SECTION A

EMISSION CONTROL SYSTEMS

ALL SERIES

CONTENTS

DIVISION I

TROUBLE DIAGNOSIS

67-1 TESTING THERMO AIR CLEANER OPERATION

Since failure of the thermo air cleaner will generally

result in the snorkel cold air door staying open, failure will probably go unnoticed in warm or hot weather. In cold weather, however, owners will complain of leaness, hesitation, sag, surge or stalling. When any type of lean operation complaint is received, always test the thermo air cleaner for proper functioning before doing any work on the carburetor.

Always perform checks in the same order as listed below.

Vacuum Motor Check

1. Check all hoses for proper hook-up. Check for kinked, plugged or damaged hoses.

2. With the engine "OFF", observe damper door position through snorkel opening. If position of snorkel makes observation difficult use the aid of a mirror. At this point damper door should be in such a position that the heat stove passage is covered (snorkel passage open). If not, check for binds in linkage.

3. Apply at least 9 in. Hg. of vacuum to diaphragm assembly through hose disconnected at sensor unit. This can be done by mouth. Damper door should completely close snorkel passage when vacuum is applied. If not check to see if linkage is hooked up correctly and for a vacuum leak.

4. With vacuum applied, bend or clamp hose to trap vacuum in diaphragm assembly. Damper door should remain in position (closed snorkel passage). If it does not, there is a vacuum leak in diaphragm assembly. Replace diaphragm assembly.

b. Sensor Check

Quick Check of System:

1. Start test with engine cold, air cleaner at a temperature below 85 degrees. If the engine has been in recent use, allow it to cool.

2. Observe the cold air door before starting the engine: it should be wide open.

3. Start the engine and allow it to idle. Immediately after starting the engine, the cold air door should close.

4. As the engine warms up, the cold air door should start to open and the air cleaner should become warm to the hand.

5. The system is operating normally as described above. If the air cleaner fails to operate as above or if correct operation of the air cleaner is still in doubt, proceed to the thermometer check.

Thermometer Check of Sensor:

1. Start test with air cleaner temperature below 85 degrees. If engine has been run recently, allow it to cool down. While engine is cooling, remove air cleaner cover and install a temperature gage such as J-22973 as close as possible to sensor. Reinstall air cleaner cover. Do not install wing nut. Let car stand idle for 1/2 hour or more before proceeding to step 2.

2. Start and idle engine. Cold air door should close immediately if engine is cool enough. When cold air door starts to open (in a few minutes), remove air cleaner cover and read temperature gage. It must read 115 degrees plus or minus 20 degrees.

3. If cold air door does not start to open at temperature indicated, temperature sensor is defective and must be replaced.

67-2 TESTING TRANSMISSION CONTROLLED VACUUM ADVANCE

A failure in the transmission controlled vacuum advance spark system could result in either of two troubles:

1. Continuous vacuum advance in first and second gears which would prevent the car from passing the Federal emissions standards.

2. No vacuum advance in third gear which would result in lower gas mileage.

Check for proper operation of the Transmission Controlled Vacuum Spark Advance System as a part of each engine tune-up, as follows:

WARNING: Make sure parking brake is applied firmly and that a wheel is blocked in front and back.

1. With a timing light and tachometer hooked up and with transmission in D, increase engine speed to approximately 1000 RPM by positioning the fast idle cam. Check timing mark--there should be no vacuum advance.

2. Shift transmission into R. Check timing mark 1000 RPM - there should now be full vacuum advance.

A check of the vacuum retard switch can be accomplished as follows:

CAUTION: *To prevent damaging the pressure switch, the tester used must have sufficient resistance that it does not supply the switch with more than .8 amp of current at 12 volts. Test lamps which use size 1893 or smaller bulb, will not damage the switch.*

1. With engine running, place a continuity light on the transmission connector and to ground. The light should be on when the transmission is in "D" or drive gear.

2. Shift the transmission from drive into "R" reverse, the light in this position, should go out. If above check shows lack of continuity, a check at the output terminal of the transmission will be necessary.

3. With engine running, place a continuity light on the output terminal of the transmission, the light should be on when the transmission is in "D" or drive gear.

This is a positive check for the retard switch in the transmission only. This check shows the switch is operating as designed and further checking of the switch will not be necessary.

67-3 A.I.R. PUMP DIAGNOSIS CHART

Condition	Possible Cause	Correction
Excessive Belt Noise	1. Loose belt.	1. Tighten belt.
	2. Seized pump.	2. Replace pump.
Excessive Pump Noise, Chirping, Rumbling Or Knocking	1. Leak in hose.	1. Locate source of leak and correct.
	2. Loose hose.	2. Reassemble and replace or tighten hose clamp.
	3. Hose touching other engine parts.	3. Adjust hose position.
	4. Diverter valve failure.	4. Replace valve.
	5. Check valve failure.	5. Replace valve.
	6. Pump mounting fasteners loose.	6. Retorque all mounting screws.
	7. Impeller damaged.	7. Replace impeller.
	8. Pump failure.	8. Replace pump.
No Air Supply	1. Loose belt.	1. Tighten belt.
	2. Leak in hose.	2. Locate source of leak and correct.
	3. Leak at hose fitting.	3. Reassemble and replace or tighten hose clamps.
	4. Diverter valve failure.	4. Replace valve.
	5. Check valve failure.	5. Replace valve.
	6. Pump failure.	6. Replace pump.

67-4 CHECKING E.G.R. VALVE OPERATION

The E.G.R. valve cannot be disassembled and no actual service is required, except that it should be checked for proper operation.

The valve shaft can be checked for movement by opening the throttle to 1200-1500 RPM. The valve

shaft should move upward at these RPM's and return to the downward position when engine speed is reduced to normal idle speed.

An outside vacuum source can also be applied to the vacuum supply tube at the top of the vacuum diaphragm. The diaphragm should not leak down and move to the full-up position between 8-10" of vacuum.

67-5 P.C.V. VALVE TROUBLE DIAGNOSIS

Condition	Possible Cause	Correction
Slow, Unstable Idle, Rolling, Frequent Stalling, Breather Backflow	Valve completely plugged or stuck in backfire (engine off) position.	Replace valve.
Engine Operation Okay But Breather Backflow at Heavy Throttle	Valve stuck in idle position.	Replace valve.
Rough, Fast Idle - Engine Stalls - No Backflow	Valve stuck in intermediate position.	Replace valve.

DIVISION II

DESCRIPTION AND OPERATION

67-6 EMISSION CONTROL SYSTEM GENERAL DESCRIPTION

All 1972 cars must be capable of passing certain tests which measure the quantity of unburned impurities in the exhaust gases. Federal law places a limit on the amount of hydrocarbon, oxides of nitrogen and carbon monoxide released from the exhaust system.

The purpose of this law is to keep the atmosphere cleaner, particularly in populous areas where these impurities add to the smog problem.

Basically, excessive exhaust emissions are caused by incomplete combustion of the air-fuel mixture in the cylinders.

All 1972 Buicks are equipped with various systems to control the emission of pollutants to the atmosphere. The Positive Crankcase Ventilation (P.C.V.) System, Transmission Controlled Vacuum Spark Advance (T.C.S.) and the Controlled Combustion System (C.C.S.) are on all engines for 1972. The Air Injection Reactor (A.I.R.) System is standard on all engines, except non-California 350 cu.in. with automatic transmissions. All California cars and all manual transmission cars are equipped with the Exhaust Gas Recirculation (E.G.R.) System. The Evaporative Emission Control System, which prevents loss of fuel vapor from the fuel tank is explained in the Fuel Tank and Exhaust Section.

67-7 CLOSED POSITIVE CRANKCASE VENTILATOR SYSTEM

All cars have a closed Positive Crankcase Ventilating System to help reduce air pollution and to provide more complete scavenging of crankcase impurities. Ventilation air is drawn through a filter assembly located in the air cleaner, through a hose, into the left rocker arm cover, down into the crankcase, across and up into the rear of the intake manifold, up through the ventilator valve, through a hose and into the intake manifold. Intake manifold vacuum draws any fumes from the crankcase to be burned in the engine. See Figure 67-7.

When air flow through the carburetor is high, added air from the Positive Crankcase Ventilating System has no noticeable effect on engine operation; however, at idle speed, air flow through the carburetor is so low that any large amount added by the ventilating system would upset the air-fuel mixture, causing rough idle. For this reason, a flow control valve is used which restricts the ventilating system flow whenever intake manifold vacuum is high. See Figure 67-5.

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

CAUTION: *If an engine is idling too slow or rough, this may be caused by a clogged ventilator valve or plugged hose; therefore, never adjust the*

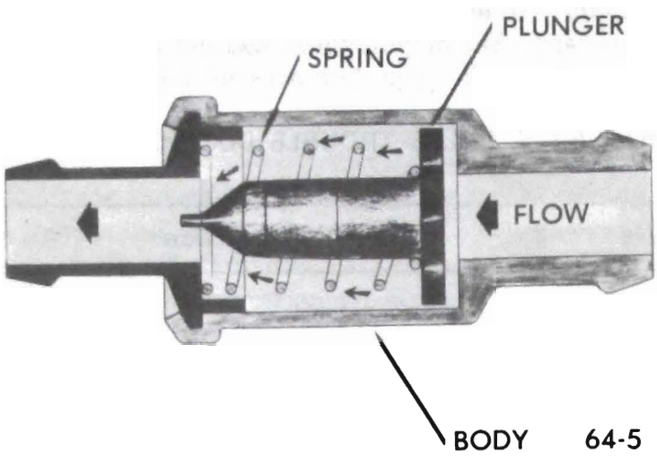

Figure 64-1 Positive Crankcase Ventilator Valve

carburetor idle without first checking the crankcase ventilator check valve and hose.

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

All cars have a closed P.C.V. System. With this system, any blow-by in excess of the system capacity (from a badly-worn engine, sustained heavy load, etc.) is exhausted into the air cleaner and is drawn into the engine.

67-8 DESCRIPTION AND OPERATION OF TRANSMISSION CONTROLLED VACUUM SPARK ADVANCE SYSTEM

The Transmission Controlled Vacuum Spark Advance (T.C.S.) System is used with engines designed for no spark advance at lower engine speeds, plus leaner carburetor and choke calibrations. With retarded idle timing, the throttle must be opened slightly more to maintain the same idle speed. This gives better mixture distribution and less exhaust dilution, resulting in much more complete combustion.

All 1972 Buicks, therefore, have "ported" spark advance, with the vacuum take-off just above the throttle valve, so that there is no vacuum advance at closed throttle, The transmission controlled vacuum advance system consists of a solenoid valve (inserted in the ported vacuum hose to the distributor), an oil pressure operated switch (installed in the transmission) and an electrical harness connecting these two units.

The solenoid valve is normally open but closes off vacuum when electricity flows through the solenoid. A vent bleeds off any vacuum in the hose to the distributor advance unit when the valve closes.

The oil pressure switch is located internally in the direct clutch circuit and is pressurized when the car has shifted into third or drive gear.

The oil pressure switch is normally closed but opens to stop electrical flow to ground when there is oil pressure to the switch. The switch is controlled by direct clutch apply pressure.

An electrical harness connects the ignition switch to one terminal of the solenoid valve, through the solenoid, out the other solenoid terminal and to ground thru the oil pressure switch (when closed).

Operation of the transmission controlled vacuum advance system is as follows:

1. When operating in P, N, L2, or L1 positions; or Neutral, 1st gear or 2nd gear, in the case of synchromesh transmission (3rd gear for 4-speed manual), there is no oil pressure in the direct clutch circuit to the transmission switch, so there can be no vacuum advance.

2. When operating in D, there is no oil pressure to the transmission switch until the transmission upshifts to third gear, at which time vacuum advance starts to operate normally.

3. When operating in R, there is always oil pressure in the direct clutch circuit to the transmission switch, so there is normal vacuum advance.

Because of the greater heat rejection to the coolant during idle with little vacuum spark advance, some engines are liable to overheat if allowed to idle for an extended period. For this reason, some engines have a thermo vacuum switch located in the coolant passage at the left front corner of the intake manifold. This vacuum switch has three nipples:

1. The nipple marked "MT" has a hose either directly to the intake manifold or to a tee which connects to the manifold.

2. The nipple marked "C" is connected to the carburetor for a "ported" vacuum source.

3. The nipple marked "D" is connected to the distributor vacuum advance unit.

When engine coolant is at normal temperatures, the thermo vacuum switch (not included on manual transmission equipped cars) is positioned internally to supply "ported" vacuum to the distributor. However, if coolant temperature should ever rise above 220 degrees, the thermo vacuum switch will supply full intake manifold vacuum to the distributor, even at closed throttle. This will improve idle quality and will cause an idling engine to speed-up, resulting in improved fan and water pump action, besides reducing heat rejection to the coolant because of the 14 to 20 degrees spark advance.

67-9 CONTROLLED COMBUSTION SYSTEM (C.C.S.)

