

General Safety Guidelines to Follow When Working on Vehicles

To prevent accidents that could result in serious injury and/or damage to your vehicle or test equipment, carefully follow these safety rules and test procedures at all times when working on vehicles:

- DO NOT use Model KM2529 Fuel Pressure Tester on Diesel or Flex Fuel engines!
- Always wear approved eye protection.
- Always operate the vehicle in a well-ventilated area. Do not inhale exhaust gases – they are very poisonous!
- Always keep yourself, tools and test equipment away from all moving or hot engine parts.
- Always make sure the vehicle is in **Park** (Automatic transmission) or **Neutral** (manual transmission) and that the **parking brake is firmly set**. Block the drive wheels.
- Never lay tools on vehicle battery. You may short the terminals together causing harm to yourself, the tools or the battery.
- Never smoke or have open flames near vehicle. Vapors from gasoline and charging battery are highly flammable and explosive.
- Never leave vehicle unattended while running tests.
- Always keep a fire extinguisher suitable for gasoline/electrical/chemical fires handy.
- Always use extreme caution when working around the ignition coil, distributor cap, ignition wires, and spark plugs. These components contain **high voltage** when the engine is running.
- Always turn ignition key OFF when connecting or disconnecting electrical components, unless otherwise instructed.
- Always follow vehicle manufacturer's warnings, cautions and service procedures.

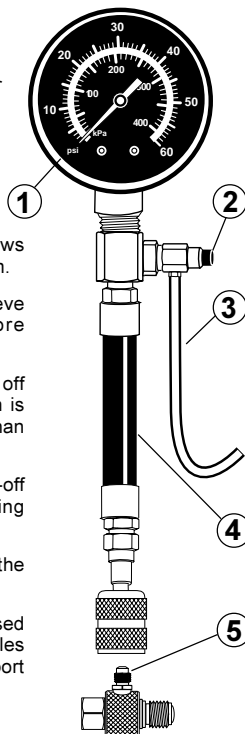
CAUTION:
Some vehicles are equipped with safety air bags. You must follow vehicle service manual cautions when working around the air bag components or wiring. If these precautions are not followed, the air bag may deploy unexpectedly, resulting in personal injury. Note that the air bag can still deploy several minutes after the ignition key is off (or even if the vehicle battery is disconnected) because of a special energy reserve module.

KM2529 Components

Part Number	Part Description
0180-000-1320	GM TBI adapter, M16 x 1.5
0032-000-0126	42 in. hose, gauge connector fitting with pressure relief button, and 72 in. plastic tubing (bleed-off hose)
0031-000-0355	Fuel Pressure Gauge, 0-60 psi

- 1. Dial Face:** Measurement scale that shows amount of fuel pressure present in fuel system.
- 2. Pressure Relief Button:** Used to relieve fuel pressure in the gauge hose before disconnecting the gauge from the fuel line.
- 3. Bleed-Off Hose:** A 6-ft. hose that bleeds off fuel pressure when the pressure relief button is pressed. Never use a bleed-off hose shorter than 6 ft.
IMPORTANT: Always make sure end of bleed-off hose is in an approved fuel container during testing and when bleeding off fuel pressure!
- 4. Gauge Hose:** Hose that carries fuel to the gauge so that pressure can be measured.
- 5. GM TBI Test Adapter:** This adapter is used to connect the gauge hose to GM TBI vehicles NOT equipped with a fuel access valve test port on the fuel rail.

Figure 1



All information, illustrations and specifications contained in this manual are based on the latest information available from industry sources at the time of publication. No warranty (expressed or implied) can be made for its accuracy or completeness, nor is any responsibility assumed by Actron Manufacturing Co. or anyone connected with it for loss or damages suffered through reliance on any information contained in this manual or misuse of accompanying product. Actron Manufacturing Co. reserves the right to make changes at any time to this manual or accompanying product without obligation to notify any person or organization of such changes.

Vehicle Service Information

The following is a list of publishers who have manuals containing fuel system testing information. Some manuals may be available at auto parts stores or your local public library. For others, you need to write for availability and pricing, specifying the make, model and year of your vehicle.

Vehicle Service Manuals from General Motors Corp.:

Buick, Cadillac, Chevrolet, GEO, GMC, Oldsmobile, & Pontiac
Helm Incorporated
Post Office Box 07130
Detroit, MI 48207

Saturn
Adistra Corporation
c/o Saturn Publications
101 Union St.
Post Office Box 1000
Plymouth, MI 48170

Vehicle Service Manuals:

Chilton Book Company
Chilton Way
Radnor, PA 19089

Haynes Publications
861 Lawrence Drive
Newbury Park, CA 91320

Cordura Publications
Mitchell Manuals, Inc.
Post Office Box 26260
San Diego, CA 92126

Motor's Auto Repair Manual
Hearst Company
250 W. 55th Street
New York, NY 10019

Suitable manuals have titles such as:
"Electronic Engine Controls"
"Fuel Injection and Feedback Carburetors"
"Fuel Injection and Electronic Engine Controls"

INITIAL CHECKS

Fuel System Checks

Before doing any fuel system pressure testing, check the following fuel system components and correct any problems you may encounter:

1. Check fuel level and fuel tank venting (filler cap, etc.).
2. Check fuel for water or contamination.
3. Check fuel lines and hoses for damage or looseness.
4. Check fuel system electrical fuses.

