



TIF360
Digital Fuel
Pressure Tester

OWNER'S MANUAL

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INTRODUCTION



Thank you for purchasing the TIF360 Digital Fuel Pressure Tester. Your new unit is quality built to provide years of dependable service.

The 360 was designed to accurately measure fuel pressure in any application, whether it be gasoline or diesel, low pressure or high. The unique digital gauge provides a crisp, clear reading in one pound increments. System diagnosis such as pressure drop, static and dynamic fuel pressure and fuel pump deadhead pressure are simple to perform.

Please carefully read this owner's manual in order to completely understand and utilize the features of this instrument. If you have any questions or comments please call us at 1-800-327-5060.

FEATURES & APPLICATIONS



Features of the TIF360:

- Digital Gauge
- Instant readings
- Variable electronic controls
- Multiple injector lead harness
- Pulse width & on-time controls
- Signal light
- Aluminum manifold
- Brass connections
- Drain & access hoses included
- Rugged ABS carrying Case
- Made in the U.S.A
- One Year Warranty

Applications of the TIF360:

- Pressure drop tests on multi-point EFI systems and isolation of clogged or leaky injectors
- Static pressure tests
- Dynamic (running) pressure tests on MPF1, TB1 and CIS systems
- Fuel pump "deadhead" pressure tests on MPF1, TB1 and CIS systems
- Leakdown tests
- Aid in location of leaks

WARNINGS



Warnings

Failure to follow the warnings outlined below may result in personal injury and/or damage to property and the unit. Any misuse or improper application of this product will automatically void the warranty.

- This instrument is designed for use on systems that contain fuel under pressure. It should only be used by professionals who are fully trained in fuel system service.
- Keep all open flames and sparks away from the work area. Never smoke while operating this unit: fire or explosion may occur.
- Always wear proper eye protection when operating this instrument.
- Never store any parts or hoses, from this unit, while they contain fuel. Always drain hoses and manifold.

PRECAUTIONS

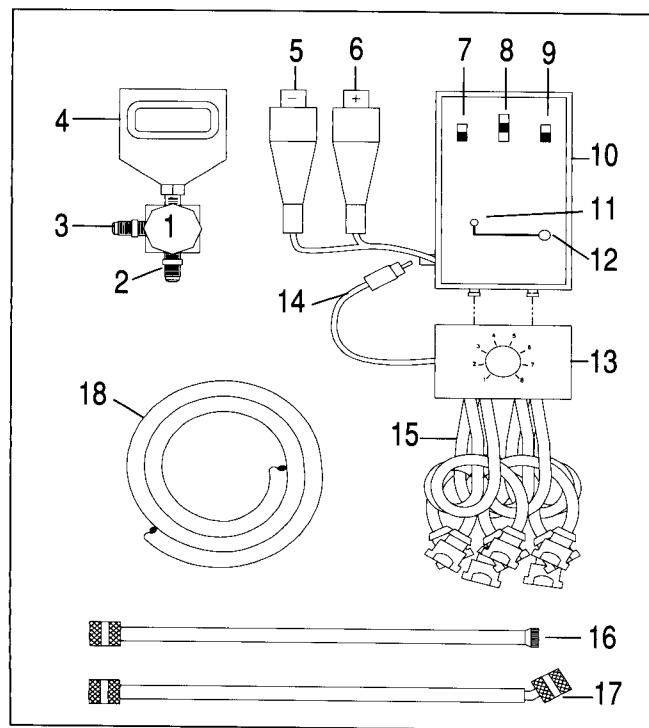


Precautions

Please take a few minutes to carefully read and understand the precautionary measures that should be followed. Following these recommended guidelines will ensure that your unit will provide years of dependable service.

- Carefully follow all vehicle manufacturer's recommended service procedures. Instructions in this manual are only general guidelines.
- Keep all hose and wires clear of fans, belts and other rotating objects.
- Be carefull not to spill or drip fuel on hot engine parts or on the vehicle finish.
- Drain hoses and manifold completely before storage.
- Always dispose of excess fuel in the proper manner.
- Make sure to keep dirt and moisture away from electronic control boxes.
- Do not expose electronics to severe mechanical shock or prolonged high temperatures.

