ROCHESTER 2GV CARBURETOR

CONTENTS

DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

The air inlet to the adjustable off-idle air screw has been extended further upward into the air horn bore for improved air flow through the adjustable off-idle air system. This provides more accurate air/fuel mixtures during this range of carburetor operation.

The steps on the fast idle cam have been revised to improve engine performance during the warm-up period.

An exhaust gas recirculation system (E.G.R.) is used on all applications, for 1973, to control oxides of nitrogen. The vacuum supply necessary to operate the recirculation valve is located in the throttle body and connects through a channel to a tube which is located just beneath the spark vacuum tube in the float bowl. See Idle System for port location, and operation.

The dual vacuum break system is continued on all 1973 models. The main vacuum break unit is the same in operation as on previous units. However, the internal check bleed valve in the secondary (auxiliary) vacuum break unit is changed to provide a longer delay in opening of the choke valve to prevent stalling after initial start and during the warm-up period.

A clean air purge feature is added to the secondary (auxiliary) vacuum break unit. The purpose of the clean air purge is to bleed air into the vacuum circuit to purge the system of fuel vapors and dirt to prevent the possibility of plugging the check valve bleed in the vacuum break unit. The purge bleed hole is located beneath a rubber boot which contains a filter, on the secondary vacuum break stem. The filter used over the vacuum bleed hole prevents any dirt from entering the bleed system.

If adjustment of the secondary (rear) vacuum break diaphragm unit is necessary, the rubber boot and filter element will have to be removed from the vacuum break diaphragm tube and the bleed hole plugged when using an outside vacuum source to seat the diaphragm.

The Rochester Model 2GV carburetor is of the side bowl design. While not interchangeable, the carburetors used on automatic and standard transmission cars are basically the same, and the description and service operations are identical. The only difference is in some of the internal calibrations. The carburetor float bowl is located forward of the main bores of the carburetor. The carburetor is compact in design in that all of the fuel metering is centrally located. See Figure 6E-0.

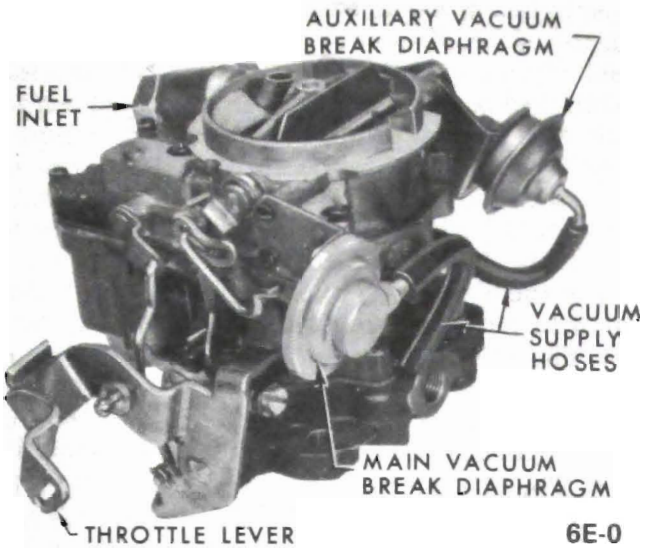

Figure 6E-0 - Rochester 2GV Carburetor Assembly

This carburetor uses a calibrated cluster design, which places in a removable assembly, the main well tubes, idle tubes, mixture passages, air bleeds and pump jets. This cluster can easily be removed for cleaning and inspection purposes. The venturi cluster fits on a flat portion of the carburetor bowl in front of the main venturi with a gasket underneath. The idle and main well tubes are permanently installed in the cluster body by means of a precision pressed fit and, therefore, cannot be serviced separately. The main nozzles and idle tubes are suspended in the fuel in the main wells of the float bowl. Removable plastic main well inserts surround the main fuel nozzles to insulate the nozzles, to prevent fuel percolation, and provide smooth fuel flow through the main metering system during hot engine operation.

The main metering jets are of the fixed type. Metering calibration is accomplished through a system of calibrated air bleeds which give the correct air/fuel mixtures throughout all operational ranges. Flat metal inserts have been added inside the main well tubes (discharge nozzles) to provide even fuel flow and break up vapor bubbles during hot operation.

The Rochester Model 2GV carburetor employs the use of a vacuum-operated power system for extra power when needed. Power mixtures are regulated by drop in engine manifold vacuum regardless of the degree of throttle opening.

Thereby, additional fuel can be supplied for power mixtures according to the engine demands.

The carburetor is internally vented through a large tube which leads from beneath the air cleaner inside the air horn bore to the fuel in the float bowl. No external venting is used in order to meet evaporative loss emissions.

In that the fuel tank will not be vented to atmosphere, all fuel vapors are collected in a vapor collection canister. Purge ports for the canister are provided in the carburetor air cleaner snorkel.

The idle mixture needles are preset at the factory and plastic limiter caps are installed. This idle mixture adjustment should not be changed in the field unless incidental to major carubretor overhaul.

The carburetor part number is stamped on a flat section of the float bowl just beneath the fuel inlet nut. When replacing the float bowl assembly, follow the manufacturer's instructions contained in the service package, so that the part number can be transferred to the new float bowl.

Adjustments have been made as simple as possible. They consist of idle, float level, float drop, pump, choke, choke rod, choke unloader, pump rod, choke coil rod, and vacuum break adjustments.

Incorporated in the Rochester Model 2GV carburetor are six basic systems. They are Float, Low Speed, Main Metering, Power, Accelerating and Choke systems. The following explanation and illustrations show that each system operates to provide efficient carburetion through all operating conditions.

Operation of Float System

The float system controls the level of the fuel in the carburetor fuel bowl. Fuel level is very important because it must be maintained to give proper metering through all operating ranges.

Fuel entering the carburetor must first pass through the inlet filter, by the inlet needle seat, then past the float needle, into the float bowl; flow continues until the fuel level raises the float to a position where it closes the float valve. As fuel is used from the carburetor bowl the float drops, moving the float needle off its seat and replenishing the fuel in the bowl, thereby keeping the fuel level constant. See Figure 6E-1.

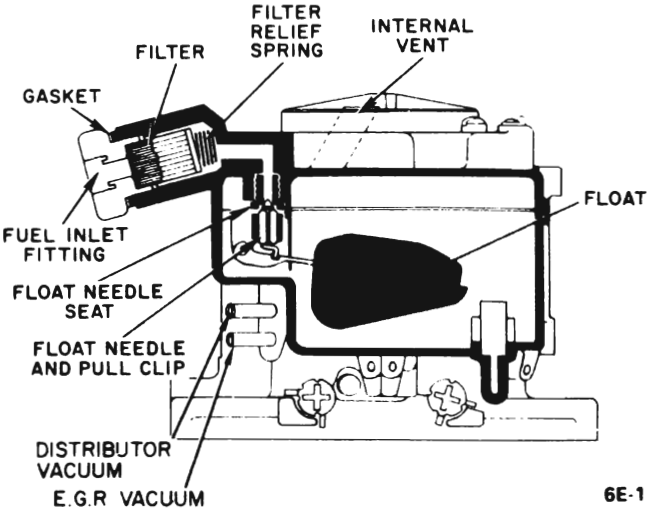

Figure 6E-1 - Float System

A float tang located at the rear of the float arm between the float hangers prevents the float assembly from moving too far downward, but allows the float assembly to move down far enough for maximum fuel flow into the carburetor bowl. A float needle pull clip connecting the float arm to the needle valve keeps the needle from sticking closed in the seat, which may be caused by dirt or gum formation.

The fuel bowl is internally vented by a tube which leads from inside the air horn bore to the top of the fuel in the float bowl. The carburetor is internally balanced through the internal vent because the same pressure causing air to flow will be acting upon the top of the fuel in the float bowl, causing fuel to flow.

Operation of Idle (Low Speed) System

During engine idle operation, air flow through the carburetor venturi is very low and is not great enough to cause fuel to flow from the main discharge nozzles. Therefore, the idle system is used to provide the proper mixture ratios required during idle and low- speed operation of the engine.

The idle system consists of the idle tubes, idle passages, idle air bleeds, idle mixture adjustments, off-idle discharge ports and idle needle discharge holes.

At idle speed the throttle valves are held slightly open, allowing a small amount of air to pass between the wall of the carburetor bore and the edge of the throttle valves. Since there is not enough air flow for efficient venturi action, the fuel is made to flow by the application of vacuum (low pressure) directly through the idle system to the fuel in the carburetor float bowl. See Figure 6E-2.

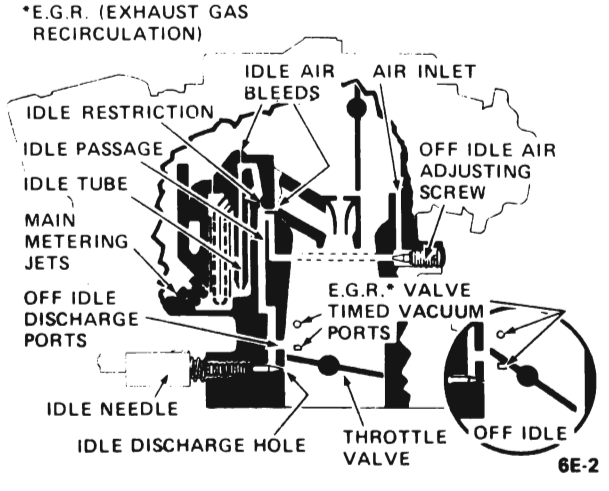

Figure 6E-2 - Idle (Low Speed) System

Fuel from the float bowl passes through each main metering jet into the main fuel well where it is metered by the orifice at the lower tip of the idle tubes. It then passes up the idle tubes and is mixed with air at the top of the idle tube by a calibrated idle air bleed located in the top of the cluster casting. The air/fuel mixture then passes down through calibrated restrictions into a vertical passage and then past a second idle air bleed located just below the channel restriction. It then moves down past the off-idle discharge port located just above the nearly- closed throttle valve where it is again bled with air. It then moves down to the idle mixture needle hole where it combines with air by-passing the slightly-open throttle valve. The idle mixture needle controls the amount of fuel mixture which enters the carburetor bore during curb idle of the engine. The idle mixture will be pre-set at the factory and plastic limiter caps installed. The idle mixture limiter caps should not be removed, except if necessary for cleaning or overhaul of the carburetor. New (red) plastic limiter caps are provided in the overhaul kit. The original limiter caps should be destroyed and the red caps installed in their place after cleaning or overhaul.

As the throttle valve is opened further, the off-idle discharge port is exposed to manifold vacuum. This port supplies additional fuel mixture for off-idle engine requirements. Improved fuel control is achieved by an off-idle air adjustment which is made at the factory. The adjusting screw is sealed at the factory, because this adjustment cannot be made in the field.

As explained under GENERAL DESCRIPTION, the exhaust gas recirculation system is used on all 1973 model vehicles. The exhaust gas recirculation valve is operated by a vacuum signal taken from the carburetor. A vacuum supply tube, installed in the float bowl beneath the spark tube, connects by a channel to two timed vacuum ports located just above the throttle valve in the throttle body bore.

As the throttle valve is opened beyond the idle position, the first E.G.R. port is exposed to manifold vacuum to supply a signal to the E.G.R. valve located at the right rear of the intake manifold. The second port in the throttle body is located mid-way between the top of the valve and the throttle body casting and is positioned higher to act as an air bleed for the lower port, thereby, modulating the amount of vacuum signal supplied by it.

As the throttle valve is opened further in the part throttle range, at higher air flows, the vacuum signal decreases at the lower port. The upper port ceases to function as an air bleed and is gradually exposed to manifold vacuum to supplement the signal at the lower port. In this way the E.G.R. valve operation is timed for precise metering of exhaust gases to the intake manifold, so that just the right amount of exhaust gases can be added to the inlet mixtures for proper control of the oxides of nitrogen.

Operation of Main Metering (High-Speed) System

As the throttle valves are opened beyond the off- idle position and the engine demands more air and fuel, the throttle valves move gradually away from the wall of the carburetor bore, reducing the vacuum so that the discharge of fuel mixture at the idle mixture needle holes and off-idle port gradually diminishes.

With the increased throttle opening, there is increased velocity in the venturi system. This causes a drop in pressure in the large venturi which is increased many times in the small venturi. Since the low pressure (high vacuum) is now in the small venturi, fuel will flow in the following manner:

Fuel from the float bowl passes through the main metering jets into the main well and rises in the main well tubes. Plastic main well inserts are used in the main wells to provide smooth fuel flow for more efficient metering. This results in improved fuel control in the off-idle transfer and part throttle range. Air entering the main well through the main well air bleeds is mixed with fuel through calibrated holes in the main well tube. The mixture moves up and out of the main discharge nozzle into a mixture (high speed) passage where more air is added. The mixture then travels down to the mixture passage to the small venturi where it is delivered to the air stream and then to the intake manifold. See Figure 6E-3.

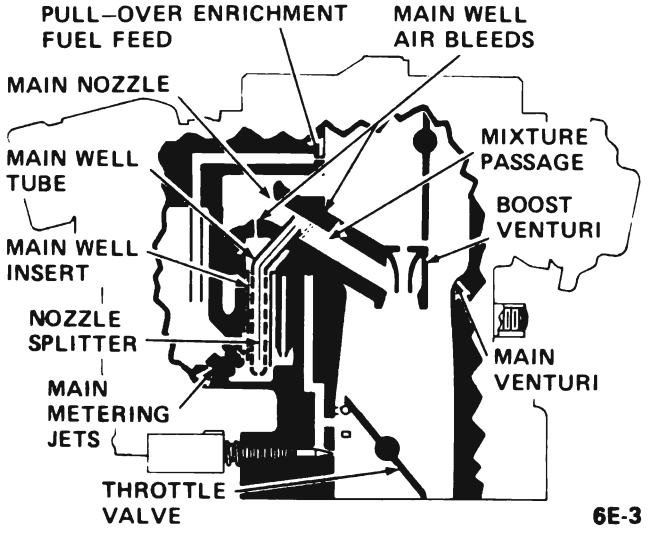

Figure 6E-3 - Main Metering (High-Speed) System

An additional fuel circuit has been provided which supplements the main metering system of the carburetor unit. The purpose of the fuel enrichment system is to provide additional enrichment to the part throttle system at higher air flows. To accomplish this, two additional fuel feeds are located in the air horn just above the choke valve. They connect directly to the fuel i: he float bowl, through channels which lead directly into a tube that extends into the fuel, just above the main metering jets. At approximately 8 lbs. of air per minute and above the fuel begins to feed from these discharge ports to supplement the main metering system. See Figure 6E-3.

Operation of Power System

To achieve the proper mixtures required when more power is desired or for extreme high speed driving, a vacuum operated power piston in the air horn and a power valve located in the bottom of the float bowl are used. Through a connecting vacuum passage from the base of the carburetor to the power piston cylinder in the air horn, the power piston is exposed to manifold vacuum at all times. See Figure 6E-4.

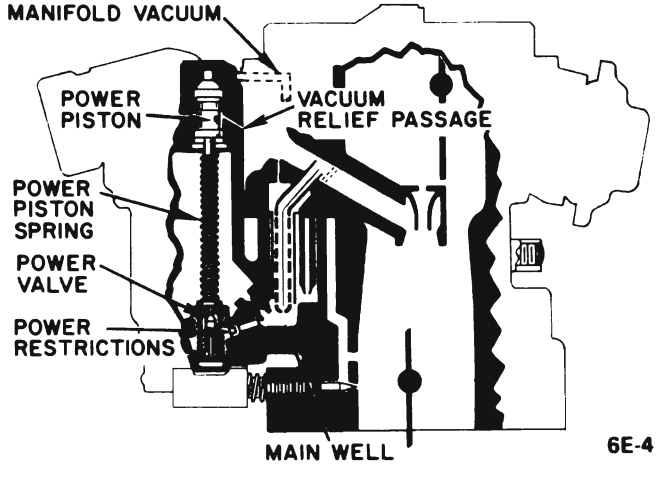

Figure 6E-4 Power System

During idle and part throttle operation, the relatively high vacuum holds the power piston up against spring tension and the power valve remains closed.

Increase in engine load lowers the manifold vacuum. When it has dropped sufficiently, the power piston spring overcomes the upward vacuum pull and the power piston moves downward, opening the power valve to allow additional fuel to flow through calibrated restrictions into the main well.

As the engine load decreases, the resulting higher vacuum overcomes the spring tension on the power piston, and raises the power piston closing the power valve.

A two-stage power valve is used. In the first stage, fuel is metered by the valve itself. This stage is used for light power loads. On heavy power loads the valve is fully opened to the second stage, and in this location the power valve allows the fuel to be metered by the power restriction in the fuel channel located in the bottom of the fuel bowl.

It will be noted that the power piston cavity in the

carburetor air horn is connected to the main air flow passage by a vacuum relief passage. It is the purpose of this passage to prevent the transfer of vacuum acting on the piston from acting also on the top of the fuel in the float bowl. Any leakage of air past the upper grooves of the piston will be compensated for by this relief passage and will not affect carburetor metering.

Operation of Accelerating System

When the throttle valve is opened rapidly, air flow and manifold vacuum change almost instantaneously, while the heavier fuel tends to lag behind causing a momentary leanness. The accelerator pump provides the fuel necessary for smooth operation on rapid acceleration.

Fuel for acceleration is supplied by a double-spring loaded pump plunger. The top and bottom springs combine to move the plunger so that a smooth, sustained charge of fuel is delivered for acceleration.

Fuel is drawn into the pump well through the inlet ball check on the intake stroke of the pump plunger (upward stroke). See Figure 6E-5.

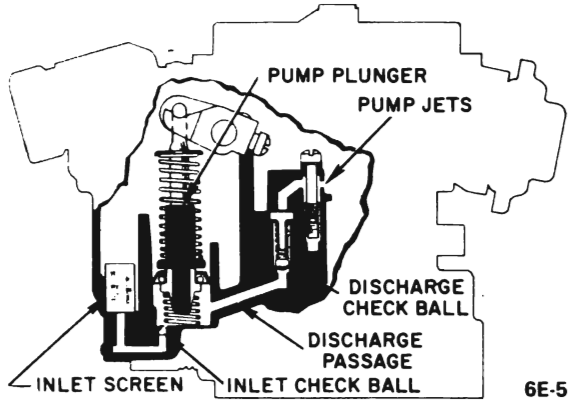

Figure 6E-5 - Accelerating Pump System

Downward motion of the pump plunger seats the inlet ball check and forces the fuel through the discharge passage where it unseats the pump discharge ball and then passes on through to the pump jets where it sprays into the venturi.

The expander spring located behind the pump cup insures good contact between the lip of the pump cup and the pump well at all times. When the pump is not in operation, the pump cup unseats from the plunger head and acts as a vent for the pump well. If vapors form in the pump well during hot operation, they are vented between the head and pump cup out into the float bowl. Without this vent, vapor pressure in the pump well might force fuel from the pump system into the engine manifold causing hard starting when the engine is hot.

The pump discharge ball check in the accelerator pump passage prevents any pullover or discharge of fuel from the pump nozzles when the accelerator pump is inoperative.

Operation of Choke System

The Model 2GV choke system consists of a choke valve located in the carburetor air horn, two vacuum break diaphragm units, fast idle cam, choke linkage and a thermostatic coil which is located on the engine manifold. See Figure 6E-6.

The thermostatic coil is connected to the choke valve by a rod. The choke operation is controlled by a combination of intake manifold vacuum, the off-set choke valve, and temperature.

The thermostatic coil located on the engine manifold is calibrated to hold the choke valve closed when the engine is cold. While starting the engine, air velocity against the off-set choke valve causes the valve to open slightly, against the torque of the thermostatic coil. When the engine starts, manifold vacuum increases. Two vacuum break diaphragm units connected by linkage to the choke valve shaft, open the choke valve a pre-determined amount against choke coil tension, so that the fuel mixture will be lean enough and the engine will run without stalling.

Two vacuum break diaphragm units are used for refined fuel mixture blending during this period. The primary or main vacuum break diaphragm opens the choke valve to a point where the engine will run without loading or stalling. As the engine manifold is wetted and friction in the engine decreases, the secondary or auxiliary vacuum break unit which has a delayed action, gradually opens the choke valve a little further to prevent loading and reduce exhaust emissions. The primary (main) vacuum break unit located on the throttle lever side operates the same as on previous units. The secondary or auxiliary vacuum break unit located at the opposite end of the choke shaft has a delayed action created by an internal check valve which has a very small bleed orifice. This delays the movement of the vacuum diaphragm a few seconds until the engine will run at slightly leaner mixtures.

The auxiliary vacuum break unit has a spring loaded plunger. The purpose of the spring loaded plunger is to off-set choke thermostatic coil tension to provide leaner mixtures during warm-up for reduced exhaust emissions. A clean air purge feature is added to the auxiliary vacuum break unit. The purpose of the clean air purge is to bleed air into the auxiliary vacuum break circuit and purge the system of any fuel vapors or dirt contamination which might be pulled into the bleed check valve located inside the diaphragm unit. The purge system consists of a small bleed located in the vacuum break diaphragm

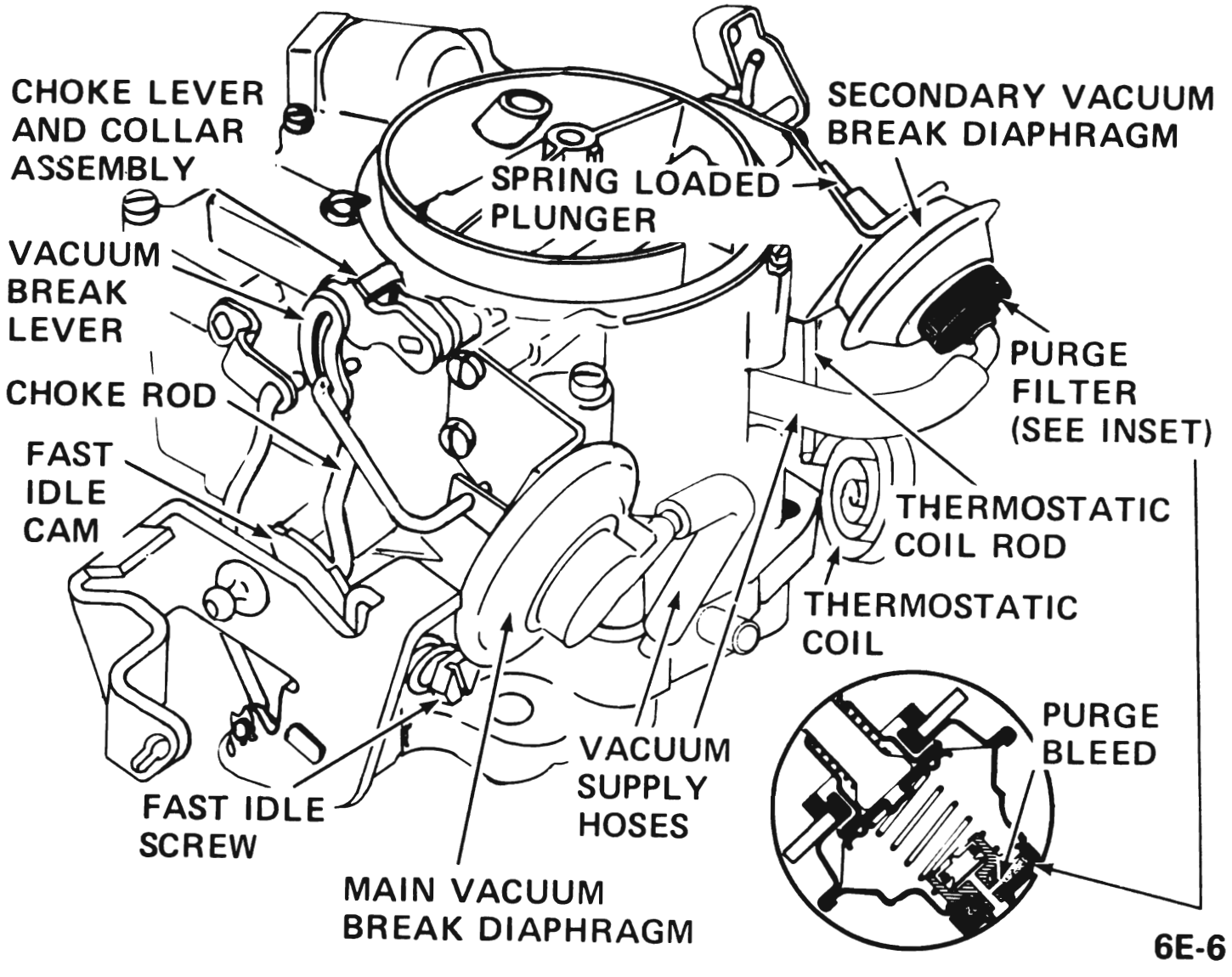

Figure 6E-6 - Choke System

tube just beneath a filter element covered by a rubber boot. During engine operation vacuum acting upon the diaphragm unit pulls a small amount of filtered air through this bleed hole to purge the system.

