FUEL PRO

SERIES

www.fuelpro-x.com

ADVANTAGE ENGINEERING

Printed in the U.S.A.
3/2006

Part No. 7702-40-01-1

ADVANTAGE ENGINEERING

FUEL PRO X SERIES

OPERATIONS MANUAL

TABLE OF CONTENTS

I. INTRODUCTION to the FUEL PRO X-SERIES 2

II. SAFETY INFORMATION 3

- Section 1.01: Important Safety Notice 3
- Section 1.02: Important Safety Instructions.....5

III. SYSTEM FEATURES & SPECIFICATIONS 9

- Section 2.01: Features.....9
- Section 2.02: Dimensions & Technical Specifications.....10
- Section 2.03: Machine Overview.....11
- Section 2.04: Control Panel Overview.....12

IV. OPERATING PROCEDURES 14

- Section 3.01: Tool Usage / Battery Voltage Chart.....14
- Section 3.02: Identifying The Fuel System Type 15
- Section 3.03: Two-Line Fuel Delivery Systems 16
- Section 3.04: One-Line Fuel Delivery Systems 22

V. TROUBLESHOOTING & ADDITIONAL HELP.....28

- Section 4.01: Troubleshooting Guide 28

APPENDIX A - ADAPTERS 29

- Section 5.01: Standard Adapter Kits.....29
- Section 5.02: Optional Adapters 40

APPENDIX B - REPLACEMENT PARTS 41

- Section 6.01: Replacement Parts.....41

APPENDIX C - MAINTENANCE.....44

- Section 7.01: Maintenance Procedures 44

APPENDIX D - MATERIAL SAFETY DATA SHEET.....45

WARRANTY INFORMATION.....47

MAINTENANCE LOG.....48

I. INTRODUCTION TO THE FUEL PRO X-SERIES

Congratulations on the purchase of your FUEL PRO system.

The FUEL PRO system represents the most technologically advanced method for cleaning harmful fuel related contaminants from gasoline internal combustion engines.

With specially formulated Advantage Engineering Petrol Fuel System Cleaning Solution and Filters, the FUEL PRO system provides a safe, easy to use, quick, and comprehensive way of maintaining optimum fuel system and vehicle performance, fuel delivery, and reduced exhaust emissions. Integrated functions within the control panel include diagnostic procedures to isolate, and properly identify fuel system deficiencies.

The FUEL PRO system is fully electronic. When connected to a gasoline engine, it temporarily replaces the vehicle's fuel supply and performs most of the cleaning and diagnostic functions with a four to one (4:1) mixture of fuel and Advantage Engineering Petrol Fuel System Cleaning Solution and Filters. This mixture is circulated through the fuel distribution system, loosening and dissolving accumulated deposits and contaminants which are then trapped in the Ultra Fine Filtration system of your FUEL PRO. Induction and combustion system contaminants are similarly released and then consumed in the combustion process. Post combustion contaminants are also broken down and released, particle by particle, passing them safely from the exhaust system.

Restoration of horsepower, fuel economy, and reduced exhaust emissions are commonly realized as a result of periodic comprehensive fuel system service. It is recommended that you perform this service every 12,000 miles or annually to maintain the highest level of fuel system efficiency and overall reliability.

The FUEL PRO system control panel is logically arranged into sections for diagnostic, two-line, and single line service procedures. Cleaning processes are graphically sequenced to guide you through service procedures for two-line fuel delivery systems (PFI, CIS and TBI) and one-line fuel delivery systems (carburetor and some PFI systems). Diagnostic functions are also graphically displayed

To diagnose and isolate potential problems in most fuel systems, the FUEL PRO system is capable of measuring the following:

- Vehicle fuel supply flow rate
- Vehicle fuel pump maximum output pressure (deadhead)
- Vehicle fuel system regulated and un-regulated pressure
- Vehicle fuel system component leakdown testing
- Vehicle fuel system pressure check
- Vacuum

II. SAFETY INFORMATION

1.01 IMPORTANT SAFETY NOTICE

For your safety, read this manual thoroughly before operating your FUEL PRO system. Your FUEL PRO system is intended for use by properly trained, skilled professional automotive technicians. The safety messages presented below and throughout this user's manual are reminders to the operator to exercise care when using this unit. Before using your FUEL PRO system, always refer to and follow the safety messages and applicable service procedures provided by the manufacturer of the vehicle being serviced.

• Read All Safety Instructions

Read, understand and follow all safety messages and instructions in this manual. Safety messages in this section of the manual contain a signal word with a three-part message and, in some instances, an icon.

• Signal Words

The signal word indicates the level of the hazard in a situation:

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

WARNING

Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor injury to the operator or to bystanders.

IMPORTANT

Indicates a situation which, if not avoided, may result in damage to the FUEL PRO system or the vehicle being serviced.

• Safety Messages

Safety messages in this section contain three different type styles:

- Normal type states the hazard.
- **Bold type** states how to avoid the hazard.
- *Italic type* states the possible consequences of not avoiding the hazard.

• Safety Symbols

A safety symbol, when present, gives a graphical description of the potential hazard, and how to avoid the hazard:

Risk of Fire

Read Instructions Before Use

Risk of Explosion

Mandatory Eye Protection

Risk of Entanglement

Mandatory Protective Gloves

Dangerous Fumes

Mandatory Protective Clothing

Do Not Pull or Move

1.02 IMPORTANT SAFETY INSTRUCTIONS

DANGER

Vehicle gases contain Carbon Monoxide, which is a colorless & odorless lethal gas.

- **Only run engines in well ventilated areas and avoid breathing exhaust gases.**

Extended breathing of exhaust gases will cause serious injury or death.

WARNING

Improper use and operation.

- **Read, understand and follow all safety messages and operational procedures in this manual before operating the FUEL PRO system.**
- **This equipment should be operated only by qualified personnel.**
- **Use this equipment only as described in this manual.**

Improper use and operation of this product can result in injury.

WARNING

Exhaust gases, moving parts, hot surfaces, and potent chemicals may be present during use of the fuel system equipment.

- **When using chemicals always refer to the MSDS sheets and manufacturer's instructions for the proper procedure to handle emergency medical treatment, cleanup, handling, and storage requirements.**

Improper use of the fuel system equipment or exposure to exhaust gases, moving parts, hot surfaces, or moving parts may cause injury.

WARNING

Flammable fuel chemical and vapors can ignite.

- **Avoid exposure to flames, sparks, hot engine parts, and other ignition sources.**
- **Keep a fully charged fire extinguisher nearby. The extinguisher should have a class B rating and be suitable for gasoline, chemical, and electrical fires.**
- **Clean up any fuel or chemical spills immediately. Refer to MSDS sheets and manufacturer's instructions for clean up requirements**
- **Dispose of contaminated clean up materials according to governing environmental laws.**
- **Never look directly into the air induction plenum or carburetor throat when the engine is operating.**
- **Plug or cap open fuel lines during service.**
- **Keep Fuel System Cleaning Solution container closed except when filling reservoir.**

Explosion or flame or exposure to flammable liquids and vapors can cause injury.

WARNING

Many fuel systems maintain residual pressure in fuel lines after the engine has been turned off.

- **Wear safety glasses, chemical resistant gloves, and protective clothing when connecting and disconnecting fuel lines and adapters.**
- **Confirm ZERO pressure before connecting and disconnecting fuel lines and adapters.**

Explosion or flame or exposure to flammable liquids and vapors can cause injury.

WARNING

Risk of expelling pressurized fluids.

- **Verify that engine and machine are off before connecting or disconnecting lines and adapter hoses.**
- **Keep the service hoses away from hot or moving engine parts. Hoses can split or burst causing fluid to be expelled.**
- **Tighten all connections properly.**

Chemicals may cause respiratory tract and/or skin and eye irritation.

- **Use only approved chemicals (refer to operator's manual).**
- **Use safety glasses and protective clothing when handling chemicals.**
- **Do not ingest chemicals or breathe vapors**
- **Treatment methods are as follows:**
  - **Eyes: Flush eyes with plenty of water.**
  - **Skin: Wash with soap and water.**
  - **Inhalation: Move to uncontaminated area.**
  - **Ingestion: If large amount, get medical attention.**
  - **If any irritation persists, get medical attention.**
- **Dispose of used fluid according to environmental laws and regulations.**

Although motor oil and engine flush solution pose no significant health hazards, some individuals may experience adverse reactions upon contact. Pressurized fluid can cause serious injury.

WARNING

Batteries produce explosive gases and can explode.

- **Keep sparks and flames away from the battery.**
- **Do not lay tools, equipment, or other conductive items on the battery.**
- **Connect the positive lead of the equipment to the positive lead of the battery first.**
- **Connect the negative lead of the equipment to vehicle ground as far away from the battery as leads will allow to prevent sparking and igniting of battery gases.**
- **Keep battery acid away from skin and eyes. In case of eye contact, flush with clean water for 15 minutes and get medical attention.**

Battery explosion and ignited gases can cause injury.

WARNING

Risk of unexpected vehicle movement.

