ROCHESTER 4MV CARBURETOR

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DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

The 1974 model 4MV for Buick is similar in operation to the 1973 models, except for the following:

The 1974 Quadrajet carburetors have been recalibrated to assist meeting the exhaust emission requirements.

A new three-step fast idle cam is used for improved warm-up on 350 V-8 engines.

The surface of the primary throttle shaft and accelerator pump lever is coated with teflon for smoother operation of these working parts and a heavier pump return spring is used for increased throttle closing tension.

On California models for the 350 V-8 engine, a tube is added to the rear of the float bowl, below the Hot Idle Compensator cavity, as the vacuum source for the dual diaphragm Exhaust Gas Recirculation (E.G.R.) valve.

On 1974 model carburetors, the idle mixture screw and limiter are new. A new plastic limit cap permits limited mixture adjustment. Adjustments should be made only at the 24,000 mile point. See TUNE-UP SECTION for proper idle mixture adjustment procedure.

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. See Figure 6E-41.

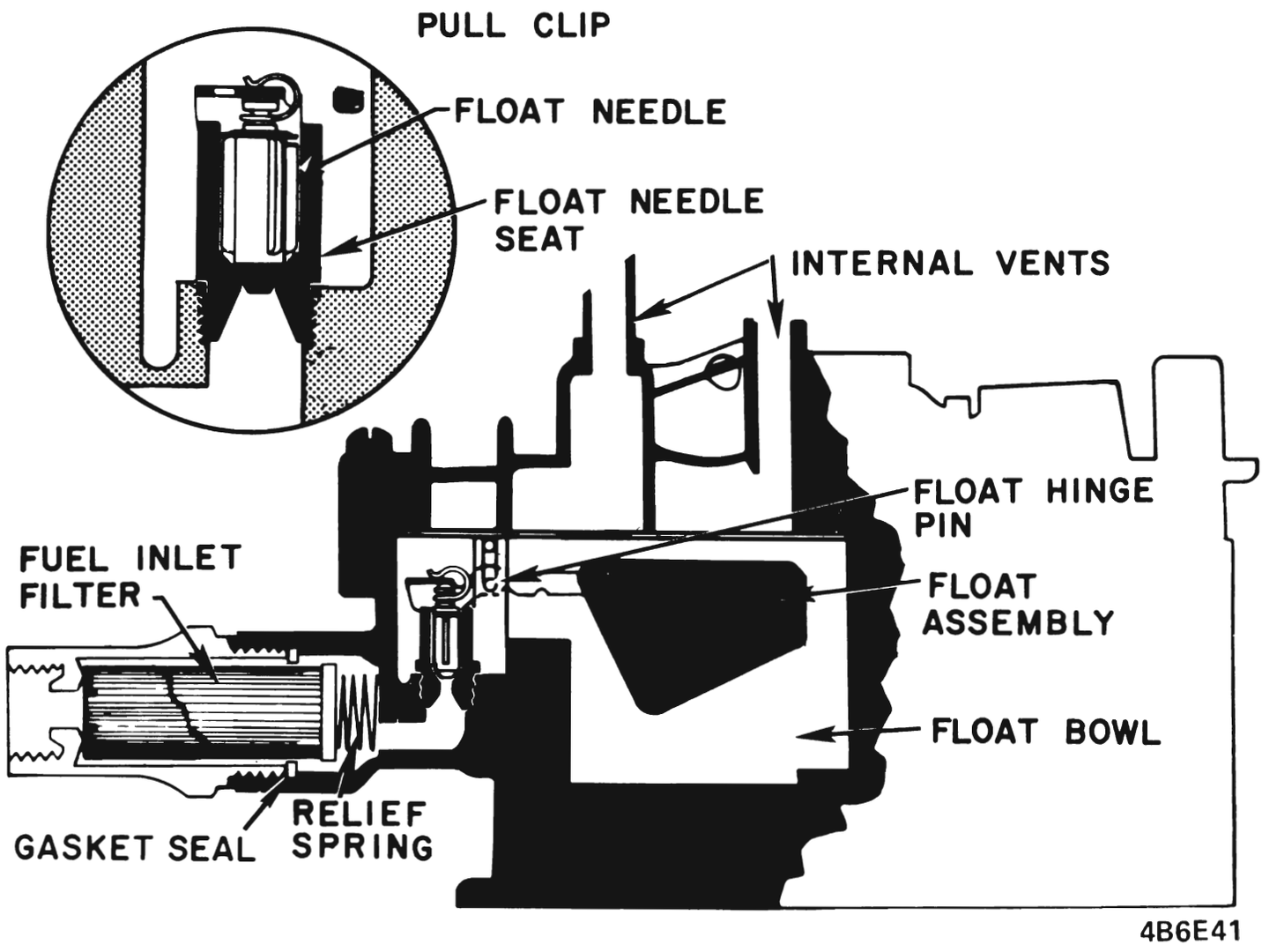

Figure 6E-41 Float System

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.

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.

The carburetor models used on the larger engines for 1974 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-42.

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-43.

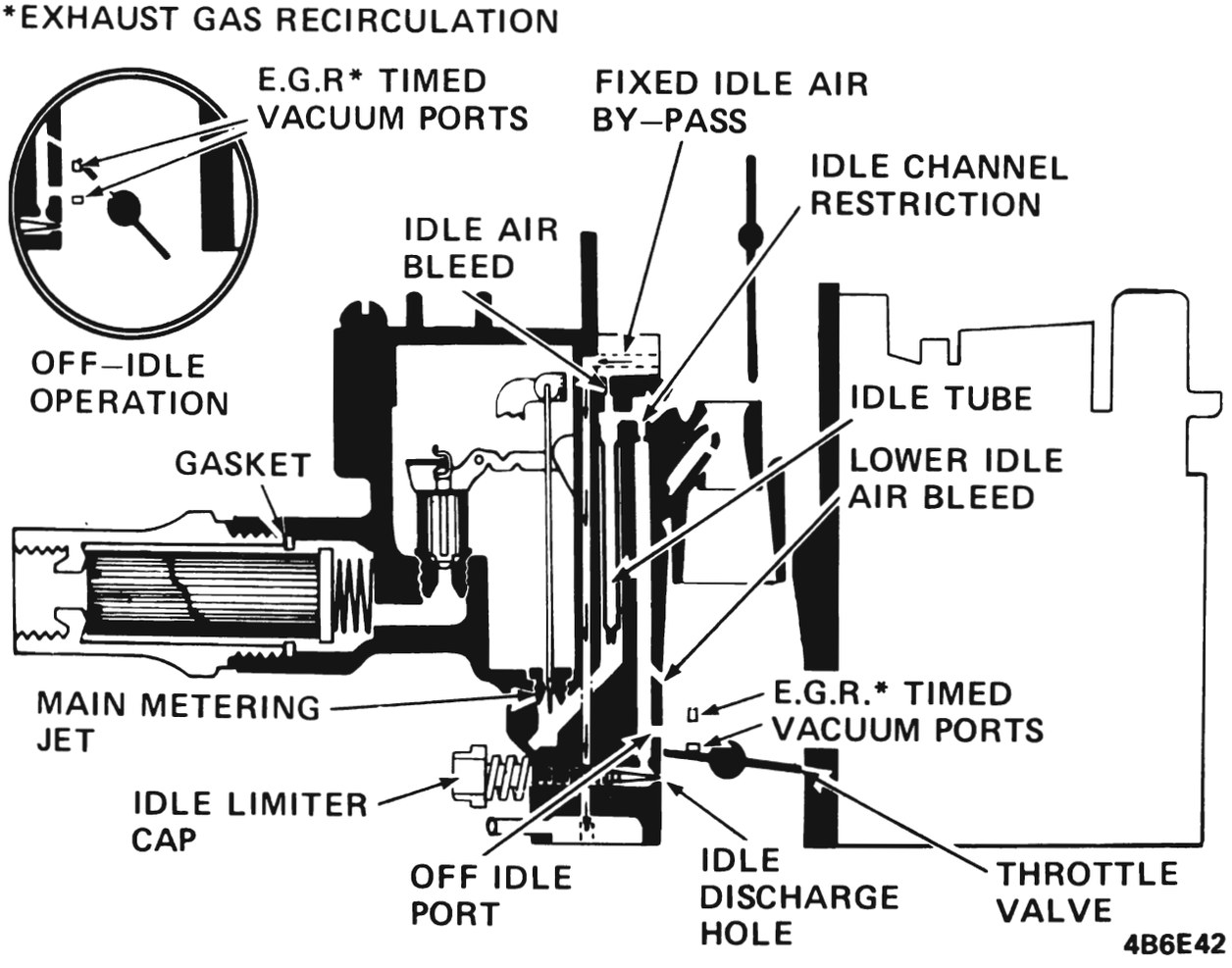

Figure 6E-42 Idle System

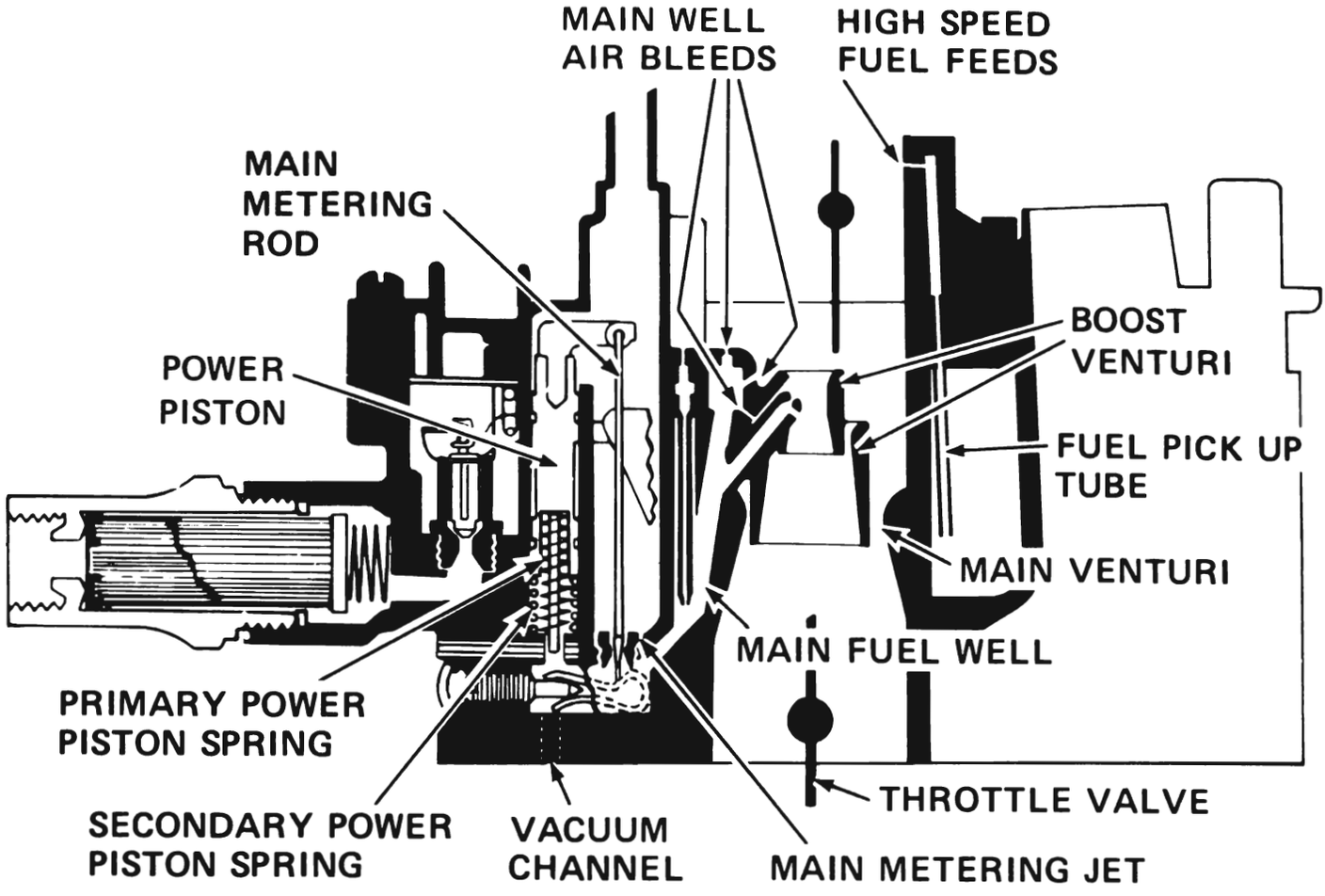

Figure 6E-43 Main Metering System

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-44.

