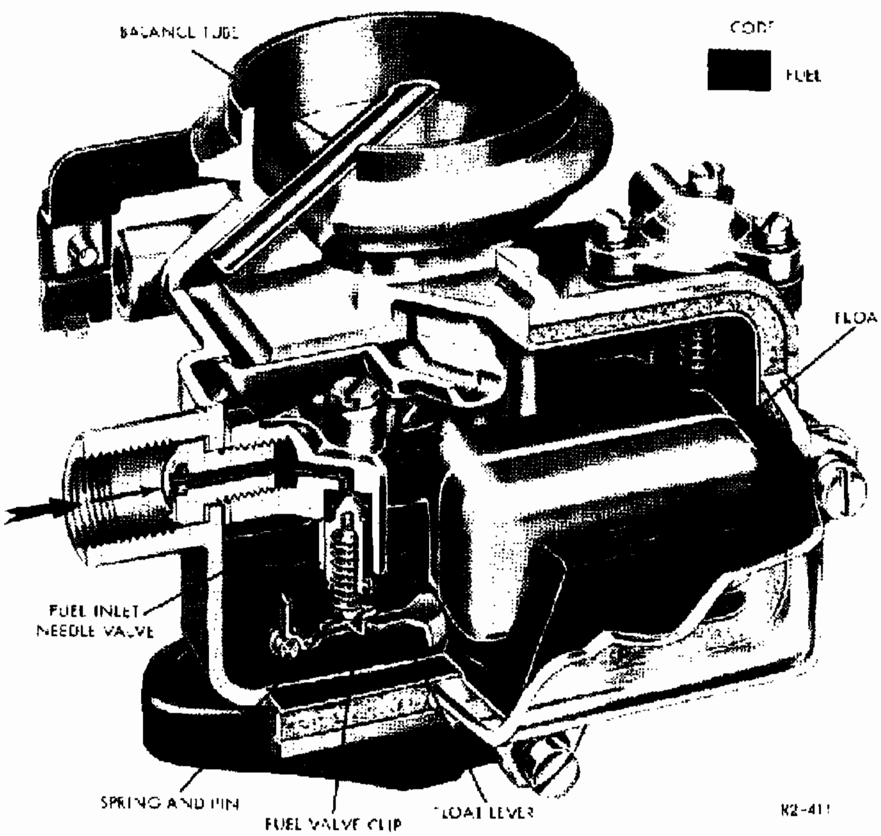
3. MAJOR SUBASSEMBLIES

This carburetor model is composed of two subassemblies: the main body assembly and the throttle body assembly. The die cast main body contains the float and fuel inlet valve, the fuel bowl, the carburetor air inlet, the venturi, the choke mechanism, the economizer diaphragm and stem assembly, the accelerating pump, the main well and economizer body assembly, the main nozzle, and the pump discharge nozzle. Included in the main well and economizer body assembly are a large part of the various fuel metering components and fuel passages of the carburetor. The cast iron throttle body contains the throttle plate, the idle discharge ports, the distributor vacuum port, and the idle speed and mixture adjusting screws.

On the carburetor used with automatic transmission engines, the dashpot assembly is mounted on a boss on the side of the main body.

OPERATION

The fuel-air requirements of an automotive engine vary considerably throughout its range of operation. To assure effective carburetion, the carburetor must supply an efficient but economical mixture for normal cruising conditions, a richer mixture when a high power output is desired,



FUEL INLET SYSTEM

and a still richer mixture for a smooth idle and low speed performance. In order to supply the correct mixture to the engine under all operating conditions, the Holley Carburetor Model 1904 has four basic fuel metering systems. These are the main metering system, the idle system, the power enrichment system, and the accelerating pump system. In addition, there is a fuel inlet system which provides the four basic fuel metering systems with a constant supply of fuel, and the choke system which provides a means of temporarily enriching the mixture to aid in starting and running a cold engine.

1. FUEL INLET SYSTEM

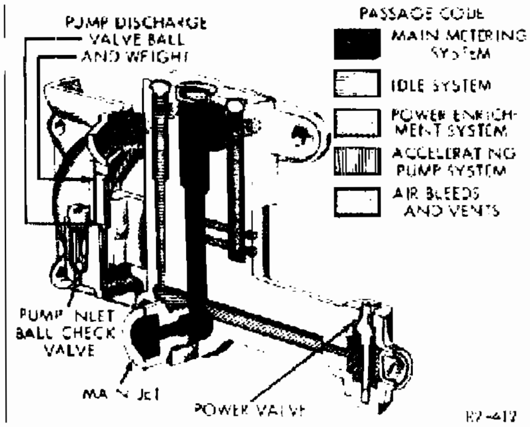
The fuel inlet system provides the four basic fuel metering systems and the choke system of the carburetor with a constant supply of fuel. This fuel, under pressure from the engine's fuel pump, enters the carburetor through the fuel inlet needle valve and seat assembly and flows into the float chamber. The float, rising and falling with the fuel level in the float chamber, moves the fuel inlet needle in relation to its seat to regulate the amount of fuel entering the carburetor. When the fuel in the float chamber reaches a specified level, the float moves the needle valve to a position to restrict the flow of fuel. Only enough fuel to replace that being used will then be admitted. 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 the proper fuel level. The fuel inlet system must constantly maintain this specified level of fuel because the basic fuel metering systems are calibrated to deliver the proper mixtures when the fuel is at the specified level only.

A spring and pin inside the hollow fuel inlet needle valve cushion the needle valve for protection against road shocks and vibration. A fuel valve clip, attached to the bottom of the needle valve, fits under the tab of the float lever to insure proper response of the needle when the float drops.

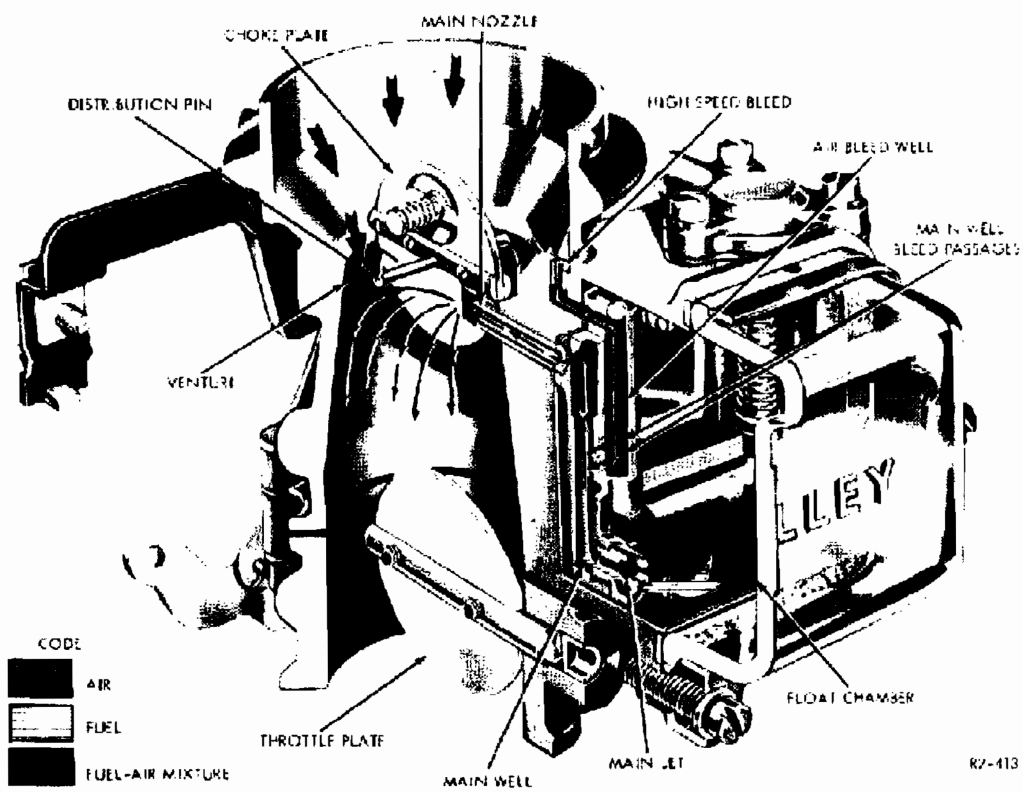
A balance tube in the air inlet of the carburetor bore vents the float chamber to maintain balanced air pressures in that chamber, assuring proper fuel metering in all phases of engine operation.

2. MAIN WELL AND ECONOMIZER BODY

Fuel in the float chamber is distributed to the fuel passages of the four basic fuel metering systems through the main well and economizer body. A study of the passages in this assembly will insure a clearer understanding of the explanation of the operation of the four fuel metering systems.