As the engine continues to warm up, the choke coil continues to relax its tension until the choke valve is fully opened and the engine can now run at normal fuel mixtures.

To provide correct engine speeds during warm up, a fast idle cam is used to run the engine at slightly higher speeds than idle to prevent stalling. This is accomplished by graduated steps on the fast idle cam. During engine starting, the fast idle speed screw is on the highest step of the cam which holds the throttle valve open further than at normal idle. As the engine warms up and the choke valve begins to move open, the fast idle speed screw drops to lower steps on the cam and gradually lowers engine speed until the engine is thoroughly warm, at which point the engine will run at normal idle speed. The fast idle cam follows rotation of the choke valve. When the choke valve is fully open, the fast idle cam drops so that the fast idle screw no longer comes in contact with the fast idle cam. At this point, the engine idle is controlled by the idle stop solenoid.

A mechanical choke unloader is provided to allow the driver to open the choke valve mechanically during the cold starting period, should the engine become flooded. When the accelerator pedal is depressed, a tang on the throttle lever pushes on the tail of the fast idle cam and forces the choke valve slightly open to allow extra air into the engine to lean the fuel mixtures so the engine will start.

DIAGNOSIS

MODEL 2GV

Condition	Possible Cause	Correction
Engine Cranks (Turns Over) Will Not Start	1. Improper starting procedure used.	1. Check with the customer to determine if proper starting procedure is used, as outlined in the Owner's Manual.
	2. Choke valve not closing.	2. Adjust the choke thermostatic coil. Check the choke valve and/or linkage for binds. Realign the choke valve or linkage as necessary. Replace parts if defective. If caused by dirt and gum, clean with automatic choke cleaner.
	3. No fuel in carburetor.	3. Remove fuel line at carburetor. Connect hose to fuel line and run into metal container. Remove the high tension wire from the coil to distributor and ground. Crank over engine - if there is no fuel discharge from the fuel line, test fuel pump as outlined in the Service Manual. If fuel supply is okay, check the following: a) Inspect fuel inlet filter. If plugged, replace. b) If fuel filter is okay, remove air horn and check for a bind in the float mechanism or a sticking float needle. If okay, adjust float as specified.
	4. Engine flooded. To check for flooding remove the air cleaner, with the engine off, and look into the carburetor bores. Fuel will be dripping off nozzles and/or the carburetor bores will be very wet.	4. Check to determine if customer is using proper carburetor unloading procedure. Depress the accelerator to the floor and check the carburetor to determine if the choke valve is opening. If not, adjust the throttle linkage and unloader, as specified. If choke unloader is operating properly, check for carburetor flooding. Before removing the carburetor air horn, use the following procedure which may eliminate the flooding: Remove the fuel line at the carburetor and plug. Crank and run the engine until the fuel bowl runs dry. Turn off the engine and connect fuel line. Then restart and run engine. This will usually flush dirt past the carburetor float needle and seat.

Condition	Possible Cause	Correction
		If dirt is in fuel system, clean the system and replace fuel filters as necessary. If excessive dirt is found, remove the carburetor unit, disassemble and clean. Check float needle and seat for proper seal. If a needle and seat tester is not available, apply mouth suction to the needle seat with needle installed. If the needle is defective, replace with a factory-matched set. Check float for being loaded with fuel, bent float hanger or binds in the float arm. A solid float can be checked for fuel absorption by lightly squeezing between fingers. If wetness appears on surface or float feels heavy (check with known good float), replace the float assembly. Check metal float for leakage by shaking. Adjust float.
Engine Starts - Will Not Keep Running	1. Engine does not have enough fast idle speed when cold.	1. Check and reset the idle stop screw and fast idle cam.
	2. Choke vacuum break units are not adjusted to specification or are defective.	2. Adjust both vacuum break assemblies to specification. If adjusted okay, check the vacuum break units for proper operation as follows: Connect a piece of hose to the nipple on the vacuum break unit and apply suction by mouth or use Tool J-23417 to apply vacuum. Plunger should move inward and hold vacuum. If not, replace the unit. Always check the fast idle cam first before adjusting vacuum break units.
	3. Choke valve and/or sticking or binding.	3. Clean and align linkage, or replace if necessary. Readjust if part replacement is necessary.

Condition	Possible Cause	Correction
	4. Insufficient fuel in carburetor.	4. Check fuel pump pressure and volume. Check for partially-plugged fuel inlet filter. Replace if dirty. Check the float mechanism for sufficient float drop. Adjust as specified.
Engine Idles Rough and/or Stalls	1. Idle speed incorrectly set.	1. Reset idle speed per instructions on decal in engine compartment.
	2. Air leaks into carburetor bores beneath throttle valves, manifold leaks, or vacuum hoses disconnected or installed properly.	2. Check all vacuum hoses leading into the manifold or carburetor base for leaks or being disconnected. Install or replace as necessary. Torque carburetor to manifold bolts (10-14 ft.lbs., using a pressure oil can, spray light oil or kerosene around manifold legs and carburetor base. If engine RPM changes, tighten or replace the carburetor or manifold gaskets as necessary.
	3. Carburetor flooding. Check by using procedure outlined under "Engine Flooded".	3. Remove air horn and check float adjustments. Check float needle and seat for proper seal. If a needle and seat tester is not available, mouth suction can be applied to the needle seat with needle installed. If the needle is defective, replace with a factory-matched set. Check float for being loaded with fuel, bent float hanger or binds in the float arm. A solid float can be checked for fuel absorption by lightly squeezing between fingers. If wetness appears on surface or float feels heavy (check with known good float), replace the float assembly. Check metal float for leakage by shaking. If excessive dirt is found in the carburetor, clean the fuel system and carburetor. Replace fuel filters as necessary.

Condition	Possible Cause	Correction
Engine Hesitates on Acceleration	1. Accelerator pump not adjusted to specification.	1. Adjust accelerator pump.
Engine hesitation can be caused by many different engine problems.	2. Defective accelerator pump system.	2. Remove air horn and check pump cup. If cracked, scored or distorted, replace the pump plunger.
Before checking the carburetor, make sure the engine has been thoroughly tuned. This should include a complete fuel pump and electrical check.	A quick check of the pump system can be made as follows: With the engine off, look into the carburetor bores and observe pump shooters, while briskly opening throttle valves. A full stream of fuel should emit from each pump jet and strike the boost venturi area.	Check the pump inlet and discharge balls for proper seating and location. The pump discharge ball is 3/16" steel and is located beneath the venturi cluster assembly. Check pump discharge ball for proper seating by filling cavity above ball with fuel to level of casting. No "leak down" should occur with discharge ball, spring and retainer in place. Restake or replace check ball if leaking. The pump inlet ball is the small aluminum ball located in the bottom of the pump well.
	3. Dirt in pump passages.	3. Clean and blow out with compressed air.
	4. Float level too low.	4. Check and reset float level to specification.
Engine hesitation at low speeds on acceleration	1. Misadjusted front wheel Max-Trac sensor	1. Set Max-Trac switch to off position. If hesitation disappears check fron wheel sensor for proper gap. Proper gap is: a. Felt pad still in place: position sensor so felt pad just touches rotor. b. Felt pad not in place: with feeler gauge position sensor .050" from rotor.
No Power on Heavy Acceleration or at High Speed	1. Carburetor throttle valves not going wide open. Check by pushing accelerator pedal to floor.	1. Adjust throttle linkage to obtain wide open throttle in carburetor.
	2. Dirty or plugged fuel inlet filter.	2. Replace with a new filter element.

Condition	Possible Cause	Correction
	3. Power system not operating.	3. Remove the carburetor air horn and check the power valve in the bottom of the float bowl for the following: Look for dirty, sticking or loose valve. Clean, tighten and/or replace as necessary. Check the power piston spring and power piston in the air horn cavity. Check for bent or sticking power piston or distorted spring. Clean or replace as necessary.
	4. Float level too low.	4. Check and reset float level to specification.
	5. Float not dropping far enough into float bowl.	5. Check and adjust float drop as specified.
	6. Main metering jets or venturi cluster dirty, plugged or incorrect part.	6. If the main metering jets are plugged or dirty and excessive dirt is in the fuel bowl, the carburetor should be completely disassembled and cleaned. If the jets are incorrect size, consult the parts list for proper usage. The last two digits stamped on the jet face are the same as the last two digits of the part number.
Engine Starts Hard When Hot This can be caused by many other items than carburetor, so a complete ignition and fuel pump check should be made before proceeding with carburetor items.	1. Choke valve not opening completely when engine is warm.	1. Check for binding choke valve and/or linkage. Clean and/or replace as necessary. Check and adjust choke thermostatic coil.
	2. Engine flooded.	2. See procedure under "Engine Cranks, Will Not Start - Engine Flooded".
	3. No fuel in carburetor.	3. Check fuel pump. Run pressure and volume test. Check fuel by-pass line for cor- restriction. Pinch off by-pass line to prime fuel pump. Check float needle for sticking in seat or binding float.

Condition	Possible Cause	Correction
	4. Leaking float bowl.	4. Fill bowl with fuel and look for leaks.
Poor Fuel Economy	1. Customer driving habits.	1. Run mileage test with customer driving, if possible. Make sure car has 2000-3000 miles for the "break-in" period.
	2. Engine needs complete tune-up.	2. Check engine compression, examine spark plugs (if dirty or improperly gapped, clean and regap or replace), ignition point dwell, condition, readjust ignition points, if necessary, and check and reset ignition timing. Clean or replace air cleaner element if dirty. Check for restricted exhaust system and intake manifold for leakage. Make sure all vacuum hoses are connected.
	3. Choke valve not fully opening.	3. Clean choke and free up linkage. Check choke coil for proper adjustment. Reset to specification.
	4. Fuel leaks.	4. Check fuel tank, fuel lines and fuel pump for any fuel leakage.
	5. High fuel level in carburetor.	5. Check for dirt in the needle and seat. Test, using suction by mouth or needle seat tester. Check for loaded or leaking float. Reset carburetor float to specification. If excessive dirt is present in the carburetor bowl, the carburetor should be cleaned.
	6. Power system in carburetor not functioning properly - power piston sticking or power valve leaking or stuck open.	6. Free up or replace, as necessary.
	7. Incorrect main metering jets installed.	7. Consult parts list for proper jet. The last two digits of the part number appear on the jet face.

Condition	Possible Cause	Correction
	8. Fuel being pulled from accelerator system into venturi through pump jets.	8. Run engine at RPM where nozzles are feeding fuel. Observe pump jets. If fuel is feeding from jets, check the pump discharge ball, spring and retainer. Check pump discharge ball for proper seating by filling cavity above ball with fuel to level of casting. No "leak down" should occur with discharge ball, spring and retainer in place. Restake or replace leaking check ball.

MAINTENANCE AND ADJUSTMENTS

EXTERNAL ADJUSTMENT OF ROCHESTER 2GV CARBURETOR

All adjustments on the carburetor, except for float adjustments are made externally.

Pump Rod Adjustment

Back out the fast idle stop screw and completely close throttle valves in bore. Place pump gauge across top of carburetor air horn ring, as shown, with leg of gauge pointing downwards towards top of pump rod. Lower edge of gauge leg should just touch the top of the pump rod, with the gauge set at the specified dimension. Bend the pump rod as required to obtain the specified setting using Tool J-4552. See Figure 6E-7.

Fast Idle Cam Adjustment

Place the fast idle speed adjusting screw in its normal position, which is approximately 1 to 1-1/2 turns in after contact with the lowest step of the fast idle cam. After initial fast idle screw adjustment, place the screw on the second step of the fast idle cam against the shoulder of the high step, as shown. With the choke valve held towards the closed position, measure the distance between the upper edge of the choke valve and the inside air horn wall with the specified plug gauge. Bend the tang on the choke lever, as shown, to adjust. See Figure 6E-8.

Primary Vacuum Break Adjustment

Seat primary vacuum break diaphragm plunger with Special Tool J-23417, Carburetor Vacuum Break Actuator. Rotate choke valve towards the closed position so that the vacuum break rod is at the bottom of the slot in the choke shaft lever, place the proper gauge between the upper edge of the choke valve and inside wall of the air horn bore. To adjust, bend the vacuum break rod so that the gauge will just fit between the edge of valve and bore. See Figure 6E-9.

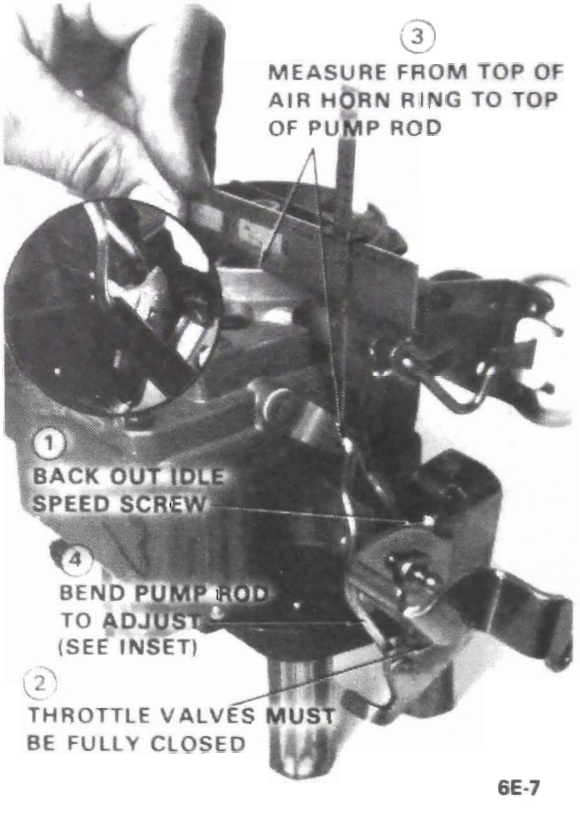

Figure 6E-7 - Pump Rod Adjustment

Secondary Vacuum Break Adjustment

In order to make sure that the secondary vacuum break diaphragm will stay in the seated position, when applying vacuum, the small bleed hole in the diaphragm tube beneath the filter element must be plugged. Remove the vacuum break diaphragm hose and the rubber covered filter element from the vacuum break tube. Use a small piece of tape and plug the small bleed hole. After adjustment, remove the tape making sure that the small bleed hole is open and install the rubber covered filter element over the

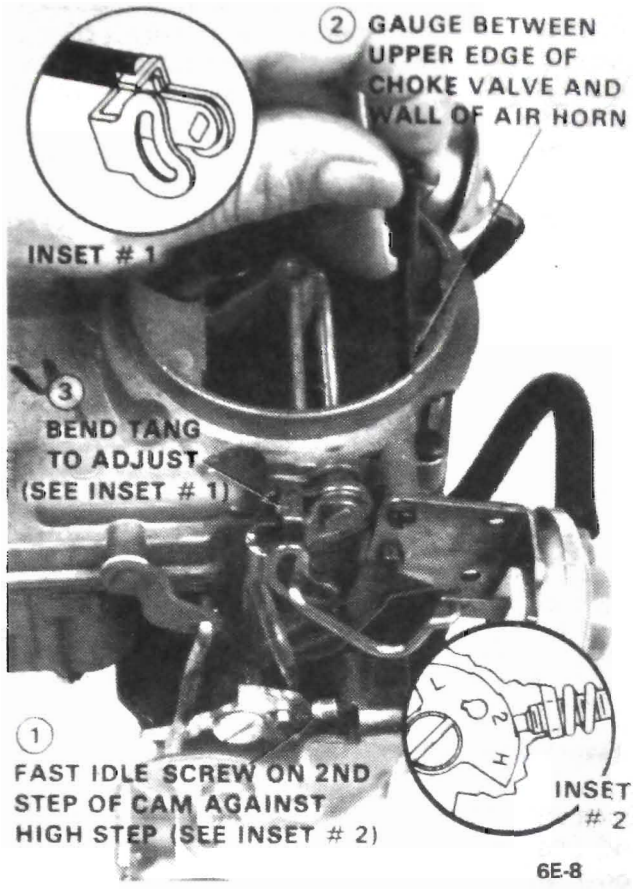

Figure 6E-8 - Fast Idle Cam Adjustment

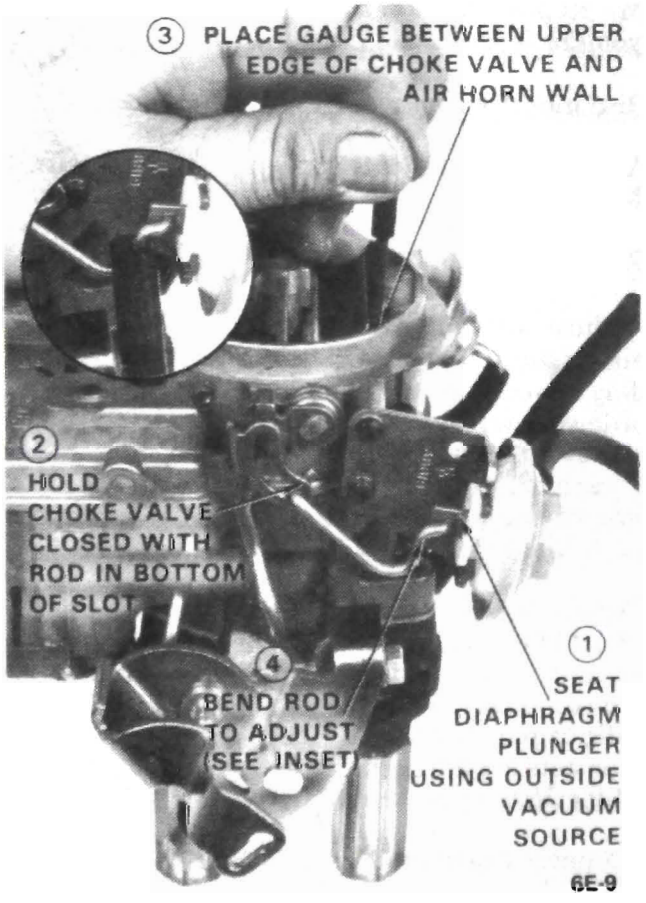

Figure 6E-9 - Primary Vacuum Break Adjustment

vacuum break tube. Fully seat the secondary vacuum break diaphragm plunger using J- 23417, Carburetor Vacuum Break Actuator. It will take approximately eight seconds for diaphragm to retract. With the secondary vacuum break diaphragm in the fully seated position, push the choke valve toward the closed position until the spring loaded diaphragm plunger is fully extended. With the choke valve held in this position, measure the distance between the upper edge of choke valve and inside air horn wall. Dimension should be as specified, if not, bend the vacuum break link at the point shown to adjust. See Figure 6E-10. Care should be used when compressing the diaphragm plunger spring so that the force used in closing the choke valve does not pull the vacuum diaphragm off its seat.

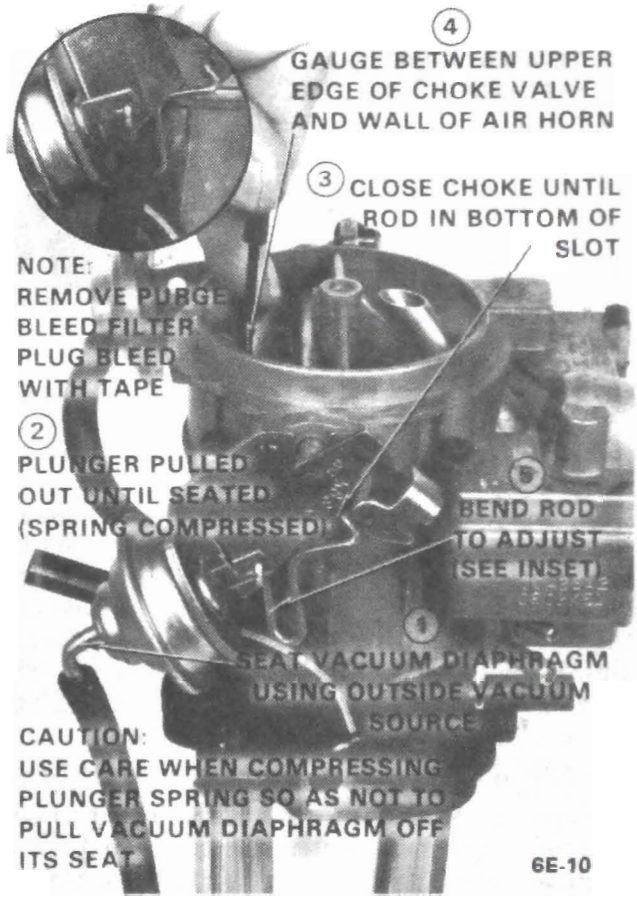

Figure 6E-10 - Secondary Vacuum Break Adjustment

Choke Unloader Adjustment

With the throttle valves held wide open, choke valve should be opened enough to admit end of gauge between upper edge of choke valve and inner air horn wall. Bend unloader tang on the throttle lever to obtain the correct measurement. See Figure 6E-11. It is advisable to check the choke unloader by depressing the accelerator pedal to insure full throttle valve opening of the carburetor.

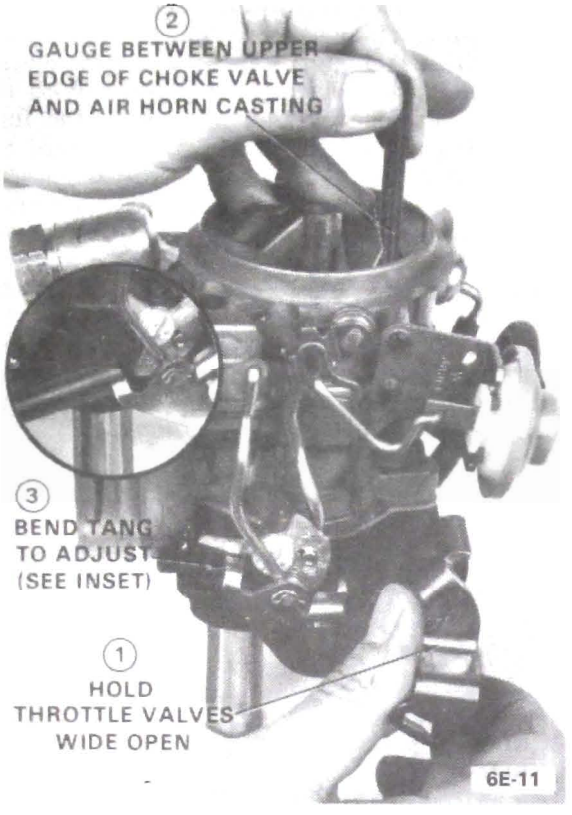

Figure 6E-11 - Choke Unloader Adjustment

Choke Coil Rod Adjustment

To adjust, remove clip and disconnect the upper end of choke coil rod from the choke lever. With the choke valve completely closed, pull upward on the choke coil rod to the limit of its travel. The end of the rod should fit into the gauge notch in lever. To adjust, bend the rod as shown. See Figure 6E-12. After adjustment is complete, install the rod end in the lever hole and install retaining clip.

Idle Adjustment

Carburetor speed screws are pre-adjusted to obtain specified engine RPM after the engine is broken in (approximately 500 miles). New engines are expected to idle as much as 100 RPM slower. If the idle speed is adjusted to specifications at new car delivery, care should be taken to reset after a few hundred miles to prevent dieseling and improve idle quality.