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.

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

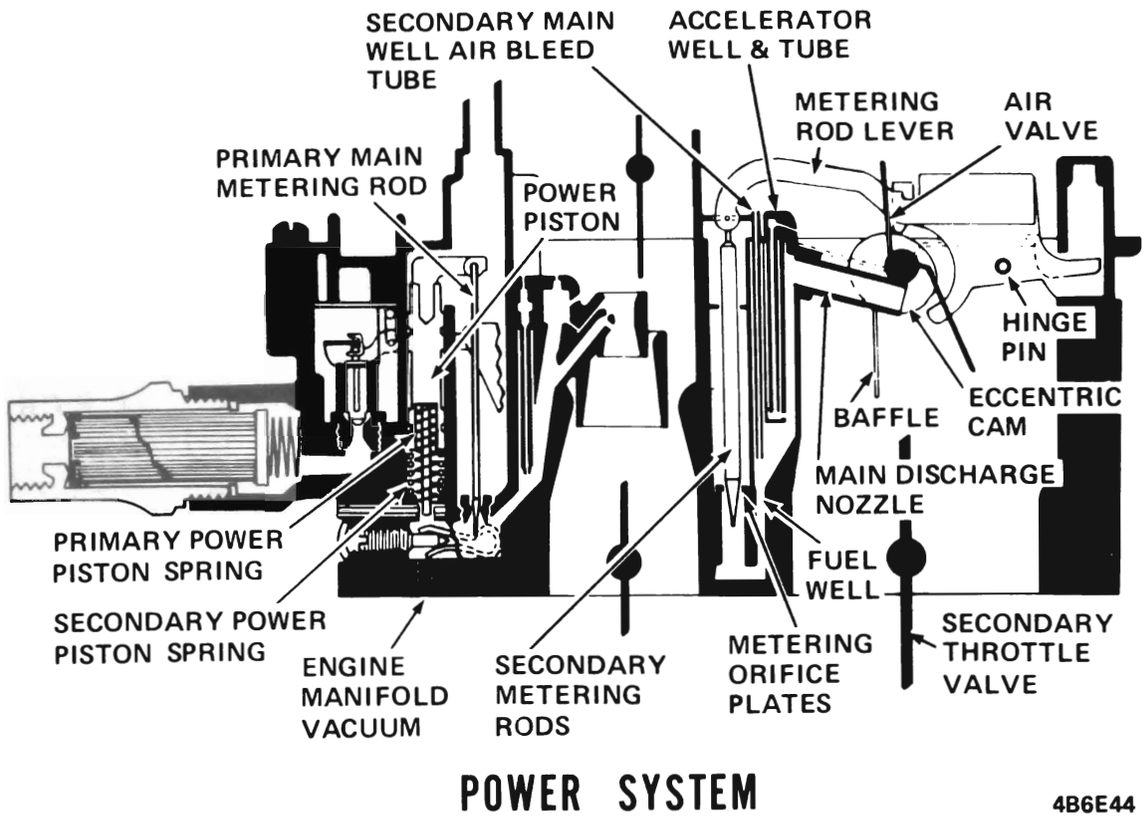

Figure 6E-44 Power System

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. See Figure 6E-46.

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.

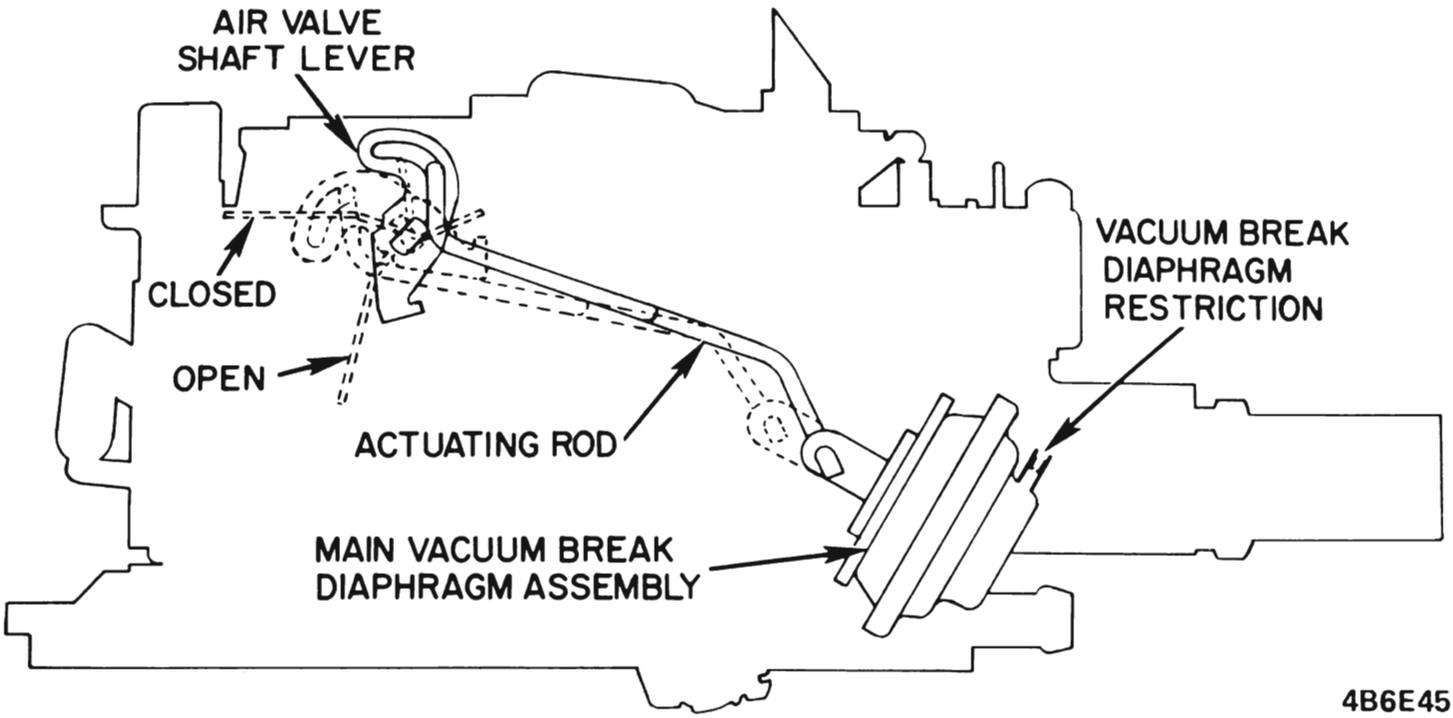

Figure 6E-45 Air Valve Dash Pot Operation

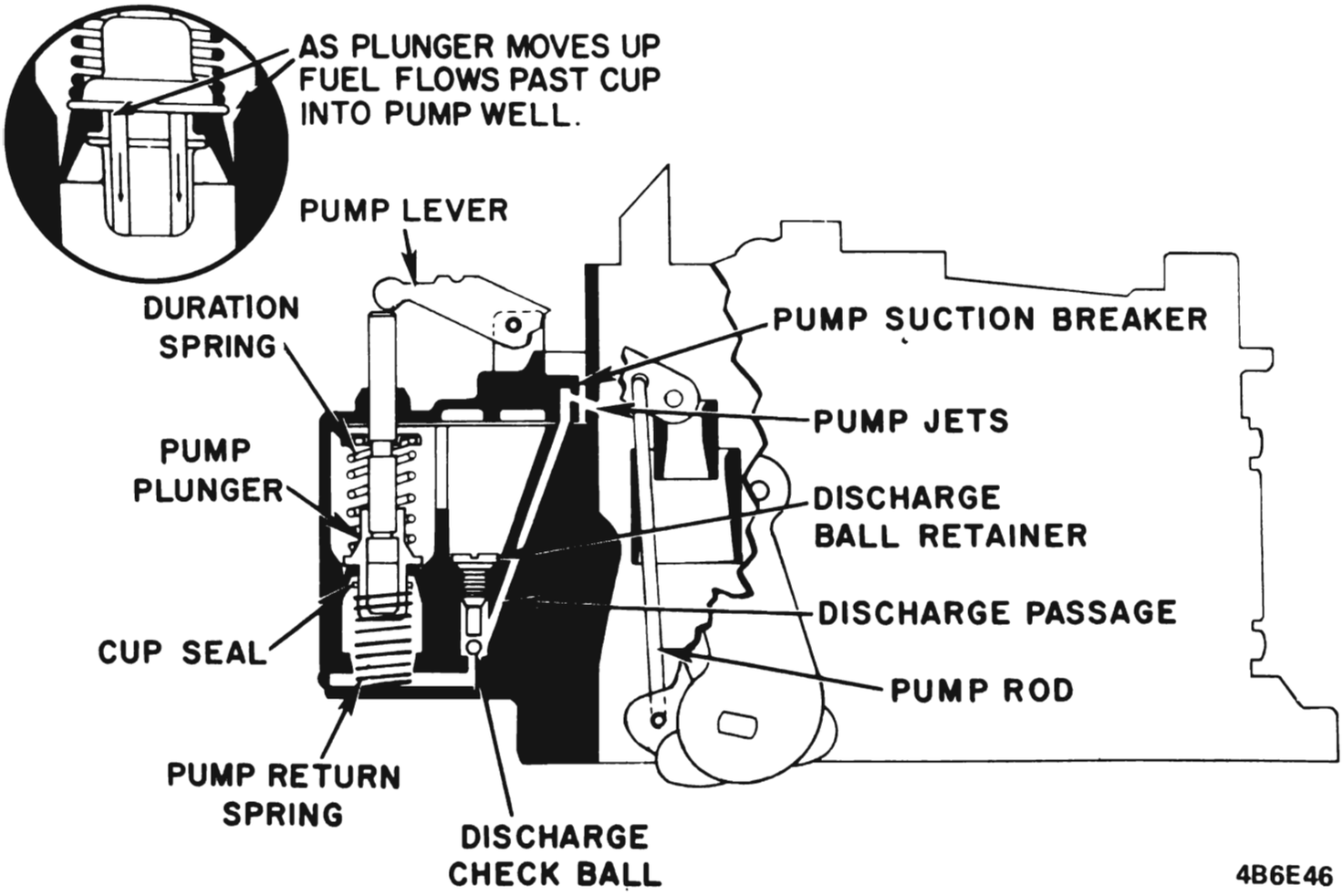

Figure 6E-46 - Accelerator Pump System

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-47.

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.