MAIN WELL AND ECONOMIZER



MAIN METERING SYSTEM

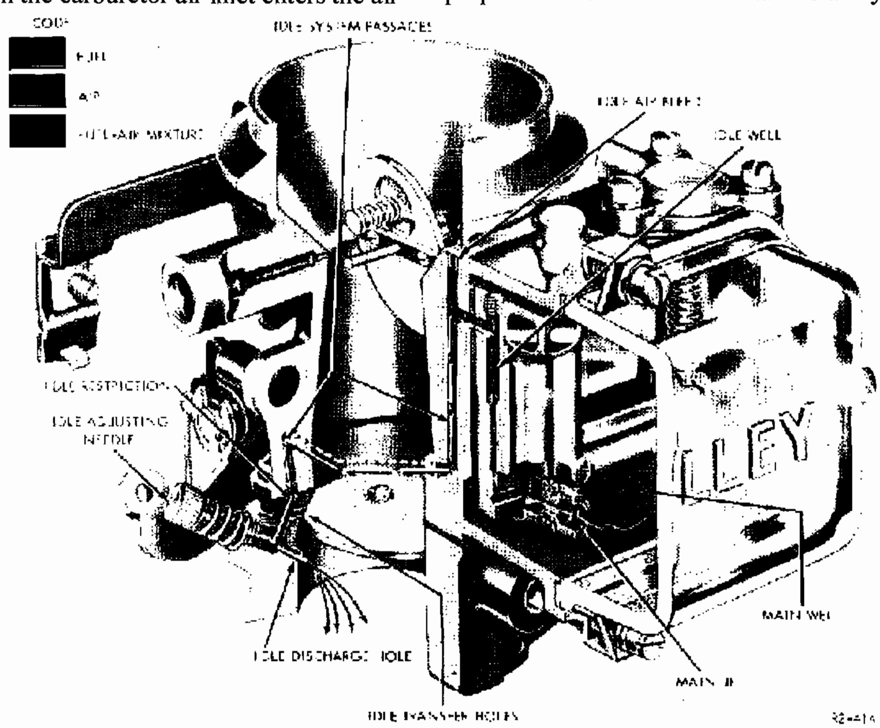
3. MAIN METERING SYSTEM

When the engine is running, the intake stroke of each piston draws air through the carburetor. As this air passes through the venturi of the carburetor, the drop in pressure in the venturi creates what is commonly called a vacuum. The strength of that vacuum varies in proportion to the velocity of the air flow through the venturi. This, in turn, is governed by the speed and power output of the engine.

At normal cruising speeds, the difference between the normal, atmospheric air pressure in the float chamber and the vacuum in the venturi is used to operate the main metering system. This pressure differential draws a metered flow of fuel from the float chamber through the main metering system and out the main nozzle into the air stream in the venturi. When the fuel passes out of the float chamber, it is metered (or measured) by the main jet as it flows into the bottom of the main well.

The fuel moves up the main well past the two narrow air bleed passages and enters the main nozzle. Filtered air from the carburetor air inlet enters the air speed bleed and passing out the two narrow air bleed passages is mixed with the fuel flow in the main well. The high speed bleed meters a properly increasing amount of air into the fuel as speeds increase, stabilizing the fuel discharge and maintaining the required mixture ratios. This emulsion of fuel and air, being lighter than the raw fuel, has a more instantaneous response to any change in venturi vacuum and is more readily vaporized than raw fuel upon being discharged into the air stream. The fuel flows through the main nozzle and is sprayed onto the open choke plate in the venturi. Airstream turbulence over the distribution pin and choke plate distributes the fuel over the lower portion of the choke plate where it is vaporized and mixed with the air flowing through the carburetor.

The throttle plate controls the amount of fuel-air mixture admitted to the intake manifold, regulating the engine speed and power output in accordance with accelerator pedal movement. The distribution pin extending perpendicularly from both sides of the choke plate creates a turbulence as an aid to the proper distribution of the mixture to all cylinders of



IDLE SYSTEM

At the idle and low speeds, the velocity of the air flowing through the carburetor is reduced and the vacuum created in the venturi will not be strong enough to operate the main metering system. Because of the restriction of the air flow through the carburetor due to the nearly closed throttle plate, intake manifold vacuum will be high. This high manifold vacuum provides a pressure differential which is used to operate the idle system.

At the idle, fuel flows through the main jet into the bottom of the main well. The high manifold vacuum acting on this fuel through the idle system passages draws the fuel from the main well through a short horizontal passage into the idle well. A calibrated restriction in the lower portion of the idle well meters the flow of fuel entering the idle system. The fuel passes out the top of the idle well and into the idle system passages in the main body. A metered flow of air from the idle air bleed is admitted to the fuel as it enters the idle passage in the main body. The idle air bleed also serves to vent the idle system to prevent any siphoning effect at higher speeds or when the engine is stopped. This mixture of fuel and air continues down, flowing through the idle restriction and, passing the two idle transfer holes in the throttle body, is discharged through the idle discharge hole into the strong manifold vacuum existing below the throttle plate. The two idle transfer holes act as additional air bleeds at the idle. An idle adjusting needle, which seats in the idle discharge hole, controls the discharge of fuel at the idle and provides a means for adjusting the idle mixture of the engine. Turning the idle adjusting needle in moves the pointed tip of the needle closer to its seat, restricting the fuel flow out of the idle discharge hole. This results in a leaner idle mixture. Conversely, turning the needle out allows more fuel to flow out the idle discharge hole to provide a richer idle mixture.

During off-idle operation, which occurs when the throttle plate is moved open slightly past the two idle transfer holes, each hole begins discharging fuel as it is exposed to manifold vacuum. As the throttle plate is opened still wider and engine speed increases, the velocity of the air flow through the carburetor is also increased. This creates a vacuum in the venturi strong enough 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 a smooth, even transition from idle to cruising speeds.

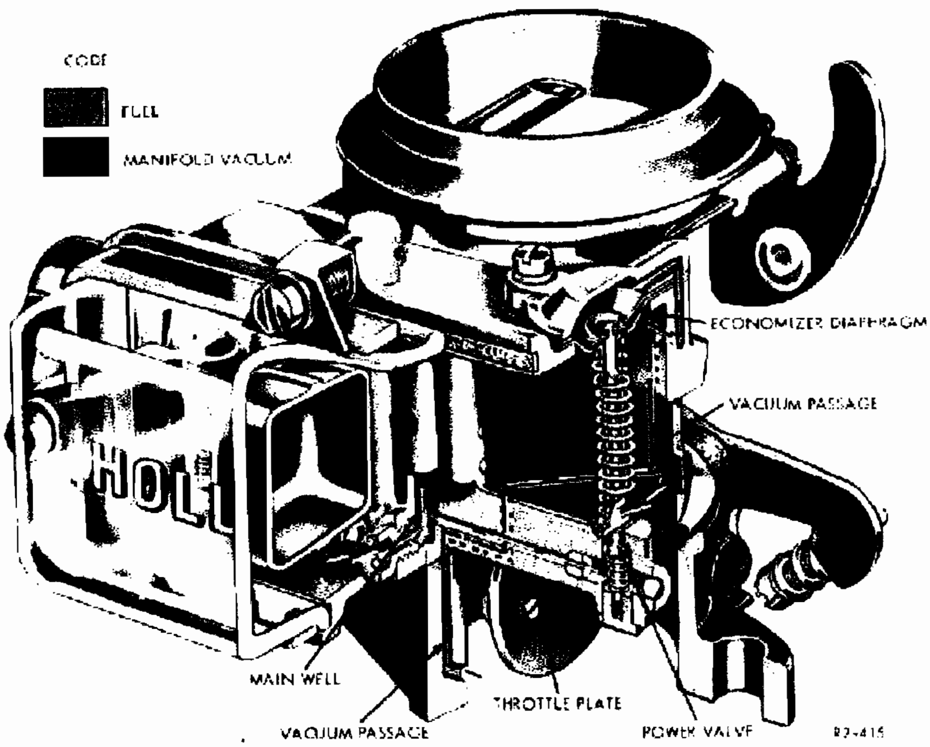
S. POWER ENRICHMENT SYSTEM

When high power output is required, a richer mixture must be provided than is required for normal cruising when no great load is placed on the engine. The carburetor provides the added fuel for high power operation by means of the power enrichment system, sometimes called the economizer system.

The power enrichment system is actuated by manifold vacuum. Manifold vacuum, which is strongest at the idle when there is no load on the engine, is reduced in proportion to the increase in engine loading. This is due to the fact that, as the load on the engine is increased, the throttle plate must be opened wider to maintain any given speed. Manifold vacuum will be reduced because the restriction offered to the air flow entering the intake manifold by the throttle plate will be lessened as the plate is opened. The strength of the manifold vacuum is thus an accurate indicator of the power demands placed on the engine..

Manifold vacuum acting on the economizer diaphragm actuates the power enrichment system. This vacuum from the lower portion of the throttle bore below the throttle plate is transmitted through the vacuum passage to the vacuum chamber on top of the economizer diaphragm. At idle and normal cruising speeds, the vacuum acting on the economizer diaphragm is strong enough to hold the diaphragm up against the tension of the diaphragm. spring. This raises the economizer diaphragm stem clear of the power valve and the power valve will be held in the closed position by the tension of its spring. The power enrichment system will thus be inoperative in conditions of high manifold vacuum.

When high power demands place a greater load on the engine, manifold vacuum is reduced. When the vacuum is reduced below a predetermined point, the diaphragm can no longer overcome the tension of the diaphragm spring and the stem will be forced down. This depresses the pin in the center of the power valve, opening the valve. Fuel from the float chamber will flow into the valve and, passing through a horizontal passage, enter the main well. There it is added to the fuel flow of the main metering system, enriching the mixture for full power. The drilled plug in the passage between the power valve and the main well is a calibrated restriction which meters the flow of fuel through the power enrichment system.



