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 12000 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. Cleaning Fuel Filter

The fuel filter is a can-type throw-away filter and is located in the line between the fuel pump and the carburetor.

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

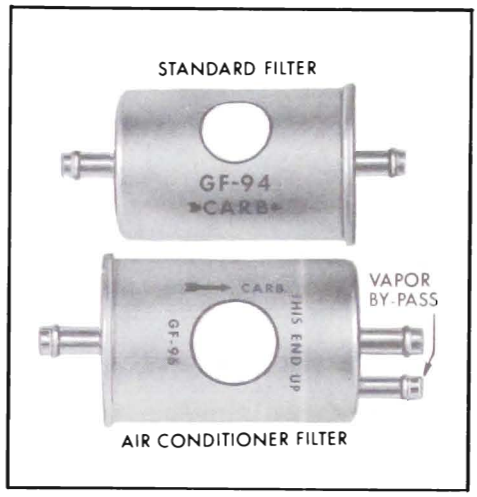

Figure 3-12—Can-Type Throw-Away Fuel Filters

in the carburetor. This filter prevents the passage of water under ordinary conditions. The filter should be replaced every 24000 miles for maximum filtering efficiency. See paragraph 1-1.

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

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.

c. Cleaning Carburetor Gasoline Strainers

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

d. Freeing Up Sticking Exhaust Manifold Valve

Lubricate the exhaust manifold flange shaft every 6000 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 "Heat Riser Valve Lubricant" to the valve

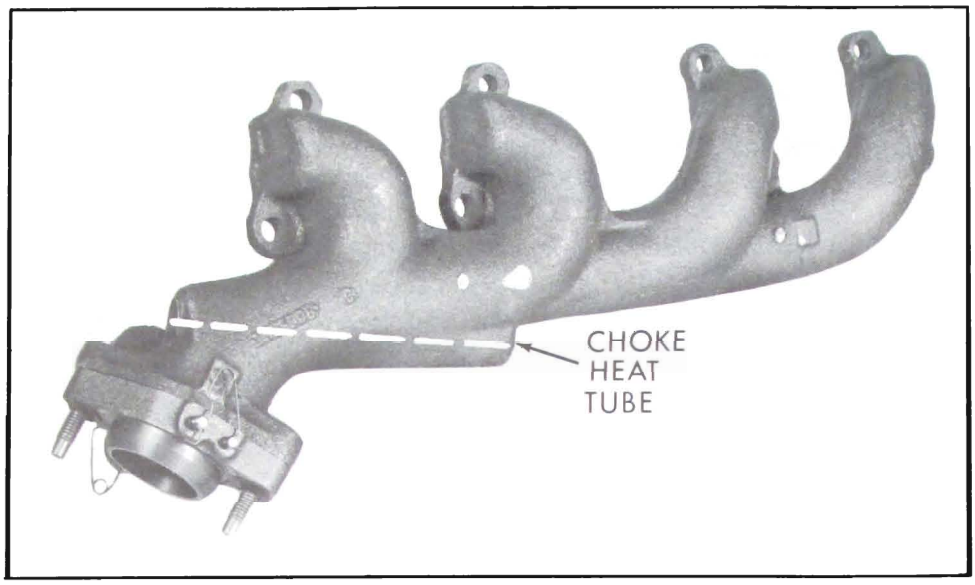

Figure 3-13—Right Exhaust Manifold and Valve Assembly - 300 Engine

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. See Figure 3-13.

e. 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 pin on the manifold and hold the valve in the closed position. To bring the end of thermostat to the anchor pin will then require approximately 1/2 turn wind-up of the thermostat as shown in Figure 3-14.

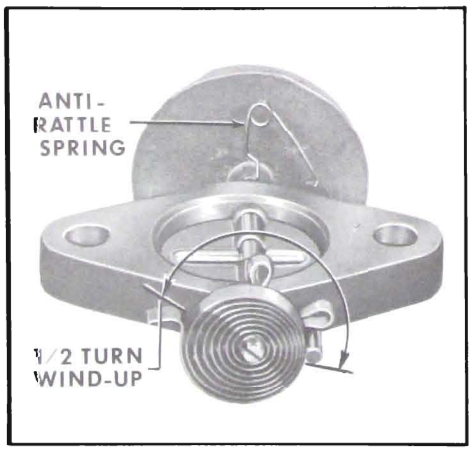

Figure 3-14—Manifold Valve Thermostat Wind-Up - 401 and 425 Engines

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.