1. Connect an accurate tachometer to engine.

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

3. Disconnect and plug distributor vacuum line, start engine, and set ignition timing.

4. Set transmission in "Drive" for automatic transmissions, and "Neutral" for manual transmission.

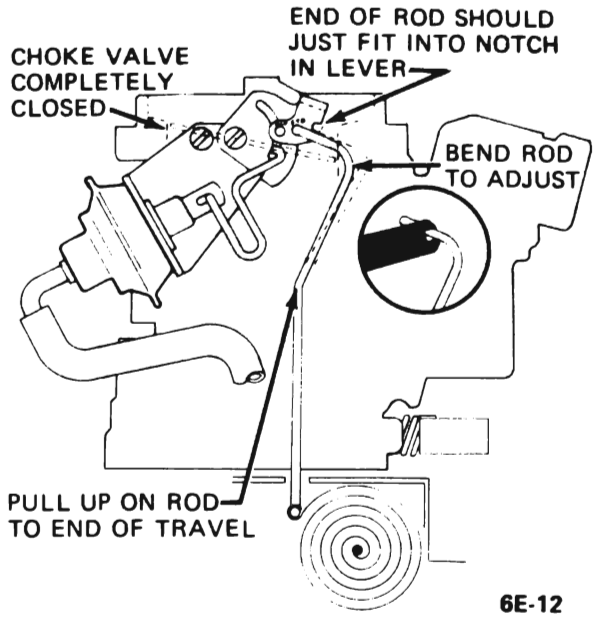

Figure 6E-12 - Choke Coil Rod Adjustment

5. Open throttle sufficiently to allow solenoid to extend and contact the throttle lever pad in the idle position.

6. Adjust solenoid set screw to obtain specified RPM. Reposition solenoid bracket if additional movement is required.

7. Disconnect solenoid wire to disengage solenoid.

8. Adjust carburetor idle screw to obtain specified RPM.

9. Reconnect solenoid wire.

10. Adjust idle mixture needles, one at a time, to obtain highest tachometer reading. After highest reading is reached, using mixture needles, readjust throttle stop screw and mixture screws, as required, to obtain 50 RPM faster than specified idle. Next, turn each mixture needle in (lean as required to reduce engine speed 25 RPM). This reduces idle speed to the recommended RPM.

11. Adjust fast idle speed on all four-barrel carburetors. Fast idle must be adjusted after slow (curb) idle speed and mixture have been adjusted. Automatic transmission cars are adjusted on the low step of the fast idle cam in "Drive" to 700 RPM. Manual transmission cars are adjusted on the low cam step to 820 RPM for 350 engines and 920 RPM for 455 engines.

12. Connect distributor vacuum hose.

13. Install "red" service idle needle limiter caps on mixture screws.

Idle Control Solenoid Adjustment

All 1973 Buick engines are equipped with an idle control solenoid. The solenoid is energized with the ignition switch in the "On" or "Run" positions and deenergized in the "Off" position.

Adjust solenoid with transmission in "Drive" for automatic transmissions and "Neutral" for manual transmissions.

All adjustments are to be made with engine at normal operating temperature, choke open, air cleaner on and air conditioning off and plug disconnected vacuum fittings.

1. Disconnect hose from air cleaner to vapor canister.

2. Disconnect distributor vacuum hose. Plug hose to carburetor.

3. Set dwell and timing.

4. Open throttle sufficiently to allow solenoid to extend and contact the throttle lever pad in idle position.

5. Adjust solenoid set screw to obtain specified RPM. Reposition the solenoid mounting bracket if additional movement is required.

6. Disconnect solenoid wire to disengage solenoid.

7. Adjust carburetor idle screw to obtain specified RPM.

8. Reconnect solenoid wire.

9. On all four-barrel carburetors, set fast idle to specified RPM.

10. Reconnect distributor and canister hoses.

Fast Idle Adjustment

With the addition of the idle stop solenoid, it will be necessary to make an initial idle stop setting with the fast idle screw. This will be made on the low step of the fast idle cam and will correspond to the speed specified with the idle stop solenoid electrically disconnected.

MAJOR REPAIR

ROCHESTER 2GV CARBURETOR REMOVAL AND INSTALLATION

Removal

1. Remove air cleaner.

2. Disconnect gas line at carburetor.

3. Disconnect choke coil rod.

4. Disconnect throttle cable.

5. Disconnect vacuum lines to carburetor.

6. Disconnect cruise control chain, if equipped.

7. Disconnect throttle spring.

8. Remove 4 carburetor-to-manifold bolts.

9. Remove vacuum hose fitting at back of carburetor.

Installation

1. Install manifold vacuum fitting at back of carburetor.

2. Install carburetor gasket and carburetor.

3. Connect throttle spring.

4. Connect cruise control chain, if equipped.

5. Connect vacuum lines to carburetor.

6. Connect throttle cable.

7. Connect choke coil rod.

8. Connect gas line to carburetor.

9. Replace air cleaner.

DISASSEMBLY, CLEANING AND INSPECTION OF ROCHESTER 2-BARREL CARBURETOR

Choke Disassembly and Removal of Air Horn

1. Mount carburetor on a proper mounting fixture such as J-5923.

2. Remove fuel inlet fitting, gasket, fuel filter, and filter spring.

3. Remove pump rod by removing lower retaining clip and rotating pump rod until lug on upper end of rod passes through upper pump lever.

4. Remove fast idle cam attaching screw. Then remove fast idle cam and rod assembly by rotating until lug on upper end of choke rod passes through slot in the upper choke lever and collar assembly.

5. Remove vacuum break diaphragm hoses from both vacuum breaks units and from each vacuum tube at throttle body.

6. Remove primary vacuum break diaphragm (throttle lever side) by removing two attaching screws. Vacuum break rod can now be removed from lever at end of choke shaft by rotating the rod until the end slides out of slot in lever and lug on other end of rod out of slot in end of diaphragm plunger shaft.

7. Remove secondary vacuum break unit (choke coil side) by first removing lever from end of choke shaft. Then remove lever from the diaphragm plunger rod and rod from diaphragm plunger shaft. Then remove two bracket attaching screws and remove diaphragm and bracket assembly from air horn.

8. Remove eight air horn attaching screws and carefully remove air horn assembly from fuel bowl by lifting gently upward.

Disassembly of Air Horn

1. Place air horn assembly inverted on bench. Remove float hinge pin and lift float assembly from cover. Remove float needle from the float arm. Remove float needle seat and fibre gasket.

2. Remove air horn gasket.

3. Remove power piston by depressing shaft and allowing spring to snap repeatedly, thus forcing the power piston retaining washer from casting. If heavy staking is encountered, remove staking from around power piston retaining washer.

4. The following should be observed when removing the air horn. Remove the pump plunger assembly and inner pump lever from pump shaft by loosening set screw on inner lever. Then rotate pump assembly and remove from inner pump arm.

> **CAUTION:** : *Do not bend arm on inner pump lever to remove pump assembly. If inner pump lever is bent it will cause binding of the pump assembly which could hold the throttle open.*

A plastic washer is used between the outer pump lever and air horn casting on the pump shaft. This should be removed from the pump shaft and not immersed in carburetor cleaner.

5. Remove two choke valve retaining screws, then remove choke valve from choke shaft. Remove choke shaft from air horn, then choke lever and collar assembly can be removed from choke shaft. Note position of the choke lever in relation to the choke trip lever on the end of the choke shaft for ease in reassembly.

Disassembly of Float Bowl

1. Remove pump plunger return spring from pump well. Remove small aluminum check ball from the bottom of pump well by inverting bowl and shaking into hand. Remove pump inlet screen from bottom of fuel bowl.

2. Remove main metering jets.

3. Remove power valve and fibre gasket.

4. Remove three venturi cluster attaching screws and remove cluster and gasket. Center cluster screw has smooth shank and fibre gasket for sealing the accelerator pump fuel by-pass.

5. Remove plastic main well inserts.

6. Using a pair of long nosed pliers, remove pump discharge ball spring "T" shaped retainer. Then remove pump discharge spring and steel discharge ball.

7. Invert carburetor and remove three throttle body to bowl attaching screws. Remove throttle body and throttle body to bowl gasket.

Disassembly of Throttle Body

No further disassembly of the throttle body is needed. The throttle valves should never be removed as the idle holes are drilled in direct relation to the location of the throttle valves and shaft. Removal of the throttle valves will upset this location. The throttle body assembly is only serviced as a complete unit with throttle valves intact.

The plastic idle limiter caps should not be removed, except if it is necessary to clean out the idle channels or the idle mixture needles are damaged. If necessary to remove the idle mixture needles, break the plastic caps, then remove the mixture needles from the throttle body.

After installation of the mixture needles, it will be necessary to readjust the idle on the car and install new red limiter caps provided in the repair kit.

Cleaning and Inspection

Dirt gum, water or carbon contamination in or on , the exterior moving parts of a carburetor are often responsible for unsatisfactory performance. For this reason, efficient carburetion depends upon careful cleaning and inspection while servicing.

1. Thoroughly clean carburetor castings and metal parts in carburetor cleaning solvent. Pump plunger or any fibre or rubber parts should never be immersed in carburetor cleaner. Wash pump plunger in clean solvent.

2. Blow out all passages in the castings with compressed air and blow off all parts until they are dry.

Make sure all jets and passages are clean. Do not use wires for cleaning fuel passages or air bleeds.

3. Check all parts for wear. If wear is noted, defective parts must be replaced. Note especially the following:

(a) Check float needle and seat for wear. If wear is noted, the assembly must be replaced.

(b) Check float hinge pin for wear and float for dents or distortion.

(c) Check throttle and choke shaft bores for wear and out of round.

(d) Inspect idle mixture adjusting needles for burrs or grooves. Such a condition requires replacement.

(e) Inspect pump plunger cup; replace if damaged worn, or hard.

(f) Inspect pump well in bowl for wear or scoring.

4. Check filter for dirt or lint. If dirty, replace.

5. If for any reason, parts have become loose or damaged in the cluster casting, the cluster assembly must be replaced.

6. It is recommended that new gaskets be used whenever the carburetor is disassembled or overhauled.

ASSEMBLY OF ROCHESTER 2-BARREL CARBURETOR

Assembly of Throttle Body

1. If the idle mixture needles and springs had to be removed, turn the mixture needles in until finger tight. Back out screws two turns as a preliminary idle adjustment.

Do not install the new plastic limiter caps provided in the repair kit until the carburetor mixture has been adjusted after the carburetor is installed on engine. Refer to idle mixture adjustment section for proper adjustment procedure.

Do not force the idle mixture needles against their seats or damage may result.

2. Invert the float bowl assembly and place the new throttle body gasket on bowl. Install throttle body on bowl, using three screws and lockwashers. Tighten securely.

Assembly of Float Bowl

1. Drop steel pump discharge check ball into discharge hole. Install pump discharge spring and "T" shaped retainer, staking retainer in place. Top of retainer must be flush with flat of bowl casting.

2. Install two main well inserts. Install venturi cluster with gasket. Install venturi cluster screws and tighten evenly and securely. Make sure center screw is fitted with fibre gasket and special smooth shank screw is used.

3. Install two main metering jets, power valve gasket and power valve.

4. Install small aluminum inlet check ball in pump inlet in the bottom of pump well; insert pump return spring and center in well by pressing downward with finger.

5. Install pump inlet screen in the bottom of float bowl.

Assembly of Air Horn

1. Install choke lever and collar onto choke shaft. Tang on choke lever faces away from air horn and is on top of vacuum break lever.

2. Install choke shaft and lever assembly into air horn. Choke rod hole in the choke lever faces fuel inlet side of carburetor.

3. Install choke valve in choke shaft so that letters "RP" will face upward in finished carburetor. Install two new choke valve attaching screws but do not tighten securely until choke valve is centered. Center choke valve on choke shaft by holding choke valve tightly closed; then slide choke shaft in to obtain approximately .020 clearance between choke vacuum break lever and choke lever and collar assembly. Tighten choke valve screws securely and stake lightly in place. Choke valve will be perfectly free in all positions when installed correctly.

4. Install pump lunger assembly into hole on the inner pump lever with end of pump plunger shaft pointing towards the air horn bore. The retainer tang on the inner pump lever will be towards the outside of the carburetor when installing on upper pump shaft and lever.

5. Install plastic washer over pump shaft and slide against outer lever. Install outer pump lever and shaft assembly into air horn with lever pointing towards choke shaft. Holding the pump plunger assembly and inner pump lever into the air horn cavity, slide the pump hsaft into the inner pump lever until seated and tighten set screw securely.

6 Install float needle seat and gasket in air horn. . Tighten needle seat securely, using a wide bladed screwdriver.

7. Install power piston into vacuum cavity. Lightly

stake piston retainer washer in place. Piston should travel freely in cavity.

8. Install air horn gasket on air horn, fitting gasket over guide pin.

9. Attach float needle to float. Carefully position float and insert float hinge pin. Drop tang on rear of float arm should point downward toward air horn.

A fuel inlet baffle is used which surrounds the float needle seat. Make sure that the hinge pin slides through the holes provided in the baffle and also that the baffle is not distorted so that the float arm does not bind in any position.

10. Install fuel inlet fitting, gasket, fuel filter, and relief spring.

11. *Float level adjustment*

With air horn assembly inverted, measure distance from air horn gasket to lip at toe of float, as shown. Bend float arm as required to obtain 15/32 inch measurement. See Figure 6E-13.

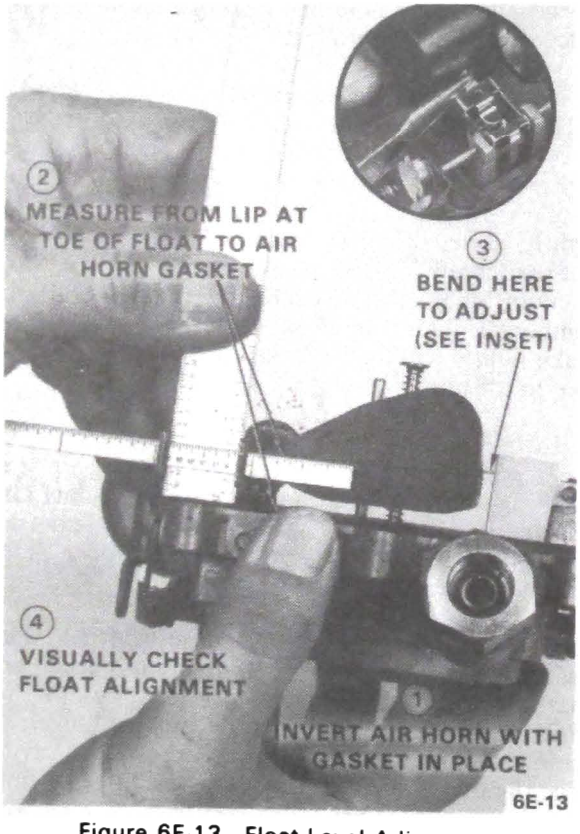

Figure 6E-13 - Float Level Adjustment

12. *Float drop adjustment*

With air horn assembly held upright, measure distance from gasket to notch at toe of float as shown. Bend float tang as required to obtain a 1-7/8 inch measurement. See Figure 6E-14.

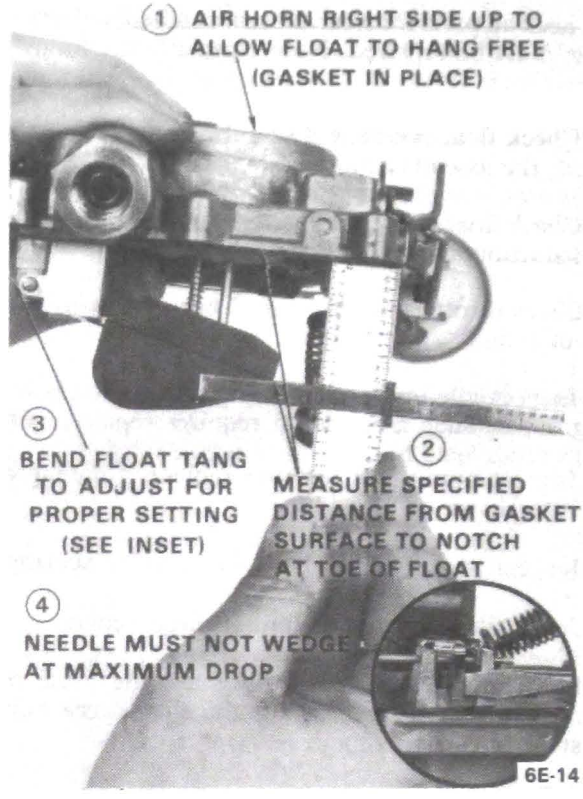

Figure 6E-14 - Float Drop Adjustment

13. Carefully place air horn assembly on float bowl, making certain that the pump plunger is properly positioned in the pump well. Lower the cover gently, straight down, then install air horn to float bowl attaching screws. Longer air horn screw goes in top of pump housing. Tighten evenly and securely.

14. Install primary vacuum break assembly onto throttle lever side of air horn. Rotate end of vacuum break rod so that it slides into slot in vacuum break lever on the end of the choke shaft. The other end of the vacuum break rod will slide into the vacuum diaphragm plunger lever by aligning lug on rod with slot in plunger shaft. Attach vacuum break assembly to the air horn casting with two attaching screws. Tighten securely.

15. Install choke rod into choke lever and fast idle cam. Install fast idle cam screw and tighten securely. See Figure 6E-8 for proper installation.

16. Install accelerator pump rod in pump lever and in throttle lever and install retainers.

17. Install secondary vacuum break lever on end of choke shaft with retaining screw. Slot in lever hangs downward when choke valve is open when installed correctly. Tighten securely.

18. Install secondary vacuum break assembly onto air horn using two attaching screws and actuating rod in slots in the vacuum break lever and vacuum diaphragm plunger shaft. Loop on secondary vacuum break rod hangs downward. Tighten vacuum break attaching screw securely.

19. Install vacuum hoses to primary and secondary vacuum break diaphragms. Then connect each vacuum hose to the separate tubes provided on the throttle body. See Figure 6E-0.

SPECIFICATIONS

ROCHESTER 2GV CARBURETOR CALIBRATIONS

	350 Eng. Man.Trans.	350 Eng. Auto Trans.
Note: All carburetors have a colored metal tag with a two-letter code for identification.		
Paint Color	Yellow	Black
Model Designation	2GV	2GV
Number of Barrels	2	2
Code Letters	KB	KA
Part Number	7043143	7043142
Throttle Bore	1-11/16"	1-11/16"
Small Venturi	1/8"	1/8"
Large Venturi	1-1/4"	1-1/4"
Main Metering Jet Prod.	.060"-60°	.060"-60°
High Altitude	Same	Same
Note: No changes are required for altitude.		
Idle Tube Restriction	#67	#67
Idle Needle Hole	#53	#53
Spark Holes	.045x.125"	.045x.125"
Pump Discharge Holes	2-#62	2-#67
Choke Coil Letters	AG	AG
Fast Idle Cam Number	7038179	7043669
Dome Vent	2-#67	2-#67
Cluster Top Bleed	2-#58	2-#58

ROCHESTER 2GV CARBURETOR ADJUSTMENTS

Float Level Adjustment	15/32"	15/32"
Float Drop Adjustment	1-9/32"	1-9/32"
Pump Rod Adjustment	1-15/32"	1-15/32"
Choke Tang Adjustment	.080"	.080"
Choke Unloader Adjustment	.200"	.180"
Idle Speed (On Car)		
Solenoid Energized	800 In "N"	650 In "D"
Solenoid De-energized	600 In "N"	500 In "D"
Vacuum Break Adjustment (Primary)	.150"	.140"
Vacuum Break Adjustment (Secondary)	.120"	.120"
Choke Coil Rod Adjustment	Gauge Slot	Gauge Slot
Choke Assembly Number	7042194	7042194

ROCHESTER 4MV CARBURETOR

CONTENTS

DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

The 1973 model 4MV for Buick is similar in operation to the 1972 models, except for the following:

The 1973 Quadrajet carburetors have been recalibrated to assist meeting the exhaust emission requirements.

A new fast idle cam with revised steps is used on the Quadrajet models 7043240 and 7043244 for improved warm- up and cold driveaway operation. The fast idle cams used on all other models are carryover from 1972.

The dual delayed vacuum break system is continued on all 1973 models. The main (front) vacuum break unit is the same in operation as on previous units. However, the internal check bleed valve in the secondary (rear) vacuum break unit is changed to provide a longer delay in opening of the choke valve to prevent stalling after initial start and during the warm-up period.

A clean air purge feature is added to the secondary (rear) vacuum break unit. The purpose of the clean air purge is to bleed air into the vacuum circuit to purge the system of fuel vapors and dirt to prevent the possibility of plugging the check valve bleed in the vacuum break unit. The purge bleed hole is located beneath a rubber boot which contains a filter, on the secondary vacuum break stem. The filter used over the vacuum bleed hole prevents any dirt from entering the bleed system.

If adjustment of the secondary (rear) vacuum break diaphragm unit is necessary, the rubber boot and filter element will have to be removed from the vacuum break diaphragm tube and the bleed hole plugged when using an outside vacuum source to seat the diaphragm.

The Quadrajet has two stages in operation. The primary side has small bores with triple venturi equipped with plain tube nozzles. The triple venturi, plus the smaller primary bores, give excellent fuel control in the idle and economy ranges of operation. Fuel metering in the primary side is accomplished with tapered metering rods positioned by a vacuum piston.

The secondary side has two very large bores which have ample air capacity to meet engine horsepower requirements.

Using the air valve principle, fuel is metered in direct proportion to the air passing through the secondary bores.

The small fuel reservoir is centrally located to avoid problems of fuel slosh causing engine turn cut-out and delayed fuel flow to the carburetor bores. The float system uses a single pontoon float. The float valve has a synthetic tip which gives added insurance against flooding problems caused by dirt.

A two inch pleated paper fuel filter is mounted in the fuel inlet casting behind the fuel inlet nut and is easily removed for inspection and/or replacement.

The 1973 model 4MV carburetor has no external venting, which prevents any raw fuel vapors from entering the atmosphere. The carburetor is internally vented to insure efficient metering by balancing the pressure acting upon the fuel in the float chamber with the air passing through the carburetor venturi.

Plastic limiter caps are installed over the idle mixture needles after calibration at the factory and should not be readjusted in the field. During cleaning or overhaul, it may be necessary to remove the mixture screws or replace due to damage or dirt in the idle mixture passages. New limiter caps are provided in the carburetor overhaul kits.

The 1973 model cars have completely closed fuel tank venting to prevent any raw fuel vapors from entering the atmosphere. The vent from the Fuel tank leads into a carbon canister located in the engine compartment. The air cleaner snorkel is equipped with a purge tube which is connected to the vapor canister to purge the canister during engine operation.

The primary side of the carubretor has 6 systems in operation. They are float, idle, main metering, power, pump and choke.

The secondary side of the carburetor has one metering system which supplements the primary main metering system and receives its fuel from the common float chamber.

Operation of Float System

The float system consists of a fuel chamber in the float bowl, single pontoon float, float hinge pin, and retainer combination, float needle valve and seat, and a float valve pull clip. A plastic filler block is located in the top of the float chamber over the float valve to prevent fuel slosh into this area.

The float system operates in the following manner: Fuel from the engine fuel pump enters the carburetor fuel inlet passage. It passes through the filter element, fuel inlet valve and on into the float chamber. As the incoming fuel fills the float bowl to the prescribed level, the float pontoon rises and forces the fuel inlet valve closed, shutting off fuel flow. As fuel is used from the float bowl the float drops, which opens the float needle valve, allowing more fuel to again fill the bowl. This cycle continues, maintaining a constant fuel level in the float bowl.

A float needle pull clip, fastened to the float needle valve, hooks over the edge of the float arm at the center as shown in Figure 6E-15. Its purpose is to assist in lifting the float valve off its seat whenever fuel level in the float bowl is low.

