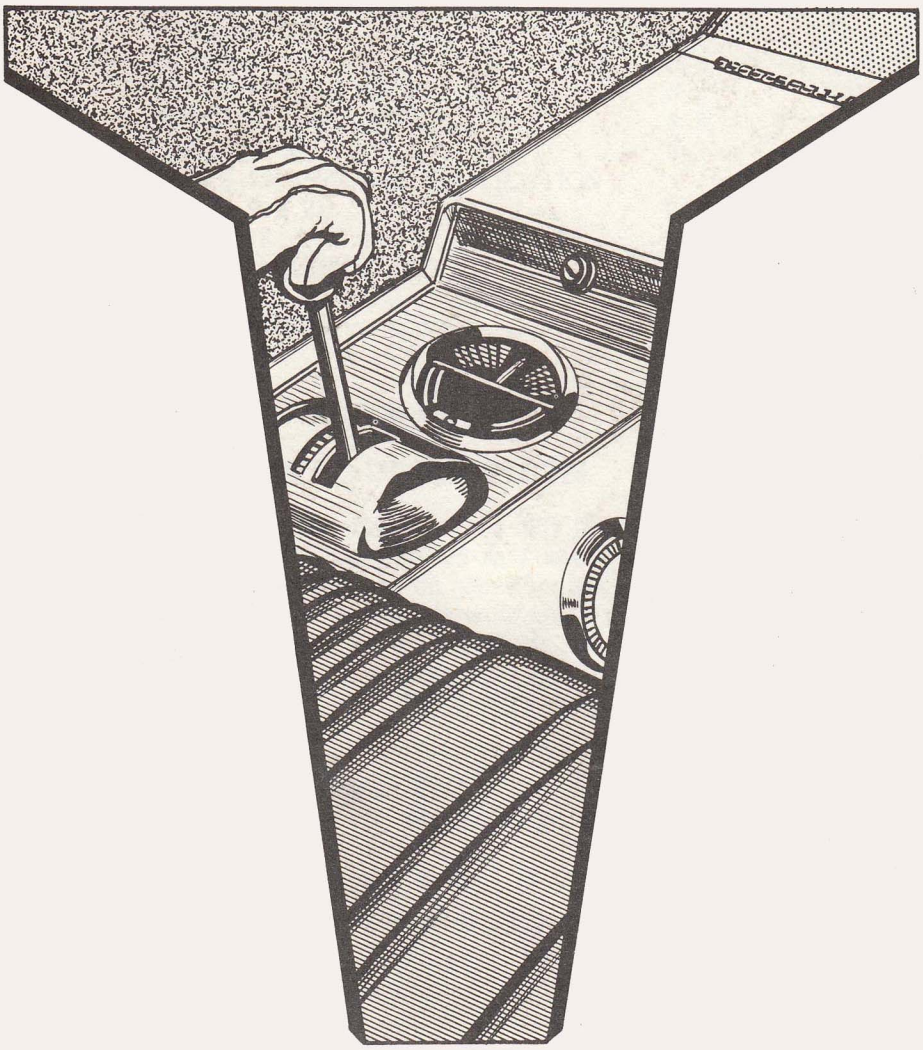
JETFIRE

SERVICE MANUAL



OLDSMOBILE F-85

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Oldsmobile Division
General Motors Corporation
Lansing, Michigan

Litho in U.S.A.

JETFIRE

(F-85)

CONTENTS

GENERAL DESCRIPTION

The Turbo-Rocket Engine, used only in the Jetfire (3147 model), has a 10:25 to 1 compression ratio designed to operate on premium grade fuel. The Turbo-Rocket engine uses a turbo-charger coupled to a single barrel, Model RC, side draft carburetor. With this system the engine develops 215 H.P. at 4600 RPM. The Jetfire model has a rear axle ratio of 3.36:1.

The Turbo-Rocket engine design differs from the regular F-85 engine in the following respects:

Main Bearing Caps and Bolts - (Fig. 8-101)

Main and Connecting Rod Bearings - (Fig. 8-102)

Pistons - (Fig. 8-103)

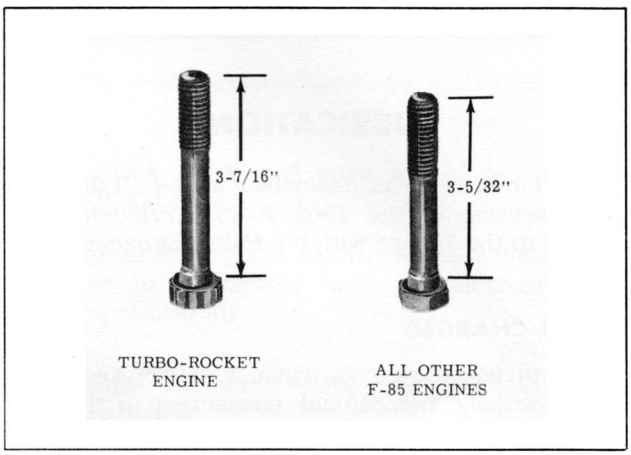


Fig. 8-101 Main Bearing Cap Bolts

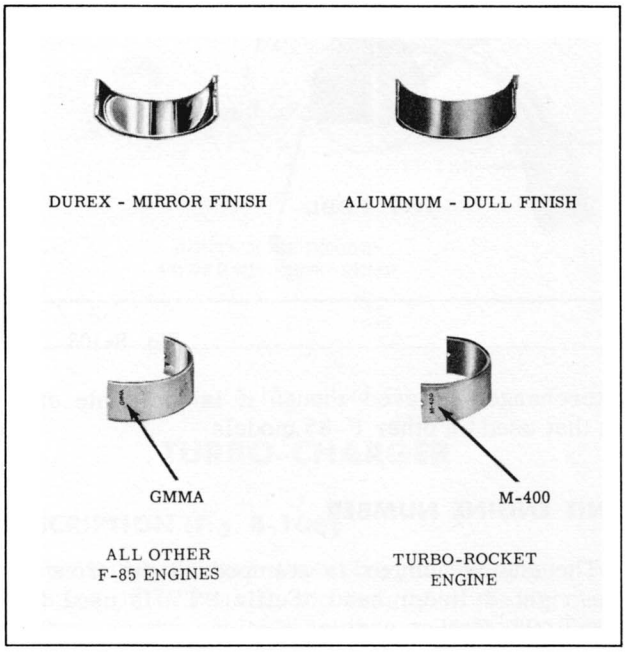


Fig. 8-102 Bearing Identification

Other changes are: Aluminized valve heads and seats, new exhaust and intake manifolds, designed to accommodate the turbo-charger, choke heat stove in the left exhaust manifold, fuel pump pressure of 6 to 8 p.s.i. and a fuel return line system. A separate by-pass type fuel filter is mounted between the fuel pump and the carburetor and 3/8" fuel lines are used. To provide adequate cooling, a cross flow radiator is used. The fan clutch, used on the 3147 model, air conditioned equipped car, is identified by the number 2200 stamped on the forward face of the clutch, this fan clutch is not

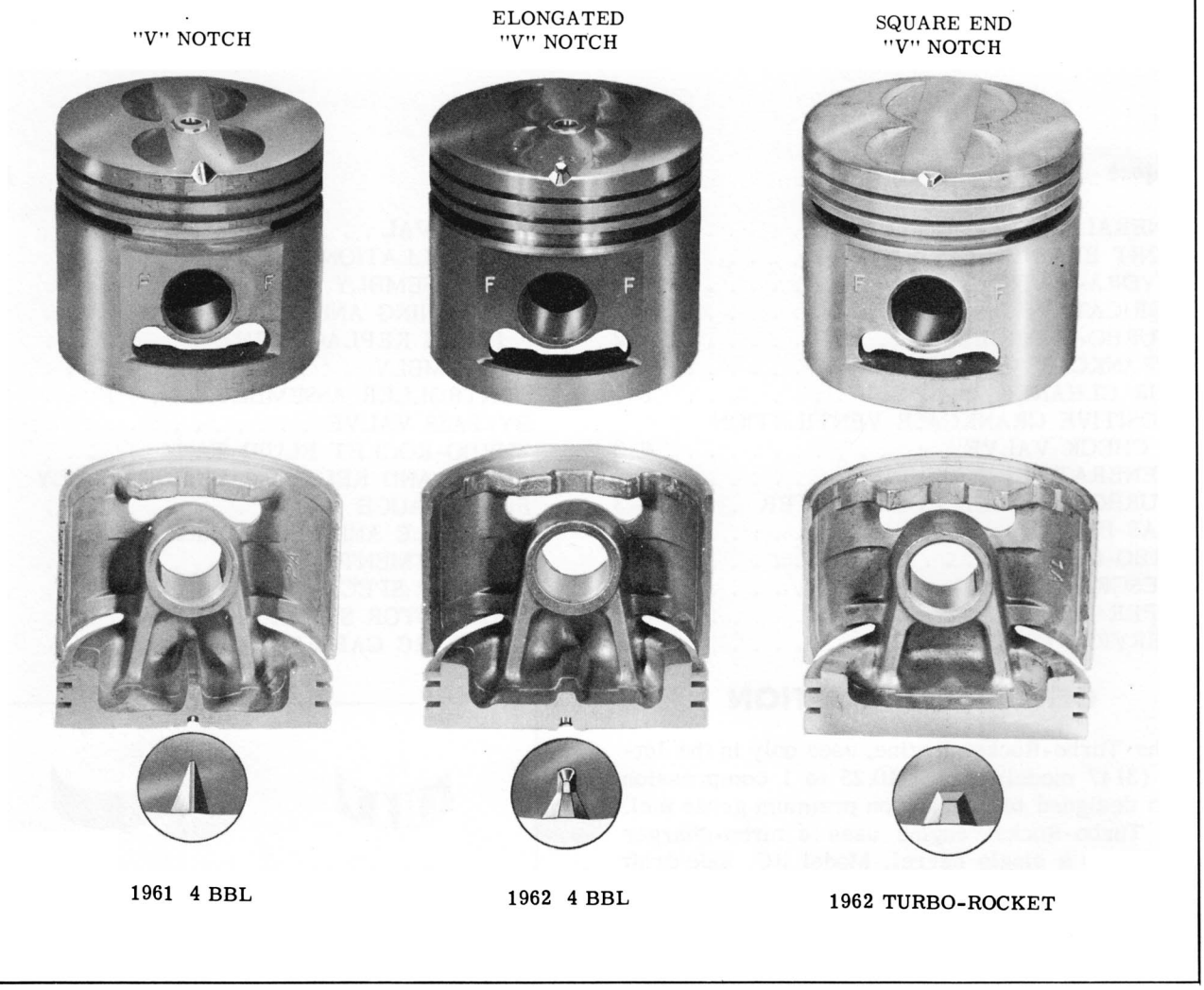


Fig. 8-103 Piston Identification

interchangeable even though it is the same size as that used on other F-85 models.

UNIT ENGINE NUMBER

The engine number is stamped on the front of the right cylinder head. Suffix "T" is used for the Turbo-Rocket engine.

HYDRA-MATIC

The Hydra-Matic Transmission serial number plate is attached to the right side of the case and is painted dark brown with the prefix OX-562.

1. The coupling driven torus uses a larger needle thrust bearing between the torus and the Accel-a-rotor.

2. The valve body and governor calibrations have been tailored to match the high performance engine.

3. Line pressure has been increased 10 p.s.i.

4. The band apply servo mechanism has been redesigned to permit a full band application with less travel and is now throttle controlled during closed throttle shifts. The band servo also has three springs to aid in releasing the band.

LUBRICATION

The lubrication as described in the "Lubrication" section of the 1962 F-85 Service Manual applies to the Jetfire with the following exceptions.

TURBO-CHARGER

The turbo-charger is exhaust driven and performs without mechanical connection to the engine. The turbo-charger is lubricated by the engine oil directed through a line at the top of the unit. Periodic maintenance, other than changing

the engine oil at the specified interval is not required.

CRANKCASE BREATHER (Inlet Cap)

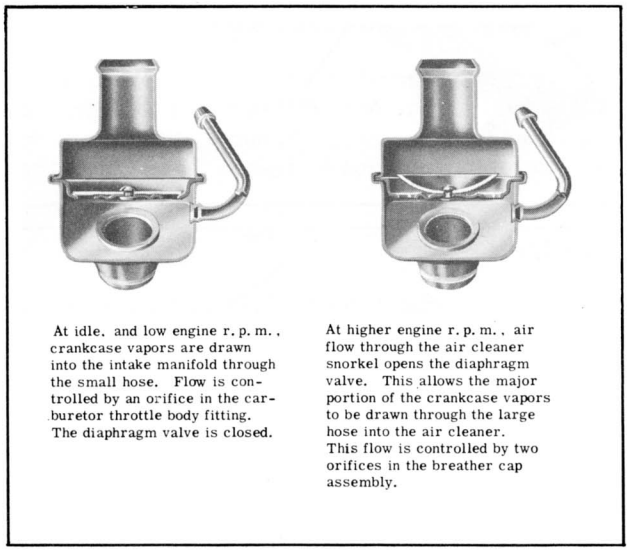
The polyurethane or sponge like material should be removed from the cap and washed in kerosene at every oil change interval. Squeeze out excess kerosene and dip in S.A.E. 10W-30 oil and squeeze to remove excess oil.

AIR CLEANER

Non Disposable Type - Under normal operating conditions the element should be inspected and cleaned every 8,000 miles. Under dusty conditions it may be necessary to clean more often. The element should be washed in kerosene, squeezed out and dipped in S.A.E. 10W-30 oil, then drain and squeeze to remove excess oil.

POSITIVE CRANKCASE VENTILATION CHECK VALVE (3147 Model)

The positive crankcase ventilation check valve, located in the left rocker arm cover, is standard equipment on the Turbo-Charger equipped 3147 model. (Fig. 8-104)



At idle, and low engine r. p. m., crankcase vapors are drawn into the intake manifold through the small hose. Flow is controlled by an orifice in the carburetor throttle body fitting. The diaphragm valve is closed.

At higher engine r. p. m., air flow through the air cleaner snorkel opens the diaphragm valve. This allows the major portion of the crankcase vapors to be drawn through the large hose into the air cleaner. This flow is controlled by two orifices in the breather cap assembly.

Fig. 8-104 Positive Crankcase Ventilation

The check valve and hose should be cleaned every 10,000 miles.

1. Remove the valve to air cleaner hose and valve to carburetor hose and blow out with compressed air.

2. Remove the check valve assembly and clean in kerosene.

3. Install the valve and hoses.

GENERATOR

The generator on the 3147 model does not require periodic maintenance.

TURBO-CHARGER FLUID FILTER (Fig. 8-105)

The filter is sealed and does not require periodic maintenance. If the filter becomes plugged or clogged it must be replaced.

GAS FILTER

The filter does not require periodic maintenance, if gas flow is restricted at the filter, the element must be replaced.

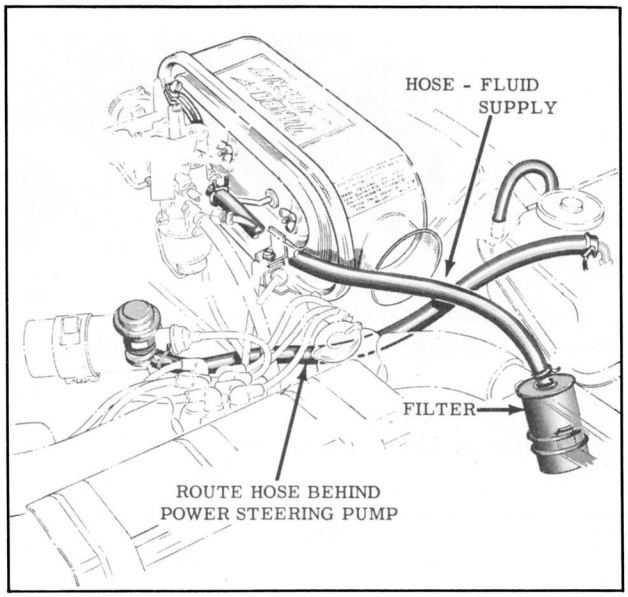


Fig. 8-105 Fluid Filter

TURBO-CHARGER

DESCRIPTION (Fig. 8-106)

The turbo-charger supercharges the engine by boosting or increasing the density of the air-fuel mixture in the engine's intake manifold. With the density of the air-fuel mixture increased, the engine takes in more pounds of air-fuel mixture on each intake stroke. This supercharging of the air-fuel mixture makes possible a greater power output for the engine's displacement.

The turbo-charger assembly consists of the following units or assemblies: an exhaust driven turbine and housing, a compressor with a water jacket housing, a by-pass valve and a controller assembly.

The turbine wheel and compressor wheel are mounted on a common shaft, the turbine is welded

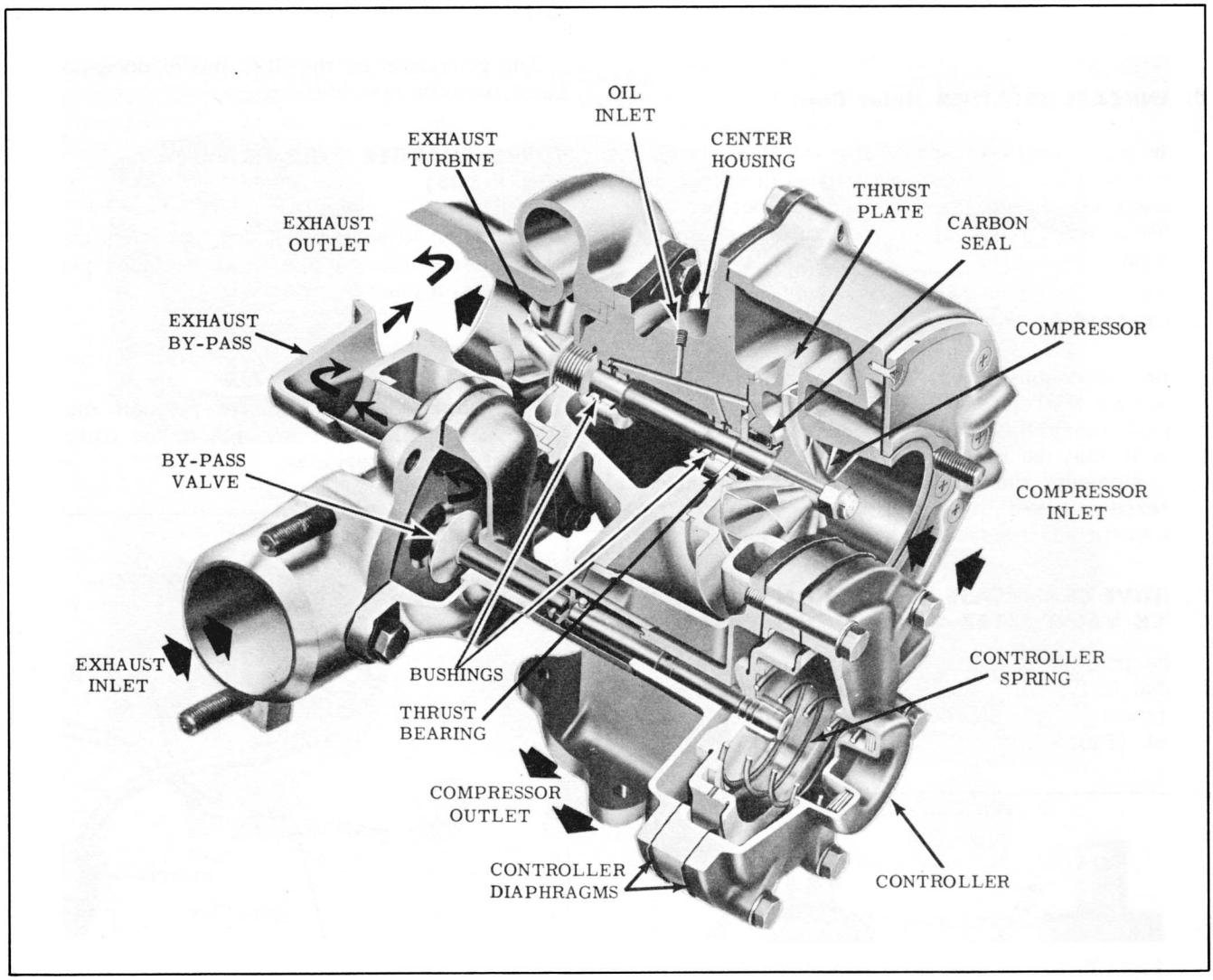


Fig. 8-106 Turbo-Charger Assembly

to the shaft and the compressor is pressed onto the shaft and retained with a nut. The turbine wheel and compressor impeller are enclosed in separate housings. The balanced shaft is supported in the center housing by two floating bushings lubricated by engine oil pumped through passages in the center housing, and drained back into the right rocker arm cover. The turbine housing provides the acceleration and proper angle to the exhaust gases to drive the turbine which in turn through the shaft drives the compressor.

The compressor housing is provided with a water jacket to provide pre-heating of the compressor discharge air.

The by-pass valve located in the turbine housing is operated by the controller. When the engine is first started the by-pass valve is closed, as engine RPM increases the exhaust also increases which turns the turbine faster. The by-pass valve controls the amount of exhaust pressure used to turn the turbine and compressor thereby controlling the engine power output and the speed of the turbo-charger.

The controller bolted to the compressor housing with two passages to the compressor housing senses compressor inlet and outlet pressures. When pressure differential is enough to overcome the controller spring within the controller, the controller will open the by-pass valve to divert exhaust gases from the turbine wheel. The controller limits the pressure the turbo-charger will deliver to the engine to 5 to 6 p.s.i.

OPERATION

When the engine is started the by-pass valve is closed and the exhaust is directed into the turbine housing turning the turbine shaft. Air is drawn through the air cleaner into the carburetor where it is mixed with fuel then into the turbo-charger where it is compressed and forced into the intake manifold at pressures of 5 to 6 p.s.i. As exhaust increases, the compressor speed increases the pressure until pressure reaches a

pre-determined value which is the spring force in the controller. When compressor pressure reaches the pre-set limits the controller opens the by-pass valve allowing exhaust gases to by-pass, however, the major portion of the exhaust gas will pass through the turbine.

Turbo-charging the engine packs air-fuel mixture into the combustion chamber and when ignition occurs, the resultant explosion can cause detonation unless properly cooled or controlled. Cooling or controlling is accomplished by an anti-detonant fluid. "Turbo-Rocket Fluid" is injected into the combustion chamber by a fluid metering valve on the side of the carburetor, any time manifold pressure exceeds 1 p.s.i. Do Not Use A Substitute. A safety device in the Fluid Metering Valve limits the amount of boost pressure if the fluid supply is depleted or restricted.

A filter is used between the fluid supply tank and the metering valve to prevent foreign material from entering the valve. The filter does not require periodic maintenance, if the fluid is restricted at the filter the filter should be replaced.

SERVICE PRECAUTIONS

The design and use of the turbo-charger places the exhaust pipes at the top of the engine - do not touch the exhaust pipes or turbo-charger until they have cooled. Keep manifolds and exhaust pipes clean, anything left in them such as torn gaskets, bolts or nuts will destroy the turbo-charger. Use BT-6219 protective caps whenever the turbo-charger is being serviced. With the air cleaner removed do not lay any shop towels or rags near the carburetor air inlet. Fig. 9-126 illustrates the use of protective screen BT-6218 to be used when the turbo-charger is being operated without the air cleaner.

REMOVAL (Fig. 8-107)

CAUTION: Before removing the turbo-charger, clean as much dirt as possible off the turbo-charger and carburetor connections. Cleanliness is essential when servicing this unit, due to close tolerances and high operating RPM. Cover the oil inlet and outlet ports with tape or plastic plugs to prevent entrance of dirt.