The C.C.S. package includes leaner carburetor calibration at idle and part throttle plus leaner choke calibration. Since past model carburetion was as lean as possible consistent with good driveability with inlet air temperatures as low as minus 20 degrees, this still leaner C.C.S. carburetion is only possible because of the heated air system that is also a part of the C.C.S. package. With the heated air system operating, inlet air temperature is around 115 degrees after the first few minutes of operation; this makes use of leaner (hot weather) calibration possible, and the car still responds and drives well in cold weather.

The heated air part of the C.C.S. consists of a heat stove, a corrugated paper heated-air pipe, a plastic adapter elbow and an air cleaner containing temperature control doors operated by vacuum through a temperature sensor.

The heat stove is a sheet metal cover, shaped to and bolted on with the left exhaust manifold. Air drawn in along the lower edge of the stove passes across the manifold surface, picking-up heat. The heated air is drawn out from the upper center of the manifold, through the heated air pipe and plastic adapter elbow into the snorkel of the air cleaner.

The temperature control air cleaner is designed to mix this heated air with cold air from under the hood so that carburetor inlet air temperature averages about 115 degrees. This mixing is done by two air doors, a cold air door and a hot air door, which move together so that when the cold air door is closed, the hot air door is open and vice versa. Most of the time, both doors will be partially open as required to control the temperature. When the underhood temperature reaches about 135 degrees, the cold air door will open wide and the hot air door will close tight. See Figure 67-1. Obviously, if underhood temperatures rise above 135 degrees, the air cleaner will no longer be able to control temperature and the inlet air temperature will rise with underhood temperature.

The temperature doors are moved by a diaphragm type vacuum motor. When there is no vacuum present in the motor, the diaphragm spring forces the cold air door open and the hot air door closed. Whenever the engine is running, the amount of vacuum present in the vacuum motor depends on the temperature sensor in the air cleaner which is located in the vacuum line between the intake manifold and the vacuum motor. In the sensor, a bi-metal temperature sensing spring starts to open a valve to bleed more air into the vacuum line whenever the temperature in the air cleaner rises above about 115 degrees. Whenever the temperature falls below about 115 degrees, the sensing spring starts to close the air bleed into the vacuum line, allowing more manifold vacuum to reach the vacuum motor. Whenever there is 9 inches or more of vacuum in the vacuum motor, the diaphragm spring is compressed, the cold air door is closed and the hot air door is opened.

When the engine is not running, the diaphragm spring will always hold the cold air door open and the hot air door closed. However, when the engine *is* running, the position of the doors depends on the air temperature in the air cleaner.

When starting a cold engine (air cleaner temperature under 85 degrees), the cold air door will close and the hot air door will open immediately. See Figure 67-2. This is because the air bleed valve in the sensor is closed so that full manifold vacuum, is applied in the vacuum motor. The cold air door will remain tightly closed only a few minutes, however. As soon as the air cleaner starts receiving hot air from the heat stove, the sensor will cause the cold air door to open partially, mixing cold air with the hot air as necessary to regulate air cleaner temperature within 20 degrees of the ideal 115 degrees air inlet temperature. See Figure 67-3.

If underhood air temperature rises to 135 degrees, the air bleed valve in the sensor will be wide open so that vacuum to the vacuum motor approaches zero. The diaphragm spring in the vacuum motor will hold the cold air door wide open and close the hot air door tightly. If underhood temperature rises above 135 degrees, carburetor inlet air termperature will also rise above 135 degrees.

While air cleaner temperature is being regulated, accelerating the engine hard will cause the vacuum level in the intake manifold and in the vacuum motor to drop. Whenever vacuum drops below 5 inches, the diaphragm spring will open the cold air door wide in

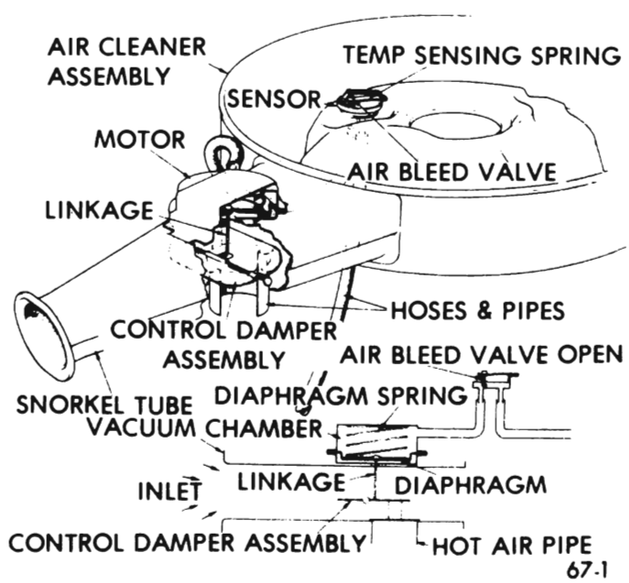

Figure 67-2 - Cold Air Door Open

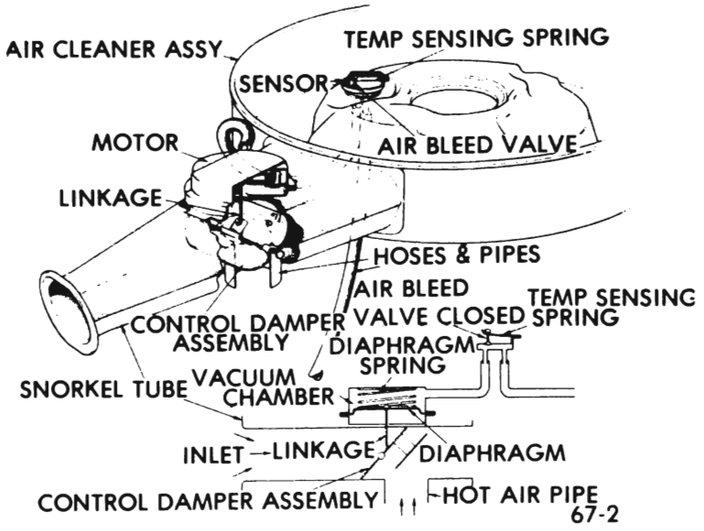

Figure 67-3 - Hot Air Door Open

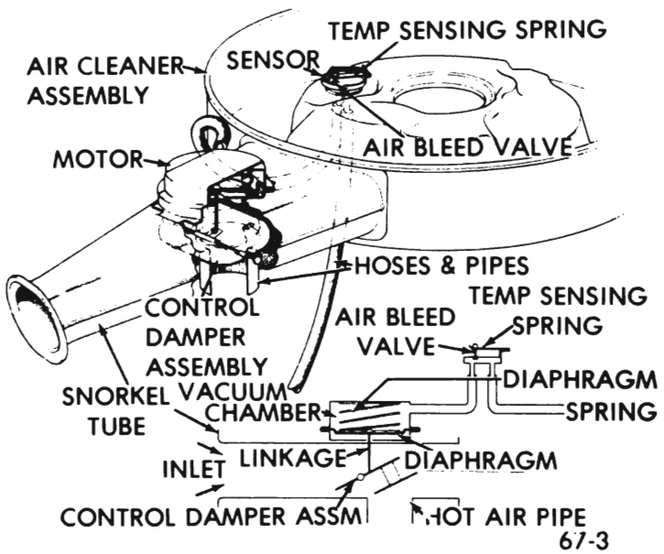

Figure 67-4 - Cold and Hot Air Doors Both Partially Open

order to get the maximum air flow required for maximum acceleration.

67-10 AIR INJECTION REACTOR SYSTEM (A.I.R.)

A. General

The A.I.R. System reduces the hydrocarbon and carbon monoxide content of the exhaust gases by injecting air into the exhaust port of each cylinder. The oxygen in the air reacts with the hot exhaust gas, causing further combustion in the exhaust manifold before the gas enters the exhaust pipe.

The A.I.R. System is used on all 1972 Buicks, except the 350 cu.in. engine with automatic transmission, non-California cars.

The system consists of a belt-driven air pump, diverter valve and silencer assembly, check valve, special intake manifold and cylinder head assemblies and hoses connecting the various components. See Figures 67- 12 and 67-13 for A.I.R. System installed.

B. Air Pump

The air injection pump is a positive displacement vane type which is permanently lubricated and requires no periodic maintenance.

The belt-driven air pump is located at the upper left front of the engine. The pump mounting bracket is attached to the front of the engine. Power take-off for the pump is at the water pump pulley. Pump speed is 1.25 times crankshaft speed. Intake air passes through a centrifugal fan at the front of the pump, where foreign materials are separated from the air by centrifugal force. Air is delivered to the intake manifold galleries by a formed flexible hose of 5/8" inside diameter fitted to a 5/8" exhaust tube on the diverter valve at the back of the pump.

The only serviceable component of the pump is the centrifugal filter fan. Do not assume pump is defective if it squeaks when turned by hand. Do not lubricate the pump in any way.

If engine or underhood compartment is to be cleaned with steam or high pressure detergent, the centrifugal filter fan should be washed off to prevent liquids from entering the pump.

Do not attempt to operate vehicle with the drive belt disconnected.

C. Diverter Valve and Silencer Assembly

The diverter valve is attached to the back of the pump. It senses manifold vacuum through a 3/16" fitting at the carburetor. During sudden deceleration, vacuum increases cause the valve to open, allowing air from the air-injection pump to pass through the valve and silencer to the atmosphere. Approximate duration of the valve opening is five seconds. This valve also controls pressure within the system by diverting excessive pump output to the atmosphere through the silencer.

D. Check Valve

An adapter on the left side of the intake manifold is fitted with a screw-on check valve. This valve has a one-way diaphragm which prevents hot exhaust gases from backing up into the hose and pump and causing damage. This will protect the system in the event of

pump belt failure, abnormally high exhaust system pressure or air delivery hose ruptures.

E. Intake Manifold and Cylinder Heads Assemblies

The intake manifold on A.I.R. cars have special intake manifolds and cylinder heads to distribute air from the pump to the exhaust port of each cylinder. Figure 67-5 shows an intake manifold for A.I.R. with the air intake on the left side of the manifold. Air is pumped in the left side and across to the right side by a cast passage crossover just in front and below the carburetor bores. Openings on each side of the manifold are drilled to match passages in the cylinder heads drilled directly into each exhaust port.

67-11 EXHAUST GAS RECIRCULATION SYSTEM (E.G.R.)

the Exhaust Gas Recirculation System is used on all 1972 Buicks with manual transmissions and all cars built for California.

The Exhaust Gas Recirculation System is used to reduce oxides of nitrogen emissions from the engine exhaust. During the combustion process, nitrogen which makes up 80 percent of the air will tend to mix with oxygen at temperatures above 2500° F. During the combustion process, temperatures in the engines' cylinders will go well above 2500° F. which forms nitrogen oxides.

To lower the formations of nitrogen oxides, it is necessary to reduce combustion temperatures. This is accomplished by introducing exhaust gases into the engine intake manifold, which will enter the engine cylinders with the air fuel mixture for combustion.

The exhaust gas recirculation (E.G.R.) valve, as shown in Figure 67-6, is mounted on the right rear of the engine manifold.

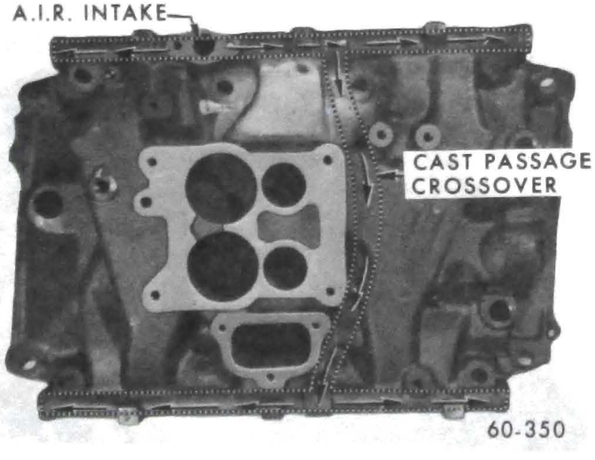

Figure 67-5 A.I.R. Manifold (Without E.G.R.)

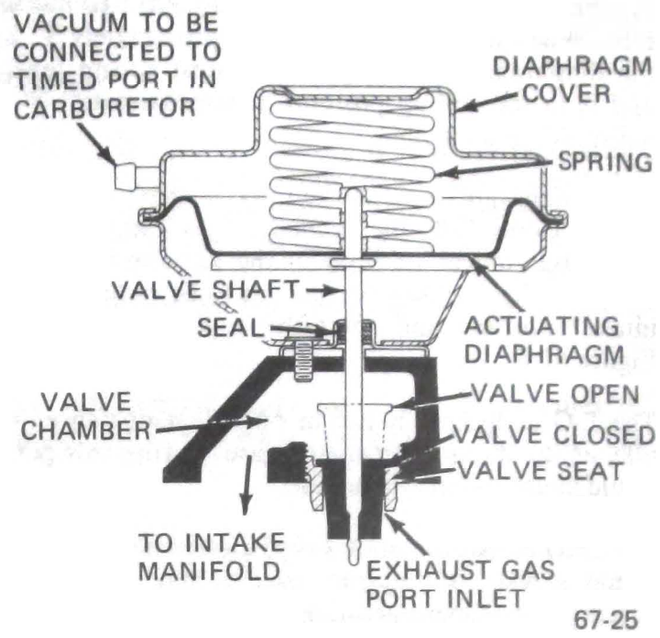

Figure 67-6 E.G.R. Valve Cross-Sectional View

The exhaust gas intake port of the E.G.R. valve is connected to the intake manifold exhaust crossover channels, where it can pick up exhaust gases. See Figure 67-7 for exhaust passages in intake manifold.