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

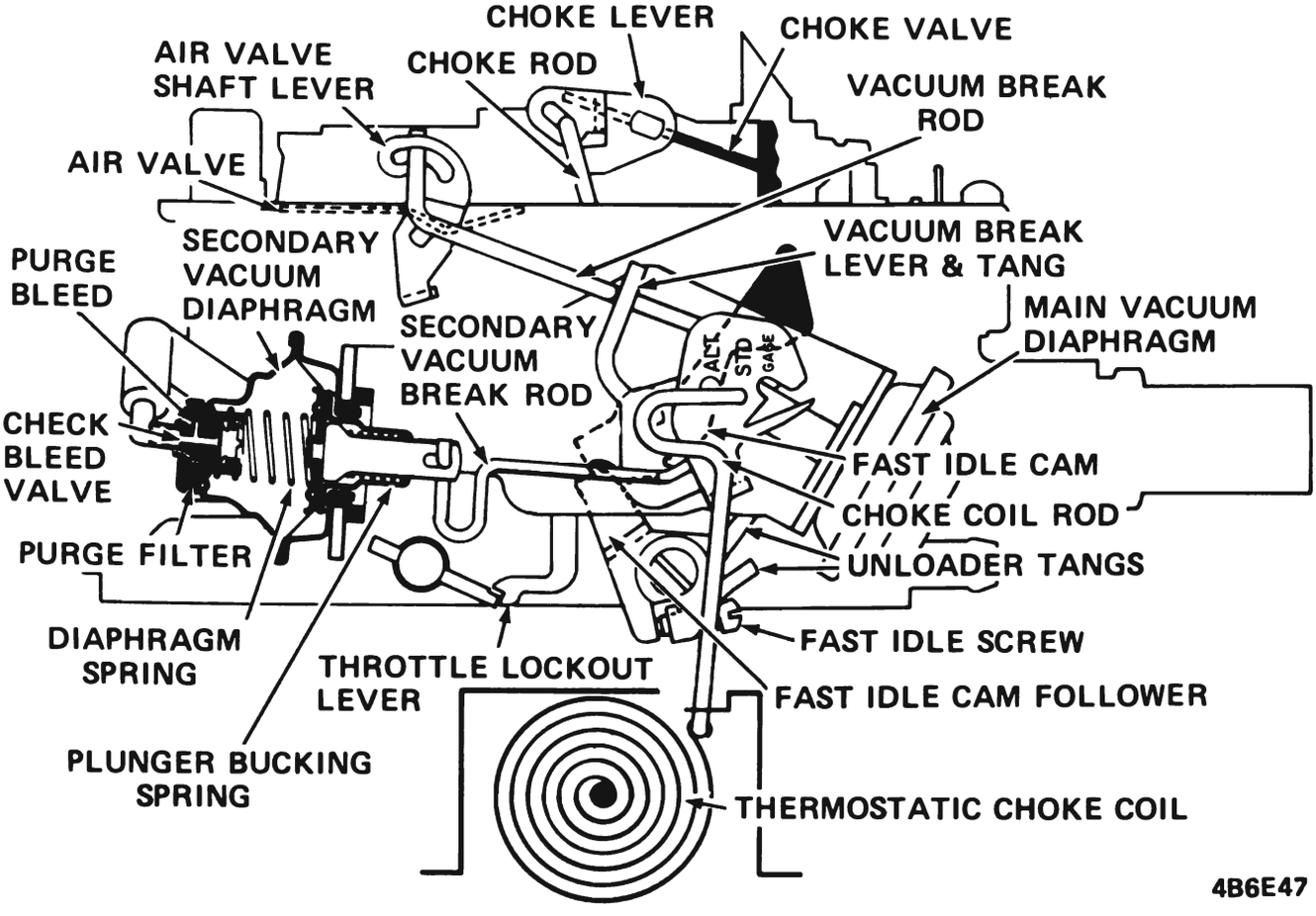

Figure 6E-47 - Choke System

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-48

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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.

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.

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. See Figure 6E-49.

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

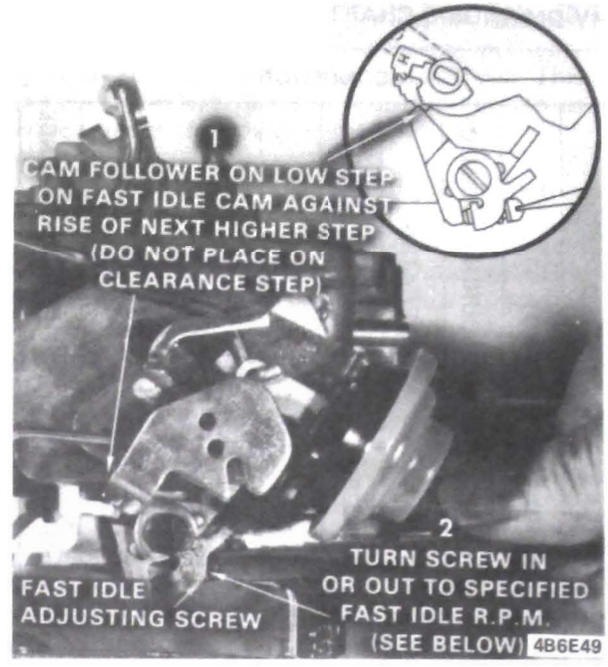

Figure 6E-49 Fast Idle Adjustment

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-50.

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-51.

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

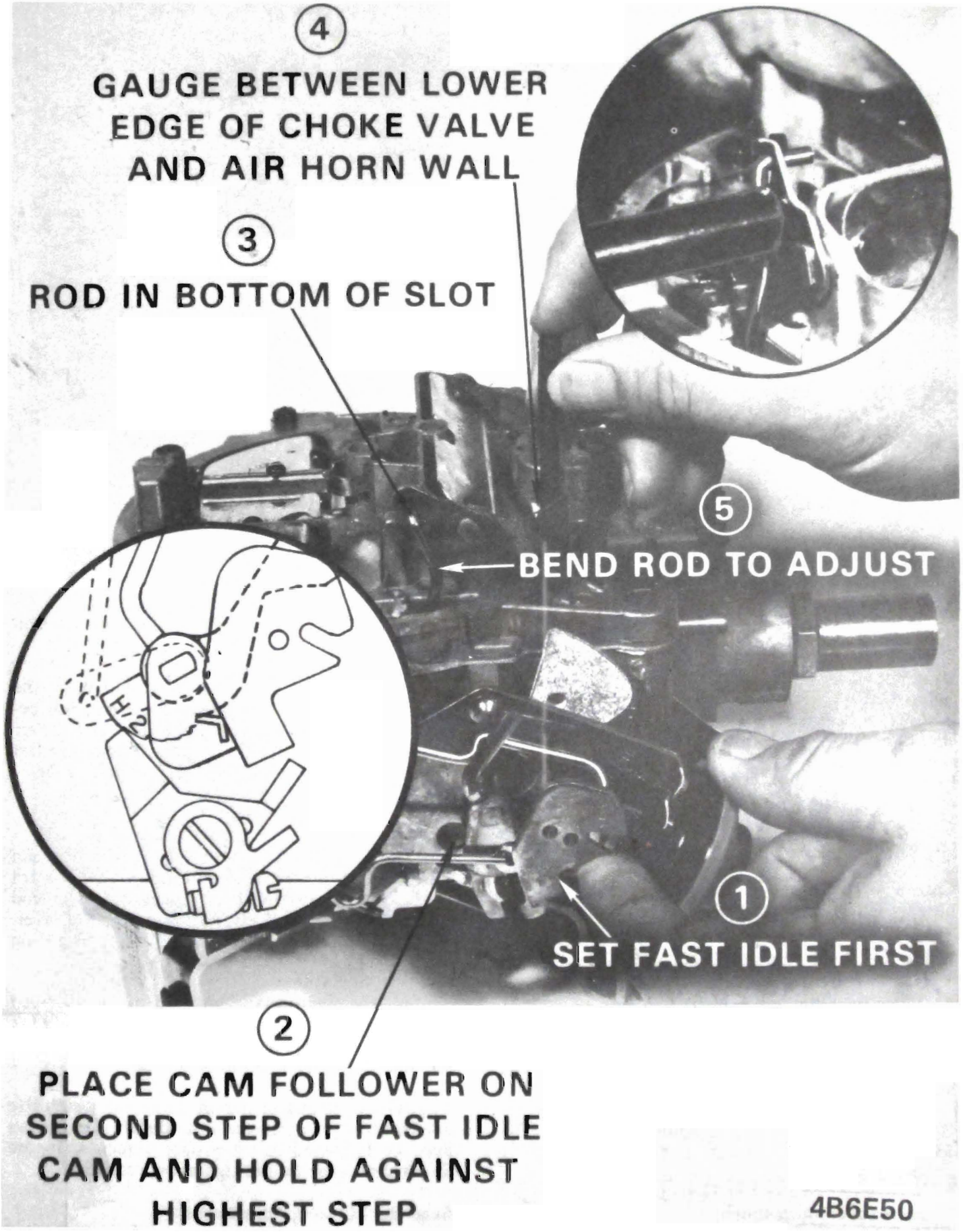

Figure 6E-50 - Choke Rod Adjustment

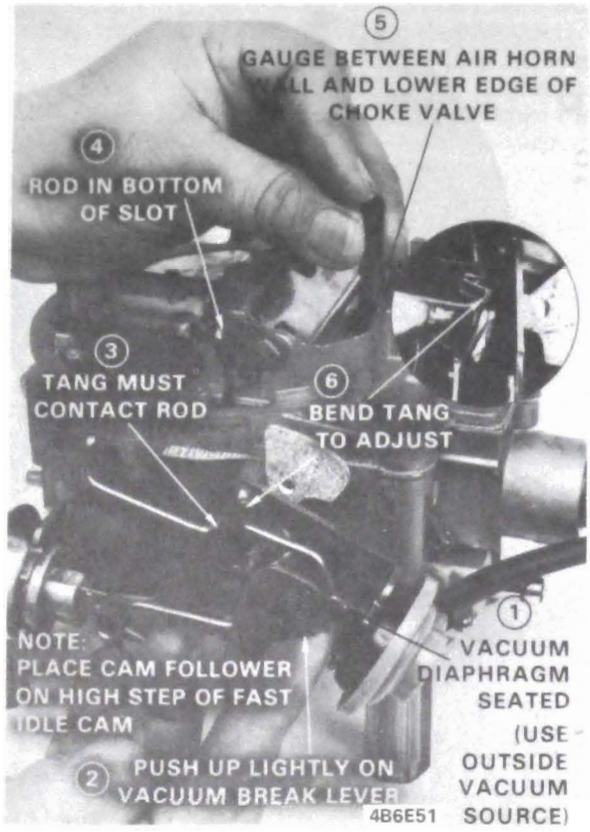

Figure 6E-51 - Primary Vacuum Break Adjustment

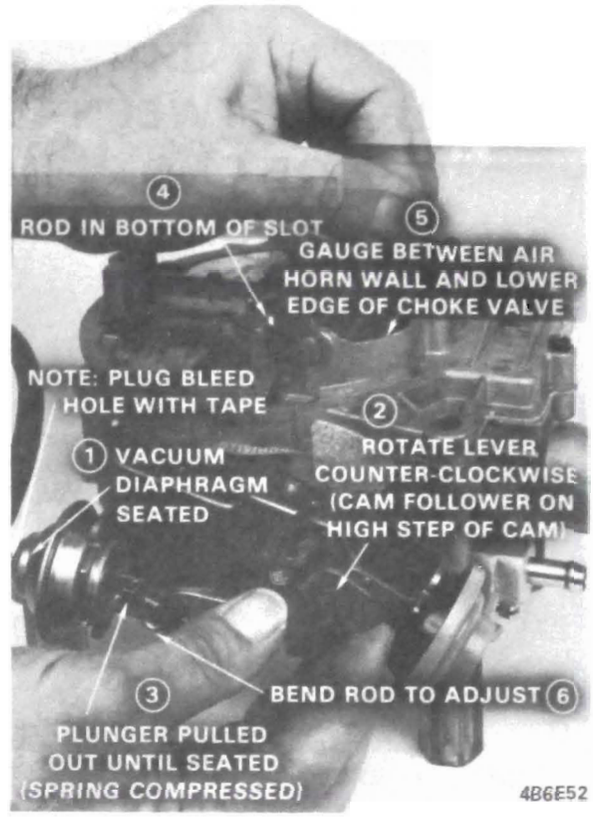

Figure 6E-52 - Secondary Vacuum Break Adjustment

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-52. *Make sure the tape is removed after adjustment and the rubber covered filter element installed on the vacuum break tube.*

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-53.

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-54.

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-55.

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-56 shows the proper tightening sequence.