- **Block drive wheels before starting vehicle's engine to begin an exchange.**
- **Unless instructed otherwise, set parking brake and put gear selector in park.**
- **Do not leave a running vehicle unattended.**

A moving vehicle can cause injury.

WARNING

Engine has moving parts. Risk of entanglement.

- **Do not place tools on fenders or other places in engine compartment.**
- **Keep yourself, clothing, adapters and service hoses clear of moving parts such as fan blades, belts and pulleys.**
- **Wear safety goggles (user and bystanders).**

Moving components can cause injury.

WARNING

Risk of burns.

- **Wear gloves when working near hot engine components.**
- **Do not touch hot exhaust systems, manifolds, engines, radiators, etc.**

Hot components can cause injury or discomfort.

⚠ WARNING

Risk of injury.

- **This equipment should be operated by qualified personnel only.**
- **Use this equipment only as described in this manual.**
- **Loop the power cord loosely in its proper location when machine is not in use.**
- **Do not operate equipment with a damaged power cord or hoses, or if the equipment has been dropped or damaged, until it has been examined by a qualified service representative.**
- **Care should be taken to arrange the power cord and service hoses so that they will not be tripped over or pulled.**
- **Never pull on the power cord or service hoses to transport the FUEL PRO system. Damage may occur to these components, or machine may tip over.**
- **Keep area of operation clear of unnecessary tools and equipment. Utilize storage area on the top of the machine and drawers.**
- **Never leave the machine running unattended.**
- **The FUEL PRO system is not designed for any other purpose than the cleaning of the fuel delivery system.**

Operation of your FUEL PRO system by anyone other than qualified personnel may result in injury.

⚠ CAUTION

Risk of equipment damage.

- **Servicing, transporting, or storing this machine in an attitude other than the normal operating position can result in fluid spillage and/or component damage.**
- **Use only the manufacturer's recommended attachments.**
- **The FUEL PRO system is fully automatic. Refer to your control panel at all times.**
- **Never pull on the power cord or service hoses to transport the FUEL PRO system. Damage may occur to these components, or machine may tip over.**
- **Periodically clean the machine by wiping down with a clean, soft, dry cloth.**

Improper operation of equipment may result in damage to machine or components.

SAVE AND FOLLOW THESE INSTRUCTIONS!

III. SYSTEM FEATURES & SPECIFICATIONS

2.01 FEATURES

Application

- Cleans the fuel delivery system, removes soft carbon build up in combustion chamber, on the intake valves, and in the intake manifold.
- Restores performance, reduces vehicle emissions, and restores fuel economy.

Functions

- Intuitive, full electronic, microprocessor controlled panel with internal fuses, overload, and ground protection
- Step-by-step guided operation
- Simpler adapter hook ups
- Service options: two (2) line and single (1) line
- Electronically controlled diagnostic features to check flow rate, deadhead pressure, running pressure, and leak down
- Pressure and vacuum diagnostic functions accessible independent of fuel system cleaning process
- Stored values for ready comparison between baseline and ending readings
- Diagnostic/Fill cycle allows for injector leak down test prior to initiating fuel service
- Auto Purge: Purges air from FUEL PRO internal lines to avoid “air locks”
- System Pressure Relief: FUEL PRO has programmed and user initiated pressure relief functions
- “Pulse Cleaning” during soak cycle (2 line application)
- Touch pad pressure and time adjustment
- Visual signal for polarity check
- Bright seven segment LED display for time, pressure, and vacuum.
- Board mounted LEDs indicate available procedures and process progression
- Emergency stop button
- Advantage Engineering Petrol Fuel System Cleaning Solution in 250 ml (8 ounce) and 1 liter (32 ounce) clear bottles for convenient and easy to read dispensing

Cabinet Features

- Composite cabinet with service and vacuum hose hangers
- Ergonomically correct working height
- 9” rigid rear wheels
- 4” swivel front casters with brakes
- 3.8 quart reservoir with precision 4 ounce increment indicator marks
- 10’ external nylon reinforced Hytron hoses
- 160 psi rated pump
- Convenient recess for ICS bottle and 30” spray tube
- Three adapter storage drawers and convenient top work surface

2.02 DIMENSIONS & TECHNICAL SPECIFICATIONS

Specifications

- 3.8 U.S. quart solution tank capacity
- 10’ external nylon reinforced Hytron hoses
- 9” rigid rear wheels
- 4” swivel front casters with brakes
- Filtration: To 3 micron
- **Electrical Requirement:** Fully charged 12 VDC Automotive Battery
- **Weight** (uncrated): 80 lbs. (36 kgs) including adapters
- **Dimensions:** 18” (46 cm) wide
  24” (61 cm) deep
  44” (112 cm) high
- One (1) year limited warranty

Standard Accessories

- Standard Adapter Kit - 0102-15-01-0
- Throttle Body Mister - 6026-02-11-2
- Advantage Engineering Petrol Fuel System Cleaning Solution:
  12 @ 250 ml bottles - 0608-12-01-1

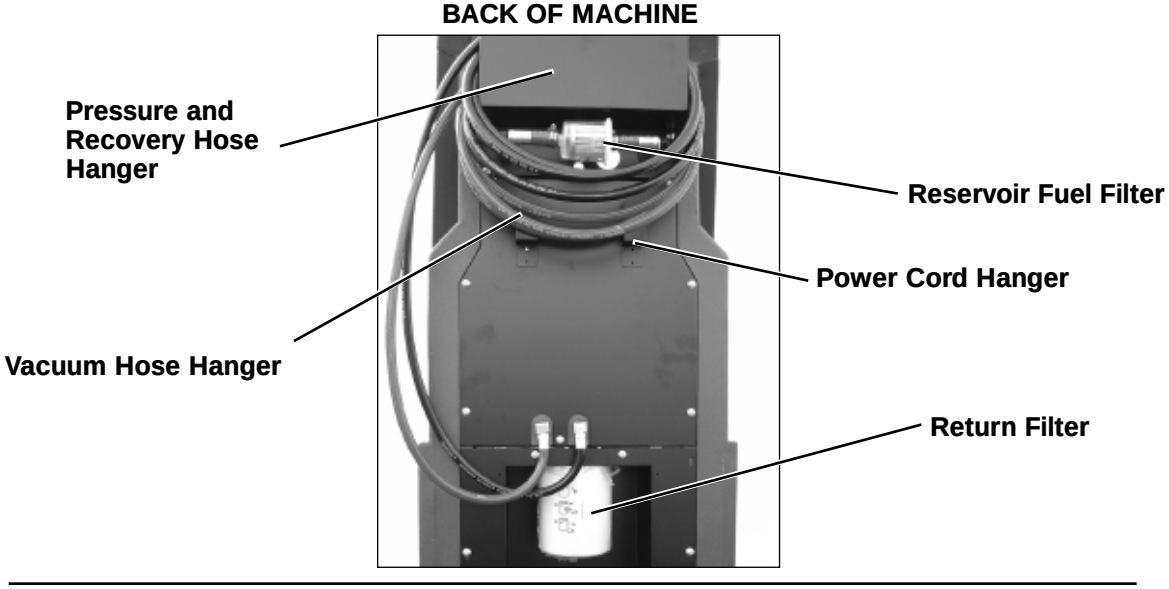
Optional Accessories

- Advantage Engineering Petrol Fuel System Cleaning Solution:
  12 @ 250 ml bottles - 0608-12-01-1
- Advantage Engineering Petrol Fuel System Cleaning Solution:
  4 @ 1 liter bottles - 0610-04-11-1
- ICS Kit - 6090-08-11-0
- Filter Kit - 0500-01-01-2 (4 pcs. total, 2 pcs. spin-on, 2 pcs. inline)

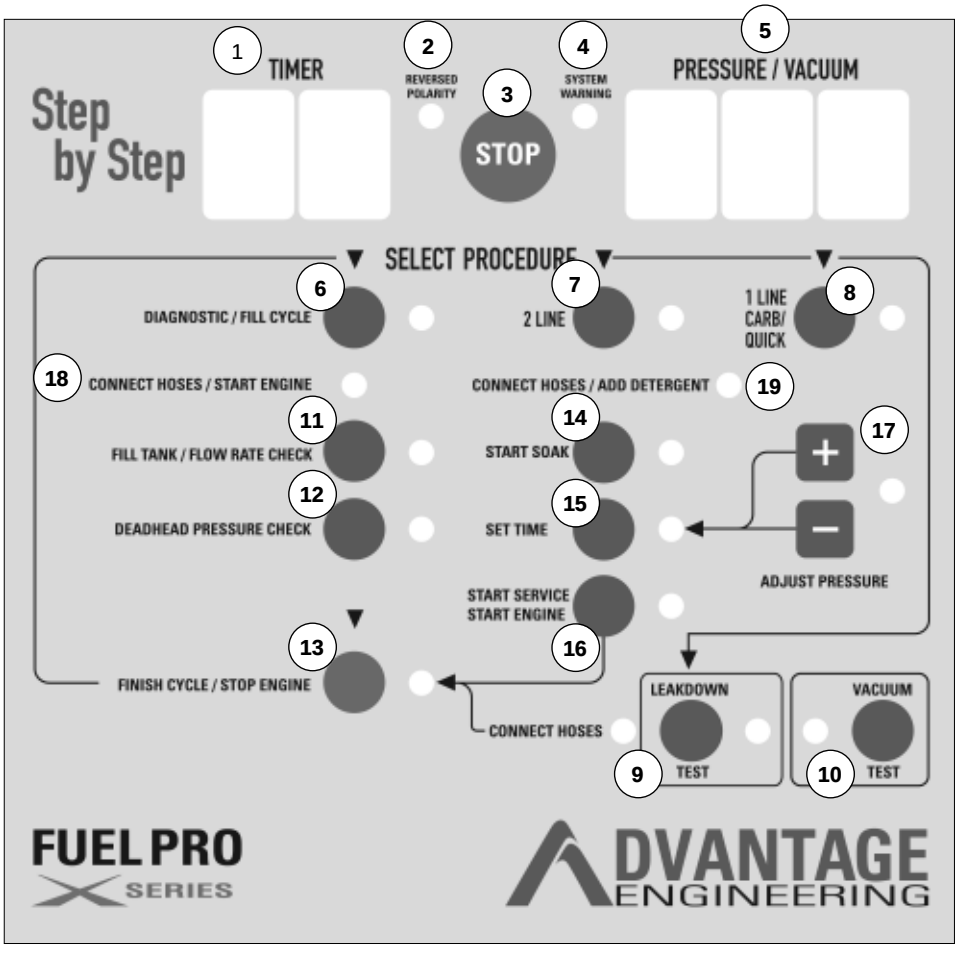
Specifications subject to change without notice.