A vacuum diaphragm, operated by intake manifold vacuum, is connected to a timed vacuum signal port located at the side of the carburetor float bowl. The vacuum supply port, located in the throttle body bore above the throttle valve, is exposed to engine manifold vacuum in the off-idle and part-throttle to wide open throttle operation.

As the throttle valves are opened and the engine

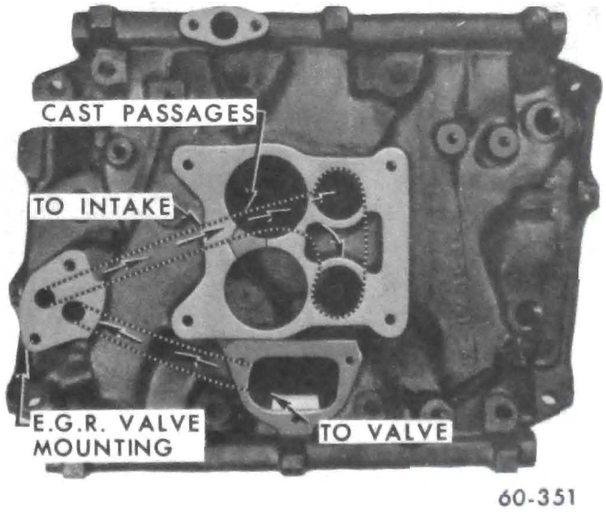

Figure 67-7 Intake Manifold E.G.R. System (With A.I.R.)

speeds up, vacuum is applied to the vacuum diaphragm on the E.G.R. valve through a connecting tube. When the vacuum reaches approximately 3" hg., the diaphragm moves upward against spring tension and is in the full-up position at approximately 8" of manifold vacuum.

The diaphragm is connected by a shaft to a valve which closes off the exhaust gas port. As the diaphragm moves up, it opens the valve in the exhaust gas port which allows exhaust gas to be pulled into the intake manifold and enter the engine cylinders. See Figure 67-6.

The E.G.R. System is not in operation during engine idle, as the mixing of exhaust gases during this period would cause rough engine idle.

The E.G.R. valve cannot be disassembled and no actual service is required, except that it should be checked for proper operation. See paragraph 67-4.

DIVISION III

ADJUSTMENTS AND MINOR SERVICE

67-12 P.C.V. FILTER

Inspect positive crankcase ventilator filter every four months or 6,000 miles and replace if necessary. Remove filter from inside air cleaner by removing breather hose clamp, breather hose and filter retainer clip. See Figure 67-11 - Positive Crankcase Ventilator System.

DIVISION IV

REMOVAL AND INSTALLATION

67-13 REMOVAL AND REPLACEMENT OF C.C.S. UNITS

The damper door is not serviceable. The air cleaner assembly must be replaced if the damper door is defective.

A. R and R Vacuum Motor

1. Drill center of two spot welds using a 1/16 inch drill. Do not center punch.

2. Enlarge two holes using a 5/32 inch drill.

Use extreme care not to damage to air cleaner snorkel.

3. Remove vacuum motor retainer strap. See Figure 67-8.

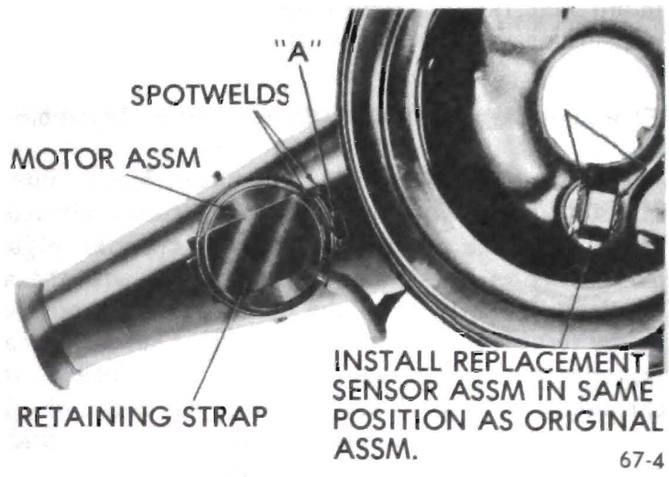

Figure 67-8 - Replacing Vacuum Motor Assembly

4. Lift vacuum motor, cocking it to one side to unhook motor linkage at the control door.

5. Drill a 7/64" hole in snorkel tube at point "A" as shown in Figure 67-8.

6. Use the motor strap retainer and the sheet metal screw provided in the motor service package to secure the retainer and motor to the snorkel tube.

7. Make sure the screw does not interfere with the operation of the damper assembly. Shorten screw if required.

B. R and R Air Cleaner Sensor

1. Remove two sensor retaining clips by prying. See Figure 67-9.

2. Pull vacuum hoses from sensor.

3. Note carefully the installed position of the sensor so that you can install new sensor in same position. Then remove sensor.

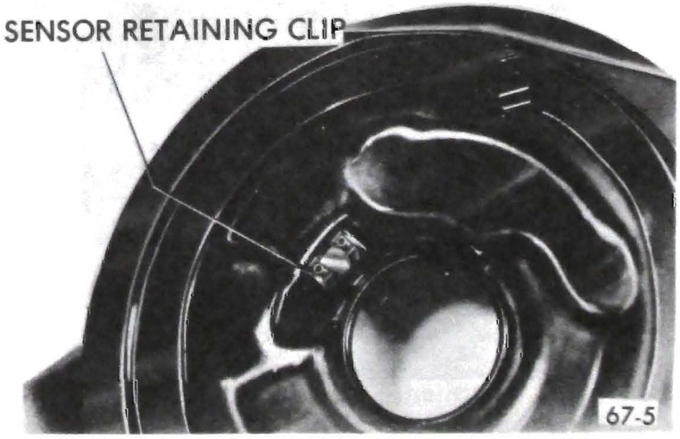

Figure 67-9 - Replacing Sensor Assembly

4. Install sensor and gasket assembly in air cleaner in same position as noted in Step 3. This is to eliminate the possibility of interference with the air filter element.

See Figure 67-8.

5. Install sensor retaining clip. Meanwhile supporting sensor at "B" around the outside rim to prevent damage to the temperature sensing spring. See Figure 67-8.

6. Reinstall vacuum hoses.

67-14 REMOVAL AND INSTALLATION OF A.I.R. SYSTEM COMPONENTS

A. Air Pump

Removal

1. Disconnect hoses from pump and valve.

2. Loosen bracket to pump mounting bolts.

3. Remove pump belt.

4. Remove pulley to hub bolts and remove pulley.

5. Remove pump.

6. Remove valve from pump if pump is to be replaced.

Installation

1. Replace valve to back of pump.

2. Position pump assembly on mounting bracket with holes lined up and install bolts loosely.

3. Place pulley on hub and tighten pulley to hub bolts to 25 ft.lbs.

4. Install pump belt over pulley.

5. Move pump until belt is tightened to 60-85 lbs. and tighten bracket bolts.

6. Connect all hoses to valve and pump.

B. Centrifugal Filter Fan

Removal

1. Remove pump as described in subparagraph A above.

2. Insert needle nose pliers and pull fan from hub, as shown in Figure 67-10. It is seldom possible to remove fan without damaging it. Care should be taken to prevent fragments from entering the air intake hole.

Installation

1. Install filter fan by drawing it into position, using pulley and bolts as tools. Draw the fan down evenly by alternately torquing the bolts, making certain that the outer edge of the fan slips into the housing.

2. Install pump, as described in subparagraph A above.

A new fan may be noisy for about 20-30 miles of operation, until the outer diameter sealing lip has worn in.

C. Diverter Valve and Silencer Assembly

Removal

The silencer is staked to the diverter valve and cannot be removed. If a damaged silencer is encountered, the diverter valve and silencer must be replaced.

1. Remove hoses on valve.

2. Remove two screws holding valve to pump and remove valve.

3. Remove gasket material from valve and pump.

Installation

1. Position new gasket on pump flange.

2. Install valve and secure with two screws.

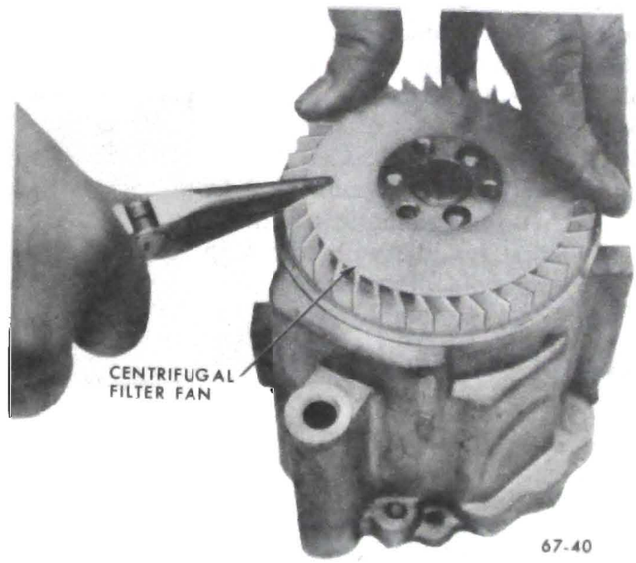

Figure 67-10 Removing Centrifugal Fan From Hub

3. Connect hoses to valve assembly.

D. Check Valve

Removal

1. Release clamp and disconnect air hose from check valve.

2. Unscrew check valve from manifold fitting.

Installation

1. Screw check valve onto manifold fitting.

2. Install air hose to check valve.

67-15 REMOVAL AND INSTALLATION OF E.G.R. VALVE

A. Removal

1. Disconnect vacuum line from valve.

2. Remove two bolts holding valve to manifold and remove valve.

B. Installation

1. Install gasket and valve in manifold and tighten bolts.

2. Connect vacuum hose to valve.

DIVISION VI SPECIFICATIONS

67-16 EMISSION CONTROL SYSTEM SPECIFICATIONS

Positive Crankcase Ventilator Valve Type	CV-679C
PCV Valve Location	Intake Manifold
Carburetor Inlet Air Regulated Temperature	115°±20°
Idle Mixture Setting (Lean From Best Idle)	50 RPM
Thermo Vacuum Switch Operating Temperature	220°
Engine Thermostat Operating Temperature	190°
Air Injection Pump Belt Tension	65-80 Lbs.

Idle Speed and Ignition Timing Chart

Engine and Transmission	Timing* (±2°)	Idle Speed ** Idle Stop Solenoid		Fast Idle Speed
		Con.	Discon.	
350 Cu.In. Manual	4° BTDC	800	600	820
350 Cu.In. Automatic	4° BTDC	650	500	700
455 Cu.In. Manual	4° BTDC	900	600	920
455 Cu.In. Automatic	4° BTDC	650	500	700
455 Stage I Manual	8° BTDC	900	600	920
455 Stage I Automatic	10° BTDC	650	500	700

* With hose disconnected from vacuum advance and plugged.

** With automatic transmission in "Drive" (manual transmission in "Neutral"), first set idle with idle stop solenoid connected, then check idle speed with solenoid disconnected.