POWER ENRICHMENT SYSTEM

6. ACCELERATING PUMP SYSTEM

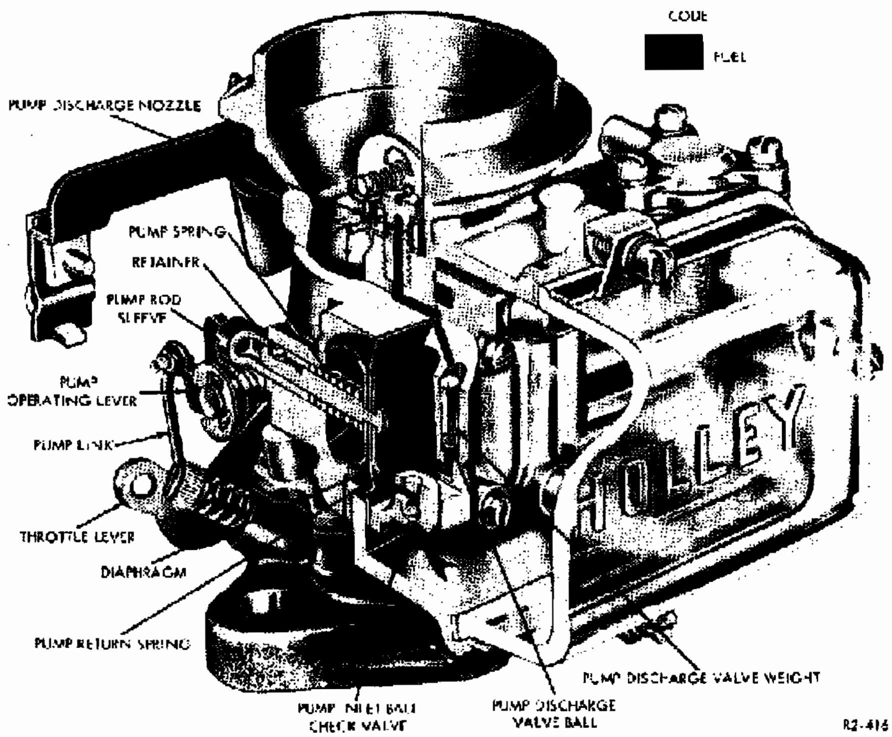
The air flowing through the carburetor responds almost immediately to any increase in throttle opening. There is, however, a brief interval before the relatively heavier fuel-air mixture in the narrow carburetor passages can gain speed and maintain the desired balance of fuel and air. The accelerating pump system operates during this interval, supplying fuel until the other systems can provide the proper mixture.

When the throttle is closed, the pump return spring forces the pump diaphragm toward the back of the pump chamber, drawing fuel into the chamber through the pump inlet. The pump inlet contains a ball check valve which opens to admit fuel from the float chamber into the pump chamber, and closes when the pump is operated to prevent a reverse flow of fuel.

When the throttle is opened, the movement is transmitted by the pump link to the pump operating lever. That lever presses the pump rod sleeve inward, compressing the pump spring. The pump spring, in turn, presses on the diaphragm, forcing the fuel from the pump chamber into the pump discharge passage. The "overriding" feature provided by the pump spring assures an even, prolonged discharge of fuel regardless of how suddenly the throttle is opened and cushions the action of the pump to prevent damage to the pump linkage due to those sudden throttle movements.

The fuel, under pressure from the diaphragm, flows through the pump discharge passage and, forcing the pump discharge ball check valve and weight up, passes into the pump discharge nozzle screw. The pump discharge ball check valve seals the passage when the pump is not discharging fuel. The hexagonal weight holds the ball check valve on its seat to prevent a loss of fuel from the pump chamber due to the siphoning effect of the airstream at high engine speeds.

Flowing up the hollow pump discharge nozzle screw, the fuel passes out holes in the head of the screw into the pump discharge nozzle and is sprayed into the airstream in the venturi. A slot cut into the pump discharge nozzle vents the system to prevent the pump discharge ball check valve and weight from being lifted and fuel drawn from the pump chamber by the siphoning tendencies of the airstream at high engine speeds.



ACCELERATING PUMP SYSTEM

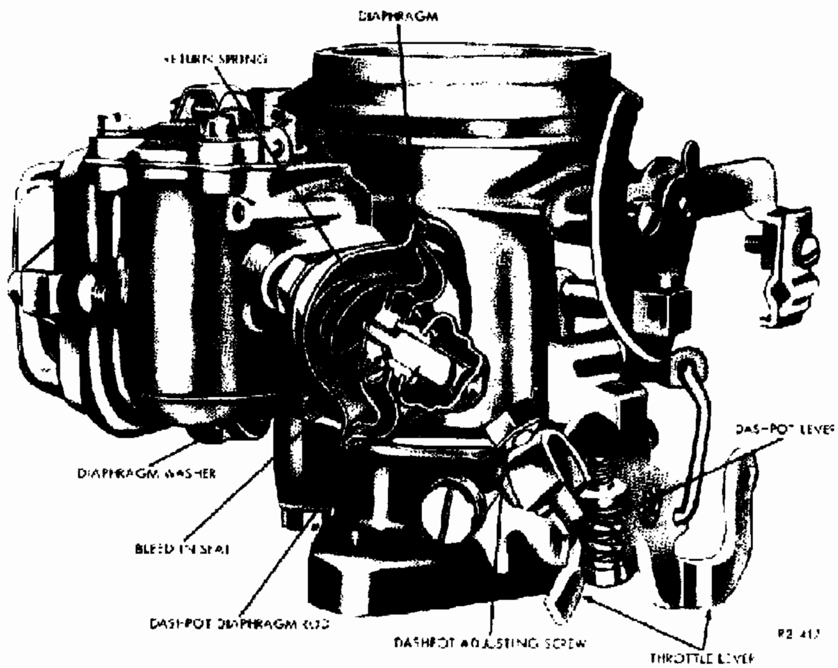
7. CHOKE SYSTEM

n a coldengine, much of the vaporized fuel from the arburetor condenses to a liquid on contact with the low-ressure area and cold surfaces of the intake manifold. This esults in an inefficient distribution of fuel to the cylinders, ausing hard starting, rough running, stalling, and loss of ower. The choke plate is the means used to provide an nriched flow of fuel to aid in starting and warming-up a old engine. Closing the choke plate which is located in the enturi, confines manifold vacuum within the carburetor nd draws a rich flow of fuel from the idle and main netering systems. When the engine starts, enough air is lrawn through the spring-loaded poppet valve in the choke late to enable the engine to run and to prevent flooding. The throttle plate opening is increased by the fast idle cam luring choking to allow the engine to operate at a fast idle o prevent stalling. The fast idle cam, which is a curved xtension of the choke lever, contacts the throttle stop screw nd prevents the throttle plate from closing completely vhen the engine is choked.

8. DASH POT

Engines equipped with automatic transmissions require an anti-stall device as protection against loading the engine when the accelerator pedal is suddenly depressed and released. This protection is provided by the dashpot. The dashpot retards the closing rate of the throttle plate as it approaches the idle position, allowing the engine to dissipate the raw fuel discharged into the intake manifold by the accelerating pump.

The dashpot slows the final phases of throttle plate closing by means of a spring-loaded diaphragm. When the accelerator pedal is released, the throttle return spring in the throttle linkage closes the throttle plate simultaneously with the release of the pedal. As the throttle plate approaches the idle position, a tab on the throttle lever contacts the lower edge of the dashpot lever. This rotates the dashpot lever, causing the head of the dashpot adjusting screw of the dashpot lever



DASHPOT-(AUTOMATIC TRANSMISSION)

to impinge on the dashpot diaphragm rod. As the rod is moved into the dashpot, the tapered step of the rod engages the diaphragm washer. Continued movement of the rod will cause a corresponding movement of the diaphragm, compressing the air in the diaphragm chamber above the diaphragm. The compressed air bleeds out of the diaphragm chamber through a groove in the seat of the diaphragm washer, retarding the closing speed of the throttle plate. This allows the engine to properly use the charge of accelerating fuel, preventing stalling from an over-rich condition in the manifold.

When the throttle is again opened, the pressure is released from the dashpot diaphragm rod and the dashpot return spring moves the rod off its seat in the diaphragm washer. This allows air to flow back into the diaphragm chamber. After moving the rod off its seat, the spring returns the rod and diaphragm to their original position.

OVERHAUL

1. INTRODUCTION

The proper overhaul of the carburetor requires that it is completely disassembled and each part is thoroughly cleaned. Each clean part should then be examined for signs of wear, damage, or deterioration. Defective parts should be replaced with genuine Holley replacement parts and the carburetor should be carefully rebuilt. Care in rebuilding and accuracy in adjusting the carburetor will insure the continuation of the characteristics of power, economy, and performance engineered into every Holley carburetor.

2. SPECIAL TOOLS AND IMPROVISED TOOLS

This carburetor may be overhauled using ordinary tools if a reasonable amount of care is exercised. Overhaul will be facilitated, however, and damage to parts avoided if factory-approved tools are used. The special tools recommended for use in the overhaul of this carburetor are listed below.

TOOL	SNAP-ON TOOL NO.	HOLLEY TOOL
Main Jet Wrench	TMC-36	82R-49
Power Valve Wrench (Used for fuel inlet seat retainer screw)	MC-128	82R-34
Float Gauge	MC-164	82R-53

In addition to the special tools listed above, a simple tool for removing or installing the distribution pin may be mprovised. Obtain a section of brass tubing at least three nches long with an inside diameter of 1/8 inch (or slightly .arger if that size is not obtainable), a length of 1/8 inch or .arger drill rod (or a flat-tip punch having an end diameter of a least 1/8 inch), and a length of No. 52 or 1/16 inch diameter drill rod. "These improvised tools are to be used as described in the overhaul procedure that follows.

REFER TO FIGURE NO.	ORDER OF REMOVAL	PART NAME
2	1	Pump Link Cotter Pin
3	2	Throttle Body Screws and Lockwashers (2)
	3	Throttle Body Gasket

3. MASTER REPAIR KITS

The Master Repair Kits contain Holley replacements for parts which are subject to wear or may be damaged in disassembly. The disassembly procedure ncludes instructions to discard all parts for which replacements are provided in the Master Repair Kit. The proper kit for this carburetor is listed in the current Holley Carburetor Parts Catalog Sheets for these carburetors.

