

Description

Part #

Qty

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Intake Manifold Assembly:

Intake Manifold (53010237)	9400045	1*	✓
Fuel Injector	53030343	6*	✓
Injector Clips	04418257	6*	✓
Fuel Rail - Single Line	53030699	1*	✓
Throttle Cable Bracket	53007486	1*	✓
MAT Sensor	05269756	1*	✓
M6x14 Cap Screw	9400052	7*	✓
Throttle Body	04856107	1*	✓
Throttle Body Gasket	53007543	1*	✓
Fuel Line Clip	34202997	1*	✓
5/16" x 1" Cap Screw	9400030	1*	✓
5/16" Lock Washers	9400031	1*	✓
Vacuum Port	53004523	1*	✓
1/4" x 3/16" 90-Degree Fitting	9400018	1*	✓
1/4" x 1/4" Straight Brass Fitting	9400019	2*	✓
Brake Booster Brass Fitting	9400060	1*	✓
M6 x 20mm Cap Screw	9400023	4*	✓
M8 x 20mm Cap Screw	9400024	0*	✓
M6 Flat Washers	9400028	11*	✓
Vacuum Cap	9400049	1*	✓
Air Filter Adapter	9400007	1*	✓
Adapter Hold Down Clamp	9400006	1*	✓
Vent Tube 1/2" x 90 Degree	9400010	2*	✓
5/16" x 1" Cap Screw	9400030	1*	✓
5/16" Flat Washer	9400040	1*	✓
5/16" Nyloc Nut	9400035	1*	✓
1/4" x 1 1/4" Cap Screw	9400025	1*	✓
1/4" Nyloc Nut	9400034	1*	✓
1/2" Plastic Hose Splice	9400016	2*	✓
1/2" PVC Hose (10")	9400048	2*	✓
Throttle Body Elbow	53006289	1*	✓
Intake Hose Adapter	9400005	1*	✓
2 3/4" Intake Hose (12")	9400008	1*	✓
Fuel Pump	HESHFP90	1*	✓
Fuel Pump Mount Clamp	9400009	1*	✓
5/16" x 1" Cap Screw	9400030	1*	✓
5/16" Flat Washer	9400040	1*	✓
5/16" Nyloc Nut	9400035	1*	✓
1/4" Nyloc Nut	9400034	1*	✓
Fuel Pressure Regulator / Filter	04798301	1*	✓
Fuel Regulator Body	9400056	1*	✓
Regulator Retainer Plate	9400062	1*	✓
1/4" x 3/8" ST. Brass Fitting	9400017	1*	✓
1/8" x 3/8" 90 Deg. Brass Fitting	9400064	1*	✓
Fuel Line-Inlet	52018417	1*	✓
Throttle Cable	52079382	1*	✓
Intake Manifold Gasket	J3242855	1*	✓
Distributor (56027028)	9400046	1*	✓
Spark Plug Wire Set	05017059AB	1*	✓
Wiring Harness	P4532698	1*	✓
Emission Cannister	53030500	1*	✓
PCM Computer - MAN TRANS	P4532679	1*	✓
PCM Computer - AUTO TRANS	P4532680	1*	✓
5/16" x 36" Fuel Hose	9400047	1*	✓
1/4" x 36" Fuel Hose	9400026	1*	✓
3/8" X 36" Fuel Hose	9400029	1*	✓
Vacuum Tube	53006237	1*	✓
Vacuum Tubing 2 Pieces Formed	53030728	1*	✓
Vacuum Tube Formed	53030473	1*	✓
Vacuum Tube Formed	53030474	1*	✓

6x6x6 Parts Box:

MAP Sensor	33000153	1*	✓
MAP Sensor Bracket	56027080	1*	✓
Crank Sensor	P4510012	1*	✓
Crank Sensor Bracket	9400004	1*	✓
1/4" x 1 1/4" Cap Screw	9400025	2*	✓
5/16" x 1 1/2" Cap Screw	9400038	1*	✓
1/4" x 1" Cap Screw	9400039	1*	✓
5/16" Flat Washer	9400040	1*	✓
1/4" Flat Washer	9400041	3*	✓
Coolant Sensor	33004281	1*	✓
Thermostat Housing	53006192	1*	✓
Speed Sensor	56027015	1*	✓
Speed Sensor Adapter	9400012	1*	✓
Valve Cover Fitting (Black)	53030497	1*	✓
Valve Cover Fitting (Gray)	53030495	1*	✓
Ignition Coil	56028172AB	1*	✓
Coil Bracket / Fuel Pump Plate	P4532710	1*	✓
1/4" x 1" Cap Screw	9400039	2*	✓
1/4" USS Nut	9400063	2*	✓
<b>Bag #1:</b>			
5/16" Nyloc Nut	9400035	1*	✓
5/16" x 1 1/2" Cap Screw	9400038	1*	✓
2 1/2" Adel Clamp (Fuel Filter)	9400037	1*	✓
5/16" x 1" Cap Screw	9400030	2*	✓
Fuel Pump Gasket	K4796679	1*	✓
Throttle Body Elbow Clamps	53008274	2*	✓
5/16" Hose Clamps	9400002	9*	✓
2 3/4" Hose Clamps	9400013	2*	✓
3/8" Mounting Clamp	9400054	1*	✓
<b>Bag #2:</b>			
Tie Wraps 3"	9400014	6*	✓
Concave Expansion Cup	9400042	1*	✓
Alternator Diode	9400044	1*	✓
#10 x 2" Sheet Metal Screws	9400015	3*	✓
#10 x 1/2" Sheet Metal Screws	9400020	2*	✓
Distributor Gasket	J3181288	1*	✓

7x7x7 Parts Box:

Air Filter	9400003	1*	✓
Oxygen Sensor	56028301	1*	✓
Fuel Pre-Filter	33000076	1*	✓
Thermostat	52001797	1*	✓
Thermostat Gasket	53020547AB	1*	✓
Wire Quick Connect A/T only	5400051	1*	✓
Transmission Cable Seal A/T only	38194074	1*	✓
Transmission Cable A/T only	52079310AB	1*	✓
Bracket A/T only	53007100	1*	✓
Spring A/T only	53007046	1*	✓
Nut A/T only	J4004075	1*	✓
Lever A/T only	38007888	1*	✓
Clip A/T only	52078465	1*	✓
Mopar Decal	N/A	1	✓
Installation Instructions	9400043	1	✓
Emissions Hood Decal	9400050	1	✓

Kit S/N:	4714	Man Trans Kit	✓
		Auto Trans Kit	✓

\* Denotes Pre-Assembled Components

Kit Checked By: AS

# INSTALLATION INSTRUCTION



## JEEP 4.2 LITER (258 CID) MULTIPOINT FUEL INJECTION KIT

**P5249610AD For Manual Transmission Vehicles**  
**P5249686AD For Automatic Transmission Vehicles**

**THIS KIT IS EMISSIONS EXEMPT IN THE STATE OF CALIFORNIA UNDER C.A.R.B. EXECUTIVE ORDER D265-21**

**THE TUNE UP PROCEDURES AND ENGINE SERVICE ARE THE SAME AS A 1994/1995 4.0 LITER JEEP WRANGLER**

**CHECK YOUR PARTS AGAINST THE BILL OF MATERIAL INCLUDED IN THE KIT (Attached to instructions)**

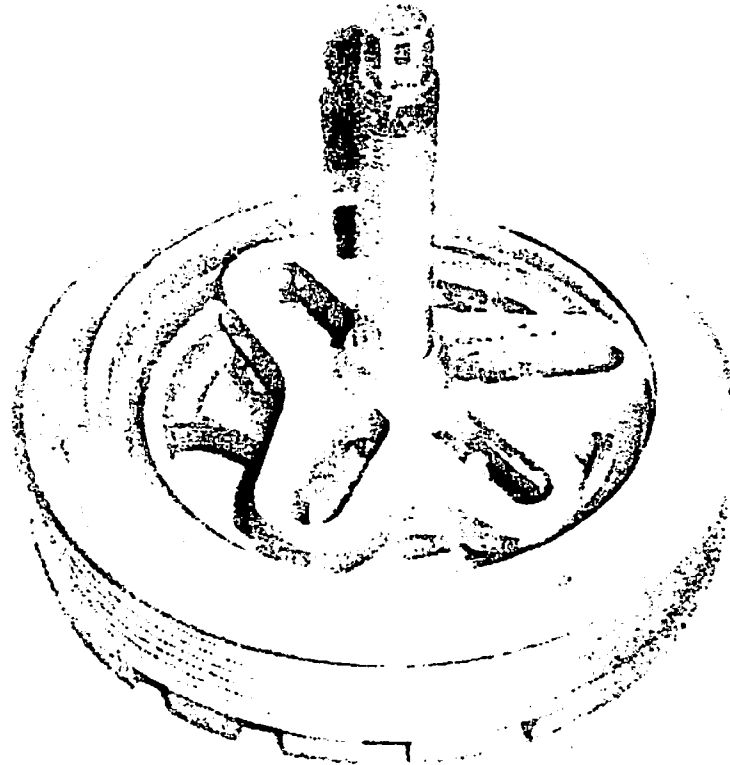
This product is intended for use on STOCK, UNMODIFIED, WELL MAINTAINED 1981-1990 4.2 LITER (258 cid.) ENGINES. Installation on engines with MODIFIED CAMSHAFTS, INCREASED COMPRESSION RATIO or engines that are in POOR MECHANICAL CONDITION, such as LOW CRANKING COMPRESSION or EXCESSIVE OIL CONSUMPTION is not recommended.

