  

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

## CONTENTS OF SECTION 3-C



## 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— V-8 Engines

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 3-13.

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.

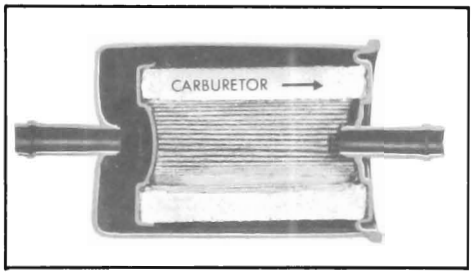


Figure 3-13—Can-Type Throw-Away Fuel Filter

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 Engines

In the V-6 engine, the fuel filter is located in the carburetor fuel inlet. See Figure 3-14. When this filter is used, the can-type throw-away filter is omitted.

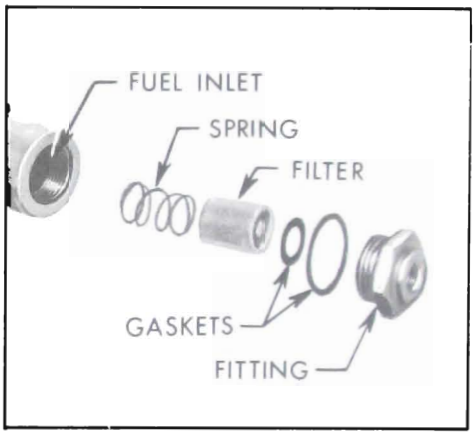


Figure 3-14—Fuel Filter Parts - V-6

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 of 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 flange 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 flange assembly, 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 flange. 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 3-15.

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 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 3-16.

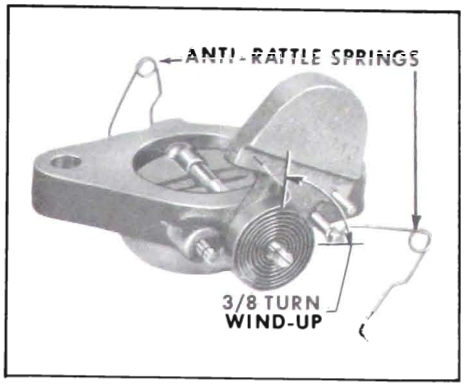


Figure 3-15—Manifold Valve Thermostat Wind-Up

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

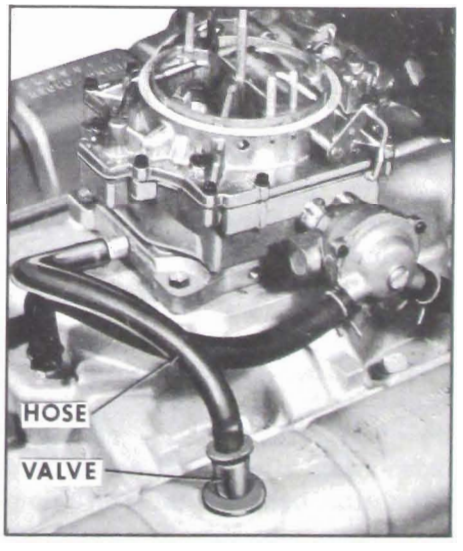


Figure 3-16—Positive Crankcase Ventilating System - 300 Engine

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 ignition and compression are in good order. Any attempt to adjust or alter the carburetor to compensate for faulty conditions elsewhere will result in reduced fuel economy and overall performance.

### a. Idle Speed and Mixture Adjustments

The positive crankcase ventilator valve should be checked as described in paragraph 3-7 before making carburetor adjustments, as this valve noticeably affects the air-fuel ratio at idle.

1. Remove air cleaner with V-8 engine. With V-6 engine, a much better idle adjustment can be obtained with air cleaner in place. Connect a tachometer from distributor terminal of coil to ground.