Fully open and fully closed positions of the exhaust manifold valve may be checked by the position of the heavy section of the manifold valve weight. If the heavy section is to the rear and approximately 45 degrees up, the valve is fully closed; if the heavy section is forward and approximately 45 degrees up, the valve is fully open. See Figure 3-15.

f. 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.

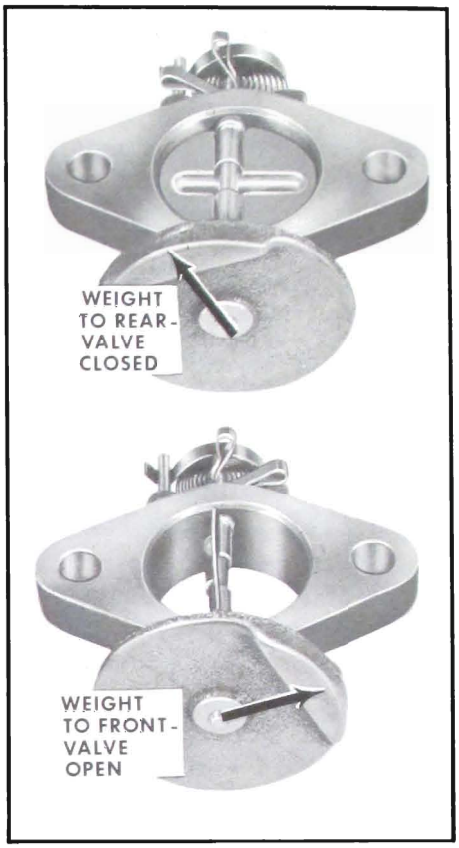

Figure 3-15—Manifold Heat Control Valve Positions - 401 and 425 Engines

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 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. See Figure 3-16.

After a period of operation, the ventilator valve may 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 12,000 miles). 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.

g. Closed Positive Crankcase Ventilator System

All cars manufactured for registration in California are required to have a closed positive crankcase ventilating system. The

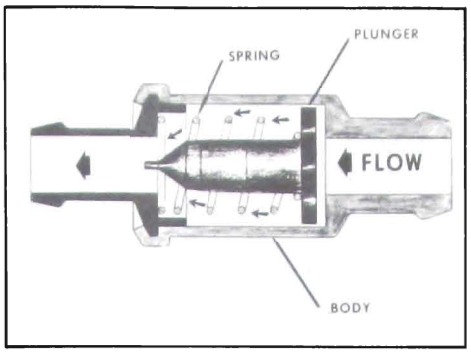

Figure 3-16—Positive Crankcase Ventilator Valve

closed PCV system consists of the standard PCV system plus additional features as shown in Figures 3-17, 18 and 19.

The standard PCV system draws air in through the mesh of the oil filler cap, down across the crankcase, up through the PCV valve and through a hose into the intake manifold.

The closed PCV system operates in the same manner except that the ventilating air is drawn in from .the air cleaner, down through a rubber tube, through a mesh filled breather assembly and into the left rocker arm cover. The oil filler cap is sealed air tight in the closed PCV system. See the illustrations.

With the standard PCV system any blow-by in excess of the system capacity (from a badly worn engine, sustained heavy load, etc.) is exhausted to the atmosphere through the oil filler cap. In the closed PCV system any such blow-by is exhausted into the air cleaner and is drawn into the engine.

3-8 CARBURETOR IDLE AND AUTOMATIC CHOKE ADJUSTMENTS

Carburetor adjustment should not be attempted until it is known that engine ignition and compression are in good order. 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. 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. 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 set idle speed at 500 RPM (550 with air conditioner). Add 50 RPM for Le Sabres.

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 disconnecting switch connector. If idle speed does not decrease, switch was not closed; adjust idle stator switch (see par. 5-8), then readjust idle speed to specifications.

