



357EFI

FUEL INJECTOR TESTER

OWNER'S MANUAL

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INTRODUCTION

Warning: This tool is for testing systems using gasoline under pressure, a hazardous situation. Due caution must be taken when servicing such a system. Operation of this unit should be by trained, professional technicians only. Manufacturer's recommended procedures should be strictly adhered to. Use approved eye protection when working with such systems and this tool.

Congratulations! Your **TIF 357EFI** fuel injector tester is among the most advanced on the market. The **357EFI** hooks directly into the fuel system. It is not necessary to remove any components of the system to check their operation. Apart from initial set-up the **357EFI** is an independent tester that does not rely on any component of the FI system for operation.

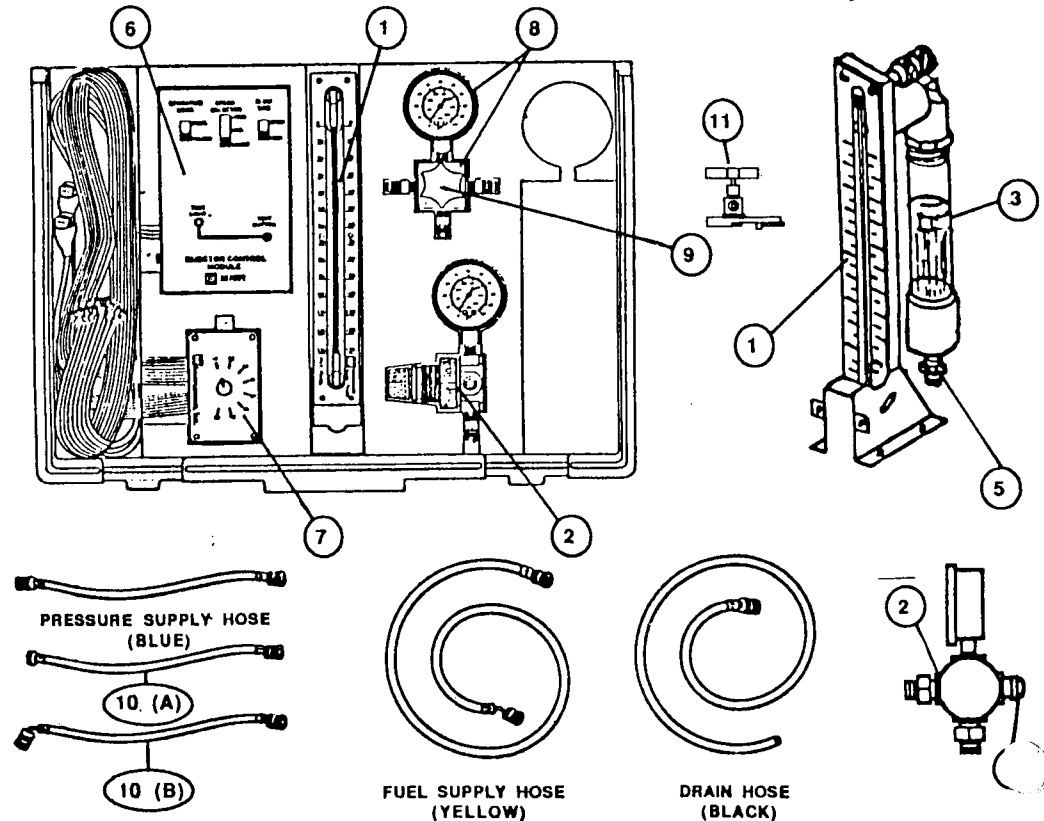
Although primarily designed to check multi-point injectors, your tester will also alert you of possible problems with the fuel pressure regulator and/or fuel pump check valve.

The **357EFI** is a comparative tester. That is, it **compares** each injector with the others in the system; and actually allows you to see the amount of fuel that flows out of each injector. It is the only tester that measures the **quantity** of fuel dispensed under actual pulsed conditions. NOTE: The graduations on the sightglass are not equivalent to any unit of measure; they are strictly a reference by which comparisons can be made. Once the reservoir is filled, the **357EFI** requires an external pressure source to provide fuel rail pressure. Such a source may be compressed "shop" air, R-12 refrigerant, propane, etc... Anything providing more than 30 psi (but not exceeding 200psi) at room temperature may be used. The unit is equipped with a regulator so that actual testing pressure can be adjusted and constantly maintained. A valve fitting for a "one-pound" can of R-12 refrigerant is supplied for those wishing to use this method.

DESCRIPTION OF 357EFI SYSTEM

The 357EFI tester checks a fuel injector by directly observing the volume of fuel injected when the fuel injector is electrically pulsed. It does so by amplifying the fuel flow in a narrow transparent column of fuel connected to the injector.

