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

## CONTENTS OF SECTION 3-C


| Paragraph | Subject | Page |
|---|---|---|
| 3-7 | Air Cleaner, Fuel Filter, Manifold Valve and Ventilator Valve Service | 3-15 |
| 3-8 | Carburetor Idle and Automatic Choke Adjustments | 3-17 |
| 3-9 | Throttle Linkage and Dash Pot Adjustments | 3-18 |
| 3-10 | Replacement of Gasoline Tank or Filler | 3-20 |


## 3-7 AIR CLEANER, FUEL FILTER, MANIFOLD VALVE AND VENTILATOR VALVE SERVICE

### a. Air Cleaner Service

An air cleaner with a dirty element 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 and inspection of the element at 12,000 mile intervals (or more frequently in dusty territory) is necessary to prevent excessive engine wear and abnormal fuel consumption. The procedure for cleaning the air cleaner is given in paragraph 1-1.

### b. Fuel Filter—4-Barrel V-8 Engine

The fuel filter is a can-type throw-away filter and is located in the line between the fuel pump and the carburetor. See cutaway view in Figure 3-12.

The filter element has a large filtering area. It is of fine enough material to assure that any particles which pass through it are too small to interfere with the operation of the float needle and seat, and also too small to cause clogging of the smallest passages in the carburetor. This element prevents the passage of water under ordinary conditions. The filter should be replaced every 12,000 miles. See paragraph 1-1.


Figure 3-12—Can-Type Throw-Away Fuel Filter

After assembling the fuel filter, always start the engine and observe the filter carefully to make sure that the clamps are not leaking.

### c. Cleaning Fuel Filter—V-6 and 2-Barrel V-8 Engines

In the V-6 and 2-barrel V-8 engines, the fuel filter is located in the carburetor fuel inlet. See Figure 3-13. When this filter is used, the can-type throw-away filter is omitted.

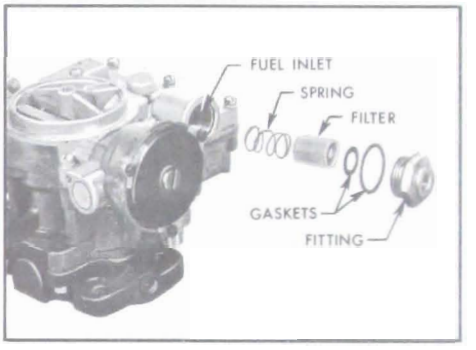


Figure 3-13—Fuel Filter Parts

The filter element is of sintered bronze, shaped to give the maximum filtering surface. The element is placed in the inlet hole with the cupped end with the center cone outward. The spring holds the element outward, sealing it against the small gasket in the inlet fitting. If the element should ever become plugged, pump pressure is sufficient to depress the spring so that the fuel by-passes the element. Thus, a plugged element, instead of causing the engine to stop running, allows the engine to continue running on unfiltered fuel. When carburetor flooding is encountered, this is an indication that the fuel is by-passing the element; the element should therefore be removed and cleaned.

Every 12,000 miles the filter element should be removed and washed thoroughly in a good

cleaning solvent, then blown dry in a reverse direction. If the element does not clean up completely, a new element should be installed.

After assembling the filter element in the carburetor, always start the engine and check for leaks in the fuel line and fittings before installing the air cleaner.

### d. Other Filters or Strainers

A woven plastic filter is located on the lower end of the fuel pickup pipe in the gas tank. This filter prevents dirt from entering the fuel line and also stops water unless the filter becomes completely submerged in water. This filter is self cleaning and normally requires no maintenance. Fuel stoppage at this point indicates that the gas tank contains an abnormal amount of sediment or water, the tank should therefore be removed and thoroughly cleaned.

Fine mesh strainers are located in the 4-barrel carburetor above each needle and seat. These strainers should seldom require cleaning because of the fuel filter which precedes them in the gasoline supply line. They should be inspected, however, if fuel supply at the carburetor inlet is adequate but carburetor operation indicates lack of fuel.

### e. Freeing Up Sticking Exhaust Manifold Valve—V-6 Engine

Lubricate the exhaust manifold valve shaft every 6,000 miles (par. 1-1).