2.03 MACHINE OVERVIEW

BACK OF MACHINE



2.04 CONTROL PANEL OVERVIEW



KEYS NAME/FUNCTION	DETAILS
1 TIMER Display (2 digits)	Display time in minutes and seconds and indicator (FL and DH) for flow rate and deadhead pressure
2 REVERSED POLARITY LED (red)	Lights when leads are improperly connected
3 STOP Button	• Press and release to pause service • Depress and hold for five seconds to reboot machine; pump stops and system automatically releases internal pressure
4 SYSTEM WARNING LED (red)	Lights to indicate pressure loss or other failures

KEYS NAME/FUNCTION DETAILS

5 PRESSURE/VACUUM
Display (3 digits) — Displays psi and vacuum

6 DIAGNOSTIC/FILL CYCLE
Button – LED (grn) — Start Diagnostic/Fill Cycle

7 2-LINE SERVICE
Button –LED (grn) — Start 2-Line Service

8 1-LINE/CARB SERVICE
Button – LED (grn) — Start 1-Line Service

9 LEAKDOWN TEST
Button – LED (grn) — System Auto Purge
Button – LED (red) — Start Leakdown Test

10 VACUUM TEST
Button LED (grn) — Display Vacuum [Negative Pressure (NP)] Reading

11 FILL TANK/FLOW RATE CHECK
Button – LED (grn) — Depress and Hold. Release when one (1) quart of fuel has been added to tank to display fill time.

12 DEADHEAD PRESSURE CHECK
Button – LED (grn) — Press and release to display deadhead pressure on 2-line system; or regulated pressure on 1-line system

13 FINISH CYCLE/STOP ENGINE
Button – LED (grn) — Depress at the end of the 2-line or 1-line service.

14 START SOAK
Button – LED (grn) — Start “Soak” Cycle - Cycle default is 10 minutes

15 SERVICE TIME SET
Button – LED (grn) — Depress to set Soak and Service Time. (Note: Soak default is 10 minutes. Service default is 20 minutes.) Five (5) minutes are added to the timer each time the button is depressed. Maximum 60 minutes reverting back to five (5) minutes if depressed again.

16 START SERVICE/START ENGINE
Button — Starts “Service” Cycle - Cycle default is 20 minutes

17 PRESSURE ADJUSTMENT
Buttons — “+” or “-” to set system pressure for 1-Line Service

18 CONNECT HOSE/START ENGINE
LED (red) — Flashing to signal Tech to connect hoses and start engine

19 CONNECT HOSES/ADD DETERGENT
LED (red) — Flashing to signal Tech to connect hoses and add detergent

IV. OPERATING PROCEDURES

3.01 TOOL USAGE

⚠ CAUTION

- **Frequently inspect and clean any tools used, and lubricate all non-sealed ratchet mechanisms with light oil.**
- **The use of any other accessories not specified in this manual may create a hazard.**
- **Read, understand and follow Safety Instructions in the front pages of this manual and on product safety labels**

BATTERY VOLTAGE CHART

VOLTAGE	% CHARGE
12.6 to 12.72 VDC	100
12.45 VDC	75
12.30 VDC	50
12.15 VDC	25
@ 80º Fahrenheit (27º Celsius)	

IMPORTANT: A charged battery is required for proper machine function.

3.02 IDENTIFYING THE FUEL SYSTEM TYPE

Identify the fuel system type of the vehicle to be serviced before performing any set up, diagnostic, or cleaning procedure on the vehicle.

THERE ARE FOUR MAJOR TYPES OF FUEL SYSTEMS.

CARBURETOR
A carburetor is the most basic of fuel delivery systems. It is usually centrally mounted over the intake manifold and can be identified by one or more barrels with throttle plates and bowl (w/float).

THROTTLE BODY INJECTION (TBI)
Throttle body fuel systems are similar to carburetor equipped engines. They are centrally mounted over the intake manifold and use one or two electronic injectors to deliver fuel.

PORT FUEL INJECTION (PFI)
Port fuel injection systems use an electronic injector per cylinder that atomizes fuel directly into the intake port.

CONTINUOUS INJECTION SYSTEM (CIS)
A CIS fuel system can usually be easily identified by a fuel distributor with solid steel or braided steel hoses running to individual injectors. The fuel distributor in these systems controls the amount of fuel sprayed. The injector opening and closing is controlled by fuel pressure.

NOTE: Running pressure and vacuum can be tested without using “Step by Step” operation:

TESTING FUEL PRESSURE: Connect power cord to a fully charged 12.0 VDC battery. Connect the positive lead of the equipment to the positive lead of the battery first. Connect the negative lead of the equipment to vehicle ground as far away from the battery as leads will allow, to prevent sparking and igniting of battery gases. Unit will perform a self test and fuel pressure calibration. Connect either the appropriate Schrader Valve Adapter Hose to the vehicle’s fuel pressure test port; or connect the T-adapter between pressure line from tank and fuel rail. Attach FUEL PRO Red Hose and start engine. Insure integrity of all connections; vehicle fuel pressure is indicated in FUEL PRO’s Pressure/Vacuum Display.

TESTING VACUUM: Connect power cord to a fully charged 12.0 VDC battery. Connect the positive lead of the equipment to the positive lead of the battery first. Connect the negative lead of the equipment to vehicle ground as far away from the battery as leads will allow, to prevent sparking and igniting of battery gases. Unit will perform a self test and fuel pressure calibration. Connect vacuum hose to vacuum source. Pressure/Vacuum display will show inches of vacuum when vacuum is present.

3.03 TWO-LINE FUEL DELIVERY SYSTEMS (PORT FUEL INJECTION, CIS, AND THROTTLE BODY INJECTION SYSTEMS)

FUEL SYSTEM CLEANING PROCEDURES

1. Power up. Connect power cord to a fully charged 12.0 VDC battery. Connect the positive lead of the equipment to the positive lead of the battery first. Connect the negative lead of the equipment to vehicle ground as far away from the battery as leads will allow to prevent sparking and igniting of battery gases.

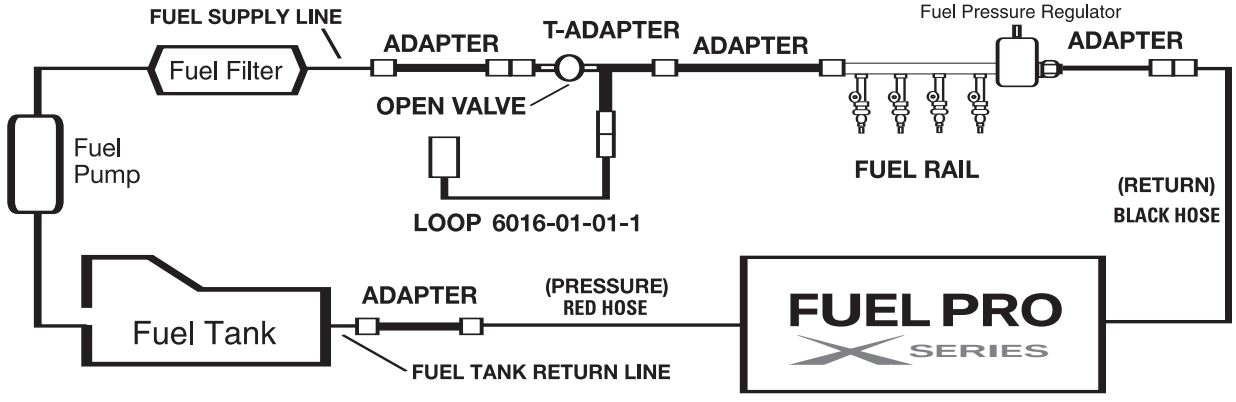
   Unit will perform a self test and fuel pressure calibration.