9. Don't take shortcuts. Inspect wiring which may be difficult to see because of location beneath air cleaner housings, alternators and other components.

10. Inspect wiring harnesses for:
 - Contact with sharp edges (this happens often).
 - Contact with hot surfaces, such as exhaust manifolds.
 - Pinched, burned or chafed insulation.
 - Proper routing and connections.

Pre-Testing Checks

1. Read Safety Guidelines.
2. Do a thorough visual and "hands-on" inspection of the engine and fuel system. Look for loose or cracked electrical wiring, battery cables, ignition wires, and fuel or vacuum lines.
3. Verify that the battery is fully charged and the fuel tank has an adequate supply of fuel.
4. Verify that all fuel system fuses are good.
5. Verify that the fuel vapor recovery system and gas cap are in good condition.
6. Verify that manifold vacuum is within manufacturer's specification (typically 18-20 in. at idle).
7. Look for fuel leaks and wipe up any spilled fuel immediately.
8. Has the vehicle been serviced recently? Sometimes things get reconnected in the wrong place, or not at all.

11. Check electrical connectors for:
 - Corrosion on pins.
 - Bent or damaged pins.
 - Contacts not properly seated in housing.

NOTE: Problems with connectors are common in the engine control system. Inspect carefully. Note that some connectors use a special grease on the contact to prevent corrosion. Do not wipe off! Obtain extra grease, if needed, from your vehicle dealer. It is a special type for this purpose.

12. Check other vehicle systems:
 - Ignition—For safety reasons, most engine computers will not deliver fuel without an ignition spark.
 - Engine computer—The engine computer has special drivers which energize the fuel injectors. These drivers are fragile and can break easily. If you suspect a computer driver problem, test by replacing the computer with a known good computer and retest.

One Year Warranty

If within one year from the date of purchase this equipment fails due to defect in materials or workmanship, return it to Actron and Actron will repair it free of charge. This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

INSTALLATION

For GM vehicles without a fuel access valve test port on the fuel rail:

When working on fuel system lines and components, always make sure to keep a dry chemical fire extinguisher ready. Never put water on a fuel or electrical fire. Keep a supply of clean dry shop towels handy to absorb leaks and spills when disconnecting fittings, lines, and hoses. Also have a 2-gallon or larger approved fuel container ready to collect fuel when testing or bleeding the fuel lines.

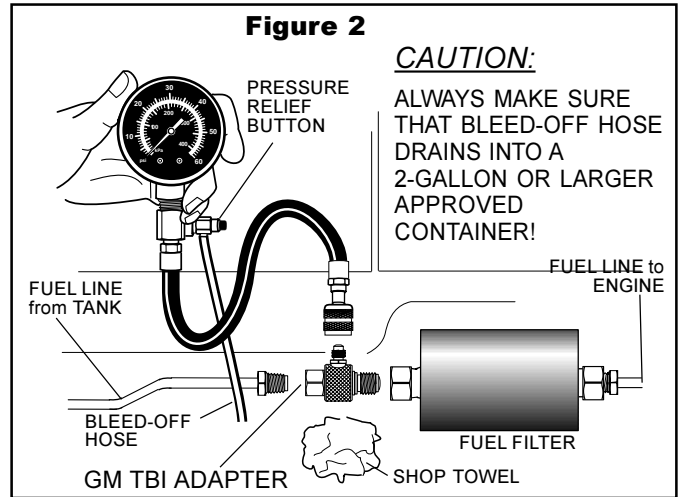
Install the fuel pressure tester as follows:

1. Relieve fuel system pressure by following the instructions given in the vehicle service manual. On most vehicles this is done by removing the fuel cap, disconnecting or deactivating the electric fuel pump(s), and running the engine for about 30 seconds until it stalls.

WARNING: Some vehicles may have more than one fuel pump. Failure to deactivate all fuel pumps can result in spilled fuel, fire, or other hazardous conditions that could cause vehicle damage, personal injury, or death.

CAUTION: The information provided here is not intended as a substitute to the procedures given in the vehicle service manual. Always follow the manufacturer's instructions when working on fuel systems.

2. At the location specified in vehicle service manual, disconnect the fuel line. Use a shop towel to catch any released fuel. Figure 2 shows the typical location at a fuel filter. If filter is attached with a clamp, remove the clamp and then remove the filter if necessary. If the filter is dirty or is suspect in any way, replace it.
3. Attach the special fuel tester adapter to the fuel filter, and then



attach the fuel line to the adapter as shown in Figure 2. Tighten all fittings finger tight and then tighten gently 1/2 turn with wrenches.