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 manifold heat control valve is sticking or seized in the manifold, free it up by applying a good solvent such as "Buick Heat Trap Lubricant" to the valve shaft and bushings at both sides of the exhaust manifold. Allow the solvent to soak for a few minutes, then work the valve by rotating the counterweight. Severe cases may be freed by tapping endwise on the shaft with a light hammer. After the shaft is free, another application of lubricant will assure complete penetration of the shaft bushings.

### f. Checking Manifold Valve Thermostat Setting—V-6 Engine

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 manifold and hold the valve in the closed position. To bring the end of thermostat to the anchor stud will then require approximately 3/8 turn wind-up of the thermostat as shown in Figure 3-14.

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.

### g. Positive Crankcase Ventilator System Service

All cars have a positive crankcase ventilating system to help

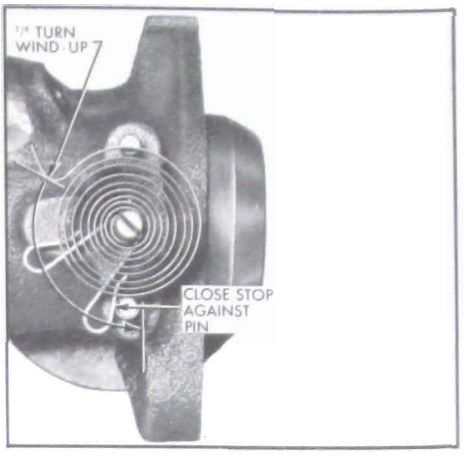


Figure 3-14—Manifold Valve Thermostat Wind-Up

reduce air pollution and to provide more complete scavenging of crankcase impurities. Ventilation air is drawn in through the filter in the filler cap on the left rocker arm cover, down into the crankcase, across and up into the right rocker arm cover, up through the ventilator valve, through a hose, into the carburetor throttle body and into the intake manifold. Intake manifold vacuum draws any fumes from the crankcase to be burned in the engine. See Figure 3-15.

When air flow through the carburetor is high, added air from the positive crankcase ventilating system has no noticeable effect on engine operation; however, at

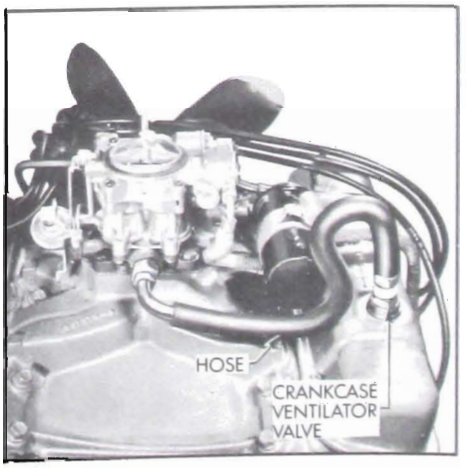


Figure 3-15—Positive Crankcase Ventilating System

idle speed, air flow through the carburetor is so low that any large amount added by the ventilating system would upset the air-fuel mixture, causing rough idle. For this reason, a flow control valve is used which restricts the ventilating system flow whenever intake manifold vacuum is high.

After a period of operation, the ventilator valve tends to become clogged, which reduces and finally stops all crankcase ventilation. An engine which is operated without any crankcase ventilation can be damaged seriously. Therefore, it is important to replace the ventilator valve periodically (each time the engine oil filter is replaced).

CAUTION: If an engine is idling too slow or rough, this may be caused by a clogged ventilator valve; therefore, never adjust the carburetor idle without first checking the crankcase ventilator check valve.

With the crankcase ventilator system operating normally, about 1/4 of the air used in the idle mixture is supplied through the ventilator valve. Therefore, if the ventilator air is shut off, the idle speed will be noticeably slower. Check operation of the ventilator system as follows:

1. Connect a reliable tachometer and adjust idle as specified.

2. Squeeze-off crankcase ventilator hose to stop all air flow.

3. If idle speed drops 60 RPM or more, crankcase ventilator system is okay.

4. If idle speed drops less than 60 RPM, ventilator system is probably partially clogged; install a new ventilator valve and recheck operation of system as described above.

5. After installing a new ventilator valve, always readjust engine idle.

## 3-8 CARBURETOR IDLE AND AUTOMATIC CHOKE ADJUSTMENTS

Carburetor adjustment should not be attempted until it is known that all items affecting engine Ignition and Compression are in good order, as outlined in paragraph 2-10. Any attempt to adjust or alter the carburetor to compensate for faulty conditions elsewhere will result in reduced fuel economy and overall performance.