4. DISASSEMBLY

A. PREPARATION

During disassembly, use separate containers for the component parts of both major subassemblies; the main body assembly, and the throttle body assembly. Cleaning, inspection, and reassembly will be facilitated by use of separate containers.

B. DISASSEMBLY-MAIN BODY ASSEMBLY FROM THROTTLE BODY ASSEMBLY

The following list contains all parts removed in separating the main body assembly from the throttle body assembly. Parts to be discarded and replaced from a Master Repair Kit are marked with an asterisk (*).

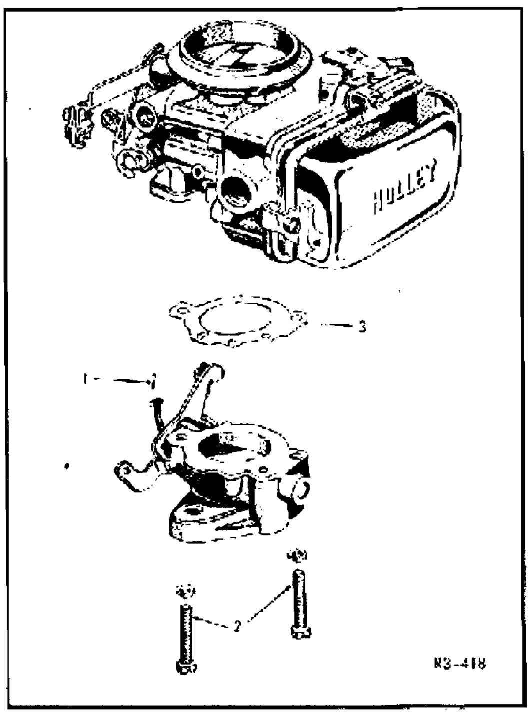


Figure I. Disassembly - Two Maior Subassemblies

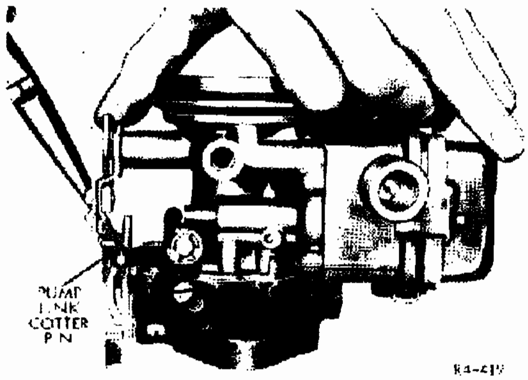


Figure 2. Removing Pump Link Cotter Pin

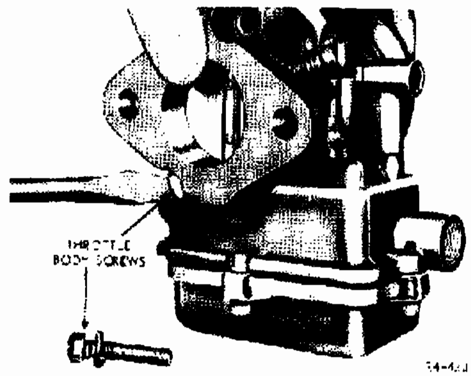


Figure 3. Removing Throttle Body Screws

(1) Remove and discard the upper pump link cotter pin. Disengage the upper end of the pump link from the pump operating lever.

(2) Remove the two throttle body screws and lockwashers. Separate the throttle body and main body and discard the throttle body gasket.

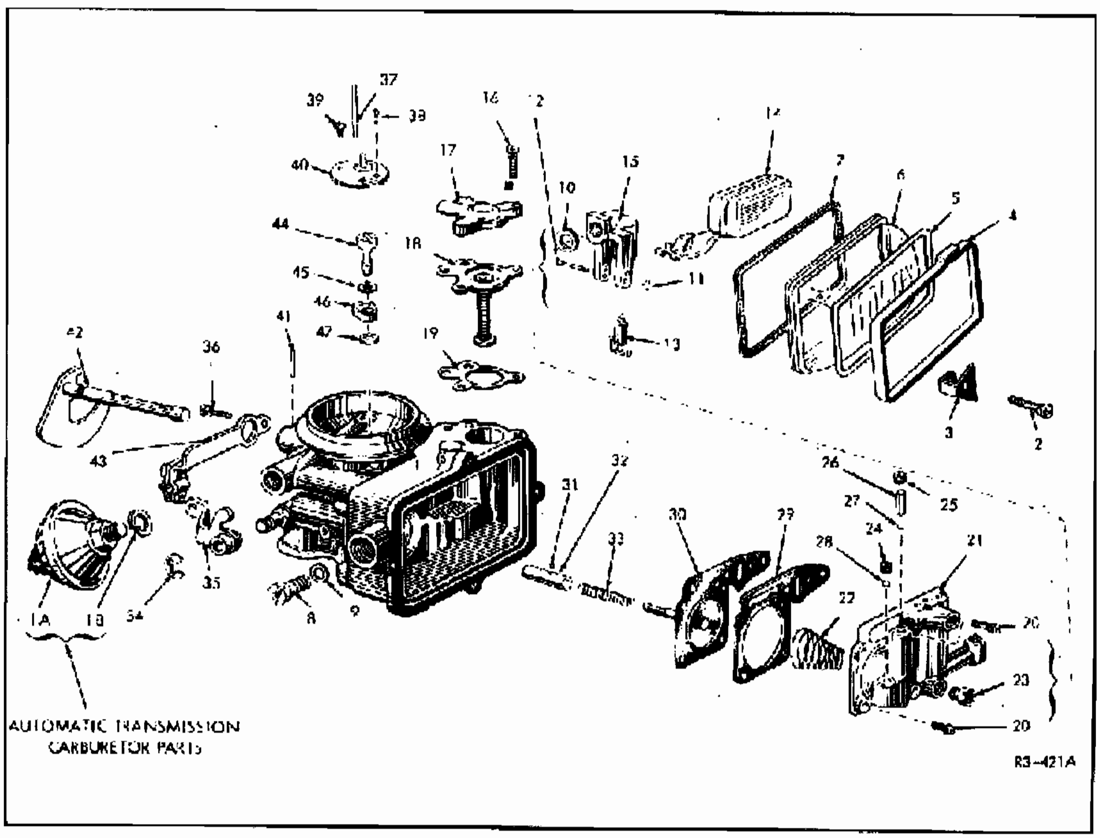


FIGURE 4. DISASSEMBLY - MAIN BODY ASSEMBLY

C. DISASSEMBLY-MAIN BODY

in disassembling the main body assembly. Parts to be discarded and replaced from a Master Repair Kit are marked with an asterisk (*).

REFER TO FIGURE NO.	ORDER OF REMOVAL	PART NAME	REFER TO FIGURE NO.	ORDER OF REMOVAL	PART NAME
5	1A	Dashpot Assembly	15	24	Pump Inlet Check Valve Retainer
5	1B	Dashpot Lockwasher	15	25	Pump Discharge Valve Retainer
6	2	Clamp Ring Retainer Screw and Lockwasher (4)	16	26	Pump Discharge Valve Weight
6	3	Clamp (4)	16	27	Pump Discharge Valve Ball
6	4	Clamp Ring	16	28	Pump Inlet Valve Ball
	5	Clamp Ring Gasket *	17	29	Spacer Gasket
6	6	Fuel Bowl	17	30	Pump Diaphragm and Rod Assembly *
	7	Fuel Bowl Gasket *	18	31	Pump Rod Sleeve Retainer Ball
7	8	Fuel Inlet Seat Retainer Screw *	18	32	Pump Rod Sleeve
	9	Fuel Inlet Seat Retainer Screw Gasket *	18	33	Pump Spring
9	10	Fuel Inlet Seat Gasket *	19	34	Pump Operating Lever Retainer
9	11	Float Shaft Retainer *	20	35	Pump Operating Lever
9	12	Float Shaft *	21	36	Choke Bracket Screw and Lockwasher
9	13	Fuel Inlet Needle Assembly *	22	37	Distribution Pin
9	14	Float and Lever Assembly	23	38	Choke Plate Screw
9	15	Fuel Inlet Valve Seat *	23	39	Choke Plate Screw and Lockwasher
10	16	Economizer Body Cover Screw and Lockwasher (4)	23	40	Choke Plate
11	17	Economizer Body Cover	24	41	Choke Shaft Retainer Pin
11	18	Economizer Diaphragm and Stem Assembly *	25	42	Choke Shaft and Lever Assembly
	19	Economizer Body Cover Gasket *	25	43	Choke Bracket
12	20	Main Well and Economizer Body Screw and Lockwasher (5)	26	44	Pump Discharge Nozzle Screw
14	21	Main Well and Economizer Body		45	Pump Discharge Nozzle Screw Gasket
13	22	Pump Return Spring	26	46	Pump Discharge Nozzle
14	23	Main Jet		47	Pump Discharge Nozzle Gasket

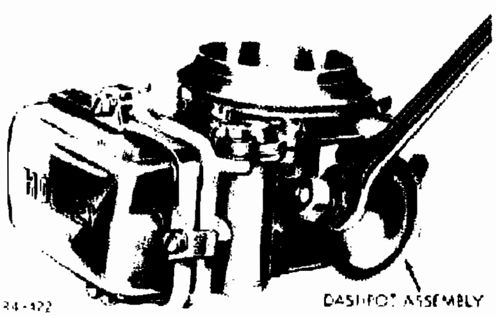


Figure 5. Removing Dashpot Assembly

(1) If the carburetor being disassembled is for an automatic transmission engine, remove dashpot assembly and dashpot lockwasher.