NOTE: If connected incorrectly, the reversed polarity LED will light.

TANK FILL AND DIAGNOSTIC PROCEDURES

1. Press DIAGNOSTIC/FILL CYCLE key. Audible signal will sound and red LED will flash prompting CONNECT HOSES and START ENGINE procedures.
2. Remove vehicle's gas cap to normalize tank pressure. On OBDII vehicles, replace gas cap; first generation OBD is at your discretion.
2. Disconnect return fuel line from regulator side of fuel rail.
3. Identify and connect adapters to the regulator side of the fuel rail and the return fuel line. (see diagram 1)

DIAGRAM 1: 2-LINE FILL AND DIAGNOSTICS



4. Connect black hose from FUEL PRO system to regulator side of fuel rail.
5. Connect red hose from FUEL PRO system to return line to tank.
6. Identify and connect adapters to the inlet (pressure) side of fuel rail and feed line from vehicle fuel supply; connect 6016-02-11-1 “T” Adapter in series with fuel inlet line to engine (long hose with gate valve facing toward vehicle fuel tank). Block off “T” male quick coupler fitting by attaching 6016-01-01-1 Loop Hose to the open male quick coupler fitting.
7. Connect vacuum hose from FUEL PRO system to manifold vacuum port.
8. Start engine and check for leaks.
9. Press and Hold FILL TANK / FLOWRATE CHECK button until one (1) quart or thirty-two (32) ounces of gasoline is added to the tank’s fluid level. The Flow Rate, in seconds, will show in the upper left display.

NOTE: If first time use or after installing a new filter, fill tank to 2 quart level and when prompted, add three (3) 250 ml bottles (approximately 24 ounces) of Advantage Engineering Petrol Fuel System Cleaning Solution to obtain the desired 4:1 mix ratio; gasoline to Cleaning Solution in FUEL PRO.

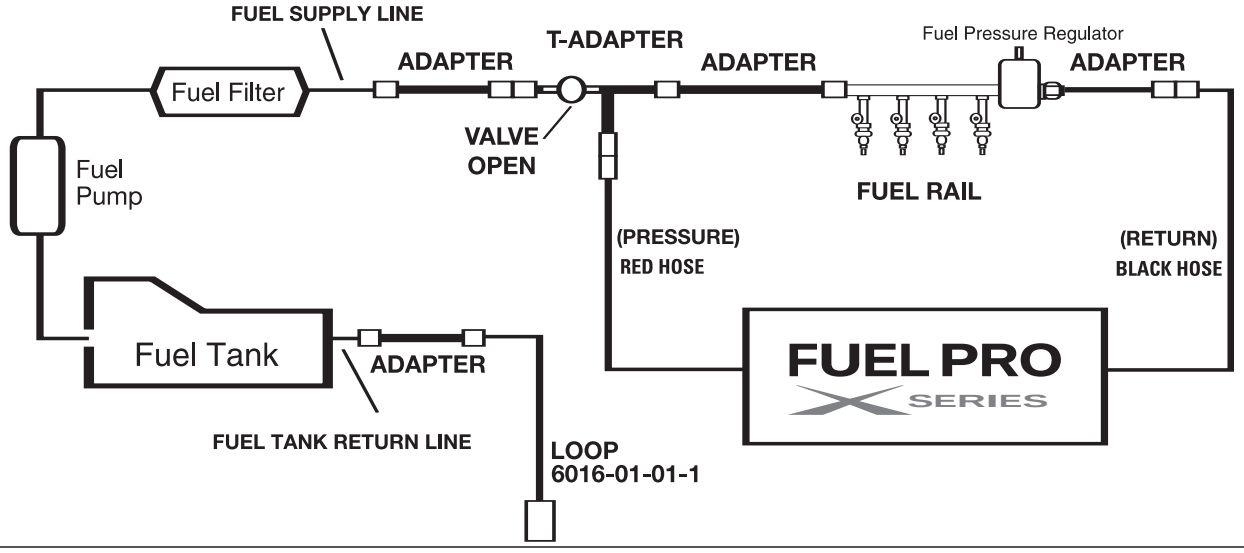
10. Press and Release DEADHEAD PRESSURE CHECK button. Upper right display will show deadhead pressure.
11. Press and release VACUUM TEST button. Upper right display will indicate current vacuum reading
12. Turn off engine; Press FINISH CYCLE / STOP ENGINE button before continuing to fuel system cleaning procedures. LEAKDOWN TEST LED will flash.

NOTE: All test values obtained during this diagnostic phase (flow rate, deadhead pressure, and leakdown) can be recalled during the fuel system cleaning service by pressing and holding the appropriate diagnostic key. Values will display in the appropriate display window. These values are erased when power to the FUEL PRO system is removed.

LEAKDOWN TEST

1. Press LEAKDOWN key. This will initiate auto purge. Display will show “PURGE.” Auto purge will evacuate air from the FUEL PRO internal lines.
2. CONNECT HOSES red LED will flash. Disconnect FUEL PRO Red Hose from Return Line adapter; connect Loop Hose 6016-01-01-1 open female quick coupler to the now open Return Line adapter (male) going to vehicle fuel tank. This allows existing pressure on fuel supply line to safely bleed off to vehicle fuel tank. Next, disconnect Loop Hose female quick coupler connected to T-adapter and connect FUEL PRO Red Hose to the now open male quick coupler on T-adapter.

DIAGRAM 2: 2-LINE LEAKDOWN



3. Press LEAKDOWN key. Pump will ramp up, pressurizing the fuel system. Once stabilized, the Pressure/Vacuum display will alternate between baseline pressure and current pressure. Timer display will show elapsed time in minutes. This step is repeatable until the FINISH CYCLE key is depressed.

NOTE: A pressure differential over time indicates a leak somewhere in the system. To determine source of leak, turn valve on T-adapter to closed position and repeat step by depressing LEAKDOWN key again. If pressure drops excessively, the leak is somewhere in the fuel rail and/or pressure regulator. To determine which, pinch off black return hose to FUEL PRO. If pressure continues to drop, check for leaky diaphragm on fuel pressure regulator (remove vacuum line to fuel pressure regulator. If gasoline is present in vacuum hose, diaphragm is bad; fuel and pressure is leaking past diaphragm), leaky connections and/or fittings; if everything looks good, chances are good that you have leaky injectors. Perform injector pressure drop test per industry standard procedures. If pressure drop stops when FUEL PRO return hose is pinched off, Pressure Regulator is leaking past flow valve (ball & seat). If pressure holds when valve on T-adapter is turned to closed position, the leak is somewhere in fuel supply, most likely a bad check valve in the fuel pump, provided that system connections are good and no external leak exists.

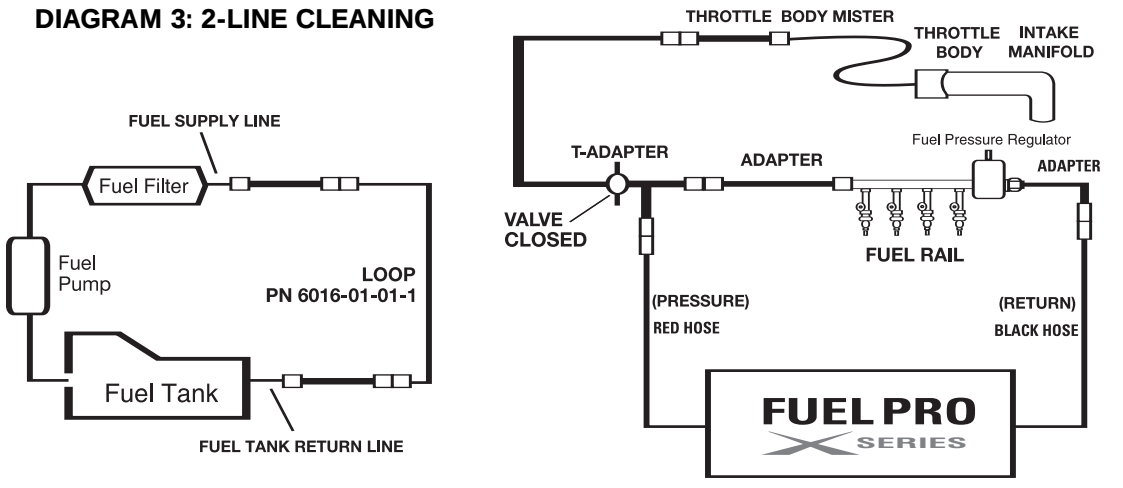
4. To stop leakdown test press FINISH CYCLE key.

   2 LINE SERVICE and 1 LINE/CARB/QUICK green LEDs will flash giving operator the option to perform either a 2 LINE service or 1 LINE/CARB/QUICK service.

FUEL SYSTEM CLEANING PROCEDURES FOR 2 LINE SERVICE

1. Press 2 LINE SERVICE button.
2. See diagram 3. Disconnect long leg (with gate valve) of T-adapter from vehicle fuel supply line coming from vehicle fuel tank. Connect open end of Loop Hose 6016-01-01-1 female quick coupler to now open adapter from vehicle fuel supply line coming from vehicle fuel tank. This creates a “Loop” of the vehicles supply line to the vehicles return line, avoiding the need to disable the fuel pump.