**NOTE: If spark knock (detonation) occurs, it is recommended that 92 octane or better premium fuel be used. The use of Mopar combustion chamber cleaner will reduce carbon deposits and help reduce spark knock.**

## DISASSEMBLY:

1. Disconnect the ground cable from the battery and drain the coolant from the radiator.
2. Loosen the power steering pump and the alternator and remove the drive belts. Remove the two bolts that hold the power steering pump to the water pump. Remove the two nuts from the rear power steering pump bracket, then slide the pump forward to **disengage it from the rear bracket. Remove the rear bracket from the intake manifold.**
3. Remove the air cleaner assembly as a unit and discard it.
4. Remove all of the production emissions controls from the engine, including the three (3) solenoids located on top of the valve cover, the vacuum switch assembly and any lines and delay valves connected to the carburetor.  
**NOTE: Refer to the Production Emissions Schematic or to a proper shop manual for your particular year vehicle.**
5. Remove the pulse air valves, which inject fresh air upstream and downstream of the catalytic converter, and all associated fittings.
6. Disconnect the heater hose from the fitting on the intake manifold. Remove the throttle linkage and throttle cable. Remove the carburetor/intake manifold assembly. This will require removing the tube that connects the exhaust manifold to the EGR valve mounted on the intake manifold.  
**NOTE: It is not necessary to remove the exhaust manifold.**
7. Remove the stock mechanical fuel pump and fuel lines from the engine. **Make sure to mark the lines PRESSURE and RETURN where you disconnect them at the fender well.**  
**CAUTION: GASOLINE IS HAZARDOUS!! WEAR eye protection and never work on a HOT engine or around FIRE OR FLAME!**
8. Disconnect the upper and lower radiator hoses and remove the radiator, fan shroud, engine fan, thermostat housing and crankshaft pulley.
9. Remove the plug wires and distributor cap. Remove the #1 spark plug and rotate the engine in its normal direction until the #1 piston is on the compression stroke. The timing mark on the dampener should line up with the "0" mark on the timing tab. Looking through the stock fuel pump mounting boss, rotate the engine backwards until the camshaft moves and note the amount of slack in the timing chain as degrees on the timing tab. If the slack is more than 10 degrees, replace the timing chain. Rotate the engine in the direction of rotation to the "0" of the timing tab. **Note the clocked position of the distributor rotor.** Loosen the hold down clamp and remove the distributor. Remove the ignition coil and bracket and discard them.
10. Using a suitable puller, remove the crankshaft dampener. You will need a new dampener, P5249688 for serpentine belt, or P5249687 for V-belt driven pulleys. See Figure 1.

Figure 1



11. Remove the brake booster fitting from the old manifold and install it in the new manifold.
12. Remove the windshield washer bottle and the charcoal fuel canister. **Be sure to mark the vacuum lines that go from the fuel canister to the intake manifold and the fuel tank.**
13. Remove the front three (3) driver's side oil pan bolts.
14. Remove the oxygen sensor from the exhaust manifold.
15. If the vehicle has a catalytic converter, it will be necessary to seal the air injection tubes at the CAT and header pipe. Seal by bending the end of the tube and crimping.

## ASSEMBLY:

1. Install the new oxygen sensor in the exhaust manifold.
2. Cut off one end of the tube that went from the exhaust manifold to the EGR valve and remove the tube nut from it. Install the saucer shaped freeze plug into the hole in the exhaust manifold where you removed the EGR tube. Secure the freeze plug by tightening the now free tube nut down against the freeze plug.
3. Install the new distributor (The distributor is shipped with an indexing lock pin and will not rotate. DO NOT REMOVE THE PIN UNTIL THE DISTRIBUTOR IS INSTALLED).  
**NOTE: If you think the engine may have moved from TDC, make sure the engine is at TDC on the crankshaft balancer (Figure 3). The oil pump should be in the position shown in Figure 4. Install the hold-down clamp and remove the yellow locking pin (Figure 5).**

Figure 3

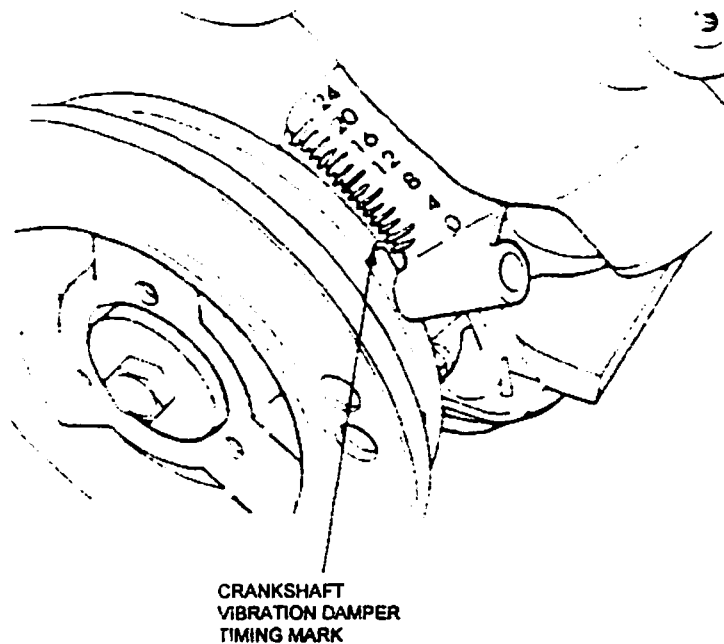


Figure 4

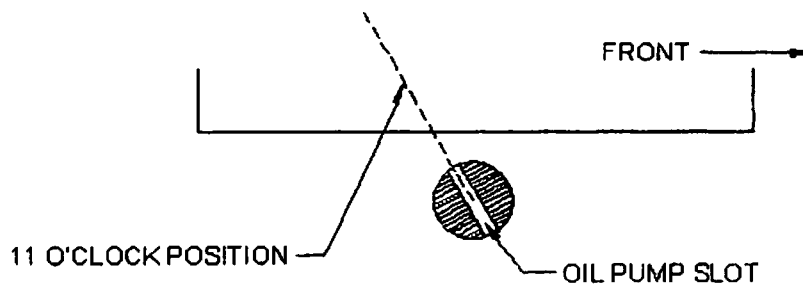
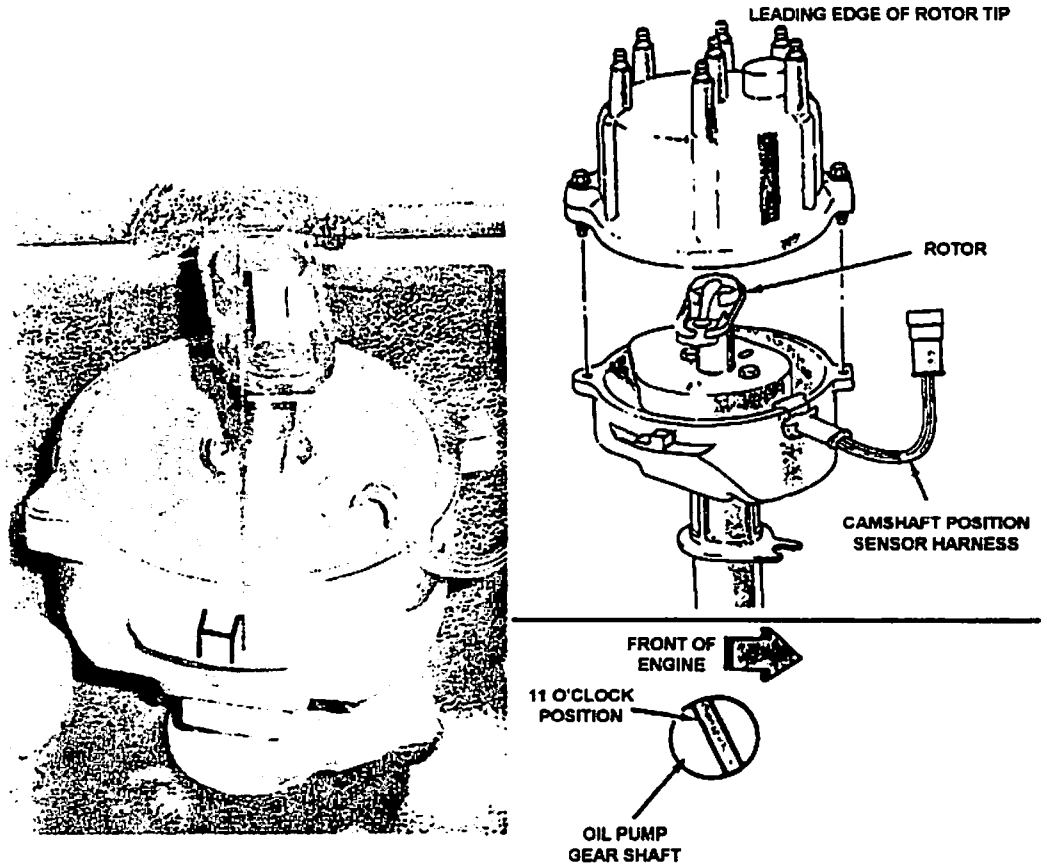
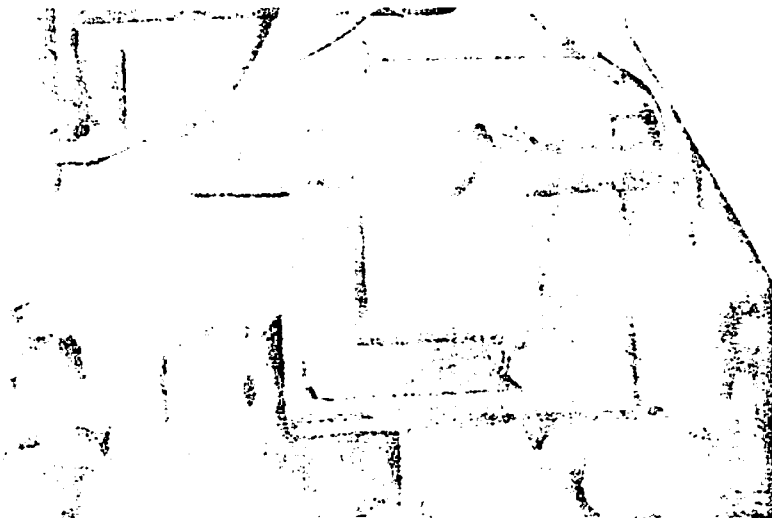


Figure 5



4. Install the combination fuel pump block-off plate/ignition coil bracket where you removed the original fuel pump. Install the coil with the plug wire terminal toward the distributor (Figure 6).