Secondary Closing Adjustment

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

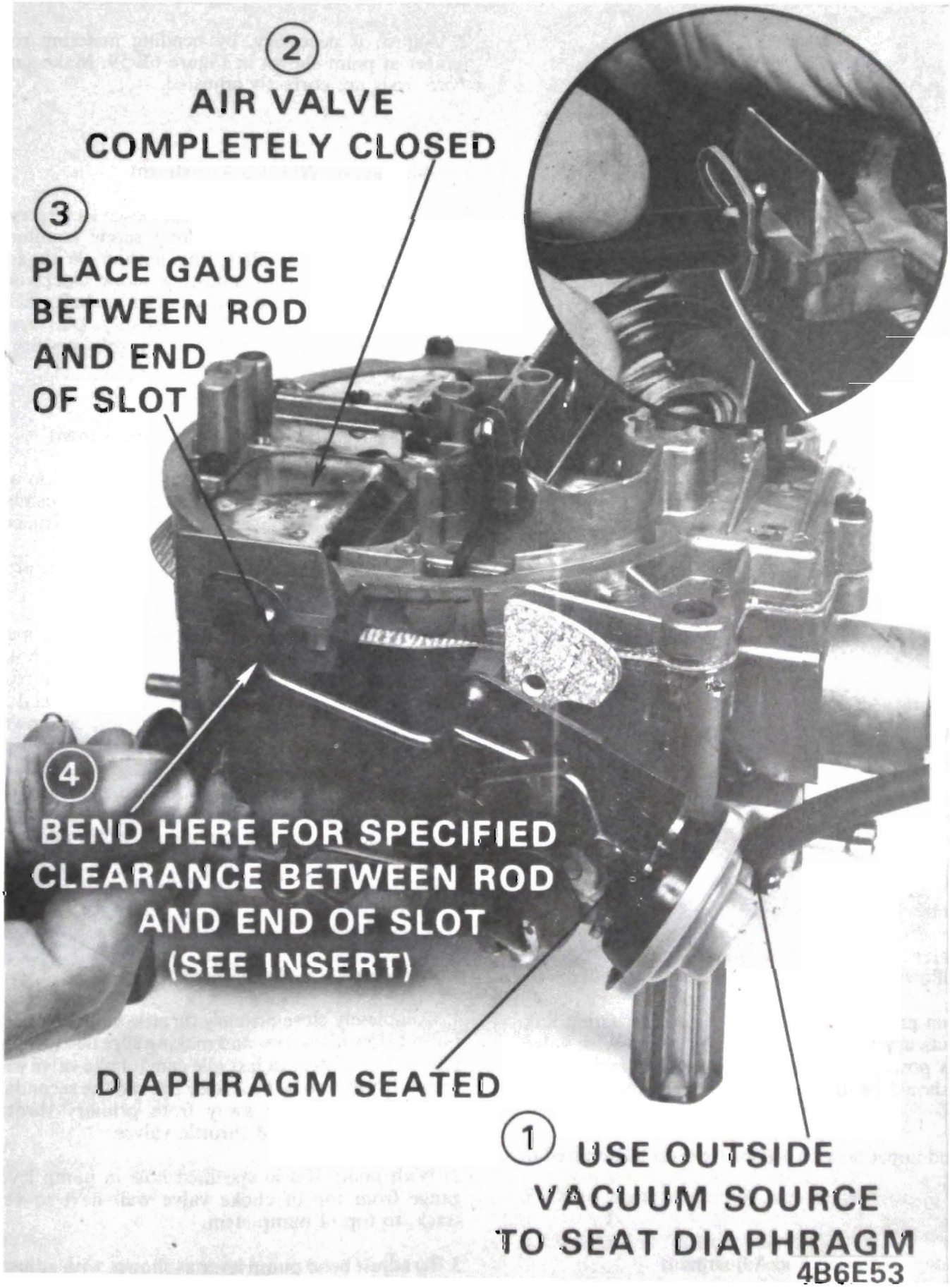

Figure 6E-53 Air Valve Dash Pot Adjustment

Figure 6E-54 Choke Unloader Adjustment

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-57.

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 this position, clearance between link and middle tang should be .070 inch. See upper part of Figure 6E-58.

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-59.

2. Adjust, if necessary, by bending metering rod hanger at point shown in Figure 6E-59. 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-60.

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 Figures 6E-61 and 6E-62.

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-63.

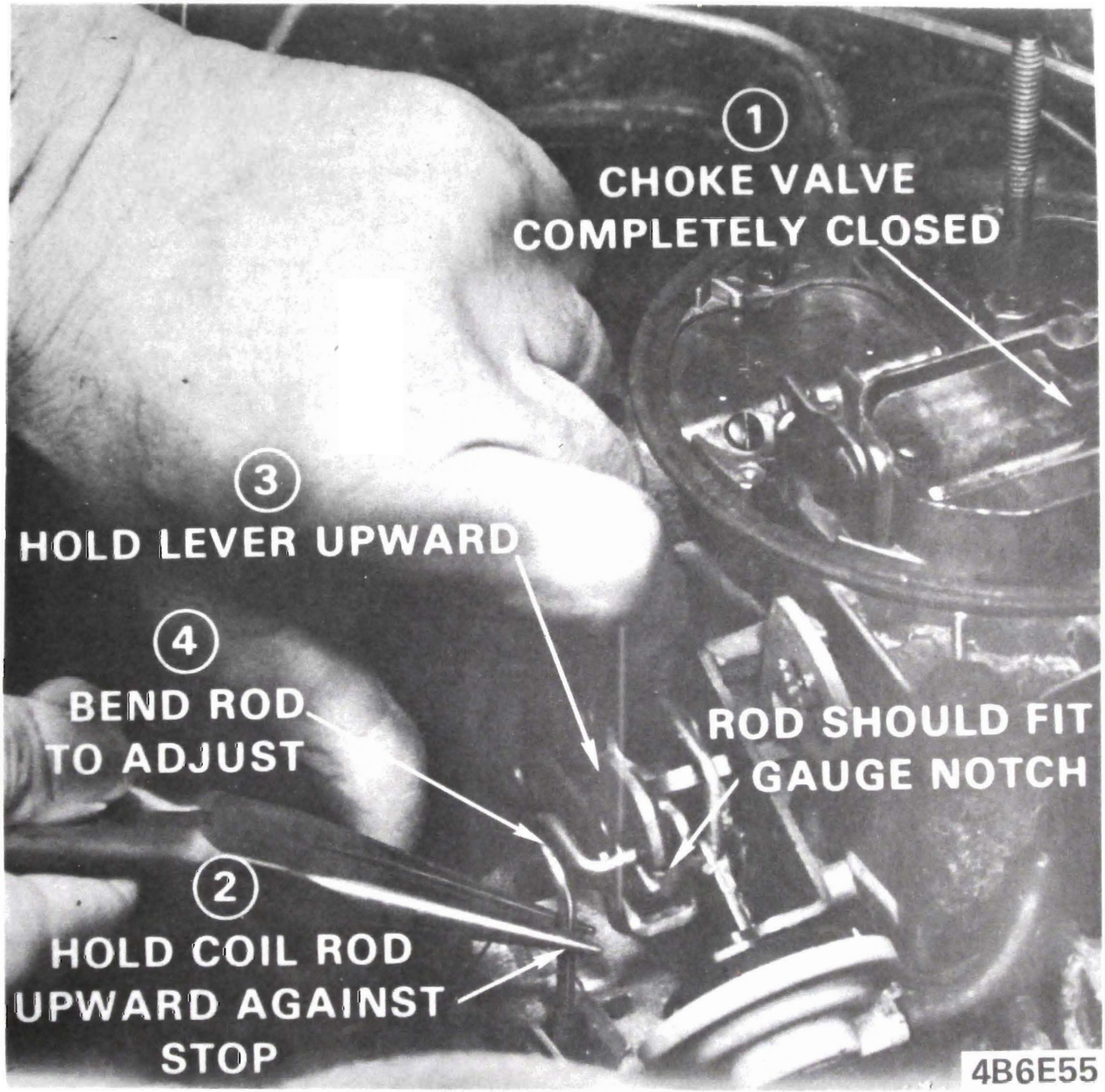

Figure 6E-55 Choke Coil Rod Adjustment

MAJOR REPAIR

ROCHESTER 4MV CARBURETOR REMOVAL AND INSTALLATION

Removal

1. Remove air cleaner.
2. Disconnect fuel line fitting at carburetor.
3. Remove choke coil rod clip and disconnect rod.
4. Disconnect throttle cable.
5. Disconnect vacuum lines to carburetor.
6. Disconnect cruise control bead chain, if equipped.
7. Disconnect throttle springs.
8. Remove four (4) carburetor-to-manifold bolts.