DIAGRAM 3: 2-LINE CLEANING



3. Add Advantage Engineering Petrol Fuel System Cleaning Solution to tank. One 250 ml bottle, approx. eight (8) ounces, are required for each one (1) quart, thirty-two (32) ounces, of gasoline collected during the Fill Tank/Flow Rate Check.

NOTE: The LED for SET TIME will flash. Soak time is preset for 10 minutes. This can be adjusted by depressing the SET TIME button. Five minutes will be added each time the button is depressed (i.e. 15, 20, 25....through 60 before reverting to 0).

NOTE: If first time use or after installing a new filter, fill tank to 2 quart level and when prompted, add three (3) 250 ml bottles, approximately 24 ounces, of Advantage Engineering Petrol Fuel System Cleaning Solution to obtain the desired 4:1 mix ratio; gasoline to Cleaning Solution in FUEL PRO system. The initial fill requires an additional bottle (or approximately 8 ounces) because the new Ultra Fine Filter is filled before any fuel comes into the FUEL PRO tank. This additional volume of fuel then becomes part of the total system volume and therefore needs to be recognized and accounted for on the initial fill. After the initial fill, the filter remains full and all volume brought into the machine is accurately represented in FUEL PRO tank readings and it is sufficient to then add one bottle of Solution for each quart of gasoline collected during the Flow Rate Check.

4. Press and release START SOAK button. Check for leaks. The FUEL PRO is circulating the mixture of cleaning solution and gasoline through the rail. This process removes contaminants and deposits that build up from the heat soak cycle and that

OPTION: INDUCTION SYSTEM CLEANING – If so desired, this is a convenient time to administer cleaning solution to the Throttle Plate Area, Idle Air Bypass circuit and the Intake Plenum with the optional Induction Cleaning System (ICS) Kit 6090-08-11-0.

a) Disconnect air intake hose from throttle body;
b) Block throttle open with suitable means;
c) Remove screw on cap and spray tube assembly from ICS Spray Bottle;
d) Pour approximately four (4) ounces Advantage Engineering Petrol Fuel System Cleaning Solution into ICS Spray Bottle;
e) Replace Spray Tube Assembly and screw on retaining cap;
f) Pressurize ICS Spray Bottle from shop air supply, not to exceed 180 p.s.i.
g) Shake ICS spray bottle to agitate contents;
h) With short spray tube in nozzle, spray throttle plate(s), throttle shaft and idle air bypass circuit;
i) With the long (30") spray tube inserted to the accessible length of the intake plenum, apply a liberal spray to the plenum while keeping the spray tube moving toward throttle plate, moving back and forth until the desired amount of cleaning solution has been applied. This amount will vary depending on the size and configuration of the induction plenum. Apply in a prudent manner;
j) If desired, use a soft bristled brush to assist in removing excessive buildup from throttle plate area after allowing solution to penetrate the contaminant;
k) Restore throttle to closed position by removing any and all means used to hold it open during induction system cleaning.
l) Install air intake hose to throttle body and if desired, insert Throttle Body Mister, 6026-02-11-2 in such a manner as to not interfere with throttle plate opening. Use caution to insure that spray from Throttle Body Mister WILL NOT contact any Mass Air Flow Sensor components. Utilization of the Throttle Body Mister can be used during the Engine Running portion of the cleaning process, so no further action is necessary with it at this time.

When soak cycle is finished the LEDs next to the SET TIME and START ENGINE keys will flash.

come in from the vehicle fuel tank.

5. Set cleaning service time. Cleaning service time is preset for 20 minutes. This can be adjusted by depressing the SET TIME button. Five minutes will be added each time the button is depressed (i.e. 25, 30, 35....through 60 before reverting to 5).
6. At this point, it is recommended to tap the starter momentarily (as if to find the TDC mark) six or eight times. This is generally enough to move the crankshaft through 360 degrees of travel. This process will allow the operator to detect any cylinders that have been unintentionally flooded with gasoline and/or cleaning solution during the Soak Mode or with the ICS Kit. If you encounter a flooded cylinder, as you are bumping the starter over, you will notice that suddenly nothing happens when you tap the starter switch. This is due to the fact that as the piston reaches the top of its travel, the liquid does not compress and the piston/rod assembly will not pass through Top Dead Center (TDC) and stops. At this stage, the operator should disable ignition; remove spark plugs; cover the open spark plug holes with shop towels to catch exiting fluids and continue to bump the

starter, allowing any excess fluids to safely escape through the open spark plug port(s). Once the engine is rolling over normally, remove the shop towels; install the spark plugs; enable ignition and, with compressed air, blow ample air in and around engine compartment to insure dispersal of gasoline vapor. NOTE: This condition rarely occurs when proper diagnostic and cleaning processes are performed; however this is an easy step that can save hours of work to correct an unrecognized hydrostatic lock.)

7. Press START SERVICE / START ENGINE button. Start engine. Operating pressure is displayed on the upper right display during this fuel system cleaning procedure. After approximately ten (10) minutes, or enough time to bring engine back up to normal operation temperature and into closed loop operation, it is now possible to utilize the Throttle Body Mister to clean the induction system.
8. Attach throttle body adapter to T-adapter with valve in closed position.
9. Increase engine speed to approximately 1200 to 1500 RPM and slowly open valve on T-adapter. NOTE: Adjust valve to the point engine does not stall.
10. Hold throttle at 1200 to 1500 rpm for maximum of 60 seconds while using the Throttle Body Mister. Close valve on T-adapter and reduce engine speed back to idle. Allow two to three minutes between additional applications.
11. Continue with 2 line rail service until timer expires.

NOTE: An audible alarm will sound and the LED next to FINISH CYCLE / STOP ENGINE button will light when the fuel system cleaning is complete.

12. Stop engine. Depress FINISH CYCLE key.

    The FUEL PRO system automatically releases pressure from the hoses when stopped. (Be advised that system pressure will increase due to the normal heat soak cycle after the engine is turned off. Remember that you can relieve system pressure from FUEL PRO system (as long as the power cables are connected to a sufficiently charged battery) by simply pressing and releasing the STOP SIGN button at the top center of the display panel.

3.04 ONE-LINE FUEL DELIVERY SYSTEMS (PORT FUEL INJECTION AND CARBURETOR)

FUEL SYSTEM CLEANING PROCEDURES

1. Power up. Connect power cord to a fully charged 12.0 VDC battery. Connect the positive lead of the equipment to the positive lead of the battery first. Connect the negative lead of the equipment to vehicle ground as far away from the battery as leads will allow to prevent sparking and igniting of battery gases.

   Unit will perform a self test and fuel pressure calibration.

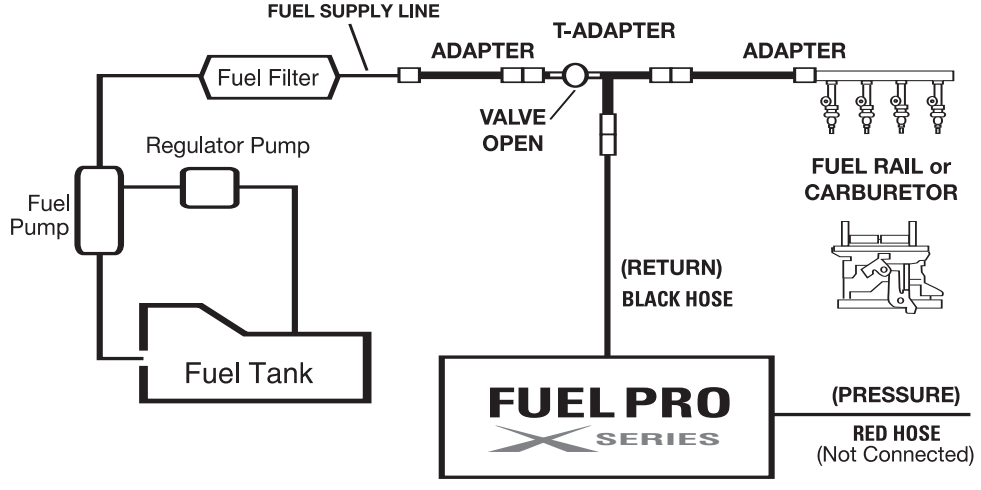
NOTE: If connected incorrectly, the reversed polarity LED will light.

TANK FILL AND DIAGNOSTIC PROCEDURES

1. Press DIAGNOSTIC/FILL CYCLE key. Audible alarm will signal and red LED will flash prompting CONNECT HOSES and START ENGINE procedures.
2. Disconnect fuel line from carburetor or fuel rail.

   (See diagram 5A) Identify and connect adapters to line coming from fuel supply and carburetor or fuel rail.

DIAGRAM 5A: 1-LINE FILL AND DIAGNOSTICS



3. Attach T-adapter as shown.
4. Connect black hose from FUEL PRO system to the male plug of the T-adapter with valve in open position as shown.
5. Start engine and check for leaks.
6. Press and Hold FILL TANK / FLOWRATE CHECK button until one (1) quart or thirty-two (32) ounces of gasoline is added to the tank's fluid level. The flow rate, in seconds will show in the upper left display. List value is used to determine flow rate.