1. Remove carburetor (see CARBURETOR REMOVAL).

2. Remove turbo-charger exhaust inlet pipe by removing the four flange attaching nuts. (Fig. 8-108)

3. Install Tool BT-6219 on the turbo-charger exhaust inlet and right exhaust manifold outlet.

4. Disconnect turbo-charger exhaust outlet pipe at upper flange.

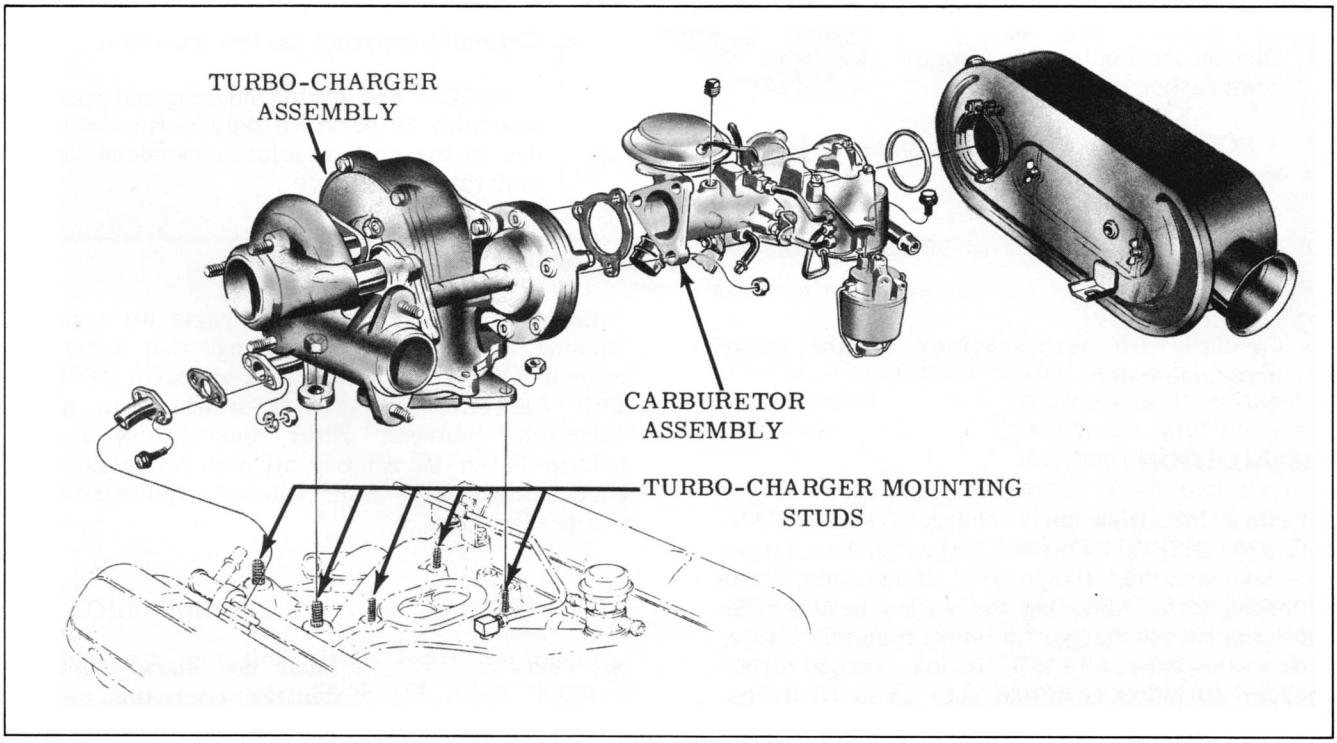


Fig. 8-107 Turbo-Charger and Carburetor Attachment

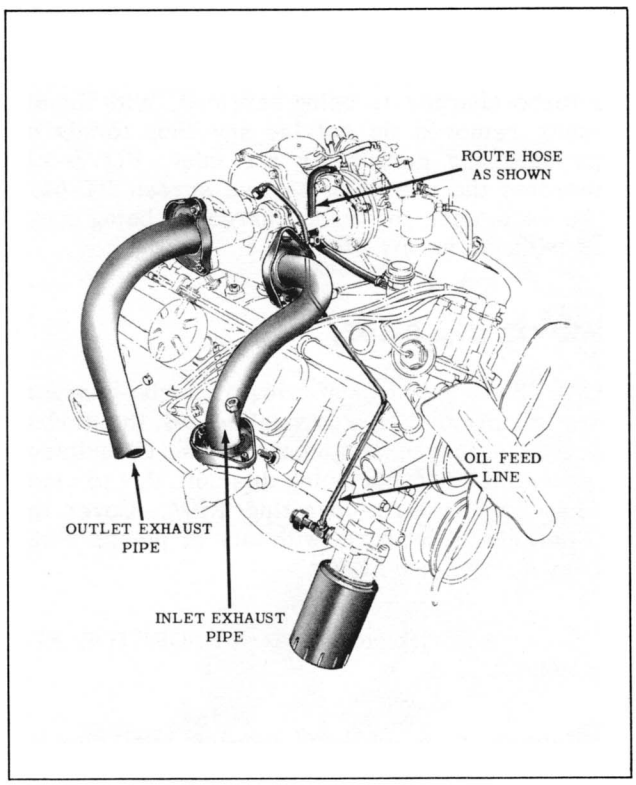


Fig. 8-108 Exhaust Pipe Connections

5. Drain radiator coolant below level of turbo-charger.

6. Disconnect oil feed line at top of center housing.

7. Disconnect oil return line.

8. Disconnect compressor water inlet hose at compressor housing.

   NOTE: Do not close compressor housing water hand shut-off valve.

9. Remove turbo-charger to intake manifold attaching nuts.

10. Carefully lift turbo-charger off the intake manifold studs.

INSTALLATION

Before installing turbo-charger (see CLEANING AND INSPECTION) and inspect turbo-charger to intake manifold flange seal, if damaged, it can be replaced by removing the socket head screws retaining turbo-charger to intake manifold flange. Torque the screws 14 to 17 ft. lbs. Torque turbo-charger to intake manifold nuts 25 to 30 ft. lbs. Install new oil return line flange gaskets and torque bolts 10 to 15 ft. lbs. Torque nuts at turbo-charger exhaust pipe connections 10 to 18 ft. lbs.

DISASSEMBLY (Fig. 8-109)

1. Remove controller assembly (see CONTROLLER REMOVAL).

2. Remove by-pass valve assembly (see BY-PASS VALVE).

3. Remove compressor housing.

   a. Scribe a line across the center housing and compressor housing.

   b. Remove the six (6) compressor housing to center housing bolts.

   c. Tap the compressor housing lightly to separate the housings.

   d. Remove the gasket.

   e. Remove the housing cover and gasket by removing the eleven (11) attaching screws.

   f. Inspect the housing and cover for cracks or indications of leakage.

4. Remove turbine housing.

   a. Scribe a line across the center housing and turbine housing.

   b. Straighten the lock tabs on the four (4) center housing to turbine housing bolts and remove bolts and lock plates.

   c. Carefully separate the two housings.

      NOTE: The center housing and rotating assembly is serviced only as an assembly due to the critical tolerances necessary to maintain the balance.

CLEANING AND INSPECTION

Before cleaning, inspect the parts for signs of burning, rubbing or other damage that might not be evident after cleaning. Soak all parts EXCEPT THE CENTER HOUSING ASSEMBLY in clean carburetor solvent. After soaking, use a stiff bristle brush to remove all dirt particles. Dry parts thoroughly with filtered, moisture-free compressed air.

ITEMS	REQUIREMENTS
All Parts	Must not show signs of damage, corrosion, deterioration. Threads must not be nicked, stripped, or crossed.

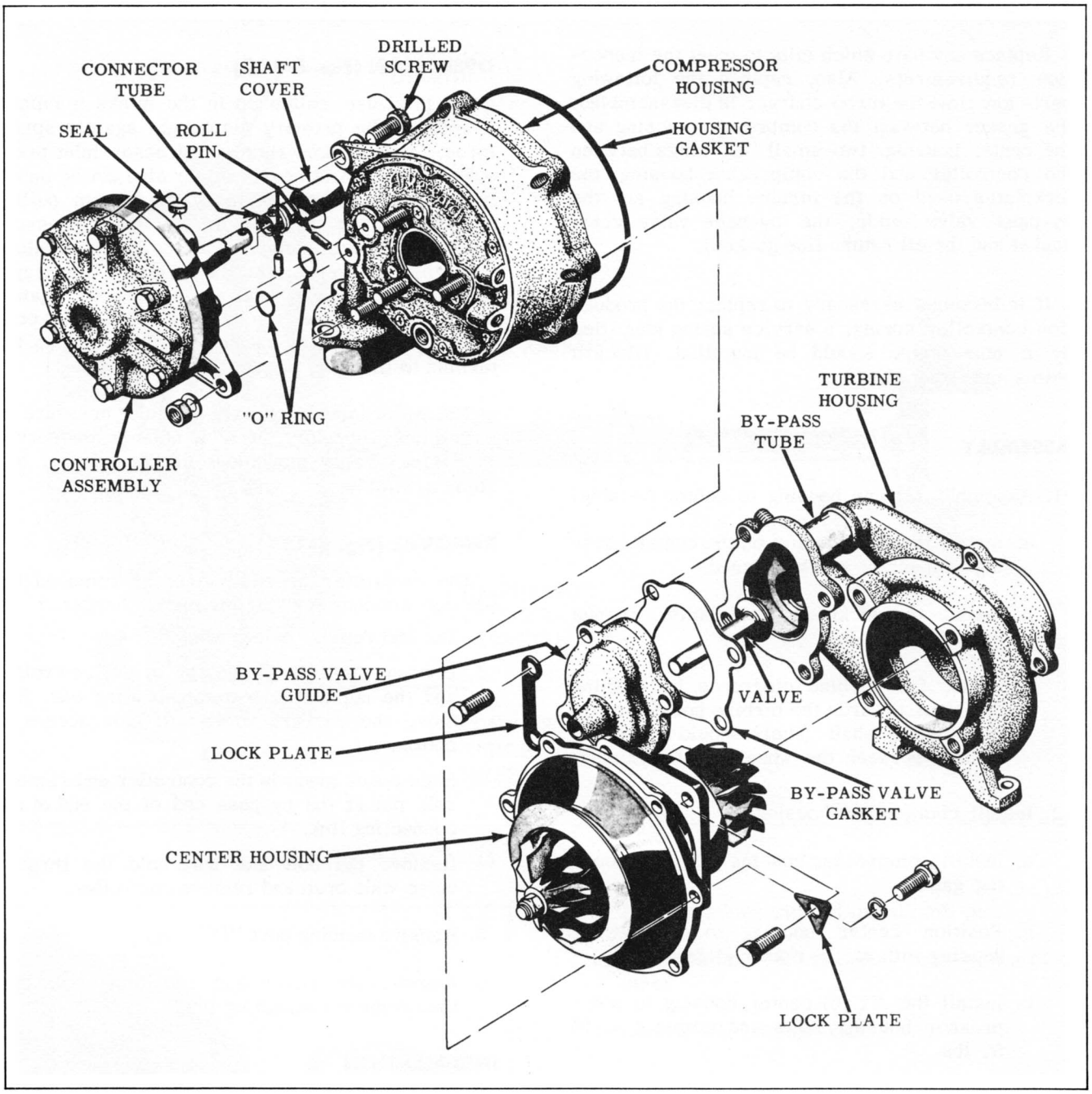


Fig. 8-109 Exploded View of Turbo-Charger

Turbine Wheel — The turbine wheel must not show signs of rubbing, and the vanes must not be eroded to a feather edge. A slight build-up of carbon will not affect the operation.

Compressor Impeller — The compressor impeller must not show signs of rubbing and must be completely free of dirt and other foreign material.

Center, Compressor and Turbine Housings — The housings must not show signs of having been in contact with the rotating parts. Oil, air and water passages must be clean and free of any obstructions.

Bearings — The rotating assembly must rotate without signs of roughness. A slight drag due to the spring loaded carbon seal is normal. Heat shield must not rub the turbine wheel.

PARTS REPLACEMENT

Replace any part which fails to meet the inspection requirements. Also, replace the following parts any time the turbo-charger is disassembled: the gasket between the compressor housing and the center housing; two small "O" rings between the controller and the compressor housing; the lockplates used on the turbine housing and the by-pass valve guide; the by-pass valve guide gasket and the oil return line gaskets.

If it becomes necessary to replace the production controller spring, a service spring identified by a blue stripe should be installed. Discard shims and retainer.

ASSEMBLY

1. Assemble turbine housing to center housing.
   a. Install turbine housing on the center housing with scribe marks aligned.
   b. Install the lockplates and bolts. Torque bolts 8 to 9 ft. lbs.
   c. Check for turbine clearance by pushing the shaft towards the turbine housing while rotating the shaft. There should not be any contact between the wheel and the housing.
2. Install compressor housing.
   a. Install compressor housing to center housing gasket.
   b. Position center housing to compressor housing with scribe marks aligned.
   c. Install the six (6) center housing to compressor housing bolts and torque 8 to 10 ft. lbs.
   d. Install the compressor housing to cover gasket.
   e. Install housing cover and secure with eleven (11) attaching screws, 25 to 30 in. lbs.
   f. Check the compressor impeller to housing clearance by pushing on the turbine end of the shaft while rotating the shaft. There should not be any contact between the compressor impeller and the housing.
3. Install the by-pass valve (see BY-PASS VALVE, ASSEMBLY).
4. Install the controller (see CONTROLLER, INSTALLATION).

CONTROLLER ASSEMBLY

OPERATION (Fig. 8-110)

As pressure builds up in the intake manifold, it acts on the primary diaphragm against spring force. At the same time compressor inlet pressure (less than atmosphere) is also acting on the other side of the primary diaphragm pulling against spring force. As manifold pressure reaches approximately 5 to 6 p.s.i. it acts, along with inlet pressure, on the primary diaphragm moving the retainer and stem assembly against spring force to open the by-pass valve. This controls the amount of exhaust gases acting on the turbine to limit the turbine speed.

The secondary diaphragm has inlet pressure on both sides; therefore, it is in balance and serves to dampen rapid movement of the retainer and stem assembly.

REMOVAL (Fig. 8-111)

The controller assembly can be removed for service without removing the turbo-charger.

1. Cut and remove safety wire.
2. Loosen the bolt at the top of the controller and the nut at the bottom mounting ear. Remove the carburetor rod to gain access to bottom nut.
3. Slide cover towards the controller and remove roll pin at the by-pass end of the end of the connecting link.
4. Remove the bolt and nut, hold the throttle valve wide open and remove controller.
5. Remove sensing port "O" rings.
6. Remove the cover and remaining roll pin, then remove connecting link.

INSTALLATION

1. Install the two new sensing port "O" rings and the connector link onto the stem of the controller.
2. Install the roll pin through the link and controller stem.
3. Slide cover, safety wire end first, over the link.
4. Pull out the by-pass valve and position the link over the valve stem.
5. Temporarily install a cotter pin through the link and by-pass valve.
6. Position the controller to the housing and install lock washers, bolt and nut. Torque 8 to 9 ft. lbs.

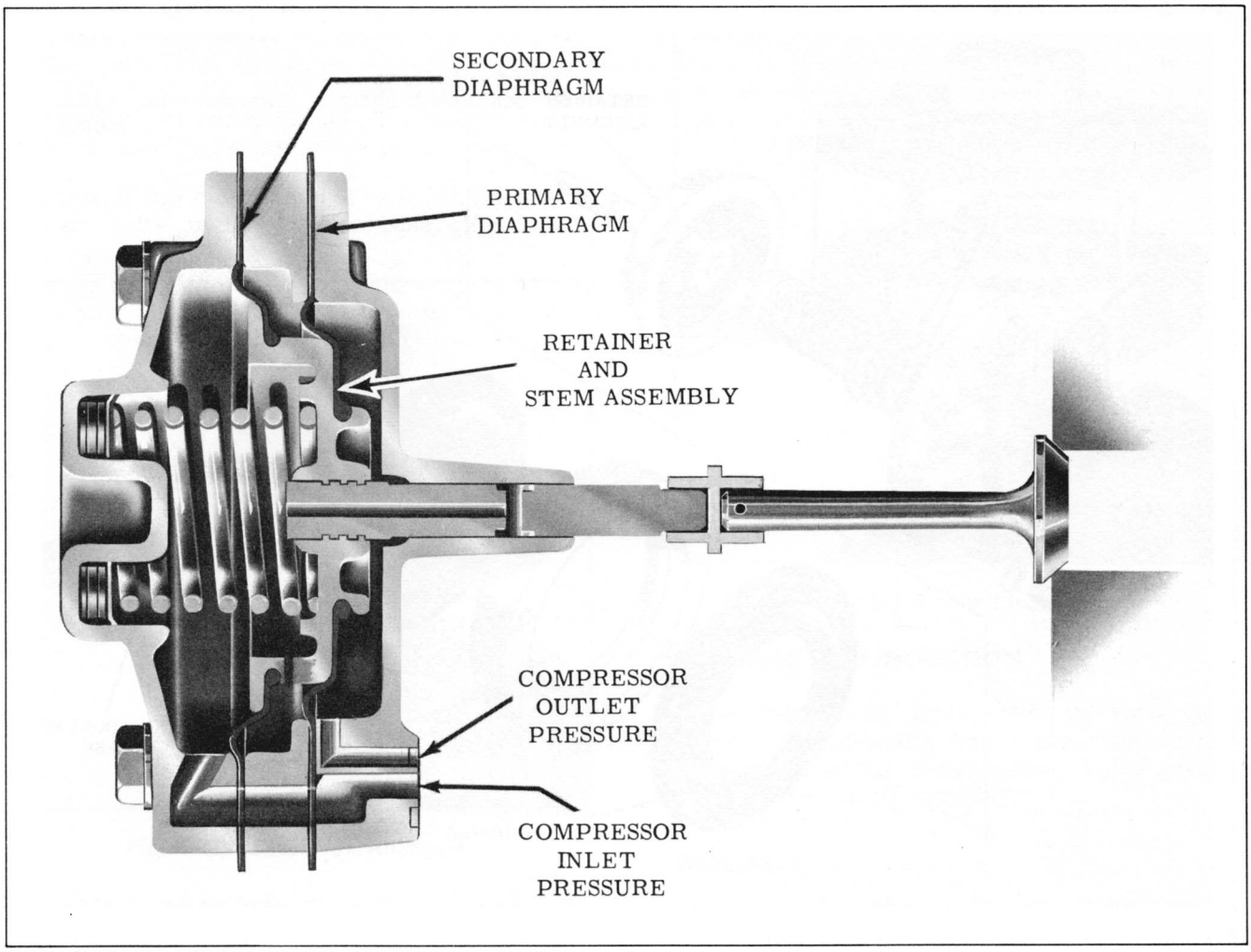


Fig. 8-110 Controller Assembly

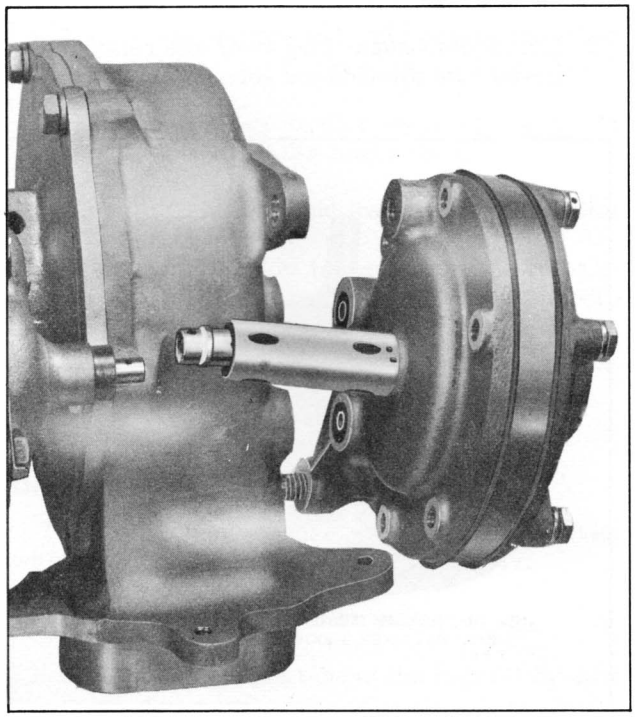


Fig. 8-111 Controller Assembly Removal

7. Remove cotter pin and install roll pin.
8. Replace the original safety wire with another piece.
9. Connect carburetor rod.

DISASSEMBLY (Fig. 8-112)

1. Scribe a line on the edge of the controller.
2. Remove four (4) of the six (6) cover bolts.
3. Loosen the two (2) remaining bolts about 1/8".

   NOTE: Cover is under spring tension.

4. Apply air, 15 to 20 p.s.i. to the pressure port first and then the vacuum port to free diaphragms. (Fig. 8-107)
5. Remove the two (2) bolts while holding cover and spring compressed, then remove cover and spring.
6. Remove shim retainer and shims from the spring seat.

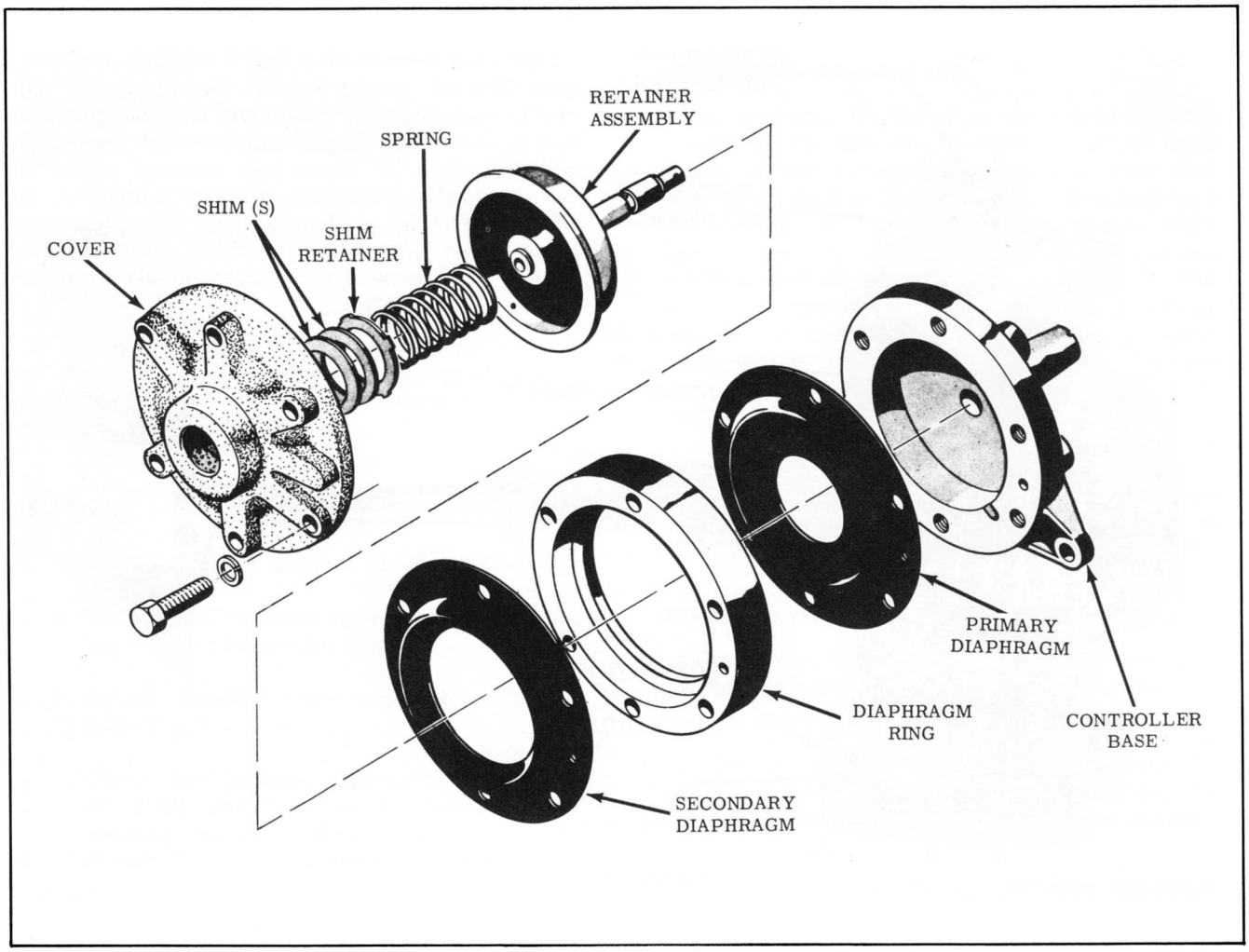


Fig. 8-112 Exploded View of Controller Assembly

NOTE: Count the number of shims. If the spring is to be replaced, discard the shims and retainer. Service springs are calibrated to be used without shims and retainer. Service springs are identified by a blue stripe.

7. Separate the controller base, diaphragm and diaphragm ring.

8. Remove the diaphragm retainer, diaphragms and ring.

9. Remove the ring from the retainer by slipping over the stem end of the retainer.

10. Remove the diaphragms off from the stem side of the retainer.

ASSEMBLY (Fig. 8-113)

1. Install diaphragms with raised ring toward retainer. (Fig. 8-110)

2. Install diaphragm ring over the retainer, relieved side towards the secondary.

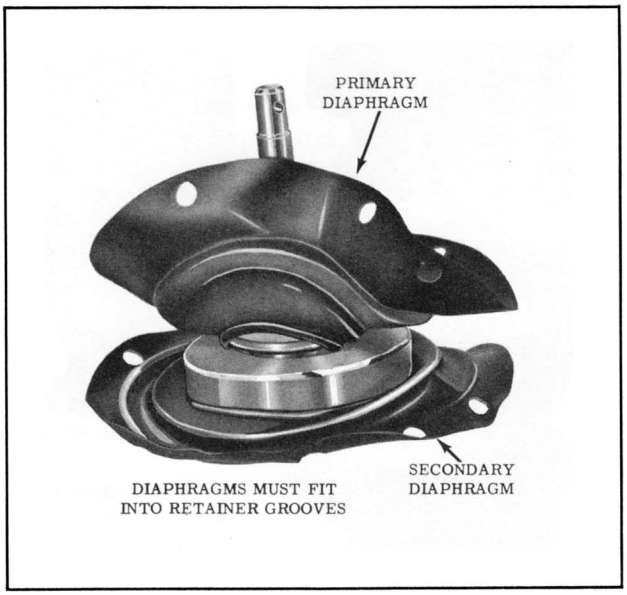


Fig. 8-113 Controller Diaphragms

3. Install primary diaphragm raised ring towards the retainer.

4. Align the pressure passage holes and bolt holes.

5. Install two guide pins 1/4" x 3", U.S.S. standard bolts, in the controller base. (Fig. 8-114)

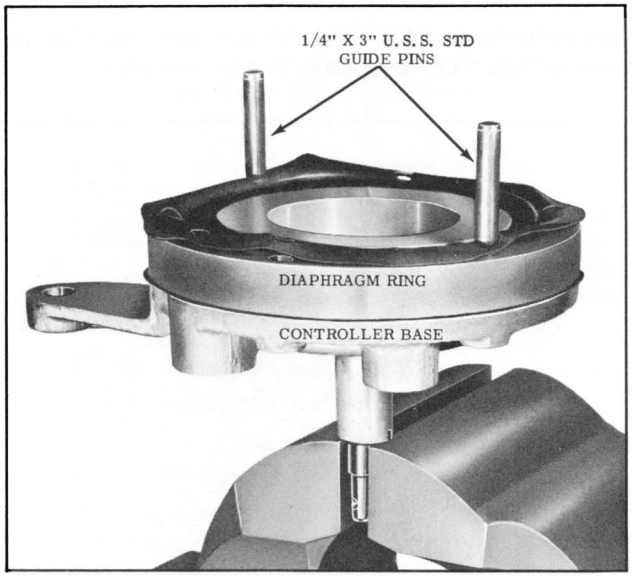


Fig. 8-114 Diaphragm Alignment

6. Install retainer with diaphragms over the guide pins with holes aligned.

7. Clamp in brass jawed vise as shown in Fig. 8-112.

8. Install the shims and retainer in the cover and position over guide pins. (Fig. 8-115)

9. Compress the controller stack up and install two (2) opposite bolts finger tight.

10. Remove guide pins and install remaining bolts.

11. Diaphragms should be centered and 1/8" edge exposed all the way around. Tighten the bolts alternately 40 to 50 in. lbs.