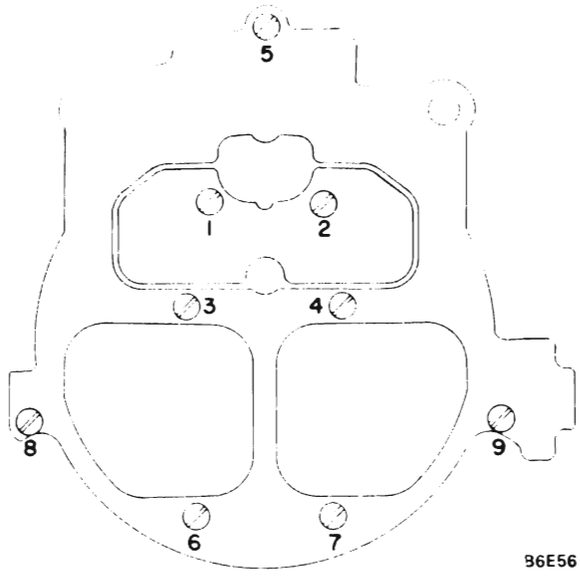

Figure 6E-56 - Air Horn Screw Tightening Sequence

Figure 6E-57 - Secondary Closing Adjustment

Installation

1. Install carburetor hose gasket and install carburetor.

2. Connect throttle springs.

Figure 6E-58 - Secondary Opening Adjustment

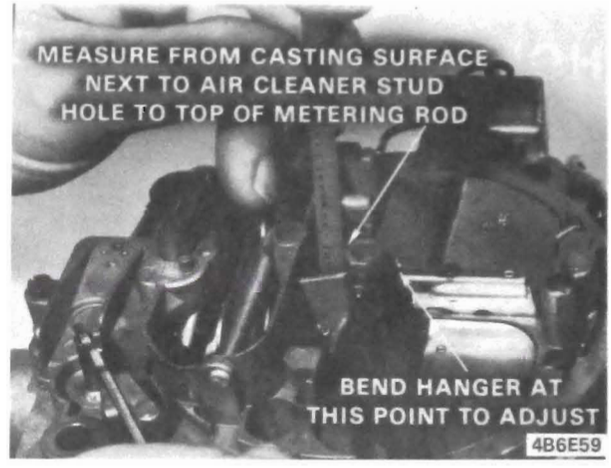

Figure 6E-59 - Secondary Metering Rod Adjustment

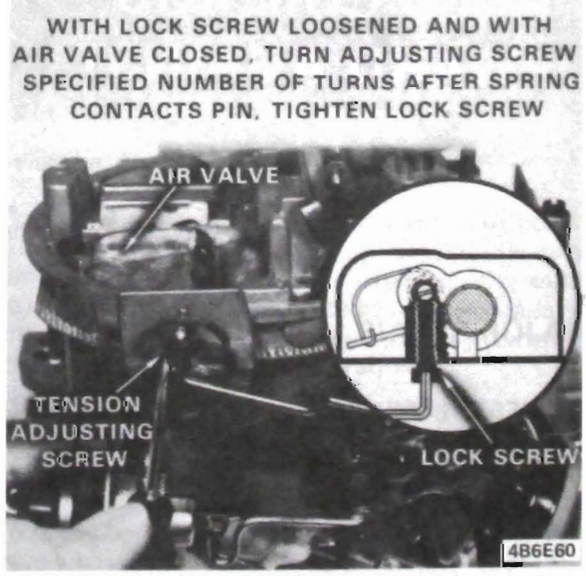

Figure 6E-60 - Air Valve Spring Wind-Up Adjustment

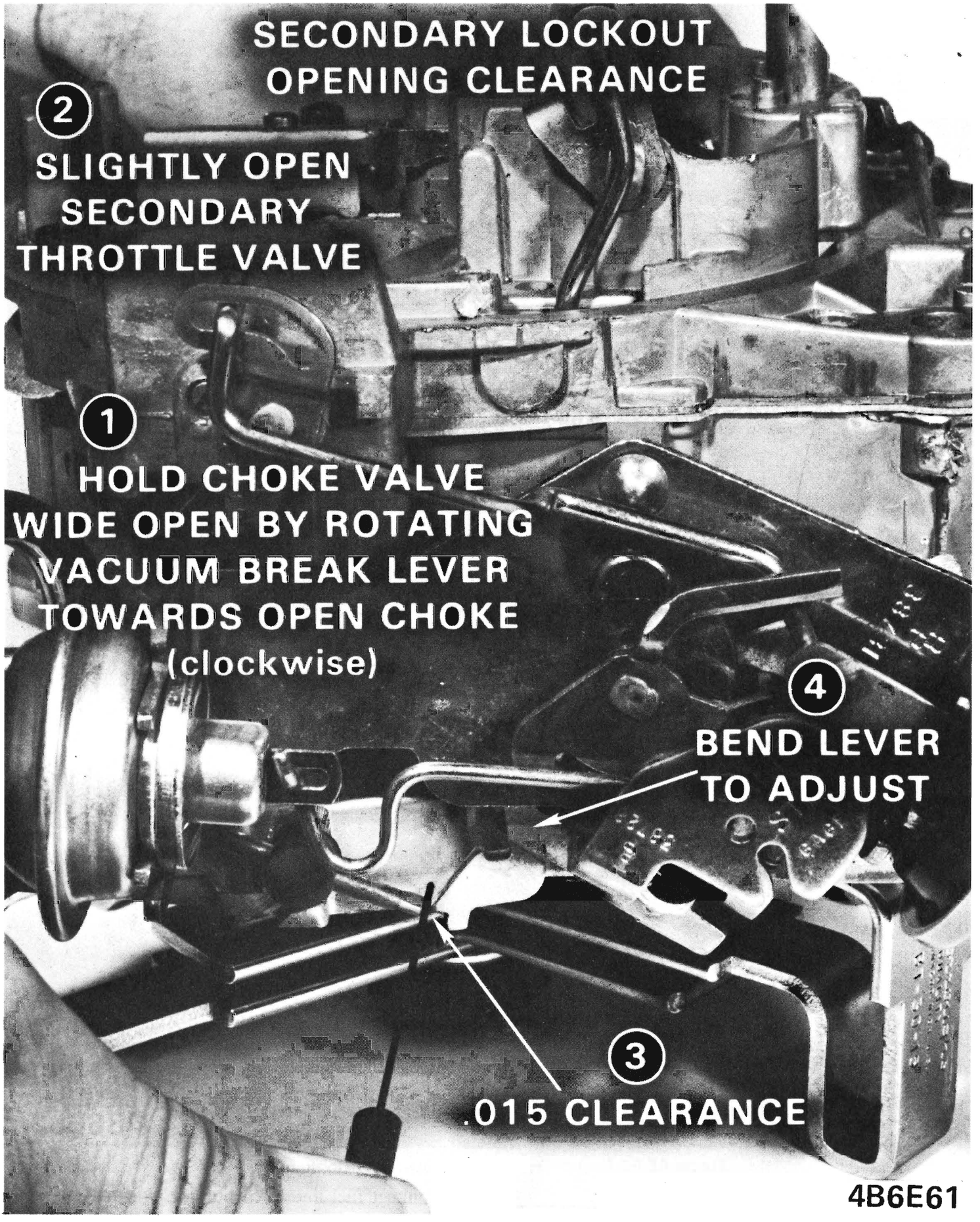

Figure 6E-61 - Secondary Lockout Adjustment

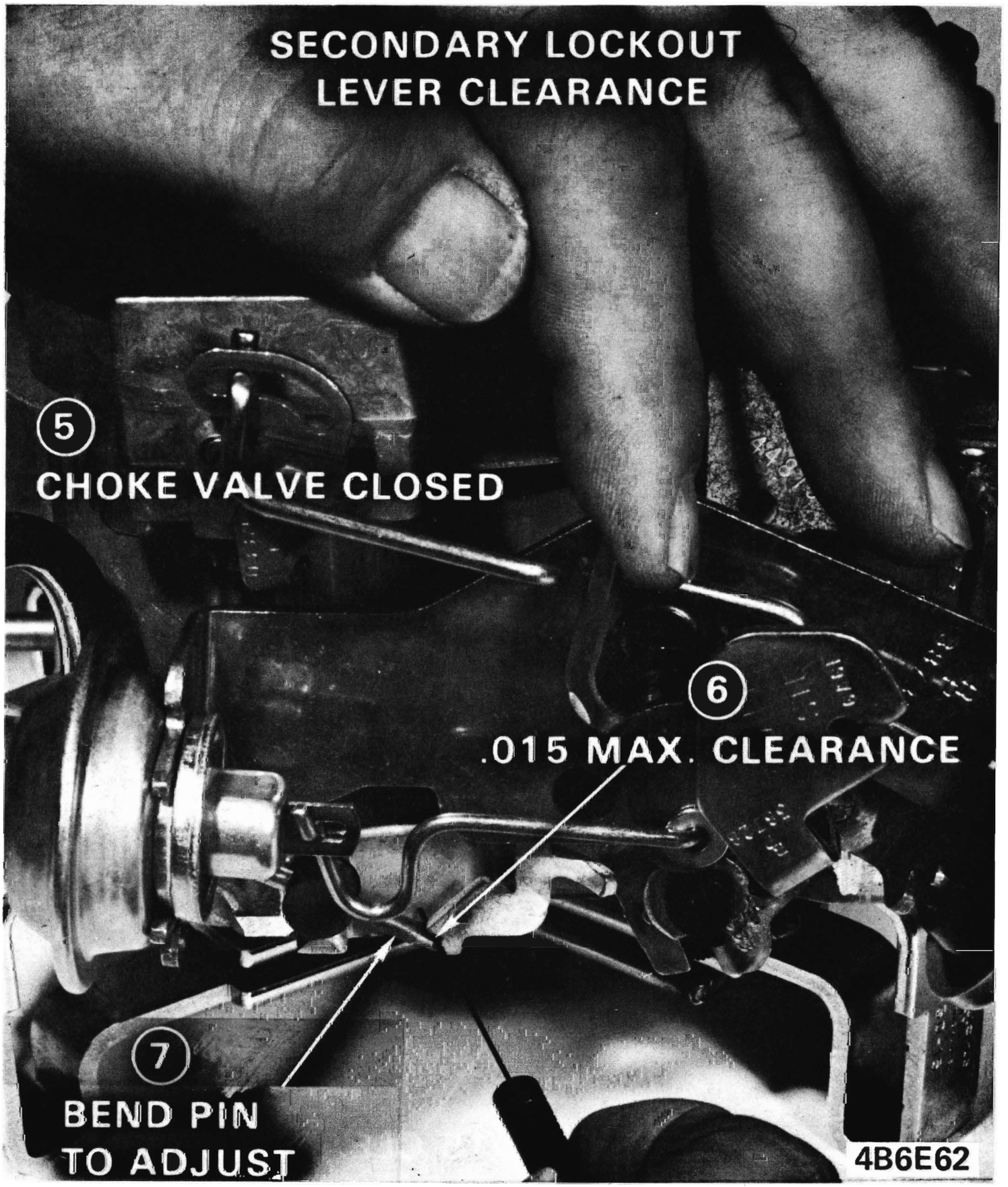

Figure 6E-62 Secondary Lockout Adjustment Continued

3. Connect cruise control bead chain.
4. Connect vacuum lines to carburetor.
5. Connect throttle cable.
6. Connect choke coil rod to carburetor.
7. Connect fuel line to carburetor.
8. Replace air cleaner and connect vacuum hoses.

DISASSEMBLY, CLEANING AND INSPECTION

Place carburetor on proper holding fixture.

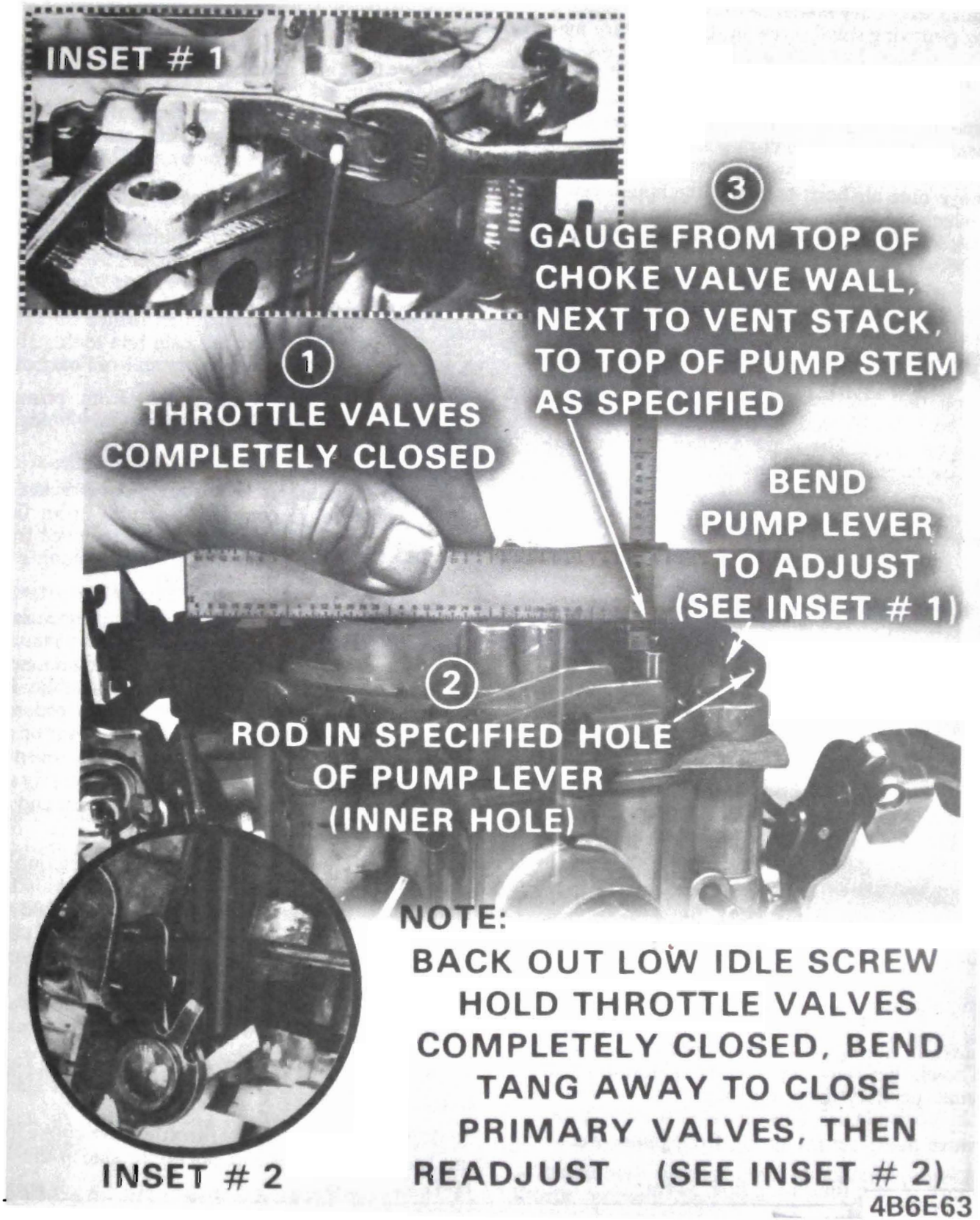

Figure 6E-63 Accelerator Pump Adjustment

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.

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 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.

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 actuating 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-64.

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.

