SECTION 3-C
ADJUSTMENTS AND REPLACEMENTS—EXCEPT IN PUMP AND CARBURETOR ASSEMBLIES

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3-8 CLEANING AND FILLING AIR CLEANER

An air cleaner with a dirty element, or with oil that is dirty, too heavy, or too high in the sump, will restrict the air flow to the carburetor and cause a rich mixture at all speeds. The device will not properly remove dirt from the air and the dirt entering the engine will cause abnormal formation of carbon, sticking valves, and wear of piston rings and cylinder bores.

Regular cleaning of the element and sump and filling sump with clean oil at 5000-mile intervals, or more frequently in dusty territory, is necessary to prevent excessive engine wear and abnormal fuel consumption.

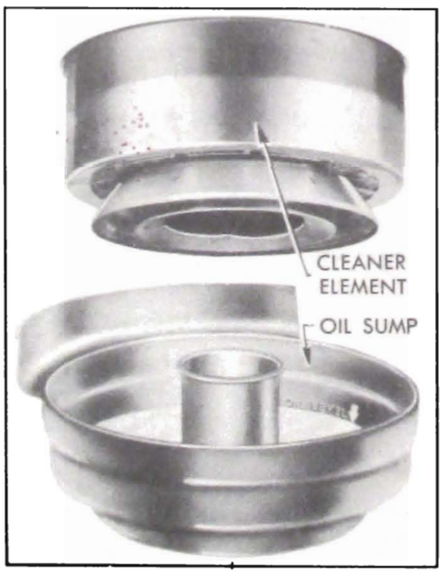


Figure 3-9—Air Cleaner Element and Sump, Showing Oil Level

1. Remove wing nut, loosen clamp screw at carburetor air horn and remove air cleaner, intake silencer and elbow from engine, being careful not to spill the oil. Separate the cleaner and silencer parts.

2. Dip the cleaner element in a non-inflammable solvent and agitate until thoroughly clean. Do not use kerosene. Shake out cleaning fluid and allow element to drain until dry. CAUTION: *Do not dry the element with a hard blast of air; this will permanently injure and distort the filtering mesh.*

3. Drain and thoroughly wash the oil sump and wipe it dry with a clean cloth. Wipe out interior of the air intake silencer.

4. Fill sump to oil level line with one pint of S.A.E. 50 engine oil. See figure 3-9. *Do not oil the cleaner element because this oil will drain back into the sump and cause sump to be overfull.*

5. Assemble and install cleaner, silencer, and elbow on engine. The baffle on oil sump must be placed toward front of engine. CAUTION: *Excessive tightening of clamp screw at carburetor air horn may distort this part and cause binding of choke valve.* Wipe all oil from outer surface of cleaner.

3-9 CLEANING GASOLINE FILTERS AND STRAINERS

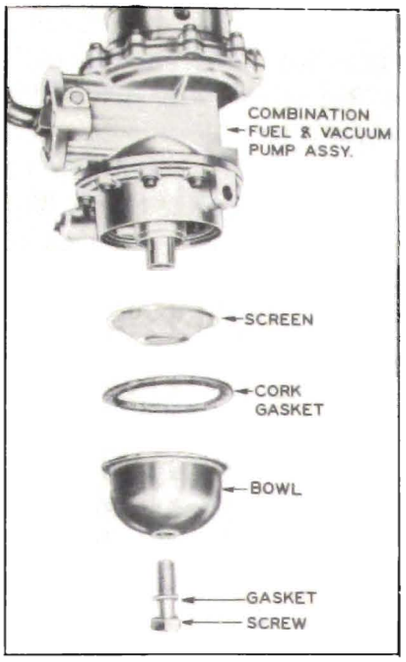


Figure 3-10—Fuel Pump Gasoline Filter—Disassembled

The bowl and strainer on the lower end of fuel pump and the gasoline filter located at carburetor inlet collect dirt and water which should be cleaned out periodically, at least twice a year. The fine mesh cylindrical strainer located in the carburetor inlet should be cleaned if fuel supply to carburetor appears to be restricted.

a. Cleaning Fuel Pump Gasoline Filter

1. Use Z-shaped Wrench KMO 655 to remove screw and gasket then remove bowl, gasket, and strainer from lower end of fuel pump. See figure 3-11.

2. Wash strainer and sediment bowl in Bendix Carburetor Cleaning Solvent, or its equivalent, to remove all traces of dirt and gum, then rinse in kerosene, distillate, or white gasoline. Gently blow through strainer with air hose.

3. Use new bowl and screw gaskets when reinstalling strainer and bowl, to insure against gasoline leakage. Tighten bowl screw securely.

