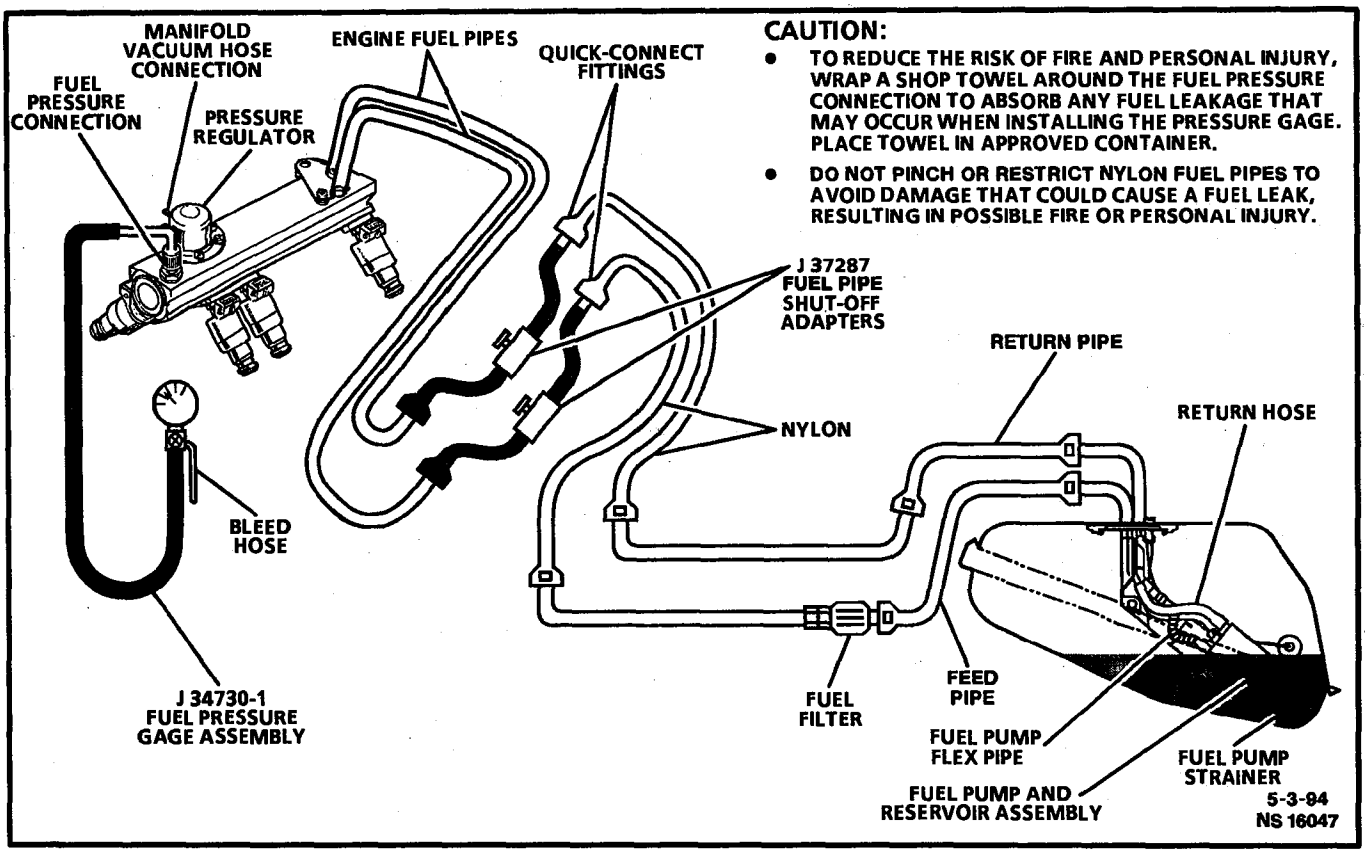

CHART A-7

(Page 1 of 3)

FUEL SYSTEM DIAGNOSIS
3.4L (VIN S) "F" CARLINE (SFI)

Circuit Description:

When the ignition switch is turned "ON," the Powertrain Control Module (PCM) will turn "ON" the in-tank fuel pump. It will remain "ON" as long as the engine is cranking or running, and the PCM is receiving reference pulses. If there are no reference pulses, the PCM will shut "OFF" the fuel pump within 2 seconds after ignition "ON" or engine stops.