1. SIGHTGLASS
2. PRESSURE REGULATOR
3. FUEL RESERVOIR
4. RELIEF VALVE
5. BLEED VALVE
6. ELECTRONIC INJECTOR CONTROL MODULE
7. INJECTOR SELECTOR
8. FUEL RAIL PRESSURE GAUGE AND MANIFOLD
9. DRAIN VALVE
10. FUEL RAIL HOSE
 - a) for FORD, except late models
 - b) for CHRYSLER, GM
11. REFRIGERANT VALVE



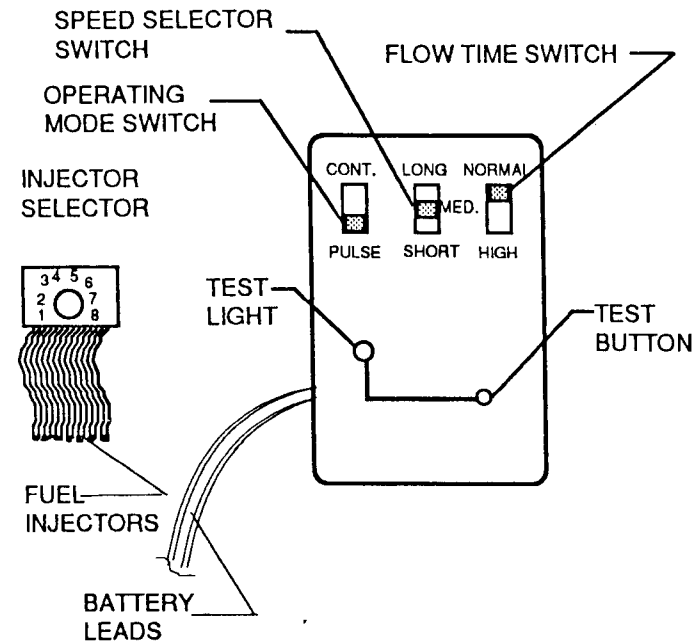
ABOUT THE ELECTRONIC INJECTOR CONTROL MODULE

The control module is used to fire the injectors. It is hooked with the injector selector, to provide power to each injector, and connected directly to the battery. Injector operation is controlled by three switches and a test button.

The **TEST BUTTON** is depressed momentarily to actuate an injector. The injector "on time" is controlled by the module and is not affected by the amount of time the test button is depressed.

The **OPERATING MODE SWITCH** allows the user to operate the injector in two different fashions. The **CONTINUOUS** position opens the injector with a single, long pulse. In this mode the speed selector switch does not affect operation. The **PULSE** position opens and closes the injector repeatedly for short periods during each "on time". The number of repeated pulses, and their width (or amount of open time) are controlled by the **SPEED SELECTOR SWITCH**. Whether in long, med or short the **TOTAL ON TIME** is the same, however, in long the pulses are longer and fewer and in short the pulses are shorter and greater in number. In medium the pulse width and frequency is somewhere in between.

The **TOTAL ON TIME** is controlled by the **FLOW TIME SWITCH**. In normal, total on time is one second, in high total on time is 1/2 second.



SWITCH SELECTION

1. Mode Switch

- A) **PULSE** - This mode is used normally. In this mode the user may set pulse width and frequency with the Speed Selector and Flow Time switches.
- B) **CONTINUOUS** - Designed for GM factory test. However, may be used on any system. Injectors are sent a single long pulse; the "on time" is controlled by the Flow Time Switch.

2. Speed Selector Switch

- A) Long (Simulates highway speeds)
- B) Med-
- C) Short (Simulates idle and slow speeds)

The purpose of these positions is to check injector performance. Since **TOTAL ON TIME** is the **same** in each position the same fuel drop should be seen in each position. If an injector is lazy, sluggish, clogged, or sticking its fuel delivery may be different during long pulses (as at highway speeds) than during short pulses (as at idle speeds). The ability to alter pulse widths (Pulse width is defined as the amount of time that the injector is open.) can help identify a faulty injector.

Note: When comparing injectors keep switches in the same position for all injectors. If an injector is isolated as questionable, fine tune the diagnosis by checking that one injector in each speed setting.