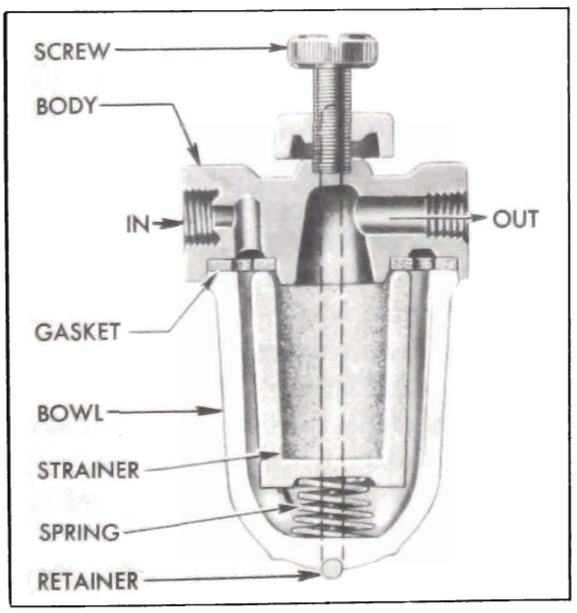


Figure 3-11—Carter Ceramic Type Gasoline Filter—Sectional View

b. Cleaning Carter Ceramic Type Gasoline Filter

1. Loosen bowl retainer screw, swing bowl retainer to one side and remove bowl, ceramic strainer, and spring. See figure 3-11.

2. Wash strainer and bowl in Bendix Carburetor Cleaning Solvent, or its equivalent, and rinse in kerosene, distillate, or white gasoline. Direct air stream against *inside* surface of strainer to force dirt from outside surface.

3. Install strainer, spring, and bowl, using a new bowl gasket.

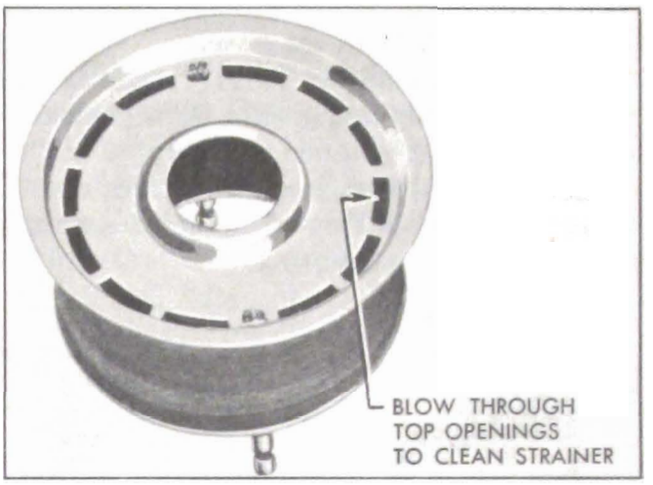


Figure 3-12—AC Paper-Edge Gasoline Filter Strainer

c. Cleaning AC Paper-Edge Type Gasoline Filter

1. Remove bowl and strainer and clean these parts in gasoline. Agitate the strainer in gasoline to loosen dirt.

2. *Gently* blow through openings in top of strainer to force dirt out from between paper laminations. See figure 3-12. Do not blow against outside of strainer.

3. Install strainer and bowl.

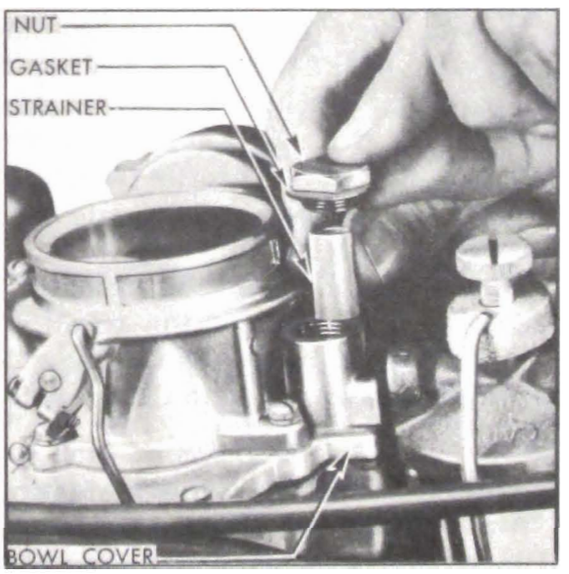


Figure 3-13—Removal of Strainer—Carter Carburetor

d. Cleaning Carburetor Inlet Strainer

1. On *Carter* carburetor remove brass strainer nut and gasket from carburetor bowl cover and lift strainer out of well in bowl cover. See figure 3-13.