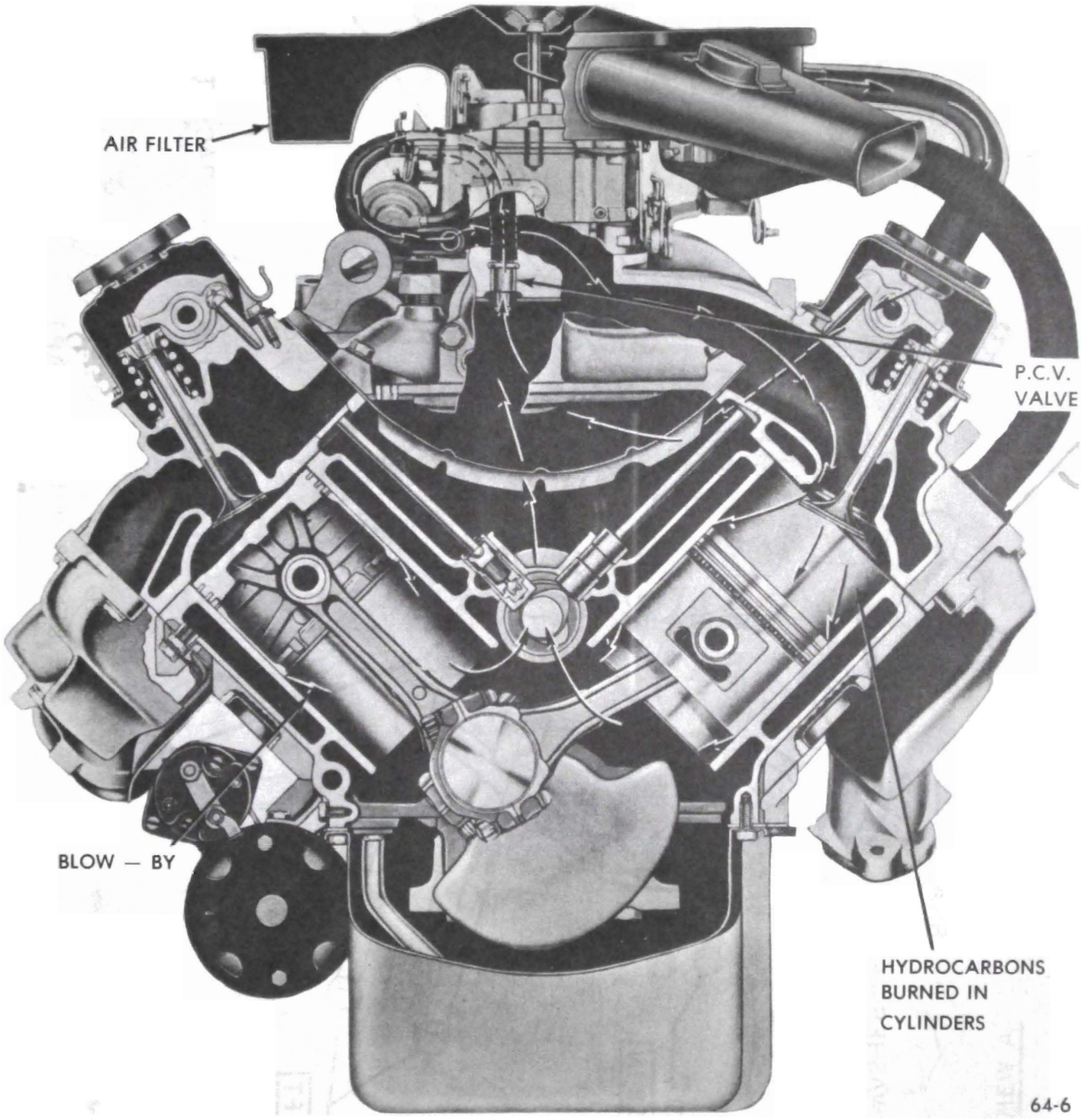

Figure 67-11 Positive Crankcase Vent System

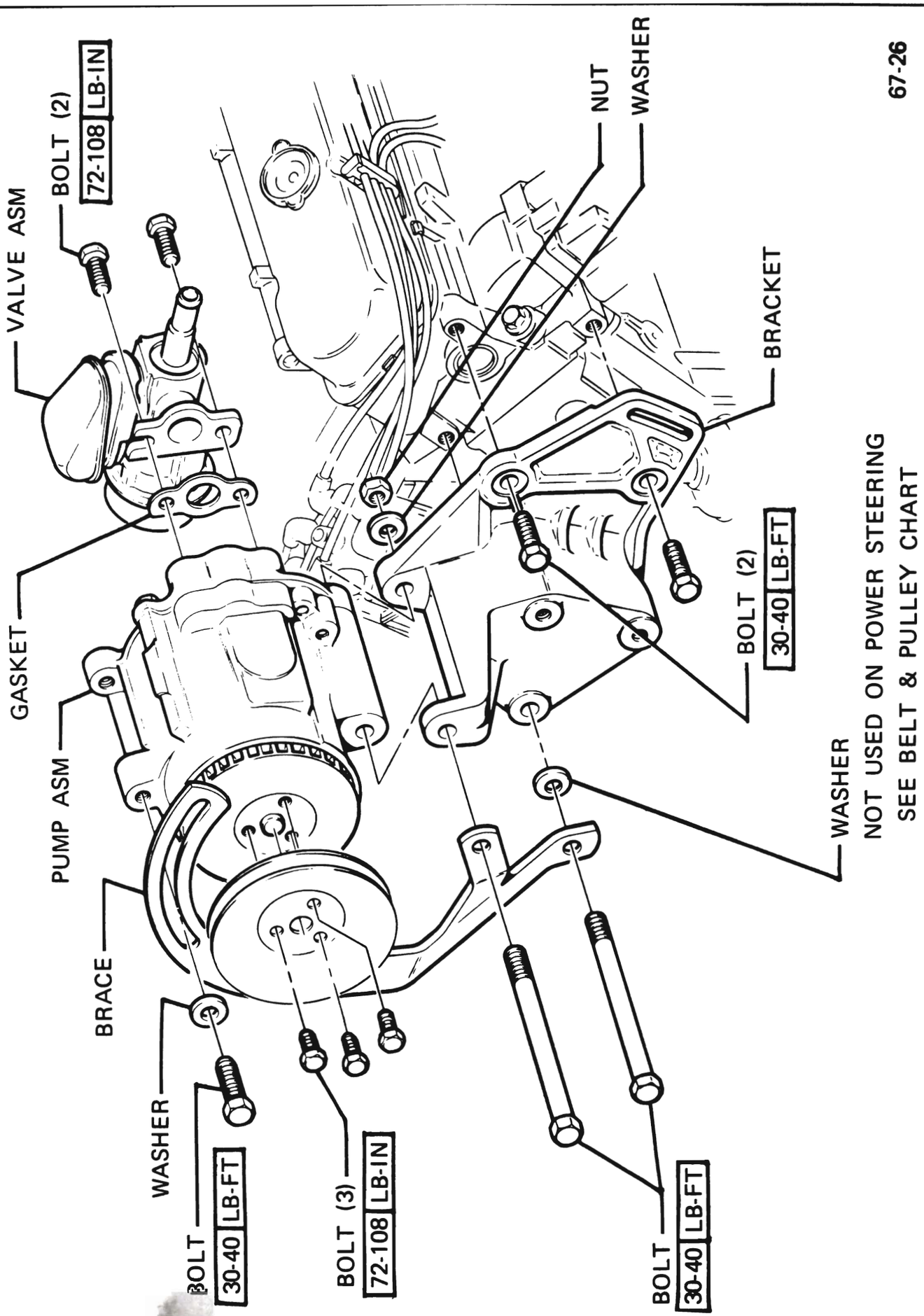

Figure 67-12 Pump, Valve and Bracket - A.I.R. System - 350 and 455 Engines

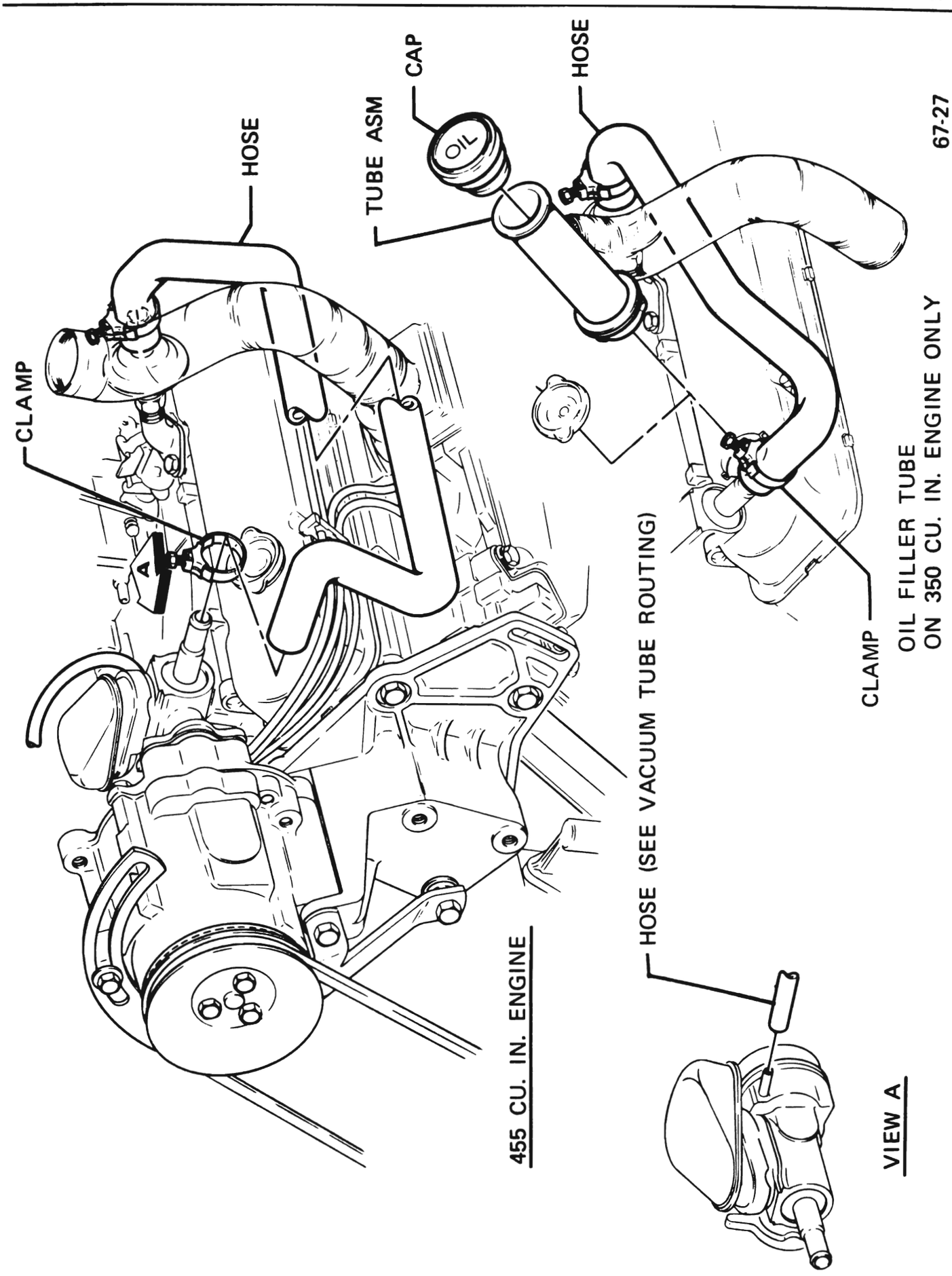

Figure 67-13 Hoses and Oil Filler - A.I.R. System - 350 and 455 Engines

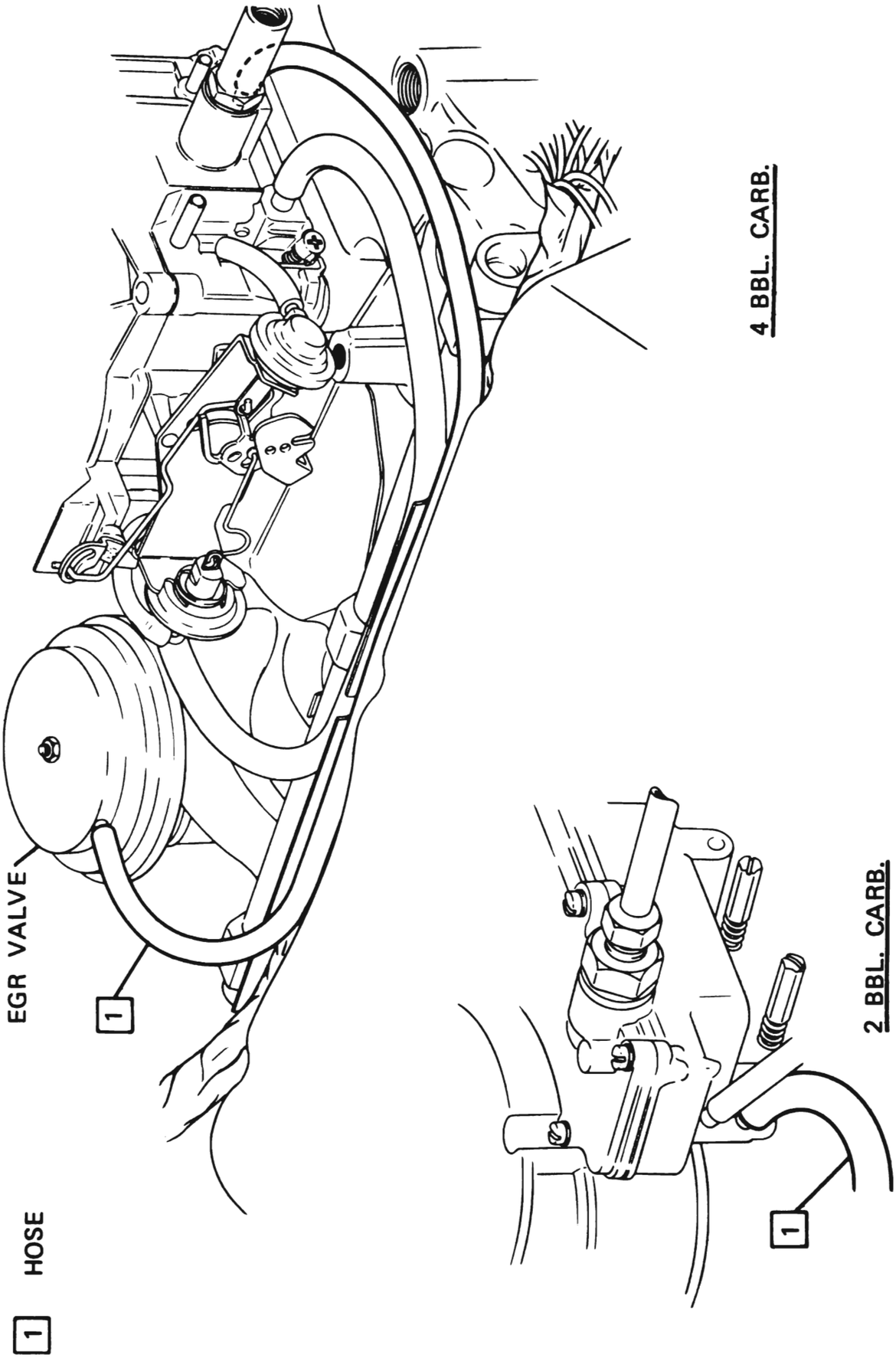