### a. Initial Setting of Idle Needle Valves and Throttle Stop Screw

1. With engine stopped, turn both idle needle valves clockwise until they are lightly seated. Forcing valves hard against seats will score valves and seats and ruin them for proper adjustment.

2. Now turn each needle OUT one full turn. This setting should give an approximate idle mixture so that engine can be warmed up for final adjustment as described in b below.

3. Back off throttle stop screw and hold fast idle cam in HOT (choke open) position so that throttle valves are fully closed.

4. On all carburetors, turn throttle stop screw IN (clockwise) until it just contacts, then turn screw IN one complete turn. This setting should give an approximate idling speed so that engine can be warmed up for final adjustment as described below. For more exact initial settings, see specifications for carburetor being adjusted.

### b. Final Adjustment of Idle Needle Valves and Throttle Stop Screw

1. With throttle stop screw and idle needle valves at the initial settings described above (subpar. a), start the engine and run it until the upper radiator tank is hot to the touch and the choke valve is wide open.

CAUTION: Idle mixture and speed adjustments cannot be made satisfactorily with an abnormally hot engine. On any carburetor having a hot idle compensating valve it is particularly important that idle adjustments be made at normal temperature so that this valve will be closed.

2. With engine at normal operating temperature, place a block in front of a front wheel and apply parking brake firmly. Then shift automatic transmission into drive position or manual transmission into neutral position.

3. Adjust throttle stop screw so that engine is idling at 500 RPM (550 RPM with air conditioner or V-6 engine).

4. Adjust one needle valve at a time (Figure 3-16) to provide smooth idle, as follows:

(a) Slowly turn needle valve "IN" (clockwise) until engine just begins to lag or run irregularly because of lean mixture.

(b) Slowly turn needle valve "OUT" until engine just begins to "roll" or "gallop" because of rich mixture.

(c) Slowly turn needle "IN" just enough to provide the smoothest engine operation.

(d) Repeat this same procedure on the other needle valve.

5. Readjust the throttle stop screw to provide an idling speed of 500 RPM (550 RPM with air conditioner or V-6 engine).

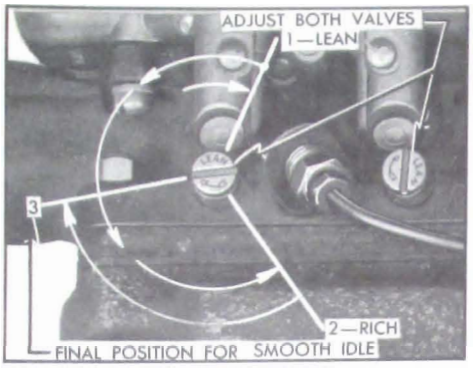


Figure 3-16—Adjustment of Idle Needle Valves

If the idling speed increased very much during the needle valve adjustments it may be necessary to readjust the needle valves slightly to insure smoothest engine operation at the corrected idle speed.

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.

### c. Automatic Choke Adjustments

The choke thermostat is calibrated to give satisfactory performance with regular blends of fuel when it is placed at the standard factory setting, which is listed in the specifications for each carburetor.

When it is necessary to adjust the thermostat loosen the housing or cover attaching screws, and turn as required.

Thermostat settings other than standard should be used only when the car is habitually operated on special blends of fuel which do not give satisfactory warm-up performance with the standard setting. A "Lean" setting may be required with highly volatile fuel which produces excessive loading or rolling of engine on warm-up with the standard thermostat setting. A "Rich" setting should be used only when excessive spitting occurs on engine warm-up with the standard thermostat setting. When making either a "Lean" or "Rich" setting, change one point at a time and test results with engine cold, until the desired performance is obtained.

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 the fast idle and choke unloader adjustments as described in paragraph 3-18.

## 3-9 THROTTLE LINKAGE AND DASH POT ADJUSTMENTS

The procedure for adjusting the throttle linkage and the dash pot is identical on synchromesh and automatic transmission cars. On automatic transmission cars, however, the throttle linkage actuates other linkage connected to a valve in the transmission. Therefore, a carburetor to transmission linkage adjustment is required on automatic transmission cars in addition to the adjustments necessary on synchromesh cars.

### a. Throttle Linkage Adjustment

1. Make sure that accelerator pedal is in good condition and that floor mat is properly installed. Make sure pedal ball studs are tight in floor pan.