Inside the fuel tank an electric fuel pump (within an integral reservoir) supplies fuel through an in-pipe filter to the fuel rail assembly. The pump is designed to provide fuel at a pressure above the regulated pressure needed by the injector. A pressure regulator attached to the fuel rail, keeps fuel available to the injectors at a regulated pressure. Unused fuel is returned to the fuel tank by a separate pipe. The fuel pump "test" connector is located in the engine compartment near the passenger side shock tower.

Chart Test Description: Number(s) below refer to circled number(s) on the diagnostic chart.

1. Connect fuel pressure gage as shown in illustration. Wrap a shop towel around the fuel connection to absorb any small amount of fuel leakage that may occur when installing the gage. With ignition "ON," and fuel pump running, pressure should be 284-325 kPa (41-47 psi). This pressure is controlled by spring pressure within the regulator assembly.
2. When the engine is idling, manifold pressure is low (high vacuum) and is applied to the pressure regulator diaphragm. Vacuum will offset spring pressure and result in a lower fuel pressure. Fuel pressure at idle will vary somewhat depending on barometric pressure but, should be less than pressure noted in Step (1).
3. A system that does not hold pressure is caused by one of the following:
   - Leaking fuel pump check valve.
   - Leaking fuel pump flex pipe.
   - Leaking valve/seat within pressure regulator.
   - Leaking injector(s).
4. A leaking injector can best be determined by checking for a fouled or saturated spark plug(s).

CHART A-7

(Page 1 of 3)

FUEL SYSTEM DIAGNOSIS 3.4L (VIN S) "F" CARLINE (SFI)

1

- INSTALL FUEL PRESSURE GAGE AS SHOWN ON FACING PAGE.
- IGNITION "OFF" FOR 10 SECONDS. A/C "OFF."
- IGNITION "ON." FUEL PUMP WILL RUN FOR ABOUT 2 SECONDS. IT MAY BE NECESSARY TO CYCLE THE IGNITION "ON" MORE THAN ONCE TO OBTAIN MAXIMUM PRESSURE.
- NOTE FUEL PRESSURE WITH PUMP RUNNING, PRESSURE SHOULD BE 284-325 kPa (41-47 psi). WHEN PUMP STOPS, PRESSURE MAY VARY SLIGHTLY THEN SHOULD HOLD STEADY. IS PRESSURE CORRECT AND DOES IT HOLD?

YES

IF FUEL PRESSURE IS WITHIN NORMAL RANGE BUT IS SUSPECTED OF DROPPING OFF DURING ACCELERATION, CRUISE OR HARD CORNERING, SEE CHART A-7 (2 OF 3).

2

- START ENGINE, ALLOW IT TO IDLE AT NORMAL OPERATING TEMPERATURE.
- FUEL PRESSURE NOTED IN STEP (1) SHOULD DROP APPROXIMATELY 21-69 kPa (3-10 psi). DOES IT?

YES

NO TROUBLE FOUND, REVIEW "SYMPTOMS," SECTION "B".

NO

- DISCONNECT VACUUM HOSE FROM PRESSURE REGULATOR ASSEMBLY.
- WITH ENGINE IDLING, APPLY 12-14 INCHES OF VACUUM TO PRESSURE REGULATOR. FUEL PRESSURE NOTED IN STEP (1) SHOULD DROP APPROXIMATELY 21-69 kPa (3-10 psi). DOES IT?

YES

LOCATE AND REPAIR LOSS OF VACUUM TO PRESSURE REGULATOR.

NO

PRESSURE REGULATOR IS FAULTY.

NO

3

FUEL PRESSURE WITHIN SPEC., BUT DOES NOT HOLD.

- INSTALL J 37287 FUEL PIPE SHUT-OFF ADAPTORS, REFER TO PAGES 3 OF 3 AND FACING PAGE ILLUSTRATION.
- MAKE SURE VALVES ARE OPEN.
- IGNITION "OFF."
- USING A 10 AMP FUSED JUMPER WIRE, CONNECT FUEL PUMP "TEST" CONNECTOR TO B+ AND WAIT FOR PRESSURE TO BUILD.
- DISCONNECT JUMPER AND CLOSE VALVE IN FUEL FEED PIPE. PRESSURE SHOULD HOLD. DOES IT?

NO

- OPEN VALVE IN FUEL FEED PIPE.
- RECONNECT PUMP "TEST" JUMPER AND WAIT FOR PRESSURE TO BUILD.
- DISCONNECT JUMPER AND CLOSE VALVE IN FUEL RETURN PIPE. PRESSURE SHOULD HOLD. DOES IT?