Figure 67-14 E.G.R. Valve and Hose Routing

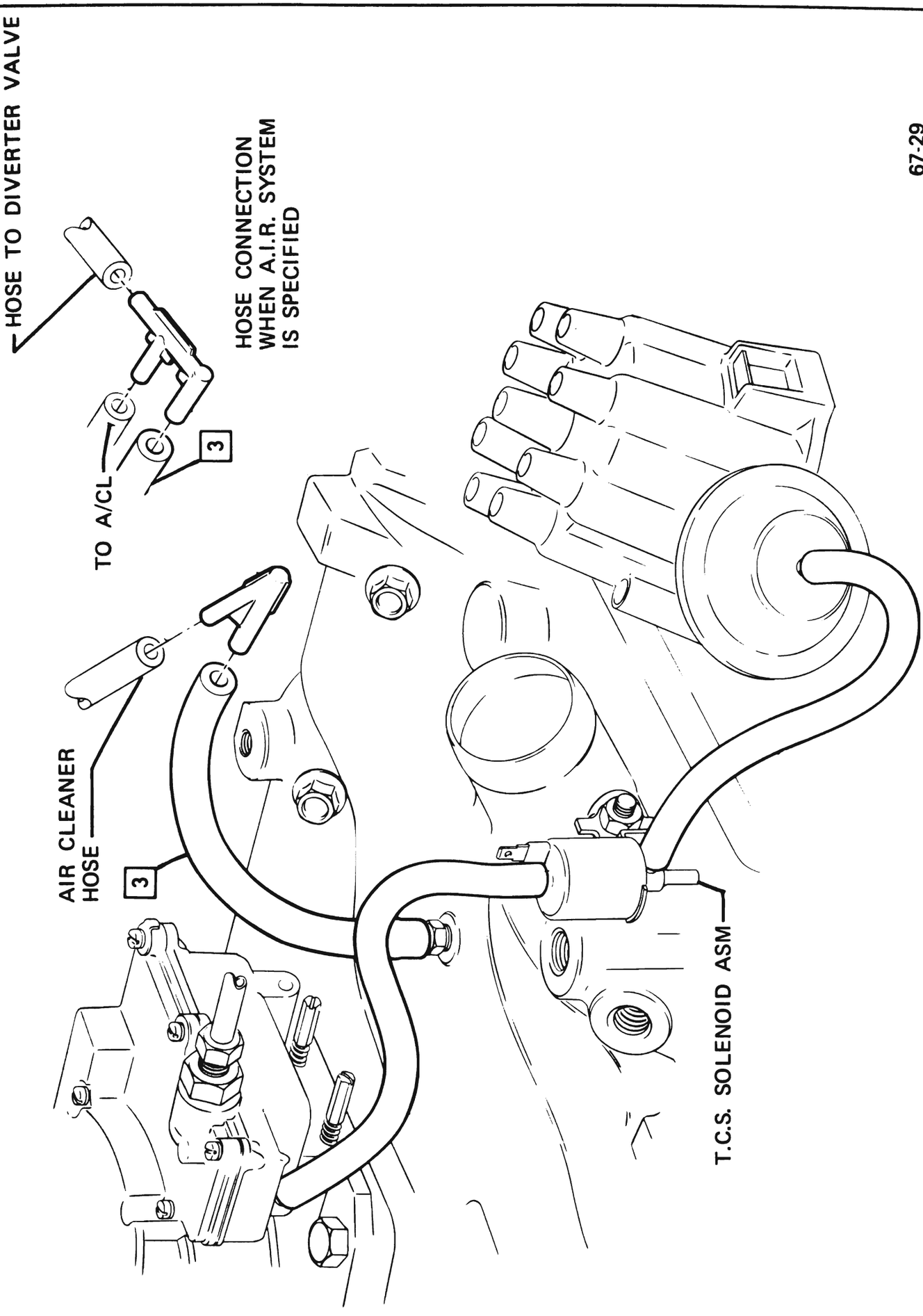

Figure 67-15 Vacuum Tube Routing - 350 2-BBL - 4D-4F-4H-4L-4N Series Less A/C and Heavy Duty Cooling

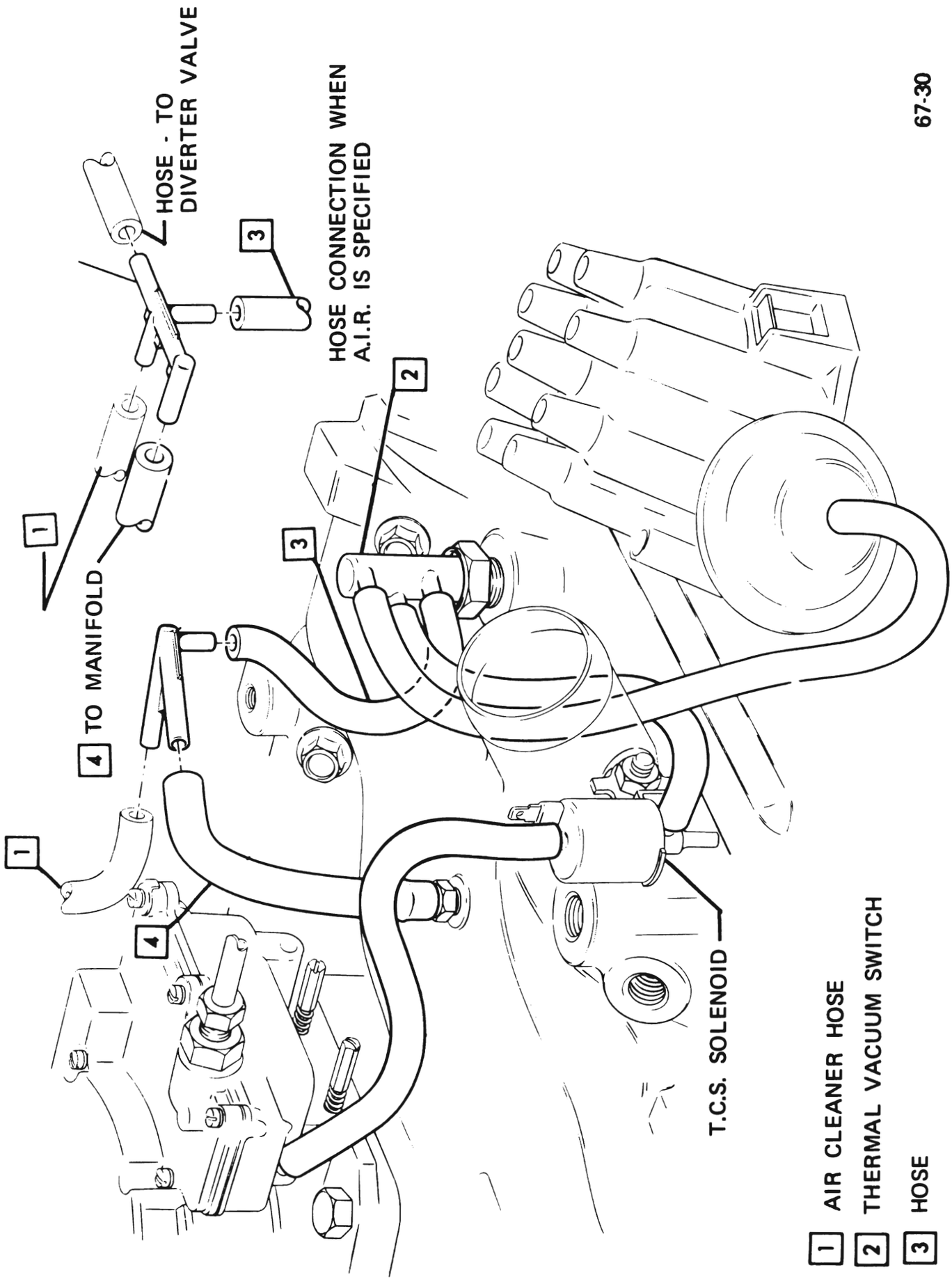

Figure 67-16 Vacuum Tube Routing - 350 2-BBL - 4D-4F-4H-4L-4N Series With Heavy Duty Cooling Less A/C