BY-PASS VALVE

DISASSEMBLY (Fig. 8-109)

The by-pass valve can be removed for service without removing turbo-charger assembly.

1. Remove controller assembly.

2. Straighten the lock tabs at the four (4) by-pass valve guide bolts.

3. Remove the bolts, guide, gasket and valve.

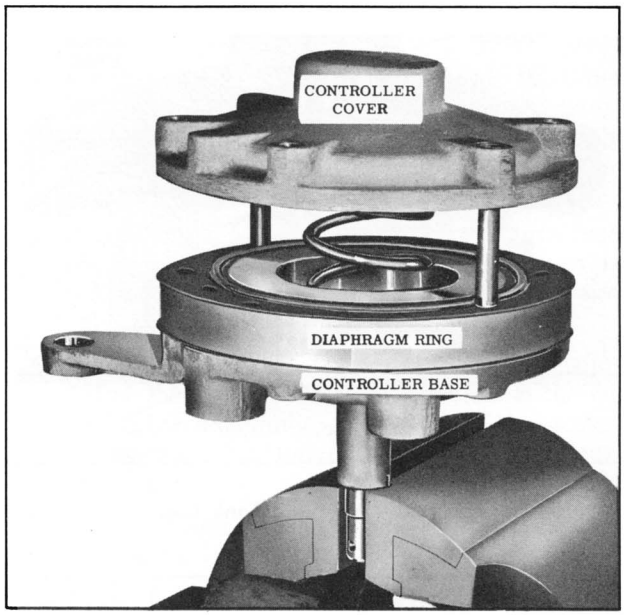


Fig. 8-115 Installing Cover

CLEANING AND INSPECTION

Check valve for freeness in the valve guide. Clean carbon deposits from valve. Inspect valve head and seat for deterioration. Valve guide is serviced only as an assembly.

ASSEMBLY

1. Install the valve in the valve guide, and position a new gasket and guide assembly on the turbine housing.

2. Install two (2) new lock plates and four (4) valve guide bolts. Torque evenly 8 to 9 ft. lbs.

3. Install the controller assembly using new "O" rings at sensing ports.

TURBO-ROCKET FLUID TANK

The tank located on the left front inner fender panel has a capacity of five quarts. The tank is equipped with a fluid level gauge which will light the console fluid warning lamp when the fluid level reaches 1-1/2 pints. When the fluid tank is empty, the performance gauge pointer will not register in the red or boost area. The fluid tank has a reset type cap designed to open at 6.5 to 7.5 p.s.i. to prevent excessive boost pressure. If the cap is in open position the fluid delivery will stop, thereby limiting the boost pressure. (Fig. 8-116)

REMOVAL (Fig. 8-117)

1. Loosen fluid filter clamp and lift filter up from mounting bracket.

2. Disconnect and clamp fluid supply hose at the fluid metering valve.

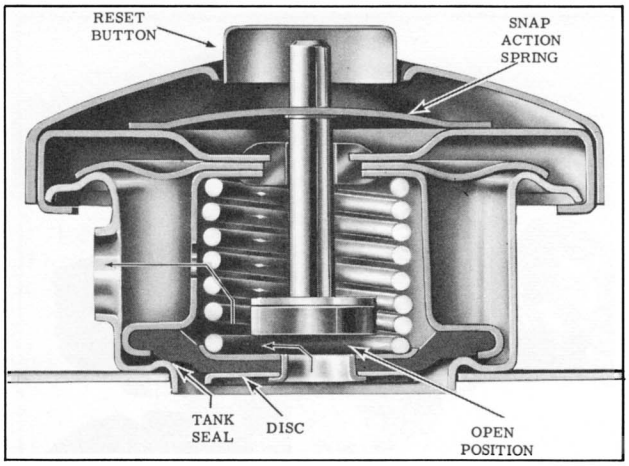


Fig. 8-116 Fluid Tank Cap

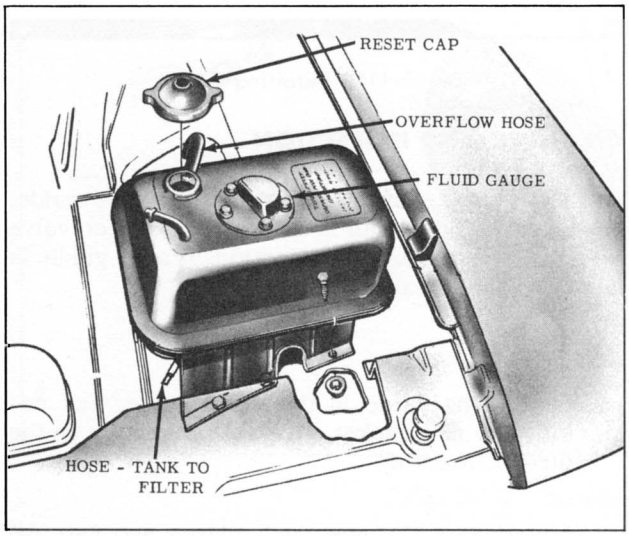


Fig. 8-117 "Turbo Rocket Fluid" Tank

3. Lower the hose and filter to underside of car, release clamp and drain fluid into a clean container.

4. Disconnect gauge wire and disconnect the remaining hoses at the tank.

5. Remove the attaching bolts and nuts, three (3) on each side of the tank, and remove the tank.

INSTALLATION

To install, position the tank and install the tank attaching bolts and nuts. Connect all hoses and check for leaks.

CHECK AND RELIEF VALVE ASSEMBLY

OPERATION

The check and relief valve assembly allows the Turbo-Rocket Fluid tank to be pressurized during boost operation and remain pressurized during normal engine operation when there is a vacuum in the intake manifold. It also permits a slight relief of pressure, caused by normal thermal expansion, in the fluid supply tank thus preventing the reset cap from relieving the pressure.

REMOVAL (Fig. 8-118)

Disconnect hoses, remove coil, remove valve assembly and nylon gasket. Lift connector, large washer and "O" ring from intake manifold.

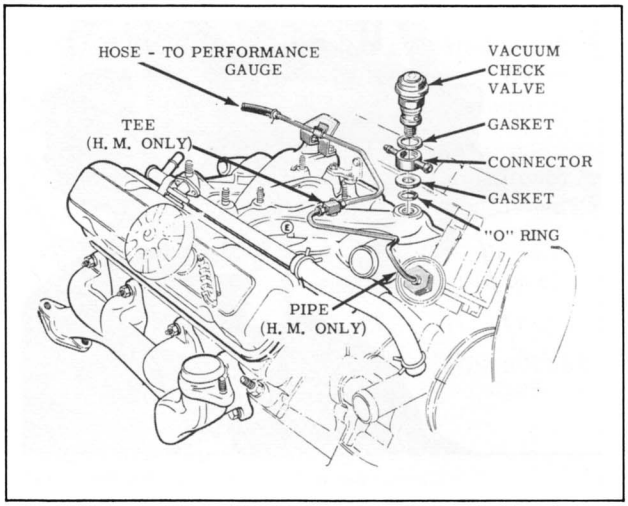


Fig. 8-118 Exploded View of Relief Valve

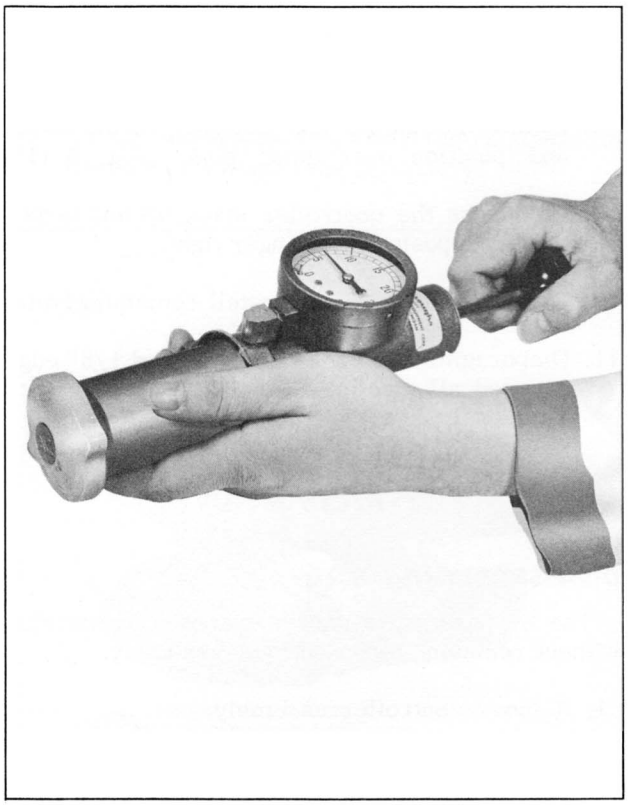


Fig. 8-119 Testing Fluid Tank Cap

TURBO-ROCKET ENGINE DIAGNOSIS

TESTING WITH THE BT-6225 GAUGE

TESTS: Check and Relief Valve Assembly, Depressure Valve, supply tank and hoses.

1. Install gauge BT-6225 on the fluid supply tank and start engine.
2. Pump up the gauge to 8 lbs. with the engine idling, relief valve should reduce pressure to 5-1/4 - 6-1/4 lbs., if pressure drops below 5-1/4 lbs., the depressure valve may not be closing, or leaks may be present in or around the relief valve or hose.
3. Turn off ignition, depressure valve should open, dropping pressure to zero within two minutes.

If the pressure drops below 5-1/4 lbs. when performing step 2, a leak is indicated. The following steps will pinpoint the location:

1. Clamp the upper hose leading from the fluid tank with Vise Grip pliers.
2. Install BT-6225 and pump up to 8 lbs. The tank should hold 8 lbs. for 30 seconds.
3. If the gauge pressure drops, clamp upper and lower hoses with Vise Grip pliers.
4. Pump up to 8 lbs. If the gauge holds the 8 lbs. for 30 seconds, the leak is in the Fluid Metering and Boost Limit Valve assembly. If the gauge pressure continues to drop, check for air pressure leaks at the tank.
5. If leaks are not detected, remove pliers from the upper tank hose, clamp hose between the relief valve assembly and the depressure valve.
6. Pump up to 8 lbs., if pressure drops below 5-1/4 lbs., check for external leaks at the relief valve assembly. If neither of these show a leak, the relief valve assembly may be leaking internally.
7. Remove both pairs of Vise Grip pliers, and the gauge.

TESTING THE TURBO-ROCKET FLUID TANK CAP (Fig. 8-119)

1. Install the cap on BT-6225 tester with the reset button depressed.
2. Pump up tester to 5 lbs., the cap should hold this pressure for 30 seconds.
3. Pump up the tester to 7.5 lbs., the cap must release the pressure between 6.5 to 7.5 lbs.

CONDITION	POSSIBLE CAUSE	CORRECTION
Dull whine on acceleration or deceleration.	Center housing shaft bushings worn or compressor impeller or turbine wheel rubbing the housing.	Inspect and replace necessary parts.
Pressure cap releases.	Exhaust by-pass valve stuck, or the controller stem stuck.	Inspect the by-pass valve and controller, repair or replace.
Some performance, but not maximum.	Broken primary diaphragm in controller.	Replace with diaphragm kit.
No boost operation.	Turbo-rocket fluid tank empty, or plugged fluid filter.	Check fluid level and/or fluid filter.
	Fluid tank cap released, (popped).	Reset cap.
	Depressure valve not closing, or check and relief valve defective.	These can be checked with the BT-6225 diagnosis test procedures. If the checks indicate that the malfunction is in the Fluid Metering and Boost Limit Control Valve assembly, disassembly and inspect the upper diaphragm.
	Leaks in fluid tank or hoses.	
	A leak in the upper diaphragm of the Fluid Metering and Boost Limit control valve assembly.	
	Leak in the lower diaphragm of the Fluid Metering and Boost Limit Control Valve assembly.	If the BT-6225 diagnostic tests do not show leakage in any of the components, and still "no boost", disassemble and inspect the lower diaphragm of the Fluid Metering and Boost Limit Control Valve assembly.
	Broken auxiliary throttle valve return spring.	Replace the spring.

INSTALLATION

Install a new "O" ring, install large washer and connector into intake manifold. Install valve assembly with nylon gasket. Torque valve 12 to 18 ft. lbs.

FLUID GAUGE

The fluid gauge is attached to the tank with five (5) screws. A gasket is used between the tank and gauge. The gauge is calibrated to light the console warning lamp when the level reaches 1-1/2 pints.

THROTTLE AND T.V. LINKAGE ADJUSTMENTS

1. Raise car on hoist.

2. Disconnect lower T.V. rod from T.V. lever and position gauge BT-33-2 as shown in Fig. 8-120. The hole of the T.V. lever must be within the hole of the gauge when holding the T.V. lever in the rearward position. If the hole of the T.V. lever does not fall within the gauge hole, bend the lever with bending tool BT-33-7. (Fig. 8-121)

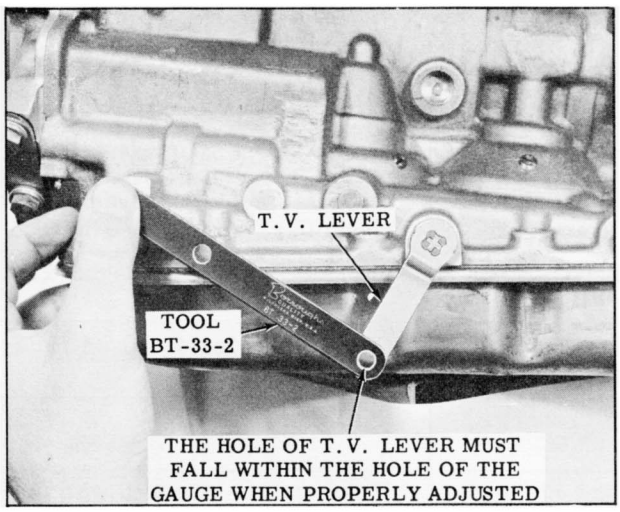


Fig. 8-120 Checking T.V. Lever

3. Disconnect the lower T.V. rod from the T.V. bellcrank.

4. While holding the lower T.V. rod downward and T.V. bellcrank down at the rear, the clevis pin must be a free pin. If necessary, adjust clevis, then connect lower T.V. rod to bellcrank.

5. Remove air cleaner and disconnect upper end of the carburetor rod. (Fig. 8-122)

6. Install throttle return check tool J-6342-01

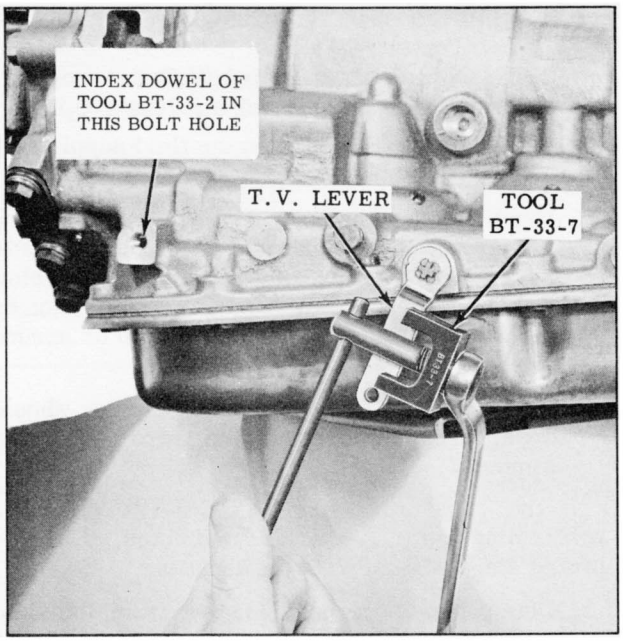


Fig. 8-121 Bending T.V. Lever

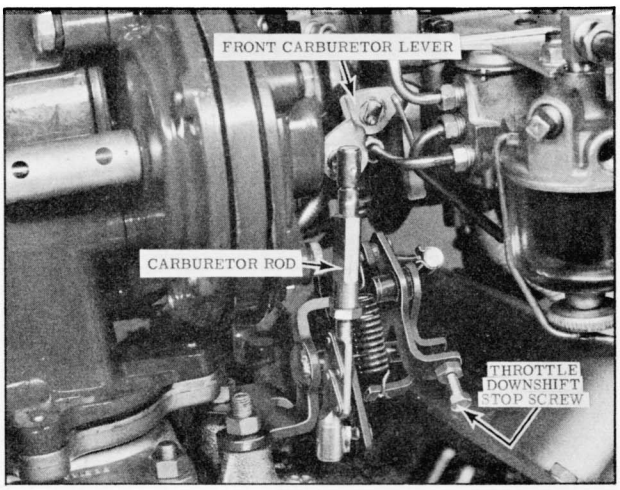


Fig. 8-122 Carburetor Rod

and back out slow idle screw. Fast idle screw should not contact cam, if necessary insert a screwdriver into the carburetor bore to block open the choke valve. (Fig. 8-123)

7. Back out the auxiliary bellcrank stop screw until the bellcrank contacts the stop. (Fig. 8-124)

8. Loosen the carburetor lock nut and shorten the rod. (Fig. 8-122) Connect the upper end of carburetor rod to the front carburetor lever.

9. While holding the throttle valve at closed bore with the rear carburetor lever, lengthen the carburetor rod until the links close and a

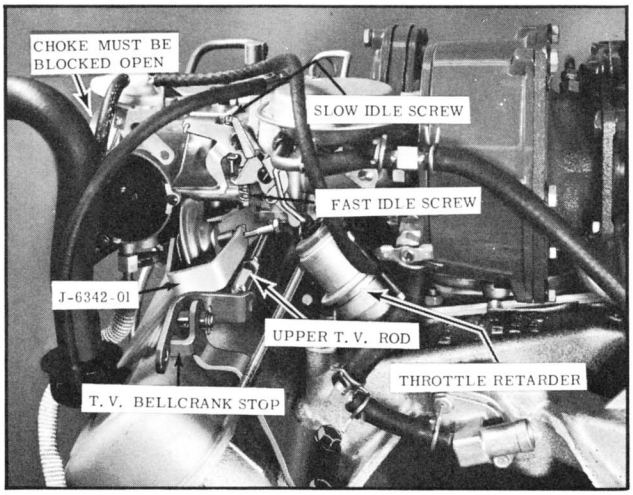


Fig. 8-123 Throttle Return Check Holding Tool J-6342-01

slight load is felt on the threads. Then shorten rod one (1) turn and tighten the lock nut.

10. Shorten the upper T.V. rod slightly and connect it to the ball stud on the T.V. bellcrank. While holding the T.V. bellcrank against its stop, lengthen the upper T.V. rod until a slight resistance is felt on the threads and tighten the lock nut.

11. Adjust the slow idle to 550 RPM in drive.

12. Adjust the auxiliary bellcrank stop screw until it just affects the slow idle and then back it out one turn. (Fig. 8-124)

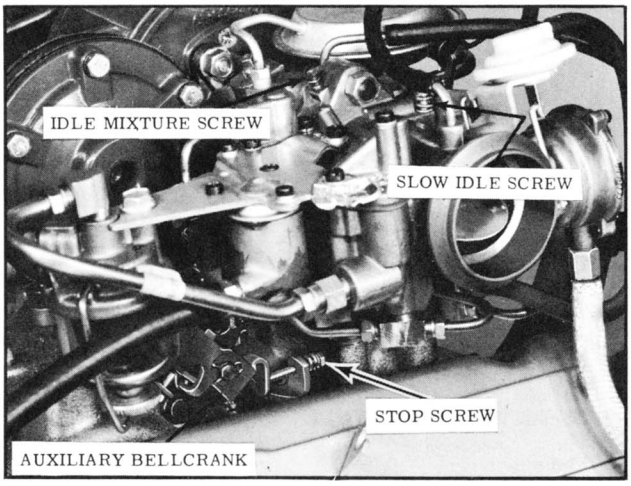


Fig. 8-124 Bellcrank Stop Screw

13. Adjust the fast idle to 1500 RPM with the fast idle screw on the second step of the fast idle cam. (Fig. 8-125)

14. With engine off, choke fully off and fast idle screw not touching the fast idle cam, adjust

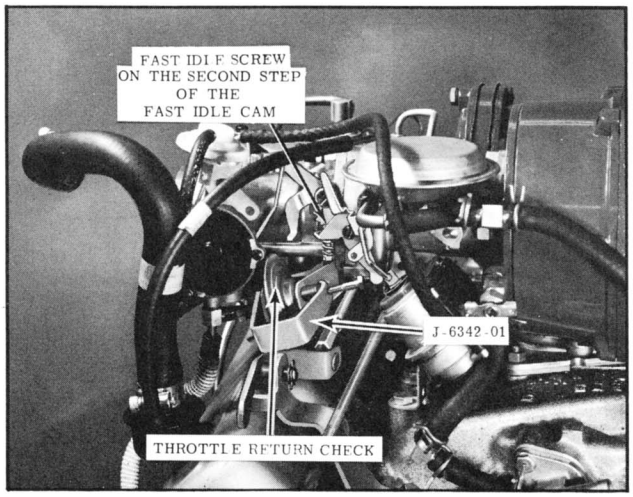


Fig. 8-125 Fast Idle Adjustment

the pedal height, if necessary, with Tool BT-33-2 as shown in Fig. 8-126.

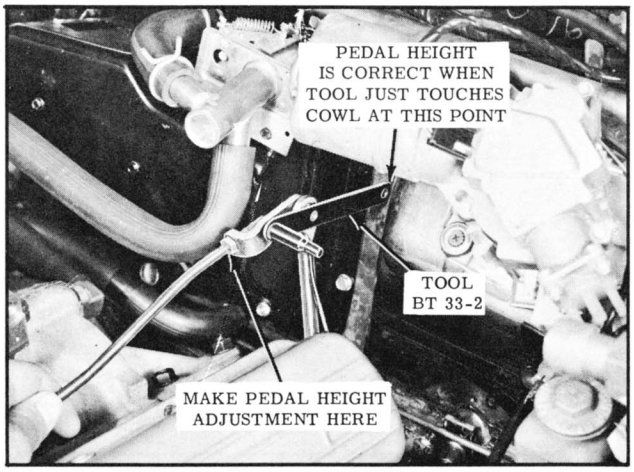


Fig. 8-126 Checking Pedal Height

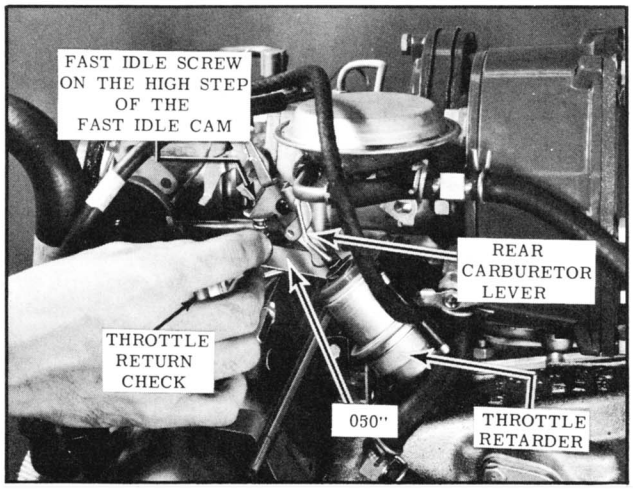


Fig. 8-127 Throttle Return Check Removal and Installation

15. Adjust the throttle return check to .050" with the fast idle screw positioned on the high step of the fast idle screw. (Fig. 8-128)

16. Loosen the throttle downshift stop screw lock nut and back off stop screw approximately six (6) turns. With the accelerator lever, move the throttle to wide open and over travel the linkage to point of maximum transmission T.V. lever travel. (Fig. 8-129)

    CAUTION: Do not bend or stretch linkage.

17. Holding the accelerator lever in the wide open position, set the stop screw to just touch the downshift lever tang, then screw the stop screw in an additional 1-1/2 turns and tighten lock nut.