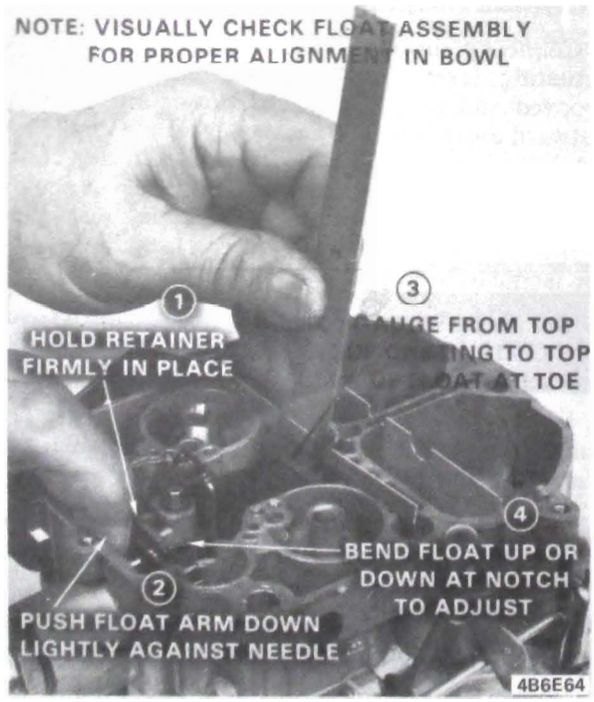

Figure 6E-64 Float Level Adjustment

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

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.

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-56 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 Engine A-B-C-E Series Non California	455 Engine A-B-C-E Series California And B-C-E Series 455 Stage I	455 Stage Engine A Series	455 Engine A-B-C-E Series Non California With Altitude Option	350 Engine A-B Series Non California	350 Engine A-B Series California	350 Engine X-Series Non California	350 Engine X-Series California
Carburetor Number	7044240	7044540	7044242	7044241	7044244	7044544	7044546	7044246
Model Designation	4MV	4MV	4MV	4MV	4MV	4MV	4MV	4MV
Number of Barrels	4	4	4	4	4	4	4	4
Throttle Bore Primary	1-3/8"	1-3/8"	1-3/8"	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"	2-1/4"	2-1/4"	2-1/4"
Small Venturi	9/32"	9/32"	9/32"	9/32"	9/32"	9/32"	9/32"	9/32"
Middle Venturi	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
Large Venturi	1-7/32"	1-7/32"	1-7/32"	1-7/32"	1-3/32"	1-3/32"	1-3/32"	1-3/32"
Pull Over Orifice	.026"	N.A.	N.A.	N.A.	.026"	.034"	.034"	.026"
Main Metering Jet	.073"	.073"	.075"	.071"	.068"	.068"	.068"	.068"
Metering Rod "Pri" Prod.	.049"	.049"	.051"	.042"	.045"	.045"	.045"	.045"
Altitude (Secondary Rods)	7048092	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Metering Rod Secondary	CT	CT	CV	DE	CZ	CZ	CZ	CZ
Idle Needle Hole	.086"	.086"	.086"	.086"	.075"	.075"	.075"	.075"
Spark Hole	.045" x.151"	.045" x .151"	.045" x .151"	.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-.034"	2 - .028"	2 -.028"	2-.028"	2-.028"
Fast Idle Cam Number	7047705	7047705	7044873	7047705	7048980	7048980	7048980	7048980
Choke Assembly Number	7043191	7043191	7043190	7043190	7044192	7044192	7044192	7044192
Choke Coil Rod Adjustment	Gauge Slot	Gauge Slot	Gauge Slot	Gauge Slot	Half of rod diameter below gauge slot	Half of rod diameter below gauge slot	Half of rod diameter below gauge slot	Half of rod diameter below gauge slot
Choke Hole Setting	Std. Hole	Std. Hole	Std. Hole	Alt. Hole	Std. Hole	Std. Hole	Std. Hole	Std. Hole
Float Level	13/32"	13/32"	13/32"	13/32"	15/32"	15/32"	15/32"	15/32"
Pump Rod Location	Inner	Inner	Inner	Inner	Outer	Outer	Outer	Outer
Pump Adjustment	1/4"	1/4"	1/4"	1/4"	.306"	.306"	.306"	.306"
Choke Rod Adjustment	.130"	.130"	.130"	.130"	.130"	.130"	.130"	.130"
Vacuum Break Adjustment Pri.	.215"	.215"	.200"	.215"	.170"	.170"	.170"	.170"
Vacuum Break Adjustment Sec.	.160"	.160"	.180"	.160"	.150"	.150"	.150"	.150"
Air Valve Dash Pot Adjustment	.015"	.015"	.015"	.015"	.015"	.015"	.015"	.015"
Secondary Opening Adjustment	.070"	.070"	.070"	.070"	.070"	.070"	.070"	.070"
Secondary Closing Adjustment	.020"	.020"	.020"	.020"	.020"	.020"	.020"	.020"
Secondary Metering Orifice	53/64"	53/64"	53/64"	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	7/16 of a turn	11/16 of a turn	11/16of a turn	11/16 of a turn	11/16 of a turn

4B6E65

Figure 6E-65 Model 4MV Carburetor Specifications

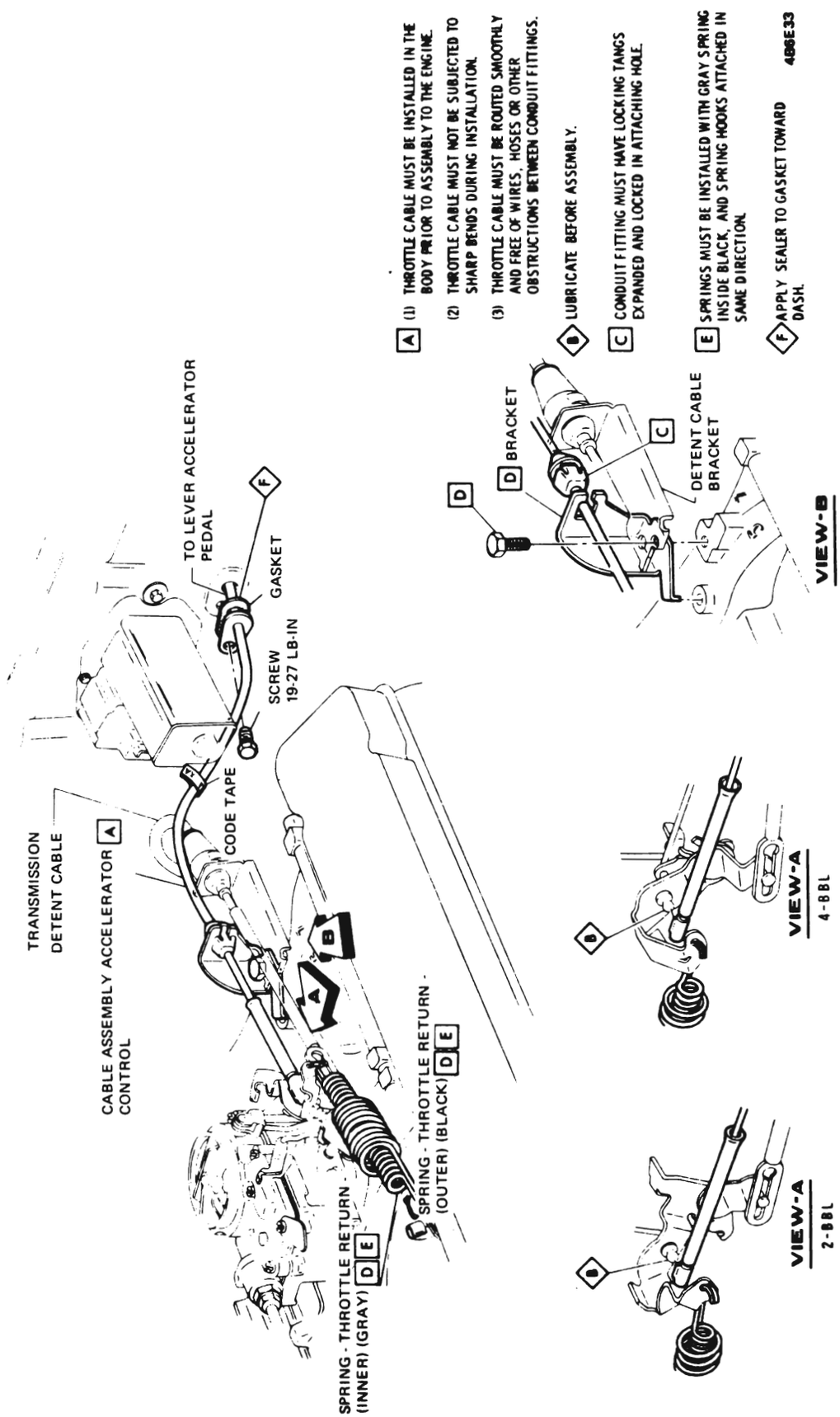

Figure 6E-66 "X" Series Accelerator Controls (350 Engine)

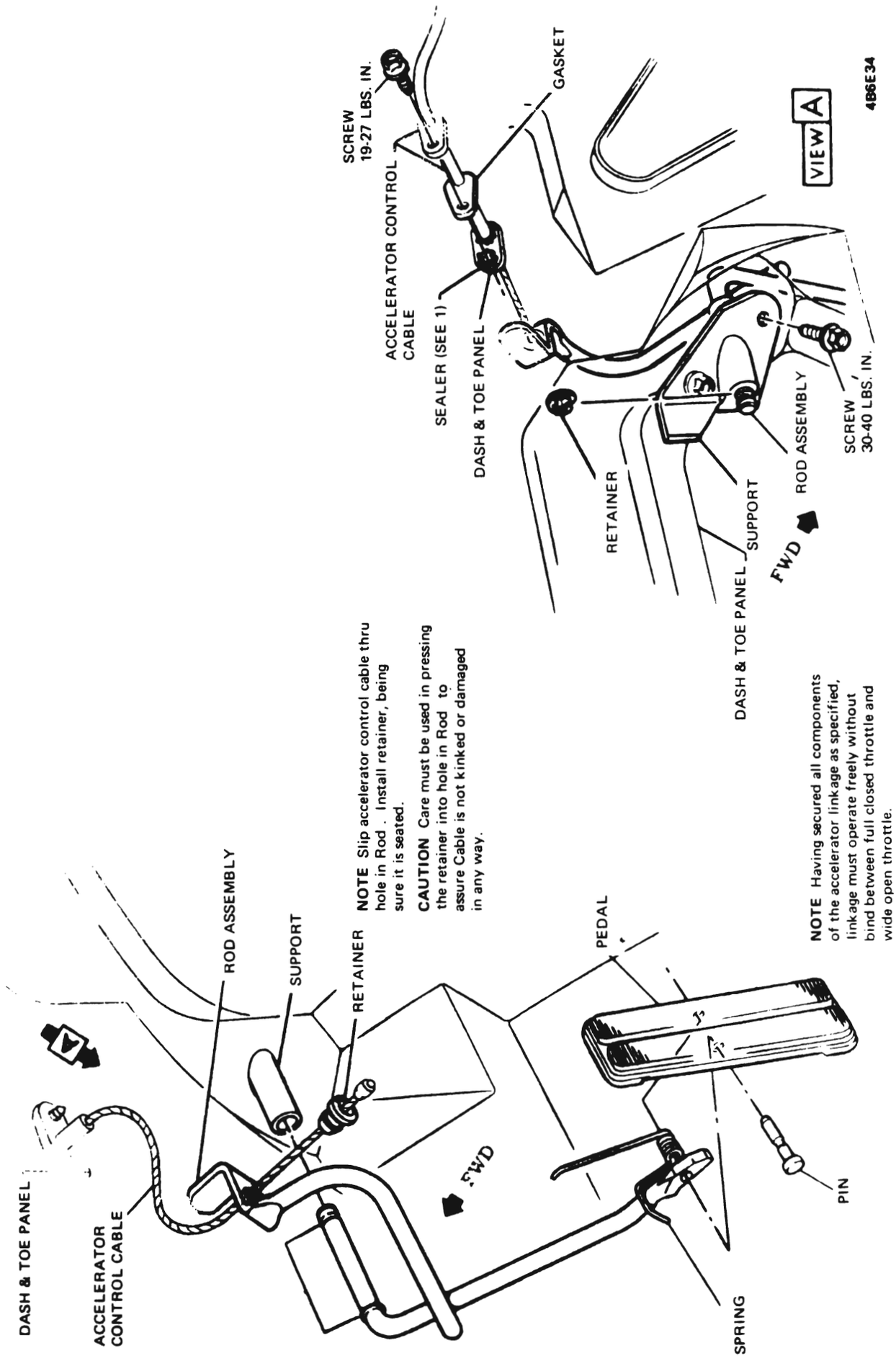

Figure 6E-67 "X" Series Accelerator Controls (Passenger Compartment)