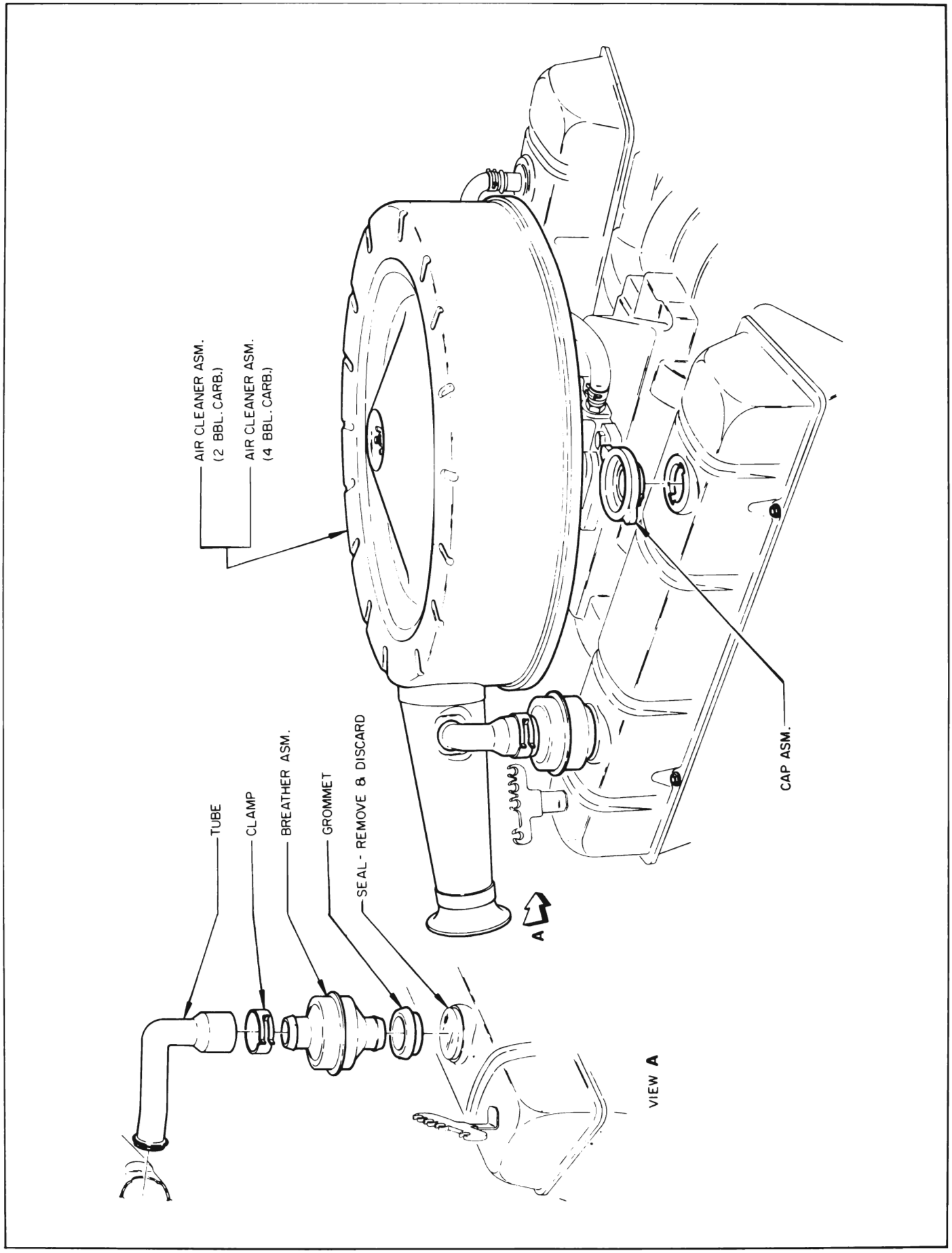

Figure 3-17—Closed Positive Crankcase Ventilation System - 300 Engine

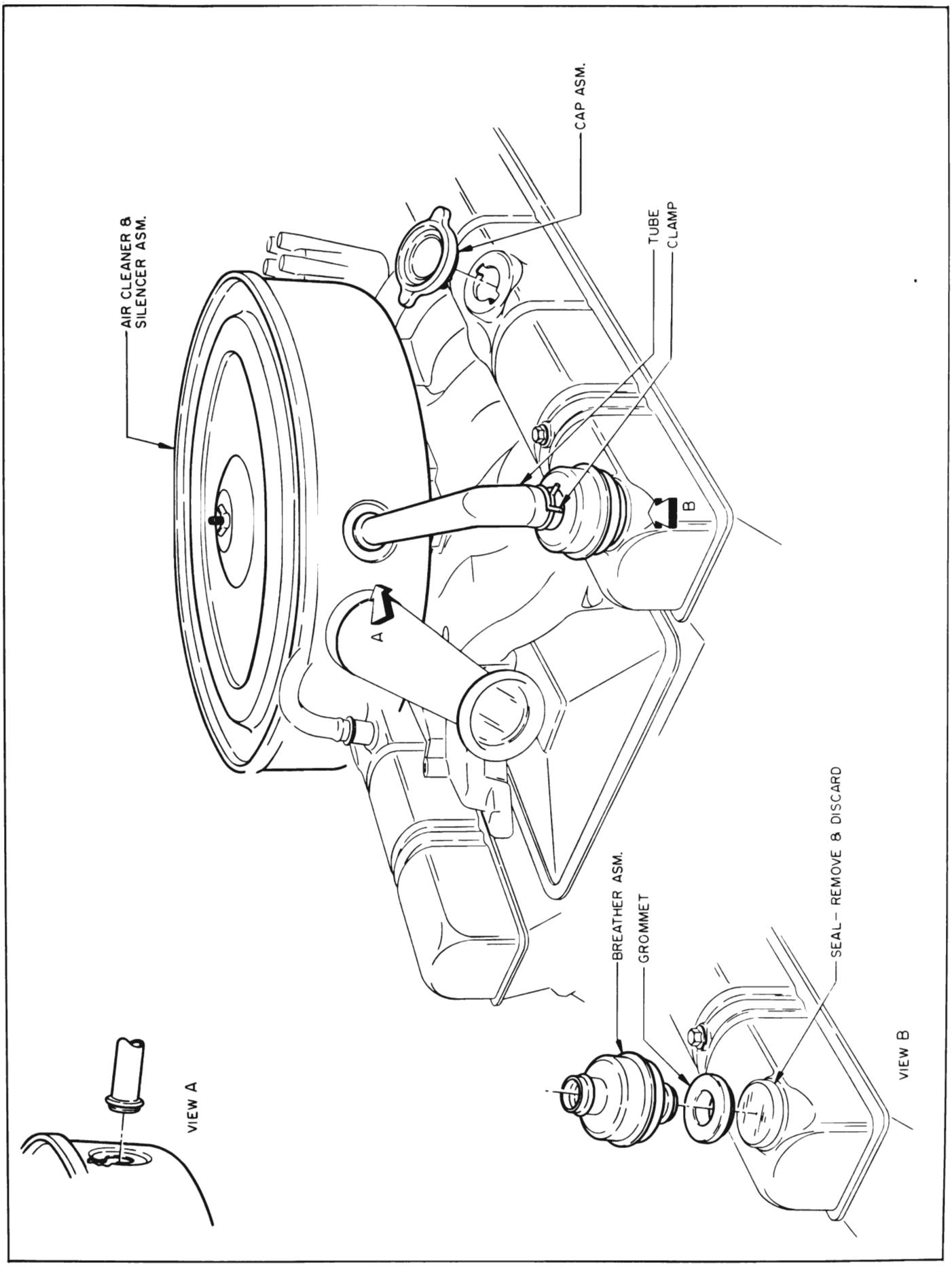

Figure 3-18—Closed Positive Crankcase Ventilation System - 401 and 425 Engines