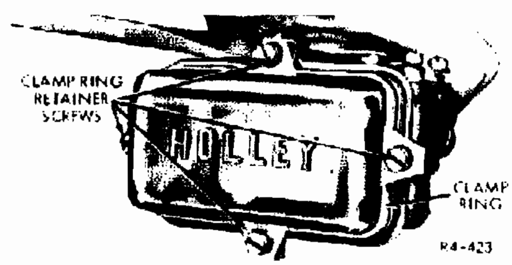


Figure 6. Removing Clamp Ring Retainer Screws

(2) Remove the fuel bowl by removing the four clamp ring retainer screws and lockwashers, and clamps. Lift the clamp ring off the fuel bowl. Remove and discard the fuel bowl gasket and the paper clamp ring gasket.

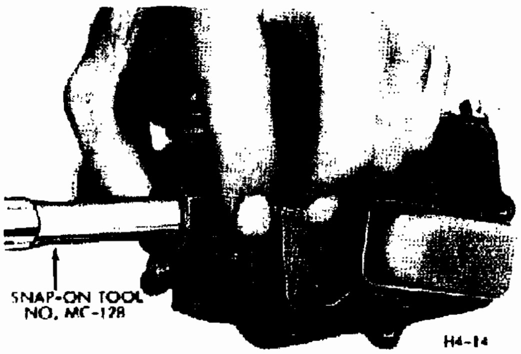


Figure 7. Removing Fuel Inlet Seat Retainer Screw

(3) Using Snap-On Tool No. MC-128, remove the fuel inlet seat retainer screw. Discard the retainer screw and gasket.

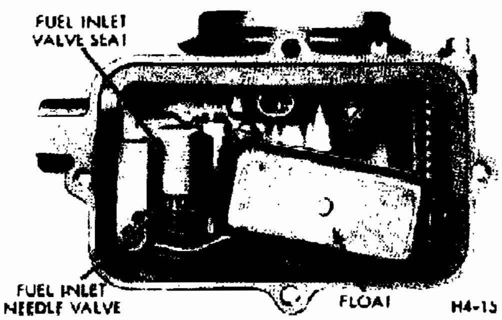


Figure 8. Float and Fuel Inlet Valve Assembly

(4) Lift out the float and fuel inlet assembly and discard the gasket.

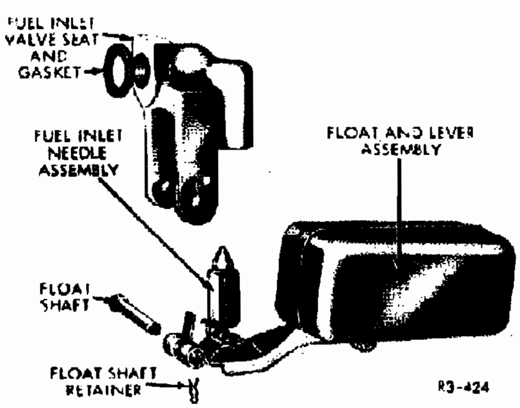


Figure 9. Float and Fuel Inlet Valve Separated

(5) Remove the float shaft retainer and separate the float and lever assembly from the fuel valve assembly by sliding out the float shaft. Discard all parts except the float and lever assembly.

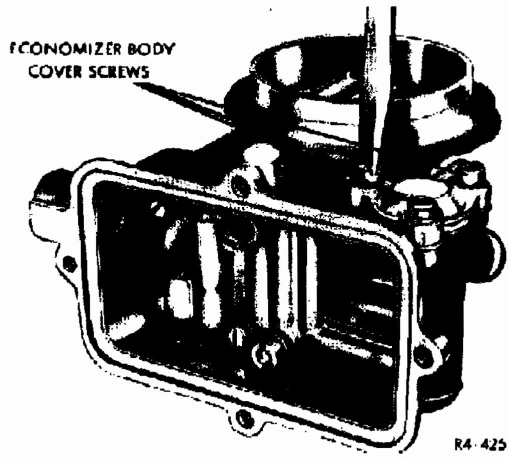


Figure 10. Removing Economizer Body Cover

(6) Remove the three economizer body cover screws and lockwashers.

(7) Lift the economizer assembly out of the main body and discard the gasket.

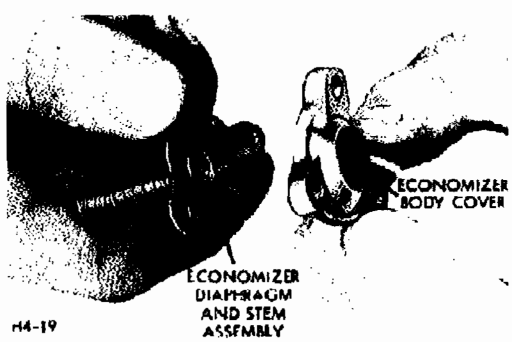


Figure 11. Removing Economizer Body

(8) Separate the economizer body cover from the economizer diaphragm and stem assembly. Discard the economizer diaphragm and stem assembly.

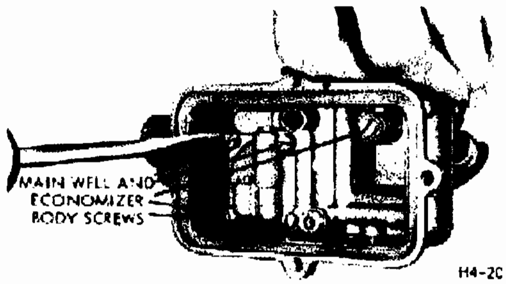


Figure 12. Removing Main Well and Economizer Body Screws

(9) Remove the five main well and economizer body screws and lockwashers. (Place a thumb against the main well and economizer body to retain it in position until those screws and lockwashers have been removed.) Lift out the main well and economizer body.

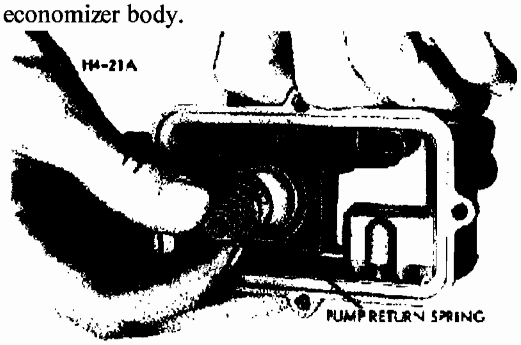


Figure 13. Removing Pump Return

(10) Remove the pump return spring which bears against the metal disk of the accelerating pump piston.

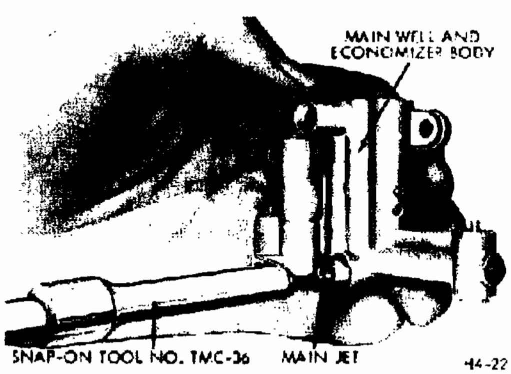


Figure 14. Removing Main Jet

(11) Using Snap-On Tool No. TMC-36, remove the main jet from the main well and economizer body. Discard the main jet.

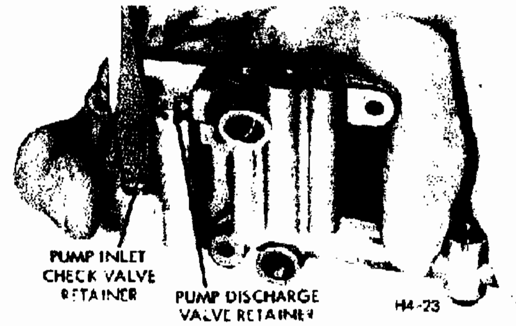


Figure 15. Removing Pump Valve Retainers

(12) Remove the pump inlet check valve retainer and the pump discharge valve retainer.

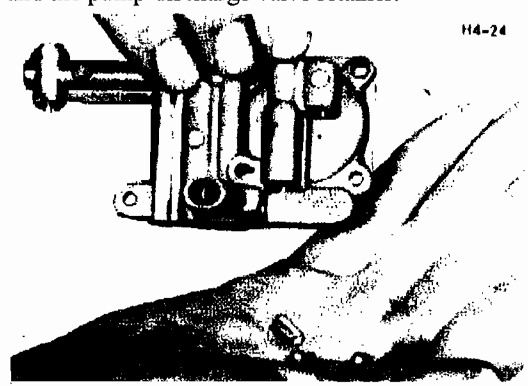


Figure 16. Removing Pump Inlet and Discharge Valve Balls and Weight

(13) Invert the main well and economizer body and allow the pump inlet check valve ball, pump dischargvalve weight, and pump discharge valve ball to drop out. Discard the two steel balls.

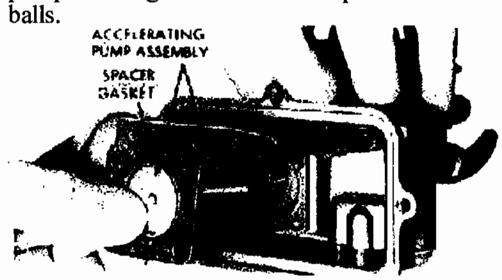


Figure 17. Removing Accelerating Pump Assembly

(14) Slide the accelerating pump assembly out of the main body. Remove and discard the spacer gasket.