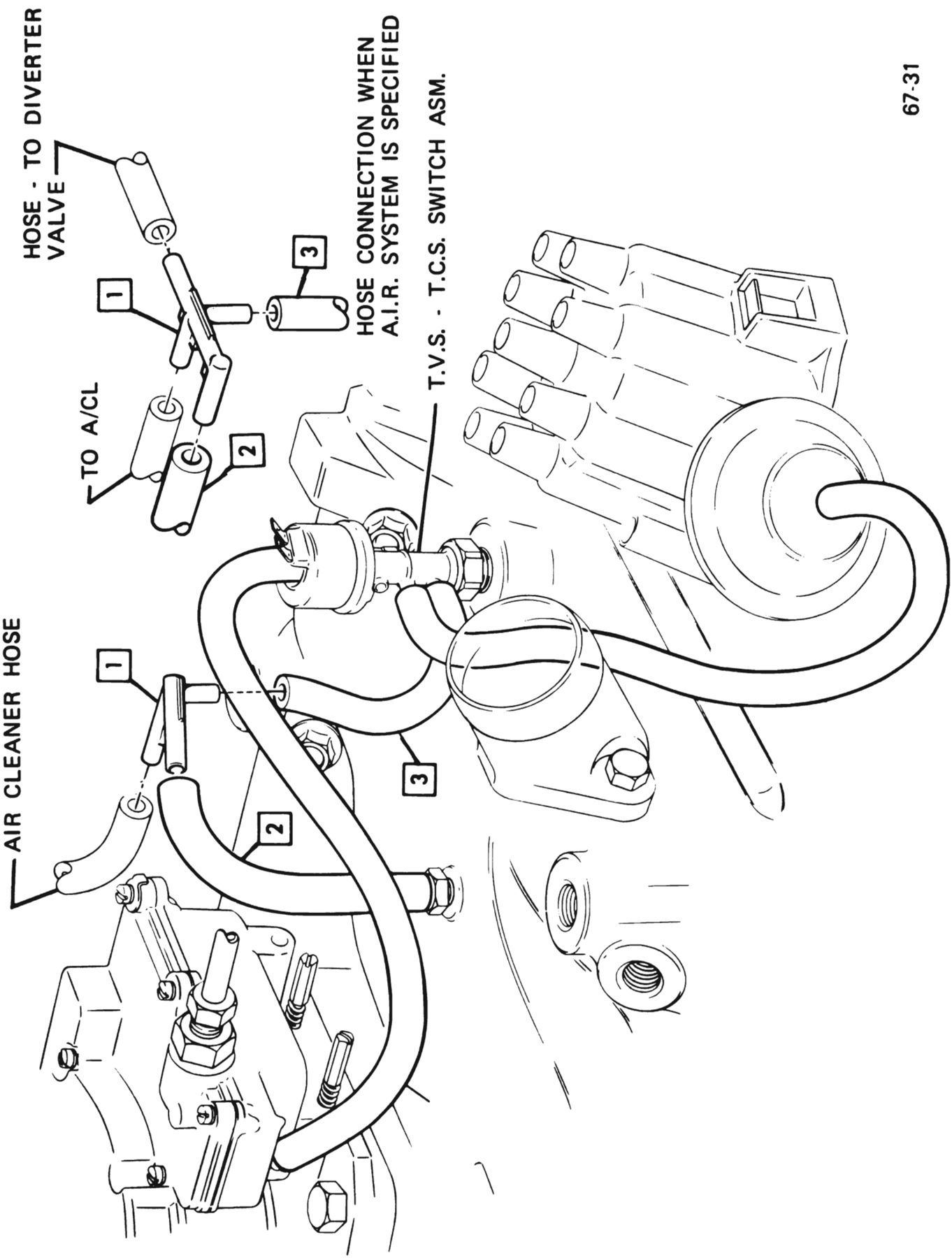

Figure 67-17 Vacuum Tube Routing - 350 2-BBL - 4D-4F-4H-4L-4N Series With A/C

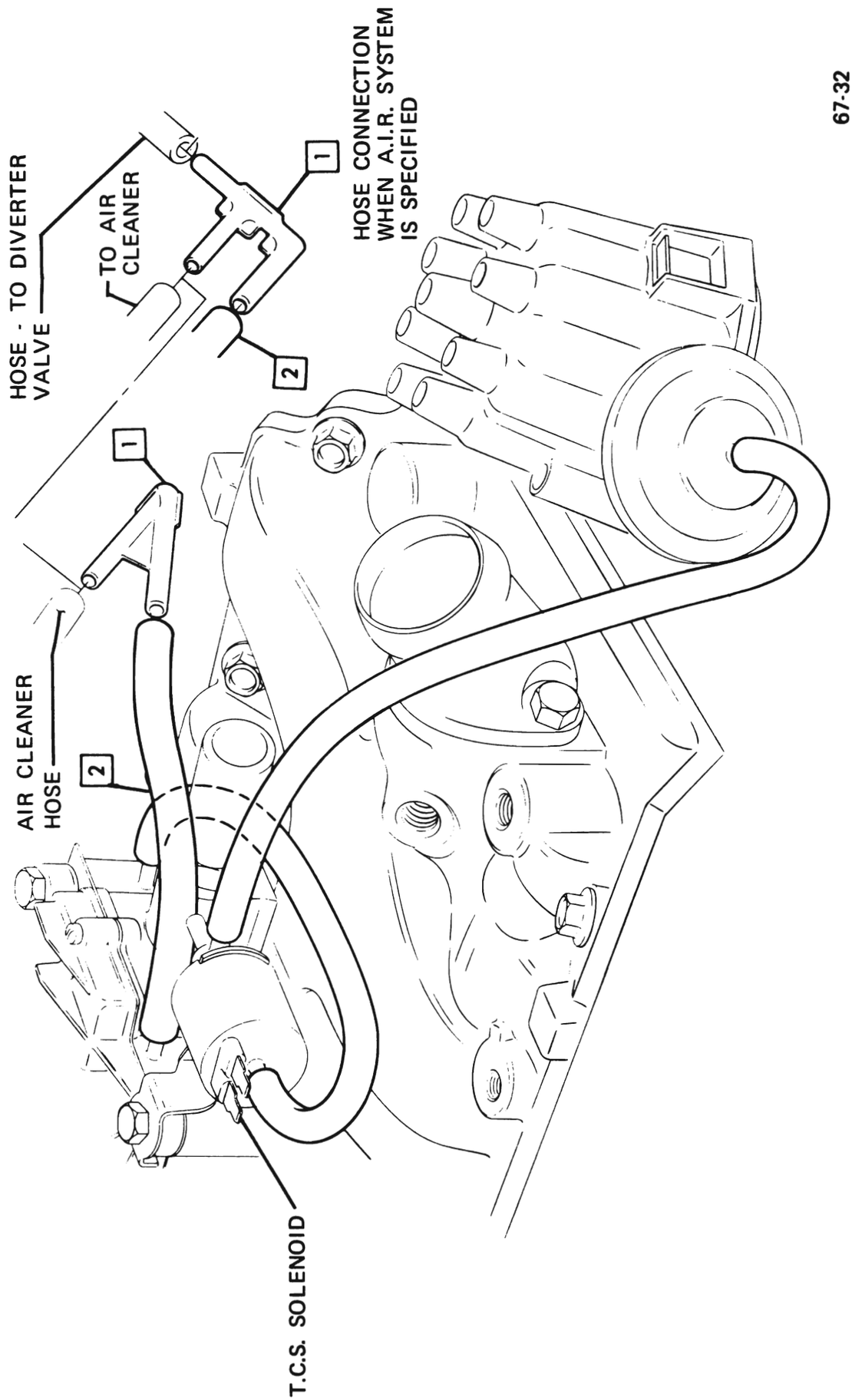

Figure 67-18 Vacuum Tube Routing - 350 4-BBL - 4D-4F-4G-4H-4L-4N Series Less A/C and Heavy Duty Cooling

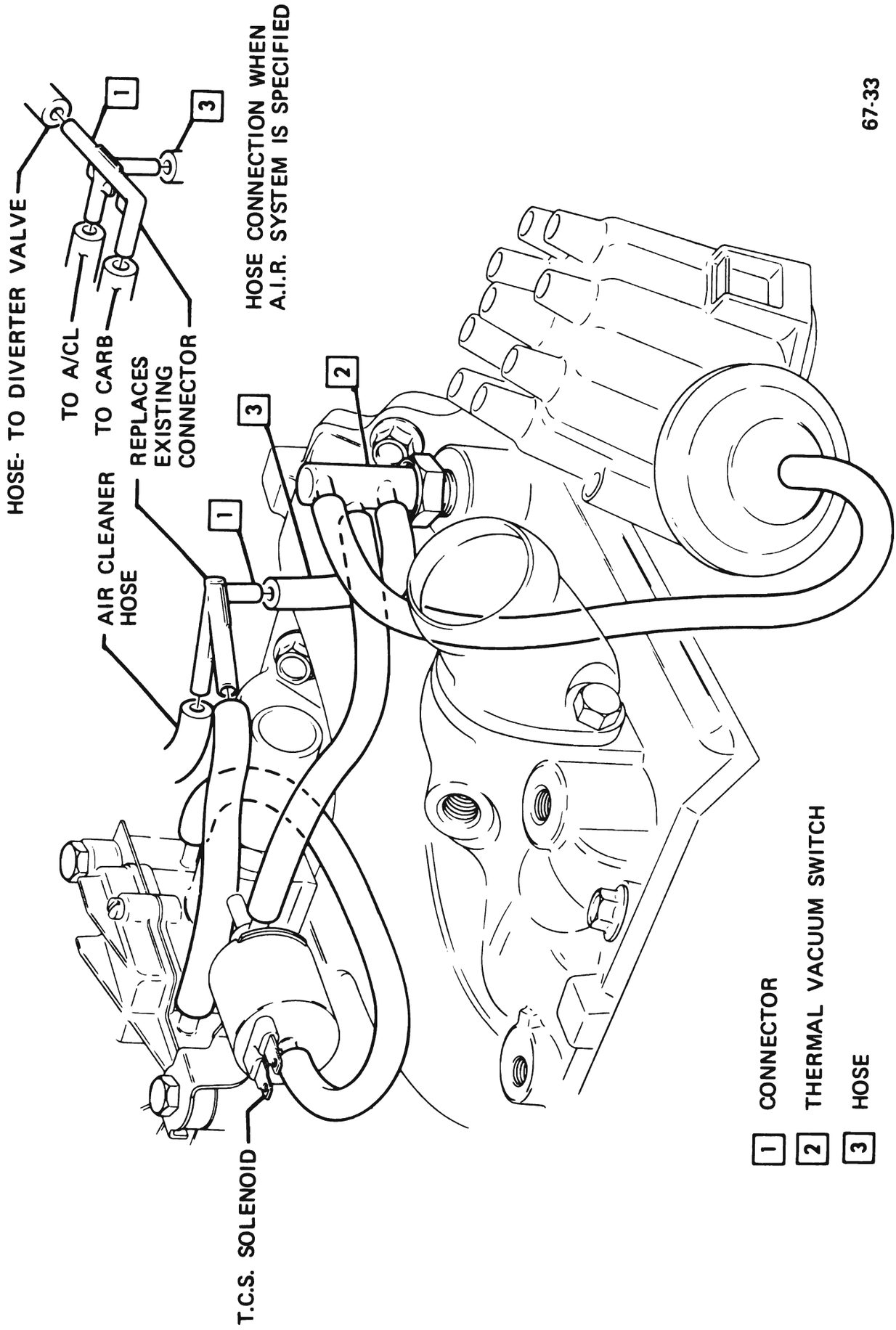

Figure 67-19 Vacuum Tube Routing - 350 4-BBL - 4D-4F-4G-4H-4L-4N Series With Heavy Duty Cooling Less A/C