2. Start engine and run it at fast idle until upper radiator tank is hot and choke valve is wide open.

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

3. On automatic transmission cars, place a block in front of a front wheel and apply parking brake firmly, then shift transmission into drive.

4. Adjust throttle stop screw to idle speed at 550 RPM (add 50 RPM for an air conditioner).

5. Adjust idle mixture needles alternately to obtain highest tachometer reading. Readjust idle speed as necessary, always adjusting idle mixture last.

6. Make sure idle stator switch is closed by depressing switch lever with finger. If idle speed increases, switch was not closed; readjust idle speed to specifications with switch held closed, then adjust idle stator switch (see par. 3-9, c).

7. If carburetor is equipped with a hot idle compensating valve, press a finger on valve to make sure it was closed. If idle speed drops, valve was open, readjust idle speed and mixture, making sure valve remains closed.

### b. 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.

## 3-9 THROTTLE LINKAGE AND TRANSMISSION SWITCH ADJUSTMENTS

The procedure for adjusting the throttle linkage is identical on synchromesh and automatic transmission cars. On automatic transmission cars, however, the throttle linkage also actuates two transmission switches connected by wires to two solenoid valves located inside the transmission. Therefore, whenever the throttle linkage is adjusted on an automatic transmission car, the transmission switches should also be checked and adjusted if necessary.

### a. Throttle Linkage Adjustments

1. Remove air cleaner. Check throttle linkage for proper lubrication. Make sure that linkage is free in all positions and that return spring fully closes the throttle, even though throttle is released very slowly.

2. Unsnap front end of throttle rod from throttle lever. While another man presses accelerator pedal against floor mat, hold carburetor throttle lever in wide open position and hold throttle rod socket in alignment with ball on throttle lever. Socket must be approximately 1/16 inch (2 turns) short of ball. If adjustment is necessary, loosen lock nut, adjust throttle rod length as required, and retighten lock nut. See Figures 3-17 and 18.

3. With accelerator pedal released, reinstall throttle rod on throttle lever. With accelerator pedal pressed again to floor mat, recheck throttle for wide open position.

### b. Transmission Detent Switch Adjustment (Automatic Transmission Cars)

This switch has two sets of contacts. The first set of contacts closes slightly before the throttle reaches wide open; this causes a solenoid valve in the transmission to operate, which, in turn, causes the stator blades to "switch-the-pitch" to high performance angle.

The second set of contacts closes just before wide open throttle; this causes a second solenoid valve in the transmission to operate, which causes the transmission to "downshift".