NO

4

LOCATE AND CORRECT LEAKING INJECTOR(S).

YES

PRESSURE REGULATOR IS FAULTY.

YES

CHECK FOR:
- LEAKING FUEL PUMP FLEX PIPE.

IF OK

FUEL PUMP IS FAULTY. (LEAKING CHECK BALL INSIDE PUMP.)

YES

CHECK FOR:
- PLUGGED IN-PIPE FILTER.
- RESTRICTED FUEL FEED PIPE.
- PLUGGED FUEL PUMP STRAINER.
- LEAKING FUEL PUMP FLEX PIPE.

IF OK

FUEL PUMP IS FAULTY.

FROM CHART A-3

FUEL PRESSURE OUT OF SPEC.

SEE CHART A-7 (2 OF 3)

NO FUEL PRESSURE

USE DTC 54 CHART TO DIAGNOSE FUEL PUMP ELECTRICAL CIRCUIT.

IF OK

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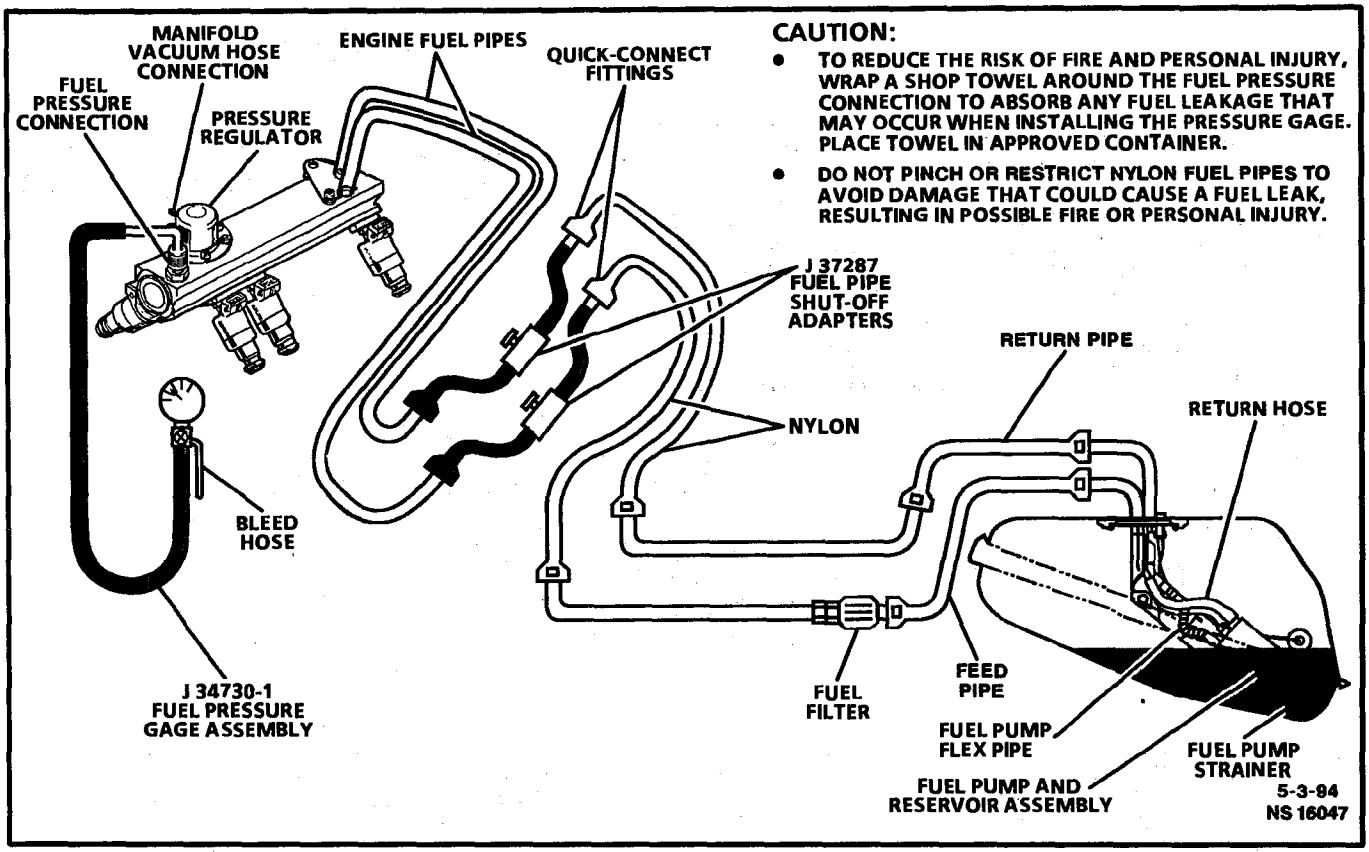