The carburetor float chamber is internally vented through two vent tubes located in the air horn. The internal vent tubes lead from beneath the air cleaner to the float bowl chamber. Their purpose is to balance air pressure acting on the fuel in the bowl with air flow through the carburetor bores. In this way, balanced air/fuel ratios can be maintained throughout all carburetor ranges of operation. The internal vent tubes also allow the escape of fuel vapors which may form in the float chamber during hot engine operation. This prevents fuel vaporization from causing excessive pressure build up in the float bowl, which can result in excessive fuel spillage into the carburetor bores.

Operation of Idle System

The Quadrajet carburetor has an idle system on the primary side of the carburetor only. Each primary bore has a separate and independent idle system consisting of an idle tube, idle passages, idle air bleeds, an idle channel restriction, an idle mixture adjustment needle, and an idle discharge hole. See Figure 6E-16.

The idle system operates as follows:

Fuel is forced from the float bowl down through the primary metering jets into the main fuel well. It passes from the main fuel well into the idle passage where it is picked up by the idle tubes. The fuel is metered at the tip of the idle tubes and passes up through the idle tubes. The fuel is mixed with air at the top of each idle tube through an idle air bleed. The fuel mixture then crosses over to the idle down channels where it passes through a calibrated idle channel restriction.

It then passes down the idle channel past the lower idle air bleed holes and off-idle discharge ports, just above the primary throttle valves where it is mixed with more air. The air/fuel mixture then moves down to the idle needle discharge holes, where it enters the carburetor bores and mixes finally with air passing around the slightly open throttle valves. The idle needle hole size is fixed to limit richness in the idle range.

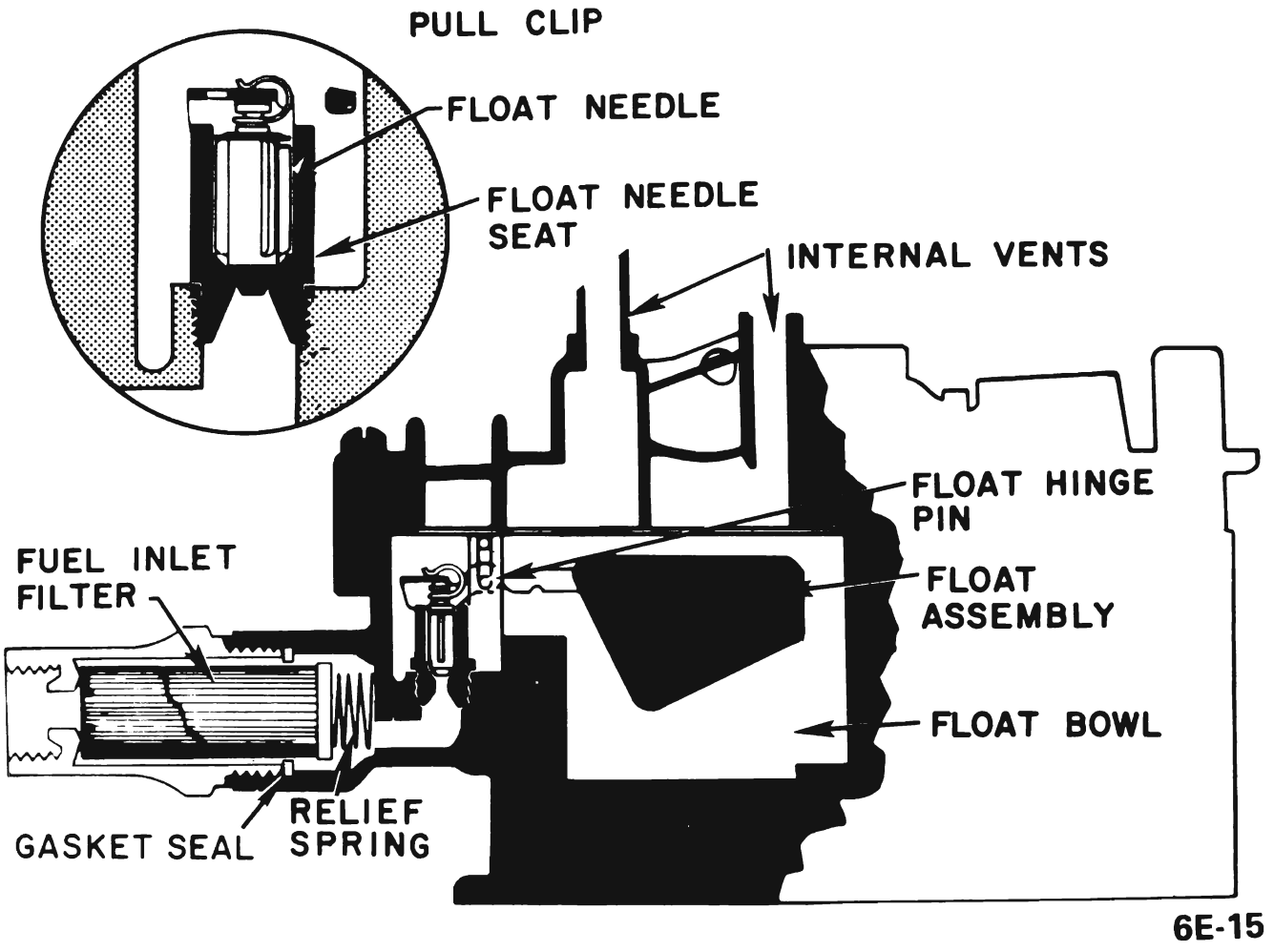

Figure 6E-15 Float System

The carburetor models used on the larger engines for 1973 have a fixed idle air by-pass system. This consists of air channels which lead from the top of each carburetor bore in the air horn to a point below each primary throttle valve. At normal idle, extra air passes through these channels supplementing the air passing by the slightly opened throttle valves. The purpose of the idle air by-pass system is to allow reduction in the amount of air going past the throttle valves so that they can be nearly closed at idle. This reduces the amount of air flowing through the carubretor venturi to prevent the main fuel nozzles from feeding during idle operation. The venturi system is very sensitive to air flow and on these applications where larger amounts of idle air are needed to maintain idle speed, the fixed idle air by-pass system is used.

Off Idle Operation

As the primary throttle valves are opened from curb idle to increase engine speed, additional fuel is needed to combine with the extra air entering the engine. This is accomplished by the slotted off-idle discharge ports. As the primary throttle valves open, they pass by the off-idle ports, gradually exposing them to high engine vacuum below the throttle valves. The additional fuel added from the off-idle ports mixes with the increasing air flow past the opening throttle valves to meet increased engine air and fuel demands.

Further opening of the throttle valves increases the air velocity through the carburetor venturi sufficiently to cause low pressure at the lower idle air bleeds. As a result, fuel begins to discharge from the lower idle air bleed holes and continues to do so throughout operation of the part throttle to wide open throttle ranges, supplementing the main discharge nozzle delivery. See Figure 6E-16.

An exhaust gas recirculation system is used on all 1973 models to reduce oxides of nitrogen emissions. The E.G.R. valve is operated by a vacuum supply signal from the carburetor. Two punched ports, one just above the throttle valve and one mid-way between the throttle valve and upper surface of the throttle body are located in the primary bore.

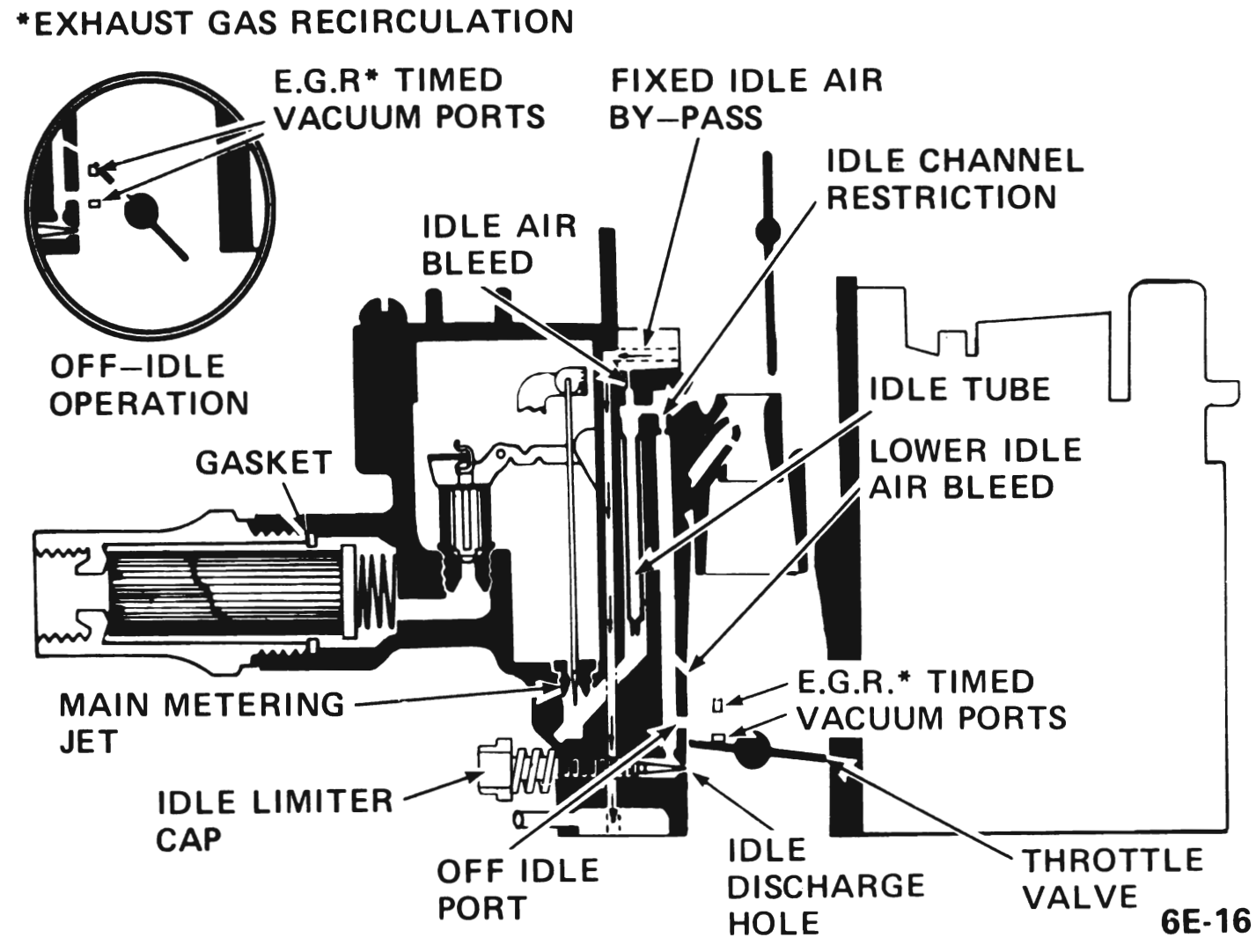

Figure 6E-16 Idle System

As the primary throttle valve is opened beyond the idle position, the first vacuum port for the E.G.R. system is exposed to manifold vacuum to supply a vacuum signal to the E.G.R. valve. To control the vacuum signal at the lower port the upper port bleeds air into the vacuum channel and modulates the amount of vacuum signal supplied by the lower E.G.R. port. In this manner, the E.G.R. valve can be timed for precise metering of exhaust gases to the intake manifold dependent upon location of the ports in the carburetor bore and by the degree of throttle valve opening.

The upper and lower vacuum ports connect to a cavity in the throttle body which, in turn, through a passage supply the vacuum signal to an E.G.R. tube pressed into the front of the throttle body. The tube in the throttle body is connected by a hose to the E.G.R. valve located at the right rear section on top of the intake manifold.

The E.G.R. valve remains closed during periods of engine idle and deceleration to prevent rough idle from excessive exhaust gas contamination in the idle air/fuel mixtures.

As described under "General Description", idle mixture needle limiters are used which restrict the amount of idle mixture adjustment. The limiter caps should be left in place and not removed unless it is necessary for overhaul or cleaning purposes.

Operation of Main Metering System

The main metering system supplies fuel through the primary bores from off-idle to wide open throttle operation.

During cruising speeds and light engine loads, the high engine manifold vacuum holds the main metering rods down in the main metering jets against spring tension. Fuel flow is then metered between the largest section of the metering rods and the main metering jets. See Figure 6E-17.

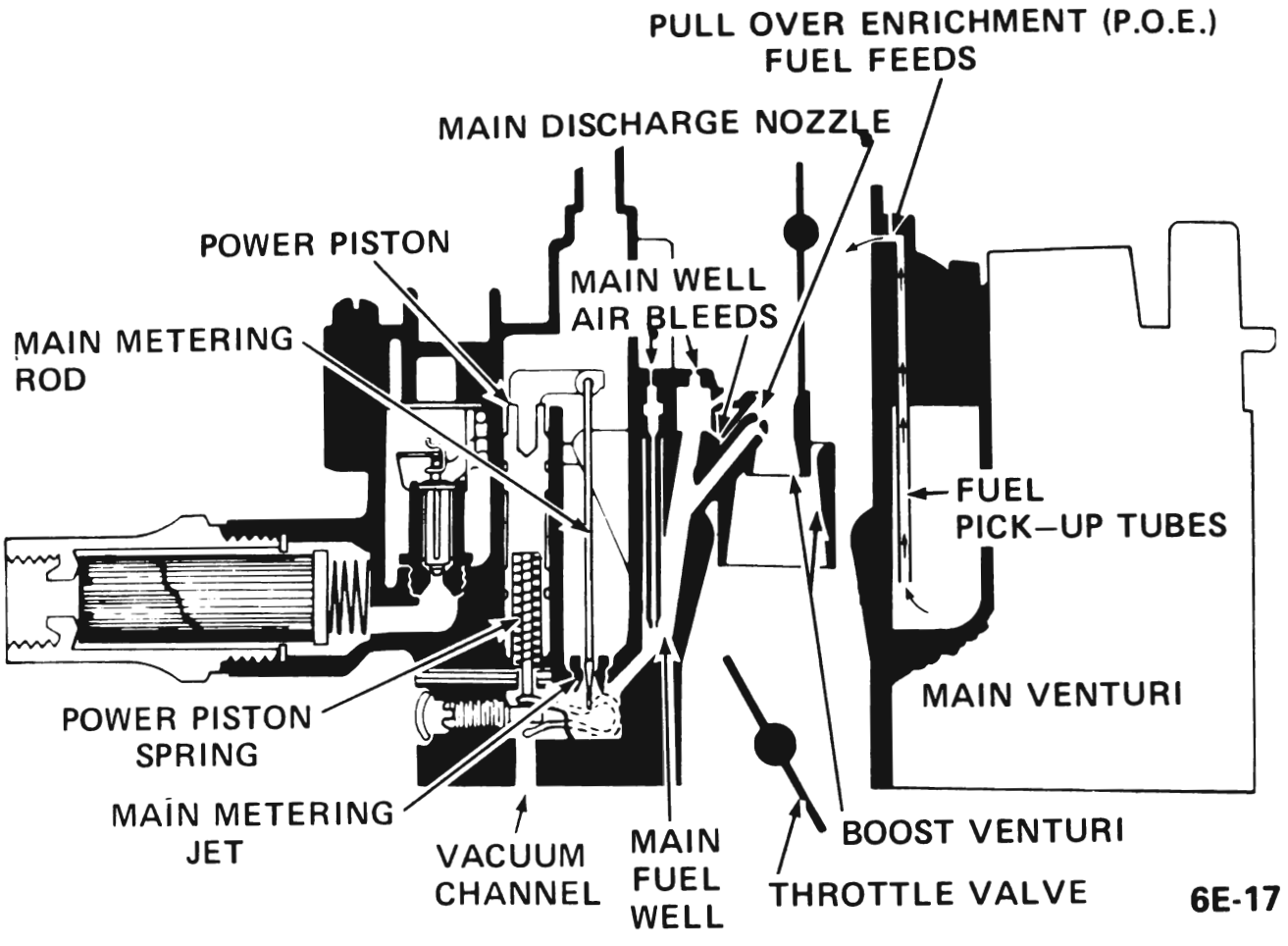

Figure 6E-17 Main Metering System

Fuel flows from the float bowl through the main metering jets into the main fuel well and is mixed with air from the vent at the top of the main well and side bleeds (one of which leads from inside the bore area above the venturi and another from the cavity around the main fuel nozzle in the main well). The fuel then passes through the main discharge nozzle into the boost venturi and on into the engine.

A part throttle adjustment is made at the factory, then sealed: no attempt should be made to adjust it in the field. The adjustable part throttle feature includes a power piston and primary metering rods. The piston has a pin pressed into it, which protrudes through the float bowl and gasket and contacts the adjustable link in the throttle body. See Figure 6E-17. The new primary metering rods have a different taper than the rods used before. These rods can be identified by the suffix "B" stamped after the diameter on the rod.

The purpose of the adjustable part throttle feature is to give finer metering control in the part throttle range for elimination of exhaust emissions. If the throttle body needs replacement in the field, there are specifications and adjustment procedures included in the throttle body kit.

The models for the 350" V8 engine have a pull-over enrichment (P.O.E.) circuit. The high speed fuel enrichment circuit referred to as pull-over enrichment, has been added to supplement fuel feed from the primary main discharge nozzles. The purpose of the supplementary fuel feeds is to allow the use of lean fuel mixtures during part throttle operation and still provide the extra fuel needed at higher engine speeds for good performance. Two calibrated holes, one in each primary bore are located just above the choke valve and feed fuel from the float bowl. During high carburetor air flows, low pressure created in the air horn bore pulls fuel from the high speed fuel feeds, supplementing fuel flow from the primary main metering system. The pull-over enrichment system begins to feed fuel at approximately 16# of air per minute and continues to feed at higher engine speeds to provide the extra fuel necessary for good engine performance.

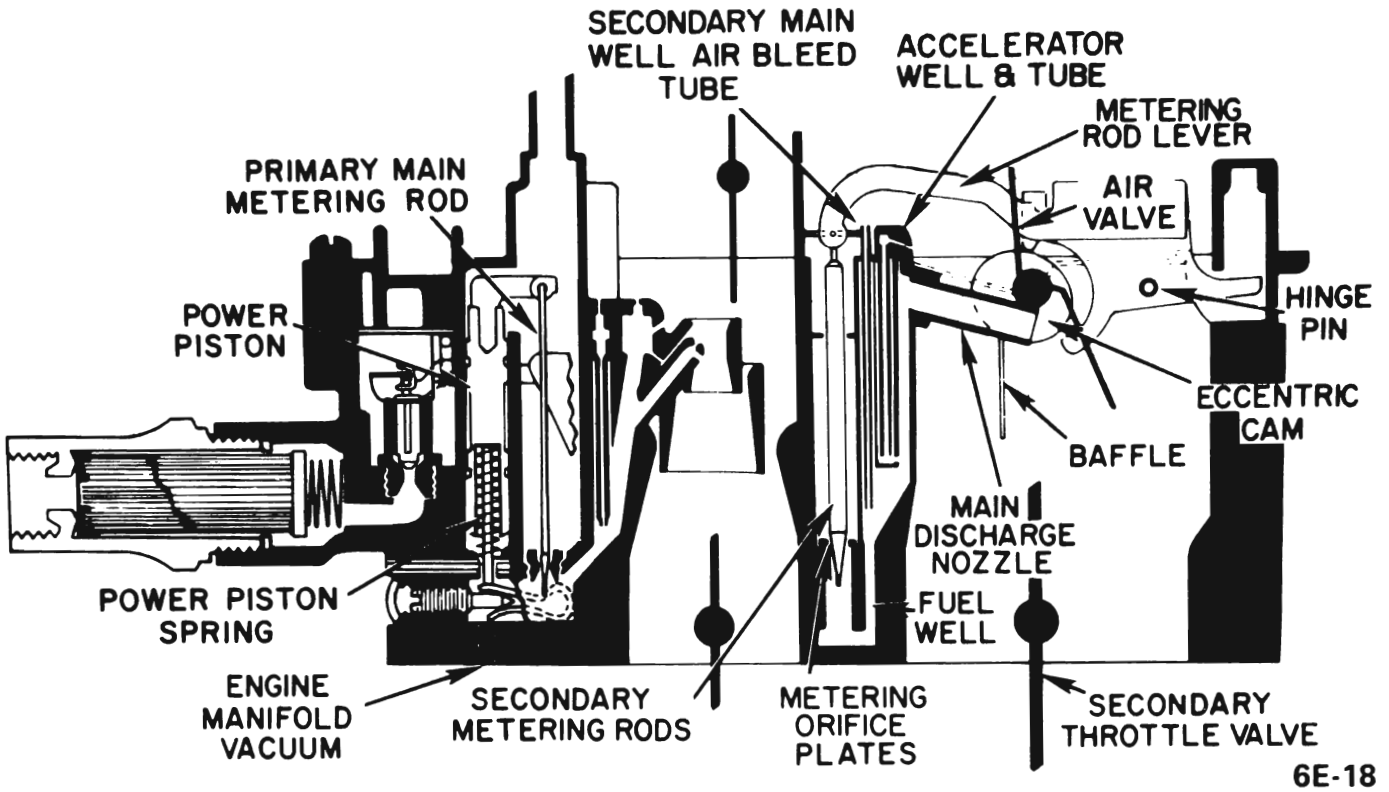

Figure 6E-18 Power System

Operation of Power System

The power system provides extra mixture enrichment for heavy acceleration or high speed operation. The richer mixture is supplied through the main metering system in the primary and secondary sides of the carburetor.

The power system located in the primary side consists of a vacuum piston and spring located in a cylinder connected by a passage to intake manifold vacuum. The spring located beneath the vacuum operated power piston tends to push the piston upward against manifold vacuum. See Figure 6E-18.

In part throttle and cruising ranges, manifold vacuums are sufficient to hold the power piston down against spring tension so that the larger diameter of the metering rod is held in the main metering jet orifice. Mixture enrichment is not necessary at this point. However, as engine load is increased to a point where extra fuel enrichment is required, the spring tension overcomes the vacuum pull on the power piston and the tapered primary metering rod moves upward in the main metering jet orifice. The smaller diameter of the metering rod allows more fuel to pass through the main metering jet and enrich the mixture flowing into the primary main wells and out the main discharge nozzles.

As the engine speed increases, the primary side of the carburetor can no longer meet the engine air and fuel requirements. To meet these demands, the secondary side of the carburetor is used. As air flow through the secondary bores creates a low pressure (vacuum) beneath the air valve, atmospheric pressure on top of the air valve forces the air valve open against spring tension. This allows the required air for increased engine speed to flow past the air valve.

When the secondary throttle valves begin to open, the accelerating well ports are exposed to manifold vacuum. The ports immediately start to feed fuel from the accelerating wells and continue to feed fuel until the fuel in the well is gone. This prevents a momentary leanness as the air valve opens and before secondary nozzles begin to feed fuel.

The secondary main discharge nozzles (one for each secondary bore) are located just below the air valve and above the secondary throttle valves. They, being in the area of lowest pressure, begin to feed fuel as follows:

When the air valve begins to open it rotates a plastic cam attached to the center of the main air valve shaft. The cam pushes on a lever attached to the secondary main metering rods. The cam pushes the lever upward, raising the metering rods out of the secondary orifice discs. Fuel flows from the float chamber through the secondary orifice discs into secondary main wells, where it is mixed with air from the main well tubes. The air emulsified fuel mixture travels from the main wells to the secondary discharge nozzles and into the secondary bores.

As the throttle valves are opened further, and engine speeds increase, increased air flow through the sec-

ondary side of the carburetor opens the air valve to a greater degree which in turn lifts the secondary metering rods further out of the orifice discs. The metering rods are tapered so that fuel flow through the secondary metering orifice disc is directly proportional to air flow through the secondary carburetor bores.

There are three other features incorporated in the secondary metering system which are as follows:

1. The main well bleed tubes extend below the fuel level in the main well. These bleed air into the fuel in the well to quickly emulsify the fuel with air for good atomization as it leaves the secondary discharge nozzles.

2. Two baffle plates are used, one in each secondary bore. They extend up and around the secondary fuel discharge nozzles. Their purpose is to provide good fuel distribution at lower air flows by preventing too much fuel from going to the front of the engine.