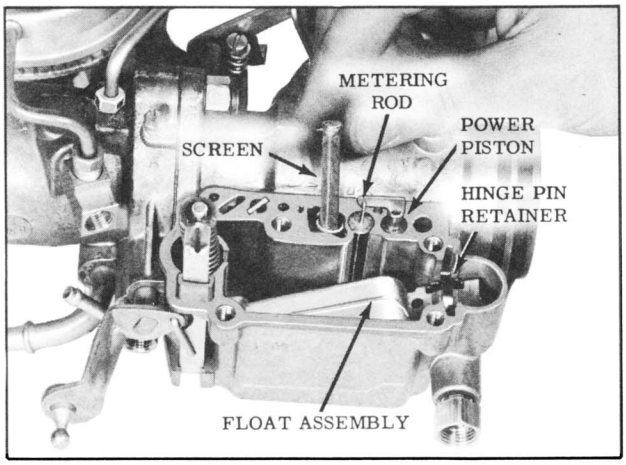


Fig. 8-128 Throttle Return Check Adjustment

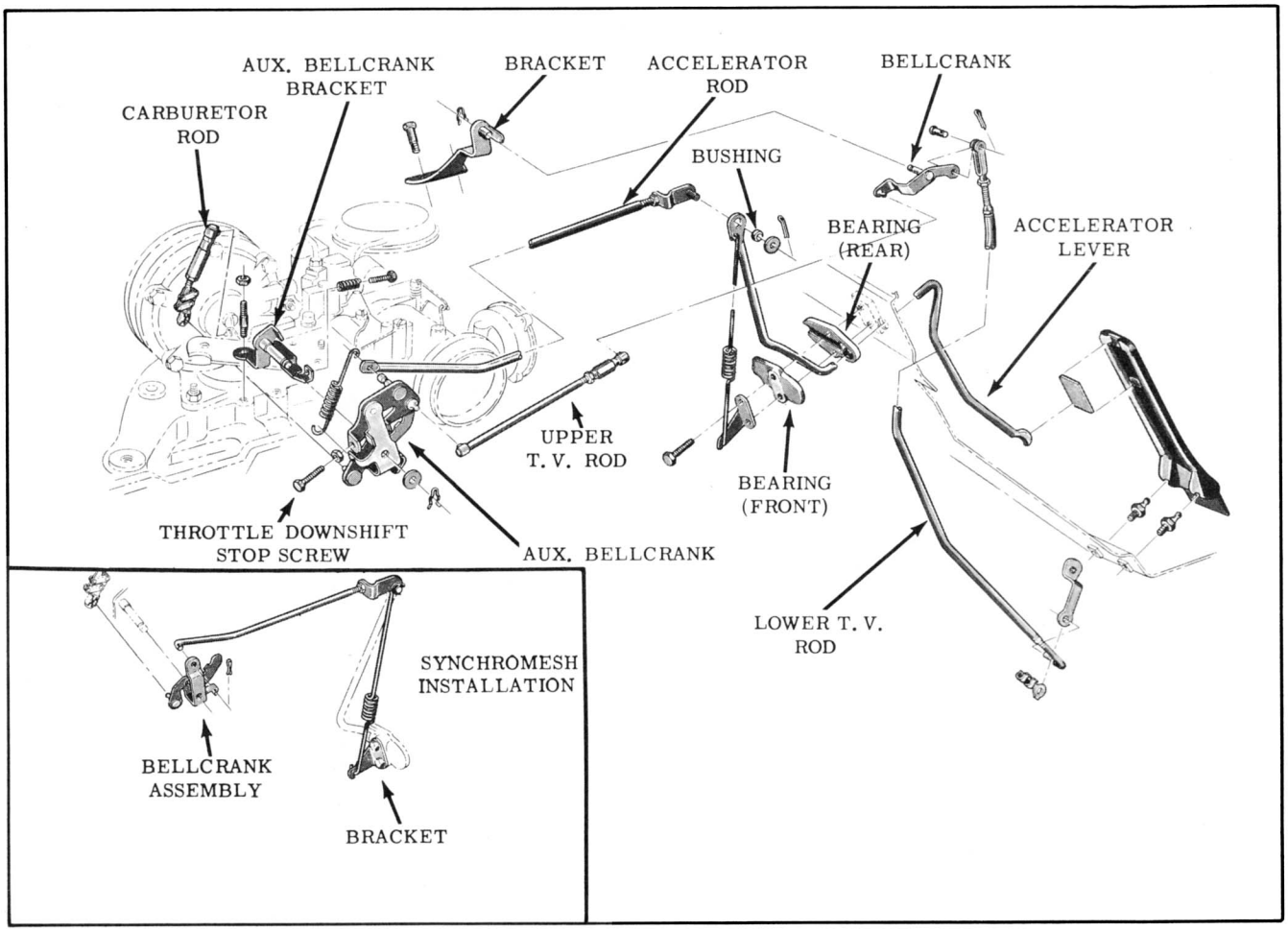


Fig. 8-129 Throttle Linkage

TUNE-UP SPECIFICATIONS

Tune-up specifications for the Turbo-Rocket engine that differ from the standard F-85 engine are as follows:

FAST IDLE

1500 RPM with fast idle screw on second step of the fast idle cam.

Transmission in neutral with A/C "OFF".

SLOW IDLE

550 RPM - H.M.T. in "Drive" - Except A/C.

550 RPM - S.M.T. in "Neutral" - Except A/C.

600 RPM - H.M.T. in "Drive" - A/C "OFF".

600 RPM - S.M.T. in "Neutral" - A/C "OFF".

IDLE MIXTURE

Adjust to "Rich" best idle without loss of engine RPM.

THROTTLE RETURN CHECK

.050" with the fast idle set and the screw resting on the high step of the fast idle cam.

CHOKE SETTING

Index H.M.T.

For S.M.T. refer to "CHOKE ADJUSTMENT" (Figs. 9-137, 9-138 and 9-139)

IGNITION TIMING

10^{o} BTDC at 850 RPM (vacuum advance disconnected)

FIRING ORDER

1 - 8 - 4 - 3 - 6 - 5 - 7 - 2 (same as standard F-85)

DISTRIBUTOR SPECIFICATIONS

H.M.T. part number 1111013

Vacuum advance (Dist. degrees)

start - 4" to 6"

10.5^{o} to 13^{o} at 17"

Mechanical advance (Dist. RPM)

0^{o} to 2^{o} at 500 RPM

5^{o} to 7^{o} at 1000 RPM (max.)

S.M.T. part number 1111021

Vacuum advance (Dist. degrees)

start - 9" to 11"

10.5^{o} to 13^{o} at 17"

Mechanical advance

same as H.M.T.

IGNITION COIL

The ignition coil is identified by the number 170 stamped in the coil housing. The internal resistances of the coil are higher than the standard coil.

Primary 1.00 to 1.16 ohms.

Secondary 7,500 to 10,000 ohms.

Used in conjunction with this is a new value (approximately .5 ohms) external resistor. This is necessary for proper ignition at higher engine RPM.

SPARK PLUGS

Make - AC

Type - 45 FF

Gap - .030"

TORQUE SPECIFICATIONS

NOTE: Specified torque is for installation of parts only. Checking torque during inspection may be 15% below the specified.

Application	Ft. Lbs.
Carburetor to Turbo-Charger Nuts	14 to 17
Exhaust Pipe Nuts - Exhaust Manifold to Turbo-Charger	10 to 18
Exhaust Pipe Nuts - Exhaust Outlet to Turbo-Charger	10 to 18
Turbo-Charger to Intake Manifold Nuts	25 to 30
Intake Manifold Flange to Turbo-Charger Screw	14 to 17
Oil Return Line Bolts	10 to 15
Controller Cover Bolts	40 to 50 In. Lbs.
Controller to Compressor Bolt and Nut	8 to 9
Center Housing to Compressor Housing Bolts	8 to 10
Compressor Housing Cover Screws	25 to 30 In. Lbs.
Turbine Housing to Center Housing Bolts	8 to 9
Check and Relief Valve to Intake Manifold	12 to 18

MODEL RC CARBURETOR

(F-85)

CONTENTS

THEORY OF OPERATION

FLOAT SYSTEM (Fig. 9-101)

The RC carburetor has one float which actuates the float needle, as the float raises or lowers it controls the float needle, allowing the fuel to enter or shut-off which maintains correct fuel level. The float bowl is vented both externally and internally which gives a balanced metering.

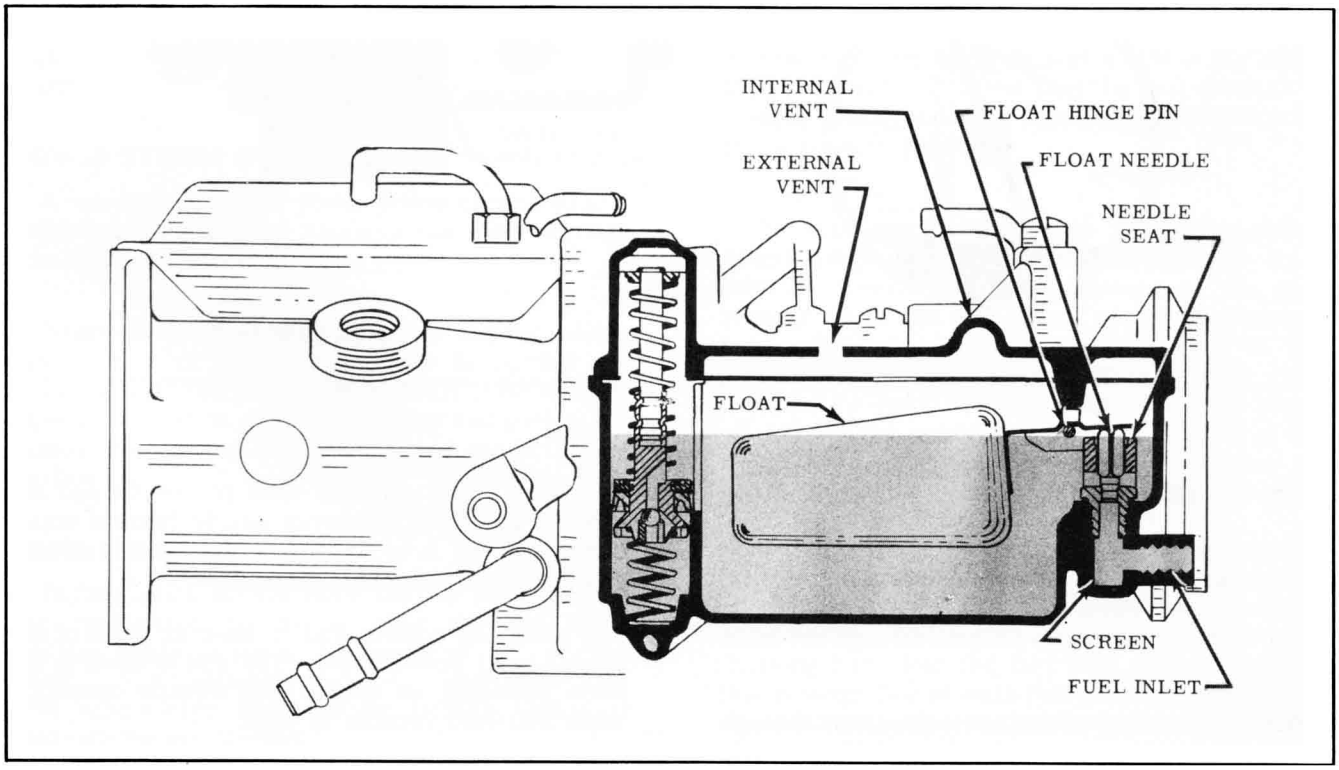


Fig. 9-101 Float System

IDLE SYSTEM (Fig. 9-102)

The idle system supplies the necessary fuel for curb idle and off-idle speed operation.

At idle the throttle valve is opened slightly which does not allow enough air flow for venturi action so the fuel needed to mix with the small amount of air is supplied by the idle mixture needle hole and is controlled by the idle mixture needle.

At off-idle speeds the throttle valve is opened slightly from the idle position and additional fuel is needed to increase engine speed. The slotted off-idle port supplies the fuel for off-idle operation by gradually uncovering the slot to high engine vacuum as the throttle is opened. The idle needle hole and off-idle discharge port continues to feed fuel until air flow is great enough to obtain good metering from the main discharge nozzle in the venturi.

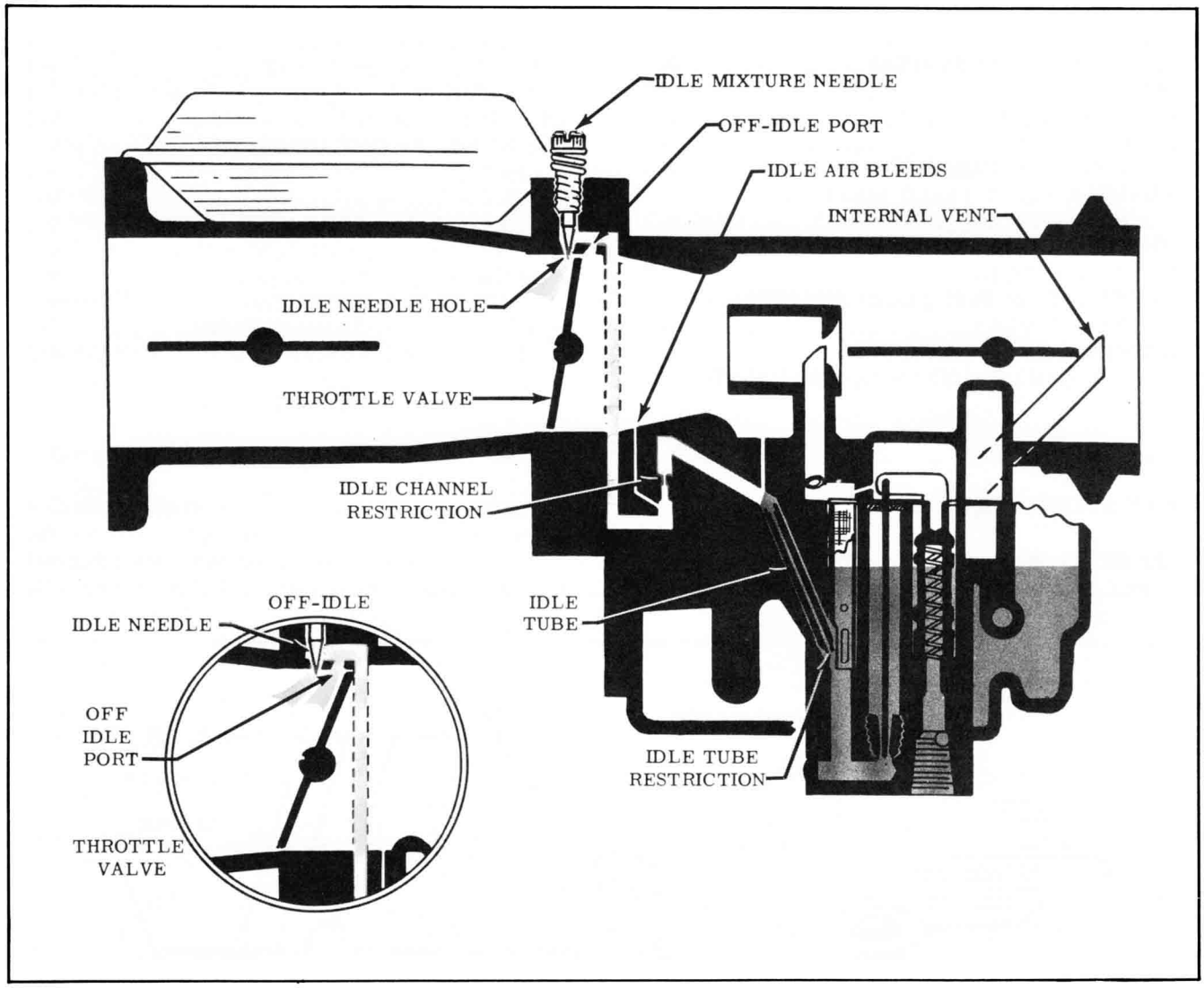


Fig. 9-102 Idle System

MAIN METERING SYSTEM (Fig. 9-103)

Further opening of the throttle valve increases the speed of the air stream through the venturi. It is at this point that the means to provide engine fuel requirements is done through the main metering system.

Fuel is forced by atmospheric pressure through the main metering jet into the screened main well. Air entering through the main well bleed is mixed with the fuel through calibrated holes in the main well tube. The mixture then moves up and out through the main discharge nozzle into the small venturi where it is delivered into the air stream and then on into the intake manifold.

A metering control rod is used in place of the conventional power valve. The rod is down in the main metering jet during part throttle operation when manifold vacuum is high.

The main well bleed acts as a fuel siphon breaker when the main metering system is not in

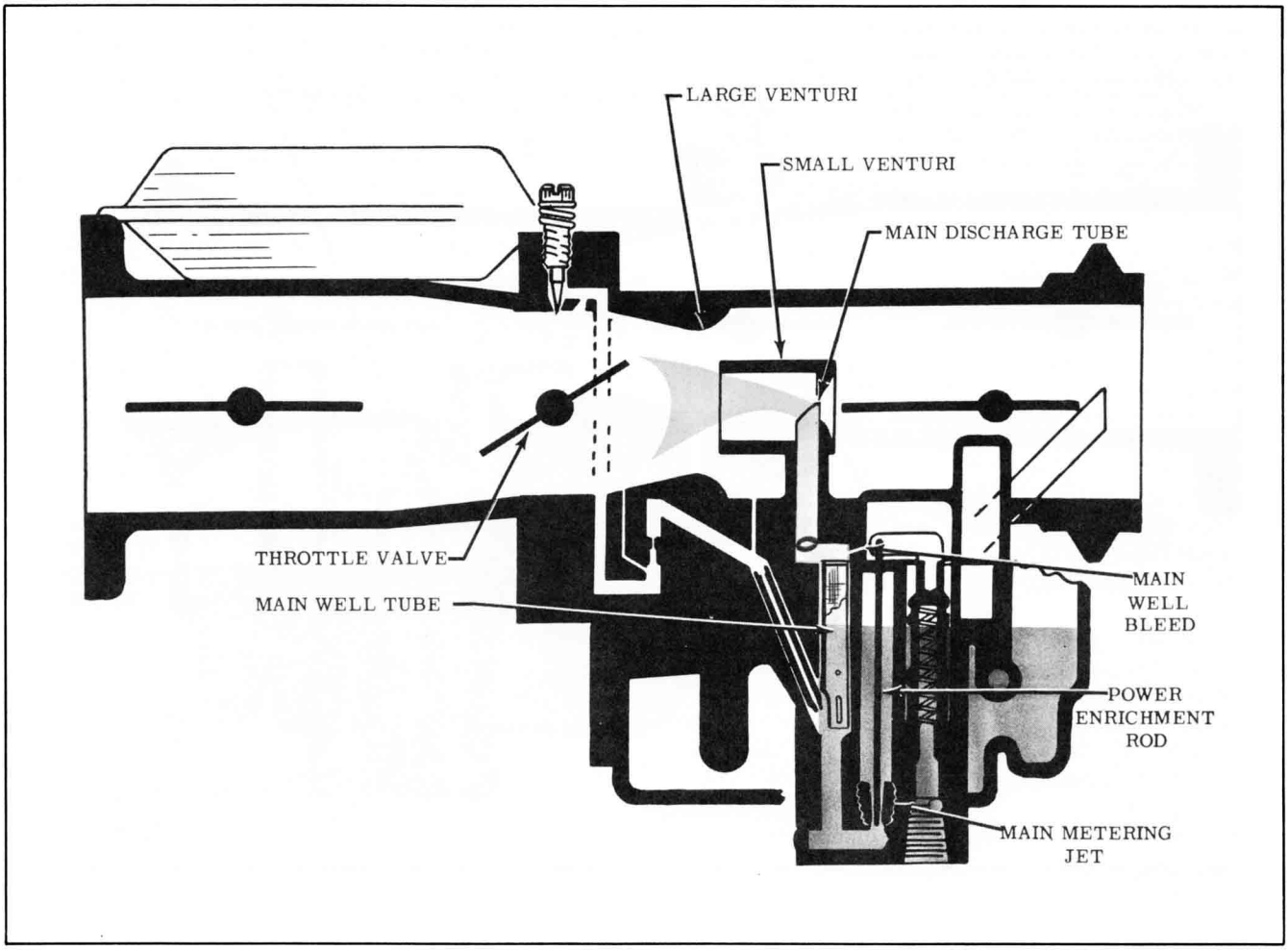


Fig. 9-103 Main Metering System

operation. This prevents the possibility of fuel siphoning out through the main discharge nozzle from the main well.

POWER SYSTEM (Fig. 9-104)

A vacuum operated power piston connected to a metering control rod controls fuel flow through the main jet.

When manifold vacuum drops to a point where enrichening of the fuel mixture is needed for added power, the piston spring overcomes the pull created by engine manifold vacuum and pushes the piston up, pulling the control rod out of the jet orifice allowing more fuel to flow through it.

PUMP SYSTEM (Fig. 9-105)

During quick acceleration the air flow through the carburetor increases while the fuel being heavier tends to lag momentarily causing a leanness. An accelerator pump is used to prevent this momentary leanness by forcing additional fuel into the air stream.

When the throttle valve is closed the pump plunger moves upward, fuel from the float bowl enters the pump well through a slot in the side of the pump well. It flows past the ball check in the plunger head and fills the pump well below the pump plunger head.

On acceleration the pump plunger is forced downward by the linkage connected directly to the throttle lever. Downward motion of the pump plunger seats the ball check in the pump plunger head. Fuel beneath the pump plunger is then forced through the pump discharge passage where it unseats a pump discharge ball check and passes on through the passage to the pump discharge hole where it sprays into the carburetor bore just above the throttle valve.

The spring-loaded check ball in the pump discharge passage is normally in the seated position and prevents fuel in the discharge passage from draining back into the fuel bowl, thereby, keeping this passage full of solid fuel when the pump is not in operation. The spring-loaded discharge ball check in the pump fuel passage also prevents any "pullover" or discharge of fuel from the pump nozzles when the pump is inoperative.

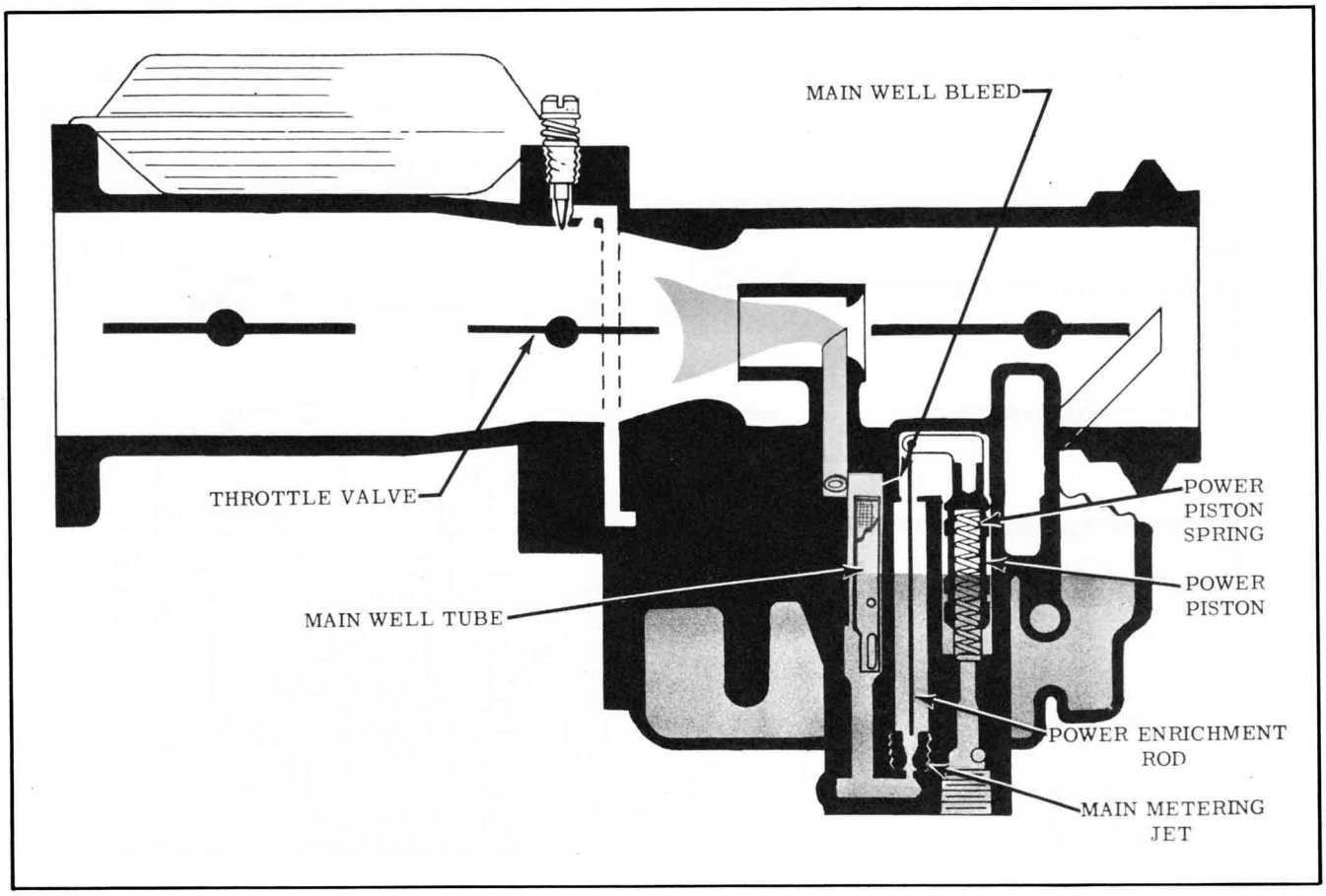


Fig. 9-104 Power System

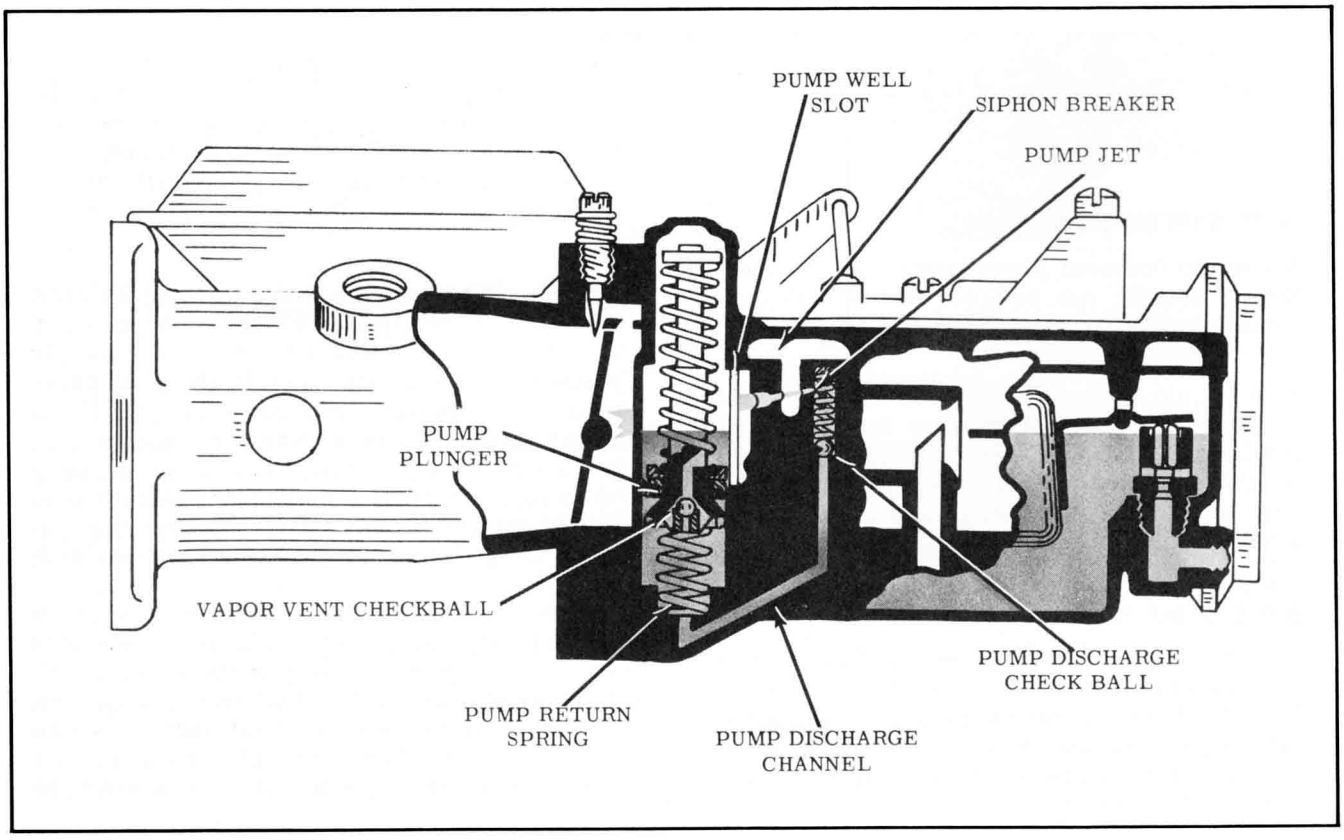


Fig. 9-105 Pump System

The check ball in the pump plunger head also serves as a vapor vent from the pump well during "hot" engine operation. Without this vent, vapor pressure build up in the pump well might force fuel from the pump system into the carburetor bore and consequently on into the engine, causing hard starting. It also insures the pump system will be completely vented from fuel vapor so that a solid discharge of fuel will be maintained at all times.