CAUTION

Care must be taken when removing the accelerating pump assembly as the pump rod sleeve is under considerable spring tension. The assembly must be pulled straight out and not rotated during removal.

Figure 18. Removing Pump Rod Sleeve Retainer Ball

(15) Press the pump rod sleeve toward the pump diaphragm, compressing the pump spring; and allow the pump rod sleeve retainer ball to drop out (rotate the sleeve if the ball sticks in place). Discard the ball.

(16) Slide the pump rod sleeve and pump spring off the pump diaphragm rod. Discard the pump diaphragm and rod assembly.

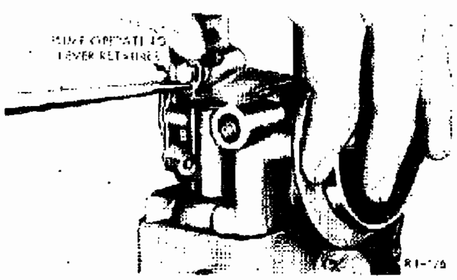


Figure 19. Removing Pump Operating Lever Retainer

(17) Using the thin-bladed screwdriver, pry the pump operating lever retainer off the pump operating lever stud. Discard the retainer.

Figure 20. Removing Pump Operating Lever

(18) Slide the pump operating lever off the stud.

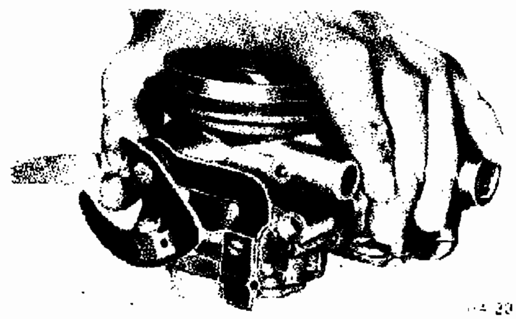


Figure 21. Removing Choke Bracket Screw

(19) Remove the choke bracket screw and lockwasher.

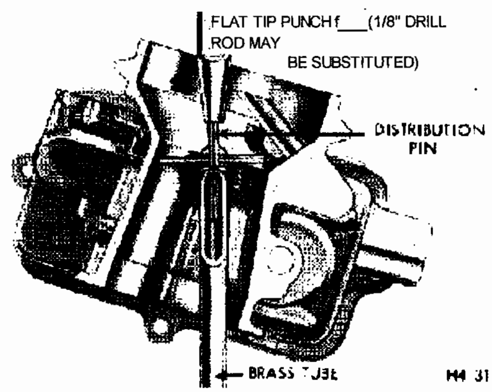


Figure 22. Removing Distribution Pin

(20) Rotate the choke plate past the full open position until it is nearly inverted. Place the distribution pin in a section of brass tubing with the end of the tube bearing against the choke shaft. Using a flat tip punch or a piece of 1/8 inch drill rod, drive the pin flush with the choke shaft. Then, using a smaller diameter punch or drill rod, drive the pin out of the choke shaft. Refer to "Special Tools and Improvised Tools" on page 10 for complete information on the improvised tools.

NOT

In the illustration (Figure 22), a section of the upper portion of the brass tubing is shown cutaway for the purpose of clarity. Do not cut out this section of tubing.

CAUTION

Care is to be taken when removing the distribution pin to prevent damaging the choke shaft and poppet valve.

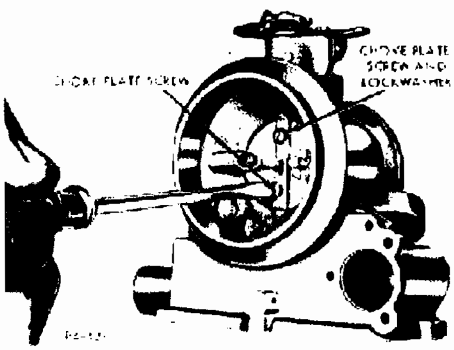


Figure 23. Removing Choke Plate

(21) Remove and discard the choke plate screws ıd lockwasher and slide the choke plate out of the ıoke shaft.

NOT

If the tip of the choke plate screw has been flared out excessively by staking, it is advisable to file off the flared-out portion to avoid damaging the threads in the choke when removing the screw. Care is to be taken while filing the screw tip to avoid damaging the carburetor bore, choke shaft, or other components.

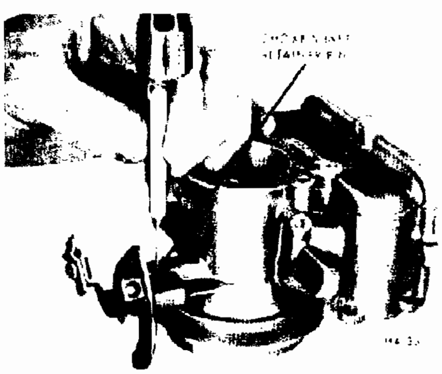


Figure 24. Removing Choke Shaft Retainer Pin

(22) Using a small flat-tip punch, drive the hoke shaft retainer pin out of the main body.

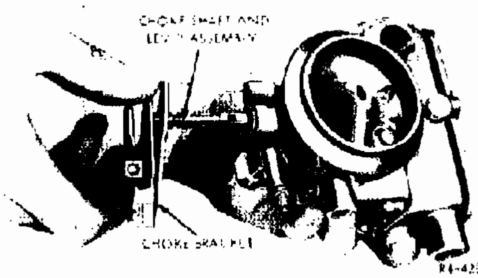


Figure 25. Removing Choke Shaft

(23) Remove the choke shaft and lever assembly and the choke bracket.

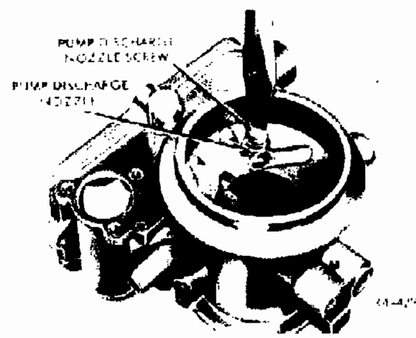


Figure 26. Removing Pump Discharge Nozzle Screw

(24) Remove the pump discharge nozzle screw and lift out the pump discharge nozzle. Discard the two gaskets.

NOT

In some versions of this carburetor model the fuel bowl contains an externally adjusted needle for regulating fuel flow through the main jet. Replacements for this main adjusting needle assembly will be found in the Master Repair Kit.

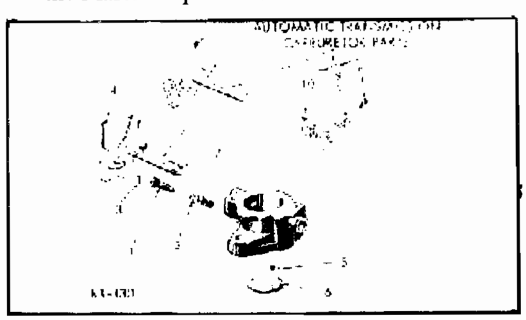


Figure 27. Disassembly - Throttle Body Assembly

This completes the disassembly of the main body assembly. Do not attempt to remove any of the pressed-in passage plugs, air bleed plugs, or the main nozzle in the main body,

D. DISASSEMBLY-THROTTLE BODY ASSEMBLY

The following list contains all parts removed in disassembling the throttle body assembly. Parts to be discarded and replacement made from a Master Repair Kit are marked with an asterisk (*).

REFER TO FIG. NO.	ORDER OF REMOVAL	PART NAME
28	1	Idle Adjusting Needle*
28	2	Idle Adjusting Needle Spring
29	3	Pump Link Cotter Pin*
29	4	Pump Link*
30	5	Throttle Plate Screw and
		Lockwasher (2)*
30	6	Throttle Plate
30	7	Throttle Shaft
31	8	Dashpot Lever Screw
31	9	Dashpot Lever Spring
31	10	Dashpot Lever

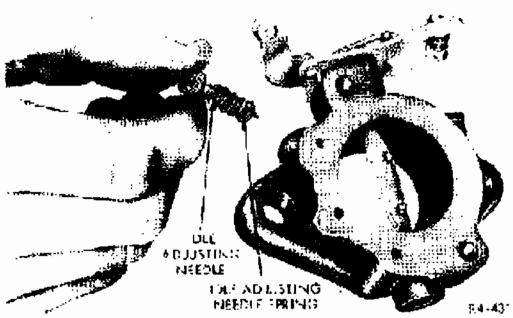


Figure 28. Removing Idle Adjusting Needle

(1) Remove the idle adjusting needle and spring. Discard the needle.

(2) Remove and discard the pump link cotter pin and pump link.

(3) Scribe the throttle plate along one side of the throttle shaft to facilitate proper alignment during reassembly. Remove and discard the two throttle plate screws and lockwashers. Lift out the throttle plate.

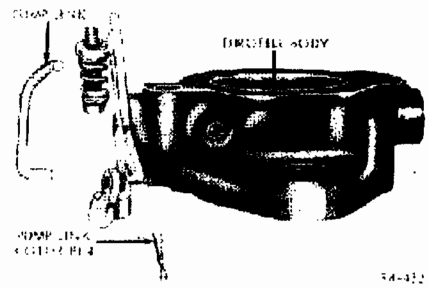


Figure 29. Pump Link and Cotter Pin

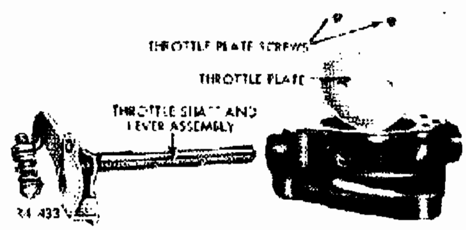


Figure 30. Throttle Shaft and Plate Removed

(4) Slide the throttle shaft and lever assembly out of the throttle body.