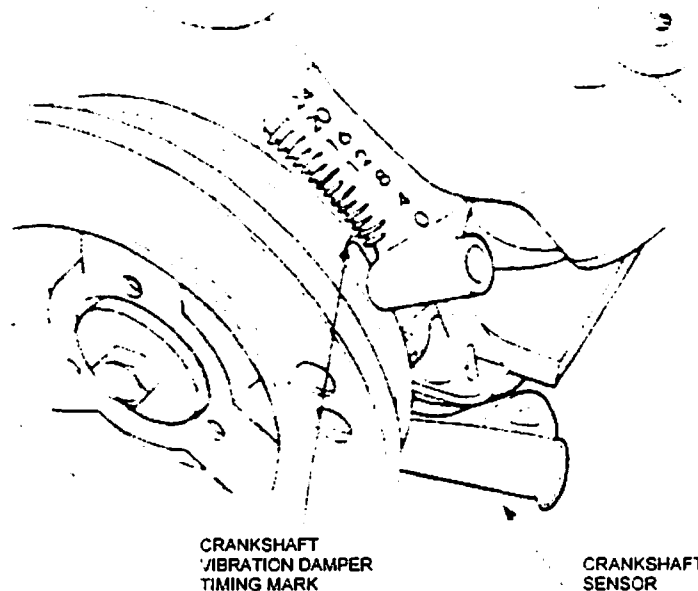
Figure 6



5. Install the new crankshaft dampener. (Torque the bolt to 120 ft. lb.)

6. Install the pickup sensor bracket. The bracket bolts to the oil pan where you removed the three (3) bolts in step #13 of the disassembly instructions. Install the pickup sensor on the bracket with the bolt provided. **NOTE: There should be between .020" and .060" clearance between the sensor and the crankshaft dampener.** This clearance is the thickness of the paper button on the end of the sensor. You push the sensor up against the dampener then tighten the mounting screw. This will set the initial clearance (Figure 7).

Figure 7



7. Install the crankshaft pulley, the fan, and the radiator. Install the new 195 degree thermostat. **This is critical. Temperature level of 195 degrees is critical for fuel system operation.** Install the coolant sensor supplied into the new thermostat housing in the 3/8" pipe hole, then reinstall this new assembly on the engine. Reinstall the radiator hoses and heater hoses.
8. Install the new intake manifold. You will only be able to reinstall one of the power steering pump bracket bolts and you may have to trim the top lip off of the power steering pump bracket to make it fit the new manifold. **DO NOT over tighten the bolts!** Bolt torque is 23ft. lb. (Figure 8).
9. Install the throttle cable and bracket (Figures 9 and 10).

Figure 3

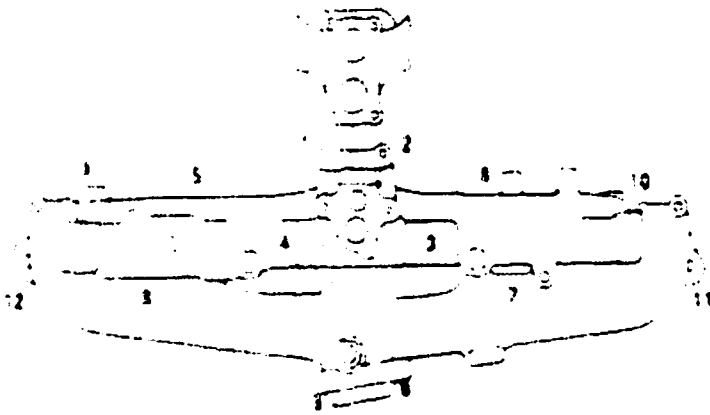
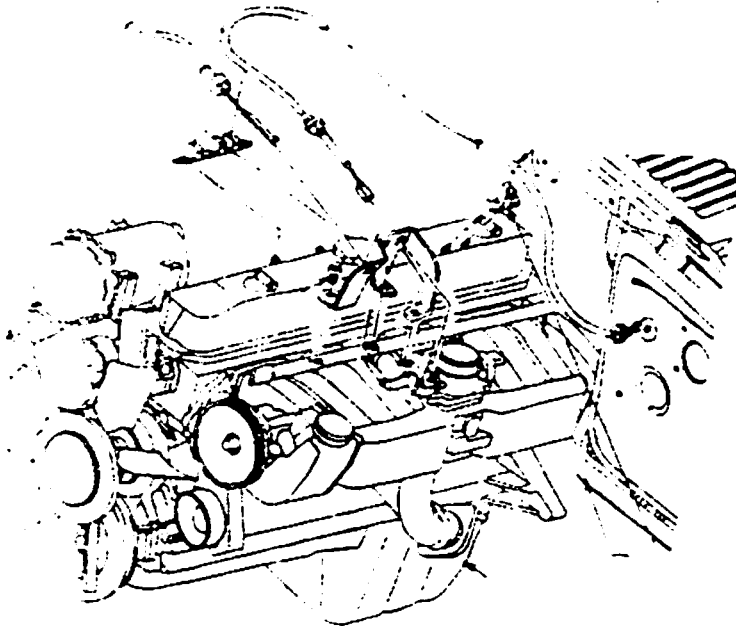


Figure 9



Figure 10



10. On automatic transmission vehicles: the kick down linkage must be installed (Figures 11, 12 and 13). Once these parts are assembled, you should set the adjustment. Rotate the throttle body to wide open throttle. This will cause the cable to ratchet to the proper zero clearance (Figure 12). At this time, verify that the throttle linkage works smoothly and returns to IDLE (closed throttle).
11. Reinstall power steering pump bracket and belts. Tension the belts. The hole in the bracket may need to be enlarged slightly.



Figure 11

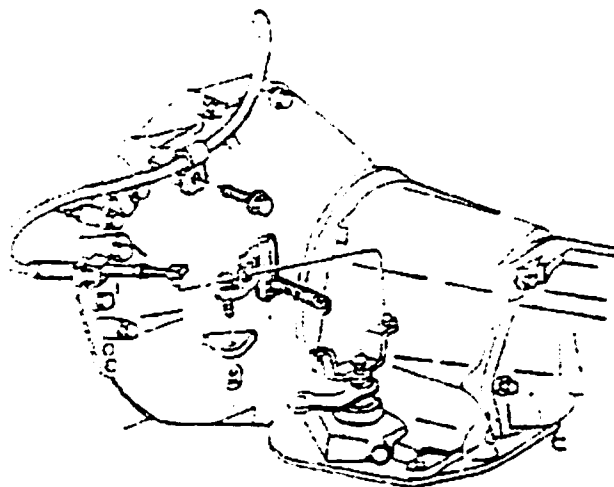


Figure 12

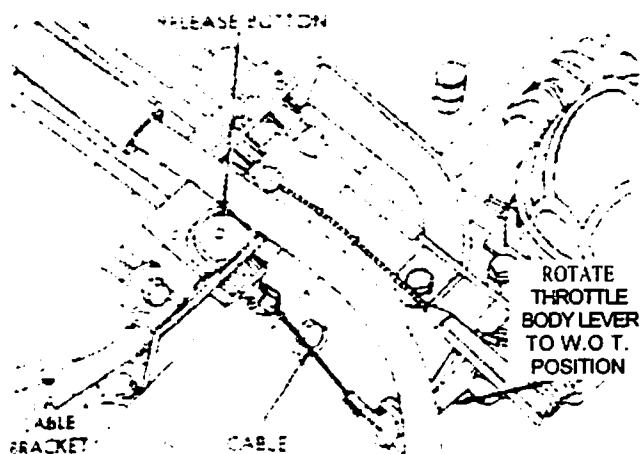
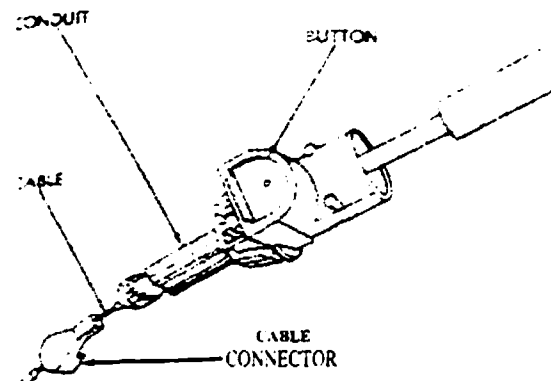


Figure 13



12. Connect the new fuel line to the fuel rail and attach to the mounting bracket on the new intake manifold. Find the fuel inlet line where it was connected to the stock mechanical fuel pump (**NOTE: Some CJ models have the fuel supply line routed down the right passenger side of the vehicle.**) Trace this line back across the engine bay to the driver's side frame rail. Cut this line a few inches behind the front leaf spring eye. Bend it up slightly to align with the new fuel line that comes from the MPI fuel rail. Connect the line with the 5/16" fuel hose and clamps provided.

**NOTE: On models with the fuel supply line on the right side, carefully route the line around to the fuel rail similar to the O.E. setup.**

**CAUTION: If you must buy any fuel line to aid in your installation, make sure it is rated to handle EFI pressures!**

## INSTALL THE FUEL PUMP AS FOLLOWS:

- 13A.** Jack up the rear of the vehicle and place on jack stands. From under the vehicle looking to the rear you will notice a cross member in the frame above and behind the axle housing. On the driver's side of this cross member you will notice a rubber block with three (3) flexible fuel lines emerging from it. The lines turn 90 degrees toward the frame and are connected to hard lines with clamps. On the flange of the cross member are three (3) bolts that attach the fuel tank skid pan to the cross member.
- 13B.** Remove the center bolt.
- 13C.** Disconnect the center fuel line from its hard line at the clamp. Reconnect this flexible line to the inlet side of the new fuel filter.
- 13D.** Mount the fuel pump assembly to the cross member flange (or as close as possible) using the nut and lock washer provided. Connect the fuel filter to the inlet side of the fuel pump using 3/8" fuel hose.
- 13E.** Connect the 3/8" flexible fuel line from the new fuel pump outlet to the inlet of the new fuel pressure regulator. (bottom fitting). Connect the center fitting to the fuel return line to the tank. Connect the outlet side of the fuel regulator filter to the fuel hard line leading to the engine. Remove the bolt closest to the right side frame rail and mount the fuel pressure regulator unit. Connect the center fitting of the regulator to the fuel return going to the fuel tank. The original fuel return hard line is not used and may be removed or left in place. Refer to the picture in the tip sheet.
- 14.** Install the new charcoal canister in the stock location and hook up the new vacuum lines. (Figures 14, 15 and 16.) Some engines will not have to use both the plastic valve cover fittings. The many different valve covers have different PCV and fresh air fittings. Make sure to use the grey fitting in the rear of the valve cover. The stock open vent located at the front of the valve cover may remain. It is important that the engine is ventilated to properly to meet emissions and reduce oil leaks caused by crankcase pressure.