TIF360 DIAGRAM



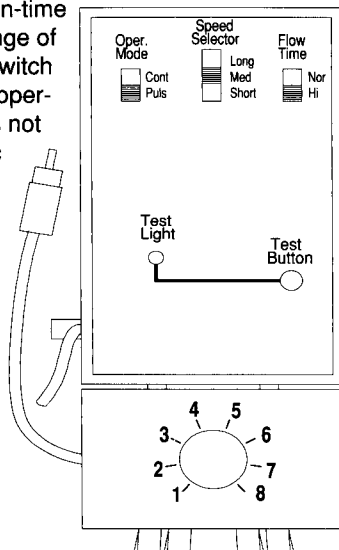
TIF360 PARTS & CONTROLS

1. Blue Manifold Valve
2. Fuel Rail Hose Fitting
3. Side Manifold Block Fitting
4. Digital Pressure Gauge
5. Negative (black) Battery Lead
6. Positive (red) Battery Lead
7. Operating Mode Switch
8. Speed Selector Switch
9. Flow Time Switch
10. Electronic Control Box
11. Test Light
12. Test Button
13. Selector Box
14. Selector Power Lead
15. Injector Test Leads
16. Ford Fuel Rail Hose (Hose #2)
17. GM/Chrysler Fuel Rail Hose (Hose #1)
18. Clear Bleeder Hose

ELECTRONIC CONTROLS

Electronic Control Functions

The TIF360 Injector Control Module is the remote triggering device for firing injectors during pressure drop or injector balance tests. Three switches allow the user to vary firing mode, pulse width and total on-time in order to provide for any range of testing. Although particular switch settings are described in the operating instructions section, it is not mandatory that those specific settings be used exclusively. An understanding of each control's function will provide a great deal of flexibility and permit simulation of varying engine speeds and conditions. Always remember, however, that once a test has begun the switches must be kept in the same position for each injector to ensure a fair comparison.



ELECTRONIC CONTROLS

Operating Mode Switch - Controls the signal pattern sent to the injectors; the manner in which the injectors are opened.

Continuous - A signal pulse is sent to the injector; it is opened only once during the test. This is useful when flow tests are required.

Pulsed - Multiple pulses are sent to the injector; which opens and closes repeatedly during the test. This simulates actual injector behaviour when the engine is running. The pulse width and frequency are controlled by the Speed Selector Switch.

Speed Selector Switch - Allows the user to change the pulse width of the firing signal when in the **pulsed mode**. This switch has no effect on the **cont. mode**. Switch positions refer to pulse width, and simulate varying driving conditions. Although the number of pulses and their width vary, total on-time (injector open time) is always the same; since there are fewer long pulses and more short pulses.

Long - Simulates highway driving or acceleration

Medium - Simulates steady city driving

Short - Simulates engine idle

Varying the pulse width will allow you to see if the injector

ELECTRONIC CONTROLS

performs in the same manner under a range of conditions. Since total on-time is always the same, pressure drop or fuel flow should also be the same in each position.

Flow Time Switch - Controls the total on-time, or the total time the injectors are opened.

Normal - Most applications should be tested in the normal position, on time is 360 ms.

High - On time is one half of normal. It may be necessary to use this on low pressure systems if the pressure drop is excessive in the normal position. Since injector open time is less, pressure drop will also be less.

Test Button - Use to fire, or activate, the injector. Firing time is controlled by the module and is not affected by the amount of time the button is pressed.

Test Light - The test light will illuminate when power is sent to an injector. In continuous mode it stays alight while the injector is open; in pulsed mode it will flash on and off as the injector opens and closes.

OPERATING INSTRUCTIONS

Set-Up

Before using your new TIF360, the battery must be installed in the digital gauge. Please refer to page 18 in the maintenance section for battery installation instructions.

Static Pressure Test

1. **Select correct fuel hose** for the vehicle to be tested.

Hose #1 will connect directly to most GM and Chrysler fuel rail service fittings. Hose #2 will connect to most Ford fuel rail service fittings. For vehicles which do not have schrader type service fittings it will be necessary to use adapters (not included), such as in-line tee's.

Adapter sets can be obtained from Snap-On Tools; part #'s MT3350 and 3360.

2. Connect **fuel hose** to bottom fitting on manifold. If using hose #1, connect the straight end to the manifold, if using hose #2 connect the only end that fits the manifold.