NOTE: If first time use or after installing a new filter, fill tank to 2 quart level and when prompted, add three (3) 250 ml bottles, approximately 24 ounces, of Advantage Engineering Petrol Fuel System Cleaning Solution to obtain the desired 4:1 mix ratio; gasoline to Cleaning Solution in FUEL PRO system. The initial fill requires an additional bottle (or approximately 8 ounces) because the new Ultra Fine Filter is filled before any fuel comes into the FUEL PRO tank. This additional volume of fuel then becomes part of the total system volume and therefore needs to be recognized and accounted for on the initial fill. After the initial fill, the filter remains full and all volume brought into the machine is accurately represented in FUEL PRO tank readings and it is sufficient to then add one bottle of Solution for each quart of gasoline collected during the Flow Rate Check.

7. Press and Release DEADHEAD PRESSURE CHECK button. Upper right display will show, in this case, regulated pressure.
8. Press and release VACUUM TEST button. Upper right display will indicate current vacuum (baseline) reading.

9. Press FINISH CYCLE / STOP ENGINE button and shut off engine before continuing to fuel system cleaning procedures. LEAKDOWN TEST LED will flash.

NOTE: All test values obtained during this diagnostic phase (flow rate, deadhead/regulated pressure, and leakdown.) can be recalled during the fuel system cleaning service by pressing and holding the appropriate diagnostic key. Values will display in the appropriate display window. These values are erased when power to the FUEL PRO system is removed.

LEAKDOWN TEST

1. Press LEAKDOWN key. This will initiate auto purge. Display will show “PURGE.” Auto purge will evacuate air from the FUEL PRO internal lines.

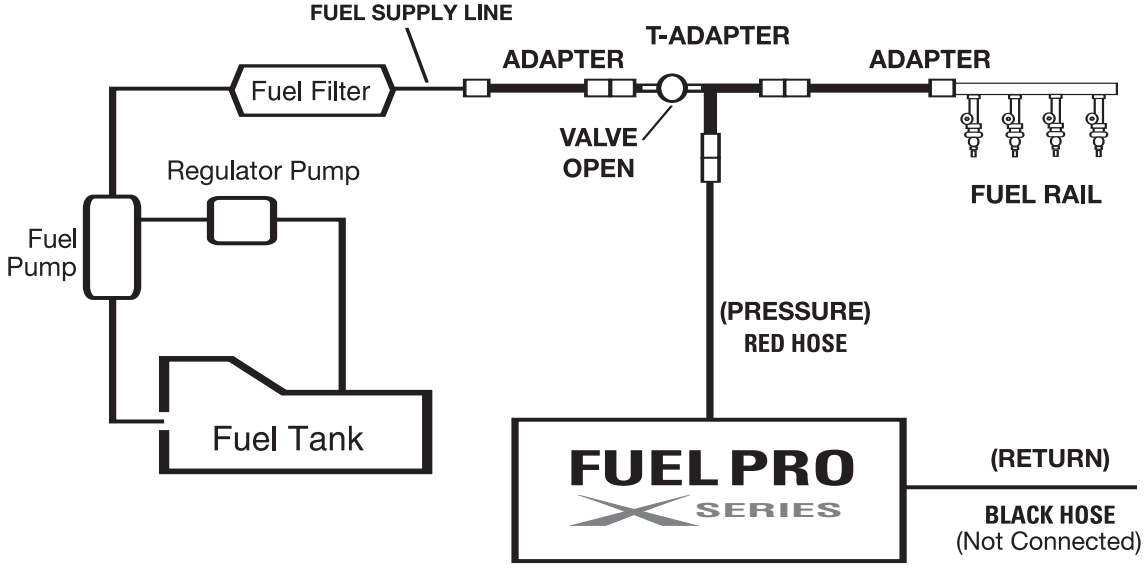
NOTE: Auto purge may take up to 90 seconds after filter change.

2. CONNECT HOSES red LED will flash. Connect hoses (see diagram 5B).
3. Press LEAKDOWN key. Pump will ramp up, pressurizing the fuel system. Once stabilized, the Pressure/Vacuum display will alternate between baseline pressure and current pressure. Timer display will show elapsed time in minutes. This step is repeatable until the FINISH CYCLE key is depressed.

NOTE: A pressure differential (difference between baseline and current pressures) over time indicates a leak somewhere in the system. Turn valve on T-adapter to closed position and repeat step by depressing LEAKDOWN key again. If pressure differential remains, the leak is somewhere in the fuel rail. If pressure differential does not remain, the leak is somewhere in fuel supply.

4. To stop leakdown test press FINISH CYCLE key.

DIAGRAM 5B: 1-LINE LEAKDOWN (PFI ONLY – NOT FOR CARBURETOR)



2 LINE SERVICE and 1 LINE/CARB/QUICK green LEDs will flash giving operator the option to perform either a 2 LINE service or 1 LINE/CARB/QUICK service.

FUEL SYSTEM CLEANING PROCEDURES FOR 1 LINE SERVICE

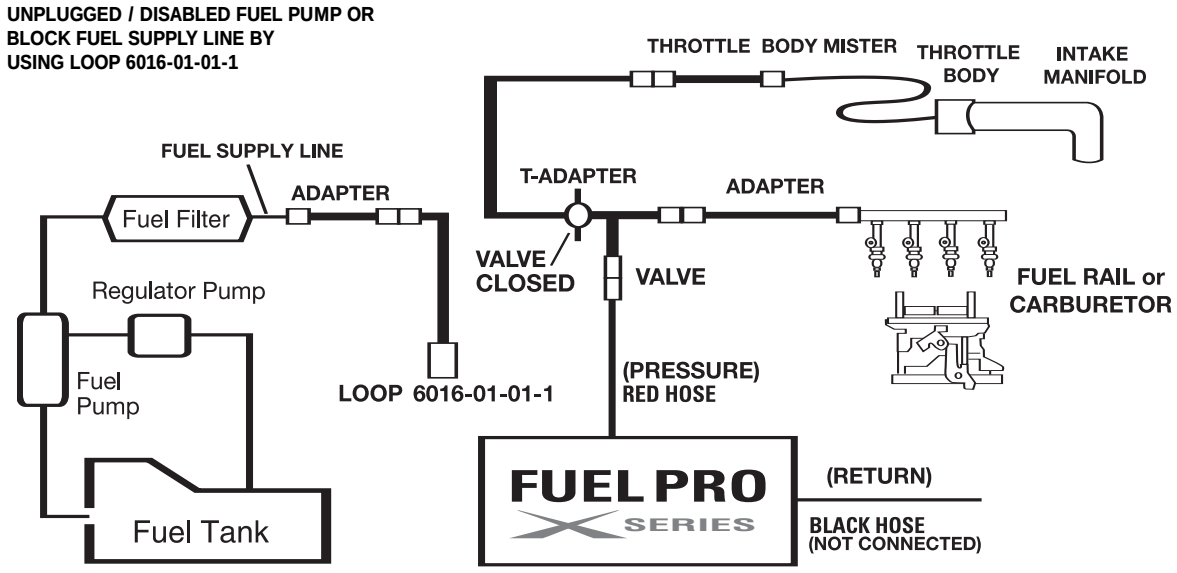
OPTION: INDUCTION SYSTEM CLEANING – If so desired, this is a convenient time to administer cleaning solution to the Throttle Plate Area, Idle Air Bypass circuit and the Intake Plenum with the optional Induction Cleaning System (ICS) Kit 6090-08-11-0.

a) Disconnect air intake hose from throttle body;
b) Block throttle open with suitable means;
c) Remove screw on cap and spray tube assembly from ICS Spray Bottle;
d) Pour approximately four (4) ounces Advantage Engineering Petrol Fuel System Cleaning Solution into ICS Spray Bottle;
e) Replace Spray Tube Assembly and screw on retaining cap;
f) Pressurize ICS Spray Bottle from shop air supply, not to exceed 180 p.s.i.
g) Shake ICS spray bottle to agitate and contents;
h) With short spray tube in nozzle, spray throttle plate(s), throttle shaft and idle air bypass circuit;
i) With the long (30") spray tube inserted to the accessible length of the intake plenum, apply a liberal spray to the plenum while keeping the spray tube moving toward throttle plate, moving back and forth until the desired amount of cleaning solution has been applied. This amount will vary depending on the size and configuration of the induction plenum. Apply in a prudent manner;
j) If desired, use a soft bristled brush to assist in removing excessive buildup from throttle plate area after allowing solution to penetrate the contaminant;
k) Restore throttle to closed position by removing any and all means used to hold it open during induction system cleaning.
l) Install air intake hose to throttle body and if desired, insert Throttle Body Mister, 6026-02-11-2 in such a manner as to not interfere with throttle plate opening. Use caution to insure that spray from Throttle Body Mister WILL NOT contact any Mass Air Flow Sensor components. Utilization of the Throttle Body Mister can be used during the Engine Running portion of the cleaning process, so no further action is necessary with it at this time.