Figure 14

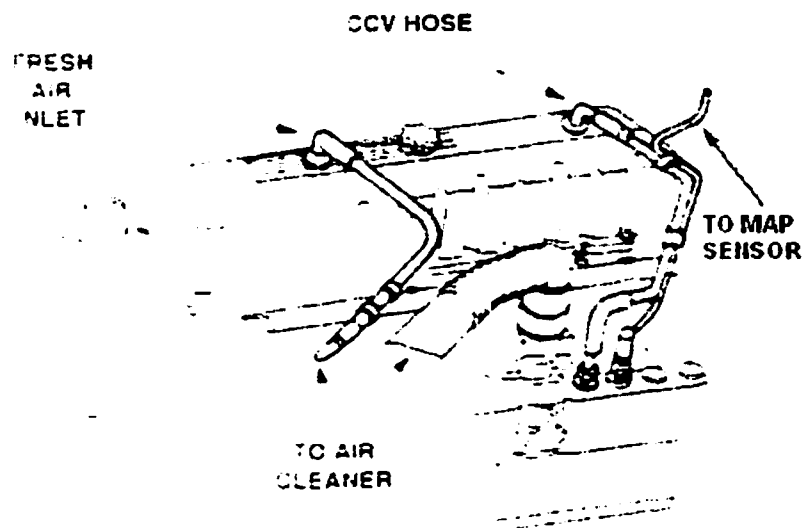


Figure 15

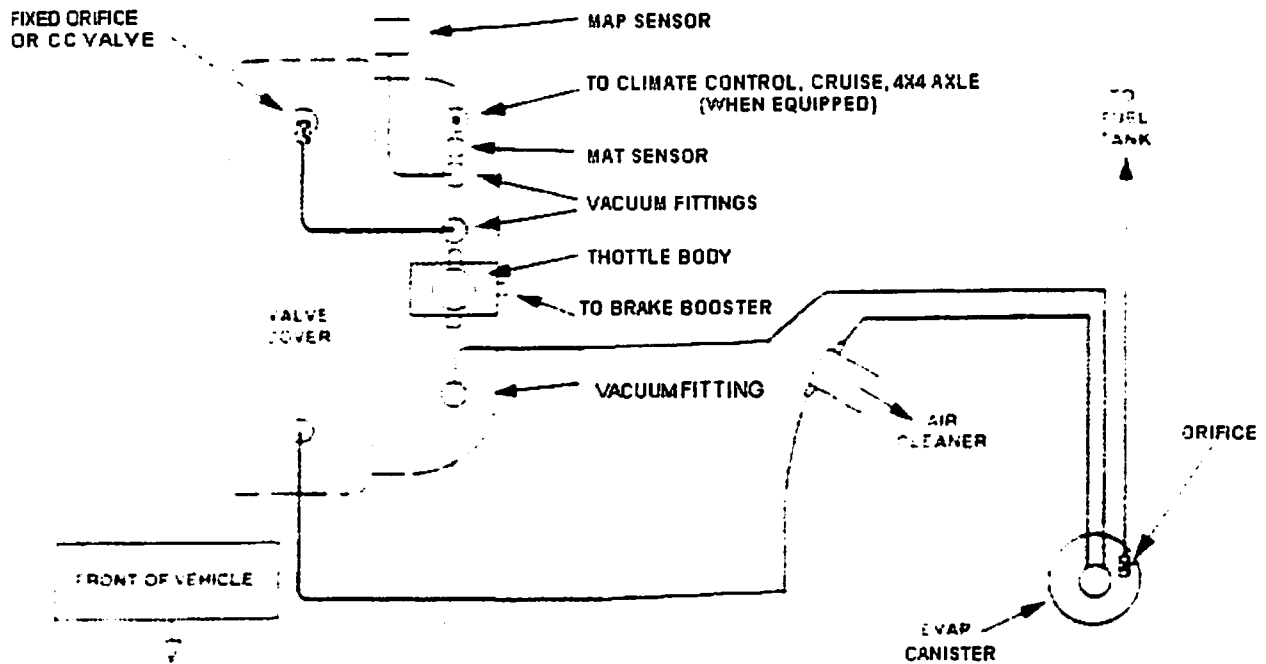
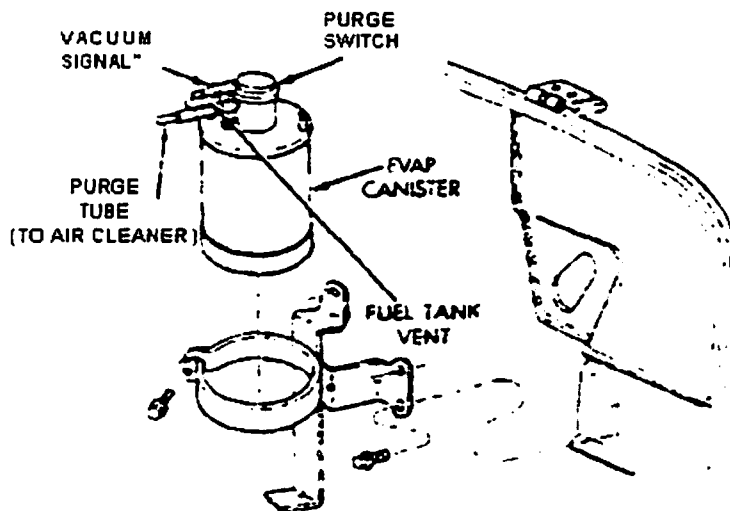


Figure 16



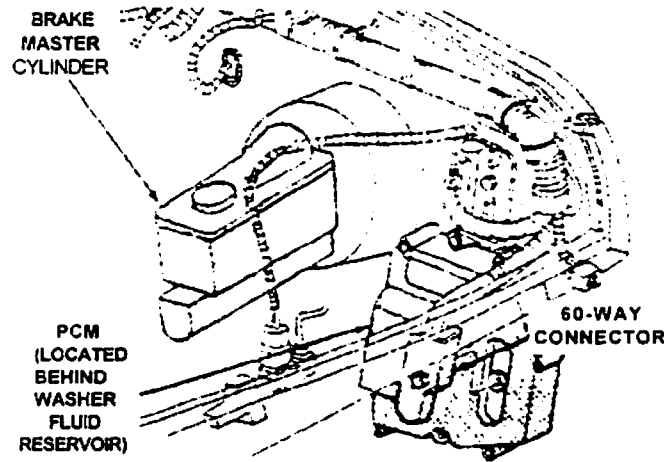
15. Install the new Power train Control Module (PCM) right above the charcoal canister on the bulkhead with the supplied hardware.

**NOTE: Some models may vary in the space to mount the PCM, however, it should fit in this approximate location. DO NOT OVERTIGHTEN SCREWS.**

16. Plug in the wiring harness to the PCM using the 60-pin connector. **DO NOT OVERTIGHTEN THE CONNECTOR!** Drape the harness over the top of the master cylinder, then around the back side of the engine.

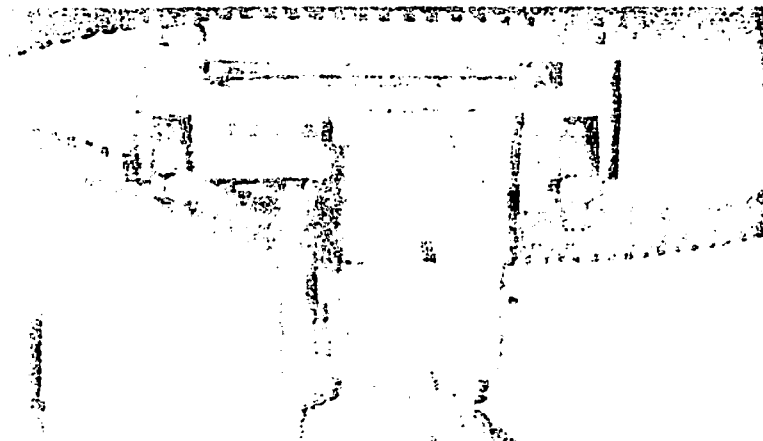
**CAUTION: THE HARNESS MUST NOT BE CLOSE TO THE EXHAUST; USE TIE WRAPS TO SECURE IT OVER THE MASTER CYLINDER (Figure 17).**

Figure 17



17. Find the two relays on the harness a short distance from the PCM. Mount them to the bulkhead with the screws provided. **NOTE: Mount the relays with the wires pointed down. This is to prevent water build-up within the relays. The PCM may be mounted at any angle, however, do NOT mount it with the wire connector facing up. This would allow water to pool in the connector! The PCM is waterproof. The 60-pin connector is splash proof, but will not work when immersed in water.**
18. Mount the MAP sensor to the bulkhead right behind the engine with the screws provided. Plug the green three (3) prong plug from the harness into the MAP sensor (Figure 18).

Figure 18



19. Route the harness down along the valve cover toward the front of the engine. Connect the fuel injectors. Each one is marked where it goes.
20. In the center of the harness between injector plugs #3 and #4 is a group of four plugs. Connect three (3) of these to the throttle body in their respective receptacles, and the fourth one to the Manifold Air Temperature (MAT) sensor (Figure 15).
21. In the harness at the front of the engine is another group of three (3) plugs. One of them is very long; this is the Oxygen Sensor plug. The three (3) prong plug in this group is the pickup sensor plug. The other (two prong) plug is the coolant sensor plug. These will only plug in to the correct sensors. Secure the cables with tie wraps provided. Make sure the pickup sensor connector is tied away from the exhaust manifold.
22. Bend the harness toward the passenger side of the Jeep® and down along the spark plug side of the head. The next plug is the ignition coil connection. Then comes the harness ground with the distributor plug. Connect the harness ground under the bolt that holds the dipstick tube to the engine block. (It has other ground wires on it. **Do not remove any.**) Connect the distributor.
23. Route the rest of the harness along the top of the transmission. The next plug will be the vehicle speed sensor. (Figure 19.) Route the remaining harness along the frame rail to the rear of the Jeep® to connect the fuel pump power (+) **to the green wire with the black stripe.** The ground wire is black with an orange stripe. **Secure the harness all along its length in strategic locations with the tie wraps provided. Make sure that there is clearance between any moving parts or areas of high temperature, such as the vehicle exhaust.** You may want to use dielectric grease on the connections to prevent corrosion (Mopar part number J8126688).