Operation of Air Valve Dash Pot

The air valve dashpot operates off of the main choke vacuum break diaphragm unit. The secondary air valve is connected to the choke vacuum break unit by a rod, to control the opening rate of the air valve. This delays the air valve opening rate to prevent secondary discharge nozzle "lag."

Whenever manifold vacuum is above approximately 5" to 6" Hg, the vacuum break diaphragm is seated (plunger is fully inward) against spring tension. At this point, the vacuum break rod is in the forward end of the slot in the air valve lever and the air valves are closed.

During acceleration or heavy engine loads, when the secondary throttle valves are open, the manifold vacuum drops. The spring located in the vacuum break diaphragm overcomes the vacuum pull and forces the plunger and link outward which, in turn, allows the air valves to open. The opening rate of the air valves is controlled by the calibrated restriction in the vacuum inlet nipple in the diaphragm cover. This gives the dashpot action required to delay air valve opening enough for efficient fuel flow from the secondary discharge nozzles.

Operation of Accelerating Pump System

During quick acceleration, when the throttle is opened rapidly, the air flow changes almost instantaneously. The fuel, which is heavier, tends to lag behind causing a momentary leanness. The accelerator pump is used to provide the extra fuel necessary for smooth operation during this time.

When the pump plunger moves upward in the pump well, fuel from the float bowl enters the pump well through a slot in the top of the pump well. It flows past the synthetic pump cup seal into the bottom of the pump well. The pump plunger is a floating type. (The cup moves up and down on the pump plunger head). When the pump plunger is moved upward the flat on the top of the cup unseats from the flat on the plunger head and allows free movement of fuel through the inside of the cup into the bottom of the

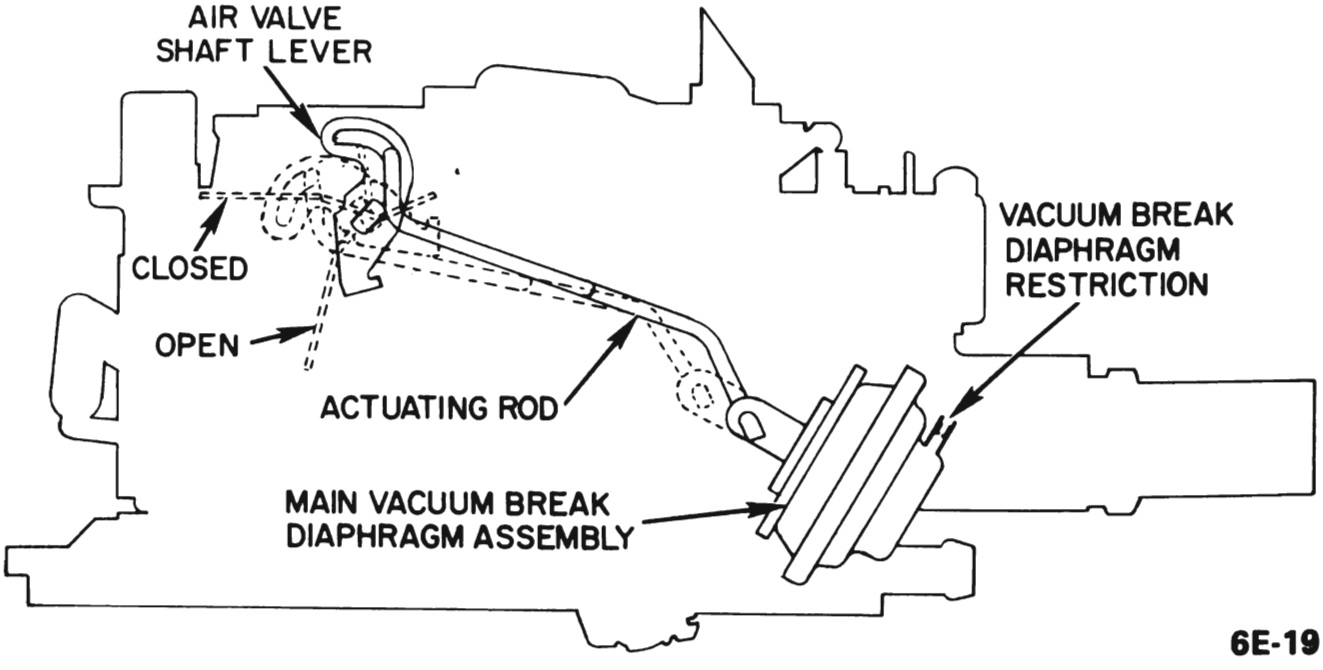

Figure 6E-19 Air Valve Dash Pot Operation

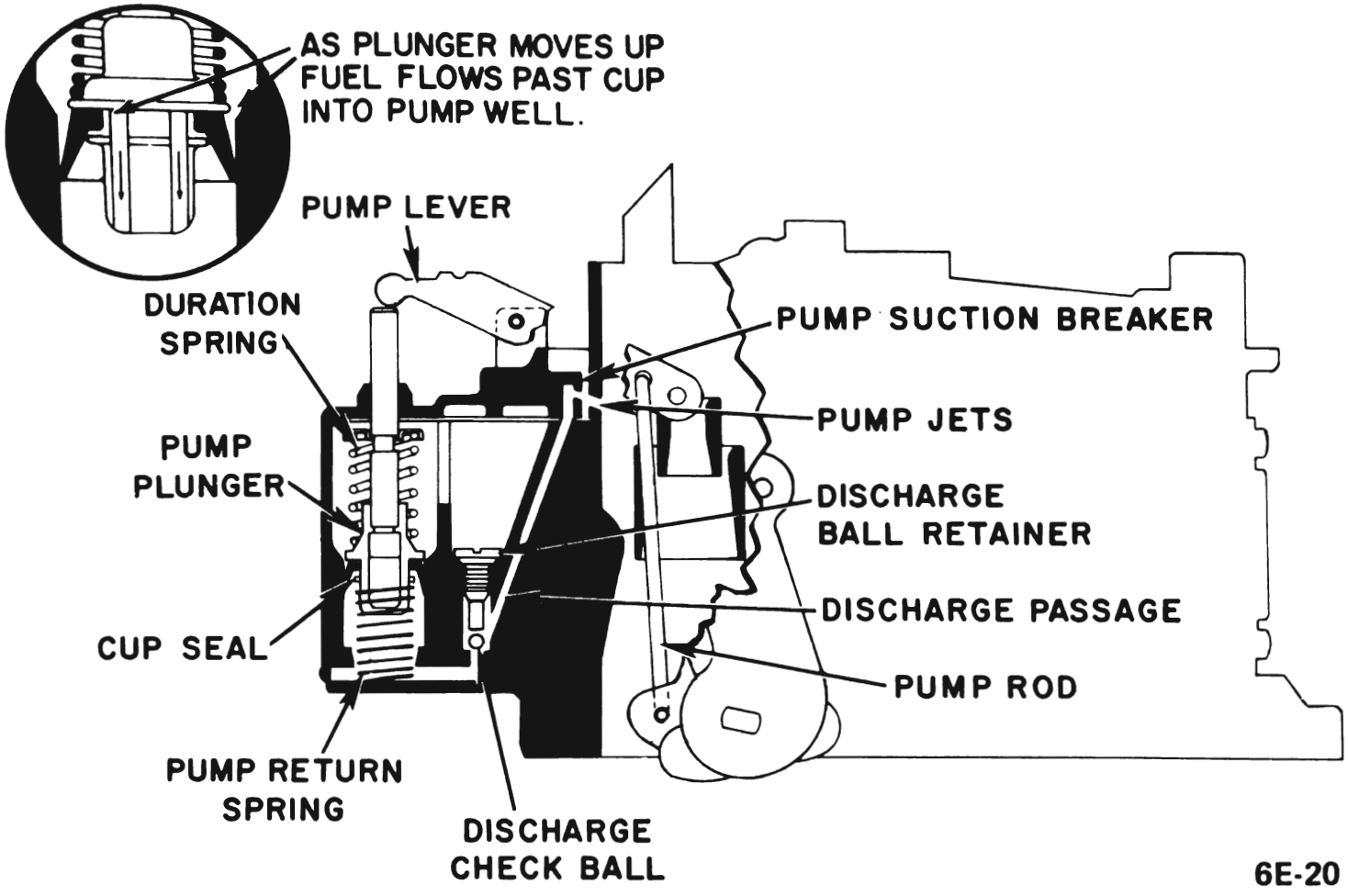

Figure 6E-20 - Accelerator Pump System

pump well. This also vents any vapors which may be in the bottom of the pump well so that a solid charge of fuel can be maintained in the fuel well beneath the plunger head. When the primary throttle valves are opened the connecting linkage forces the pump plunger downward. The pump cup seats instantly and fuel is forced through the pump discharge passage, where it unseats the pump discharge check ball and passes on through the passage to the pump jets located in the air horn. See Figure 6E-20.

It should be noted the pump plunger is spring loaded. The top pump duration spring is balanced with the bottom pump return spring so that a smooth sustained charge of fuel is delivered during acceleration.

The pump discharge check ball seats in the pump discharge passage during upward motion of the pump plunger so that air will not be drawn into the passage; otherwise, a momentary acceleration lag could result.

During high speed operation, a vacuum exists at the pump jets. A cavity just beyond the pump jets is vented to the top of the air horn, outside the carburetor bores. This acts as a suction breaker so that when the pump is not in operation fuel will not be pulled out of the pump jets into the venturi area. This insures a full pump stream when needed and prevents any fuel "pull over" from the pump discharge passage.

Operation of Choke System

The choke valve is located in the primary side of the carburetor. It provides the correct air/fuel mixture enrichment to the engine for quick cold starting and during warm-up period. See Figure 6E-21.

A secondary throttle valve lockout mechanism is used to prevent the secondary throttle valves from opening during the engine warm-up. A lockout lever located on the float bowl is weighted so that a tang on the lower end of the lever catches a lock pin on the secondary throttle valve shaft and holds the secondary throttle valves closed. As the engine warms up, the choke valve opens and the fast idle cam drops. When the engine is thoroughly warm, the choke valve is wide open and the fast idle cam drops down so the cam follower is completely off the steps of the cam. As the cam drops the last few degrees, it strikes the secondary lockout lever and pushes it away from the secondary valve lockout pin. This allows the secondary valves to open and operate, as described under the power system.

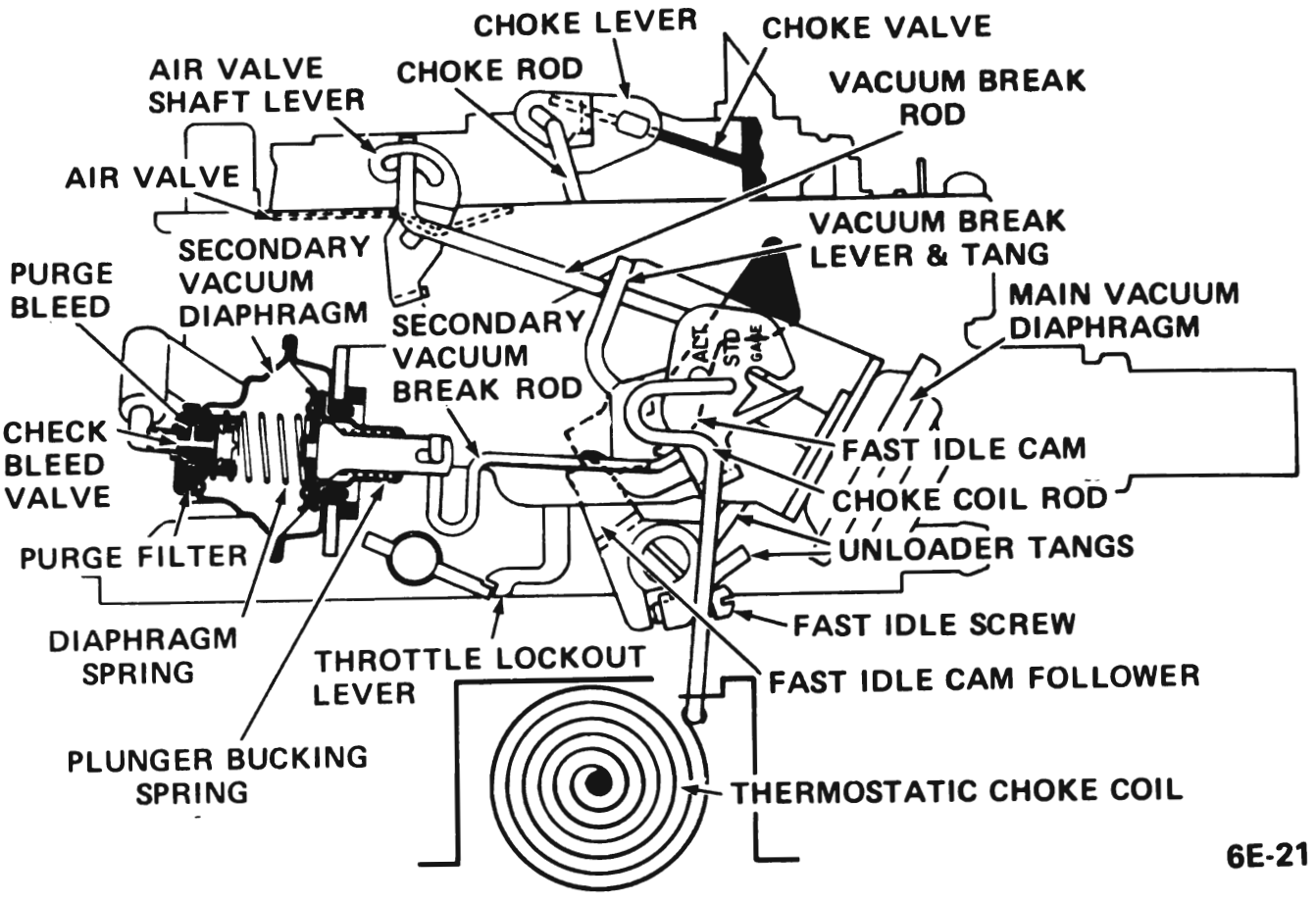

Figure 6E-21 - Choke System

The engine automatic choke operates as follows:

During engine cranking, the choke valve is held closed by the tension of the thermostatic coil. This restricts air flow through the carburetor to provide a richer starting mixture. When the engine starts and is running, manifold vacuum is applied to the two vacuum diaphragm units mounted on the side of the float bowl. The front or primary vacuum break diaphragm will open the choke valve to a point where the engine will run without loading or stalling. As the engine manifold is wetted and friction decreases after the start, the secondary, or rear, vacuum break unit, which has a delayed action, gradually opens the choke valve a little further to prevent loading and provide reduced exhaust emissions. Along with the delay bleed check valve, a clean air purge feature is added to the tube at the rear of the vacuum break unit and is located beneath a rubber covered filter. The purpose of the clean air bleed is to purge the system of any fuel vapors and dirt which may possibly enter the check bleed valve and disrupt operation. During adjustment of the secondary vacuum break unit it will be necessary to remove the rubber covered filter and plug the bleed hole, to keep the diaphragm seated when using an outside vacuum source.

The primary vacuum break unit is standard and operates the same as on previous applications. The secondary (or rear) vacuum break unit is delayed in operation by an internal bleed. This prevents further opening of the choke valve a few seconds until the engine will run at a slightly leaner mixture.

Included in the secondary vacuum break unit is a spring-loaded plunger. The purpose of the spring is to offset choke thermostatic coil tension to provide leaner mixtures during warm-up for reduced exhaust emissions. In very cold temperatures the extra tension created by the thermostatic coil will overcome the tension of the plunger spring and provide less choke valve opening with a resultant slightly richer mixture. In warmer temperatures the thermostatic coil will have less tension and, consequently, will not compress the spring as much, thereby giving a greater choke valve opening for slightly leaner mixtures.

After the vacuum break diaphragm units open the

DIAGNOSIS

4MV DIAGNOSIS CHART

CONDITION										CHECK POINTS
HARD STARTING—COLD	HARD STARTING—HOT	POOR OPERATION—DURING WARM UP	STUMBLE ON ACCELERATION	STALLING	ROUGH IDLE	ECONOMY	FLOODING	SURGE	LACK OF HIGH SPEED PERFORMANCE	**IMPORTANT** Before attempting carburetor diagnosis as outlined below, all other engine systems must be operating properly. Diagnosis of these systems (electrical, exhaust, mechanical, and in the case of fuel economy, odometer accuracy) is found in this Service Manual. The numbers 1, 2 and 3, under the CONDITION are the order of probability. The * indicates additional possibilities.
1	1					1				Driver Habits (Instruct Owner on Proper Procedures)
*		3				*				Check Choke Rod Adjustment
*		*				*				Check Vacuum Break Adjustments
*		*				*				Check Choke Coil Rod Adjustment
*										Check Choke Unloader Adjustment
2		1				2				Check Choke Valve & Linkage, Binding, Stuck or Gummed Up
			3						3	Air Valve Binding, Stuck, Wrong Spring Tension Adjustment
			*						*	Secondary Metering Rods Bent, Wrong Part
			*							Secondary Baffle Plates Missing
			*						*	Secondary Main Discharge Nozzles Plugged or Dirty
			*			3		3	*	Power Piston Stuck or Binding
			*			*		*		No Vacuum to Power Piston
			*			*		*	*	Primary Metering Rods Altered, Bent or Wrong Part
*		*	1							Check Accelerator Pump System & Adjustment
									2	Fuel Pump Pressure or Vacuum Not to Specification
			*	1	1	*				Check Slow Idle Adjustment
		2		*		*				Check Fast Idle Adjustment
						*		1	*	Primary Metering Jets Loose or Wrong Part
	*		*		*	*	2	4	*	Float Sticking or Level Misadjusted
*	*				*	*	3	*		Float Bowl Porous, Cracked, Etc.
*					*				*	Throttle Body to Float Bowl Screws Loose
	2	*		*		*	1	2		Needle Leaking
				*	2					Idle Passages Plugged or Dirty
				*	*	*				Crankcase Vent Valve Plugged
								*	*	Fuel Filter in Gas Tank Plugged
							*	*	1	Fuel Filter in Carburetor Plugged or Dirty, By Passing Fuel
						5				Air Cleaner Element Plugged
								*	4	Hole in Fuel Pump Suction Line or Kinked Hose
*	*	*	*	2	*					Secondary Throttle Valves Sticking Open
									*	Check for Full Throttle Position at Carburetor
*		*	2							Accelerator Pump Inoperative
									*	Fuel Tank Vent Plugged
			*	*						Front Wheel Max-Trac Sensor Misadjusted — See Max-Trac Section for Adjustment

Figure 6E-21A

choke valve and the accelerator pedal is depressed, the fast idle cam follower lever on the end of the primary throttle shaft will drop from the highest step on the fast idle cam to a lower step. This gives the engine the correct fast idle speed and fuel mixture for running until the engine begins to warm up and heat the thermostatic coil. As the thermostatic coil on the engine manifold becomes heated, it relaxes its tension and allows the choke valve to open further because of intake air pushing on the offset choke valve. The choke valve opening continues until the thermostatic coil is completely relaxed, at which point the choke valve is wide open.

The choke system is equipped with an unloader mechanism which is designed to partially open the choke valve, should the engine become loaded or flooded. To unload the engine, the accelerator pedal must be depressed so that the throttle valves are held wide open. A tang on a lever on the choke side of the primary throttle shaft contacts the fast idle cam and, through the intermediate choke shaft, forces the choke valve slightly open. This allows extra air to enter the carburetor bores to lean out the fuel mixture so that the engine will start.

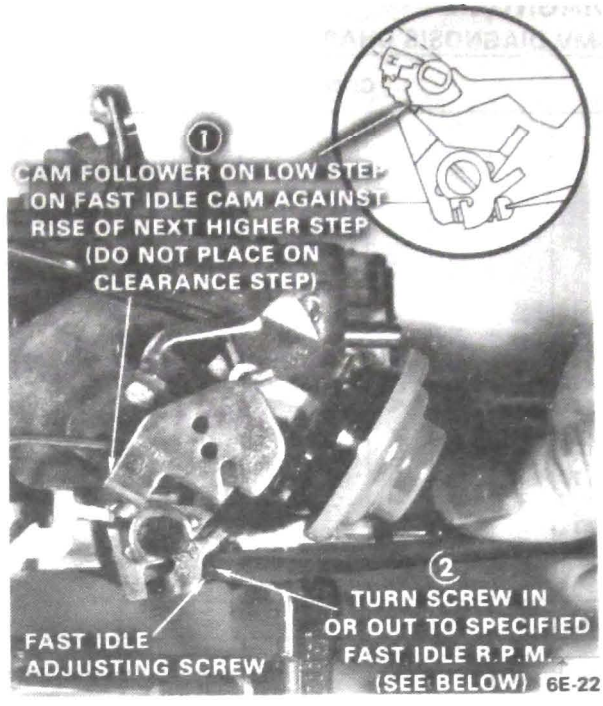

Figure 6E-22 Fast Idle Adjustment

MAINTENANCE AND ADJUSTMENTS

EXTERNAL ADJUSTMENT OF ROCHESTER QUADRAJET CARBURETOR

Fast Idle Adjustment

With engine warm, transmission in drive and cam follwer on low step of fast idle cam, adjust fast idle screw so that engine runs 700 RPM (auto. transmission), 920 RPM for 455 engine, or 820 RPM for 350 engine (manual transmission). See Figure 6E-22.

Choke Rod Adjustment

Place the fast idle cam follower on the second step of the fast idle cam and hold it against the high step by pushing lightly upward on the vacuum break lever. With the choke rod in the bottom of the slot in the choke lever, measure the dimensions between the lower edge of the choke valve at choke lever end, and air horn wall. The dimension should be as specified.

If adjustment is necessary, bend the choke rod at the point shown. See Figure 6E-23.

Primary Vacuum Break Adjustment

Seat vacuum break diaphragm using Special Tool J-23417, Vacuum Break Actuator.

With vacuum break diaphragm seated and with vacuum break lever tang held lightly against the vacuum break rod, measure the dimension between the lower edge of choke valve and air horn, as shown.

Bend vacuum break tang on lever to adjust. See Figure 6E-24.

Secondary Vacuum Break Adjustment

When seating the secondary vacuum break diaphragm, using an outside vacuum source, it is necessary to remove the rubber covered filter and plug the bleed hole with a piece of tape.