2. Remove air cleaner. Check throttle linkage for proper lubrication. Make sure that pedal rod does not bind going through dash, and make sure that return spring fully closes the throttle.

3. On automatic transmission cars only, move throttle lever to wide open position and make sure carburetor to transmission linkage does not prevent throttle from opening completely. If throttle will not open easily without springing linkage, make a carburetor to transmission linkage adjustment before proceeding with throttle linkage adjustment (see subpar. b).

4. Disconnect rear end of throttle rod from throttle operating lever. See Figure 3-17.

5. While another man presses accelerator pedal firmly against floor mat, hold throttle in wide open position, and hold rear end of throttle rod at hole in throttle operating lever. Rod end must be approximately 1/16" short of entering hole in lever. Readjust throttle rod length as required to obtain this condition.

6. Connect throttle rod to operating lever and secure cotter pin.

7. With accelerator pedal pressed against floor mat, recheck throttle for wide open position.

8. Hold choke valve closed and move throttle lever to wide open position to check adjustment of choke unloader. If choke unloader does not operate properly, adjust as described in paragraph 3-17.

9. Finally, check for smooth operation of linkage from fully closed to wide open position of throttle. Make sure that throttle closes firmly against stop screw even when throttle is closed very slowly. The desired wide open condition is to have full opening of throttle valve just as accelerator pedal strikes floor mat rather than having stop on throttle lever strike hard against boss on throttle body.