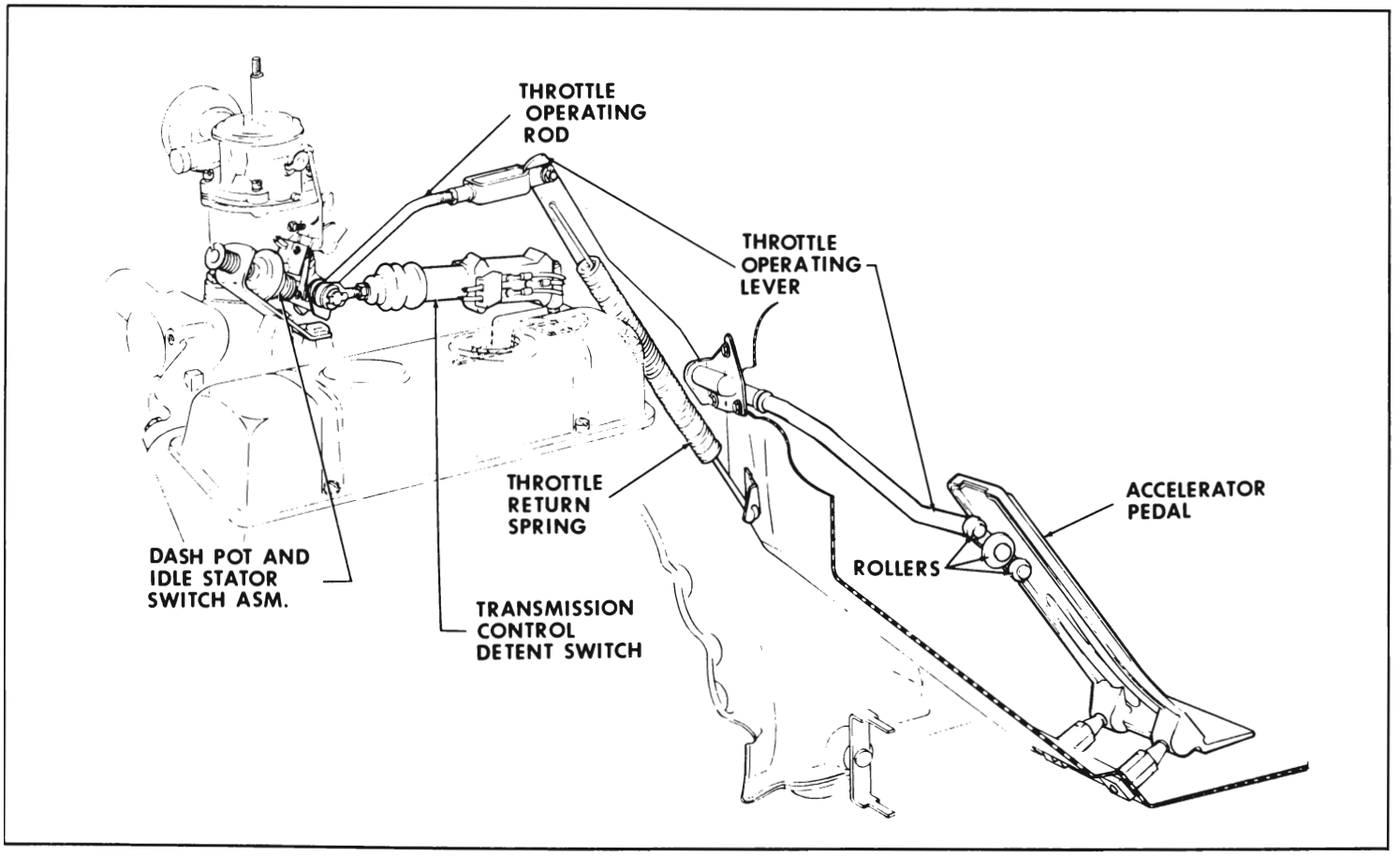


Figure 3-17—Throttle Linkage and Transmission Control Switches - V-6 Engine

To adjust the detent switch, hold carburetor at wide open throttle and adjust switch so that plunger is approximately .050 inch from bottom.

### c. Idle Stator Switch Adjustment (Automatic Transmission Cars)

This switch closes just before the throttle reaches slow idle position; this causes a solenoid valve in the transmission to operate, which, in turn, causes the stator blades to "switch-the-pitch" to high angle. This reduces the transmission load on the engine at idle, thereby reducing the tendency of the car to creep.

Before adjusting the idle stator switch, engine idle speed and mixture must be adjusted. Adjust as follows:

1. Normalize engine temperature; adjust engine idle speed and mixture.

2. Shut engine off. Unplug idle stator switch connector and plug prods of a test light (such as Diode Test Light J-21008) into end of connector.

3. Turn stator switch adjusting nut to back switch away from throttle lever until test light is out (switch open).

4. Turn adjusting nut to move stator switch toward throttle lever until light just comes on, then turn nut ten flats (ten notches) in addition, to make sure switch is closed.

5. Remove test light and reconnect stator switch connector.

## 3-10 REPLACEMENT OF GASOLINE TANK OR FILLER

The gas gauge tank unit is combined with the feed pipe. It is not 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.