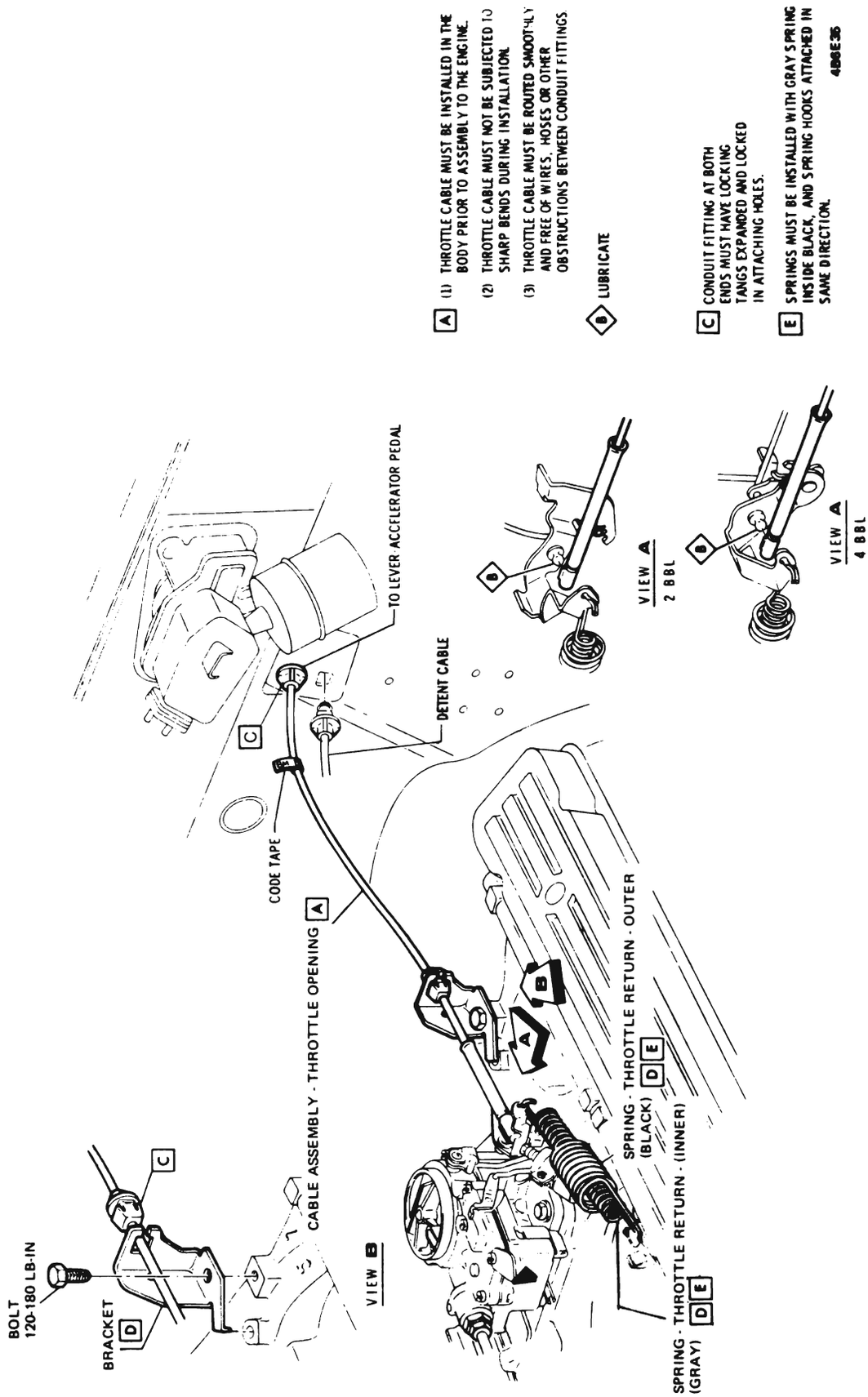

Figure 6E-68 A-B Series Accelerator Controls (350 Engine)

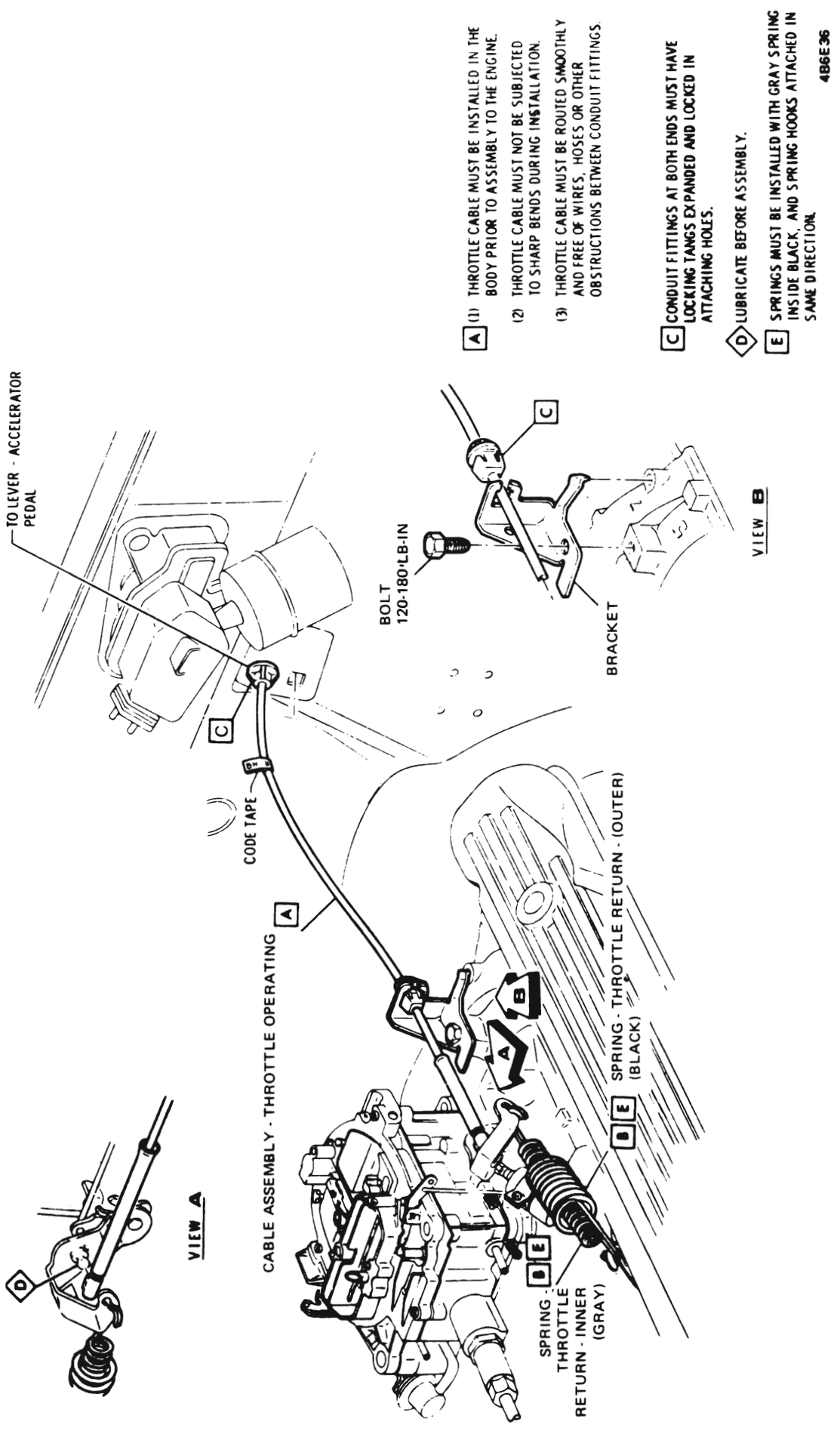

Figure 6E-69 A-B-C-E Series Accelerator Controls (455 Engine)

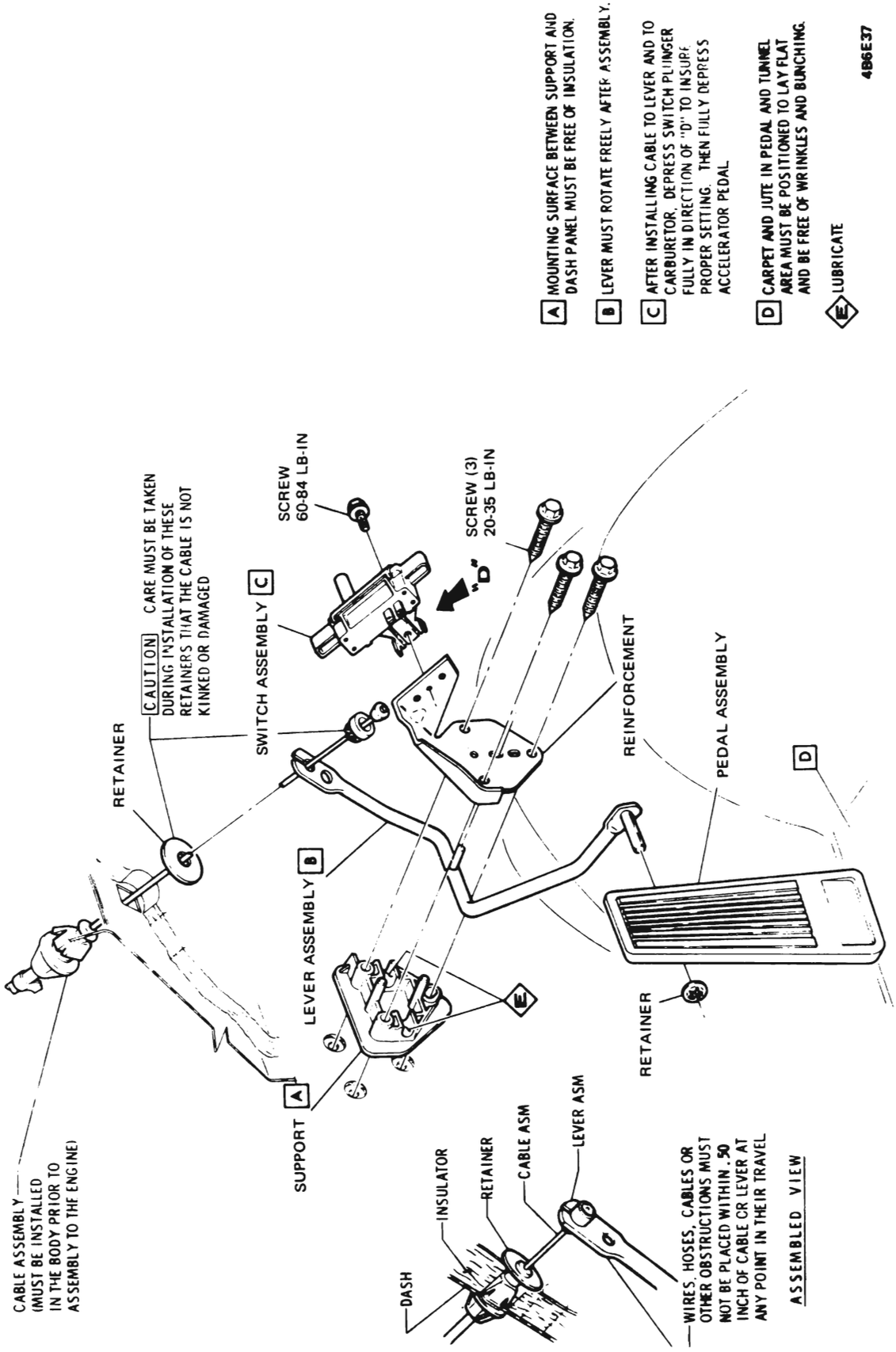

Figure 6E-70 "A" Series Accelerator Controls (400 Trans.)