Figure 19



24. To supply a switched 12 volt power supply to the two bulkhead mounted relays, locate the old positive (+) side coil wire (usually a yellow color). Connect this wire to the relay wire. Now connect the red relay wire to the starter relay, battery plus(+). The starter relay is usually located under the battery box or mounted on the fender panel. Mount the system fuse.  
**NOTE: Make sure that the switched 12 volt wire is not routed through a ballast resistor or resistance wire. Also make sure that 12 volts are present on this wire during cranking!**
25. Install the 7.5 amp diode (supplied) in the field wire of the alternator. This is the smaller of the two wires, usually brown in color, which plugs into the alternator. Cut the wire and install the diode with the pink crimp-on connector facing toward the alternator. **It is imperative that this diode be in the field circuit to protect the new electronics.**
26. You may wish to install a new windshield washer bottle and bracket. These can be obtained through your local Jeep/Eagle dealer. Washer bottle part number is 55154744; bracket is 55026288.
27. Install the new air filter and bracket. It attaches to the driver's side body support rod. Connect the two 1/2" hoses, from the aluminum connectors, to the valve cover vent and the fuel canister vent line (Figure 20).

Figure 20

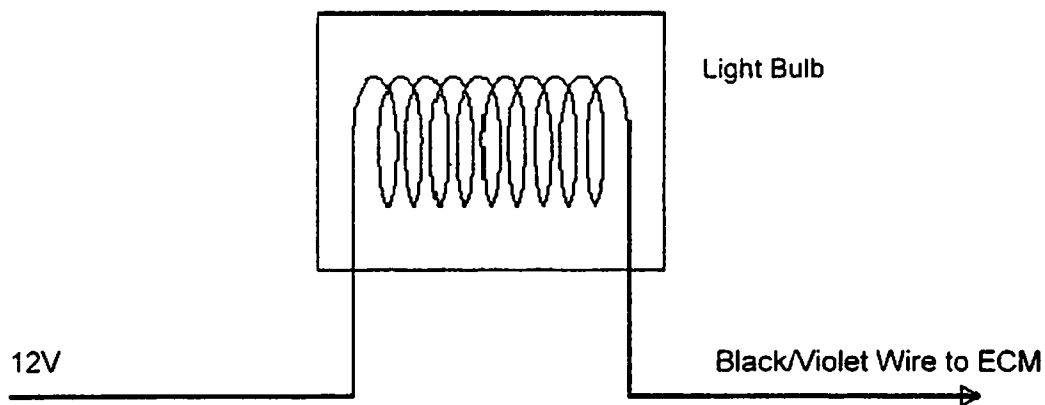


28. **OPTIONAL:** If you wish to install a tachometer or an engine light, the wires for these are already in the harness, located close to the relays. They will be hanging out of the harness. The tachometer wire is light gray with a yellow stripe. This is the tachometer trigger wire. The O.E. 81-86 Jeep® tachometer **WILL NOT** work with this system. The tach wire switches a 5V signal two times per engine revolution. Set your after market tach on the 4-cylinder scale to achieve a true RPM reading.

Some tachometers will not work with this 5V signal, or they may have needle flutter at low RPM. If this is the case, you will have to splice into the coil negative side to operate your tach. If you hook up to the coil, use the 6-cylinder setting on your tach. The coil negative side wire is gray. (Hook up the tach last, after the engine is running, because some tachometers have a low impedance and will short the coil to ground. This will not harm anything, but will prevent the engine from running.)

29. The "check engine light" wire runs directly to the PCM. The PCM grounds this wire to turn on a light to display fault codes (Figure 21). Connect the other lead to a switched 12V source.

Figure 21



The light bulb holders or LED lights are available at any local electronics supply.

30. On automatic transmission Jeeps, the brown wire that is coiled near the PCM connector must be connected to the neutral safety switch. This wire can be connected to the bottom of the starter relay, or to the center terminal on the neutral safety switch. On Chrysler automatics, this is the center terminal. If you choose to connect it to the starter relay, make sure that the terminal is for the neutral start switch. It should be grounded in park and neutral. This wire is for improved idle quality when in "Drive."
31. Reconnect the battery and turn on the ignition key. You should hear the electric fuel pump run for a few seconds and then shut off. Start the engine and IMMEDIATELY CHECK FOR FUEL LEAKS. Depending on the ambient temperature, the idle RPM may be high initially, and decrease as the engine warms up. This is normal!! Do not try to adjust the RPM by changing the opening of the throttle blade. Test Drive! Recheck all connectors and fuel lines!
32. Be sure to apply the CARB E.O. decal supplied in the kit in a visible location under the hood.

# MOPAR MPI KIT INSTALLATION TIP SHEET FOR WRANGLER & CJ

**NOTE:** This is a universal kit designed for Jeep CJ and YJ models with 4.2L engines.

**NOTE:** Keep all parts removed from the motor until the job is complete. This will avoid discarding parts that may be needed later.

## DISASSEMBLY:

1. In step 2, when removing the rear power steering bracket, **DO NOT** throw this away. You will need to modify this bracket and reinstall it later.
2. In step 4, all the wiring that goes to all the emission controls including the wires connected to the old carburetor can be completely removed. You can also remove the small computer that controls the carburetor. **NOTE:** CJ models have the carburetor computer mounted behind the glove box. If you want to remove the computer by taking out the glove box, you can. If you do not want to remove the computer that's okay too.  
Just cut the wires going through the firewall to it and seal up the hole with silicone. It will not be powered after you cut the wires.
3. In step 6, when removing the EGR tube, do not throw this away. You will need part of this later in the installation.
4. In step 7, when marking the fuel lines **PRESSURE & RETURN**, make sure you mark the correct lines. The **PRESSURE** is the larger of the 2 lines. The **RETURN** to the engine is no longer used. It may be removed.
5. In step 8, Serpentine belt motors will not remove the crank pulley (damper) at this time. V-belt motors will remove only the front pulley, not the damper, at this time.  
In step 9, before you start removing anything, mark the distributor cap where the number 1 plug wire connects to the distributor. Number 1 is the plug in the front of the motor. We recommend removing all the spark plugs at this time. The engine is much easier to turn. Make sure you are on the **COMPRESSION STROKE** when finding TDC. **THIS IS VERY IMPORTANT!** (see Figure 3)  
Note the position of the **DISTRIBUTOR**.  
After removing the old distributor, refer to Figure 4 in the assembly section of the instructions. From the passenger's side, looking down the distributor hole, you will see the oil pump slot. Position the oil pump slot to 11:00 o'clock. This is very important and will make the new distributor easier to install correctly. By now you have noticed the yellow lock pin on the bottom of the distributor. **DO NOT REMOVE THIS PIN UNTIL THE DISTRIBUTOR IS INSTALLED.** You are now ready to install the distributor. Don't forget to install the distributor gasket before you install the distributor. The gasket is located in the small parts box. After you have installed the new distributor correctly (Figure 5), make sure the old damper (still on the motor, we hope) is at "0" on the timing tab. Now remove the yellow lock pin from the distributor. It is very important that you remove the pin before you try to remove the old damper from the motor.
7. Continue disassembly per the instruction sheet.



## INSTALLATION

1. In step 4, make sure you put a gasket on the fuel pump block-off plate.
2. In step 7, look closely at the thermostat and make sure it is installed correctly. Also, make sure the thermostat does not drop down when installing the housing. Just a little heavy grease will hold the thermostat in place while you install the housing.  
**NOTE:** On some of the Serpentine motors, the Coolant Temp Sensor will not fit in the thermostat housing. The idler pulley bracket is too close. If you have this problem, you can install a 3/8" pipe plug in the thermostat housing and relocate the sensor in the heater hose. The adapter for this mod is a 4 Seasons Part Number 84540 or any comparable part. Any local parts house should be able to supply some type of adapter. 4 Seasons parts are available and in stock at Hesco if needed. Call 205-251-1472
3. In step 8, **DO NOT OVERTIGHTEN INTAKE MANIFOLD BOLTS!** Take your time installing these bolts. Make sure all the intake manifold cup washers are seated properly. There is no longer a place to bolt the power steering pump bracket to the Intake Manifold. It is not necessary to bolt the bracket to the Manifold. For a cleaner look, you may want to modify the Power Steering bracket by cutting the bracket above the power steering pump top bolt hole. This will eliminate the portion of the bracket that bolts to the intake manifold.
4. In step 12, **CJ MODELS ONLY** If you have a CJ with the fuel pressure line running down the passenger side of the vehicle, do the following: figure out how much 5/16" fuel injection hose you will need to go around the front of the engine compartment. It will usually take about 8 feet of hose. The routing goes as follows: down the passenger frame rail to the bottom of the radiator. Across the bottom of the radiator to the driver frame rail. Down the driver frame rail and up to the new metal fuel line. Keep the new line away from exhaust and make sure there are no kinks or sharp bends in the line. Double clamp the fuel injection hose at both ends. If you go behind the engine or over the top, you will create a vapor locking symptom due to fuel percolation in the line.
5. Double clamp anywhere you have metal tied to rubber after the fuel pump (High Pressure) and you should not have a leak. Turn the bolts over when you begin to mount fuel pump & fuel filter brackets as this is much easier than pushing up with the bolts. Make sure you know which fuel pump terminal is (+) and which is (-). It is hard to see once the pump is mounted.
6. In step 15, the PCM does not have to be mounted exactly vertical. It just needs to mount flush to the firewall (connector toward the engine block) so no water can stand on the PCM connector.
7. Step 24; the starter relay is also called the starter solenoid.
8. Step 25, the field wire is usually brown and is a solid wire, not a stranded wire.
9. Step 28; the Tachometer in 87-90 Wranglers will normally work with the MPI kit by connecting the old tachometer wire to the negative side of the new coil. The negative coil wire is grey or grey with a black tracer. Earlier year models will have to purchase an HES5459418 if a tachometer is desired. The cylinder setting must be set to 4 cylinder. Hesco has this unit available. Step 29; the check engine light must be wired to a **SWITCHED** 12V source so the light will always turn off when the key is switched off. The check engine light is being required in California as part of the Smog Check.
10. All diagnostic procedures, computer codes, and values are the same as a 1994 4.0 YJ.