CHOKE SYSTEM (Fig. 9-106)

Hydra-Matic Transmission

The choke system used on the RC carburetor is basically the same as on all previous models. However, a spring-loaded diaphragm mounted in a Delrin plastic case has been added. Manifold vacuum applied to the diaphragm provides a pulling action on the choke shaft against the tension of the choke coil. This pull provides a definite amount of vacuum break for starting regardless of ambient temperature around the choke coil, insuring correct fuel mixture for starting.

The second vacuum break system is that provided by the choke piston. Located in the choke piston bore in the choke housing is a vacuum break channel. After initial starting, the vacuum pull against the choke piston pulls the choke valve to an opening desirable for the ambient temperature. As the engine heats up, the choke coil gradually relaxes and takes over control of the choke blade.

During initial starting and as the engine warms up, manifold vacuum exists in the choke housing. Hot air from the choke stove is pulled into the choke housing to heat the thermostatic coil. The air is supplied to the choke stove in the manifold from the air cleaner, above the choke valve.

The baffle plate inside the choke housing distributes the heat evenly around the choke coil to prevent "hot spots" on the choke coil and give gradual relaxing of the choke coil until the choke valve is fully open and the engine is warm.

During warm up it is necessary to provide a faster than normal idle speed to prevent engine stalling. This is accomplished by a fast idle cam connected by linkage directly to the choke shaft. A fast idle screw on the throttle lever rests on steps located on the fast idle cam. The calibrated

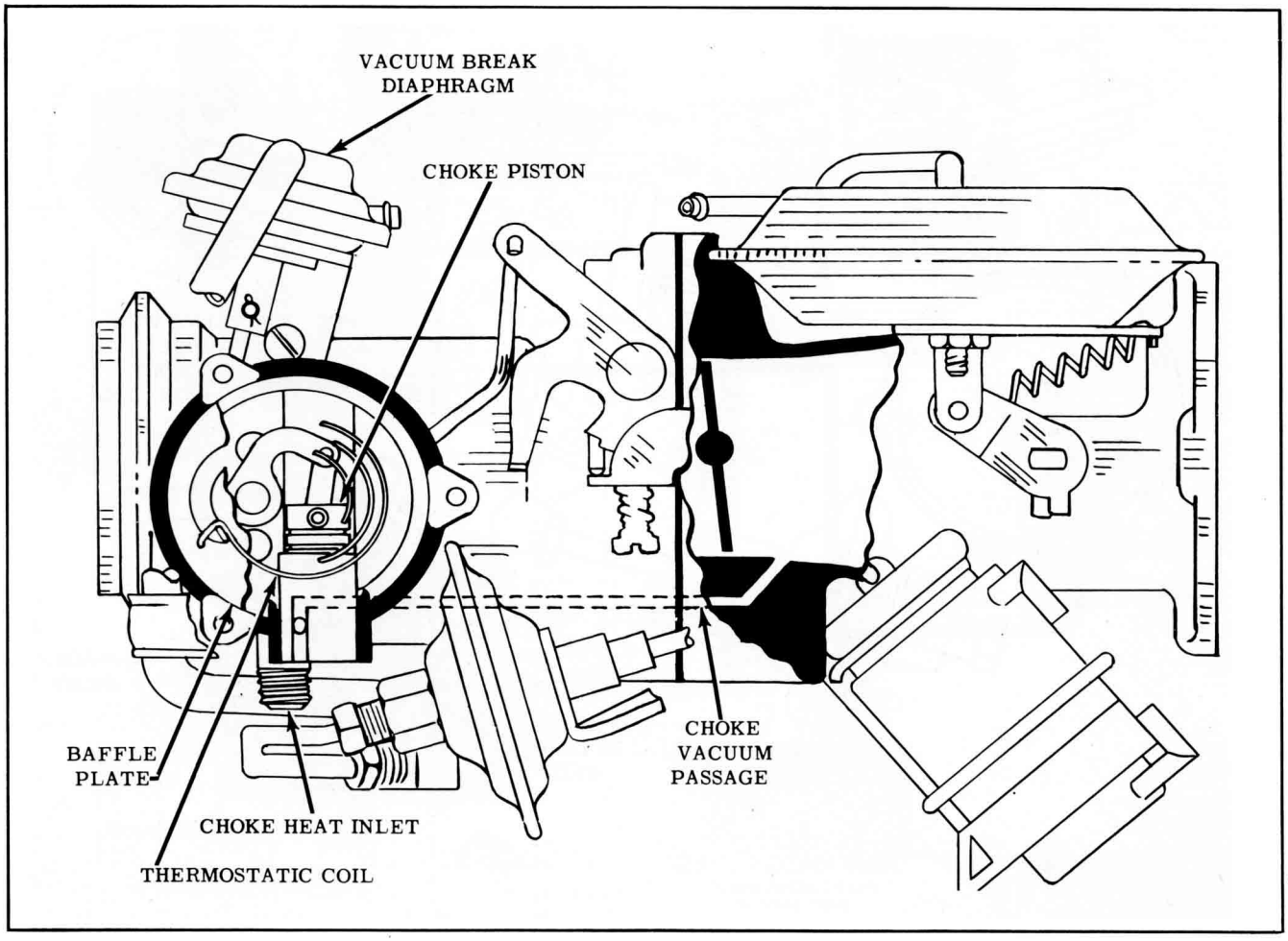


Fig. 9-106 Choke System

steps give the correct fast idle speed in relation to the amount of choke valve opening. When the engine is fully warmed up the fast idle cam no longer is needed and the engine returns to normal curb idle at which point the idle stop screw controls idle speed.

Synchromesh Transmission

The hand choke system used on the synchromesh transmission equipped cars has a simple wrap-up type spring rather than the bi-metal spring. The wrap-up type spring is connected to an adjustable pointer on the outside of the cover. The choke housing hot air inlet is capped, and a cable bracket with a detent mechanism is attached to the choke housing. The detent position is designed to provide higher than normal idle during the warm-up period by positioning the fast idle screw on the lowest step of the cam with the choke off. A two step fast idle cam is used on all synchromesh equipped cars.

THROTTLE RETARD UNIT (Fig. 9-107)

In addition to the throttle return check, the model RC carburetor also has a throttle retard unit connected to the throttle lever. This unit controls the closing of the throttle valve throughout the entire range of throttle opening, in contrast to the throttle return check which provides only partial range control. The retard unit provides a smooth transmission downshift by preventing a sudden release of power from rapid throttle closing.

The retard unit is a slow bleed air device consisting of a spring-loaded diaphragm, a rubber "flapper" valve, and a bleed restriction. As the throttle valve is opened, the diaphragm is pulled up, against the force of the spring. This action forces air above the diaphragm out of the top vent and sucks air into the chamber below the diaphragm through the bottom vent and the rubber check valve. When pressure on the accelerator pedal is released and the throttle valve starts to close, the spring in the retard unit forces the diaphragm down. The force of the spring tends to push the air below the diaphragm out of the chamber, thus closing the rubber flapper valve causing all the air to escape through the bottom vent. The air, therefore, bleeds out at a slow rate, thereby, allowing the throttle valves to close slower during deceleration.

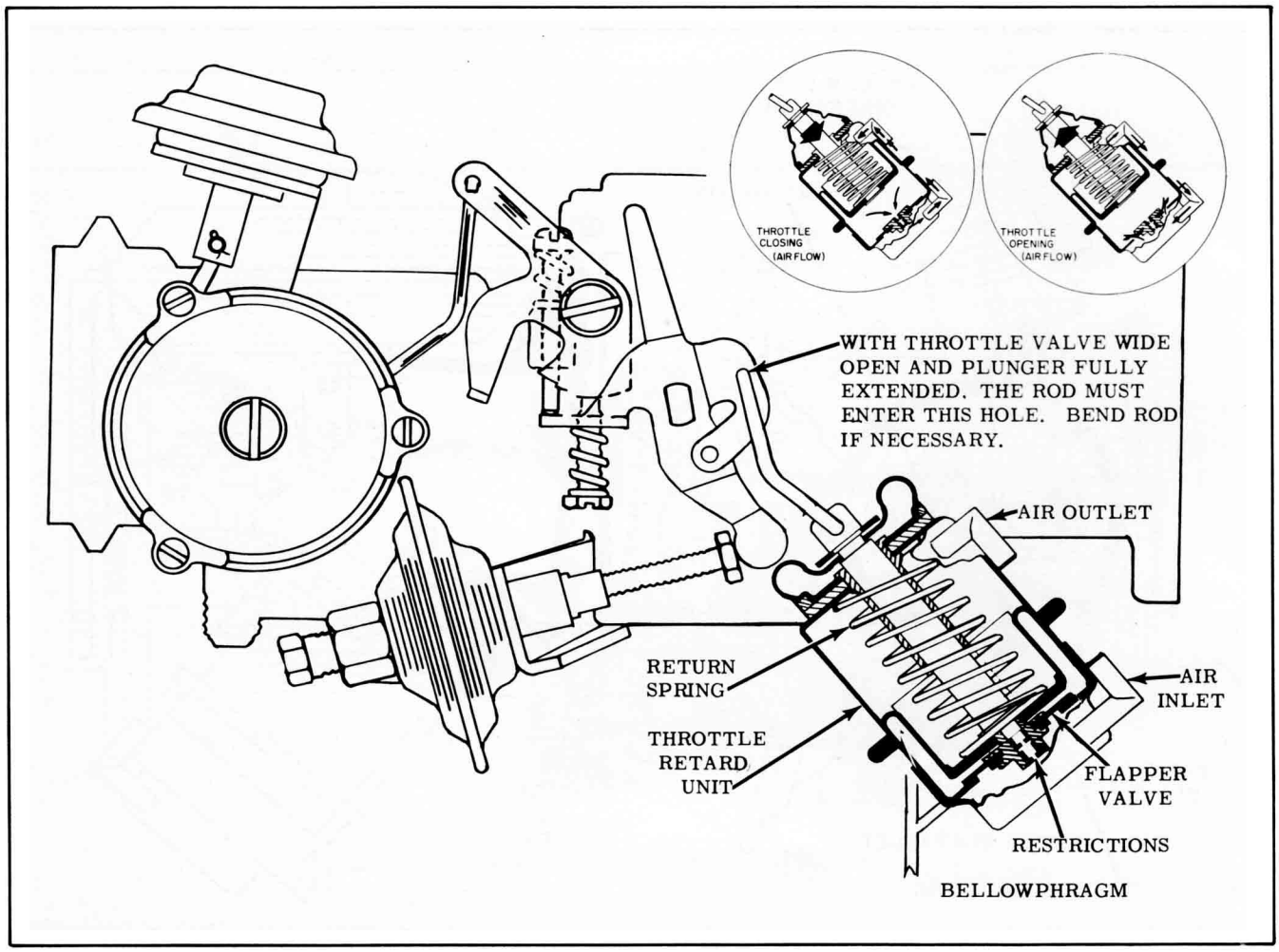


Fig. 9-107 Throttle Retarder

TURBO-ROCKET FLUID METERING AND BOOST LIMIT VALVE OPERATION

The valve is designed to deliver Turbo-Rocket Fluid any time intake manifold pressure exceeds 1 p.s.i. Periodic maintenance of the valve is not required.

ENGINE RUNNING (NORMAL— NO BOOST) (Fig. 9-108)

With the engine operating in the economy range (no boost) the depressure valve, located in the throttle flange of the carburetor, is closed by vacuum from the throttle body acting on the diaphragm to pull it up and seal the tank pressure bleed.

The intake manifold and compressor housing has lower than atmospheric pressure (vacuum).

In the Fluid Metering Valve assembly the float is down and the vent above the float is open, both check balls are seated and the boost limit control valve is closed due to intake manifold vacuum below the diaphragm and atmospheric pressure above the diaphragm.

With the Boost Limit Control Valve closed, low pressure created in the throttle body is in the tee fitting on the upper portion of the throttle body and the passage to the upper line on the boost limit control valve. This low pressure holds the diaphragm down during slight or momentary pressure changes in the boost limit control side of the valve assembly.

Both the check valve and the relief valve in the Check and Relief Valve assembly are seated.

The Turbo-Rocket Fluid supply tank has not yet been pressurized. Once the engine has been operated in the boost range, the supply tank will be pressurized and will remain pressurized until the engine is turned off.

BOOST PRESSURE

When the engine is operating in the economy range, the performance is comparable to the standard F-85 2-barrel carburetor engine. However, if additional performance is desired, the

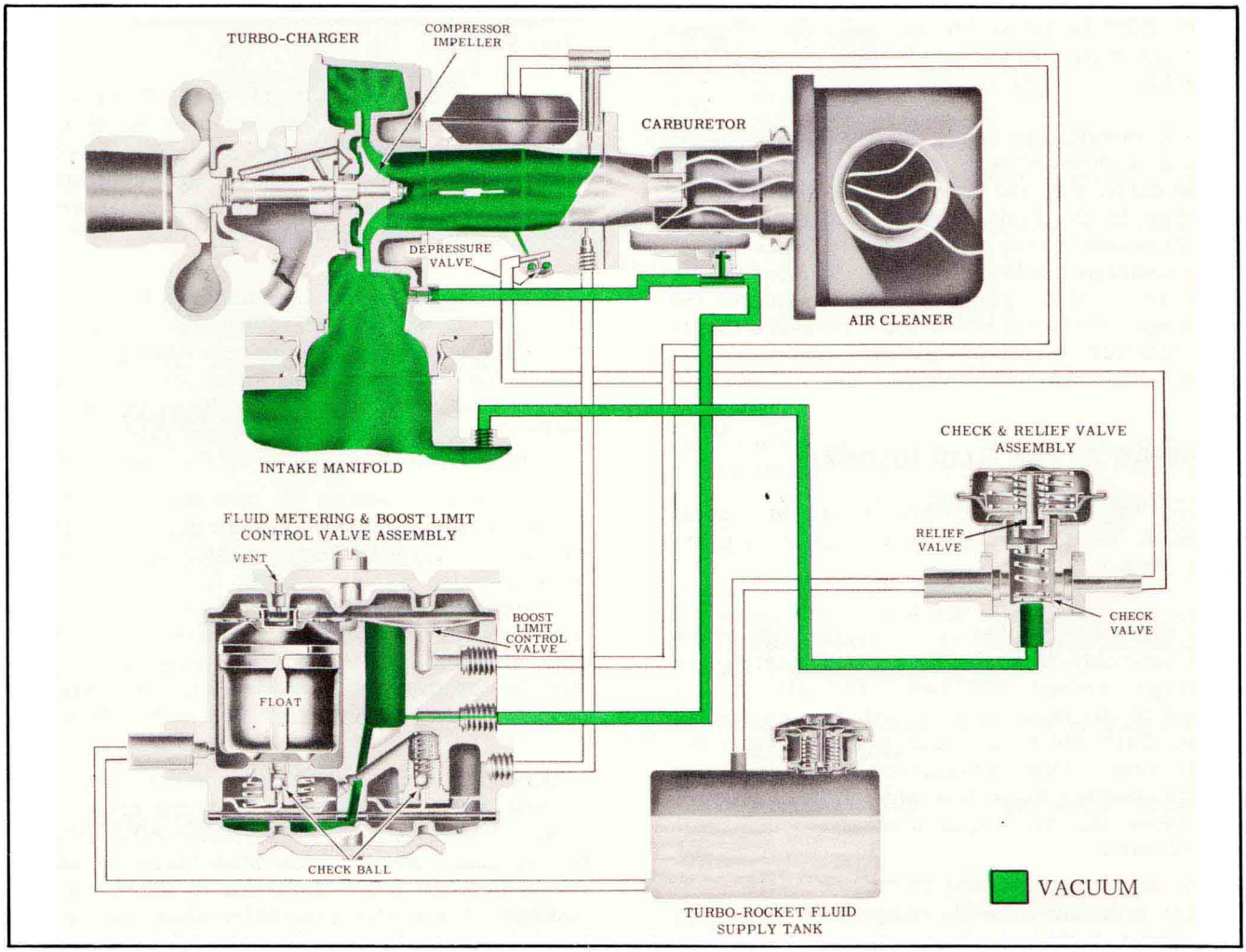


Fig. 9-108 Normal Operation (No Boost)

Turbo-Charger provides boost pressure in the engine. At this time Turbo-Rocket Fluid is metered into the carburetor throttle body where it is combined with the air-fuel mixture to control cylinder temperatures.

The following takes place when the Turbo-Charger produces a pressure of 1.0 p.s.i. or above, in the intake manifold.

As boost pressure builds up in the intake manifold, it will unseat the check valve in the Check and Relief Valve assembly and enter the supply tank pressure line where it is directed to the top of the fluid supply tank, pressurizing the tank. The boost pressure from the check valve is also directed to the depressure valve located in the carburetor throttle body.

With the fluid tank pressurized, fluid is forced from the tank into the float chamber of the fluid metering valve raising the float. The check ball below the float chamber prevents the fluid from flowing out of the float chamber at this time.

During the time pressure is being transmitted to the check valve, fluid tank and depressure valve, fluid is being forced from the tank into the fluid metering and boost limit control valve assembly.

Also, manifold pressure from the compressor housing is directed to a tee fitting at the bottom of the carburetor and then into the boost pressure chamber in the Fluid Metering Valve assembly. This pressure is then directed to the lower side of the diaphragm below the float chamber. This pressure is also against the lower side of the diaphragm at the top of the boost pressure chamber; however, the diaphragm will remain seated on the boost limit control valve.

PREPARATION FOR FLUID DELIVERY

When the engine is first placed into boost operation, the preparation for fluid delivery takes place almost instantly.

As the float chamber in the meter side of the valve assembly fills, the float rises, seating the diaphragm against the vent. The air that is trapped in the float chamber will be compressed by the fluid which is under pressure from the supply tank. This pressurized air is directed through openings in the float side of the diaphragm and above the diaphragm over the boost limit control valve.

Boost pressure from the compressor housing is also directed through the tee fitting at the carburetor, into the boost pressure chamber of the valve assembly, through the passage and below the lower diaphragm under the float. This pressure acting under the diaphragm forces the diaphragm up against spring force. This causes the tang on the diaphragm plunger to unseat the check ball, allowing fluid to flow past the check ball, through a restricted passage in the body of the Fluid Metering Valve and to the other diaphragm operated check ball.

FLUID DELIVERY (Fig. 9-109)

High air velocity past the fluid outlet in the carburetor bore creates a lower than atmospheric pressure in the line to the Fluid Metering Valve assembly and in the chamber above the diaphragm.

The low pressure on one side of the diaphragm and atmospheric pressure (cover is vented) on other side moves the diaphragm up pushing the ball check off its seat. Fluid is then drawn past the second ball check through the passage to the carburetor throttle body where it is metered by a calibrated restriction into the throttle bore.

BOOST LIMIT OPERATION (Fig. 9-110)

In the event the fluid supply to the Fluid Metering Valve assembly is exhausted or blocked, the float will drop and open the vent at the top of the float chamber. This will exhaust the trapped pressurized air in the float chamber and above the Boost Limit Control diaphragm.

If the engine is now operated in a boost condition, the boost pressure from the compressor housing, through the tee fitting at the carburetor, and to the Fluid Metering Valve assembly moves the diaphragm up, allowing the boost pressure to enter the open boost limit control valve.

This boost pressure is then directed through the valve and to the boost limit diaphragm at the carburetor throttle body, closing the auxiliary throttle valve against spring force. By closing the auxiliary throttle valve, the air-fuel mixture will be restricted to limit the maximum boost to approximately 1.0 p.s.i. Even though the engine can be operated with this boost, the cylinder temperatures will be maintained at a safe level.

During normal boost operation, the auxiliary throttle valve could be closed if the boost limit control valve, in the Fluid Metering Valve assembly, leaked. However, a calibrated bleed is incorporated in the boost limit line to allow a slight leakage without the possibility of actuating the boost limit diaphragm. This bleed is connected to the throttle bore through a tee fitting in the boost limit line.

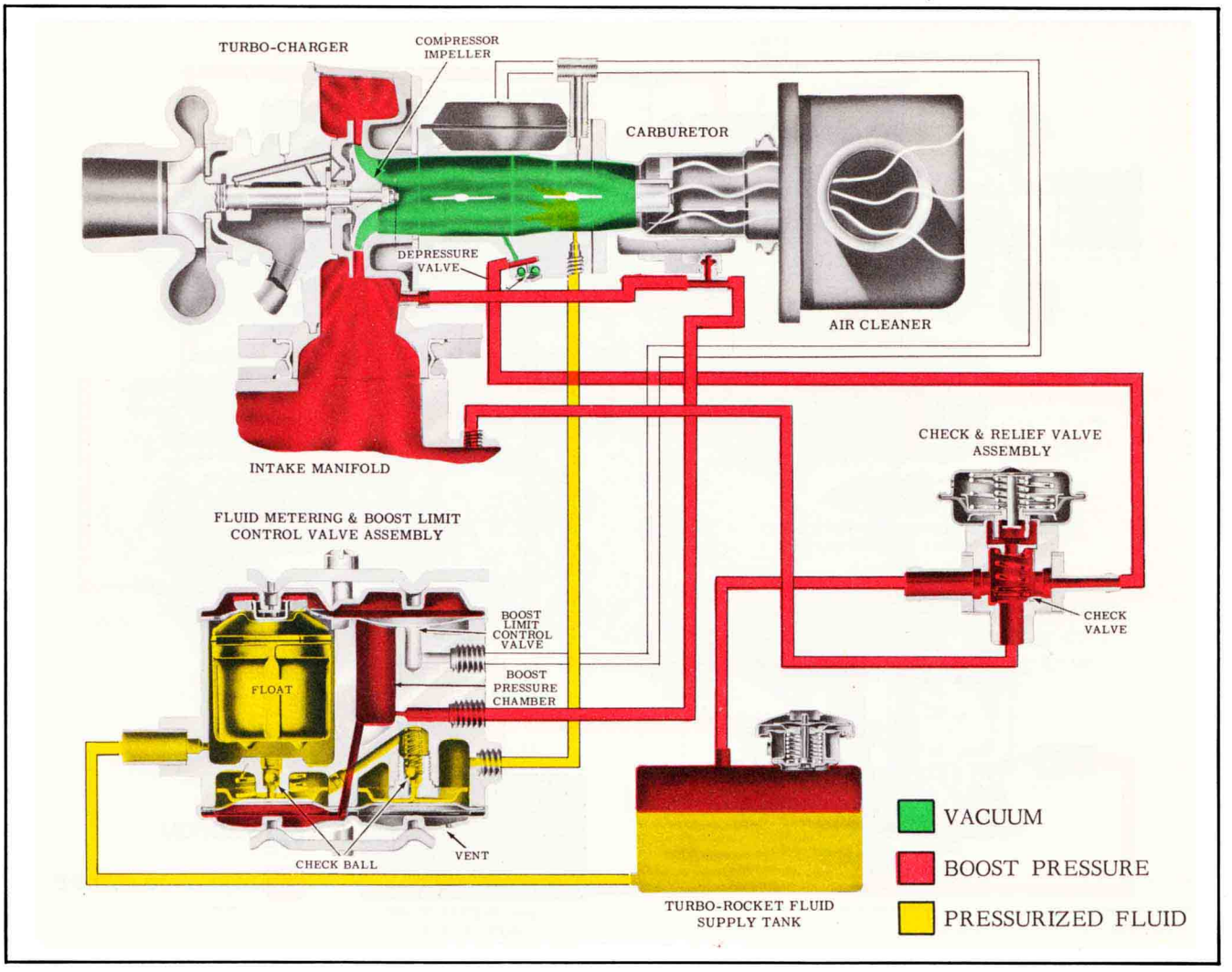


Fig. 9-109 Fluid Delivery

TURBO-ROCKET FLUID METERING VALVE

Remove and Install (Fig. 9-111)

1. Remove fluid metering valve bracket to bowl screws.
2. Remove the 3 lines, being careful not to injure rubber gaskets, on flared lines and remove valve.
3. To install, connect the three lines, middle line first, be sure all lines are in line with holes before tightening. Install valve to float bowl by the two attaching screws.