CHART A-7

(Page 2 of 3)

FUEL SYSTEM DIAGNOSIS
3.4L (VIN S) "F" CARLINE (SFI)

Chart Test Description: Number(s) below refer to circled number(s) on the diagnostic chart.

5. Fuel pressure that drops off during acceleration, cruise or hard cornering may cause a lean condition and result in a loss of power, surging or misfire. This condition can be diagnosed using a Tech 1 scan tool. If the fuel system is very lean, one or both oxygen sensors will stop toggling and output voltage will drop below 500 mV. Also, injector pulse width will increase.

Important

- Make sure system is not operating at "Fuel-Cut-Off" which may cause false readings on the scan tool.

6. Fuel pressure below 284 kPa (41 psi) may cause a lean condition and may set a DTC 44/64. Driveability conditions can include hard starting cold, hesitation, poor driveability, lack of power, surging or misfire.

7. Restricting the fuel return pipe causes fuel pressure to build above regulated pressure. With battery voltage applied to the pump "test" connector, pressure should rise above 325 kPa (47 psi) as the valve in the return pipe is partially closed.

NOTICE: Do Not allow pressure to exceed 414 kPa (60 psi) as damage to the regulator may result.

8. Fuel pressure above 325 kPa (47 psi) may cause a rich condition and may set a DTC 45/65. Driveability conditions can include hard starting (followed by black smoke) and a strong sulphur smell in the exhaust.
9. This test determines if the high fuel pressure is due to a restricted fuel return pipe or a faulty fuel pressure regulator.

CHART A-7

(Page 2 of 3)

FUEL SYSTEM DIAGNOSIS
3.4L (VIN S) "F" CARLINE (SFI)

FROM CHART A-7 (1 OF 3)

5 FUEL PRESSURE DROPS OFF DURING ACCELERATION, CRUISE OR HARD CORNERING.

CHECK FOR RESTRICTED IN-PIPE FUEL FILTER OR FUEL FEED PIPE. IS THERE A RESTRICTION?

- NO
- YES → SERVICE AS REQUIRED AND RECHECK

CHECK FOR:
- RESTRICTED FUEL PUMP STRAINER.
- LEAKING FUEL PUMP FLEX PIPE.
- WRONG FUEL PUMP.

IF OK → FUEL PUMP IS FAULTY.

6 FUEL PRESSURE LESS THAN 284 kPa (41 psi).

7
- INSTALL J 37287-2 FUEL RETURN PIPE SHUT-OFF ADAPTER, REFER TO PAGES 3 OF 3 AND FACING PAGE ILLUSTRATION.
- MAKE SURE VALVE IS OPEN.
- IGNITION "OFF."
- USING A 10 AMP FUSED JUMPER WIRE, CONNECT FUEL PUMP "TEST" CONNECTOR TO B+.
- SLOWLY CLOSE SHUT-OFF VALVE. PRESSURE SHOULD RISE ABOVE 325 kPa (47 psi). DO NOT EXCEED 414 kPa (60 psi).

DOES PRESSURE RISE ABOVE 325 kPa (47 psi)?

- NO → CHECK FOR: (see above)
- YES → PRESSURE REGULATOR IS FAULTY.

8 FUEL PRESSURE ABOVE 325 kPa (47 psi).

9
- DISCONNECT QUICK-CONNECT FITTING AT ENGINE FUEL RETURN PIPE, REFER TO PAGES 3 OF 3 AND FACING PAGE ILLUSTRATION.
- ATTACH A LENGTH OF FLEXIBLE FUEL HOSE TO ENGINE FUEL RETURN PIPE. PLACE OPEN END OF HOSE INTO AN APPROVED GASOLINE CONTAINER.
- IGNITION "OFF" FOR 10 SECONDS.
- IGNITION "ON." NOTE FUEL PRESSURE WITH PUMP RUNNING.
- PRESSURE SHOULD BE 284-325 kPa (41-47 psi).