On *Stromberg* carburetor, disconnect fuel pipe from gasoline filter then remove filter with carburetor inlet fitting. Remove strainer from carburetor air horn. See figure 3-14.

2. Clean strainer in Bendix Carburetor Cleaning Solvent, or its equivalent, to remove all traces of dirt and gum, then rinse in kerosene, distillate, or white gasoline. *Gently* blow through strainer with air hose.

3. When reinstalling *Carter* strainer make sure that strainer nut gasket is in good condition and nut is tightened securely.

When reinstalling *Stromberg* strainer coat threads of inlet fitting with joint compound and tighten fitting securely.

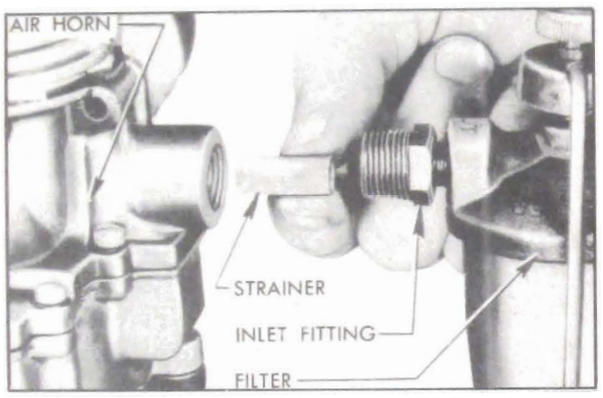


Figure 3-14—Removal of Strainer—Stromberg Carburetor

3-10 THROTTLE LINKAGE ADJUSTMENT

The throttle linkage must work freely and be adjusted so that the accelerator pedal can move the throttle valve smoothly from fully closed to wide open positions, and operate the choke unloader in the wide open position.

Make sure that accelerator pedal is securely fastened to floor pan and Rod does not bind in hole through floor mat. Throttle return spring must be strong enough to pull throttle to closed position against throttle stop screw.

When accelerator pedal is released, the throttle must close against the throttle stop screw. When pedal is pressed all the way down, the throttle must fully open to the throttle stop on carburetor.

a. Throttle Linkage Adjustment—Syncro-Mesh Transmission Cars

1. Disconnect the throttle operating rod ball joint from the throttle lever and open the throttle valve to wide open position against its stop.

2. While a second man presses accelerator pedal firmly against the floor mat, which must be in place, adjust the ball joint on throttle operating rod so that the screw will just enter the *upper* hole in throttle lever.

3. Turn ball joint 1 or 2 turns clockwise on rod and connect ball joint to throttle lever. The desired adjustment is to obtain full opening of throttle valve when accelerator pedal strikes floor mat rather than having the stop on throttle lever strike the boss on throttle body.

4. Hold choke valve closed and check for proper operation of choke unloader when accelerator is pressed to floor mat. If choke unloader does not operate properly, adjust as described in paragraph 3-23 (Carter) or 3-30 (Stromberg).

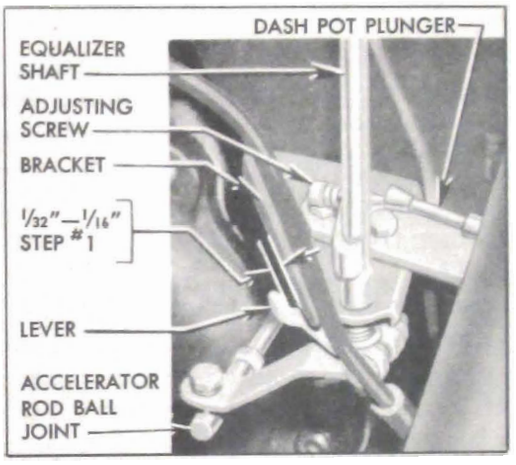


Figure 3-15—Throttle Dash Pot Adjustment—Dynaflow Drive Cars

b. Throttle Linkage and Dash Pot Adjustment—Dynaflow Drive Cars

1. With engine idling at 450 RPM, check clearance between the stop on lever at lower end of equalizer shaft and the shaft lower bracket. See figure 3-15. If clearance is not 1/32" to 1/16", adjust throttle operating rod at ball joint to obtain 1/32" to 1/16" clearance.

2. With engine shut off, check for full opening of throttle valve when accelerator pedal hits the floor mat, which must be in place. Full opening should be obtained when pedal strikes floor mat, rather than having the stop on throttle lever strike the boss on throttle body. Adjust accelerator pedal rod at ball joint, if necessary, to obtain full opening of throttle valve.