Disassembly (Fig. 9-112)

1. Remove two screws which connect upper and lower valve cover retaining brackets together. Hold valve covers in place when removing brackets.
2. Remove top cover, while holding bottom cover, then remove top gasket.
3. Carefully remove diaphragm spacer.
4. Remove diaphragm, float weight and float assembly. Diaphragm can be removed from float by carefully bending tangs in float weight slot together, then remove weight and diaphragm from float. (Fig. 9-113)
5. Remove bottom cover and diaphragm. Cover is spring-loaded, use care to avoid damaging lower diaphragm.
6. Remove diaphragm from cover, then remove spacer and gasket.
7. Remove diaphragm plunger and spring from float side.
8. Remove diaphragm plunger from boost side of valve. Plungers are interchangeable.
9. Remove fluid outlet check ball retainer, then remove check ball and spring. (Fig. 9-114)

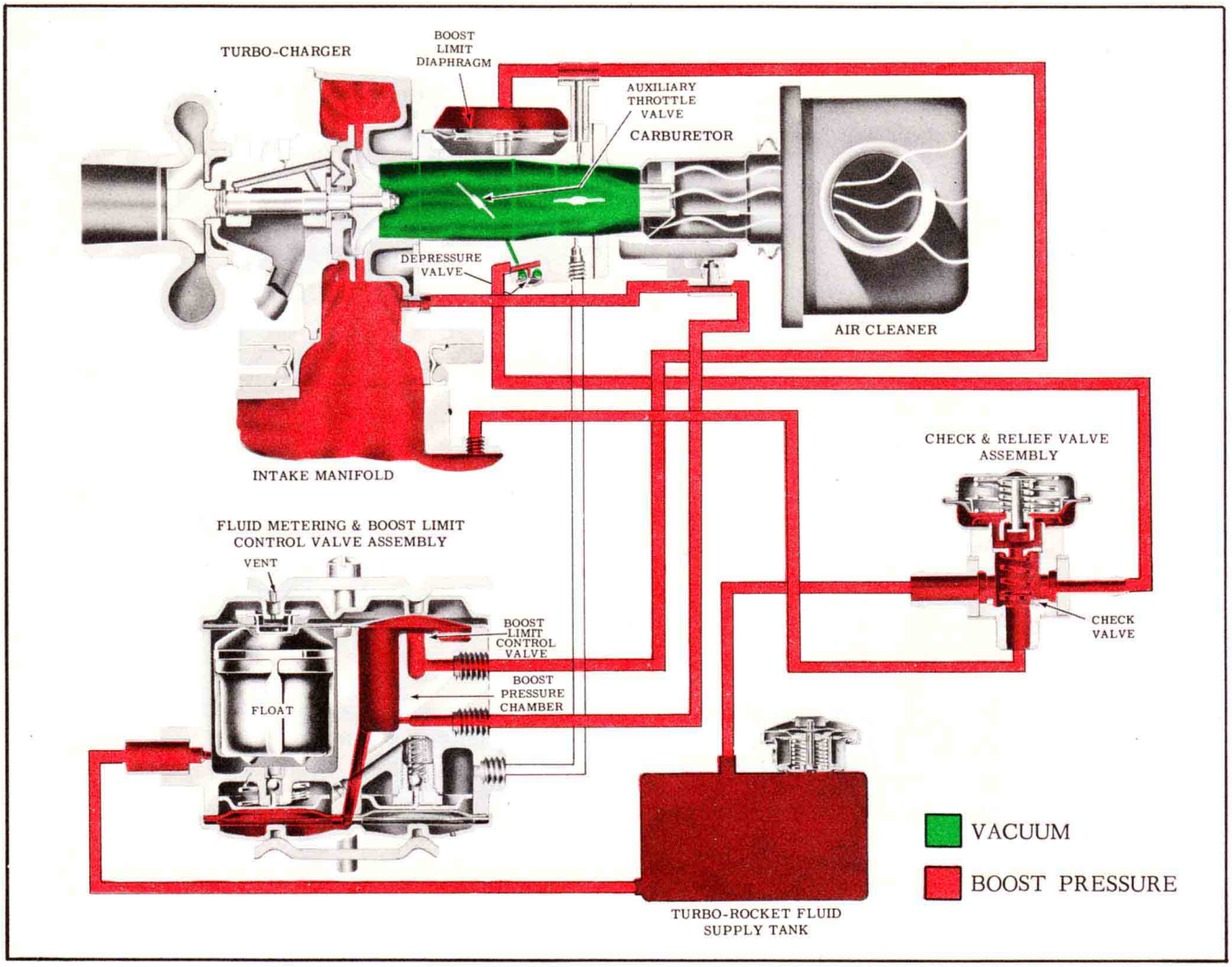


Fig. 9-110 Boost Limit Operation

Cleaning and Inspection

1. Check diaphragm for holes, cracks or tears.
2. Check fluid outlet check ball and spring for distortion.
3. Check ball at bottom of float chamber should be free and clean.
4. Inspect float for dents, leak or distortion.
5. Clean all metal parts in standard carburetor cleaner.
6. Blow out all channels.

Assembly

1. Install check valve spring, ball and retainer. (Fig. 9-114)
2. Assemble float to top diaphragm, flat valve on diaphragm facing downward.

   NOTE: Prongs on top of float should be installed through diaphragm at right angles to center line. Place float weight over top of diaphragm and bend retaining clips on float into slots in weight.

3. Assemble float and diaphragm assembly to housing. Make sure wrinkles are removed from diaphragm and it lays flat on face of housing. Install diaphragm spacer over diaphragm making center holes line up with holes in diaphragm and casting. Install gasket; then diaphragm cover, making sure center holes are aligned properly and that prongs on cover are aligned correctly with holes in diaphragm.
4. Install gasket into lower cover. Then install copper spacer next to gasket. Line up holes in gasket and spacer with holes in cover. Then install diaphragm in cover lining up holes and prong punctures.
5. Set diaphragm plungers in their centered positions on diaphragm, plunger stems pointing upward.

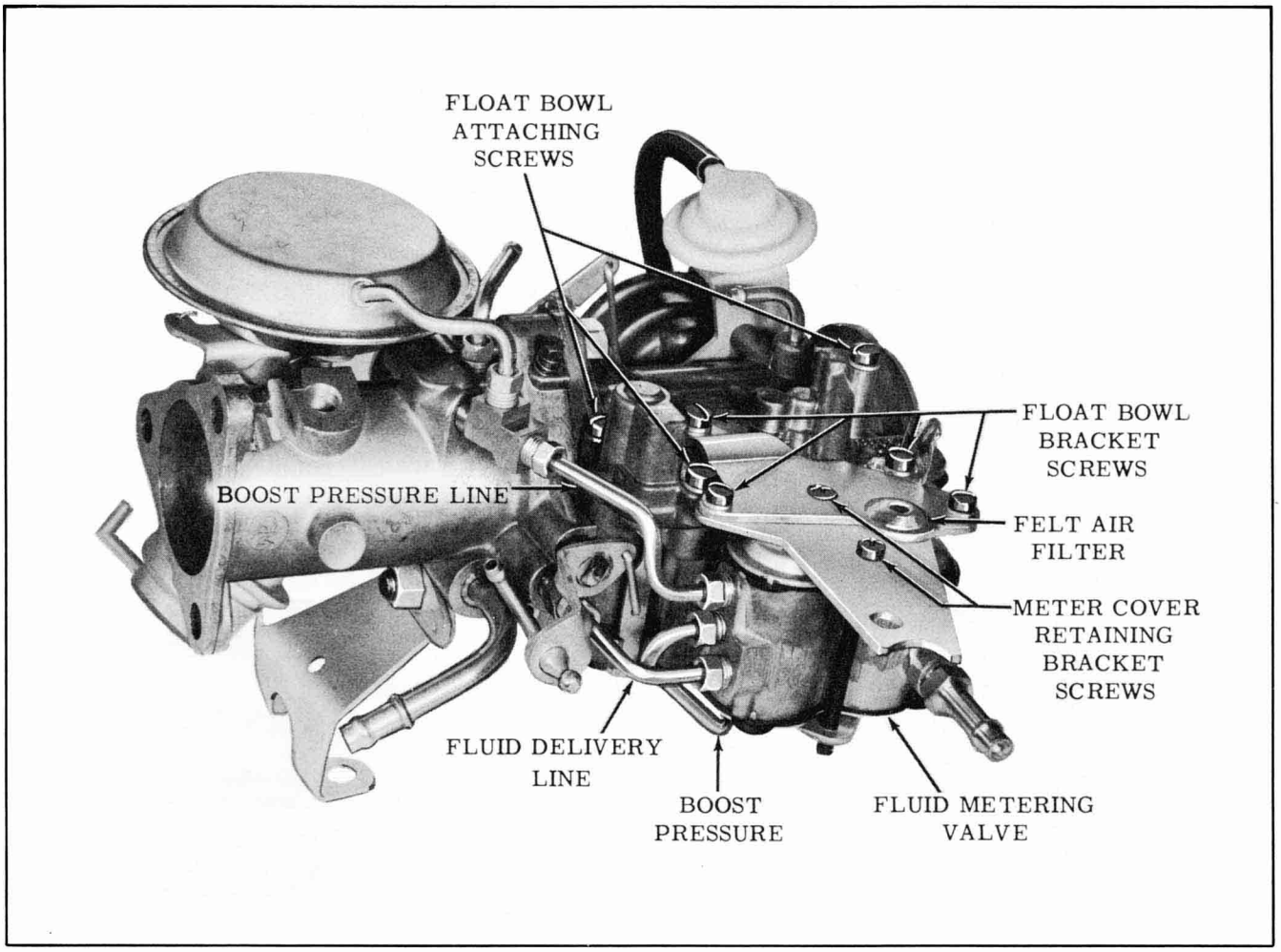


Fig. 9-111 Carburetor Assembly

6. Then set diaphragm plunger spring on top of plunger on float side of fluid meter. Then with casting held in upright position lower casting on to cover making sure diaphragm plunger stems fit into their respective holes. Also, be careful diaphragm does not wrinkle. Then assemble cover to casting.

7. Install upper and lower cover retaining brackets. Then tighten two screws evenly and securely.

NOTE: Brackets are installed correctly when liquid inlet is pointing away from float bowl.

8. Connect lines in their respective positions before attaching fluid meter to carburetor (Fig. 9-111). Connect middle line first, making sure all tubes are in line with holes before tightening fittings.

9. Install fluid meter to float bowl by installing two screws through float bowl cover.

CARBURETOR ASSEMBLY

Removal

When removing the carburetor from a warm engine release the pressure in the cooling system by loosening the radiator cap.

1. Remove hood.

2. Remove air cleaner.

3. Disconnect steel line from the filter to carburetor inlet at the carburetor inlet.

4. Disconnect short water hose, compressor housing to throttle body, at the throttle body.

5. Disconnect line from the turbo-charger to the bottom of the float bowl at the tee on the bottom of the float bowl.

6. Disconnect the carburetor rod.

7. Disconnect choke cable if so equipped. (Fig. 9-138)

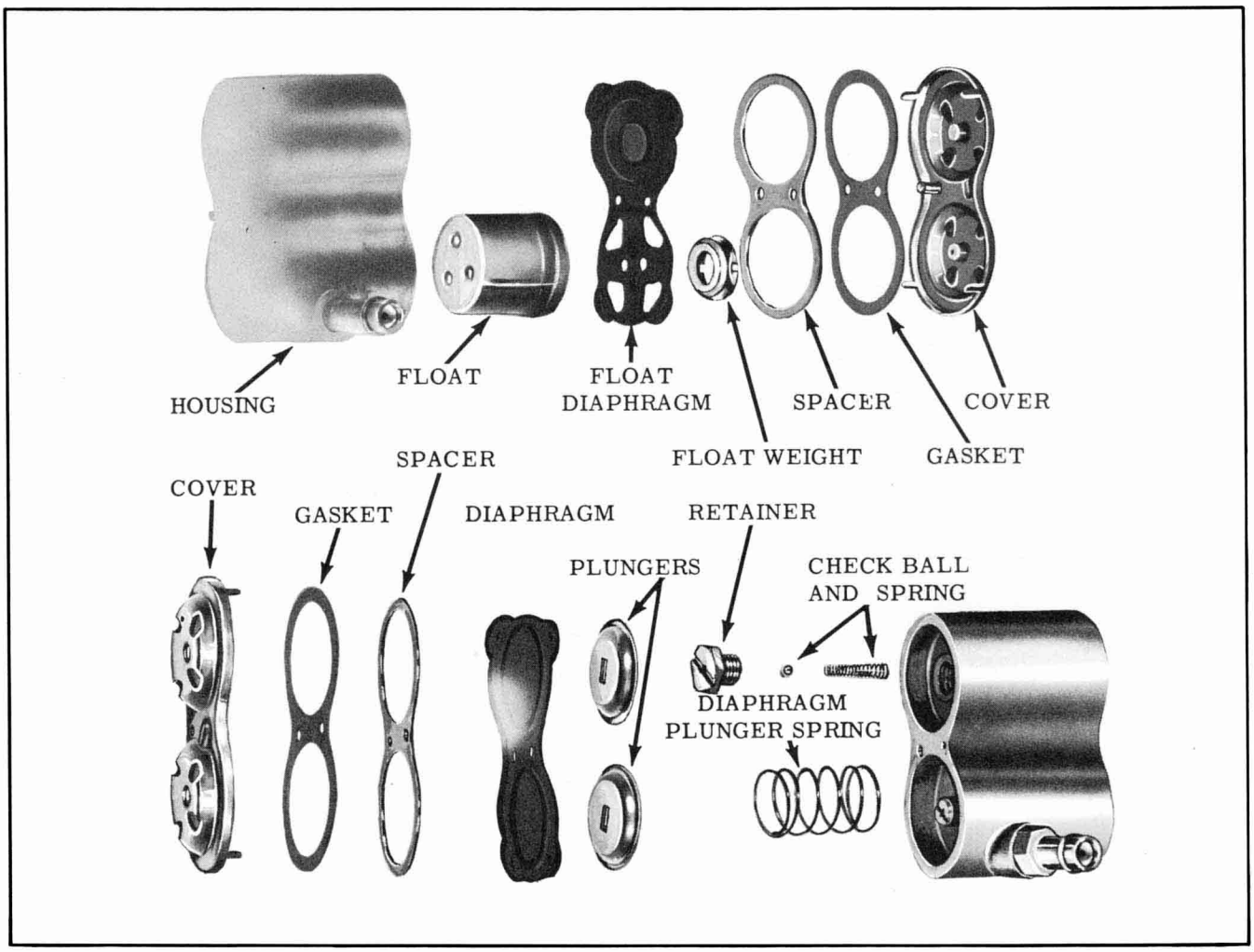


Fig. 9-112 Exploded View of Fluid Metering Valve

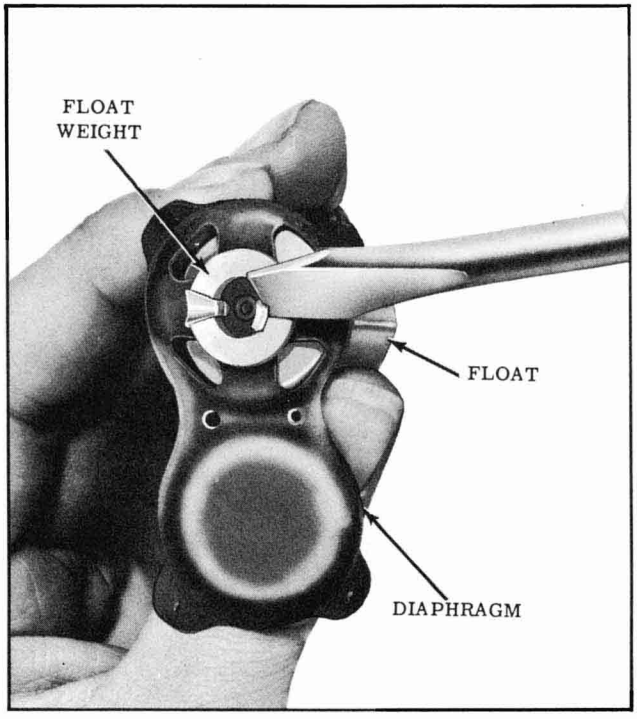


Fig. 9-113 Removing Diaphragm

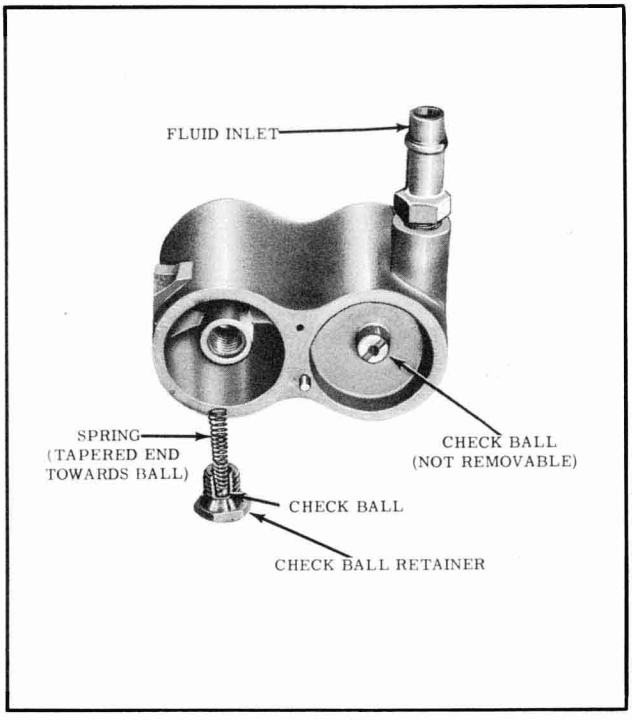


Fig. 9-114 Fluid Metering Valve

8. Disconnect turbo-rocket fluid supply hose from the metering valve.
9. Disconnect the hose-vacuum check valve to throttle body.
10. Disconnect small hose - positive crankcase ventilation valve to throttle body.
11. Remove two carburetor lower mounting bracket bolts.
12. Remove the three nuts attaching carburetor to turbo-charger.
13. Remove remaining water hose and remove carburetor.

Installation

To install, reverse above procedure. Install new gasket between the carburetor and turbo-charger. Torque the carburetor to turbo-charger attaching nuts 9 to 12 ft. lbs. Oil the mounting bracket to intake manifold bolts with engine oil and torque 20 to 25 ft. lbs.

DISASSEMBLY

Float Bowl

1. Remove fluid metering valve and float bowl bracket by removing the attaching screws. Be careful to retain felt air filter covering fluid meter vent, held by the bowl cover bracket.
2. Remove float bowl cover attaching screws and remove cover. (Fig. 9-115)

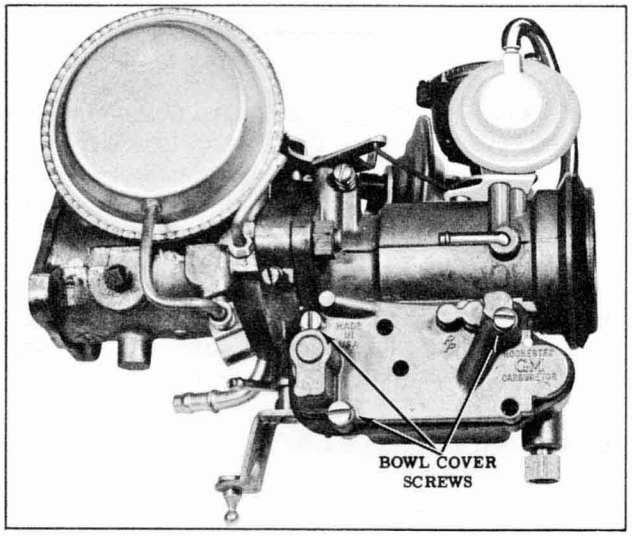


Fig. 9-115 Float Bowl Cover Screws

3. Remove bowl slotted cover gasket. (Fig. 9-116)
4. Remove float hinge pin spring retainer; then remove float assembly and hinge pin together.

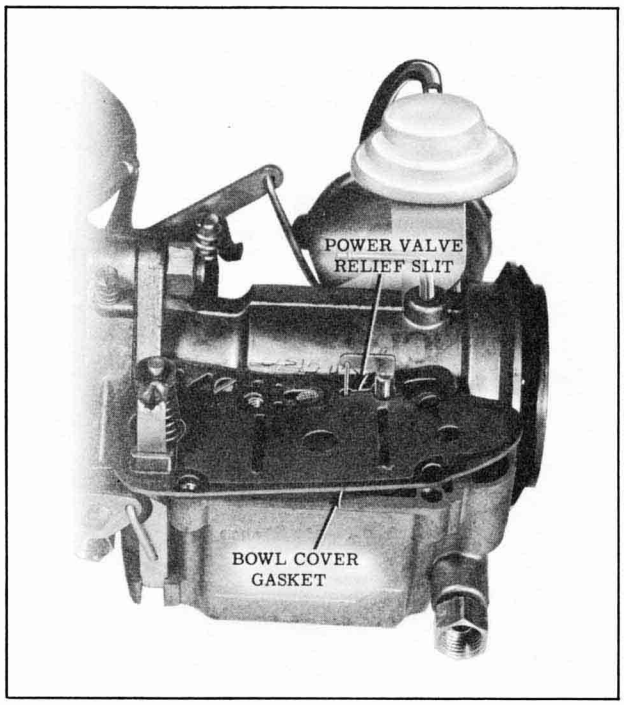


Fig. 9-116 Float Cover Bowl Gasket

Remove hinge pin from float arm. (Fig. 9-117)

5. Remove screen from main well. (Fig. 9-117)
6. Remove float needle valve by removing the float needle and then the float needle seat using Tool J-BT-52 and gasket and strainer.
7. Remove the power piston and metering control rod assembly by turning small retaining pin to side, at the top of the power piston. (Caution - Piston is spring-loaded.) Then remove power piston, spring and metering rod. (Fig. 9-117)

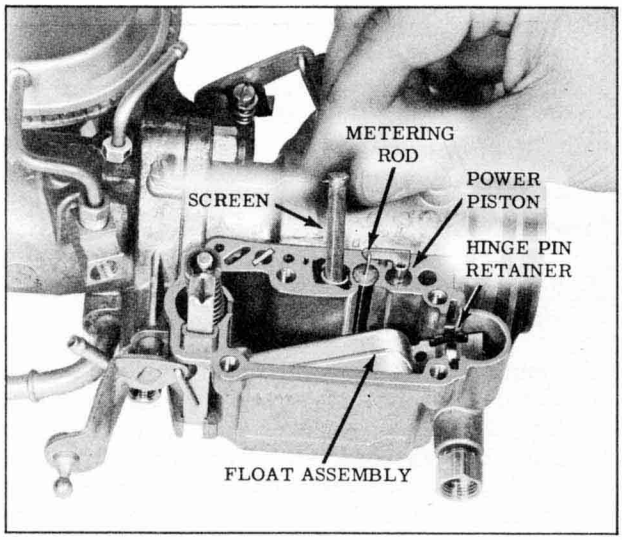


Fig. 9-117 Float Bowl Assembly

8. The main metering jet may be removed by prying upward on the small guide disc at the top of the main metering jet well. Use Tool BT-62-15 to remove the main metering jet. (Fig. 9-118)

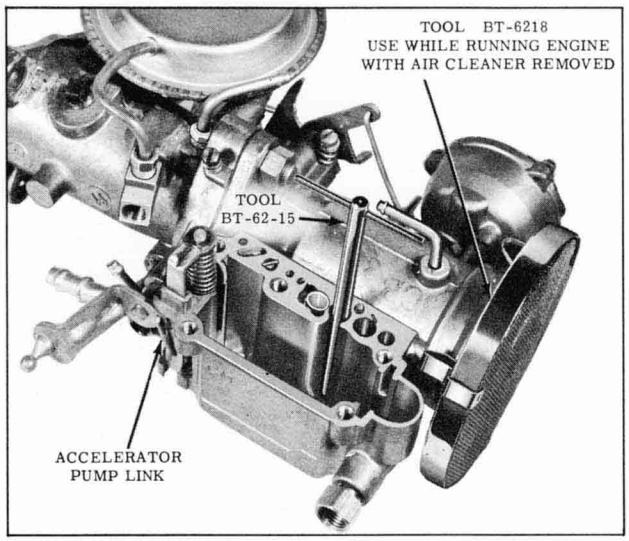


Fig. 9-118 Metering Jet Removal

9. Remove T-shaped retainer, spring and discharge ball check from discharge well using a pair of long-nosed pliers.

10. To remove pump plunger assembly, remove the link connecting the pump plunger to the throttle lever by removing the hairpin clip. Then remove end of link from throttle lever. Remove the other end of the link by rotating until the pump link passes through the slotted hole in the pump plunger arm. Rotate throttle lever to wide open position, then remove the pump plunger from the pump well. Now the pump return spring in the bottom of the pump well may also be removed. Pump arm and duration spring may be removed from pump plunger by removing spring clip at top of pump plunger stem. This will complete disassembly of the float bowl. The idle tube and main well tube are pressed in place and should not be removed. Thorough cleaning is all that is necessary.