### b. Carburetor to Transmission Linkage Adjustment (Automatic Transmission Cars)

1. Move upper end of transmission linkage idler lever forward and hold against pressure of transmission valve spring.

2. Move throttle lever to wide open position. Upper end of idler

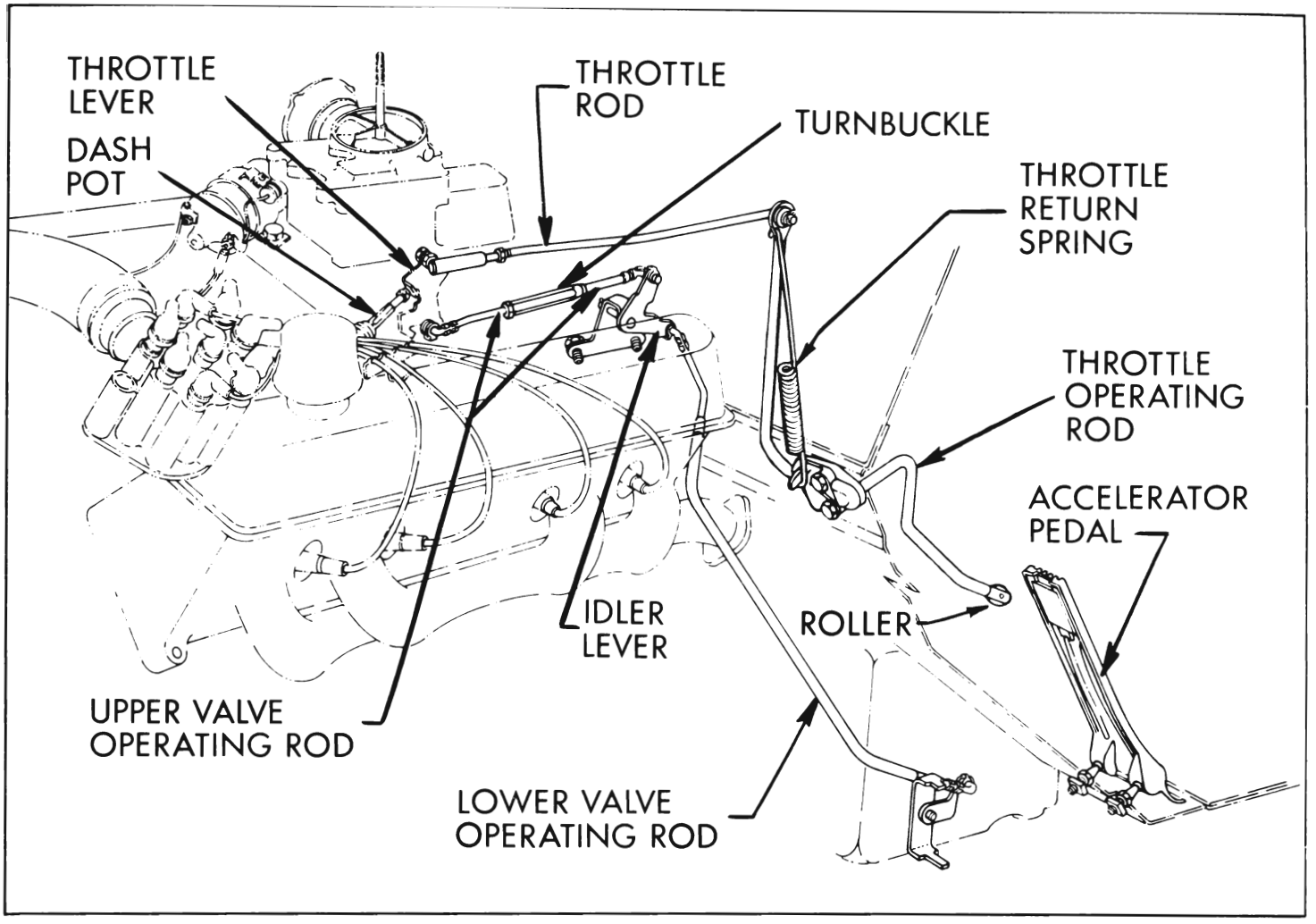


Figure 3-17—Throttle and Transmission Control Linkage (Automatic Transmission)

lever should not be bent any farther forward, nor should idler lever move rearward when released. In other words, the transmission idler lever and the throttle lever should reach their stops at the same time.

3. If wide open throttle causes idler lever to bend forward, lengthen transmission operating rod as required by rotating turnbuckle.

4. At wide open throttle, if idler lever moves rearward when released, shorten transmission operating rod as required by rotating turnbuckle.

5. Tighten turnbuckle lock nut and recheck transmission rod adjustment as described in Steps 1 and 2. CAUTION: Never drive the car with the transmission linkage misadjusted or disconnected. The transmission line pressure will be too low and burned-out clutches will result.

**c. Dash Pot Adjustment**

Adjust the dash pot with the engine at normal operating temperature and with idle speed and mixture correctly adjusted.

1. With transmission in park, accelerate engine at carburetor, allowing throttle to snap closed. Dash pot should delay the closing action approximately 2 seconds.

2. If dash pot delaying time is too short, move dash pot toward throttle lever; if delaying time is too long, move dash pot away from throttle lever. When correct, retighten lock nut. See Figure 3-18. If proper control cannot be obtained by adjustment, replace the dash pot.

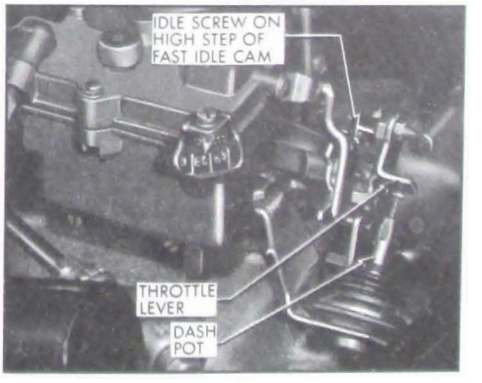


Figure 3-18—Dash Pot Adjustment

3. As a final check, apply brakes firmly and shift transmission into Drive. Jab accelerator pedal and release rapidly. If engine stalls, adjust dash pot to give slightly more retarding action, but no more than necessary to prevent engine stalling.

## 3-10 REPLACEMENT OF GASOLINE TANK OR FILLER

The gas gauge tank unit is combined with the feed pipe. It is necessary to lower the gas tank to replace this unit. See Figures 3-1 and 3-2. On air conditioner equipped cars, a vapor return pipe is also part of this assembly. See Figure 3-3.

Before condemning a gas gauge tank unit, make sure that all dirt is cleaned from around the terminal; also make sure that the wire is securely fastened to the terminal and that the insulating cover is in place. An accumulation of road dirt around the gauge terminal may permit an electrical leak that will affect the accuracy of the gauge.

To remove a gasoline tank, first syphon the gas into a clean container. Remove the vent pipe, hoses and clips. Disconnect the vent hose from the breather pipe. Pull the wire to the gas gauge tank unit apart at the connector. Disconnect the support straps at their rear ends and remove the tank.

To install a gasoline tank, reverse the above procedure used for removal. Make sure that the wire to the gas gauge tank unit is clipped to the top of the tank.