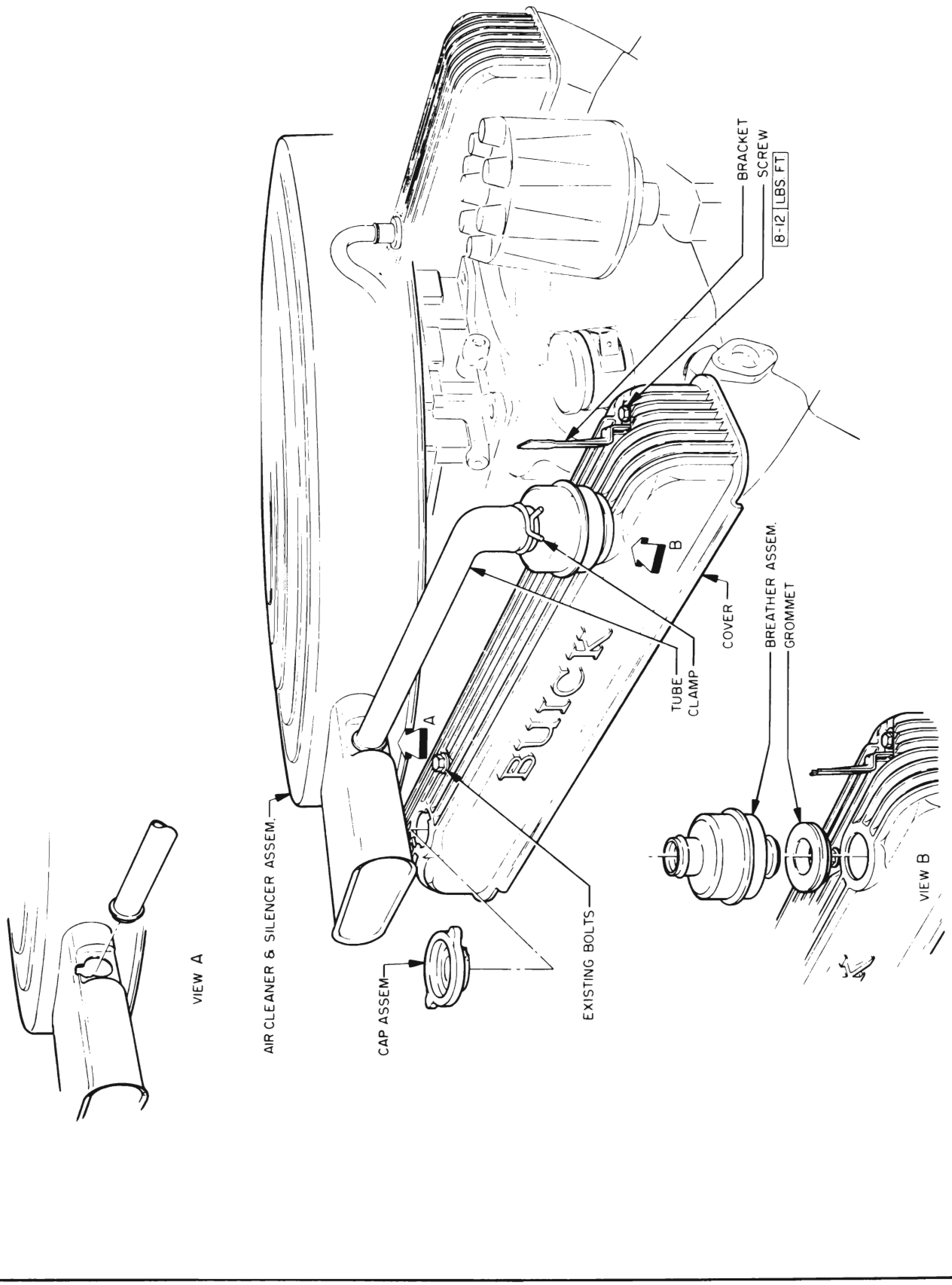

Figure 3-19—Closed Positive Crankcase Ventilation System - Dual 4-Barrel Engines

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 throttle linkage is identical on synchromesh and automatic transmission cars. Automatic transmission cars, however, have a dash pot which delays the closing action of the throttle to reduce any possibility of the engine stalling.