3. Hold choke valve closed and check for proper operation of choke unloader when accelerator pedal is pressed to floor mat. If choke

unloader does not operate properly, adjust as described in paragraph 3-23 (Carter) or 3-30 (Stromberg).

4. Hold choke valve closed and check clearance beween the fast idle cam and the adjustment or stop screw. Clearance should be 1/64" to 1/32", and may be obtained by adjusting the screw on the dash pot operating lever at lower end of equalizer shaft. See figure 3-15.

3-11 EXHAUST MANIFOLD VALVE SERVICE

a. Freeing Up Sticking Valve

Carbon or lead salt deposits around the valve shaft may cause the valve to stick or become sluggish in operation. A valve sticking in the open position will cause slow engine warm up, excessive spitting and sluggish engine operation when cold. A valve sticking in the closed position will cause overheating, loss of power, and hard starting when the engine is hot, and may also cause warped or cracked manifolds. Sticking in either position will adversely affect fuel economy.

If the valve shaft is sticking or frozen in the valve body, free it up by tapping on the ends with a light hammer, and by rotating the counterweight. Penetrating oil or kerosene may be used to aid in freeing the shaft.

When the valve shaft is free, apply a mixture of kerosene and powdered graphite liberally to the shaft bearing; the mixture to be composed of 2½ ounces of powdered graphite to 1 pint of kerosene. Lubrication of shaft every 1,000 miles is specified in Lubricare Instructions (par. 1-1).

b. Checking Manifold Valve Thermostat Setting

The setting of the exhaust manifold valve thermostat may be checked when the engine is at room temperature of approximately 70° F. Unhook the outer end of thermostat from anchor stud on the valve body and hold the valve in the closed (heat on) position. To bring the end of thermostat to the anchor stud will then require approximately ¼ turn wind-up of the thermostat.

The thermostat is not adjustable and should never be distorted or altered in any way as this will affect its calibration. If the thermostat does not have the proper setting, or is damaged, it should be replaced.

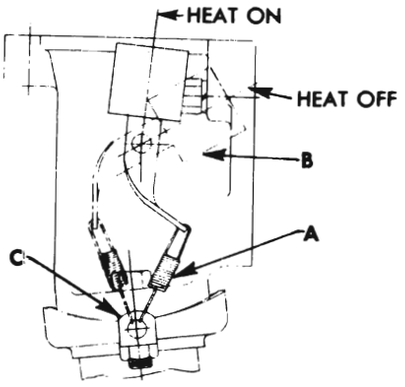


Figure 3-16—Valve Anti-Rattle Spring Adjustment

c. Adjusting Valve Anti-Rattle Spring

The anti-rattle spring shown at "A" in figure 3-16 must be adjusted so that the valve cannot flutter and chatter against the inside of valve body in either the closed (heat on) or open (heat off) positions. These positions can be felt by moving the counterweight by hand, and adjustment can be made with engine hot or cold.

Bend clip "C" as required so that spring "A" will prevent the valve from contacting the valve body in either closed or open positions. Adjustment so that valve has sufficient clearance to prevent rattle in the closed position will usually be correct for the open position also. Clearance equal to 1/16" to 1/8" movement at the extreme end of counterweight is correct.

3-12 CARBURETOR ADJUSTMENT

Do not attempt to adjust the carburetor idle needle valves until it is known that the ignition system is in proper operating condition (par. 10-44), that compression is satisfactory and valves are properly adjusted. It should also be known that the exhaust manifold valve is operating properly (par. 3-11) and that intake manifold has no air leaks, that gasoline filters and strainers are clean (par. 3-9), that fuel pump is supplying carburetor with ample fuel at specified pressure (par. 3-17), that the air supply is not restricted by the air cleaner (par. 3-8) or choke (par. 3-13) and that throttle control linkage is correctly adjusted (par. 3-10).

Any attempt to adjust or alter the carburetor to compensate for faulty conditions elsewhere in items affecting engine performance will result in reduced fuel economy and overall performance.

a. Checking Float Bowl Fuel Level

Any deviation from the specified fuel level in the float bowl will seriously affect carburetion; therefore, the level should be checked before adjusting the carburetor.