3. Close **blue manifold valve** by rotating fully clockwise as illustrated in diagram 1.

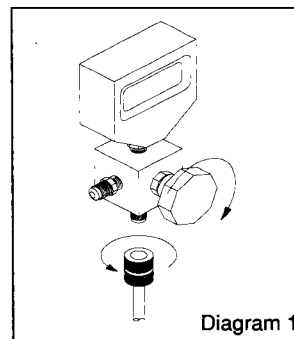
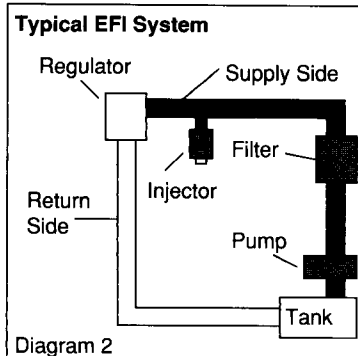


Diagram 1

OPERATING INSTRUCTIONS

4. Connect the **fuel hose** to the system, carefully follow the manufacturer's instructions. Manufacturer's most often recommend that pressure be relieved from the fuel system before connecting service gauges. On EFI systems connect the gauge between the fuel pump and the regulator on the supply side as illustrated in diagram 2. On CIS systems it is usually necessary to take several readings due to different supply pressures; follow manufacturer's testing procedures.
5. Switch gauge on. Turn on the ignition, or energize the fuel pump via the test terminals. Observe the pressure reading on gauge and compare with the manufacturer's specs. If pressure is above specs, check for either a restricted return line or a faulty regulator. If pressure is below specs, check fuel filter, regulator or pump (see Fuel Pump Deadhead Pressure on page 17 for more information).



OPERATING INSTRUCTIONS

Dynamic Pressure Test

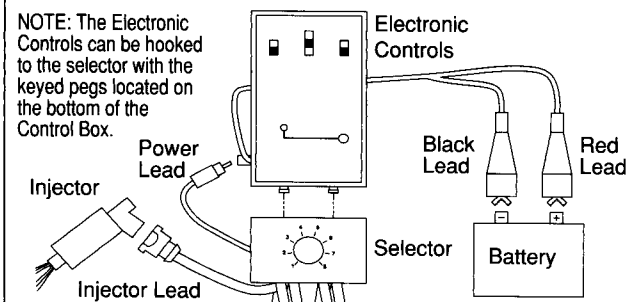
1. Proceed as outline in steps 1 through 4 in the **Static Pressure Test** section.
2. Connect the **clear bleed hose** to the left side fitting. Slide one end over the fitting, ensuring a snug fit. Place the other end in an approved container such as a gas can.
3. Start engine and carefully open the **blue manifold valve** to bleed air from the fuel hose. Close valve as soon as fuel begins to flow from the bleed hose.
4. Observe pressure reading. If the pressure regulator is vacuum controlled, which most multi-port EFI systems are, the pressure should drop below the static reading when the engine is running. Rev the engine up to a cruising RPM and check that the pressure is within the manufacturer's specifications.
5. On a vacuum controlled regulator the fuel pressure should vary slightly as the throttle is cycled and the manifold vacuum changes. To check regulator operation, monitor the gauge and disconnect the vacuum control hose from the regulator; the fuel pressure should rise.

OPERATING INSTRUCTIONS

Pressure Drop / Injector Balance Test For Multi-port EFI

NOTE: It is best to perform this test on a cool engine.

1. Perform static and dynamic tests, as instructed in the previous sections of this manual, to verify that the fuel pump and regulator are working properly. Leave gauge connected.
2. With engine and ignition off, disconnect the injector signal leads from the injectors. On some engines it may be necessary to first remove the intake plenum.
3. Connect the **Electronic Controls** to the battery and the **Injector Test Leads** to the injector connectors. Connect the **short lead** from the selector to the side jack on the Electronic Controls. See diagram 3 for clarification.



OPERATING INSTRUCTIONS

4. Set switch positions on the Electronic Controls as per the chart below:

Operating Mode	Speed Selector	Flow Time
'Pulsed"	"medium"	"Normal"

More information on the function of these switches and their applications can be found on pages 8, 9 and 10.

5. Turn the ignition key on to energize the fuel pump (or energize via test terminals) and build up static pressure.
- Do NOT start the engine.** Note and record the reading.
6. Choose the injector to be tested by rotating the selector knob on the selector box.
7. Fire the injector by depressing the test button on the control box.
8. Note and record the new pressure reading.
9. Re-energize the fuel pump to build up static pressure.
10. Repeat steps 6 through 9 for all injectors.
11. Compare pressure readings (before and after pulsing) and compare the pressure drop.
12. Diagnosis: A difference of 2 PSI or more among pressure drops is indicative of uneven fuel flow between injectors. A lower drop on a given injector indicates a restriction (clog), whereas a greater drop indicates a leak.

OPERATING INSTRUCTIONS

NOTE: The data chart below illustrates a hypothetical situation to provide clarification.

Injector #	1	2	3	4	5	6	7	8
Static Pressure	45	45	45	45	45	45	45	45
2nd Pressure	35	35	40	35	30	35	40	35
Pressure Drop	10	10	5	10	15	10	5	10
Diagnosis	OK	OK	Clog	OK	Leak	OK	Clog	OK

LeakdownTest

Most fuel injection systems are designed to maintain some or all system pressure after shutdown in order to facilitate rapid restarts. Failure to maintain pressure, or leakdown, can cause hard start conditions.