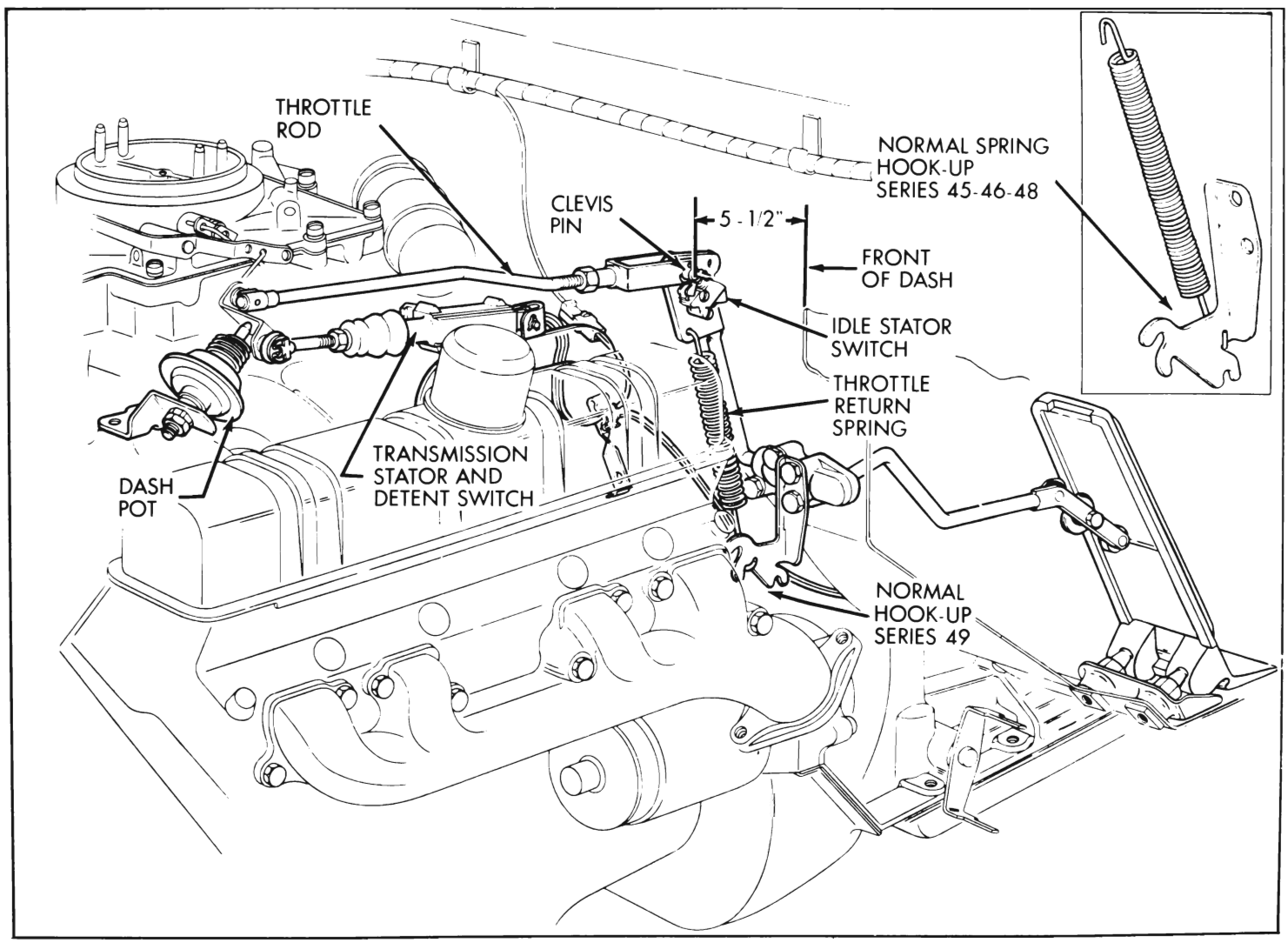

Figure 3-20—Throttle Linkage Adjustment

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 nothing touches or interferes with the linkage. Hold choke open and make sure that return spring fully closes throttle, even though throttle is released very slowly.

2. Adjust engine idle speed and mixture. See paragraph 3-8. With throttle linkage in hot curb idle position, measurement from throttle rod clevis pin horizontally to dash must be 5-1/2 inches ± 1/4 inch. If measurement is off, shorten or lengthen throttle operating rod as required to correct. See Figure 3-20.

3. Operate linkage to open carburetor and make sure carburetor wide open stop is contacting. If carburetor does not reach wide open position and nothing is interfering with throttle linkage, transmission stator and detent switch must be adjusted as described in paragraph 5-8.

4. As a final check, have a helper depress accelerator pedal and check to make sure wide open stop contacts at carburetor.

b. Dash Pot Adjustment

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

1. While observing dash pot, open carburetor and allow throttle to snap closed. If dash pot does not delay closing action just before throttle is closed, adjust dash pot for more interference. If return to idle drags out excessively (more than 2 seconds), adjust dash pot for less interference.

2. As a final check, hold car with brakes and put transmission in drive, then jab accelerator pedal. If car stalls, adjust dash pot for slightly more interference and recheck as necessary.