Throttle Body

1. Remove depressure valve, diaphragm cover and diaphragm. (Fig. 9-119)

2. Remove boost limit diaphragm opening spring and disconnect diaphragm linkage from auxiliary throttle valve lever by removing hairpin clip. Loosen boost limit line from boost limit diaphragm and tee fitting at base of float bowl, but do not try to pull the line from the tee fitting. Remove diaphragm from throttle body by removing the attaching screw.

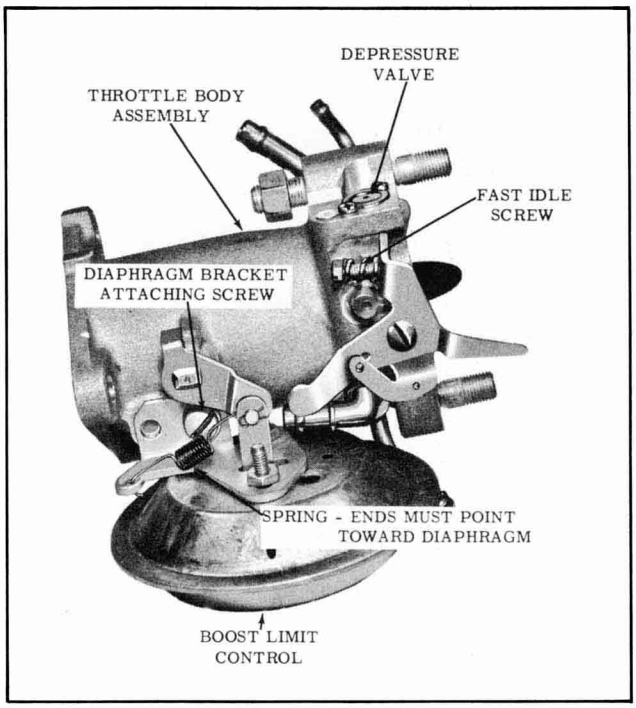


Fig. 9-119 Throttle Body Assembly

3. Remove idle mixture needle adjusting screw and spring.

4. Auxiliary throttle shaft assembly may be disassembled by removing the two retaining screws through the throttle valve; remove valve and then throttle shaft can be removed from the throttle body assembly bore.

5. Fast idle screw in the throttle lever may be removed if replacement is necessary (Fig. 9-119).

   NOTE: The throttle valve and shaft should not be removed as there is a close tolerance fit between the valve and bore and the off-idle slot. If the throttle shaft and/or valve is worn excessively, the complete throttle body assembly should be replaced.

6. To remove throttle retarder, disconnect linkage by removing hairpin clips and remove nut holding bracket to throttle body.

Air Horn to Throttle Body

1. Disconnect air horn from throttle body.

2. Remove throttle return check.

Choke and Linkage

1. Remove fast idle cam attaching screw. Fast idle cam can now be removed from the air horn assembly and the link connecting to the choke shaft lever. (Fig. 9-120)

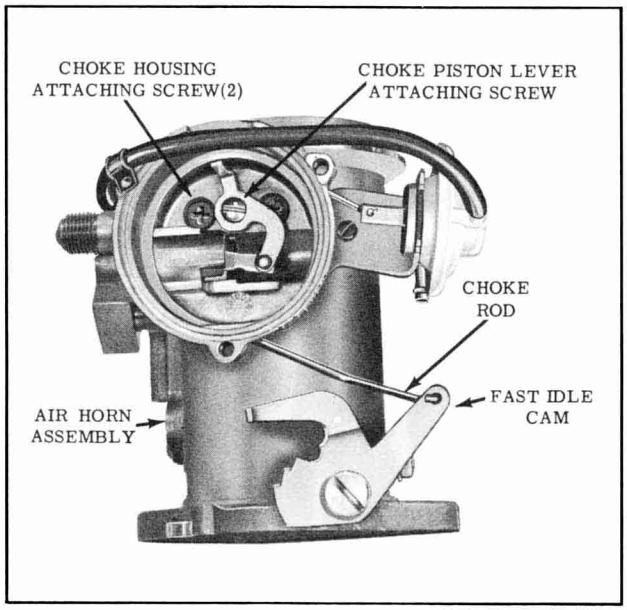


Fig. 9-120 Air Horn Assembly

2. Remove the three choke cover attaching screws and retainers, then remove the choke cover and gasket.

3. Carefully lift the baffle plate from the choke housing.

4. Remove the choke piston lever attaching screw, then remove the lever link and piston assembly from the choke housing. (Fig. 9-120)

5. Remove the two choke housing attaching screws, then remove the choke housing and spring-loaded plastic washer from the air horn assembly. Remove washer spring. Now the hairpin clip on vacuum break diaphragm link can be removed. (Fig. 9-121)

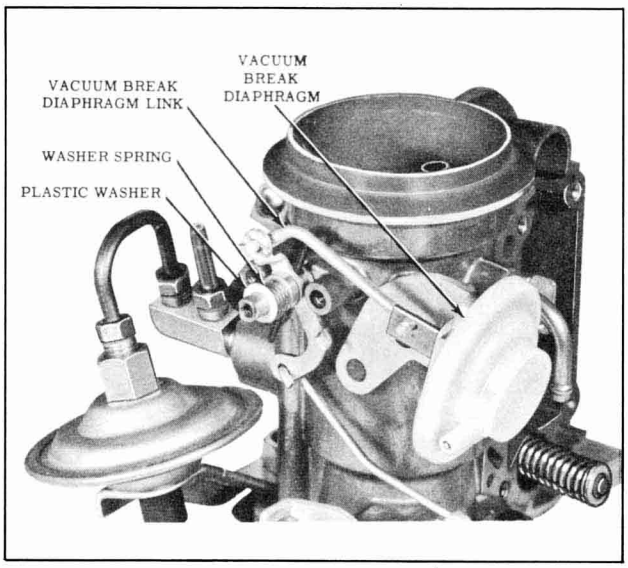


Fig. 9-121 Vacuum Break Diaphragm

6. Remove vacuum break diaphragm unit from air horn by sliding rubber vacuum hose from plastic casing and removing holding screw on bracket.

7. Remove two attaching screws which secure the choke valve to the choke shaft inside the air horn. Then the choke valve can be removed and then remove the choke shaft from air horn bore. The slow idle screw may be removed from air horn if replacement is necessary.

8. Remove idle compensator cover and passage cover by removing two attaching screws. (Fig. 9-122)

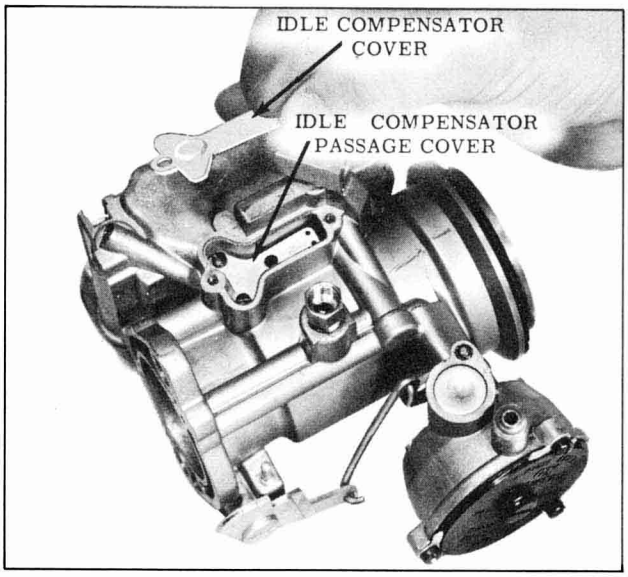


Fig. 9-122 Passage Covers

CLEANING OF PARTS

The carburetor should be cleaned in a cold immersion type cleaner.

1. Thoroughly clean carburetor castings and all metal parts in carburetor cleaning solvent.

   CAUTION: The pump plunger, felt air filter, gaskets and diaphragms should not be immersed in solvent. Clean the pump plunger and felt air filter in clean solvent only.

2. Blow all passages in the casting dry with compressed air. Do not pass drills through jets or metering passages.

3. Clean all filter screens of dirt or lint.

INSPECTION OF PARTS

1. Check float for dents or excessive wear at hinge pin holes.

2. Shake float to check for leaks. Replace if necessary.
3. Examine float needle and seat. If grooved or scored, replace with a factory matched float needle and seat and gasket assembly.
4. Inspect the idle mixture adjusting needles for ridges, burrs or bends.
5. Inspect the surfaces between the carburetor body and air horn and between the float bowl cover and float bowl to see that the sealing areas are not damaged. Damaged sealing surfaces may result in air or fuel leaks at that point.
6. Inspect holes in the pump arm, pump link throttle lever, fast idle cam and choke piston link assembly. Replace excessively worn parts.
7. Inspect the steps in the fast idle cam for excessive wear. If excessive wear is noted, the cam should be replaced to insure proper engine operation during the warm-up and choking periods.
8. Inspect the pump plunger synthetic cup for cracks or creases. If the pump plunger is damaged, replace the pump plunger assembly.
9. Inspect the throttle body assembly. Make sure the idle passages and vacuum channels are clean.
10. Inspect filter screens. If screens are distorted or plugged, they should be replaced.
11. Check the depressure valve diaphragm for cracks or holes and if any are found it should be replaced.

As mentioned during the disassembly of the carburetor, there is a very close tolerance fit between the throttle valves and the off-idle port slot. Therefore, if the throttle valves, levers or shafts are worn excessively or damaged, a complete throttle flange assembly is required.

ASSEMBLY

Choke and Linkage

1. Install choke shaft in air horn; then install choke valve on choke shaft with two attaching screws. Seat choke in air horn bore and tighten choke valve screws securely. Choke valve is installed correctly when the stamped letters "RP" face upward on the choke valve.
2. Fasten vacuum break diaphragm bracket to air horn and connect vacuum tube to diaphragm and to fitting in air horn. Connect vacuum break diaphragm link to choke lever fastening with hairpin clip on choke lever end of link. (Fig. 9-121)
3. Assemble plastic washer and spring to choke housing. Install the choke housing on the air horn assembly with two attaching screws. Tighten attaching screws securely. (Fig. 9-121)
4. Install choke piston on choke piston link (if removed) by inserting choke piston pin through the hole in the choke piston and the choke link. Install the choke piston into the choke housing, then place choke piston lever over choke shaft and install retaining screw in the end of the choke shaft tightening securely.
5. Install choke baffle plate inside choke housing, then install thermostatic coil and cover assembly, retaining with three (3) screws.
6. Automatic Choke Adjustment - Rotate thermostatic coil and cover counterclockwise until the tang on the choke coil picks up the tang on the choke piston lever and the choke valve begins to close. Continue rotation to the point where the choke valve just closes and the index is aligned with the proper mark on the choke cover. Tighten choke cover retainer screws securely.
7. Install choke link and fast idle cam (looped ends of choke rod should face outward away from air horn casting). Install fast idle cam attaching screw and tighten securely. (Fig. 9-120)
8. Install slow idle screw if removed.
9. Install new idle compensator passage gasket and cover, retaining with two attaching screws. Then install idle compensator cover with the two attaching screws. (Fig. 9-122)

Throttle Body

1. Attach throttle retarder bracket to throttle body with 9/16" nut and assemble linkage to throttle lever using hairpin clips. Link goes in hole in throttle lever closer to heated water inlet tube in throttle body. Bend in link should point toward engine.
2. Install auxiliary throttle shaft and lever into throttle body bore, then install auxiliary throttle valve attaching with two screws. Tighten screws securely.

   NOTE: Identification on auxiliary throttle valve should face towards manifold mounting surface. Valve should fit diagonally in bore with identification markings nearer to manifold mounting.
3. Install boost limit diaphragm to mounting

bracket, then position boost pressure tube in fitting. Install the diaphragm and mounting bracket to throttle body casting, connecting pressure tube at the same time to tee fitting at base of float bowl. Tighten attaching screws securely, then tighten tube fittings. Install auxiliary throttle valve link to auxiliary throttle valve lever.

NOTE: Auxiliary throttle body diaphragm should be centered on the mounting bracket so that the diaphragm plunger is parallel with the throttle lever, then tighten diaphragm to bracket attaching bolts.

4. Connect boost limit control diaphragm opening spring to auxiliary throttle shaft lever and to hole on diaphragm bracket. (Fig. 9-123)

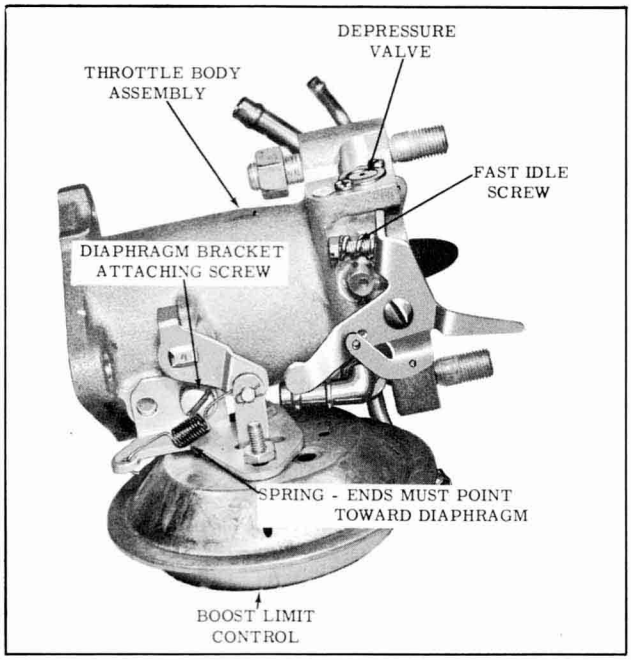


Fig. 9-123 Throttle Body

5. Install diaphragm in fluid tank depressure valve chamber. Install diaphragm cover. Make sure that diaphragm is not wrinkled. Install diaphragm cover, holding bracket, and retaining screws evenly and securely. (Fig. 9-124)

6. Install idle mixture screw and spring. Turn in until lightly seated and back off approximately 1-1/2 turns for initial adjustment.

Air Horn to Throttle Body

1. Install new gasket over studs on throttle body assembly. Line up holes in gasket with holes on face of throttle body flange. (Fig. 9-125)

2. Assemble air horn to throttle body. Unloader tang on fast idle lever should be above tang on fast idle cam.

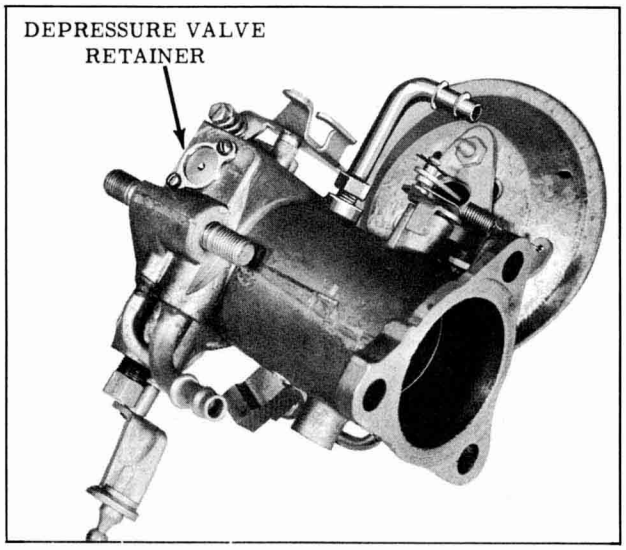


Fig. 9-124 Depressure Valve

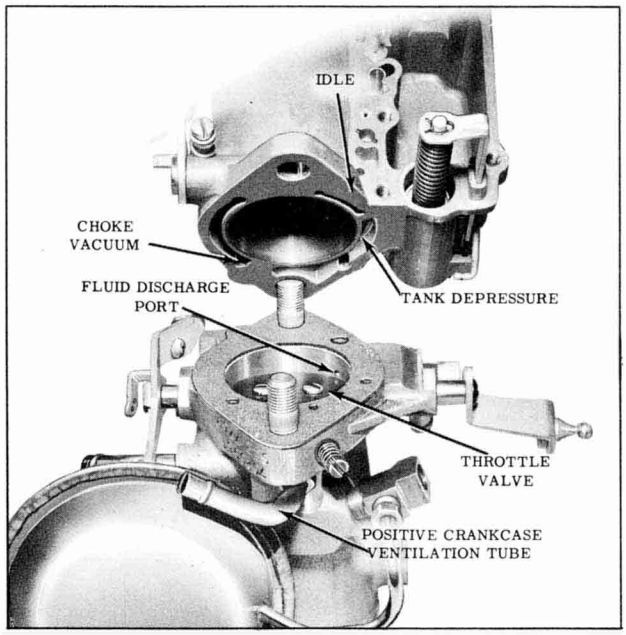


Fig. 9-125 Throttle Body Gasket

3. Install throttle return check on lower mounting stud. Then install throttle body to air horn attaching nuts and tighten evenly and securely. Make sure plunger on throttle return check lines up with pad on fast idle lever. Connect throttle return check vacuum tube to air horn fitting.

Float Bowl—Primary

1. Install pump return spring in pump well, pushing in place with finger to make sure that it is seated properly.

2. Install pump plunger into pump well being careful not to distort pump cup.

3. Install the pump link into pump plunger rod, then hook other end of link to throttle lever, retaining in place with spring clip.

4. Install pump discharge ball, spring and T-shaped retainer into pump discharge well.

5. Install main metering jet, if removed, using special main metering jet Tool No. BT-62-15 (Fig. 9-126). Then install metering rod guide into top of main metering jet well.

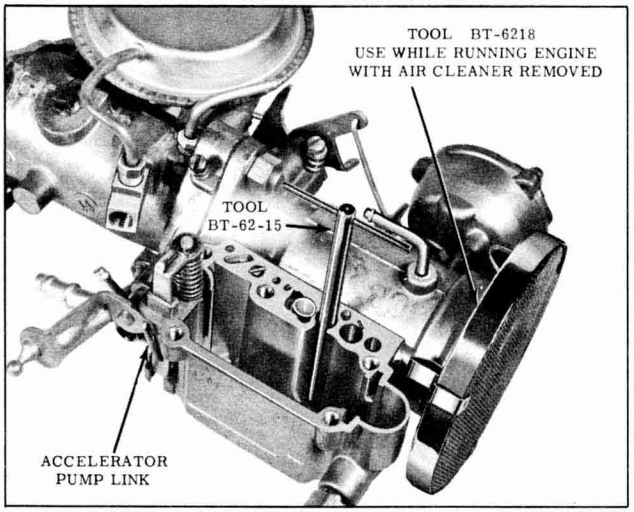


Fig. 9-126 Bowl Assembly

6. Install power piston spring into the chamber, then install power piston over the spring, while guiding metering rod through guide in the top of main metering jet well. Be sure metering rod enters orifice in the main metering jet. Retain power piston assembly in place by turning retainer wire towards power piston. Install screen into main well. (Fig. 9-127)

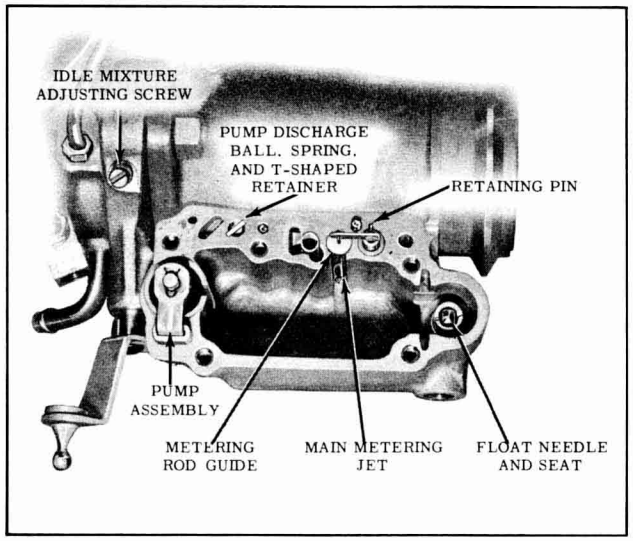


Fig. 9-127 Main Metering Jet

7. Install float needle seat and gasket into float bowl. Tighten needle seat securely using Tool BT-52 so that the needle seat will not be distorted and install needle valve.

8. Install hinge pin into float arm, then install float assembly in float bowl with hinge pin located in guide channels in float bowl. (Fig. 9-128)

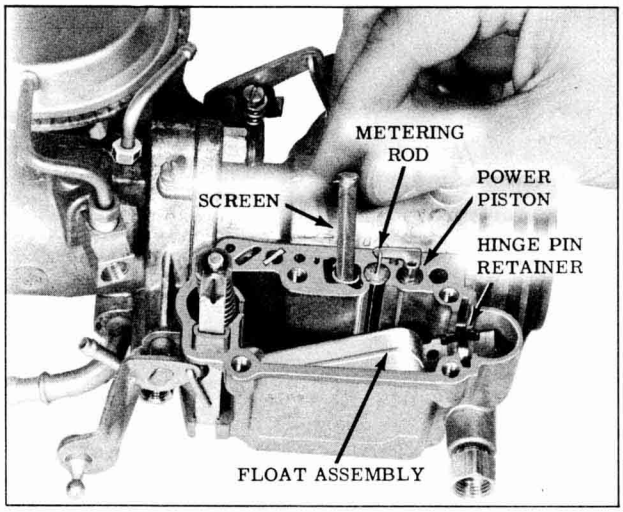


Fig. 9-128 Float Assembly

9. Install spring retainer against float hinge pin with loop of spring upwards toward bowl cover.

10. Float Level Adjustment - Setting 12/32" (Fig. 9-129). To obtain this adjustment, place the notch in gauge BT-62-16 over the edge of the float bowl with the gasket removed as shown. The leg of the gauge should then extend down into the bowl. Measurement should be taken at the end of the bowl opposite the fuel inlet end. Press downward at the rear of the float arm, seating the float needle. With gauge in place, the top corner of the float should just touch the gauge. If adjustment is needed, bend the float pontoon up or down at the float arm. Check to make sure float is centered in bowl and will not rub on walls. If alignment is needed, bend float in horizontal direction at the arm. Float drop adjustment is not required.

Float Bowl Assembly—Final

1. Install float bowl cover gasket, pushing slotted section over power piston and metering rod assembly, locating gasket on lugs on side of float bowl. (Fig. 9-130)

2. Install float bowl cover retaining in place with three (3) attaching screws.

3. Attach fluid metering valve bracket to bowl

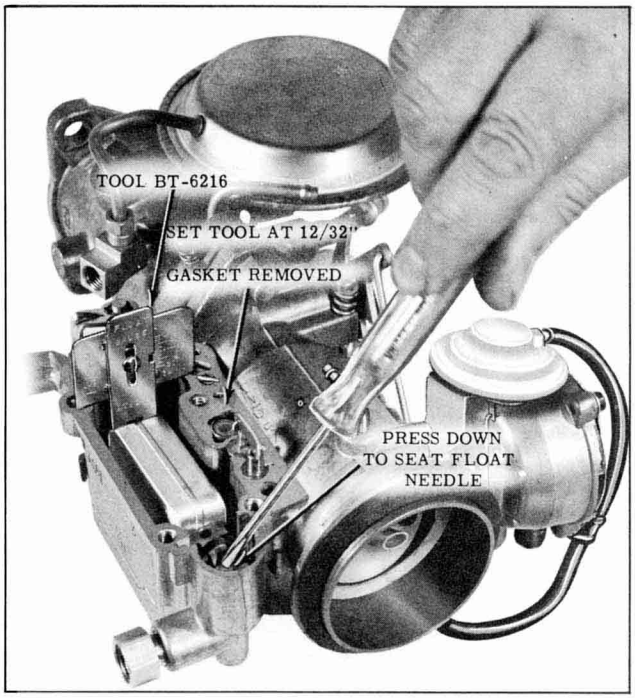


Fig. 9-129 Float Adjustment

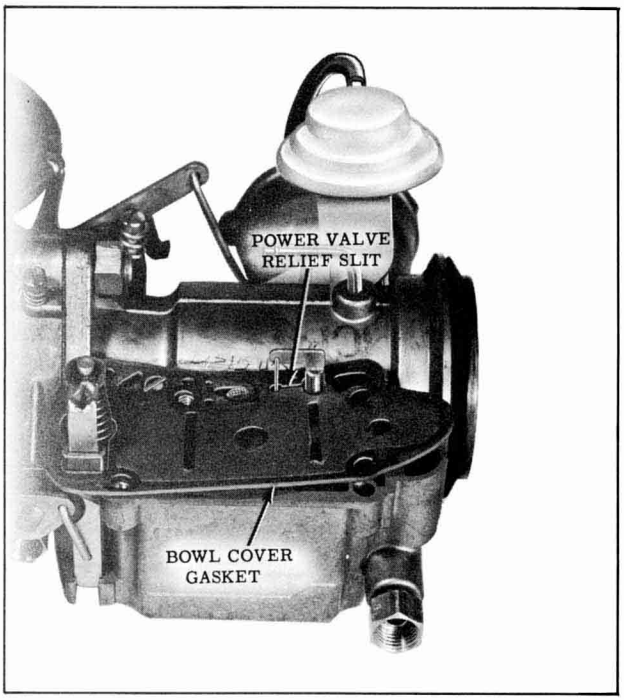


Fig. 9-130 Bowl Cover Gasket

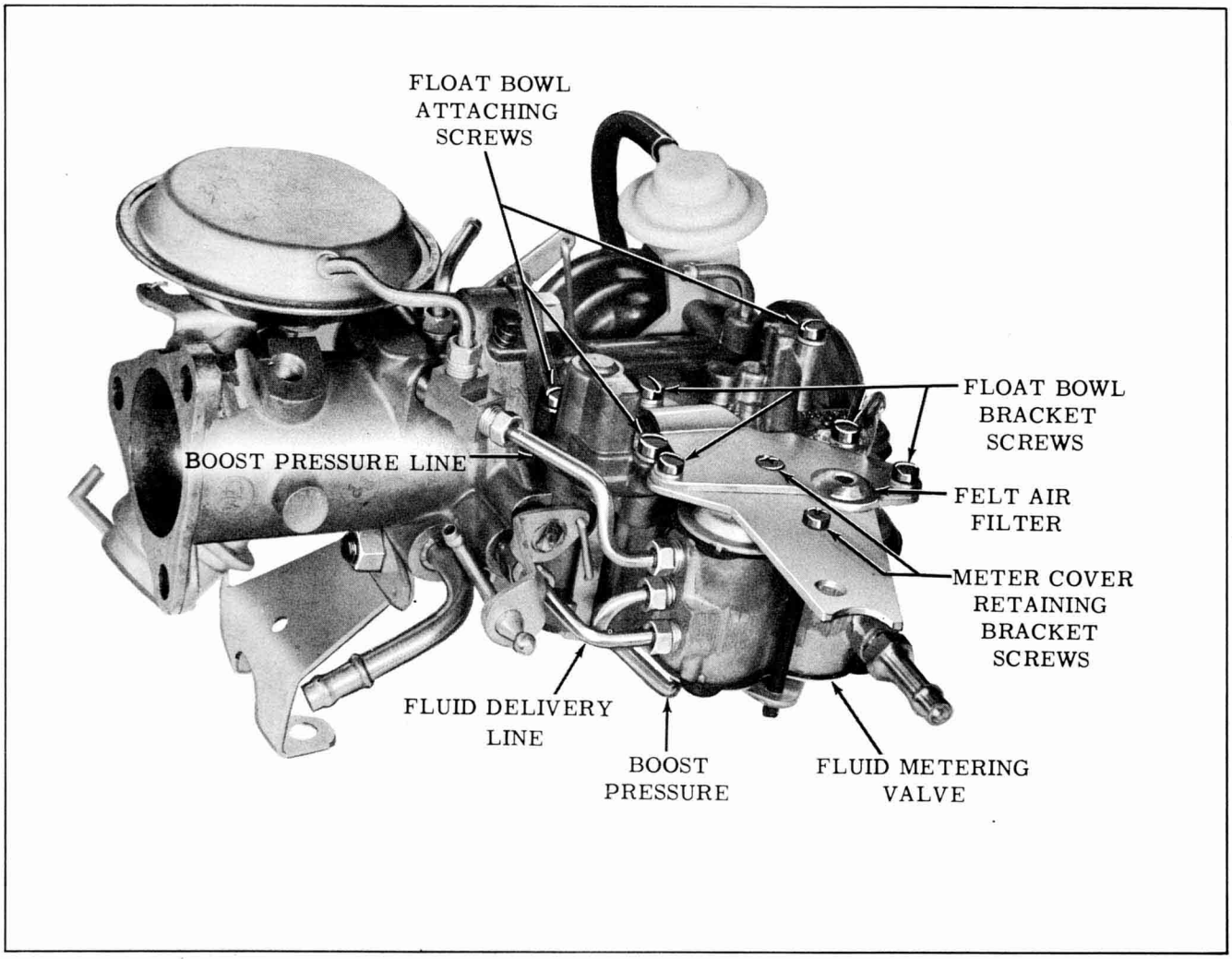


Fig. 9-131 Carburetor Assembly

cover bracket with the two attaching screws, making sure fluid metering valve fittings are aligned with their respective fittings in throttle body and boost limit diaphragm line. (Fig. 9-131)

4. Install fluid metering valve on air horn, retaining with 2 attaching screws, then tighten all screws and lines evenly and securely.