IS IT?

- NO → CHECK FOR RESTRICTED ENGINE FUEL RETURN PIPE OR FUEL RAIL OUTLET PASSAGE. IS THERE A RESTRICTION?
  - NO → PRESSURE REGULATOR IS FAULTY.
  - YES → SERVICE AS REQUIRED AND RECHECK.
- YES → LOCATE AND CORRECT RESTRICTION IN FUEL RETURN PIPE TO FUEL TANK.

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CHART A-7

(Page 3 of 3)
FUEL SYSTEM DIAGNOSIS
3.4L (VIN S) "F" CARLINE (SFI)

FUEL SYSTEM PRESSURE RELIEF PROCEDURE

Engines With Fuel Pressure Connection

(Must Be Performed Before Disconnecting Fuel Pipe Fittings)

CAUTION:
- **To reduce the risk of fire and personal injury, it is necessary to relieve fuel system pressure before disconnecting fuel pipe fittings.**
- **After relieving system pressure, a small amount of fuel may be released when disconnecting fuel pipe fittings. In order to reduce the chance of personal injury, cover fuel pipe fittings with a shop towel before disconnecting, to catch any fuel that may leak out. Place the towel in an approved container when disconnect is completed.**

Tool Required:
J 34730-1 Fuel Pressure Gage

1. Ignition "OFF."
2. Disconnect negative battery cable to avoid possible fuel discharge if an accidental attempt is made to start the engine.
3. Loosen fuel filler cap to relieve tank vapor pressure.
4. Connect gage J 34730-1 to fuel pressure connection. Wrap a shop towel around fitting while connecting gage to avoid spillage.
5. Install bleed hose into an approved container and open valve to bleed system pressure. Fuel pipe fittings are now safe for servicing.
6. Drain any fuel remaining in gage into an approved gasoline container.
7. Perform service required.
8. Tighten fuel filler cap.
9. Ignition "OFF."
10. Connect negative battery cable.
11. Cycle ignition "ON" and "OFF" twice, waiting ten seconds between cycles, then check for fuel leaks.

SERVICING QUICK-CONNECT FITTINGS

CHART A-7

(Page 3 of 3)
FUEL SYSTEM DIAGNOSIS
3.4L (VIN S) "F" CARLINE (SFI)

Important

- In order to install fuel system diagnostic equipment on vehicles equipped with plastic quick-connect fittings, fuel pipe separator tools must be used to disconnect the fittings. Using the separator tools to release the fittings will cause the plastic retainer to remain inside the female connector allowing diagnostic equipment to be connected.

  Tools Required:
  J 37088-A tool set, fuel pipe quick-connect separator;
  J 39504 tool set, fuel pipe quick-connect separator (restricted access).

Remove or Disconnect

1. Relieve fuel system pressure (see "Fuel System Pressure Relief").
2. If equipped, slide dust cover back to access quick-connect fitting.
3. Grasp both sides of fitting. Twist female connector 1/4 turn in each direction to loosen any dirt within fitting.

CAUTION: Safety glasses must be worn when using compressed air, as flying dirt particles may cause eye injury.

4. Using compressed air, blow dirt out of fitting.
5. Choose correct tool from J 37088-A or J 39504 tool set for size of fitting. Insert tool into female connector, then push/pull inward to release locking tabs.
6. Pull connection apart.

Clean and Inspect

NOTICE: If it is necessary to remove rust or burrs from fuel pipe, use emery cloth in a radial motion with the pipe end to prevent damage to O-ring sealing surface.

- Using a clean shop towel, wipe off male pipe end.
- Inspect both ends of fitting for dirt and burrs. Clean or replace components/assemblies as required.

Install or Connect

CAUTION: To Reduce the Risk of Fire and Personal Injury:
• Before connecting fitting, always apply a few drops of clean engine oil to the male pipe end of engine fuel pipe, pressure gage adapter or fuel pipe shut-off adapter. This will ensure proper reconnection and prevent a possible fuel leak. (During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.)

1. Apply a few drops of clean engine oil to the male pipe end of engine fuel pipe, pressure gage adapter or fuel pipe shut-off adapter.
2. Push both sides of fitting together to cause the retaining tabs/fingers to snap into place.
3. Once installed, pull on both sides of fitting to make sure connection is secure.
4. If equipped, reposition dust cover over quick-connect fitting.