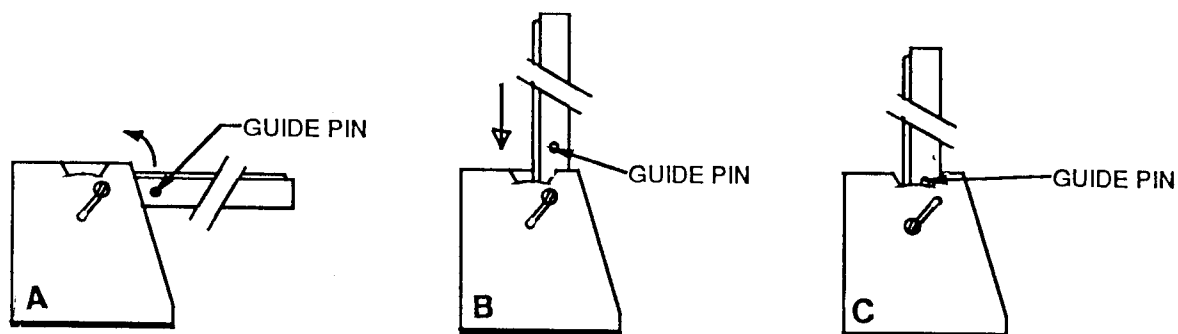
3. Flow Time Switch-controls total on time of injectors .

- A) **Normal** - for most applications; total on time, 1000 msec or one second.

Note: If the sightglass empties with a single press of the Test Button switch to **High**

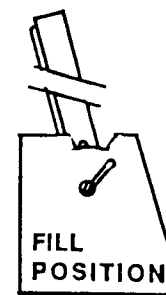
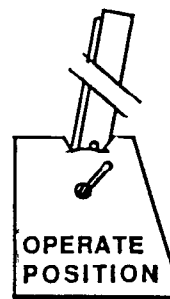
- B) **High** - for high output engines, examples: Chevy Corvette, IROC Camaro, Ford Mustang GT; total on time, 500 msec or 1/2 second. Because of the high fuel consumption of such engines total on time is reduced, simply because the sightglass cannot hold enough fuel for a one second on time.

SIGHTGLASS OPERATION



To Raise Sightglass- A) Lift sightglass to vertical position B) push down firmly making sure C) guide pin moves below top of cutout. **To Lower-** reverse procedure.

Once the sightglass is raised it can be moved to either the operate position or fill position



ENGINE HOOK-UP

A. Hose Connections

1. Connect blue hose from pressure source to regulator and **turn on pressure supply.**

2. Rotate regulator valve fully counter-clockwise, thereby setting regulator to ZERO PSI.

Note: If gauge does not now read zero, bleed pressure with relief valve on back of regulator until zero pressure is indicated.

3. Connect yellow hose from bottom of sightglass to **RIGHT** side of fuel rail manifold.

4. Connect fuel rail hose to **LEFT** side of fuel rail manifold.

NOTE: When using black fuel rail hose connect the straight fitting to the manifold and the bent fitting to the fuel rail.

5. Connect drain hose to bottom of fuel rail manifold and locate end in appropriate receptacle.

B. Connect to fuel rail service fitting. NOTE: On some vehicles an adaptor (not included) may be necessary.

1. Make sure drain valve on manifold is closed.

2. Follow vehicle service manual instructions for connection to fuel rail and attach fuel rail hose.

C. Fill the reservoir

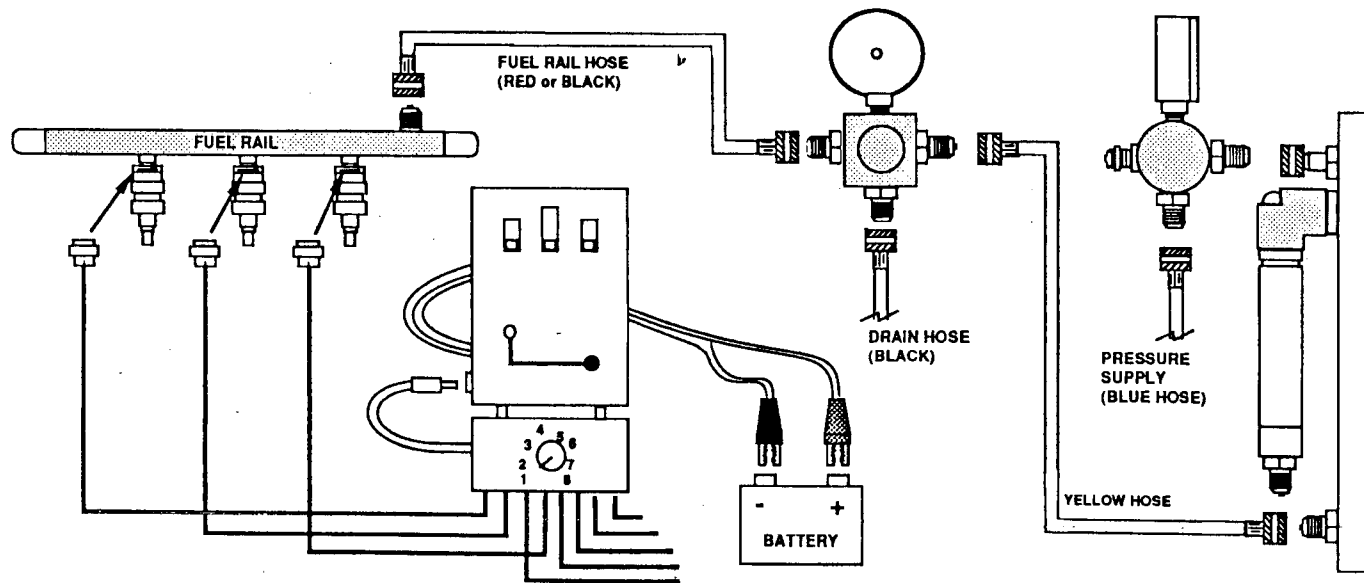
CAUTION: Ensure sightglass is at zero pressure or reservoir may not fill.