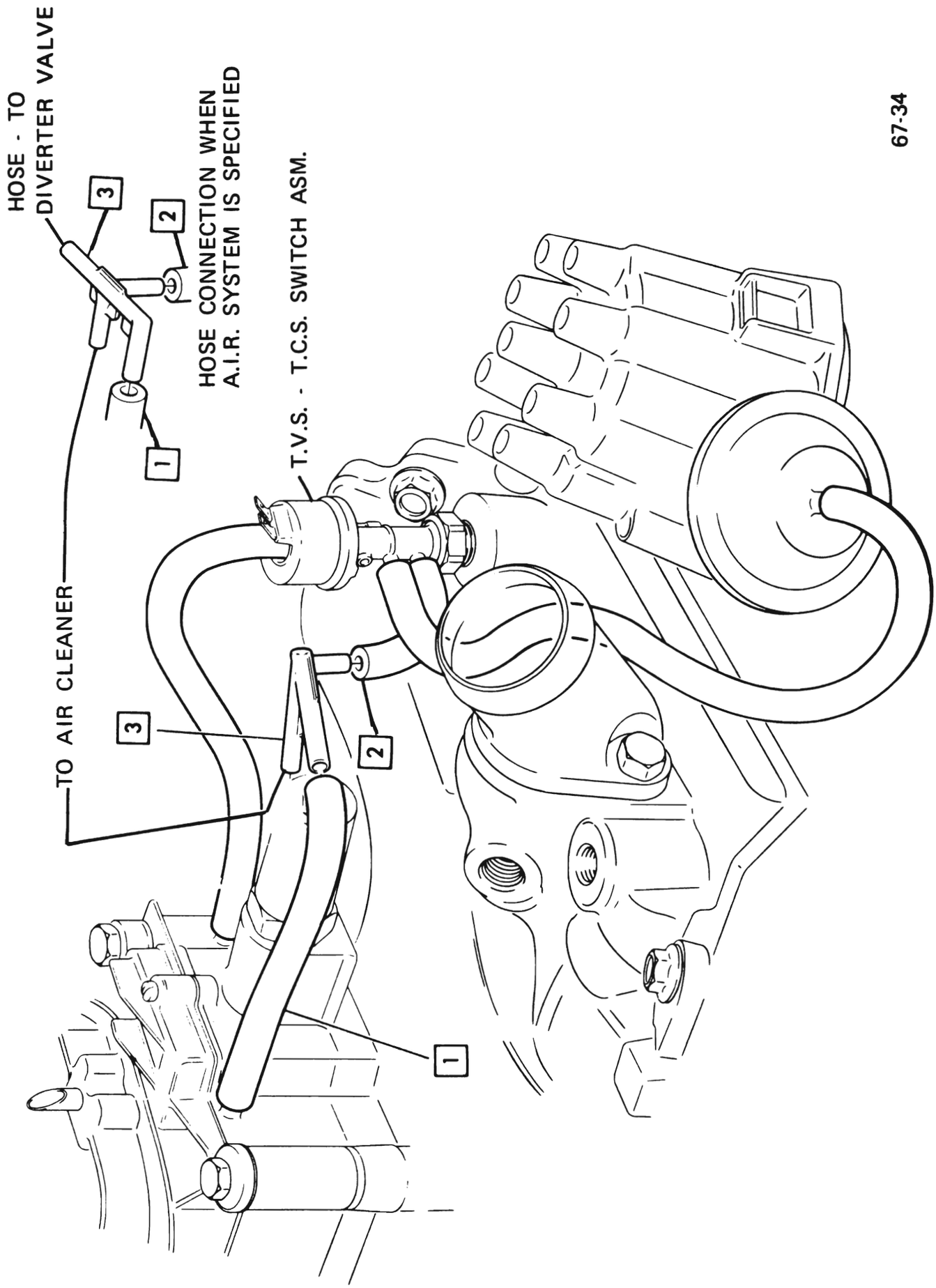

Figure 67-20 Vacuum Tube Routing - 350 4-BBL - 4D-4F-4G-4H-4L-4N Series With A/C

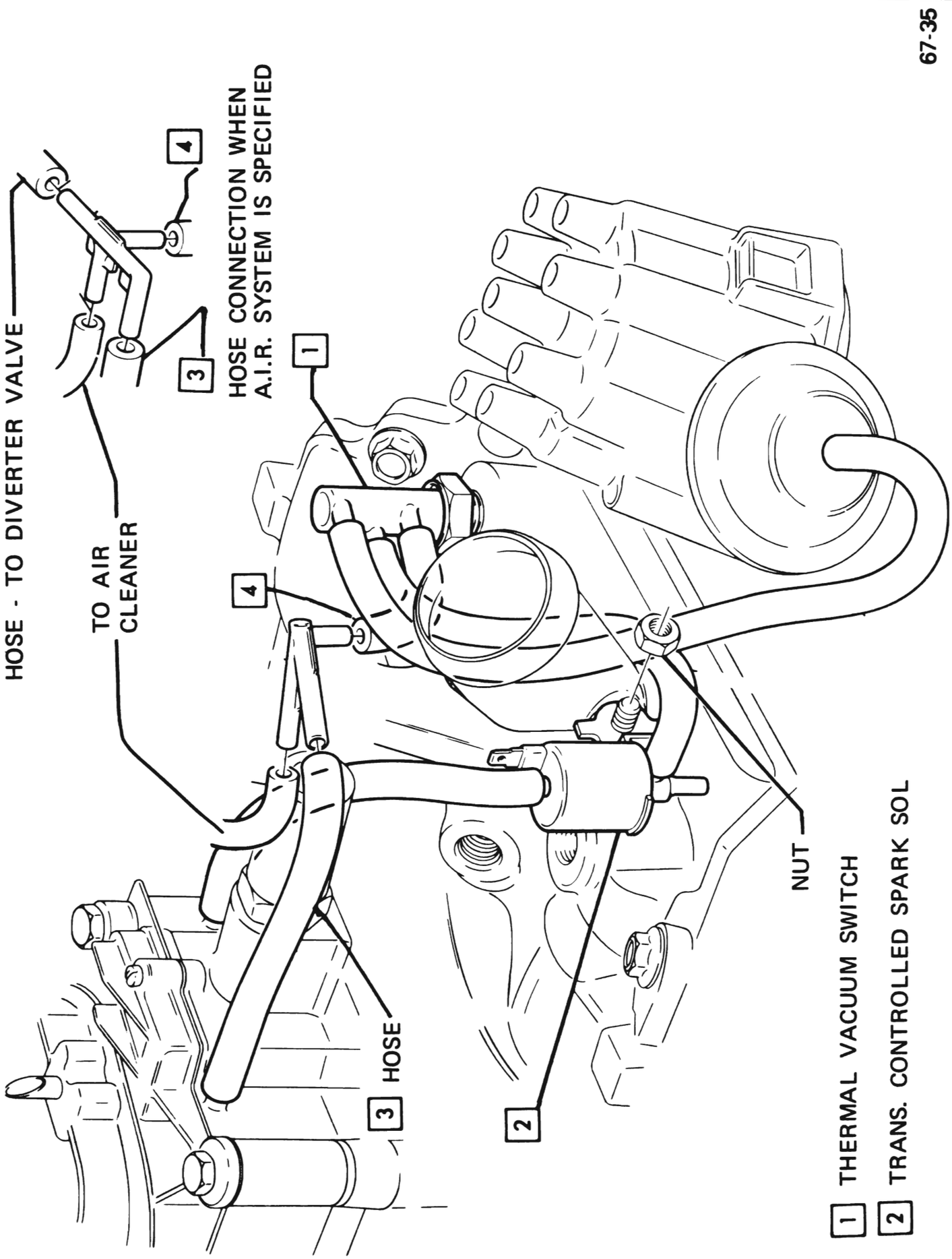

Figure 67-21 Vacuum Tube Routing - 350 4-BBL - 4G Series With A/C

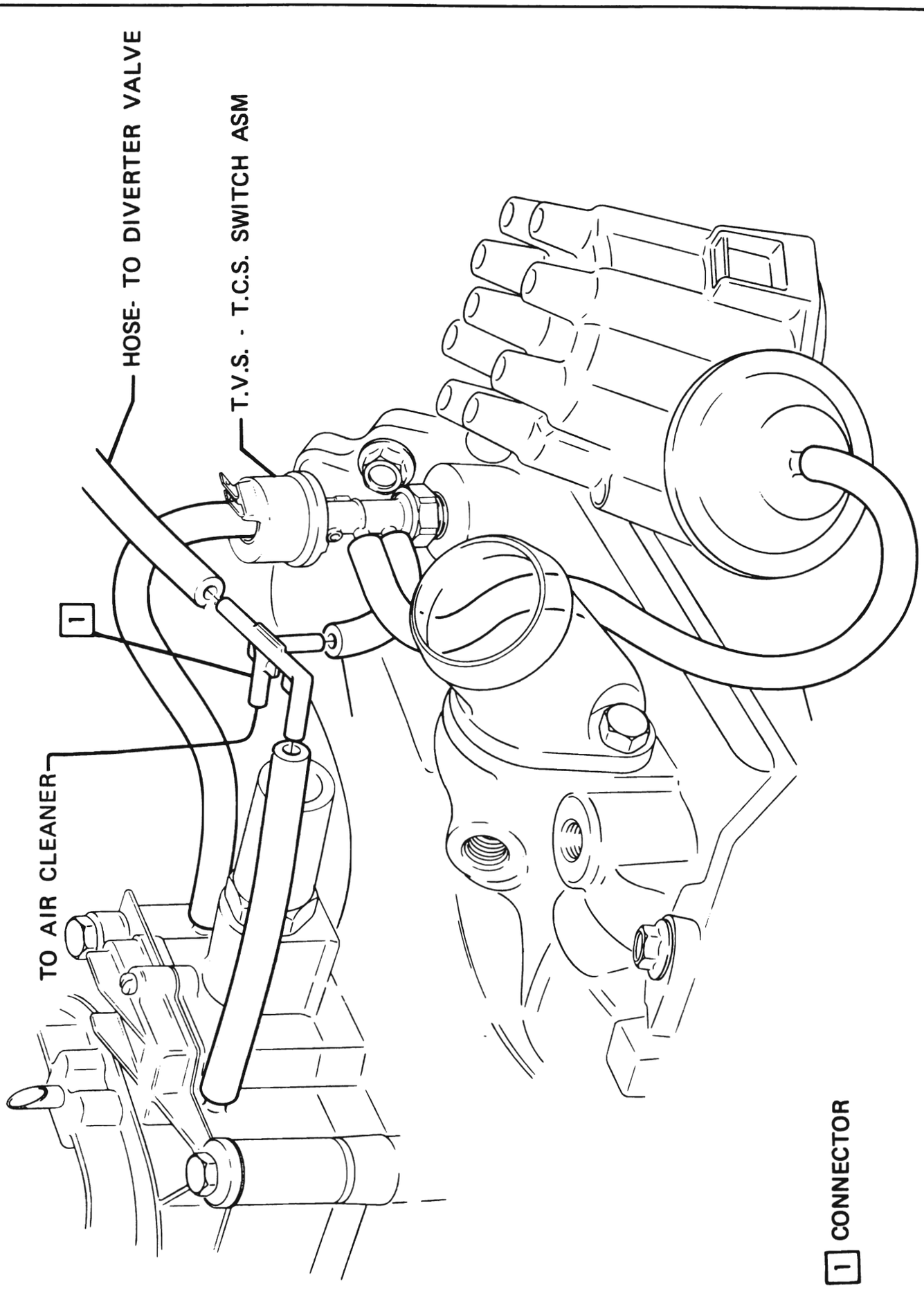

Figure 67-22 Vacuum Tube Routing - 455 Engine - 4L-4N-4R-4P-4U-4V-4Y Series

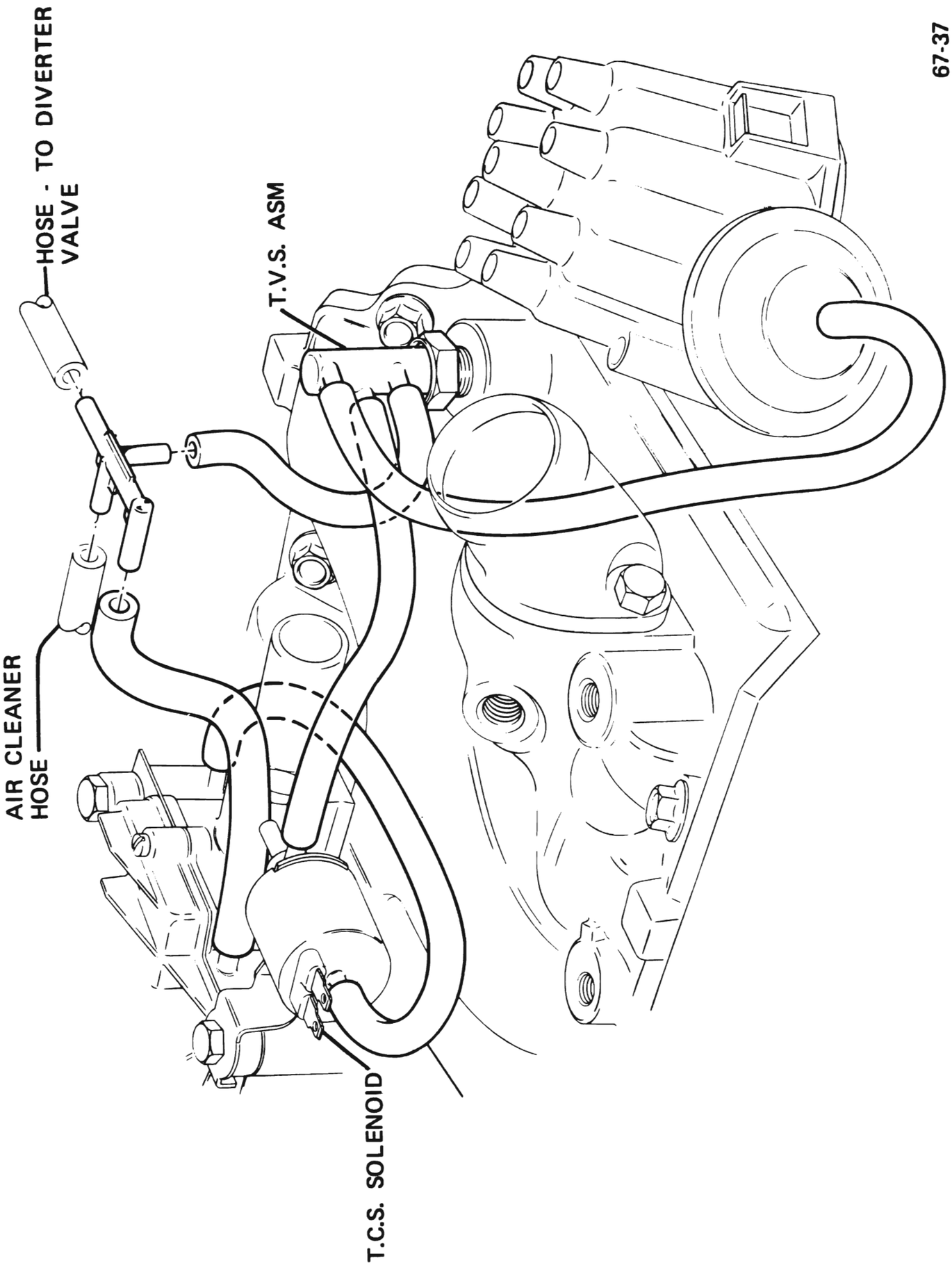

Figure 67-23 Vacuum Tube Routing - 455 G.S. and Stage I Engine - 4G Series