1. Remove the fuel level sight plug from carburetor float bowl.

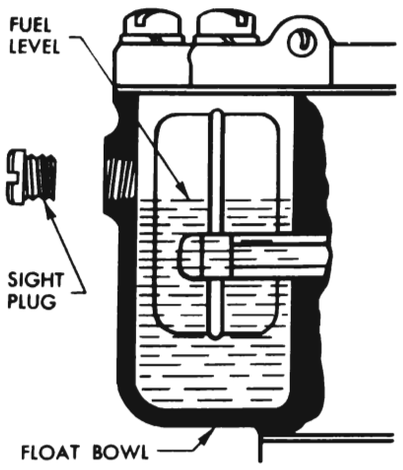


Figure 3-17—Float Bowl Fuel Level

2. With engine idling at normal operating temperature, the fuel in the bowl must be just high enough to wet the threads at the lower side of the sight hole. See figure 3-17.

3. If the fuel level is not correct, it must be adjusted to correct height to insure proper carburetor operation. If the level is too high it is advisable to check fuel pump pressure (par. 3-17) before making an adjustment of carburetor float.

b. Making Initial Setting of Throttle Stop Screw

The initial setting of the throttle stop screw will provide an engine idling speed of approximately 450 RPM (8 MPH on level road in third speed) to prevent stalling during starting and warm up of engine.

1. Back off throttle stop screw until throttle valves are fully closed.

2. With choke wide open, turn throttle stop screw "IN" (clockwise) until it just contacts the low step of fast idle cam of Stromberg carburetor or boss on throttle body of Carter carburetor.

3. Turn throttle stop screw "IN" one complete turn, which will give engine idling speed of approximately 450 r.p.m.

NOTE: *If the engine operates on fast idle too long after starting or else moves to slow idle too soon, or the choke unloader does not operate properly, check fast idle cam and choke unloader adjustments as described in paragraph 3-23 (Carter) or paragraph 3-30 (Stromberg).*

c. Making Initial Setting of Idle Needle Valves

An initial setting of the idle needle valves is necessary to make certain that both valves are opened an equal amount.

1. With engine stopped, turn both idle needle valves "IN" (clockwise) until they seat lightly. CAUTION: *Do not force valves against seats as this will damage valves and seats.*

2. On Stromberg carburetor, turn each valve "OUT" (counter clockwise) 1¾ turns. On Carter carburetor, turn each valve "OUT" 1 turn. *Be careful to turn both valves exactly the same amount. See figure 3-18.*

d. Making Final Adjustment of Idle Needle Valves

The two idle needle valves and the throttle stop screw are the only external means provided for adjusting the carburetor. Turning the idle needle valves "IN" (clockwise) makes the mixture "LEAN."

The idle needle valves control the idle or low speed system of the carburetor; all adjustments affecting the main metering or high speed system are made during assembly of the carburetor.