**NOTE:** Before you start the engine, you should bleed the fuel rail of air. Simple instructions follow: Locate the Schrader Valve on the fuel rail (looks like a bicycle tube valve stem). Remove the cap. Cycle the ignition key on and off twice. Hear the fuel pump come on for about 1 second each time. Walk out and push in on the valve stem. Hear air or see fuel come out. Repeat this procedure until you have a good stream of fuel coming out of the valve. Allow about 45 seconds between each set of key cycles as there is a pressure sensing circuit that will not allow the fuel pump to turn on immediately. If you cycle the key

and do not hear the fuel pump come on during the second cycle, wait one more minute and try again. This should give it enough reset time. When you have good fuel pressure at the rail, the engine should start easily. ***It may be necessary to prime the pump to make it pick up fuel.***

**NOTE:** The PCV fitting must be replaced by the grey fitting that is supplied with the kit. You must use it. If you have an aftermarket valvecover and the hole is too small, ream the hole out a little. The grey fitting is a calibrated orifice for this kit. Failure to use this fitting will result in oil being sucked into the Intake Manifold. Some after market valve covers can cause oil consumption due to the baffle under the CCV valve being too close to the orifice. Space the baffle downwards. When enlarging the hole for the CCV valve using a valve cover grommet (PN-02946079) from a 4.0L makes a professional fit. Some 4.2L engines have a black plastic 90 degree fitting in the valve cover originally. This may be used in the front CCV location thereby negating having to enlarge the grommet hole. Hesco PN:J3236685H can be substituted for the gray valve if you do not have the means to enlarge the valve cover for the 4.0L valve. This part is only available at Hesco.

**NOTE:** Make sure you have a fully charged battery. Weak batteries can cause erroneous sensor readings and problems with the PCM.

**NOTE:** The vacuum fittings on the Intake Manifold can be moved from hole to hole to allow clearance for brake boosters.

**NOTE:** If your engine has been rebuilt & the compression has been raised too far above stock, you are probably going to experience some kind of detonation. You might be able to adjust the timing to take this out (at the dealer with a DRB-II). If detonation persists, you may have a fuel delivery problem from the fuel tank or the distributor may have been installed advanced. A fuel pressure gauge and a timing light will be needed to check these settings. Headers, camshafts, bigger valves, excessive porting, or a combination of the above may cause detonation. Depending on your geographic location, you may experience detonation from lower than advertised octane because of additives introduced into your fuel for the purpose of lowering emissions.

**NOTE:** With the increased HP and instant throttle response the kit provides; you may experience accelerator bounce while off roading. To help alleviate this problem, an ELECTRONIC IDLE SPEED CONTROLLER (P/N HES202S) is available from Hesco. This device is also helpful with on board welders and winching. An additional throttle spring may also be installed.

Good luck on your installation. We are here to help with technical support at 205-251-1472, Monday – Friday, 7:30 – 5:30PM in the Central Time Zone. However, we do not return phone calls, as there is no charge for tech support. We can also be reached via our e-mail address: [benmie@hesco.us](mailto:benmie@hesco.us) or you may view the installation instructions and other tip sheets from the "Tech Help" section of our website: [www.hesco.us](http://www.hesco.us)

## *Troubleshooting The Most Common Complaints*

### Tools And Procedures

#### 1) Engine Pinging or Detonation

What is the fuel pressure at the fuel rail?

Using a fuel pressure gauge attached to the Schrader valve on the fuel rail the pressure should be 48-50 psi. at an idle. The pressure should also be 48-50 psi. at wide open throttle. The most accepted way to test this is to tape the gauge to the windshield and drive the vehicle. If you hear detonation at wide open throttle or while under a load (driving up hill) look at the gauge and see what the pressure is doing. If pressure is decreasing as you accelerate the gauge is telling you there is a fuel delivery problem and the engine is starting to run lean. The most common cause is debris in the fuel tank being pulled into the pick up tube strainer. The fuel tank will have to be removed and flushed of debris. Replace the strainer with a new strainer available from your Jeep dealer or auto parts store. It is usually a good idea to also replace the fuel filter because if your tank had debris in it there is a good chance some of this debris and water that may have been in the tank is now in the filter.

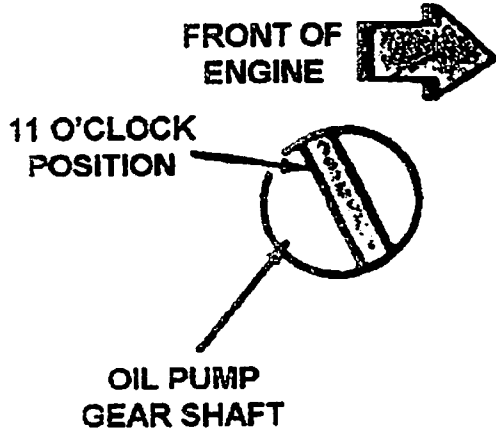
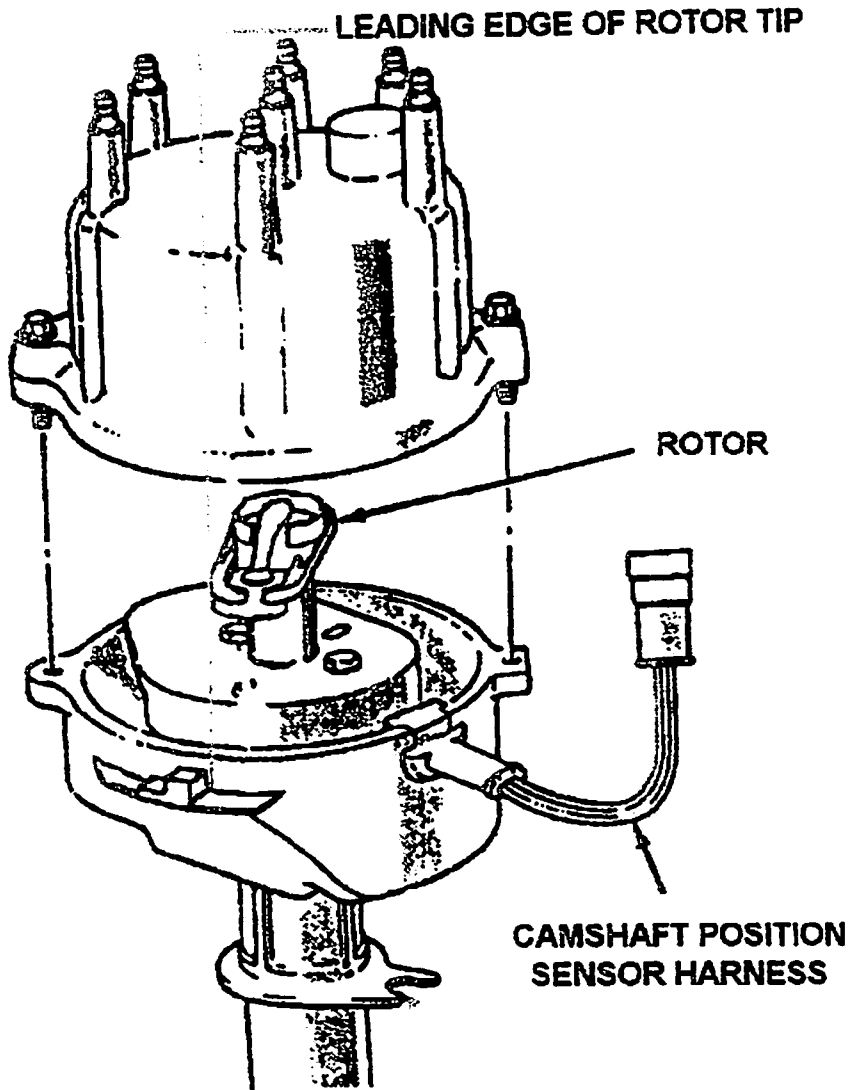
2) The next common problem causing detonation is improper distributor installation. The distributor has a locking pin to help with installation but if the timing chain has more than 8-10 degrees of slack it is easy to install the distributor in a advanced position. You can check this with a timing light. At an idle the timing should be 10-12 degrees. If it is showing 17-20 degrees the distributor is advanced and the distributor will need to be re-installed. Detonation, left unsolved will cause internal engine damage. Keep in mind you are not seeing ignition timing; but distributor placement.

3) If the catalytic converter hasn't been changed; now is the time to do so. You can up grade to a high flow if desired. The cat can cause excessive back pressure and in doing so will cause higher than normal combustion chamber temperatures which will lead to detonation.

4) Identifying and the removal of any original or excess wiring from the vehicle after installation is entirely up to the installer.

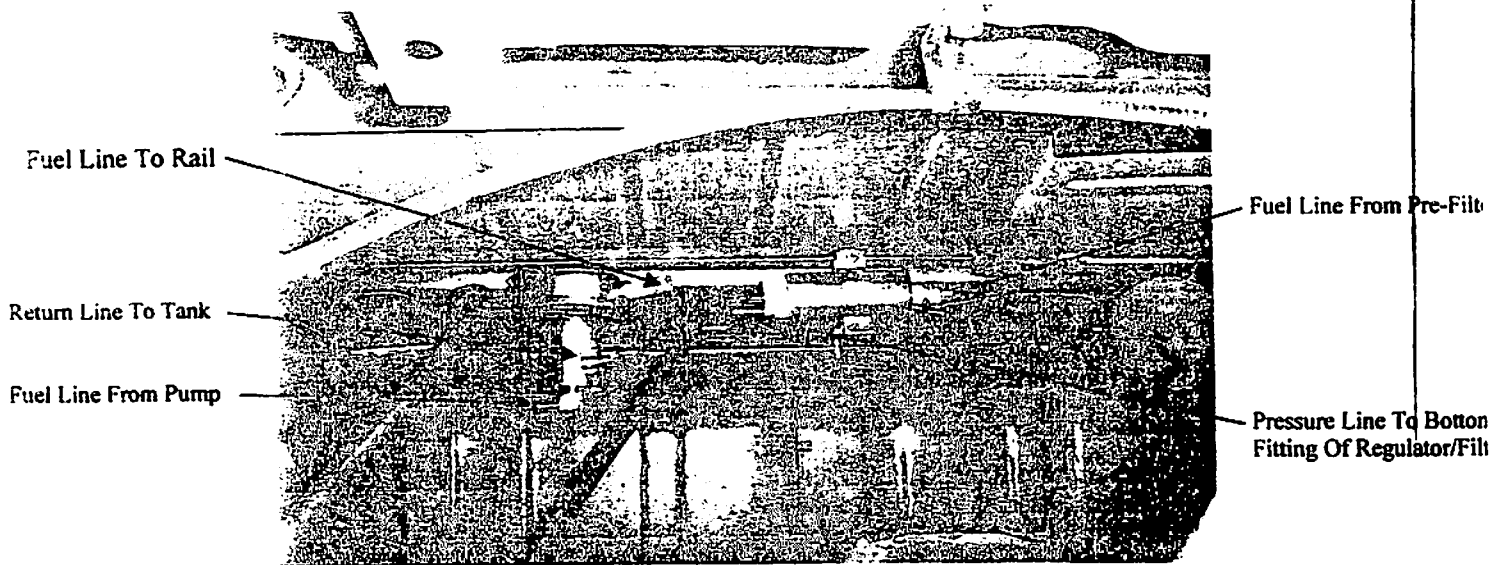
5) This conversion kit is designed to be installed by persons with average to above average mechanical knowledge and skill.