1. To check for leakdown, proceed as described in steps 1 through 3 of the **Dynamic Pressure Test** section.
2. Turn the engine off and observe and record the gauge reading. Wait 5 minutes and check the pressure reading again. If pressure has dropped, there is a leakdown. Possible leakage points include the regulator, fuel pump check valve (EFI systems), fuel accumulator (CIS system) and the injectors.

OPERATING INSTRUCTIONS

3. To isolate the leak, repressurize the system and:

- A) Restrict the fuel return line and observe the gauge. If the pressure does not drop, the regulator is leaking.
- B) Repressurize and restrict the supply line and observe the gauge, if the pressure does not drop, the fuel pump check valve (or accumulator on CIS) is leaking. If the pressure drops, the injector(s) or fuel rail is/are leaking.

Fuel Pump "Deadhead" Pressure Test

Sometimes it is necessary to directly measure fuel pump pressure, known as "deadhead pressure", as opposed to system pressure. For example, in the case of low system pressure it is important to determine if the pump is the problem.

1. Connect gauge to the fuel system between the pump and the filter or directly to the pump outlet via a short hose and barb. Remember to release residual system pressure before hand.
2. Turn gauge on.
3. Energize the fuel pump and observe pressure reading. Compare with manufacturer's specifications; if either high or low, repair or replace fuel pump.

UNIT MAINTENANCE

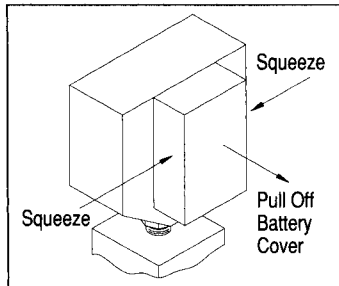
General Maintenance

Always remember that the TIF360 is a sensitive electronic instrument and should be treated as such. Avoid high temperatures, severe mechanical shock and damp and/or moist environments. Apart from keeping the electronic controls and digital gauge clean and occasional inspection for damaged wires and/or loose connections, the only regular maintenance required is gauge battery replacement.

Battery Replacement

When battery voltage is low the symbol "LB" will appear on the display.

1. Remove the battery compartment, on the back of the gauge, by gently squeezing the sides in and pulling off.
2. Remove the battery connector pigtail and attach a new and/or tested 9volt battery.
3. Place the battery inside of the battery compartment.
4. Replace the compartment by lining up the tabs with the slots in the case and popping in place. Take care not to catch the pigtail wires under the edge.



SPECIFICATIONS

Controls

Modes: 2, Continuous and Pulsed

Pulse Width Settings: 3;
Nominal values;
Long = 45ms,
Medium = 22.5ms,
Short = 11.25ms

Gauge

Pressure Range: 0 - 500 PSI

Resolution: 1 PSI

Accuracy: +/- 2% RDG

Power Supply: One 9V Battery

Battery Life: 40 hours (alkaline)

Total Injector On-Time:

Two settings;
Normal = 360ms,
High = 180ms

Power Supply: 12 VDC

Power Cord Length: 36"

Test Lead Length: 36"

Complete Unit

Dimensions: 5.75x3.25x2.75"

Weight: 12.5Lbs

Replacement Parts:

Part Description	Part #
Hi-Side Digital Gauge	TIF9685
Electronic Control Box	TIF3575
Injector Selector Box	TIF3571
Carrying Case W/Foam	TIF361
Hose Set, TIF360	TIF362
One GM/Chrysler Hose	
One Ford Hose	
One Clear Drain Hose	

WARRANTY & REPAIR



Limited Warranty and Repair/Exchange Policy

This instrument has been designed and manufactured to provide unlimited service. Should the unit be inoperative, after performing the recommended maintenance, a no-charge repair or replacement will be made to the original purchaser within one year from the date of purchase. This warranty applies to all repairable instruments that have not been tampered with or damaged through improper use.

This warranty does not cover batteries or any other materials that wear out during normal operation of the instrument.

Returning Your Unit For Repair

Before returning your instrument for repair please make sure that you have carefully reviewed the **Maintenance** section of this manual to determine if the problem can be easily repaired. Make sure that the **battery** is working properly **BEFORE** returning the unit.

If the unit still fails to work properly send the unit to the repair facility address on the back cover of this manual. Repaired or replaced tools will carry an additional 90 day warranty. For more information please call (800) 327-5060.