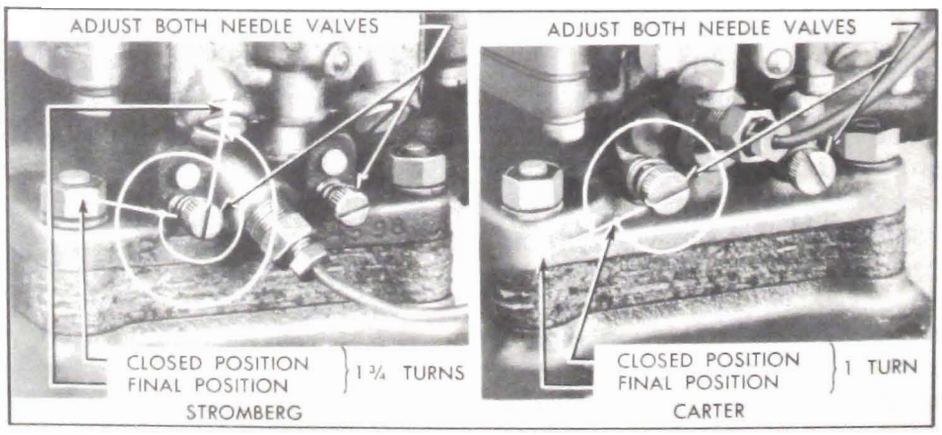


Figure 3-18—Initial Setting of Idle Needle Valves

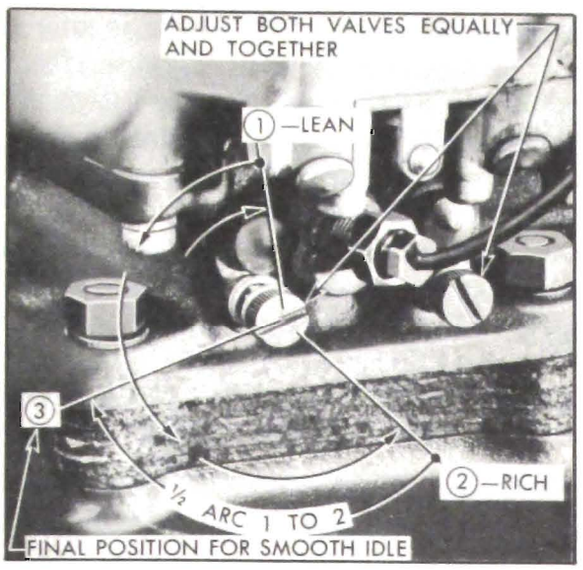


Figure 3-19—Adjustment for Smooth Idle

1. With throttle stop screw and idle needle valves at the initial settings as described above, start the engine and run it until it is at normal operating temperature.

2. Carefully turn both idle needle valves "IN" (clockwise) exactly the same amount until engine begins to roll or run unevenly.

3 Carefully turn both needle valves "OUT" (counterclockwise) exactly the same amount until engine again starts to roll or run unevenly.

4. Turn both needle valves "IN" one-half the distance between the first and second positions, being careful to turn both valves an equal amount. See figures 3-19. This should give the smoothest idling point. NOTE: *As the needle valves are changed, the throttle stop screw also must be changed to maintain engine idling speed at 450 RPM (8 MPH on level road in third speed).*

5. If outside temperature is much colder than shop where adjustment is made, turn both needle valves "OUT" a slight amount to compensate for difference in temperature.

Final adjustment of the carburetor idle needle valves also may be made with the aid of a combustion tester, tachometer, or vacuum gauge. When such instruments are used, be sure they are in good condition and are used in accordance with the instructions of the manufacturer.

Regardless of the methods or instruments used for making adjustments in the shop, the correctness of adjustment should be finally checked by a road test for smoothness at idling speed, power on acceleration, and freedom from sluggishness or flat spots throughout entire speed range.

3-13 CHOKE THERMOSTAT ADJUSTMENT

It is desirable to have the choke thermostat set as lean as operating conditions will permit in order to avoid an over rich mixture during engine warm-up. The correctness of the thermostat setting can be tested only when the engine and choke thermostatic coil are cold. The carburetor must be properly adjusted (par. 3-12) and the manifold heat control valve must be operating properly (par. 3-11). The cold engine should start readily, idle without loading or rolling, and should accelerate smoothly during the warm-up period while the choke is normally in operation.

The thermostat is calibrated to give satisfactory performance with regular blends of gasoline when it is placed at the "Normal" factory setting. A "Lean" setting should be used only when the car is habitually operated on highly volatile fuel. The need for this setting will be indicated by excessive loading or rolling of the engine on warm up, with the choke at the "Normal" setting and the carburetor properly adjusted. A "Rich" setting should be used only when excessive spitting occurs on engine warm up, with the choke at the "Normal" setting, the carburetor properly adjusted, and the manifold heat control valve operating properly.

The "Normal" settings for Carter and Stromberg choke thermostats are given below. When making either a "Lean" or a "Rich" setting, *make no adjustment except when engine and thermostatic coil are cold.* Turn thermostat housing one mark at a time in required direction and test the results, until the desired performance is obtained.

a. Setting of Carter Climatic Control Thermostat

The plastic thermostatic coil housing has an

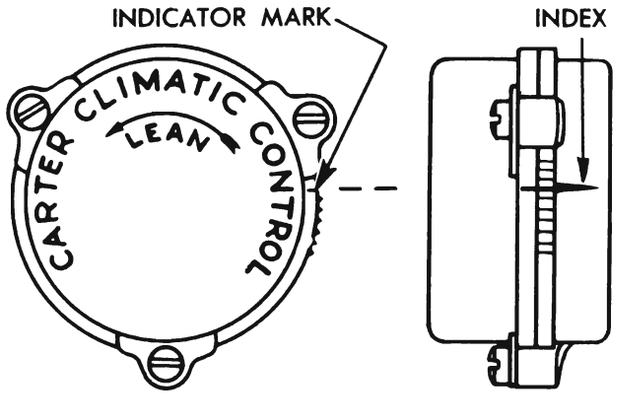


Figure 3-20—Carter Climatic Control Thermostat at Normal Setting

indicator mark cut in the flanged edge and an arrow pointing in the direction of rotation for a "Lean" setting. Small graduation ribs are cast in the flange of the choke piston housing which is integral with the air horn. A larger rib extending out on this housing serves as an index point. See figure 3-20.

The thermostatic coil housing is clamped in position by three retainers and screws which must be loosened to turn the housing. The hooked end of thermostatic coil must be in position to contact the choker shaft lever and close the choker valve when coil is cold.