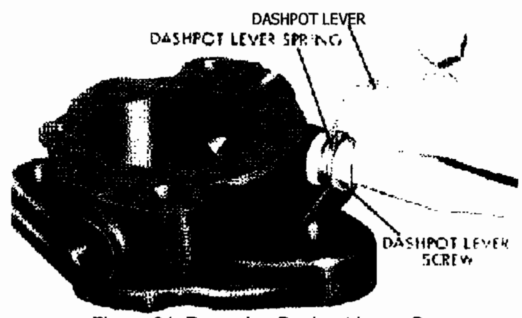


Figure 31. Removing Dashpot Lever Screw

(5) On carburetors for the automatic transmission engine, remove the dashpot lever screw, spring, and lever.

This concludes the disassembly of the Carburetor Model 1904.

5. CLEANING AND INSPECTION

A. C LEANING

(1) All castings and metal parts except the dashpot assembly are to be soaked in a cleaning

solution to loosen the accumulated foreign matter. Laquer thinner or denatured alcohol may be used if a commercial carburetor cleaning solvent is not available. Place the parts to be cleaned in a wire basket suspended in the solution. After the parts have soaked sufficiently to loosen the foreign deposits, they should be rinsed in hot water to remove all traces of the cleaning solution. All remaining foreign deposits should be scrubbed away with a stiff bristle brush while the parts are being rinsed.

(2) Soak each casting and part briefly in clean gasoline and dry them with compressed air. Direct the compressed air through all passages in the castings and through all openings, jets, and tubes. As the neoprene diaphragm of the dashpot assembly is deteriorated by most cleaning solvents, the exterior of the dashpot assembly should be wiped clean with a rag moistened with gasoline. Do not use compressed air on this assembly as the diaphragm and the synthetic rubber bellows seal may be distorted or ruptured.

CAUTION

Attempts to clean passages with a wire, drill, or similar object may distort those passages and adversely affect carburetor performance. Use of a buffing wheel, wire brush, or other abrasive means to remove surface deposits may damage the part and also remove the protective plating, exposing the part to corrosion.

NOTE

As gaskets, neoprene diaphragms, and felt seals are deteriorated by most solvents, those items should never be exposed to cleaning fluids. Never re-use old gaskets neoprene diaphragms, or felt seals when rebuilding the carburetor.

B. INSPECTION

(1) MAJOR CASTINGS

All major castings are to be examined for cracks, stripped threads, or damaged gasket mating surfaces and discarded if damage is found. Check the venturi bore in the main body casting for signs of nicks, scratches, or other imperfections. Calibration of the carburetor may be affected by even a slight irregularity in the venturi. Examine the main discharge nozzle in the venturi and other passages in the castings for signs of damage or obstruction. The check for obstruc tion may be made by directing compressed air through the passages. (Refer to the "Operation" section, beginning on page 2, for locations of passages in the castings).

(2) CHOKE SHAFT AND THROTTLE SHAFT

Check the shafts for distortion, stripped threads, or loose levers. If irregularities are found, the shaft should be discarded. Also examine the swivel assembly on the choke lever for stripped threads. If damage is found or the swivel is no longer securely riveted, the choke shaft and lever assembly must be replaced.

(3) FUEL BOWL

The fuel bowl must be replaced if the edges are chipped or if cracks are found anywhere in the bowl. In the plastic fuel bowls containing the adjustable jet, the adjusting needle body must be checked for signs of leaking or for other evidence of damage or distortion.

(4) FLOAT AND LEVER ASSEMBLY

Replace the float and lever assembly if the float leaks, or if the assembly is corroded or damaged. Shake the float to determine if fuel has leaked into it.

(5) THROTTLE AND CHOKE PLATES

Discard the plates if distortion, nicked edges, corrosion, or damage to the protective plating is found. Check to insure that the poppet valve in the choke plate IS clean and operates properly.

(6) SPRINGS AND RETAINERS

Distorted or damaged springs and retainers must be replaced.

(7) SCREWS, LOCKWASHERS, AND

Screws, lockwashers, and nuts must be replaced if stripped threads, distortion or other damage is found.

6. REASSEMBLY

A. REASSEMBLY-THROTTLE BODY

(1) Slide the throttle shaft and lever assembly into position in the throttle body. Referring the marks scribed on the plate during disassembly, set the plate in place on the throttle shaft. and hold the throttle body up to the light. If no excessive amount of light shows between the edge

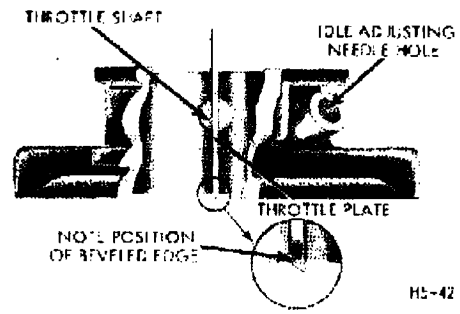


Figure 32. Installing Throttle Plate

of the throttle plate and the throttle bore, and if the throttle plate moves freely throughout its range of travel, throttle plate alignment is satisfactory. Hold the throttle plate in the closed position and tighten the throttle plate screws.

(2) Install the new pump link in the throttle lever with the double bend of the link uppermost. Secure the pump link in place with one of the new pump link cotter pins. (The two holes in the throttle permit adjustments to compensate for climatic conditions; place the pump link in the hole nearest the throttle shaft for normal climatic conditions, or use the outer hole for continuous extreme cold weather operation.)

(3) Install the new idle adjusting needle with its spring. Turn the needle down gently with the fingers until it seats, then back it off one full turn. Take care not to force the needle down on its seat. This will groove the tip of the needle and make it impossible to accurately adjust the idle mixture.

(4) On carburetor for automatic transmission engines, install the dashpot lever, spring, and screw.

B. REASSEMBLY-MAIN BODY

(1) Place a new gasket on both sides of the pump discharge nozzle, then insert the pump discharge nozzle screw into the channeled side of the nozzle. (The pump discharge nozzle screw may be identified by the hole drilled vertically from its tip to a point shortly below the head of the screw, where it joins a short horizontal drilled passage terminating in a groove in the side of the screw.) Install the pump discharge nozzle in the recess at the top of the venturi in the main body. Allow the pump discharge nozzle to rotate to the limits of its travel in a clockwise direction as the nozzle screw is tightened. The nozzle will stop against the edge of its recess in its proper operating position after a small amount of rotation.

NOTE

In the List No. 763 and 831 Carburetors, however, the pump discharge nozzle should be held in a counter-clockwise position against the limits of its rotational travel as the nozzle screw is tightened.

(2) Position the choke bracket on the boss on the main body. Slide the choke shaft and lever assembly into the main body and secure it in place by driving the choke shaft retainer pin into the small vertical hole in the top of the choke shaft boss.

(3) Rotate the choke lever until the choke lever swivel is below the choke shaft. Insert the choke plate into the slot in choke shaft with the stem and spring of the poppet valve extending upward.

CAUTION

Take care not to damage the tip of the main nozzle while installing the choke plate.

(4) Center the choke plate to avoid damaging the venturi then close the choke plate by rotating the choke lever in a counter-clockwise direction. Install the choke plate screws, fitting the screw with the attached lockwasher in the hole nearest the choke lever. Turn the screws down snugly but not tightly. Rotate the choke lever until the choke plate is nearly inverted and the poppet valve stem and spring extend downward. Align the distribution pin hole in the choke shaft with the corresponding hole in the choke plate. Brace the choke shaft from beneath and drive the distribution pin into position. Install the distribution pin so the clearance between the tip of the pin and the venturi wall is equal on both sides

NOTE

The List No. 763 and 831 Carburetors use a hex-head screw on the side of the choke shaft nearest the fuel bowl and pump discharge nozzle. A stem extends above the hex-head of the screw to facilitate proper fuel distribution in C.O.E. installations. A shakeproof external tooth lockwasher is used to retain the screw. The regular choke plate screw continues in use as the other plate screw.

(5) Check the choke plate for binding by moving the choke lever through the extent of its travel. If it moves freely, tighten the choke plate screws while holding the choke plate in the fully closed position. Stake the screws (on carburetor models having choke plate screws without lockwashers) using any approved staking tool. If an impact type staking tool, such as a punch, is used, each screw head should be braced with a solid object to prevent bending the choke shaft. Take care not to nick or mar the venturi or choke plate with the staking tool.

(6) Install the choke bracket screw and lock-washer.

(7) Place the pump operating lever on the stud in the main body and secure it by fitting the new pump operating lever retainer in the groove at the end of the shaft.

(8) Place the pump spring on the rod of the new pump diaphragm and rod assembly. Position the pump rod sleeve on the pump diaphragm rod with the small hole in the sleeve aligned with the center of the flat cutaway portion of the rod. Press the sleeve on the rod, compressing the pump spring, and drop the new pump rod sleeve retainer ball into the small hole in the pump rod sleeve. Insert the assembly into position in the main body.