6) The wiring harness has a diagnostic connector close to the 60 pin connector for using a scanner to retrieve trouble codes.



REMOVE THE TWO LOCATING LEGS FROM THE BASE OF THE DISTRIBUTOR. THIS WILL AID YOU IN POSITIONING THE DISTRIBUTOR CORRECTLY. NOTE THE LOCATION OF THE LEADING EDGE OF THE ROTOR IN RELATION TO THE RAISED BOSS ON THE SIDE OF THE DISTRIBUTOR. YOU MAY NEED TO PURCHASE A DISTRIBUTOR HOLD DOWN AFTER THIS PROCEEDURE IF YOUR ENGINE DOES NOT HAVE ONE.

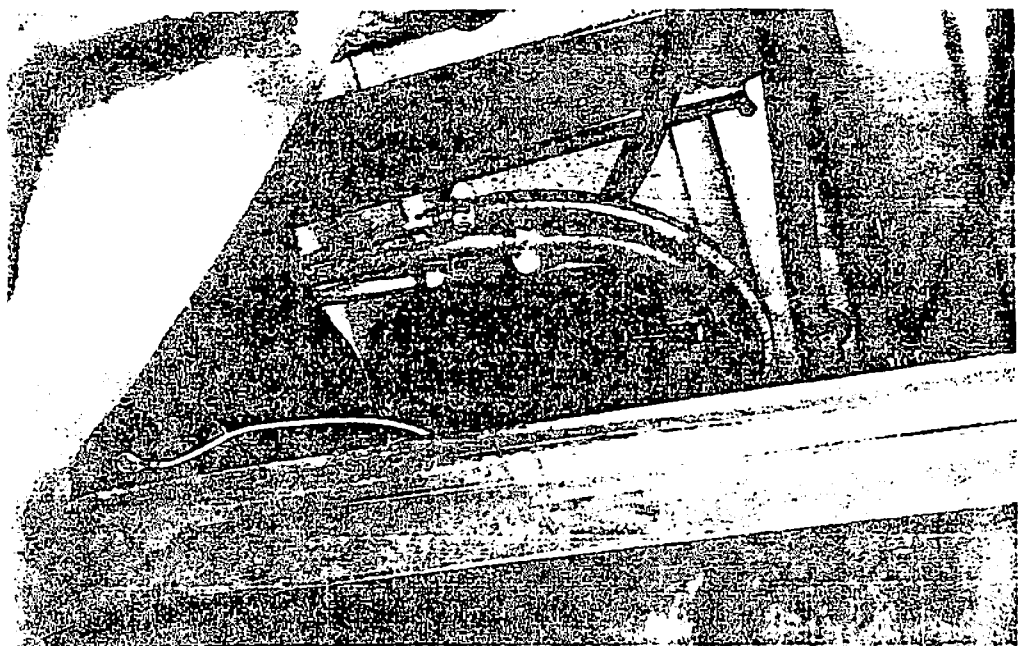
## Regulator and Fuel Pump



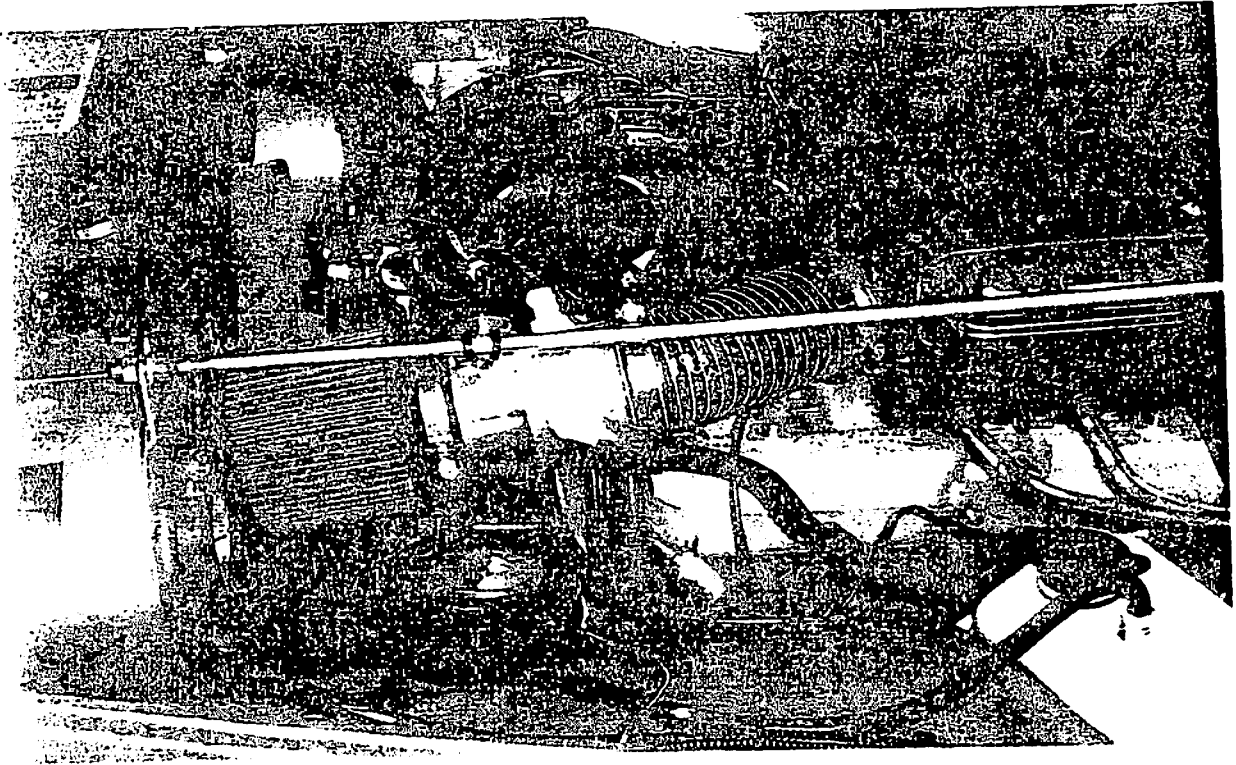
The picture shows the proper mounting locations for the fuel pressure regulator/filter and fuel pump. The bottom fitting is the feed line from the fuel pump. The center fitting is the return line to the tank. The top fitting is the outlet going to the fuel rail.

Below Picture:

On some vehicles the exhaust pipe may hinder placing the pre-filter at the fuel pump. In this case an optional location is on the back side of the cross over next to the floor pan where the fuel lines converge. This location should place the pre-filter way from the exhaust pipe.