3. Tighten lock nut securely.

3-10 REPLACEMENT OF GAS TANK OR GAS GAUGE TANK UNIT

The gas gauge tank unit is combined with the feed pipe. It is not necessary to lower the gas tank to replace this unit except on Rivieras. See Figure 3-21. 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 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.

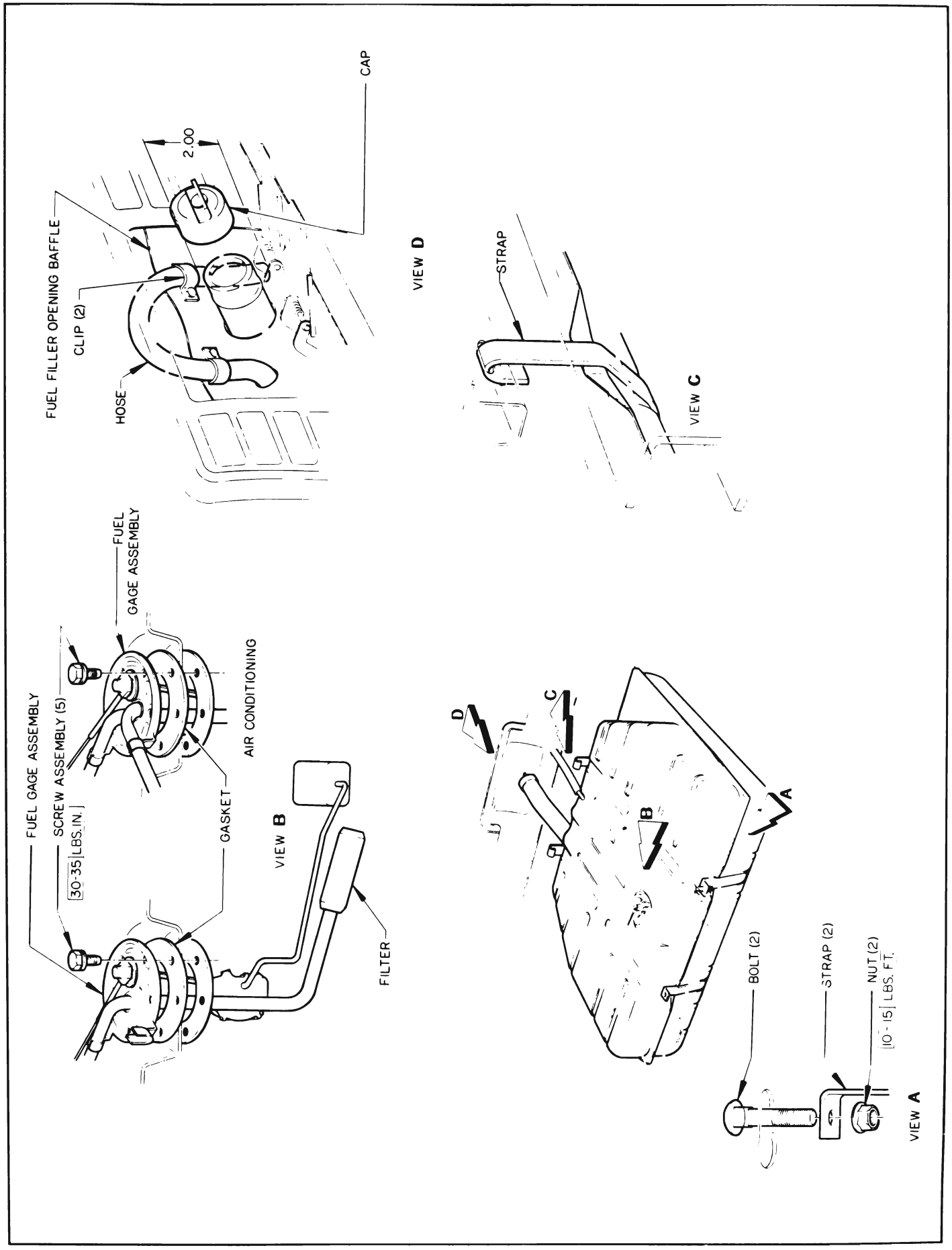

Figure 3-21—Fuel Tank - Riviera