FUEL SYSTEM CLEANING PROCEDURES FOR 1 LINE SERVICE

1. Press 1 LINE/CARB/QUICK button.
2. Connect hoses per diagram 7.
3. Disconnect the long leg of T-Adapter (the one with the gate valve) from adapter going to vehicle fuel supply line. This frees the long leg of the T-Adapter and makes it available for Induction System Cleaning, using the Throttle Body Mister. Keep gate valve closed.
4. Disconnect FUEL PRO Black (Return) Hose from T-Adapter and connect FUEL PRO Red (Pressure) Hose to T-Adapter.
5. Add Advantage Engineering Petrol Fuel System Cleaning Solution to tank. Note gasoline level. Eight (8) ounces are required for each one (1) quart, thirty-two (32) ounces, of gasoline.
6. Remove fuel pump relay or fuse **and/or** block fuel supply using 6016-01-01-1, whichever you are most comfortable with. Blocking the fuel supply does not create a deadhead condition on the vehicle's fuel pump, but rather feeds fuel through the bypass into the tank at pressure regulator or fuel filter, depending on system configuration.
7. Press PRESSURE ADJUST buttons to set the required pressure. Default pressure is set to 3 PSI when Diagnostic Tests are not performed. When Diagnostic Tests are performed, the value recorded during the Deadhead Test is used as the default setting. As mentioned previously, the Deadhead Test, when performed on a single line system, represents the regulated pressure as controlled by the vehicle's fuel supply system.
8. Set cleaning service time. Cleaning service time is preset for 20 minutes. This can be adjusted by depressing the SET TIME button. Five minutes will be added each time the button is depressed (i.e. 25, 30, 35....through 60 before reverting to 5).
9. Press START SERVICE / START ENGINE button. Start engine. Operation pressure is displayed on the upper right display during this fuel system cleaning procedure. After approximately ten (10) minutes, or enough time to bring engine back up to normal operation temperature and into closed loop operation, it is now possible to utilize the Throttle Body Mister to clean the induction system. (Connections more particularly described in Option steps A and L listed above)
10. Attach throttle body adapter to T-adapter with valve in closed position.
11. Increase engine speed to approximately 1200 to 1500 RPM and slowly open valve on T-adapter. NOTE: Adjust valve to the point engine does not stall.
12. Hold throttle at 1200 to 1500 rpm for maximum of 60 seconds while using the Throttle Body Mister. Close valve on T-adapter and reduce engine speed back to idle. Allow two to three minutes between additional applications.
13. Continue with 1-Line Service until timer expires.

DIAGRAM 6: 1-LINE CLEANING



V. TROUBLESHOOTING GUIDE

4.01 TROUBLESHOOTING GUIDE

PROBLEM: Reversed Polarity LED is on and the unit is not operational

SOLUTION: Polarity is Reversed on vehicle's battery connection.
Check connection; Red to positive and Black to vehicle ground as far away from the battery as leads will allow.

PROBLEM: The unit will not power up.

SOLUTION: Check for proper connection on power leads. Verify proper voltage at battery (see Battery Voltage Chart on page 14).

NOTE: If voltage was incorrect (above 18.0 VDC) disconnect leads and reconnect to proper power source. This will reset unit.

PROBLEM: Pump is running but unit will not build pressure.

SOLUTION: Check for proper connection on power leads. Verify proper voltage at battery (see Battery Voltage Chart on page 14).

PROBLEM: Unit performs poorly.

SOLUTION:
- Check hoses for damage.
- Check power leads for cuts or frays.
- Check Maintenance Log for filter life. If there are more than 50 services on filters, replace filters and log TTL count in Maintenance Log.

NOTE: To perform fuel service after filter change, fill tank to minimum 2 quart level. Unit purge will consume ± 1quart.

ADDITIONAL HELP

Please verify that items 1-4 above have been reviewed before calling of additional assistance.

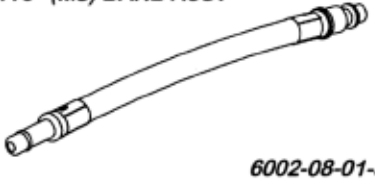
In the unlikely event that problems persist with the unit call Technical Support, have you model and serial numbers available before you call.

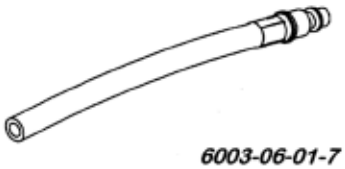
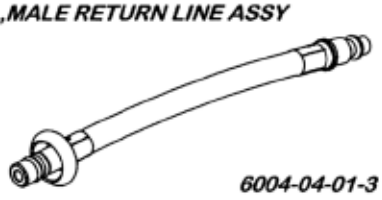
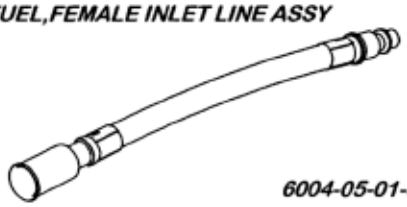
Remember to send in your warranty card, otherwise service will be delayed.

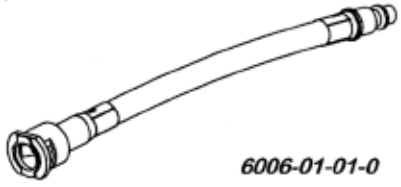
1-877-906-1395 (U.S. AND CANADA)

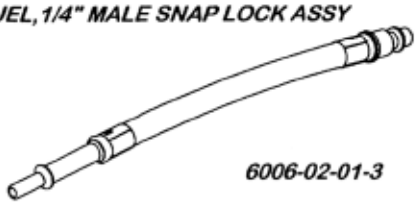
APPENDIX A - ADAPTERS

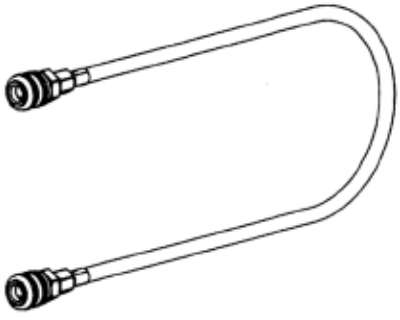
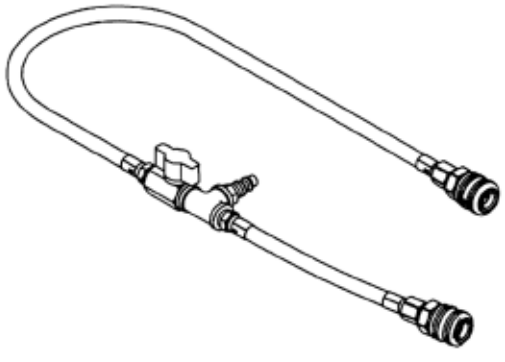
5.01 STANDARD ADAPTER KIT - 0102-15-01-0

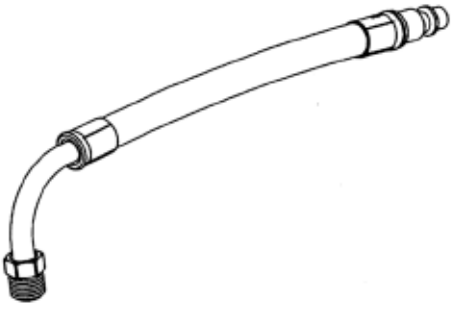
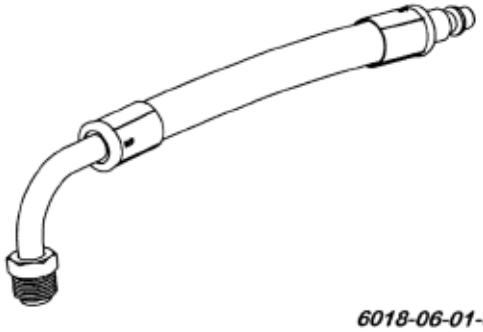
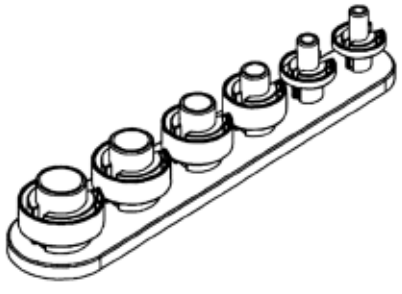
PART NO.& DESCRIPTION	QTY	APPLICATION
UNION, 5/16" FEMALE X 5/16" FEMALE PLUG, 5/16-18 X 11/16" LONG   1038-21-61-8 2158-55-55-1	1 1	PLUG AND UNION FOR DISCONNECTED 5/16" FLARED FUEL LINE ON CARBURETED VEHICLES WITH MECHANICAL FUEL PUMP
UNION, 3/8" FEMALE X 3/8" FEMALE PLUG, 3/8-20 X 5/8 LONG   1049-21-60-8 2158-56-56-1	1 1	PLUG AND UNION FOR DISCONNECTED 3/8" FLARED FUEL LINE ON CARBURETED VEHICLES WITH MECHANICAL FUEL PUMP
CLAMP,HOSE 7/32" TO 5/8"  2102-04-00-3	3	HOSE CLAMPS
ADAP FUEL,1/4" (M6) BARB ASSY  6002-06-01-3	2	GENERAL APPLICATIONS UTILIZING 1/4" FUEL LINE-MALE (USE WITH SUITABLE HOSE CLAMPS)
ADAP FUEL,5/16" (M8) BARB ASSY  6002-08-01-3	2	GENERAL APPLICATIONS UTILIZING 5/16" FUEL LINE-MALE (USE WITH SUITABLE HOSE CLAMPS)
ADAP FUEL,3/8" (M10) BARB ASSY  6002-10-01-3	2	GENERAL APPLICATIONS UTILIZING 3/8" FUEL LINE-MALE (USE WITH SUITABLE HOSE CLAMPS)