1.) Turn on ignition to enable fuel pump. Fuel should start filling the reservoir. It may be necessary to cycle the ignition switch since the fuel pump will switch off after a few seconds.

CAUTION: DO NOT FILL THE RESERVOIR ABOVE THE FILL LINE.

If the reservoir is overfilled, bleed excess fuel through the bleed valve on bottom of reservoir by connecting drain hose (use same drain hose that connects to fuel rail manifold). NOTE: pressurized fuel will be released as soon as hose is tightened against valve.

357 EFI ENGINE HOOK-UP



ADJUST TEST PRESSURE

A test pressure of 20-25 psi. will properly test all systems. However, some may prefer to test at actual fuel rail pressure. (Fuel rail pressure may be checked by connecting the fuel rail pressure gauge to the vehicle's service fitting. NOTE: connect hose to LEFT side of manifold only and ensure that drain valve is closed! USE CAUTION.) If test pressure is set above fuel rail pressure, gas will be forced back to the tank, and the test must be aborted. If this occurs, drain fuel (see pg. 11) and restart.

1. SLOWLY rotate regulator valve clockwise until desired test pressure is indicated on gauge.
2. Lock regulator valve with red ring.
3. Fill sightglass to the zero mark.
 - a) move sightglass into **FILL** position (see page 7)
 - b) rotate reservoir upward until sightglass fills.
 - c) return to original **OPERATE** position.
4. Watch the fuel level for a short while to check for movement. The level should remain at zero, if it falls refer to the troubleshooting section for possible causes.

TEST INJECTORS

1. Connect electronic injector control module leads to battery.
2. Connect injector selector to control module.
3. Connect test lead(s) to injector(s) electrical contacts.
4. Set switch positions, refer to "switch selection" section.
5. Choose injector to be tested with injector selector switch. Press and release test button. Observe and record the fuel level drop in the sightglass.
6. Refill sightglass to the zero mark as described in "Adjust Test Pressure" section, step 3.
7. Repeat steps 5 and 6 for each injector to be tested.

NOTE: The test light should illuminate each time an injector opens. If not, check power supply and connections. If the light still doesn't illuminate refer to trouble shooting chart.

F. EMPTY REMAINING FUEL

1. Close regulator valve.

2. Move the sightglass forward to the FILL position, rotate reservoir to its highest horizontal position and carefully

drain the system by opening the drain valve at the fuel rail pressure gauge (use the proper receptacle, as pressurized fuel will be released).

3. After draining the fuel, disconnect the hoses and store.

TROUBLE SHOOTING	
SYMPTOM	POSSIBLE CAUSES
FUEL IN THE SIGHTGLASS DRIFTS DOWNWARD	1. AIR BUBBLES IN HOSE BETWEEN FUEL RAIL AND MANIFOLD. 2. EXCESSIVE TEST PRESSURE relieve pressure and recheck 3. IMPLIES A FUEL SYSTEM LEAK SUCH AS: a) a defective injector. b) a leaky cold start injector. c) pressure regulator fault. d) a leaky check valve at fuel pump.
SERIOUS FLOW DISCREPANCY BETWEEN LONG AND SHORT PULSES.	MAY INDICATE A SLUGGISH INJECTOR (compare performance with another injector)
TEST LIGHT IS DIM OR OFF	THE INJECTOR HAS UNUSUALLY LOW OR SHORTED RESISTANCE
PARTICLES SEEN IN FUEL RESERVOIR	THE FUEL IS CONTAMINATED

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