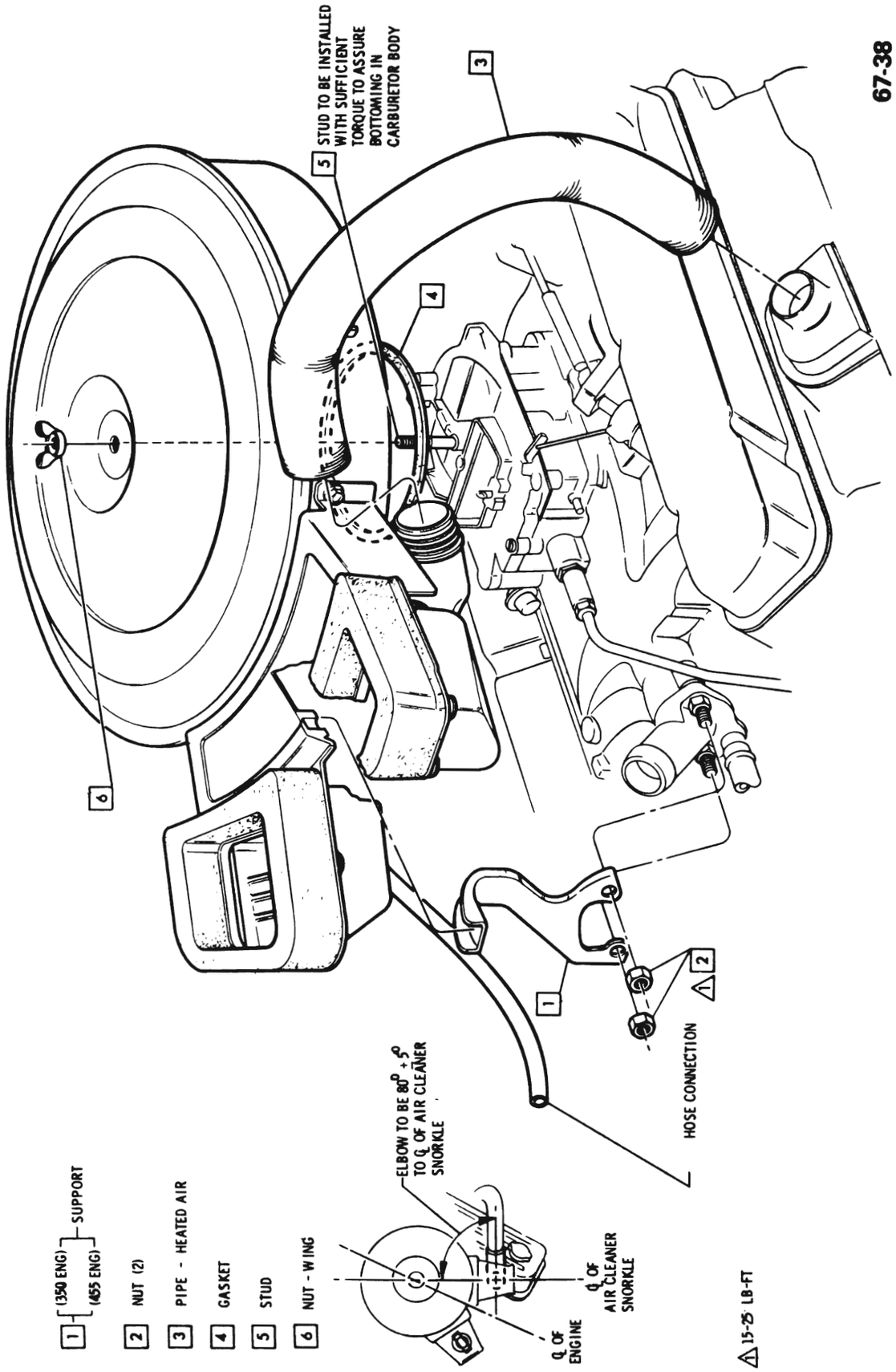

Figure 67-24 Air Cleaner Assembly - Dual Snorkel - 4G Series

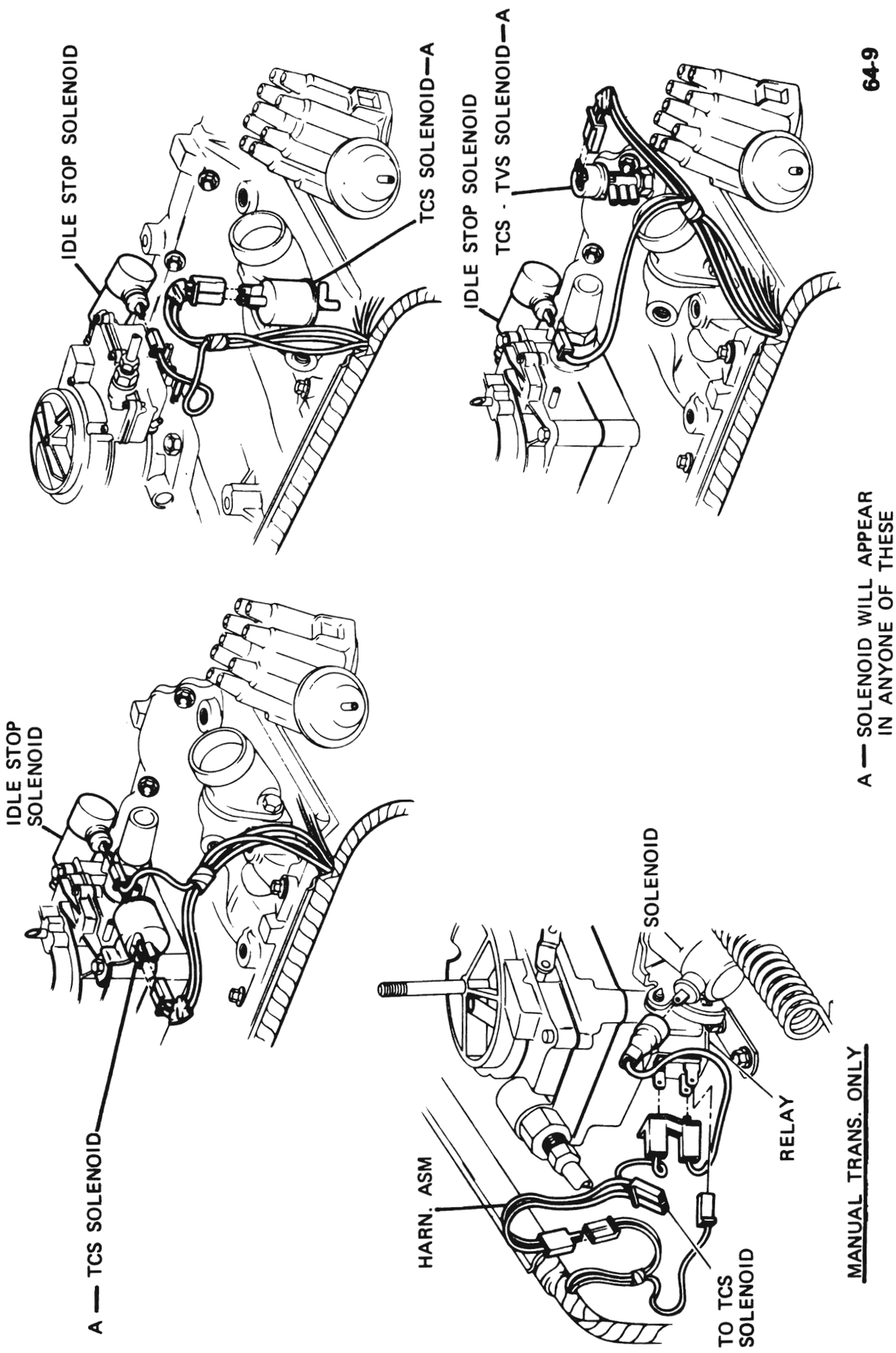

Figure 67-25 Idle Stop and T.C.S. Solenoid - 4D-4F-4G-4H Series

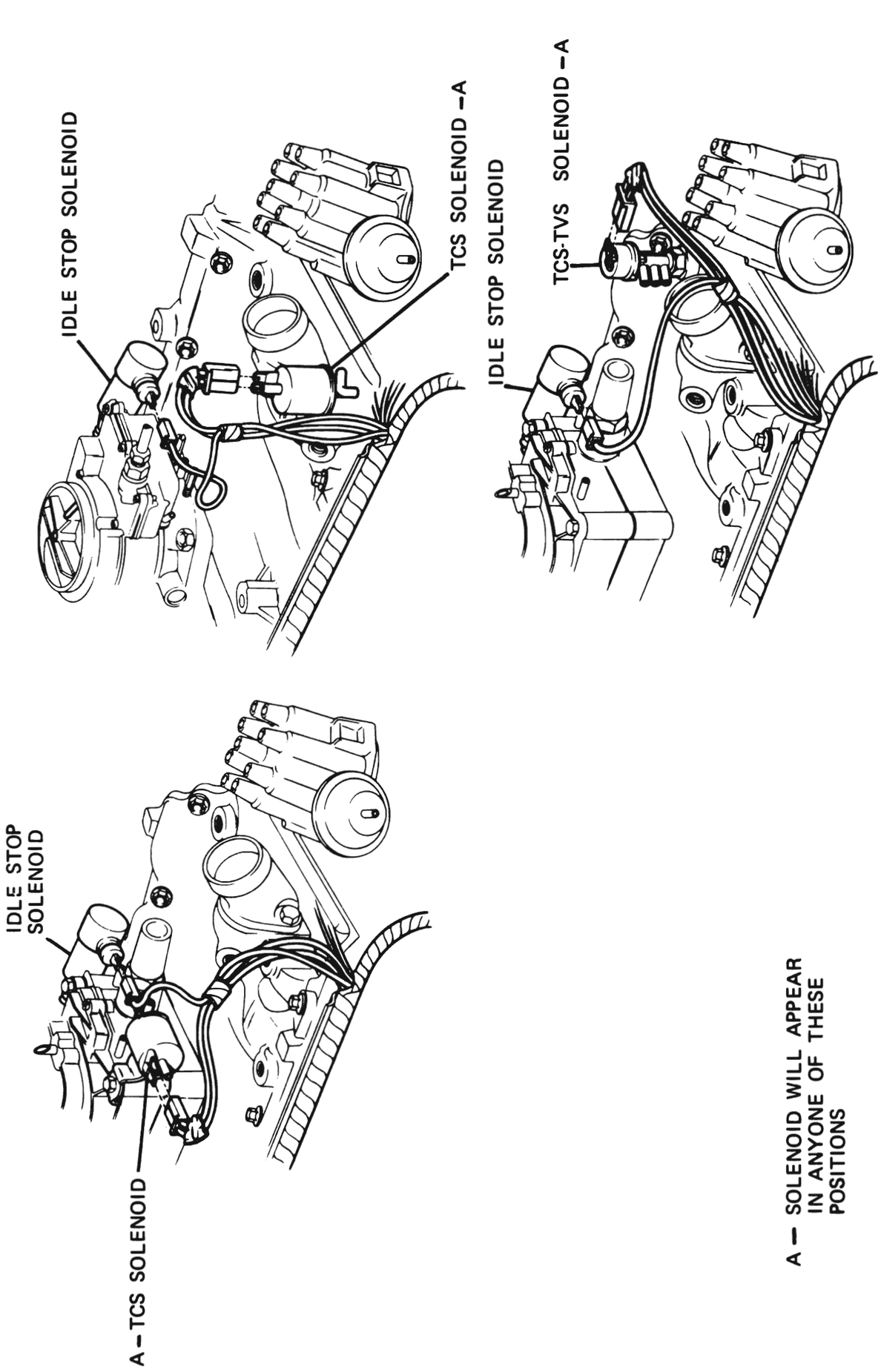

Figure 67-26 Idle Stop and T.C.S. Solenoid - 4L-4N-4R-4P-4U-4V-4Y Series

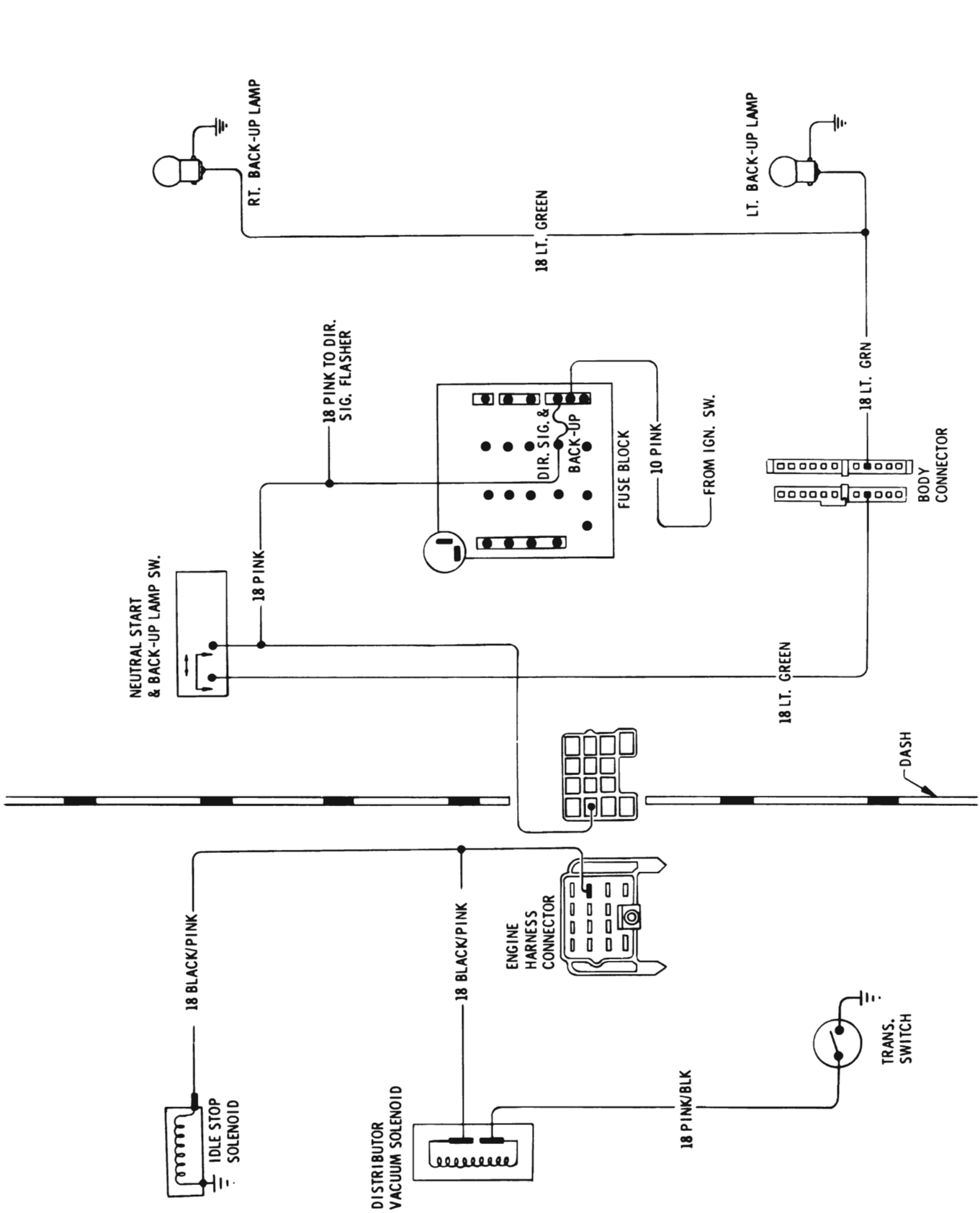

Figure 67-27 Back-Up Lamp and T.C.S. Solenoid - All Series