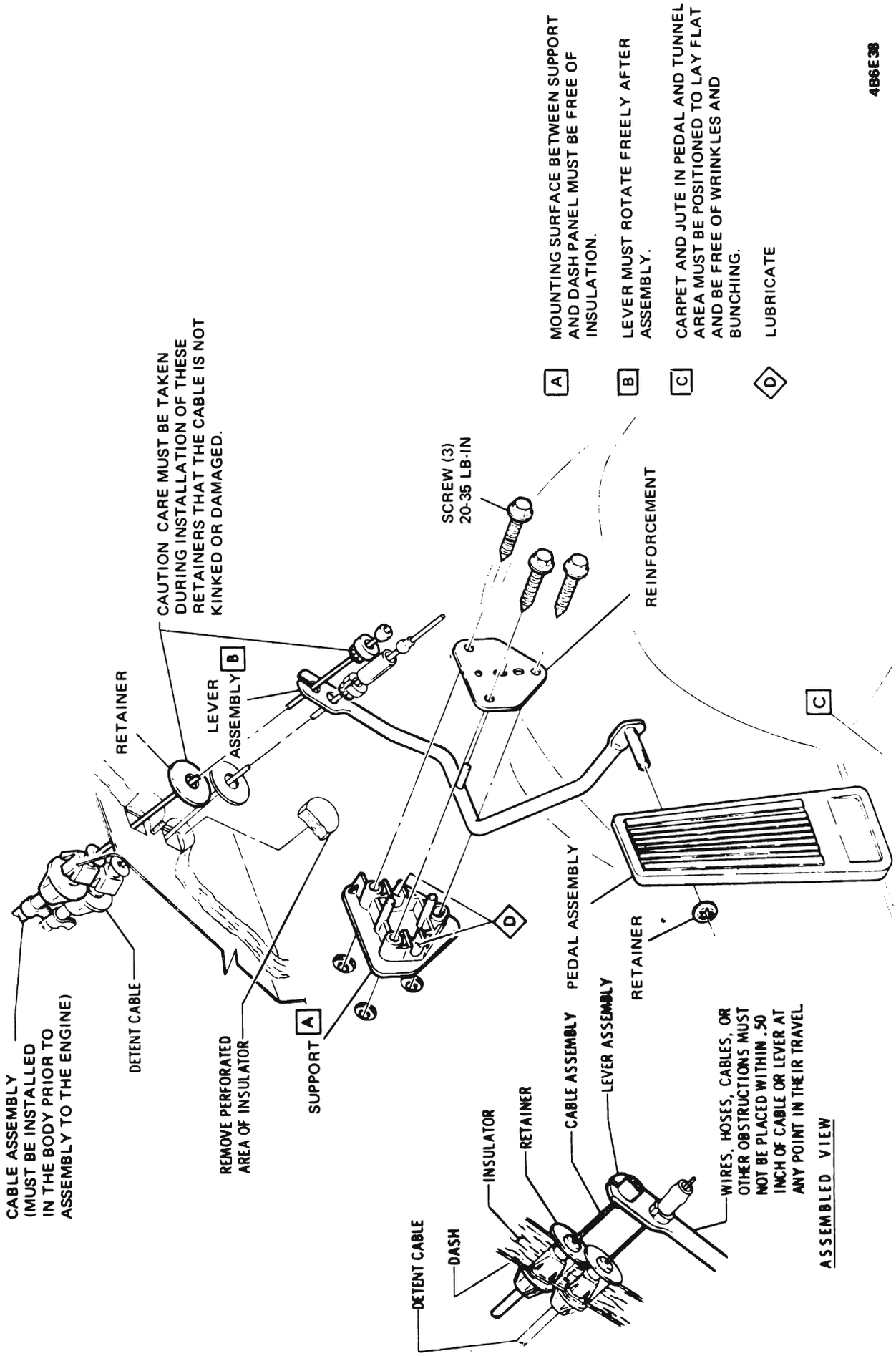

Figure 6E-71 "A" Series Accelerator Controls (350 Trans.)

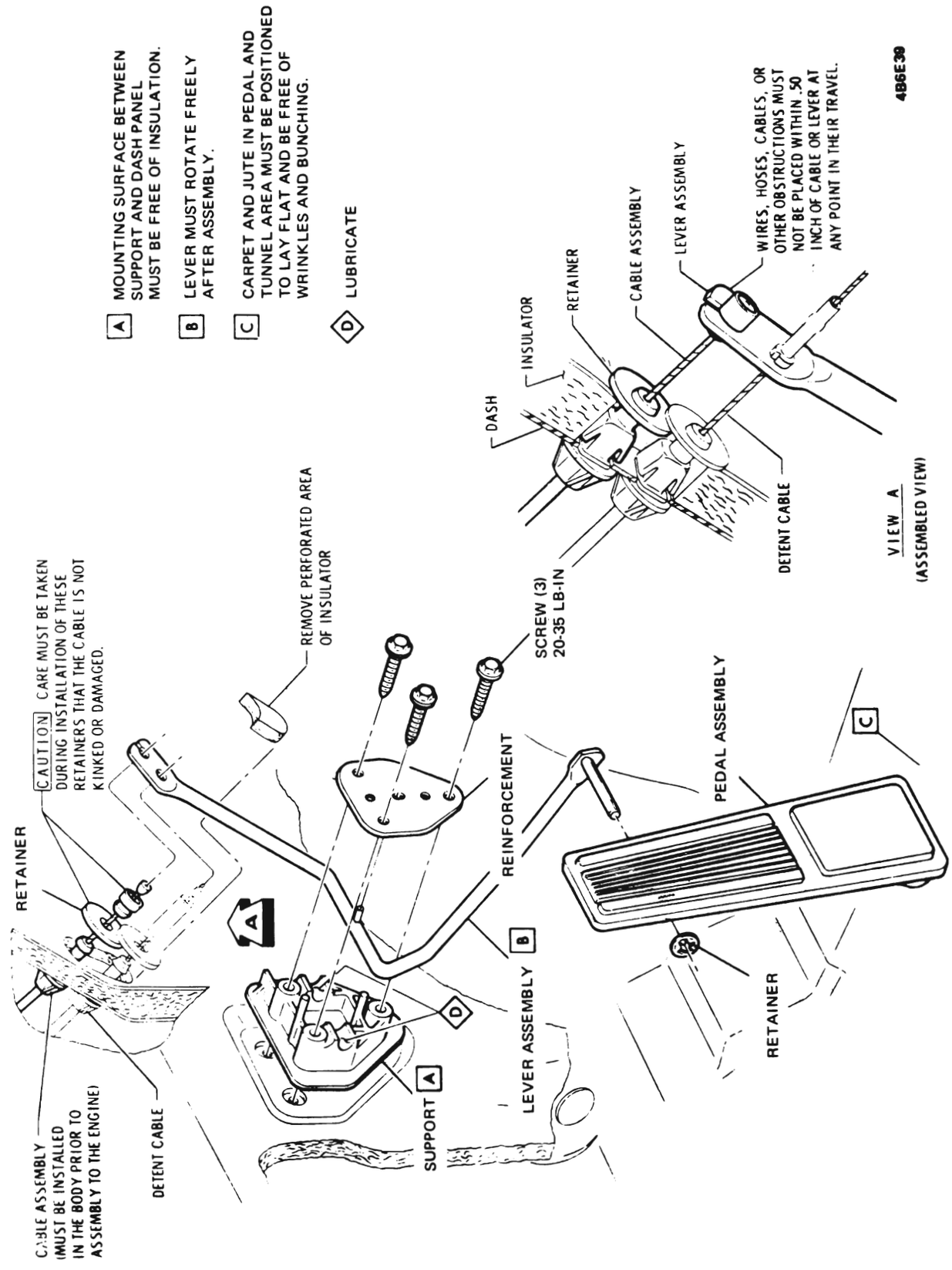

Figure 6E-72 "B" Series Accelerator Controls (375B Trans.)

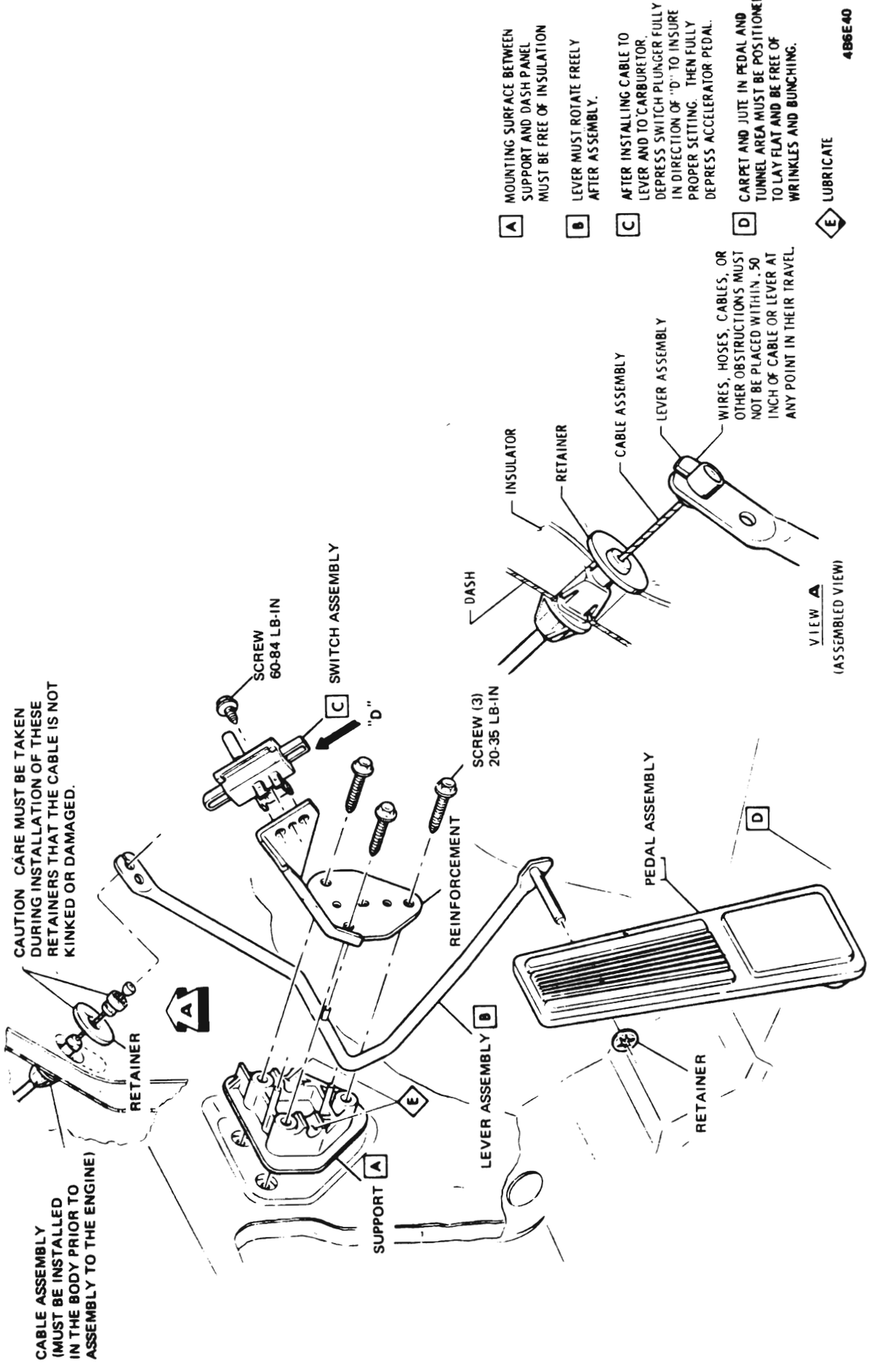

Figure 6E-73 B-C-E Series Accelerator Controls (400 Trans.)