OFF THE CAR ADJUSTMENTS

VACUUM BREAK ADJUSTMENT— SETTING .140"- .160" (Fig. 9-132)

The linkage connected to the diaphragm controls the amount of choke opening after initial engine starting. Adjustment of the vacuum break setting is made by bending the tang which engages the pin in the shaft to the choke blade.

To check the setting, seat the diaphragm in its case by pushing in on the linkage to the diaphragm. With the diaphragm seated, the gauge or drill (5/32") should just fit between the edge of the choke blade and the inner air horn wall. If adjustment is necessary, bend the tang on the linkage. Make sure that when the diaphragm is released, the choke still closes completely. If a second method of adjustment is needed, the linkage arm may be bent slightly.

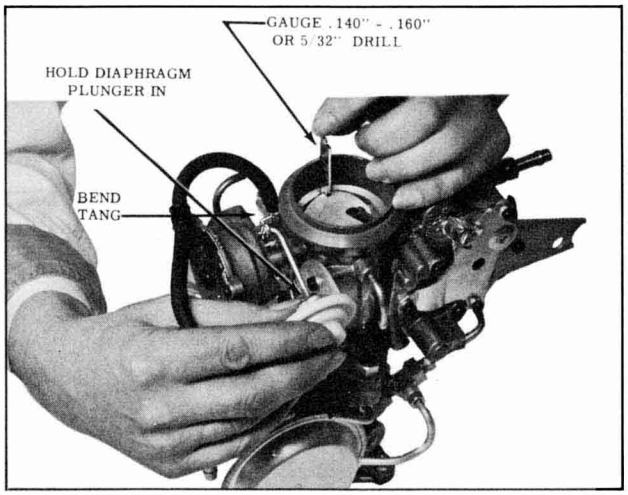


Fig. 9-132 Vacuum Break Adjustment

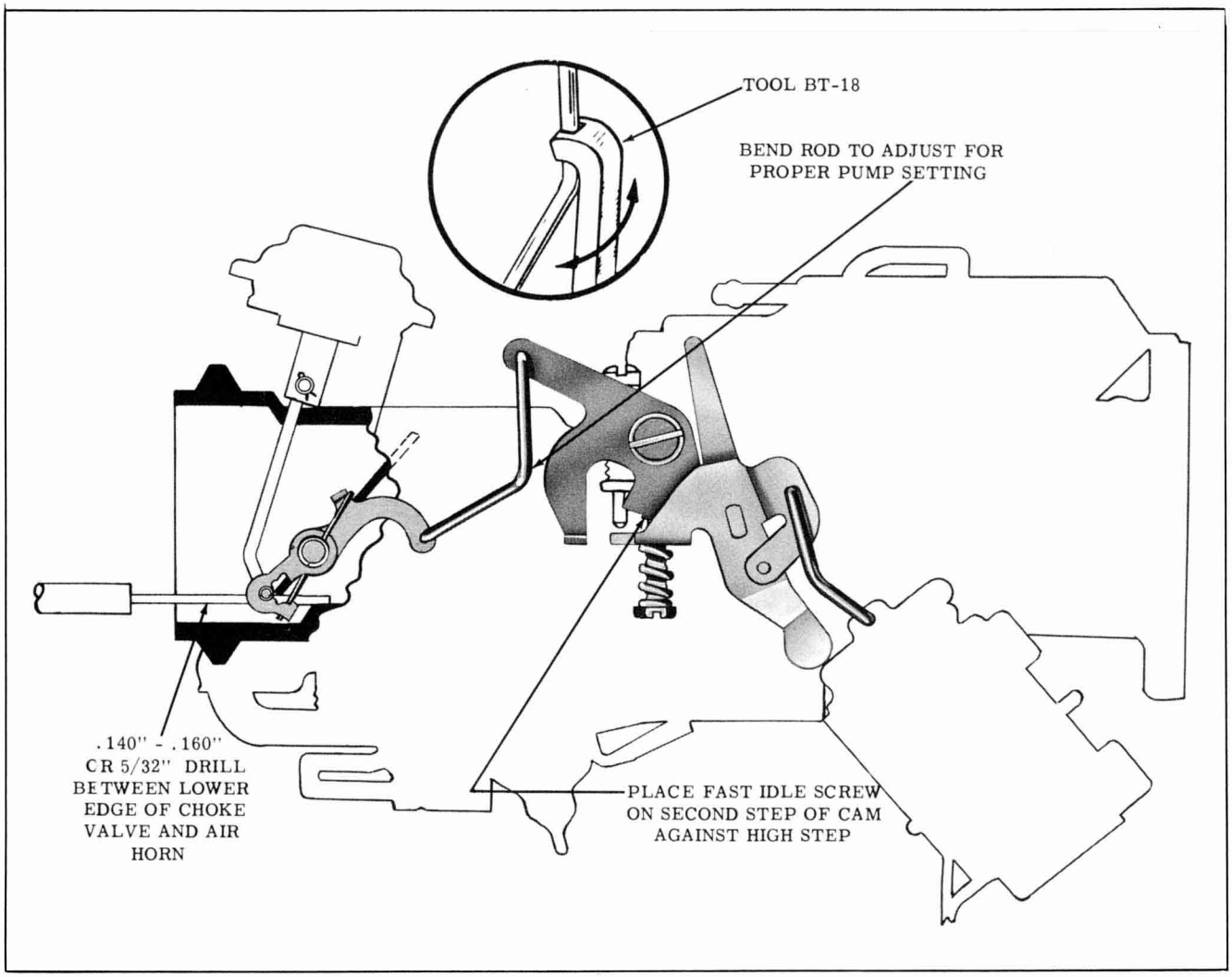


Fig. 9-133 Choke Rod Adjustment

CHOKE ROD ADJUSTMENT—SETTING .140"-.160" (Fig. 9-133)

The choke rod adjustment positions the fast idle cam in relation to the choke valve opening. This insures the correct fast idle speed during engine starting and initial warm up.

To adjust, place the fast idle screw on the second step of the fast idle cam and against the highest step.

Bend the choke rod as shown to obtain the specified clearance.

UNLOADER ADJUSTMENT— SETTING .308"-.348" (Fig. 9-134)

If the engine "loads up" or becomes flooded when starting, it is necessary to mechanically open the choke valve a small amount to admit more air to facilitate starting. This is accomplished when a tang on the throttle lever contacts the fast idle cam and forces the choke valve open.

To adjust, hold the throttle valves wide open using throttle lever (with carburetor off car) or with accelerator completely depressed to floor (carburetor on car). Check the clearance between the edge of the choke valve and air horn wall. The correct clearance is .308" - .348".

To obtain correct setting, bend small tang on fast idle cam, as shown.

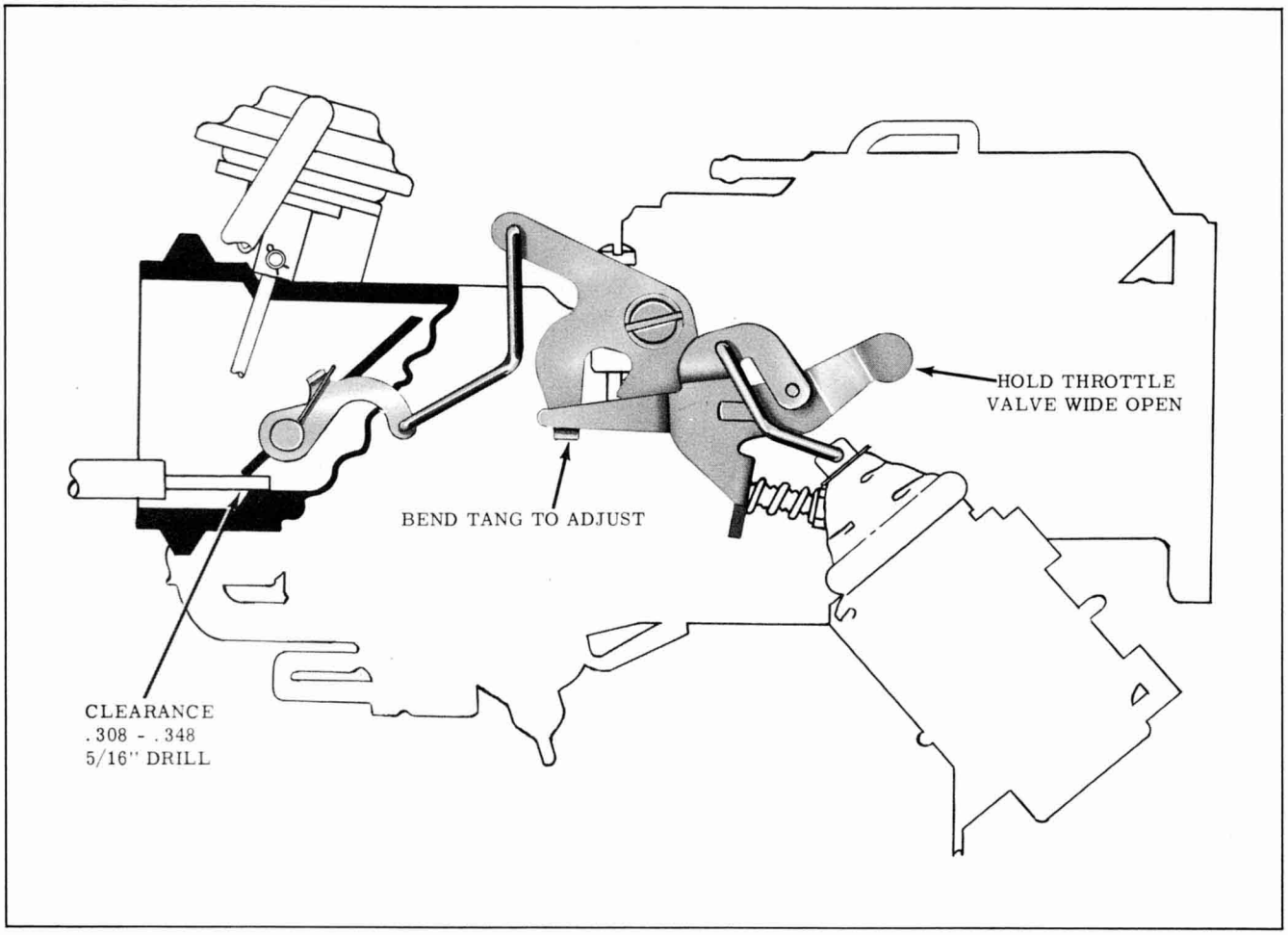


Fig. 9-134 Unloader Adjustment

THROTTLE RETARD UNIT ADJUSTMENT— ALLOWANCE SETTING (Fig. 9-107)

ON THE CAR ADJUSTMENTS

SLOW IDLE ADJUSTMENT

Set to 550 r.p.m. (if equipped with air conditioning, set to 600 r.p.m. with air conditioning "OFF") with Hydra-Matic in "Dr", Synchromesh in "Neutral".

FAST IDLE ADJUSTMENT

Set to 1500 r.p.m. on the second step of the fast idle cam, transmission in "Neutral" and engine warm - air conditioning "OFF".

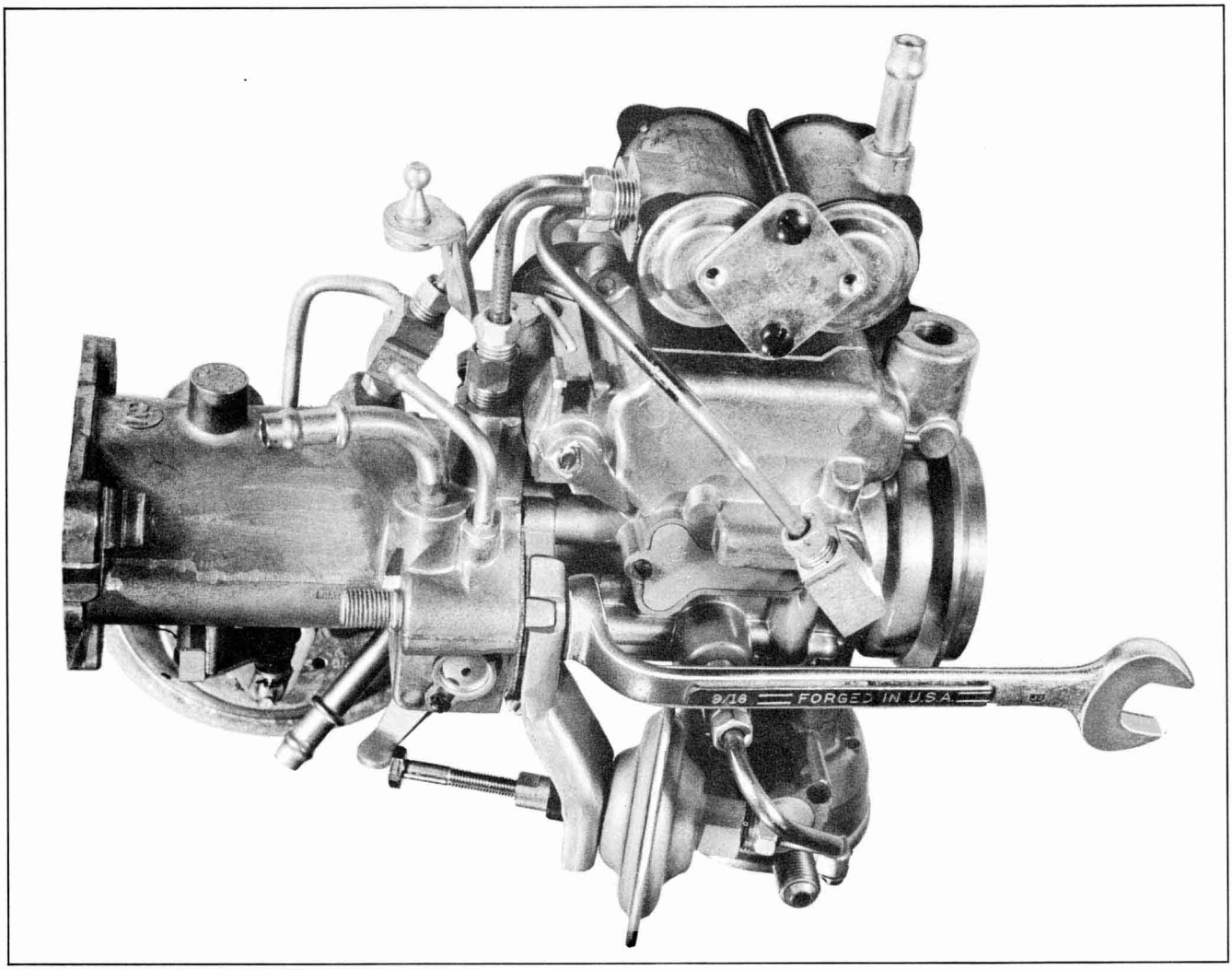


Fig. 9-135 Throttle Return Check Removal

THROTTLE RETURN CHECK

Removal

1. Remove air cleaner.
2. Remove line from carburetor to turbo-charger.
3. Disconnect vacuum line to throttle return check, at carburetor.
4. Remove return check attaching nut, using a 9/16" end wrench bent at right angles or a wrench such as OTC 520, and remove return check.

Installation

Reverse above procedure. Adjust as necessary.

Adjustment

With fast idle screw on the high step of the cam, adjust plunger screw to obtain .050" clearance.

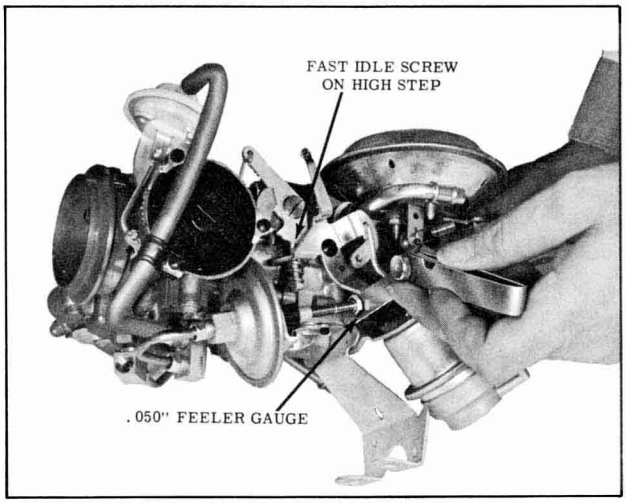


Fig. 9-136 Throttle Return Check Adjustment

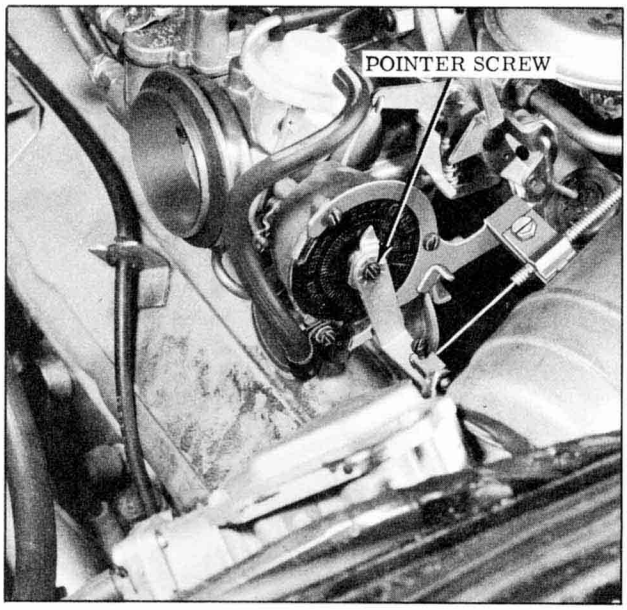


Fig. 9-137 Pointer Adjustment

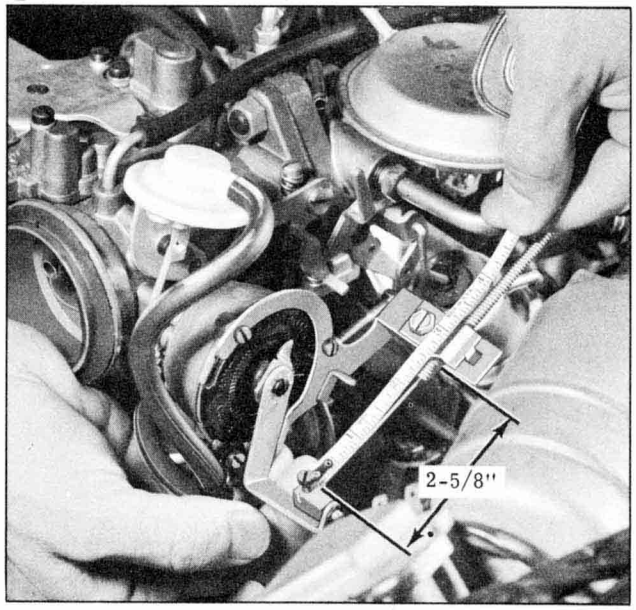


Fig. 9-138 Cable Adjustment

CHOKE ADJUSTMENT (Synchromesh)

Pointer Adjustment (Fig. 9-137)

1. Loosen pointer screw.
2. With the throttle held open to prevent the weight of the fast idle cam from affecting the adjustment, rotate the pointer counterclockwise then clockwise until the choke valve just closes. Continue rotating clockwise three notches.
3. Tighten pointer screw.

Cable Adjustment (Fig. 9-138)

1. With choke cable wire set screw loosened and the choke knob pushed all the way "in", adjust the choke wire so that the distance between the choke lever and the edge of the cable conduit clamp is 2-5/8".
2. Tighten the cable wire set screw and bend the end of the wire so that it cannot contact adjacent hoses.
3. With the choke properly adjusted the fast idle screw will be on the second step of the fast idle cam and the outside choke lever contacting the end of the detent. (Fig. 9-139)

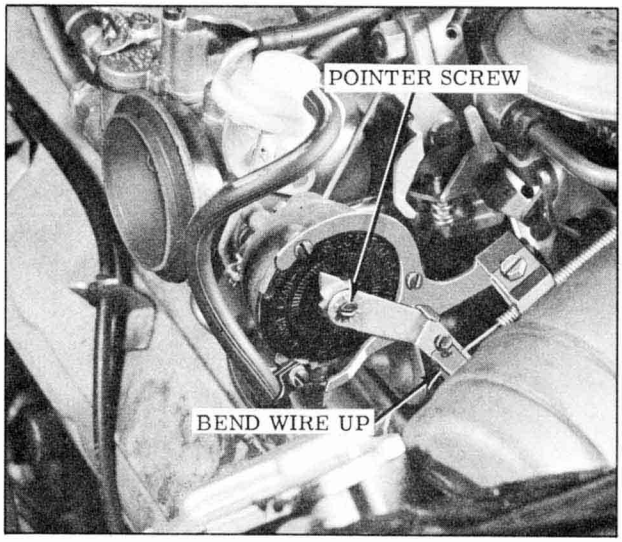
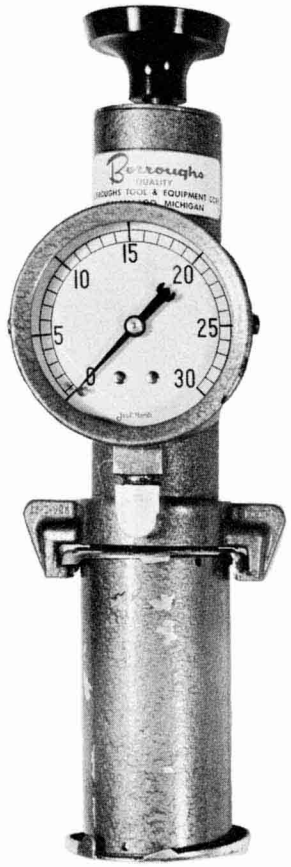


Fig. 9-139 Checking Adjustment



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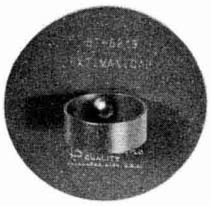

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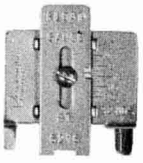
BT-6218



BT-6216

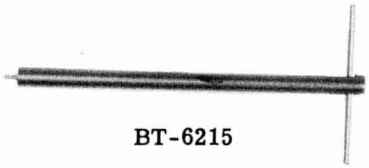


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Fig. 9-140 Carburetor and Turbo-Charger Tools