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

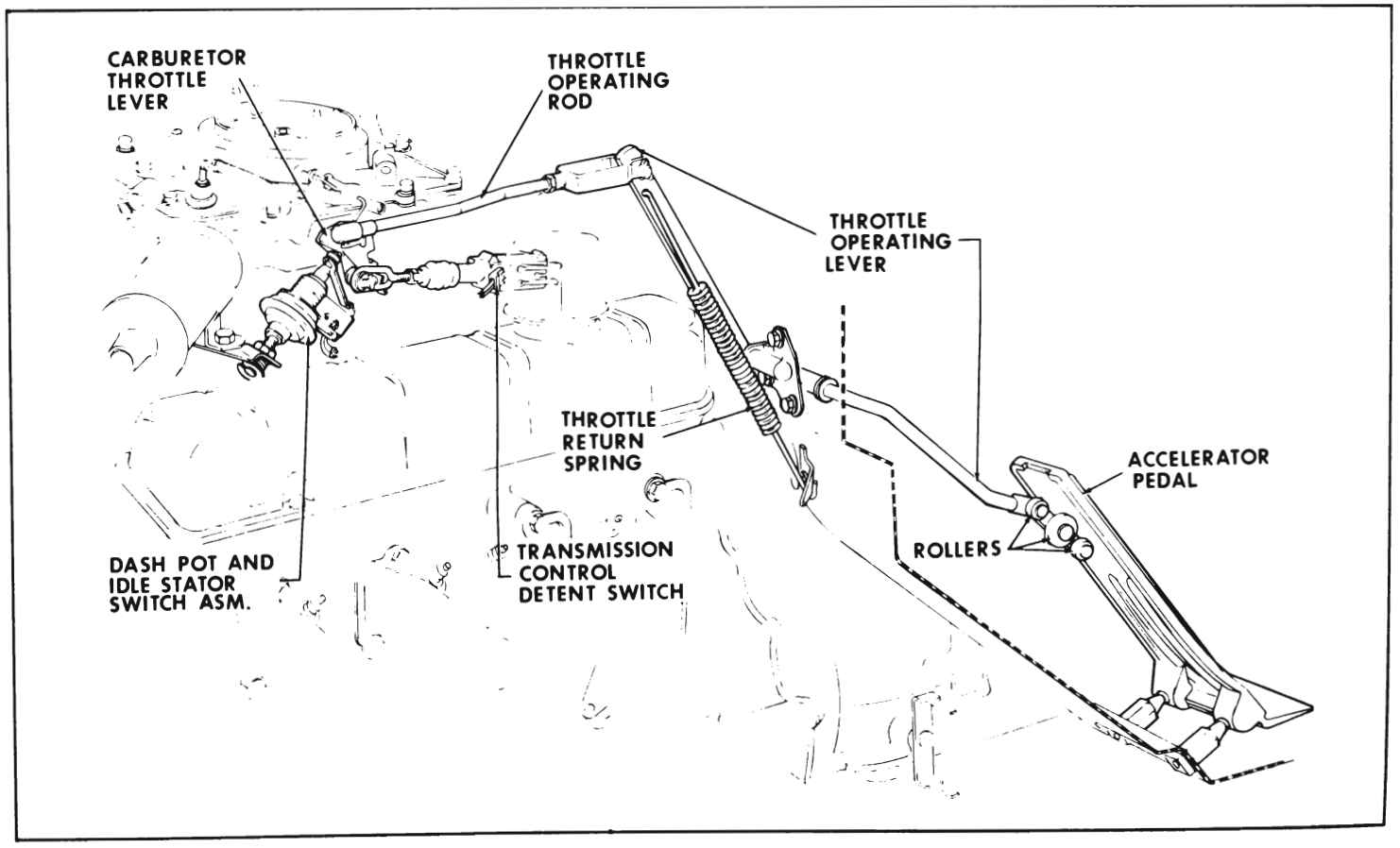


Figure 3-18—Throttle Linkage and Transmission Control Switches - V-8 Engine

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.