Fully seat the auxiliary vacuum break diaphragm plunger using an outside vacuum source. With the secondary vacuum break diaphragm in the fully seated position, rotate the choke valve towards the closed choke position, pushing on the vacuum break lever until the spring loaded diaphragm plunger is fully extended. With the choke valve held in this position, measure the distance between the lower edge of choke valve and inside air horn wall. Dimensions should be as specified; if not, bend the vacuum break link at the point shown to adjust. See Figure 6E-25. *Make sure the tape is removed after adjustment and the rubber covered filter element installed on the vacuum break tube.*

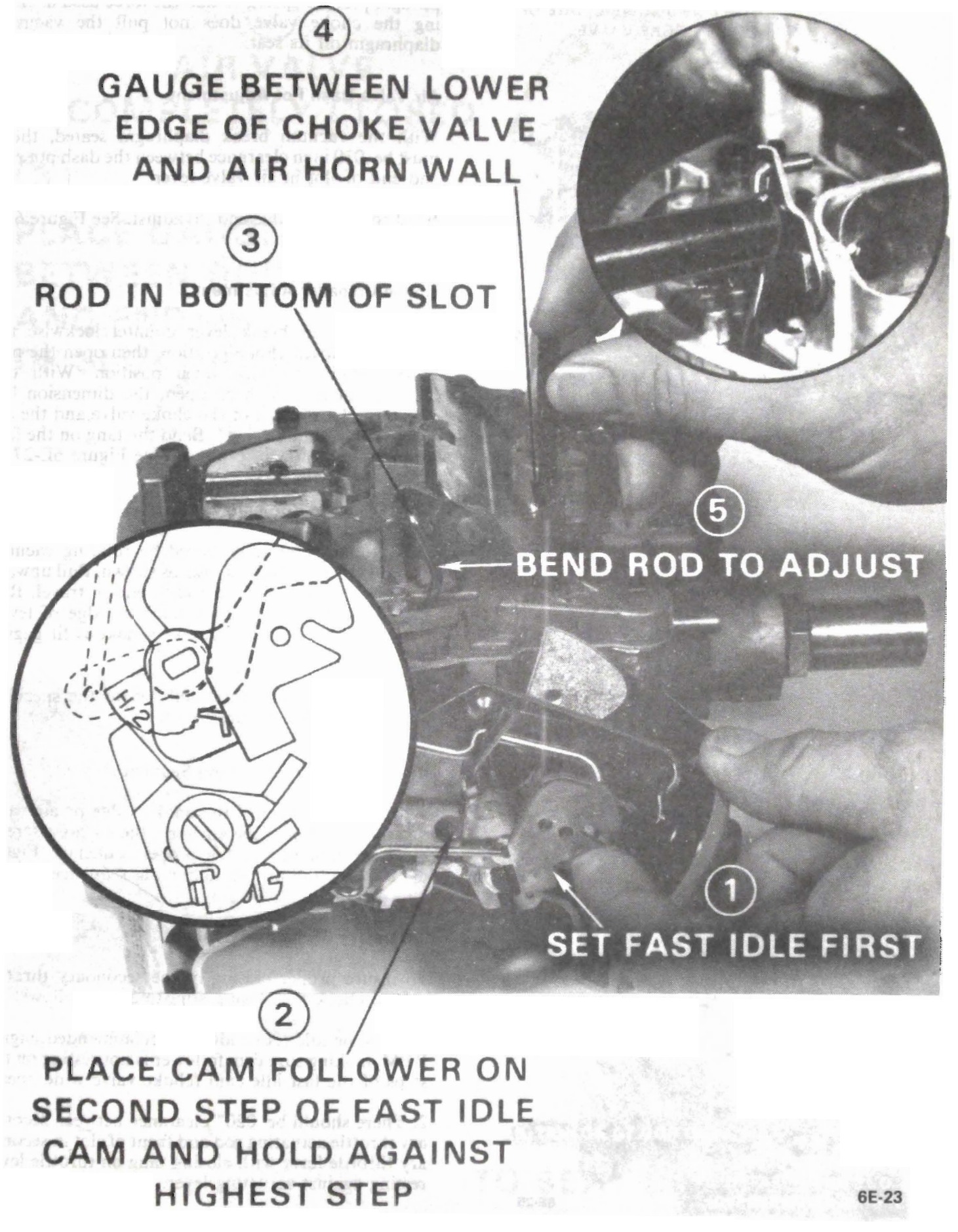

Figure 6E-23 - Choke Rod Adjustment

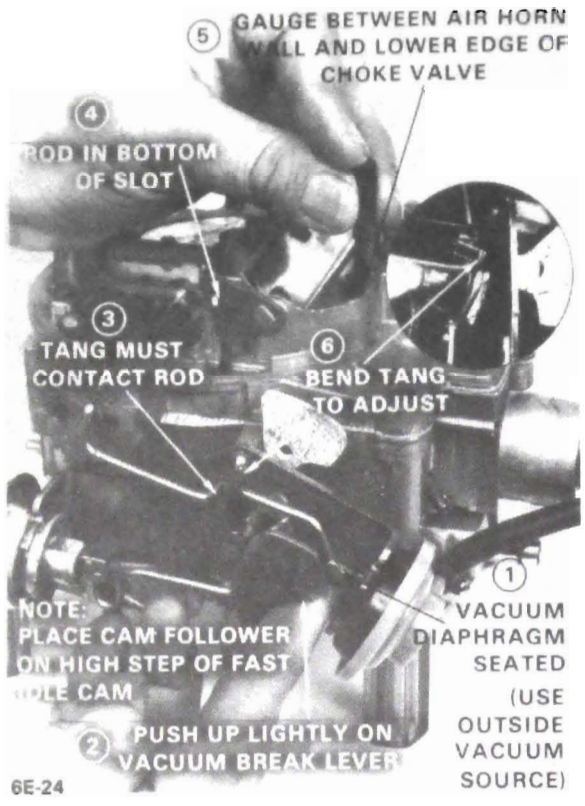

Figure 6E-24 - Primary Vacuum Break Adjustment

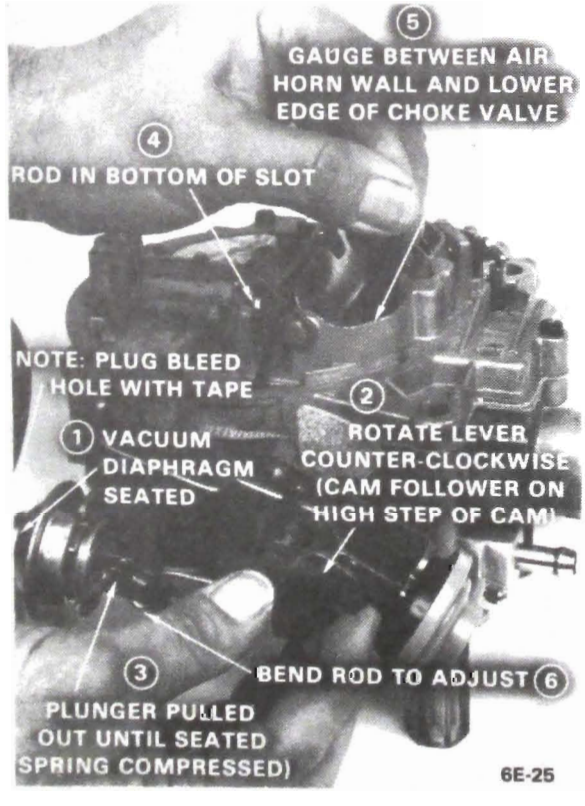

Figure 6E-25 - Secondary Vacuum Break Adjustment

Care should be used when compressing the diaphragm plunger spring so that the force used in closing the choke valve does not pull the vacuum diaphragm off its seat.

Air Valve Dash Pot Adjustment

With the vacuum break diaphragm seated, there must be .030 inch clearance between the dash pot rod and end of slot in air valve lever.

Bend rod, at air valve end, to adjust. See Figure 6E-26.

Choke Unloader Adjustment

Rotate vacuum break lever counterclockwise towards the closed choke position, then open the primary throttle to wide open position. With the throttle valves held wide open, the dimension between the lower edge of the choke valve and the air horn wall should be .335". Bend the tang on the fast idle lever, as shown, to adjust. See Figure 6E-27.

Choke Coil Rod Adjustment

Hold choke valve fully closed by rotating vacuum break lever counterclockwise, as shown. Pull upward on choke termostatic coil rod to end of travel. Rod should fit freely in gaging notch at edge of lever. Bend rod at loop as required to make it fit gaging notch.

Connect the thermostatic coil rod to the specified hole in lever. See Figure 6E-28.

Air Horn Screw Tightening Sequence

To prevent binding of the choke valve or air valve due to distortion of the air horn, the air horn screws must be tightened in the proper sequence. Figure 6E-29 show the proper tightening sequence.

Secondary Closing Adjustment

To insure proper closing of the secondary throttle valves, check the closing adjustment as follows:

1. Set slow idle (curb idle) to recommended engine RPM, making sure cam follower is not resting on the steps of the fast idle cam (choke valve wide open).

2. There should be .020" clearance between secondary throttle actuating rod and front of slot in secondary throttle lever with closing tang on throttle lever resting against actuating lever.

3. Bend tang on primary throttle actuating lever to adjust. See Figure 6E-30.

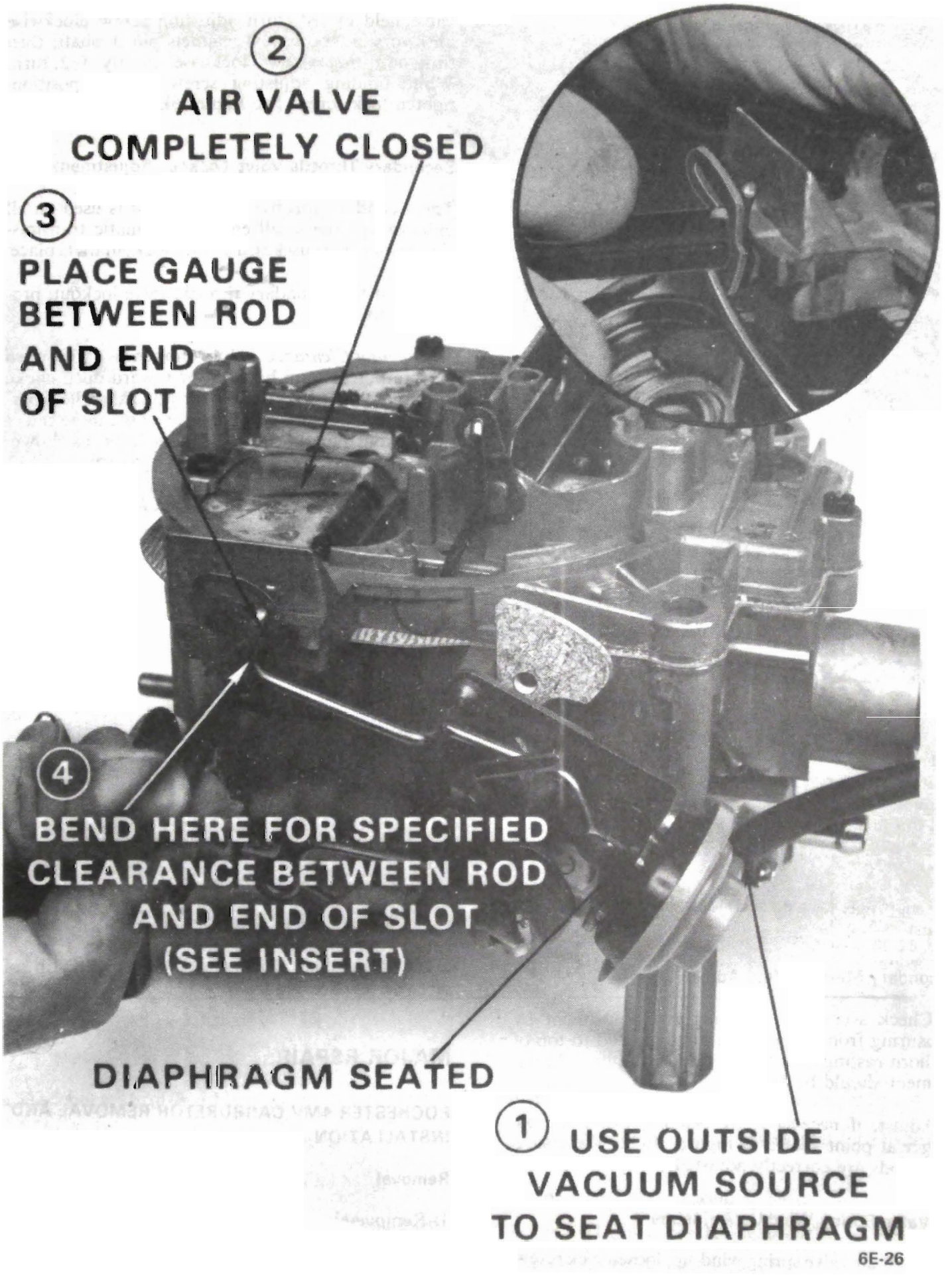

Figure 6E-26 Air Valve Dash Pot Adjustment

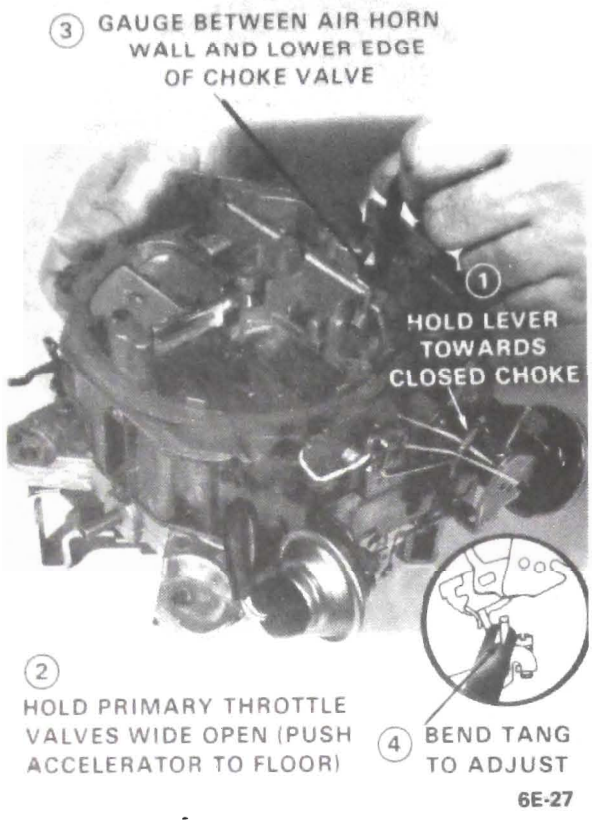

Figure 6E-27 Choke Unloader Adjustment

Secondary Opening Adjustment

For correct opening of the secondary throttle valves, the following adjustment should be checked:

1. Open primary throttle valves until actuating link contacts upper tang on secondary lever. With valve in s this position, clearance between link and middle tang should be .070 inch. See upper part of Figure 6E-31.

2. Bend upper tang on secondary lever as required to adjust.

Secondary Metering Rod Adjustment

1. Check secondary metering rod adjustment by measuring from top of each metering rod to top of air horn casting next to air cleaner stud hole. Measurement should be 53/64 in. See Figure 6E-32.

2. Adjust, if necessary, by bending metering rod hanger at point shown in Figure 6E-32. Make sure *both* rods are correctly adjusted.

Air Valve Spring Wind-Up Adjustment

To adjust air valve spring wind-up, loosen lock screw (Allen screw) and turn adjusting screw counterclockwise to remove all spring tension. With air valve held closed, turn adjusting screw clockwise until torsion spring just contacts pin in shaft; then turn adjusting screw clockwise exactly 1/2 turn. While holding adjusting screw in this position, tighten lock screw. See Figure 6E-33.

Secondary Throttle Valve Lockout Adjustment

The secondary throttle valve lockout is used on all units except the small engine, automatic transmission model. This uses an air valve lockout in its place.

To adjust the secondary throttle valve lockout, proceed as follows:

1. *Opening Clearance* - Hold choke valve wide open by rotating vacuum break lever toward open choke (clockwise). With secondary throttle valves held partially open, measure the clearance between the end of the lockout pin and toe of lockout lever, as shown. Bend lockout lever at point shown to adjust.

2. *Secondary Lockout Pin Side Clearance* - With choke valve and secondary throttle valve fully closed, bend lockout pin at point shown to maintain specified side clearance between side of lockout pin and lockout lever. See Figure 6E-34.

Accelerator Pump Adjustment

1. Completely close primary throttle valves by backing out slow idle screw and making sure fast idle cam follower is off steps of fast idle cam (choke valve wide open). It will also be necessary to bend the secondary throttle closing tang away from primary throttle lever, to obtain closed throttle valves.

2. With pump rod in specified hole in pump lever, gauge from top of choke valve wall next to vent stack, to top of pump stem.

3. To adjust bend pump lever as shown, with adjustable wrench, and also supporting pump lever between lever and top of air horn with tip of screwdriver. See Figure 6E-35.

MAJOR REPAIR

ROCHESTER 4MV CARBURETOR REMOVAL AND INSTALLATION

Removal

1. Remove air cleaner.

2. Disconnect gas line fitting at carburetor.

3. Remove choke coil rod clip and disconnect rod.

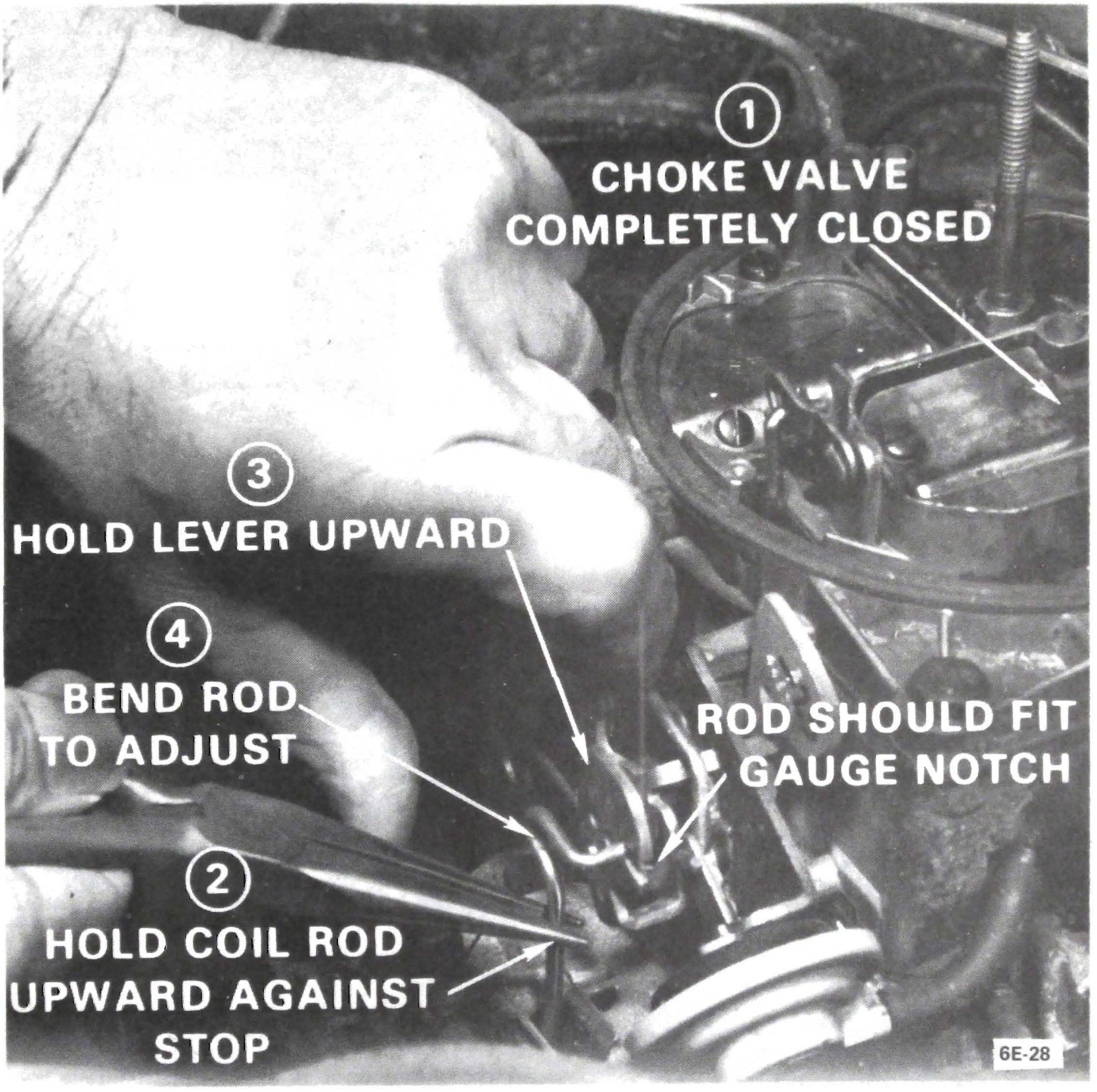

Figure 6E-28 Choke Coil Rod Adjustment

4. Disconnect throttle cable.
5. Disconnect vacuum lines to carburetor.
6. Remove T.C.S. switch bracket bolt.
7. Disconnect cruise control head chain, if equipped.
8. Disconnect throttle spring.
9. Remove four (4) carburetor-to-manifold bolts.

Installation

1. Install carburetor hose gasket and install carburetor.
2. Connect throttle spring.
3. Connect cruise control head chain.
4. Replace T.C.S. switch.
5. Connect vacuum lines to carburetor.

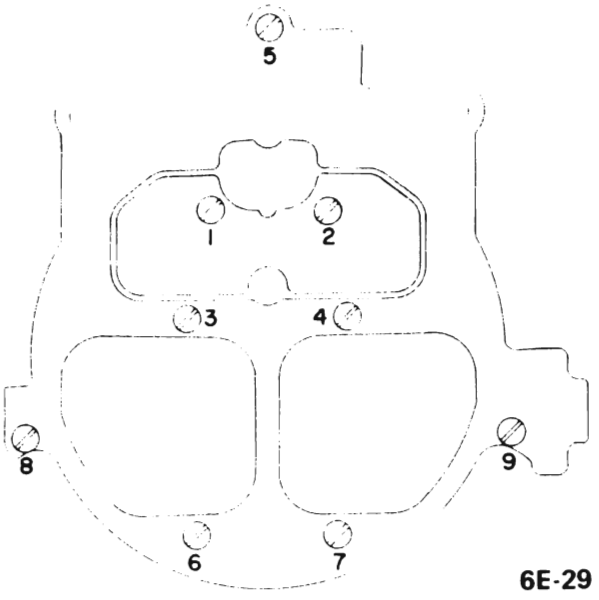

Figure 6E-29 - Air Horn Screw Tightening Sequence

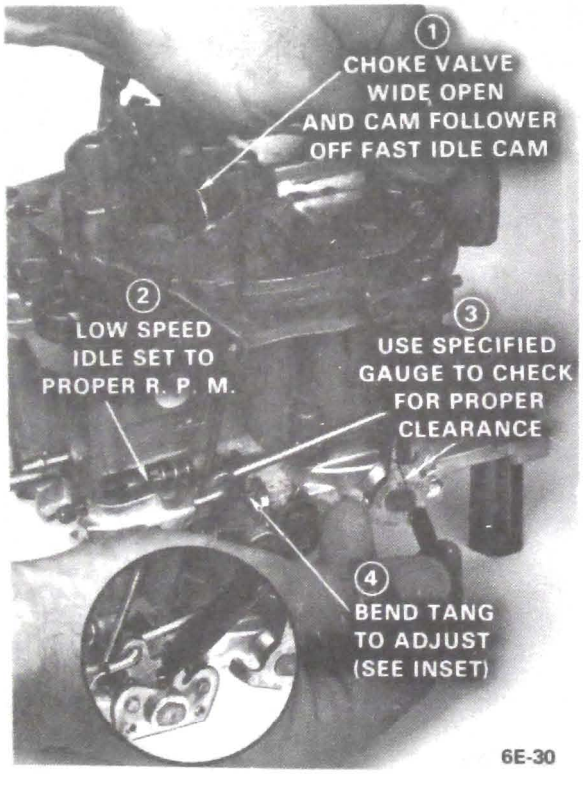

Figure 6E-30 - Secondary Closing Adjustment

6. Connect throttle cable.

7. Connect choke coil rod to carburetor.

8. Connect gas line to carburetor.

9. Replace air cleaner and connect vacuum hoses.

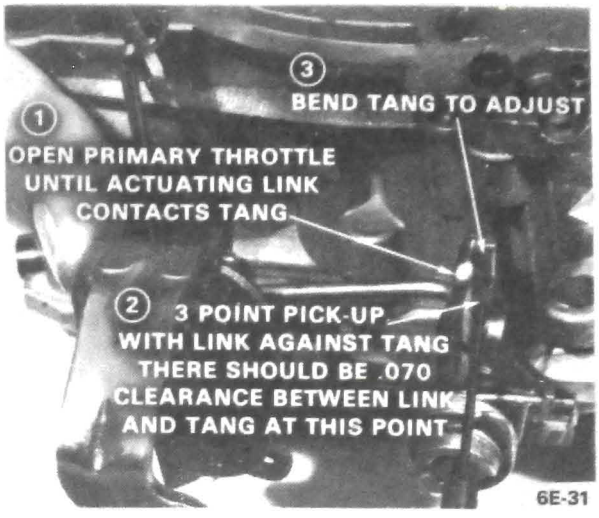

Figure 6E-31 - Secondary Opening Adjustment

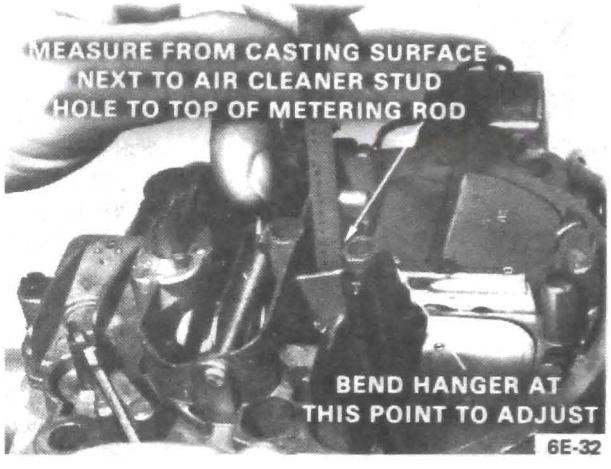

Figure 6E-32 - Secondary Metering Rod Adjustment

DISASSEMBLY, CLEANING AND INSPECTION

Place carburetor on proper holding fixture.