4. Attach the 42-inch hose and pressure gauge assembly to adapter top fitting and tighten fitting until finger tight.

TESTING WITH THE FUEL SYSTEM TEST KIT

NOTE: Before beginning any testing, perform diagnostic procedures described in vehicle service manual to eliminate other possible causes of driveability problem. Compression and ignition problems may imitate fuel injection system problems.

Before proceeding with fuel pressure testing, read and understand all safety guidelines and perform all pre-testing checks.

1. Place end of 6-ft. bleed-off hose in an approved fuel container. Bleed-off hose must remain in container until testing is complete.
2. Turn all accessories OFF (i.e. ra-

dio, A/C, blower fan, headlights, windshield wipers, etc.)

3. Turn ignition key ON.

Perform the following checks:

- Pressurize fuel system by cycling ignition ON and OFF every ten seconds until fuel pressure is at manufacturer's specifications (check vehicle service manual for your particular application).
- Check fuel system for leaks. If leaks are found, turn ignition key OFF and clean up fuel immediately!
- If fuel pressure is not within manufacturer's specifications,

cycle ignition key 2 or 3 more times. If fuel pressure is still not within specification, service vehicle according to vehicle service manual.

4. Start engine and let idle.

- If test vehicle's fuel system uses a vacuum actuated (compensated) fuel pressure regulator, then fuel pressure should drop 3-10 psi, depending on manifold vacuum.
- If test vehicle's fuel system uses a fuel pressure regulator without a vacuum port, then fuel pressure should remain constant during both key-on-engine-off and idle.

- Read fuel pressure from dial face.

- If fuel pressure is not within manufacturer's specification, then service vehicle according to vehicle service manual.

- When repair is complete and idle fuel pressure is within manufacturer's specification, then proceed to **Step 5**.

5. Turn ignition key OFF.

6. Disconnect fuel pressure gauge as described in the following section.

DISCONNECTING FUEL PRESSURE GAUGE

1. Verify that 6-ft. bleed-off hose is still in an approved container for fuel.
2. Fully DEPRESS and HOLD the pressure relief button until dial face pointer is resting on stop pin.

CAUTION: Pressurized fuel will spray out of bleed-off hose and into approved container.

3. Shake bleed-off hose to make sure that all fuel has gone into approved container.
4. Remove gauge hose from fuel line adapter fitting:
 - Wrap a shop rag around fuel line adapter fitting in case a small

amount of fuel drips out while unscrewing test adapter.

- Unscrew fuel pressure gauge from fuel line adapter fitting.
 - Wrap a shop rag around end of fuel pressure gauge hose to catch any fuel dripping from hose.
 - Remove bleed-off hose from approved fuel container and hold gauge hose over container so any remaining fuel will drip into container.
5. After relieving fuel system pressure, disconnect fuel line adapter and reconnect fuel lines as described in vehicle service manual. Use correct fuel line fitting tools. Clean up any spilled fuel immediately!
 6. Store shop rags in an approved container so they cannot cause personal injury or a hazardous situation.
 7. Store fuel pressure gauge in a well-ventilated area where it cannot cause personal injury or a hazardous situation.

GENERAL FUEL PRESSURE DIAGNOSTICS

Checking fuel pressure is an essential part of fuel injection system troubleshooting. High fuel pressure will make an engine run rich, while low fuel pressure will make an engine run lean or not at all. In some cases, low fuel pressure can cause additional damage such as burned pistons, valves, spark plugs, or blown head gaskets.

Fuel pressure readings which are higher than manufacturer's specifications are generally caused by a problem in the fuel return line components. Conversely, fuel pressure readings which are lower than manufacturer's specifications are generally caused by a problem in the fuel pressure line components.

If fuel pressure readings are not within manufacturer's specifications, refer to a vehicle service manual for step-by-step diagnostic procedures which will pinpoint the faulty component for each specific vehicle.

Possible causes of high fuel pressure readings may include:

- Faulty fuel pressure regulator.
- Restriction in fuel return line.
- Faulty fuel line couplings at fuel tank or fuel pickup.
- Sticking or "sluggish" fuel injectors.

Possible causes of low fuel pressure readings may include:

- Clogged or restricted fuel filter.
- Restriction in pressure line.
- Faulty fuel pump(s).
- Faulty fuel pump relay.
- Blown fuel pump fuse.
- Faulty fuel pump wiring.
- Clogged or restricted fuel pump filter.
- Faulty fuel pressure regulator.
- Leaking fuel injectors.
- Faulty fuel line couplings at fuel tank or fuel pickup.

Customer Service

For product information or customer service please call 1-800-ACTRON-7 (1-800-228-7667) or fax anytime at (216) 651-2388.

For technical support call:
1-800-253-9880

Internet home page:
<http://www.actron.com>