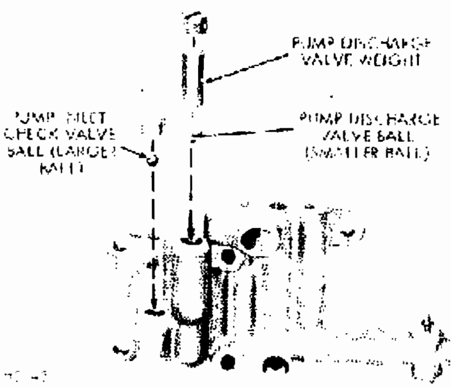


Figure 33. Installing Pump Inlet and Discharge Valve Balls

(9) Install the pump inlet check valve ball and the pump discharge valve ball in the main well and economizer body. (The pump inlet check valve ball is the larger of the two balls.) The new steel balls are to be seated by placing a thin brass rod on the top of each ball and tapping the rod very lightly three or four times with a fiber mallet, Shake the casting to insure that the balls move freely in their chambers, then install the pump discharge valve weight and the two retainers.

NOTE

It is extremely important that these parts are correctly installed or carburetor performance will be adversely affected.

(10) Using Snap-On Tool No. TMC-36, install the new main jet in the main well and economizer body.

(11) Place the new main well and economizer body spacer gasket in position over the accelerating pump diaphragm.

(12) Install the pump return spring, seating the larger end of the spring in the metal disk of the accelerating pump piston.

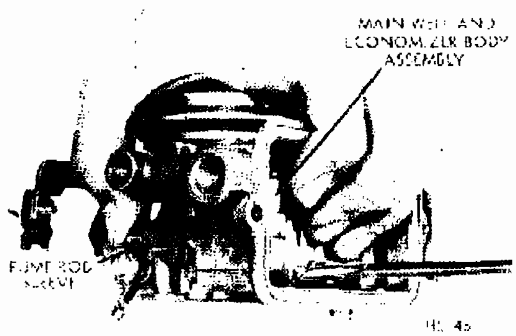


Figure 34. Installing Main Well and Economizer Body

(13) Align all holes in the main well and economizer spacer gasket with the corresponding holes in the accelerating pump diaphragm and the main body. Insert the five main well and economizer body screws and lockwashers in the main well and economizer body with the two long screws placed in the center top and bottom holes. Set the power valve situated at the extreme right end of the main well and economizer body into its position in the main body, then press the main well and economizer body into place against the accelerating pump diaphragm using the following procedure. Grasp the mabody in the left hand, holding the thumb over the protruding end of the pump rod sleeve and the fingers over the main well and economizer body. Apply pressure with thumb and fingers to compress the pump spring and pump return spring. This pressure must be applied evenly to prevent the tension of the pump return spring from disturbing the alignment of the holes in the diaphragm, spacer gasket, and the main body. After the main well and economizer body

is pressed into position, maintain the pressure until the five main well and economizer body screws have been started in their holes and a check is made on the alignment of the diaphragm and spacer gasket. Do not tighten the screws, but turn them in as far as possible without compressing the lockwashers. Release the pump rod sleeve. This will allow the pump return spring to expand, stretching the accelerating pump diaphragm to insure full travel when the accelerating pump is operated. Then tighten the five main well and economizer body screws.

(14) Insert the three economizer body cover screws and lockwashers in the economizer body cover. Place the new economizer diaphragm and stem assembly and the economizer body gasket over the screws. Insert the assembly into its position in the main body, taking care the alignment of the vacuum passage hole is not disturbed, then tighten the screws.

(15) If the fuel inlet needle assembly has been received unassembled, it is to be assembled as follows. Fit the new fuel inlet needle spring over the fuel inlet needle pin and insert those parts into the new fuel inlet needle. Install the new wire fuel valve clip in the groove in the fuel inlet needle.

(16) Set the fuel inlet needle on the float lever tab, placing the fuel valve clip under the tab to hold the needle in place. Guide the fuel inlet needle into the new fuel inlet needle seat, positioning the pivot of the float lever between the float lever bracket arms on the fuel inlet needle seat. Install the new float shaft and new float shaft retainer.

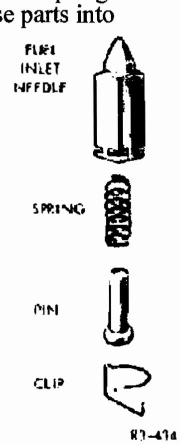


Figure 35. Fuel Inlet Needle Assembly

CAUTION

Fuel inlet needles and seats are matched assemblies, factory tested to insure proper operation, and their component parts are not interchangeable.

(17) Place the new fuel inlet seat retainer screw gasket on the new fuel inlet seat retainer screw and insert the screw in the fuel inlet fitting boss on the main body. Place the new fuel inlet seat gasket on the end of the fuel inlet seat retainer screw which protrudes into the fuel bowl. Ease the float and fuel inlet valve assembly into position and secure it in place by tightening the fuel inlet seat retainer screw, using Snap-On Tool No. MC12_8.

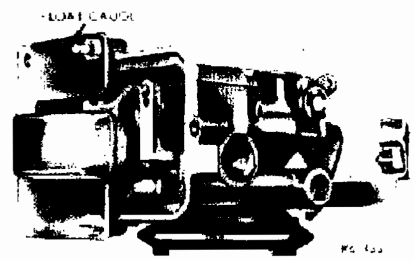


Figure 36. Setting Float

(18) At this point the float setting should be checked and necessary adjustments made. Invert the main body assembly, allowing the float to drop to the closed position. Using Snap-On Tool No. MC-164, gauge the float, checking the setting on both the "touch" and "no touch" legs of the gauge. 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 for this correction and recheck the float setting after adjustments have been made.

(19) Fit the new fuel bowl gasket into the recess in the rim of the fuel bowl in the main body. Place the new clamp ring gasket and clamp ring on the fuel bowl and set the fuel bowl in position on the main body. Install the four clamp ring retainers, screws, and lockwashers. Tighten the screws alternately, a half a turn at a time, until the lockwashers are compressed. The screws must be tightened alternately and not drawn too tightly to prevent setting up stresses that may result in a cracked fuel bowl.

NOT

The procedure for installing the plastic fuel bowls containing the adjustable jet is the same as described above except the main body is to be held in the inverted position so the float is in its fully closed position and clear of the main jet. Install the fuel bowl with the adjusting needle backed out to the open position, taking care not to damage the tip of the needle when the bowl is set in place.

(20) Install the dashpot assembly on carburetors so equipped.

C. REASSEMBLY-MAIN BODY TO THROTTLE BODY ASSEMBLY

(1) Insert the two throttle body screws and lockwashers into the throttle body. Settle the new throttle body to main body gasket in place over the throttle body screws and check to insure the proper alignment of the holes in the gasket with the corresponding holes in the throttle body. Set the main body in position on the throttle body, invert the carburetor and tighten the two screws. Tighten the screws alternately, a little at a time, to compress the gasket evenly and eliminate the possibility of an air leak.

(2) Insert the upper end of the pump link in the pump operating lever and secure it in place with the new pump link cotter pin.

This completes the reassembly of the Carburetor Model 1904. It is now ready for installation on the engine.

INSTALLATION

1. INSTALLATION ON THE ENGINE

Check the carburetor mating surface on the intake manifold for signs of rust or dirt. If it is clean, fit a new carburetor flange gasket on the manifold and install the carburetor. Turn the two carburetor mounting nuts down hand tight and connect and tighten the fuel line and the distributor vacuum line. Then draw the mounting nuts down evenly, tightening them alternately a little at a time until the flange gasket has been compressed and the nuts are tight. This method of tightening the mounting nuts will eliminate the possibility of an air leak past the flange gasket. Cohnect the throttle and choke linkage, checking the choke plate in the carburetor venturi to insure it opens fully when the choke control knob is pushed in. Clean and install the air cleaner.

CAUTION

The moving parts of the dashpot assembly are not to be lubricated. Any attempt to lubricate the diaphragm rod will eventually result in the formation of sludge in the dashpot, preventing the proper functioning of the unit.

2. CARBURETOR ADJUSTMENTS A. ADJUSTING THE IDLE

(1) All carburetor adjustments to be accurate must be made with the vehicle standing on a level surface. Start and warm up the engine. When the engine has reached its normal operating temperature, after first checking to insure that the choke plate is fully open, adjust the throttle stop screw to idle the engine at the rpm specified in the current Holley Carburetor Company Specifications Catalogue.

(2) Set the idle adjusting needle to give the highest steady manifold vacuum or, if a vacuum gauge is not available, the smoothest maximum idle speed. Clockwise rotation of the idle adjusting needle will give a leaner mixture, counterclockwise rotation a richer mixture. An effective setting may be obtained by turning the idle adjust needle in until a drop in engine speed results and then backing the needle off over the "high-spot" until the engine again slows down. Setting the idle adjusting needle between these two points result in a satisfactory idle mixture setting. Should this adjustment result in an excessive increase in the idle rpm, reset the throttle stop screw to obtain the specified rpm and again adjust the idle mixture setting.

NOTE

The accelerating pump stroke can be adjusted to compensate for seasonal or climatic changes by changing the position of the link in the throttle lever. The hole in the lever nearest the throttle shaft is the normal setting and should be satisfactory for nearly all operating conditions. Should a richer accelerating pump discharge be required for extreme cold weather operation, the pump link is to be placed in the outer hole in the throttle lever.

B. ADJUSTING THE DASHPOT

(1) The dashpot on carburetors for engines equipped with automatic transmissions is to be adjusted after the idle speed and mixture settings have been completed. Close the throttle lever to the idle position. Set the dashpot adjusting screw so the clearance specified in the current Holley Carburetor Company Specifications Catalog is obtained between the dashpot adjusting screw and the diaphragm rod with the rod in the fully compressed position. To assure an accurate adjustment, check the choke plate to insure it remains fully opened while setting the dashpot adjusting screw.