Air Horn Removal

1. Remove clip from upper end of choke rod, disconnect choke rod from upper choke shaft lever, and remove the choke rod from lower lever in bowl cavity.

2. To disconnect pump rod, drive small roll pin (pump lever pivot pin) inward, using a small drift, until pump lever can be removed from air horn. Then remove pump lever from pump rod.

3. Remove secondary metering rods from secondary wells by removing small screw in the secondary metering rod holder. Lift rods and holder as an assembly from carburetor.

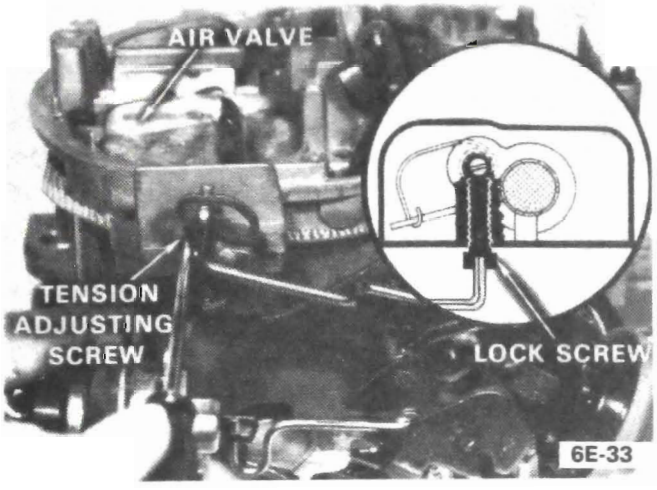

Figure 6E-33 - Air Valve Spring Wind-Up Adjustment

The vacuum break diaphragm rod is clipless, so it will be necessary to remove during air horn removal.

4. Remove nine air horn to bowl attaching screws, two of which are located next to the primary venturi; (two long screws, five short screws, and two countersunk screws).

5. Remove air horn by lifting straight up. After air horn is clear of float bowl, rotate air horn to remove the vacuum break diaphragm rod from the lever on the end of the air valve shaft. Air horn gaskets should remain on the float bowl for removal later. Care must be taken not to bend the small tubes protruding from the air horn. These are permanently pressed into the castings. Do not remove.

Air Horn Disassembly

Further disassembly of the air horn is not required for cleaning purposes. If part replacement is required, proceed as follows:

1. Remove choke valve attaching screws, then remove choke valve and shaft. Air valves and air valve shaft are calibrated and should not be removed.

2. Normally, the air valve and shaft do not have to be removed from the air horn for cleaning purposes. However, a repair kit is available which includes a new plastic cam, an air valve torsion spring and retaining pin. Complete instructions are included in the kit for installation.

Float Bowl Disassembly

1. Remove pump plunger from pump well.

2. Remove air horn gasket from dowels on secondary side of bowl, then remove gasket from around power piston and primary metering rods.

3. Remove pump return spring from pump well.

4. Remove plastic filler over float valve.

5. Remove power piston and primary metering rods, by pushing downward on the power piston against spring tension and allowing to snap upward. Do this several times until the plastic retainer pops out of the recess in float bowl casting. Then remove power piston and rod assembly from float bowl. Remove power piston spring from power piston cavity.

6. Remove metering rods from power piston by disconnecting tension springs from top of each rod; then rotate rod to remove from hanger.

7. Remove float and needle assembly by lifting up on retaining pin.

8. Remove float needle and pull clip assembly from float arm.

9. Remove needle seat and gasket.

10. Remove primary metering jets. No attempt should be made to remove secondary metering plates.

11. Remove pump discharge check ball retainer and check ball.

12. Remove baffle from secondary side of float bowl.

13. Remove vacuum break hoses from primary vacuum break assembly and secondary vacuum break assembly.

14. Remove retaining screw from choke bracket assembly and remove complete assembly from float bowl. Vacuum break rod can now be removed from the primary vacuum break diaphragm plunger by rotating rod out of plunger stem.

If further disassembly of the choke is necessary, spread the retaining ears on bracket for removing either the primary vacuum break diaphragm assembly or the secondary vacuum break assembly. The secondary vacuum break assembly has a rod connecting the plunger to the vacuum break lever on the intermediate choke shaft. This can be removed by rotating the vacuum break diaphragm assembly and sliding rod out of plunger stem and the other end out of vacuum break lever.

Do not place vacuum break assemblies in carburetor cleaner. The rubber covered filter on the secondary vacuum break diaphragm assembly should be

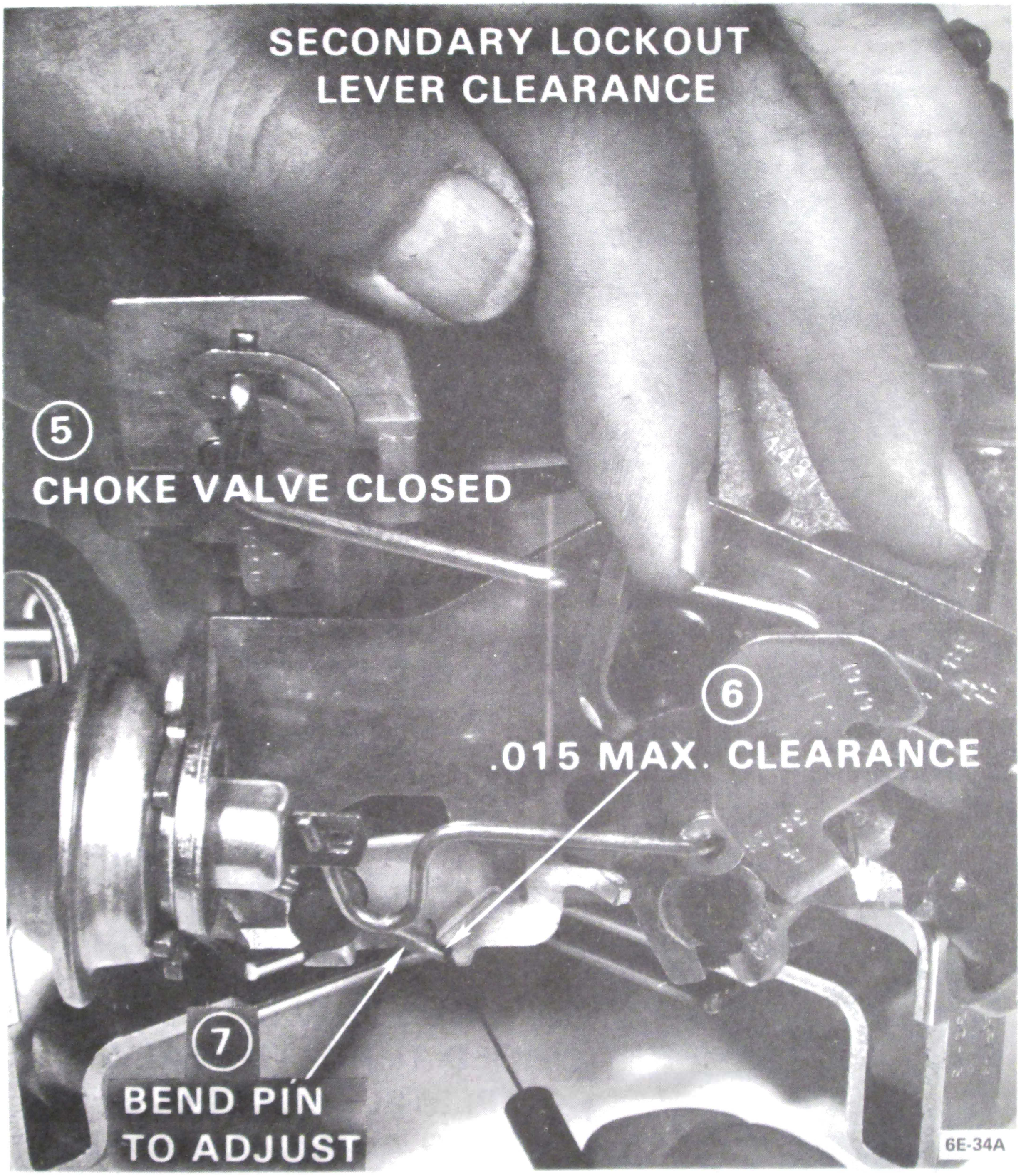

Figure 6E-34A Secondary Lockout Adjustment Continued

checked and if dirty, cleaned with compressed air or replaced if excessively contaminated. The small bleed hole in the diaphragm stem should be checked for being open. If plugged, replace the diaphragm assembly.

15. Remove the fast idle cam from bushing on choke bracket assembly.
16. Remove the secondary throttle valve choke lockout lever from the bearing pin on the side of the float bowl.

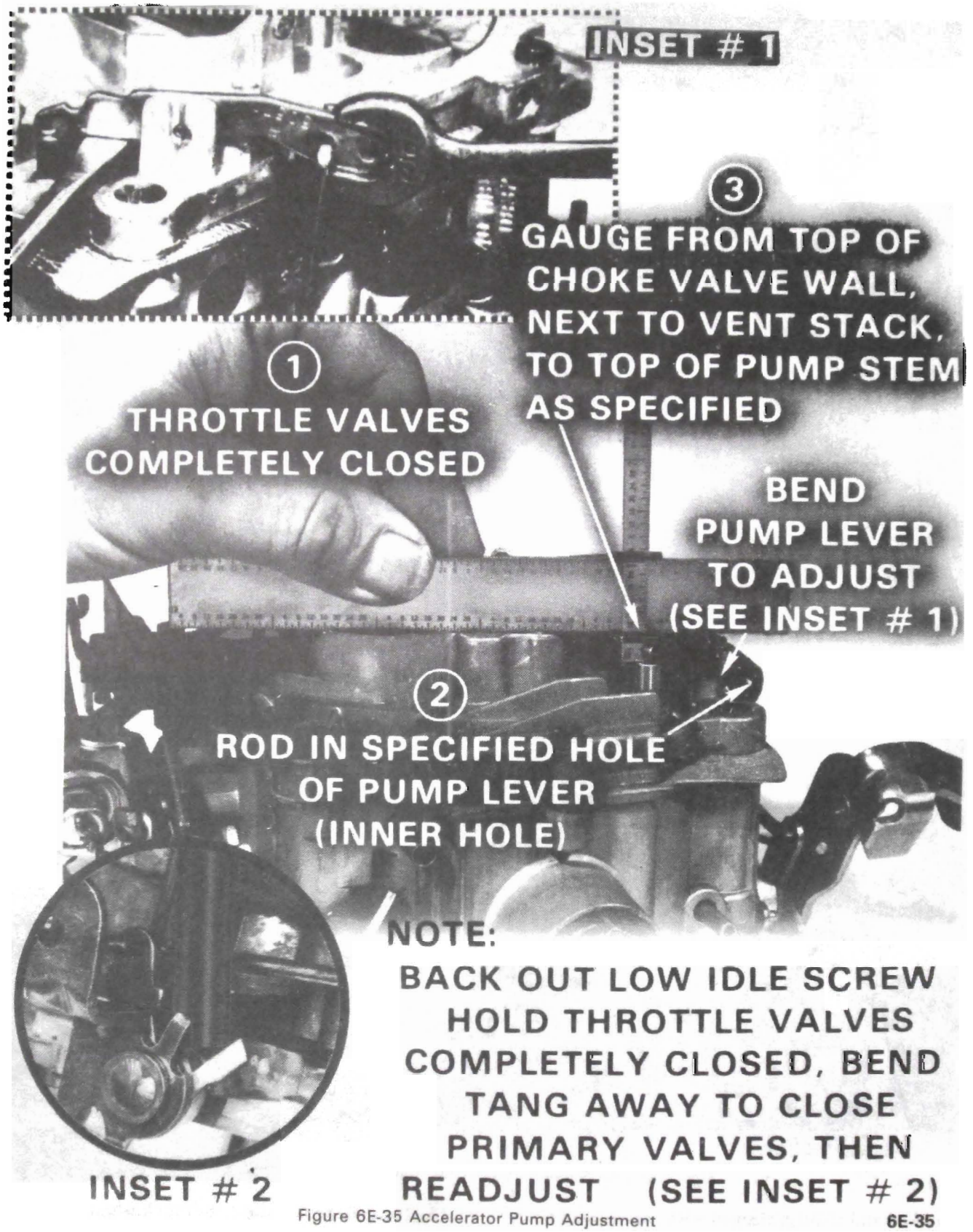

Figure 6E-35 Accelerator Pump Adjustment 6E-35

17. Remove lower choke rod actuating lever from inside cavity on side of float bowl.

18. Remove fuel inlet nut, gasket, filter and spring. The fuel inlet nut gasket is now located at the bottom of the inlet nut threads.

19. Remove throttle body by removing throttle body to bowl attaching screws.

20. Remove throttle body to bowl insulator gasket.

Throttle Body Disassembly

1. Remove pump rod from throttle lever by rotating rod out of primary throttle lever.

2. If necessary to clean the idle mixture channels and idle needle holes, remove the plastic limiter caps by breaking them. Then remove the idle mixture screws and springs.

New red plastic limiter caps are provided in the carburetor overhaul and repair kits, should it be necessary to remove the idle mixture needles. No further disassembly of the throttle body is required.

Extreme care must be taken to avoid damaging the throttle valves and also the adjustable part throttle wire located in the center of throttle body casting.

Cleaning and Inspection

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

1. Thoroughly clean carburetor castings and metal parts in an approved carburetor cleaner.

> **CAUTION:** *Rubber parts, plastic parts, diaphragms, pump plungers, should not be immersed in carburetor cleaner. However, the delrin cam on the air valve shaft will withstand normal cleaning in carburetor cleaner.*

2. Blow out all passages in castings with compressed air. Do not pass drills through jets or passages.

3. Inspect idle mixture needles for damage.

4. Examine float needle and seat for wear. Replace if necessary with float needle assembly.

5. Inspect upper and lower surfaces of carburetor castings for damage.

6. Inspect holes in levers for excessive wear or out of round conditions. If worn, levers should be replaced.

7. Examine fast idle cam for wear or damage.

8. Check air valve for binding conditions. If air valve is damaged, air horn assembly must be replaced.

9. Check all throttle levers and valves for binds or other damage.

ASSEMBLY AND INTERNAL ADJUSTMENT

Throttle Body Assembly

1. If removed for cleaning, install the idle mixture needles and springs until seated. Back out needles two turns as a preliminary idle adjustment.

The new red plastic idle limiter caps should not be installed until the carburetor is adjusted according to procedures listed under Engine Idle Adjustment. After adjustment on the engine, install red idle limiter caps over the mixture screws.

After adjustment on the engine, then install red idle limiter caps over the idle mixture screws.

2. Install the pump rod in the throttle lever by rotating end of rod into hole in lever. End of rod will protrude outward away from throttle body casting when installed correctly.

Float Bowl Assembly

1. Install new throttle body to bowl insulator gasket being certain the gasket is properly installed over two locating dowels on bowl.

2. Install throttle body making certain throttle body is properly located over dowels on float bowl then install throttle body to bowl screws and tighten evenly and securely.

3. Place carburetor on proper holding fixture.

4. Install new gasket on base of fuel inlet filter nut. Then, install fuel inlet filter spring, filter and inlet nut into float bowl. Tighten securely.

If the vacuum break diaphragm assemblies were removed from choke bracket, slide assemblies between retaining ears and bend ears slightly together to hold securely. The secondary vacuum diaphragm rod must be installed in the vacuum break lever and plunger stem previous to installing the unit on the choke bracket.

5. Install the secondary lockout lever on bearing pin on float bowl.

6. Install the fast idle cam on the choke bracket assembly. Be sure the fast idle cam actuating tang on the intermediate choke shaft lever (vacuum break lever) is located below the tail of the fast idle cam.

7. Connect plain end of choke rod to lower choke rod actuating lever. Then, holding choke rod, with grooved end pointing inward (lower end pointing outward away from the venturi), position choke rod actuating lever in well of float bowl and install choke assembly, engaging choke shaft with hole in actuat-

ing lever. Install choke bracket retaining screw and tighten securely. Remove choke rod from lower lever for installation later.

Lower choke lever holding tool (J-6911) can be used for holding lever in place while installing the choke bracket assembly.

8. Install both vacuum break diaphragm hoses. The shorter vacuum hose goes to the primary or front vacuum break diaphragm unit.

9. Install air baffle into the secondary side of bowl with notches towards top. Top edge of baffle must be flush with casting.

10. Install pump discharge check ball and retainer in passage next to pump well. Tighten securely.

11. Install primary main metering jets. Tighten securely.

12. Install float needle seat and gasket. Tighten securely.

13. Install pull clip on needle. Install needle and pull clip on float. Note that the float needle pull clip hooks over the edge of the float arm and not through the locating holes in the center.

14. Install float, needle and float hinge pin assembly into float bowl.

15. Float level adjustment:

a. With adjustable "T" scale, measure from the top of float bowl gasket surface (gasket removed) to top of float at toe (locating gauge 1/16 back from radius at toe). See Figure 6E-36.

Make sure retaining pin is held firmly in place and tang of float is seated on float needle.

b. Bend float up or down at adjustment notch provided at float hanger for proper adjustment.

16. Install power piston spring into the power piston cavity in float bowl. If the primary main metering rods were removed from hanger, reinstall, making sure that the tension spring is connected to top of each metering rod. Install power piston assembly in well with metering rods properly positioned in the main metering jets. Press downward on plastic power piston retainer so that it is seated in a recess provided in the float bowl.

It may be necessary to tap the plastic retainer lightly in place with a hammer and drift punch. Make sure the plastic retainer is flush with top of the float bowl casting.

17. Install plastic filler over float needle, pressing downward until properly seated.

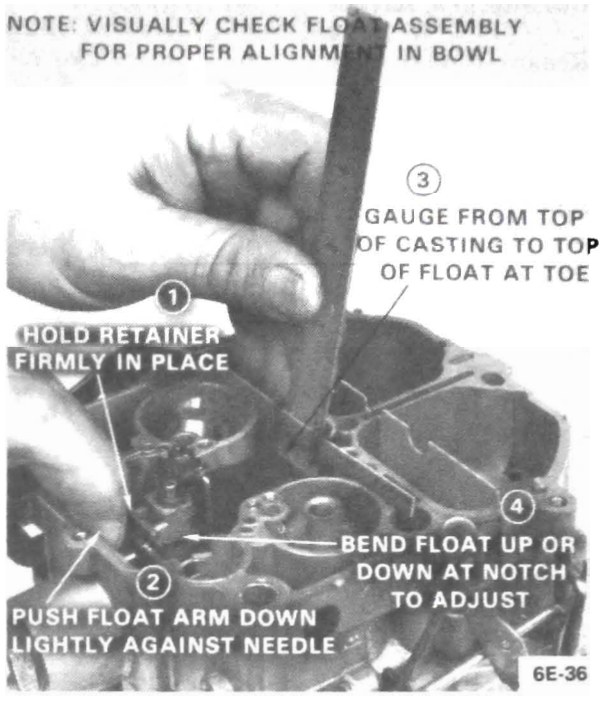

Figure 6E-36 Float Level Adjustment

18. Install pump return spring in pump well.

19. Install air horn gasket around primary metering rods and piston. Position gasket over two dowels on secondary side of bowl.

20. Install pump plunger in pump well.

It may be necessary to tap the plastic retainer lightly in place with a hammer and drift. Make sure the plastic retainer is flush with the top of the float bowl casting.

16. Install plastic filler over float needle, pressing downward until seated properly.

17. Install pump return spring in pump well.

18. Install air horn gasket around primary metering rods and piston. Position gasket over two dowels on secondary side of bowl.

19. Install pump plunger in pump well.

Air Horn Assembly

1. Install the following if removed; choke shaft, choke valve, and two attaching screws. Make sure to stake the two attaching screws after tightening securely.

2. Normally, the air valve and shaft do not have to be removed from the air horn for cleaning purposes.

A repair kit is available which includes a new plastic cam, an air valve torsion spring, retaining pin. Complete instructions are included in the kit for installation.

Air Horn to Bowl Installation

1. Place air horn assembly on bowl carefully, positioning vent tubes and accelerating well tubes over air horn gasket. Install vacuum break rod into main vacuum break diaphragm plunger and into slotted air valve lever on air horn before the air horn is lowered onto float bowl. Carefully lower air horn assembly over pump plunger stem and locating dowels until properly seated.

2. Install two long air horn screws, five short screws, and two countersunk screws in primary venturi area. All screws must be tightened evenly and securely. See Figure 6E-29 for proper tightening sequence.

3. Install two secondary metering rods into the secondary metering rod hanger (upper ends of rod point towards each other). Install secondary metering rod holder onto air valve cam follower. Install retaining screw and tighten securely. Work air valves up and down several times to make sure they are free in all positions.

4. Connect pump lever to upper end of pump rod. Place pump lever on air horn casting. Align hole in pump lever with hole in air horn casting and push pump roll pin back through casting until end of pin is flush with casting.