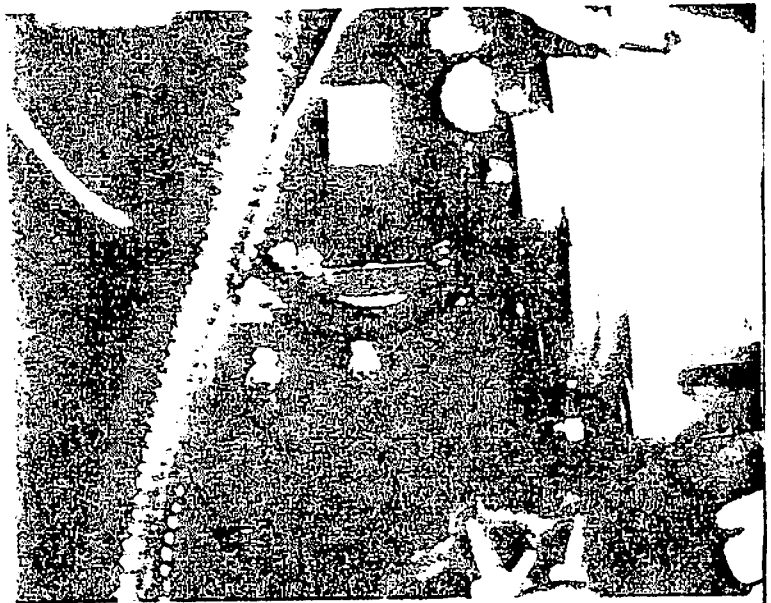
MPI Kit Illustrations



correct air filter installation

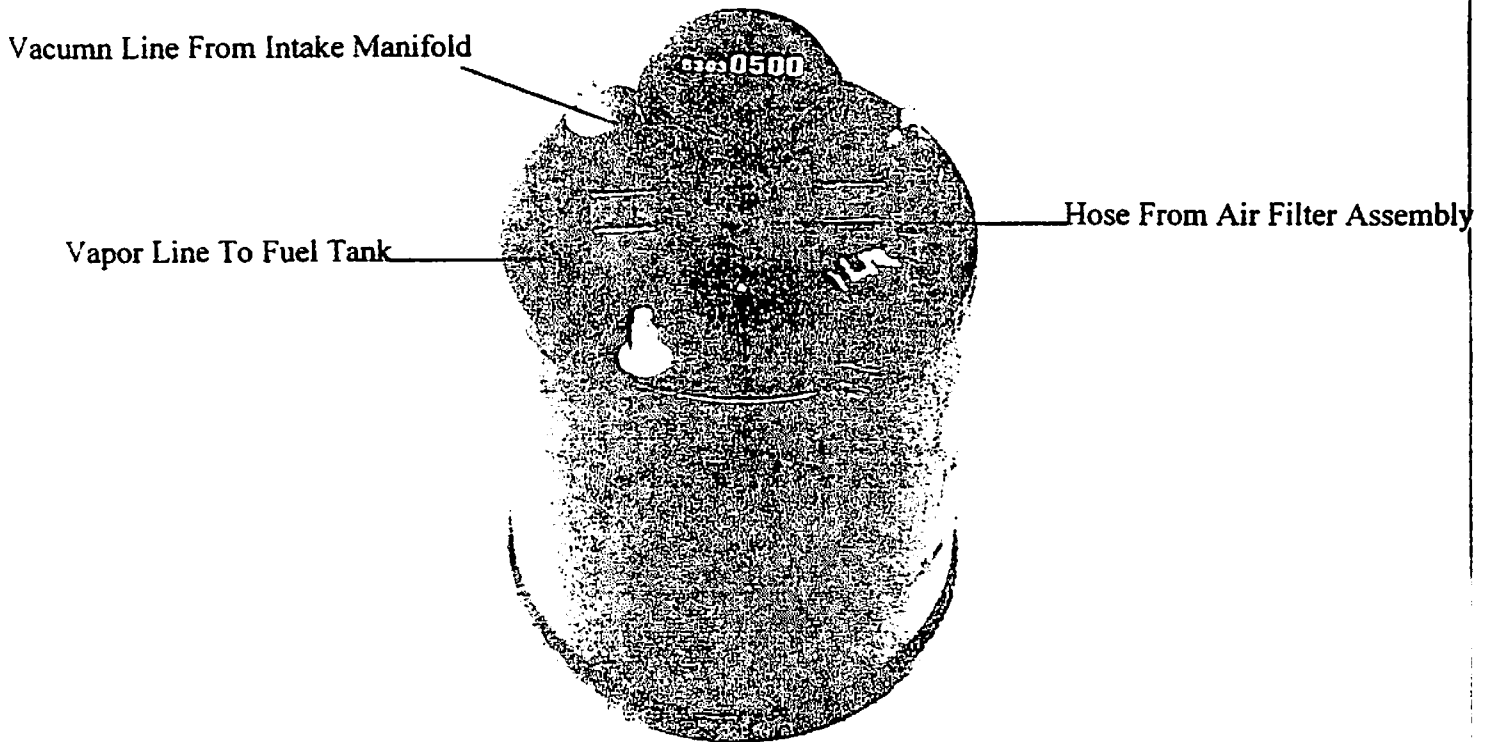


crank sensor and bracket installed

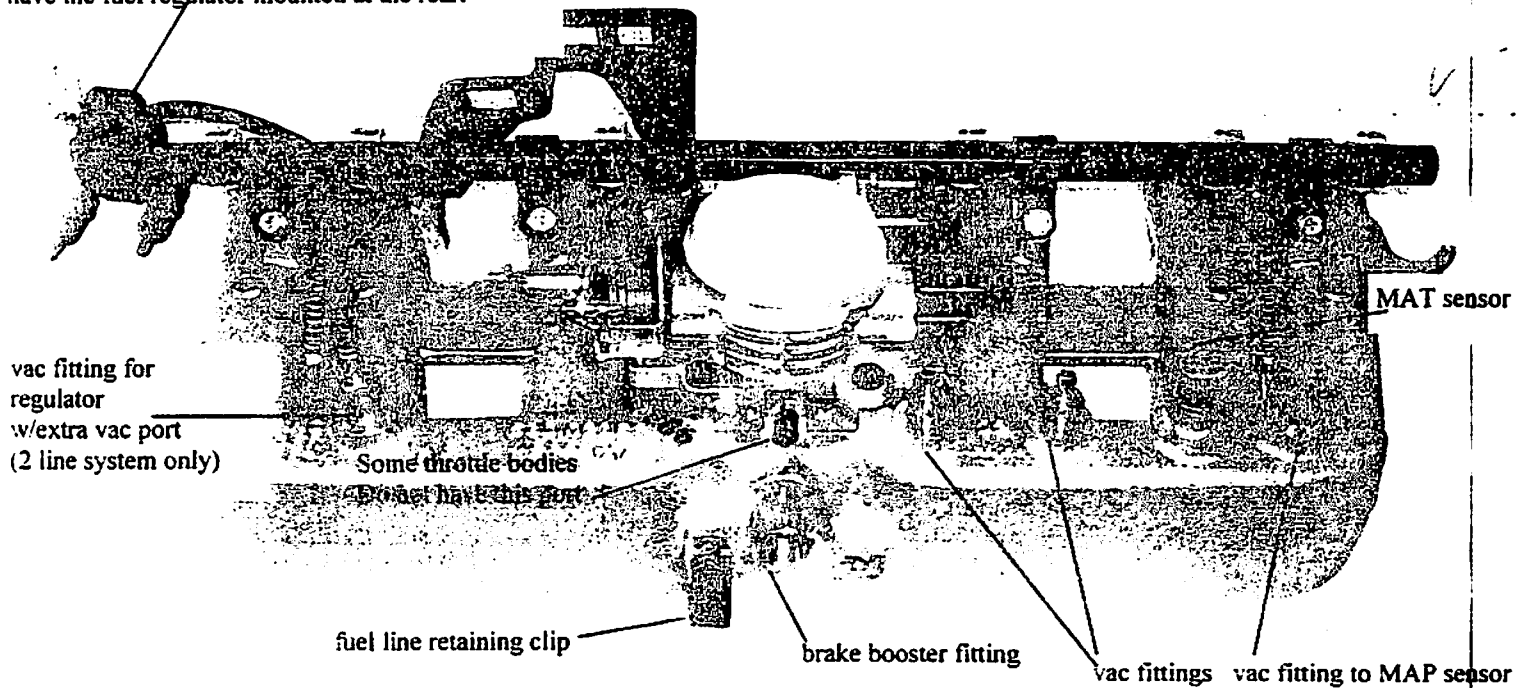


coil and bracket installed-coil wire tower points toward distributor

## Proper Emission Cannister Hose Connections

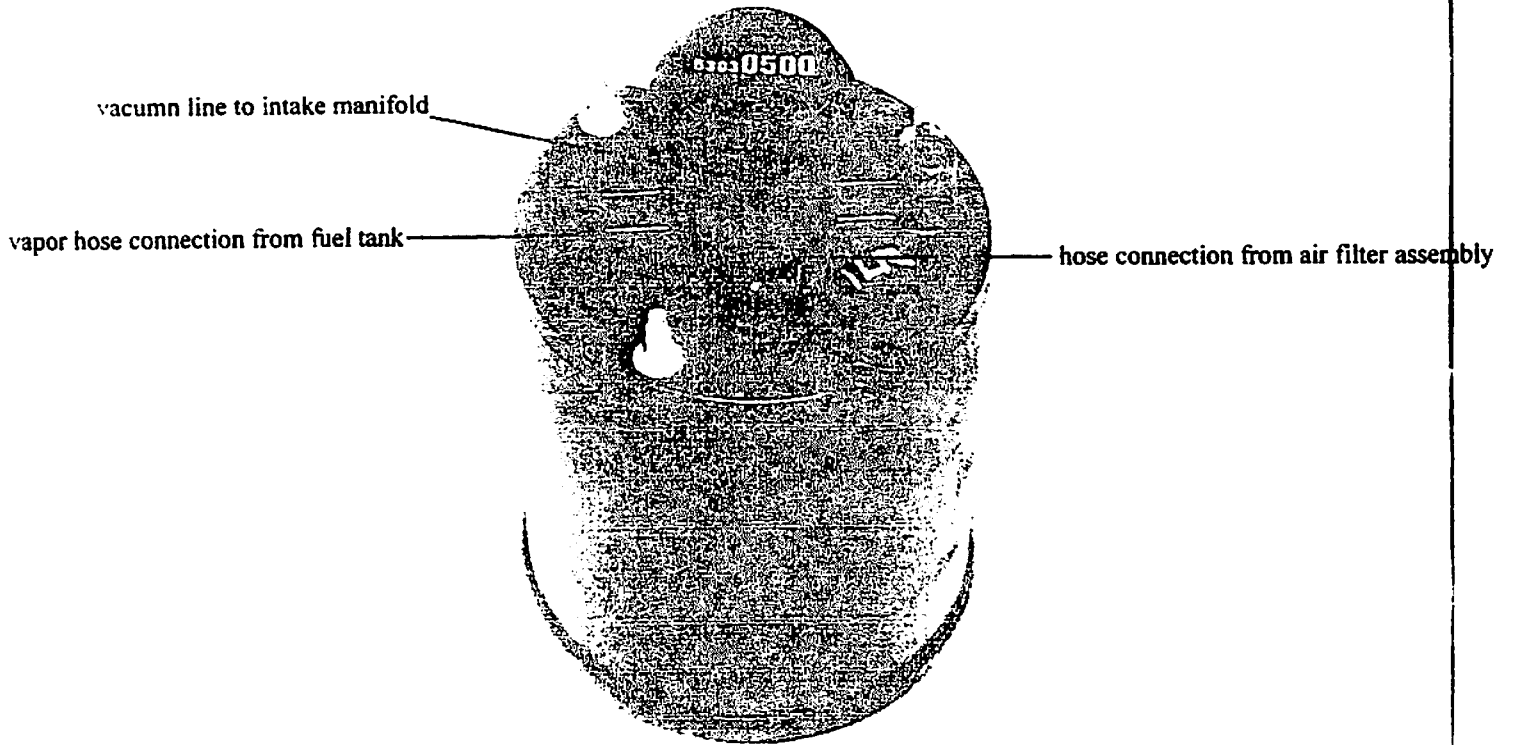


fuel pressure regulator. Kits produced after 12/03 have the fuel regulator mounted at the rear.

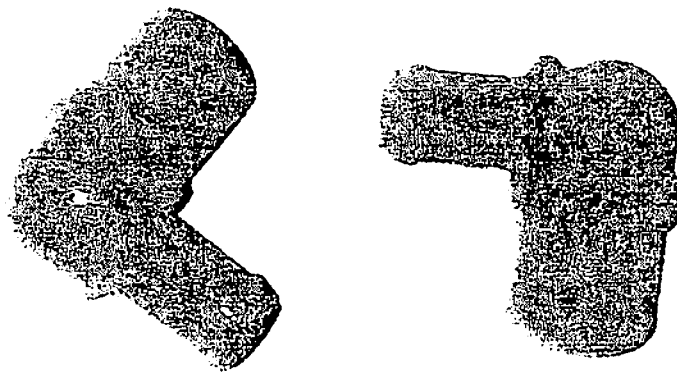


Note: un-used vacuum ports should be capped to prevent leaks and a high idle situation.  
 If you should have a high idle problem check for opens vac ports and loose intake manifold bolts.  
 Re-tighten intake/exhaust bolts after initial run-in to prevent vacuum leaks.

## Emission Cannister Hose Routing



## Alternative CCV for MPI Applications



PN-J3236685H

Designed to fit the stock 3/4" PCV gromment  
Can be used as an alternative for the larger gray CCV valve