The "Normal" or standard setting of thermostat exists when the indicator mark on coil housing is in line with the index rib on air horn. A "Lean" setting is obtained by turning the coil housing counterclockwise, in the direction of arrow. A "Rich" setting is obtained by turning coil housing in the opposite direction.

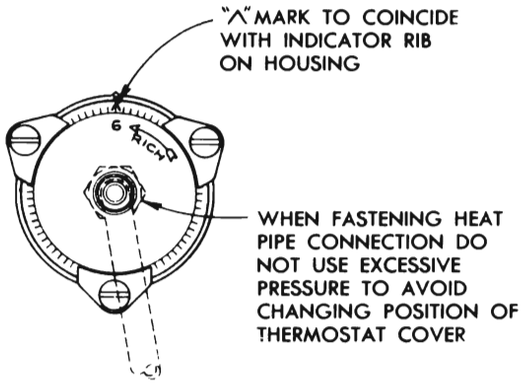


Figure 3-21—Stromberg Choke Thermostat at Normal Setting —Series 70

b. Setting of Stromberg Choke Thermostat

An indicator rib is cast on the top surface of the thermostat housing attached to carburetor air horn. Small graduation ribs are cast on the edge of the thermostat cover, and a "V" mark is punched on edge of cover to serve as an index. An arrow cast on thermostat cover points in the direction of rotation for a "Rich" setting. See figure 3-21.

The thermostat cover is clamped in position by three lug-washers and screws, which must be loosened to turn the cover. It is also necessary to loosen the heat pipe connection to turn cover. The hooked end of thermostat coil must be in position to contact the pin on the vacuum piston lever and close the choke valve when coil is cold.

On *Series 70,* the "Normal" or standard setting exists when the "V" index mark on cover aligns with the indicator rib on housing (fig. 3-21). On *Series 40-50,* the "Normal" setting exists when the "V" mark is one notch "Lean" or clockwise from indicator rib.

A "Rich" setting is obtained by turning thermostat cover counterclockwise, in direction of arrow on cover. A "Lean" setting is obtained by turning housing in the opposite direction. *When tightening heat pipe connection do not use excessive pressure, which may change position of thermostat cover.*

3-14 REPLACEMENT OF INTAKE AND EXHAUST MANIFOLDS

Exhaust manifolds should never be removed while the engine is hot because warpage is liable to occur.

When manifolds are assembled and installed, care must be exercised to avoid strain which will result in leaking joints or cracked manifolds. Assembly and installation should be done in the following manner:

1. Install the valve body on the exhaust manifold with a new ring gasket in pilot ring recess in body and a new gasket between body and manifold; make sure that pilot ring is in place. See figure 3-22. Leave attaching stud nuts snug but not tight.

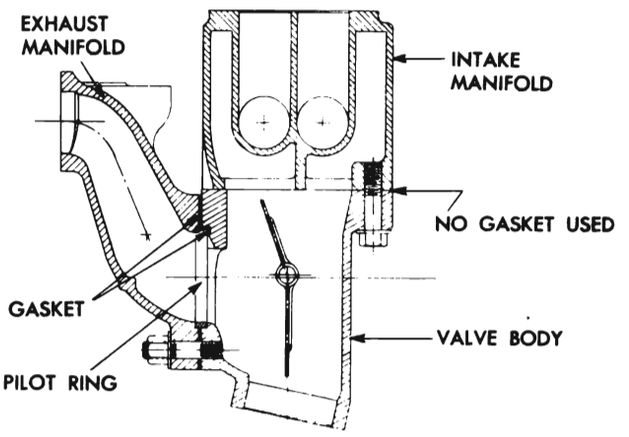


Figure 3-22—Sectional View of Joints Between Valve Body and Manifolds

2. Coat joint surfaces with graphite lubricant, then install intake manifold on exhaust manifold valve body leaving attaching bolts snug but not tight.

3. Install intake and exhaust manifold assembly on engine with new intake manifold gaskets. The individual intake manifold gaskets are centered and the branches of the intake manifold are aligned with the intake ports in cylinder head by pilot rings installed at each joint.

4. Exhaust manifold gaskets are not used.

In production, a special compound is used at joints between manifold and cylinder head, and original manifold may be reinstalled without using additional compound. When a new manifold is installed, however, coat the joint surfaces with a thin fluid mixture of graphite and oil.