5. Connect choke rod in lower choke lever and retain in upper lever with clip.

	455 Automatic Transmission A-B-C-E Series	455 Manual Transmission A - Series	455 Stage I Automatic and Manual Transmission A - Series	350 Automatic Transmission A-B Series	350 Manual Transmission A - Series
Carburetor Number	7043240	7043243	7043242	7043244	7043245
Model Designation	4MV	4MV	4MV	4MV	4MV
Number of Barrels	4	4	4	4	4
Throttle Bore Primary	1-3/8"	1-3/8"	1-3/8"	1-3/8"	1-3/8"
Throttle Bore Secondary	2-1/4"	2-1/4"	2-1/4"	2-1/4"	2-1/4"
Small Venturi	9/32"	9/32"	9/32"	9/32"	9/32"
Middle Venturi	5/8"	5/8"	5/8"	5/8"	5/8"
Large Venturi	1-7/32"	1-7/32"	1-7/32"	1-3/32"	1-3/32"
Main Metering Jet	.073"	.073"	.075"	.068"	.069"
Metering Rod "Pri" Prod.	.048"	.043"	.048"	.043"	.044"
Altitude (Secondary Rods)	7048092	N.A.	N.A.	7048091	N.A.
Metering Rod Secondary	CT	CT	CV	CZ	CZ
Idle Needle Hole	.086"	.086"	.086"	.075"	.075"
Spark Hole	.045" x.151"	.045" x .151"	.045" x .151"	.045" x .151"	.045" x .151"
Pump Discharge Hole	2 - .034"	2 - .034"	2 - .034"	2 - .028"	2 -.028"
Fast Idle Cam Number	7047705	7044874	7044873	7047706	7044876
Choke Assembly Number	7043190	7043190	7043190	7042192	7042192
Choke Coil Rod Adjustment	Guage Slot	Guage Slot	Guage Slot	Guage Slot	Guage Slot
Choke Hole Setting	Std. Hole	Std. Hole	Std. Hole	Std. Hole	Std. Hole
Float Level	13/32"	13/32"	13/32"	15/32"	15/32"
Pump Rod Location	Inner	Inner	Inner	Outer	Inner
Pump Adjustment	7/16"	7/16"	7/16"	.306"	.41"
Choke Rod Adjustment	.130"	.130"	.130"	.130"	.130"
Vacuum Break Adjustment Pri.	.215"	.215"	.200"	.170"	.170"
Vacuum Break Adjustment Sec.	.160"	.195"	.180"	.150"	.150"
Air Valve Dash Pot Adjustment	.015"	.015"	.015"	.015"	.015"
Secondary Opening Adjustment	.070"	.070"	.070"	.070"	.070"
Secondary Closing Adjustment	.020"	.020"	.020"	.020"	.020"
Secondary Metering Oriface	53/64"	53/64"	53/64"	53/64"	53/64"
Air Valve Spring Wind-Up	7/16 of a turn	7/16 of a turn	7/16 of a turn	11/16 of a turn	11/16of a turn

No Cap

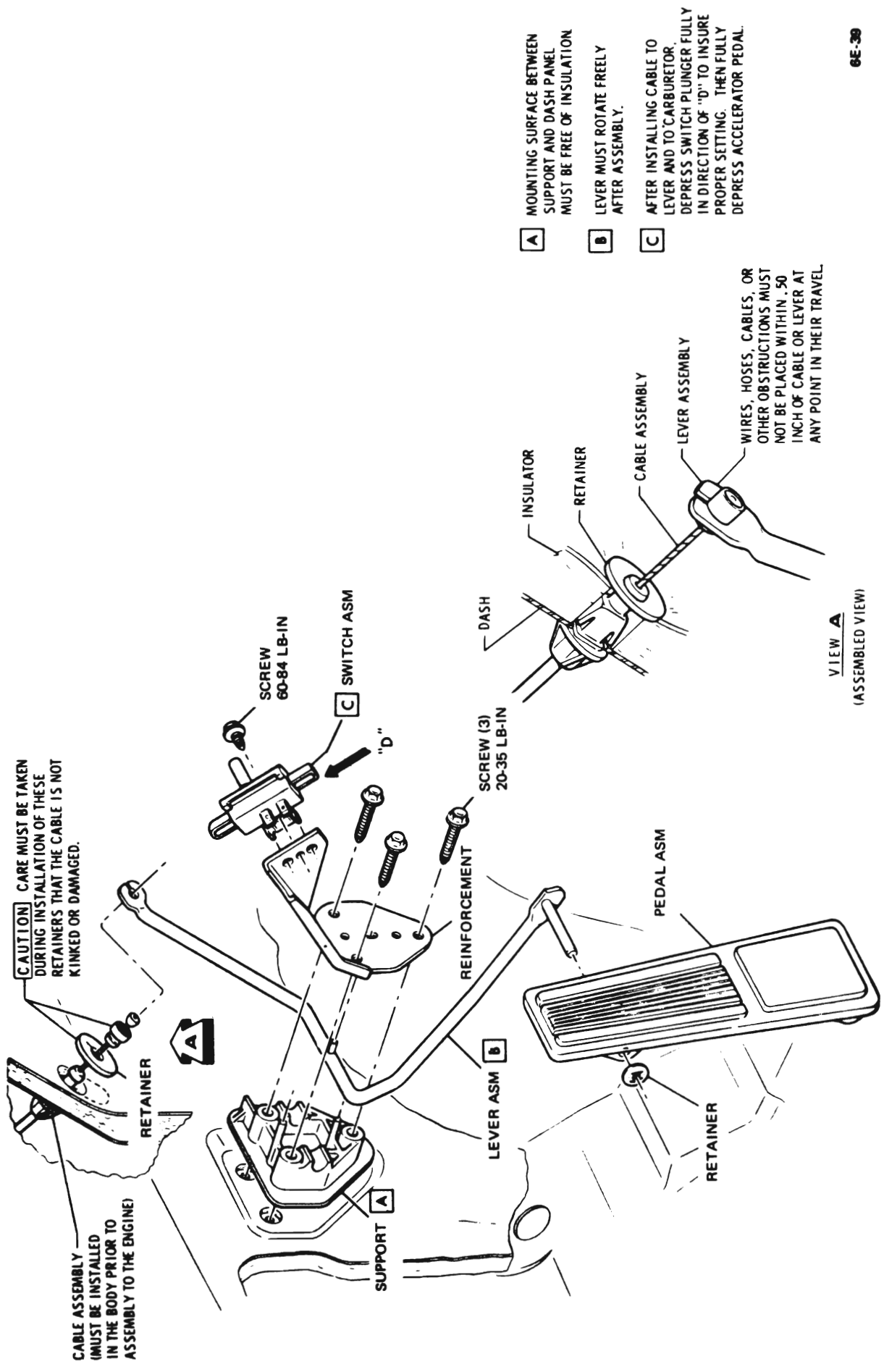

Figure 6E-39 B-C-E Series Throttle Controls Passenger Compartment (455 Engine)

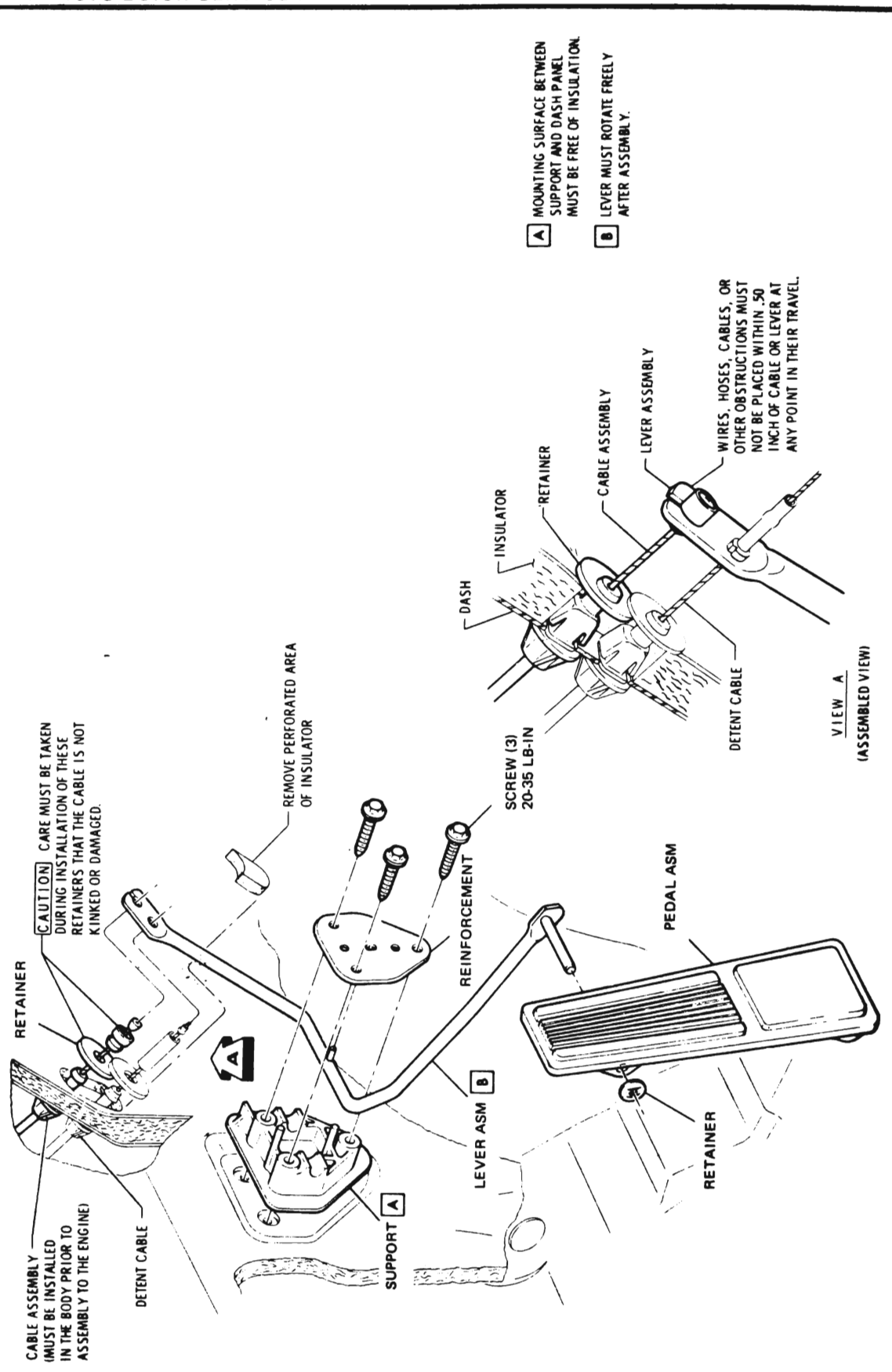

Figure 6E-40 "B" Series Throttle Controls Passenger Compartment (350 Engine)

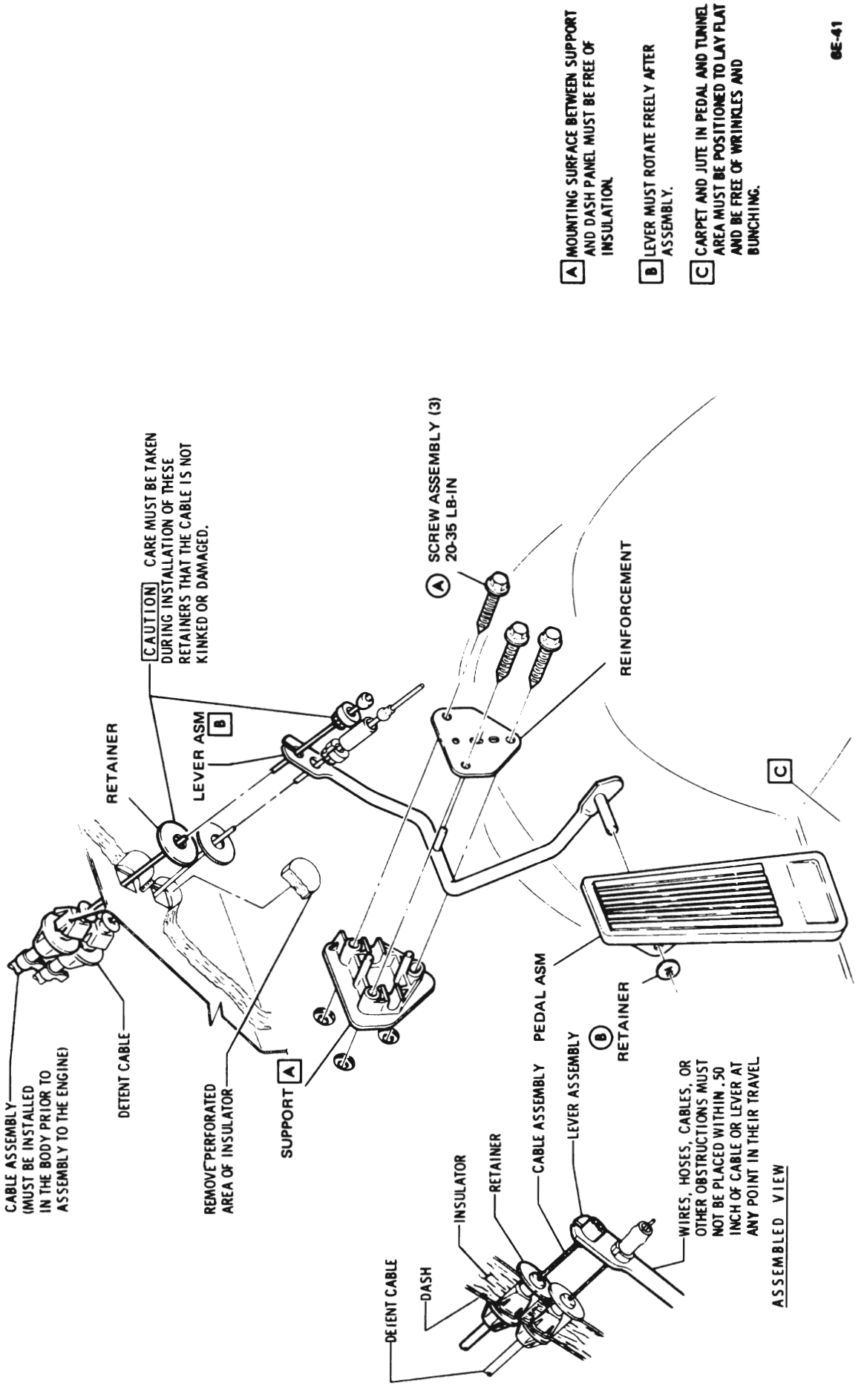

Figure 6E-41 "A" Series Throttle Controls Passenger Compartment (M38 Transmission)

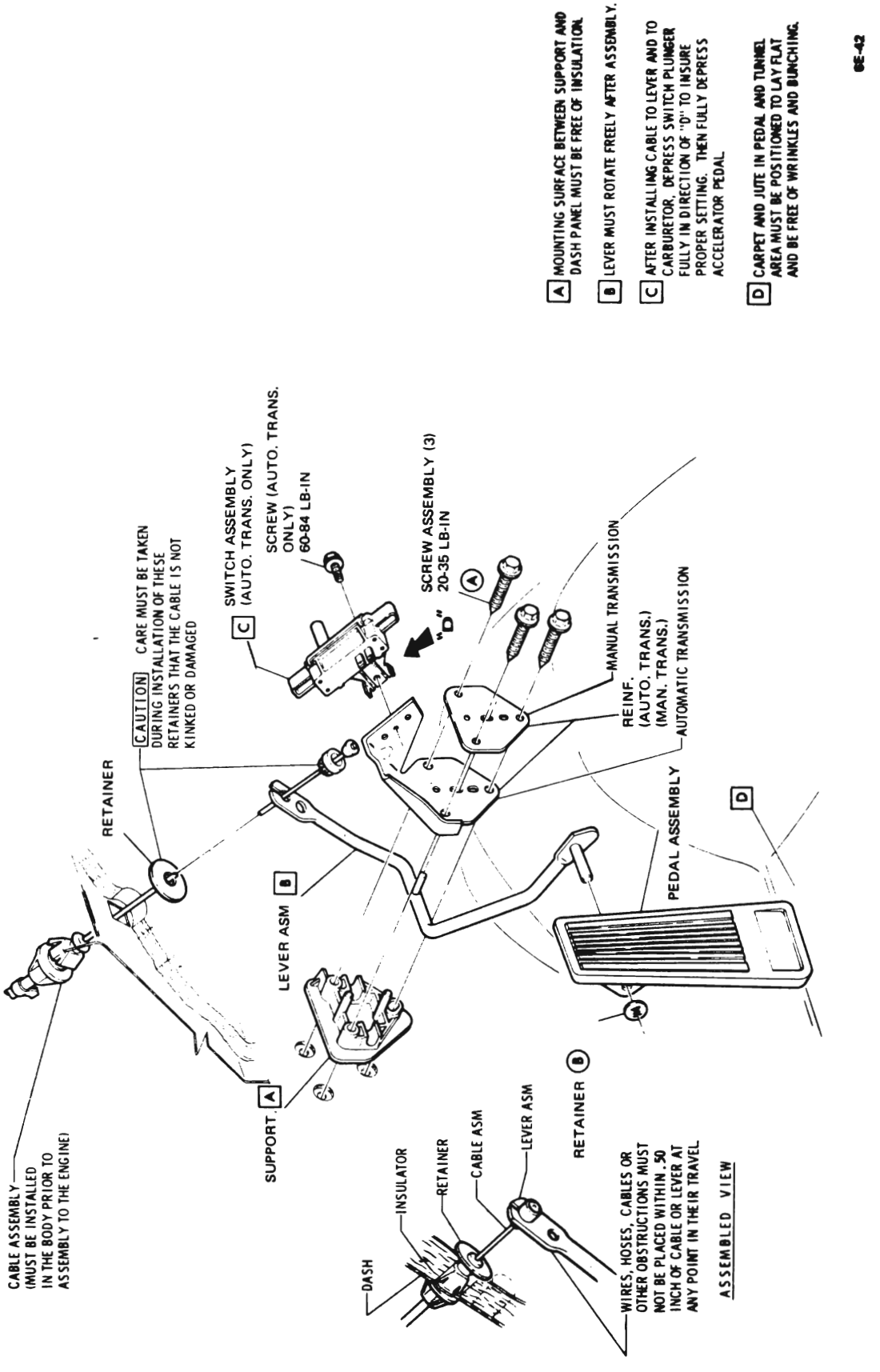

Figure 6E-42 "A" Series Throttle Controls Passenger Compartment (M40, M13, and M20 Transmission)

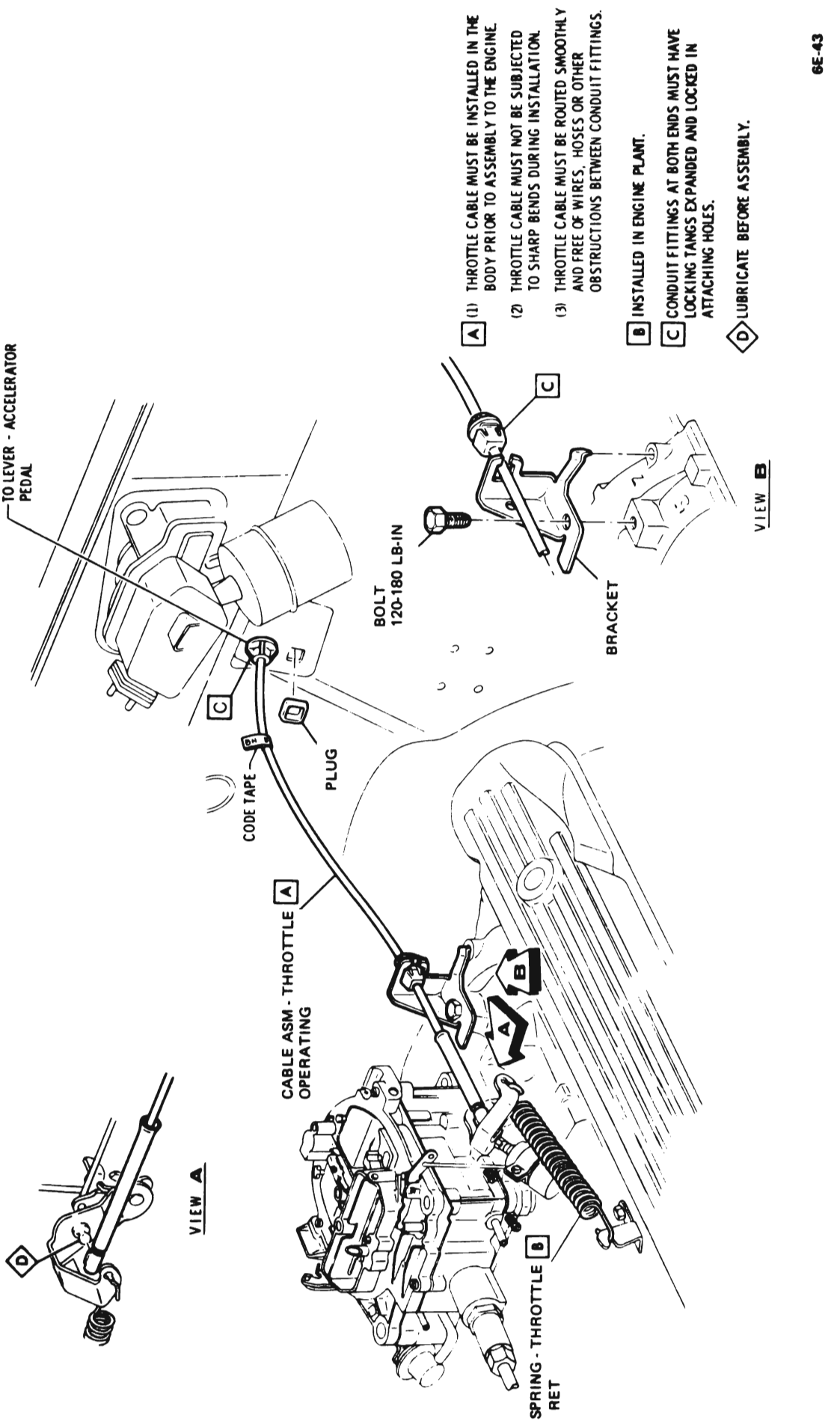

Figure 6E-43 Throttle Controls Engine Compartment 455 Engine (All Series)

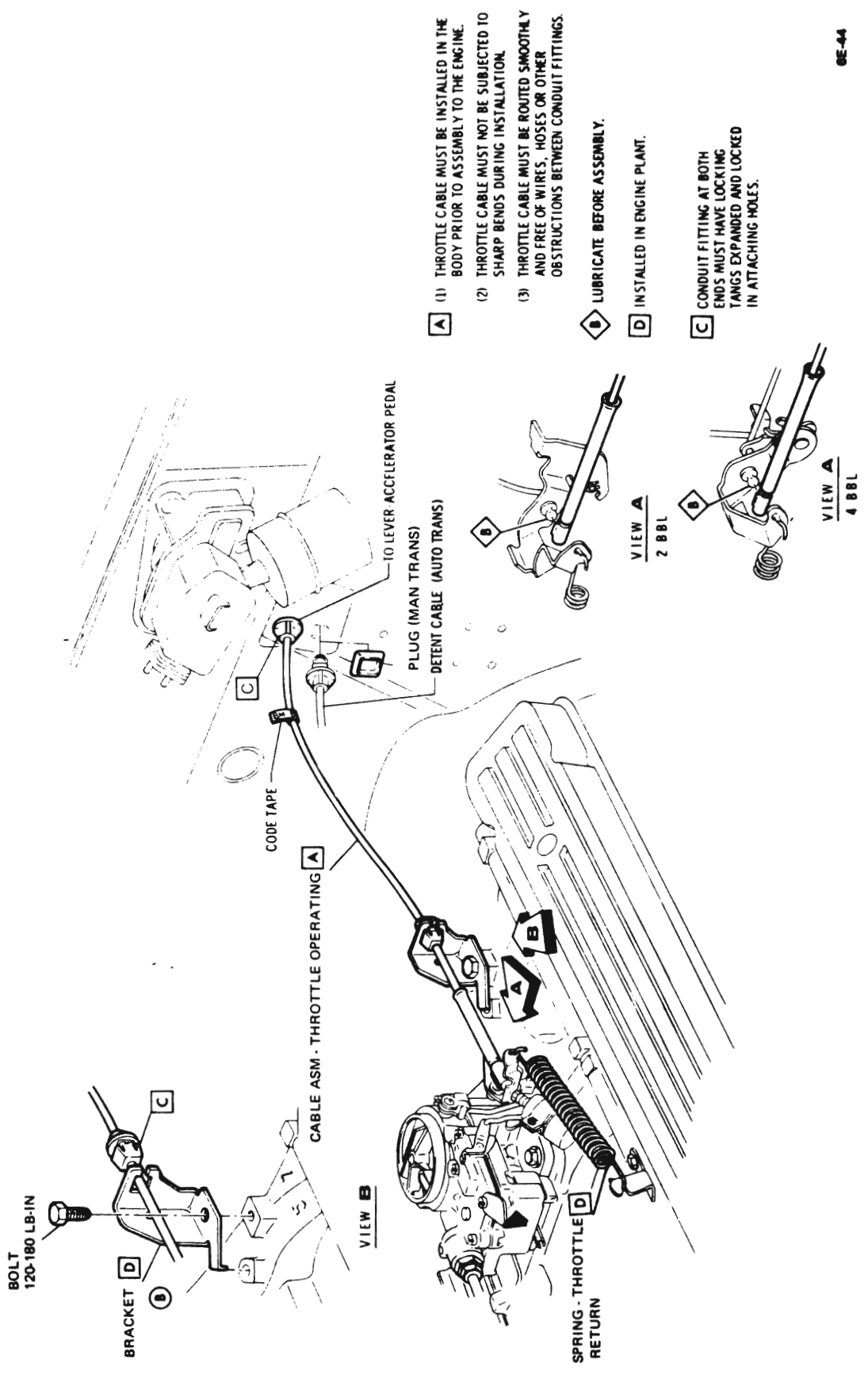

Figure 6E-44 Throttle Controls Engine Compartment 350 Engine (All Series)