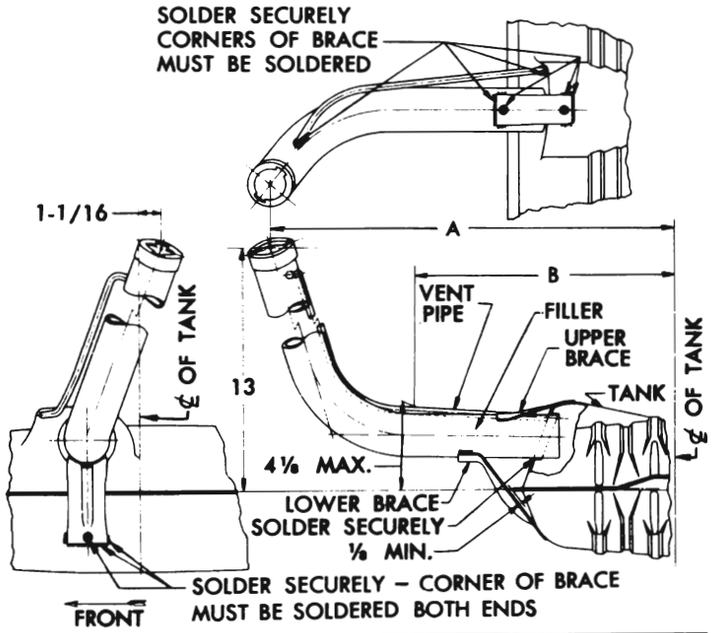
5. Uniformly tighten all stud nuts which attach manifolds to cylinder head, then tighten stud nuts which attach valve body to exhaust manifold and finally, tighten bolts which attach intake manifold to valve body.

3-15 REPLACEMENT OF GASOLINE TANK OR FILLER

When removing gasoline tank, disconnect gasoline feed pipe from gasoline gauge pipe, support the tank while disconnecting support straps at rear ends, then lower tank far enough to disconnect the wire from gasoline gauge.

When installing gasoline tank by reversing procedure for removal, make sure that all road dirt is cleaned from gasoline gauge and wire terminal; also make sure that wire is securely attached to gauge and that insulation is folded over the terminal and snapped over the wire. An accumulation of road dirt around the gauge terminal may permit an electrical leak that will affect the accuracy of the gauge. Insulating strips must be located between the tank and the upper supports on body.

The gasoline tank filler and the vent pipe are furnished separately so that they may be replaced if damaged. After unsoldering the old parts, the new filler and vent pipe should be installed in gasoline tank in accordance with the dimensions given in figure 3-23 for 1948 models or figure 3-24 for 1949 models. Joints must be thoroughly soldered and should be tested for leaks with gasoline before installing gasoline tank.



A	B	MODELS
26 1/16	20¼	ALL EXCEPT ESTATE WAGONS
28⅝	22 3/16	ESTATE WAGONS

Figure 3-23—Location Dimensions for Gasoline Tank Filler—All 1948 Models

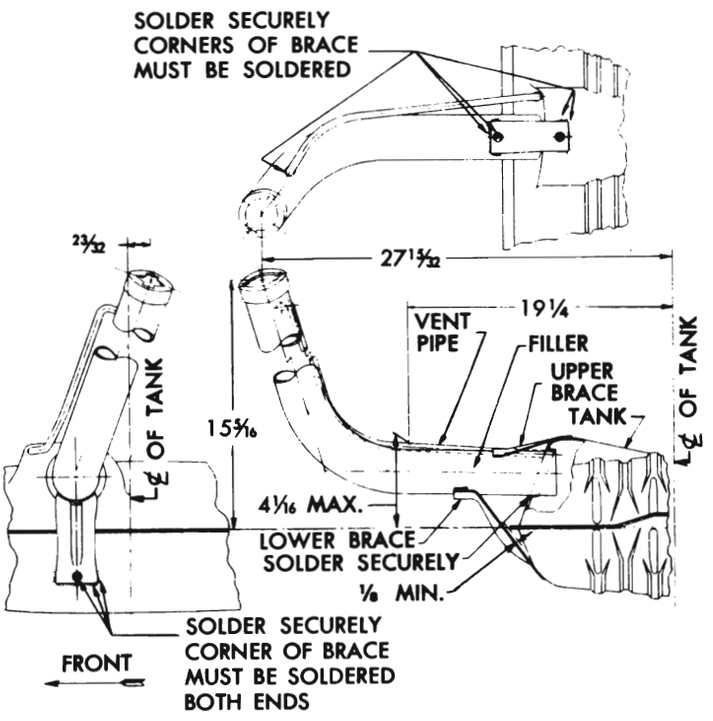


Figure 3-24—Location Dimensions for Gasoline Tank Filler—1949 Series 50-70