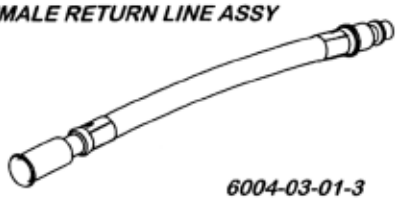
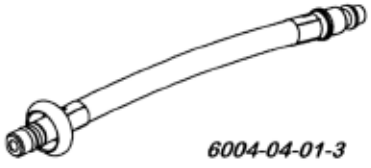
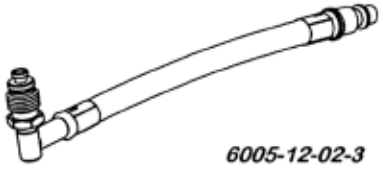
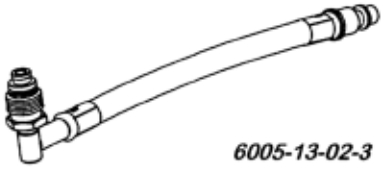
PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,1/4" (M6) OPEN END HOSE ASSY  6003-06-01-7	2	GENERAL APPLICATIONS UTILIZING 1/4" FUEL LINE-FEMALE (USE WITH SUITABLE HOSE CLAMPS)
ADAP FUEL,5/16" (M8) OPEN END HOSE ASSY  6003-08-01-7	2	GENERAL APPLICATIONS UTILIZING 5/16" FUEL LINE-FEMALE (USE WITH SUITABLE HOSE CLAMPS)
ADAP FUEL,3/8" (M10) OPEN END HOSE ASSY  6003-10-01-7	2	GENERAL APPLICATIONS UTILIZING 3/8" FUEL LINE-FEMALE (USE WITH SUITABLE HOSE CLAMPS)
ADAP FUEL,FEMALE RETURN LINE ASSY  6004-03-01-3	1	3/8" FEMALE SPRING LOCK PORT FUEL-RETURN LINE. (USE AS A PRESSURE LINE ON SOME RANGERS AND BRONCOS)
ADAP FUEL,MALE RETURN LINE ASSY  6004-04-01-3	1	3/8" MALE SPRING LOCK PORT FUEL-RETURN LINE. (USE AS A PRESSURE LINE ON SOME RANGERS AND BRONCOS)
ADAP FUEL,FEMALE INLET LINE ASSY  6004-05-01-3	1	1/2" FEMALE SPRING LOCK PORT FUEL-PRESSURE LINE FORD

PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,MALE INLET LINE ASSY  6004-06-01-3	1	1/2" MALE SPRING LOCK PORT FUEL-PRESSURE LINE FORD
ADAP FUEL, M14 FEMALE RETURN LINE ASSY  6005-02-01-3	1	TBI AND/OR PORT FUEL RETURN LINE-MALE G.M. VORTEC M14 X 1.5
ADAP FUEL, M16 FEMALE RETURN LINE ASSY  6005-03-01-3	1	TBI AND OR PORT FUEL PRESSURE LINE-FEMALE G.M. VORTEC M16 X 1.5
ADAP FUEL,1/4" FEMALE SNAP LOCK ASSY  6006-01-01-0	1	1/4" FEMALE TBI AND/OR PORT FUEL (G.M. - CHRYSLER - JEEP/EAGLE - FORD)

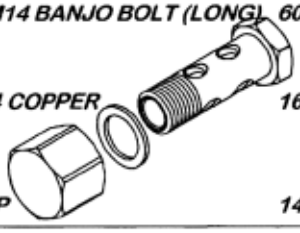
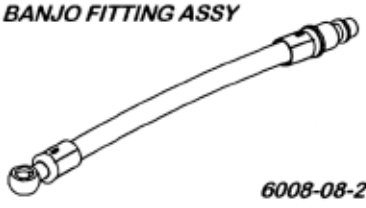
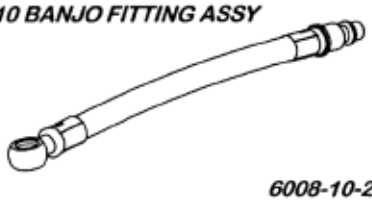
PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,1/4" MALE SNAP LOCK ASSY  **6006-02-01-3**	1	**1/4" MALE** **LATE MODEL VEHICLES TBI AND/OR PORT FUEL. (GM - CHRYSLER - JEEP/EAGLE)**
ADAP FUEL, 5/16" FEMALE SNAP LOCK X 90 ASSY *NO TOOL REQUIRED – "PRESS" TO RELEASE*  **6006-03-01-0**	1	**5/16" FEMALE SPRING LOCK** **TBI AND/OR PORT FUEL (G.M. - CHRYSLER - JEEP/EAGLE - FORD)**
ADAP FUEL, 3/8" FEMALE SNAP LOCK X 90 ASSY *NO TOOL REQUIRED – "PRESS" TO RELEASE*  **6006-05-01-0**	1	**3/8" FEMALE** **TBI AND/OR PORT FUEL. (GM - CHRYSLER - JEEP/EAGLE - FORD)**
6310-10-08-3  *USE WITH 6006-03-01-0 AND 6006-05-01-0*	1	*ADAPTER* *3/8" MALE X 5/16" MALE SNAP LOCK*

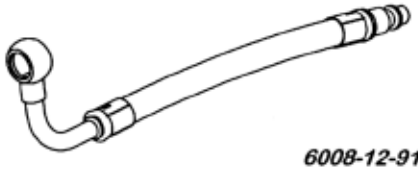
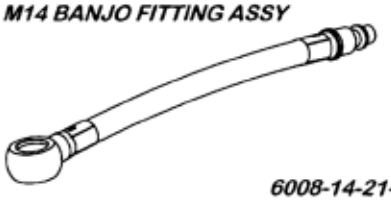
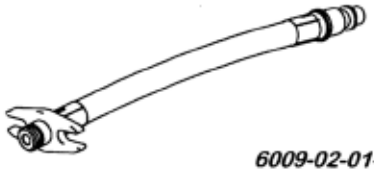
PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,LOOP DUAL QUICK DISC.BODY ASSY  6016-01-01-1	1	FORMS "TANK TO TANK" LOOP ON ALL VEHICLES. USED TO EXTEND VEHICLES RETURN LINE DURING DIAGNOSTICS
ADAP FUEL,LOOP DUAL QUICK DISC PLUG ASSY  6016-02-01-1	1	LOOP EXTENTION DUAL MALE QUICK DISCONNECT FOR USE ON ALL VEHICLES.
ADAP FUEL, QUICK DISCONNECT TEE ADAPTOR  6016-02-11-1	1	TEE ADAPTOR FORMS A DIAGNOSTIC "TEST PORT" ON ALL VEHICLES

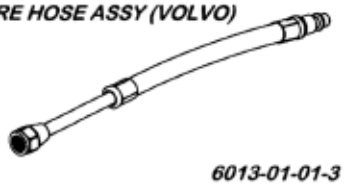
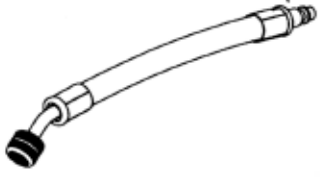
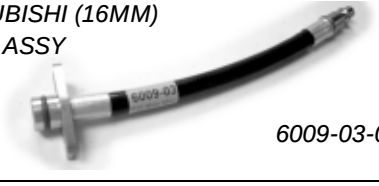
PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,5/16" FLARE X 90 DEG HOSE ASSY  6018-05-01-3	1	CARBURETED AND EARLY FUEL INJECTED VEHICLES WITH 5/16" FLARE FUEL INLETS - FEMALE
ADAP FUEL,3/8" FLARE X 90 DEG HOSE ASSY  6018-06-01-3	1	CARBURETED AND EARLY FUEL INJECTED VEHICLES WITH 3/8" FLARE FUEL INLETS - FEMALE
TOOL,ADAP FUEL DISCONNECT TOOL  6900-00-00-6	1	DISCONNECT TOOL

PART NO.& DESCRIPTION	QTY	APPLICATION
UNION,M16 X M14 (ZINC)  2152-16-14-3	2	14MM X 16MM UNION USE IN CONJUNCTION WITH 6010-14 AND 6010-16 FOR CIS APPLICATIONS
ADAP FUEL,FEMALE RETURN LINE ASSY  6004-03-01-3	1	3/8" FEMALE SPRING LOCK PORT FUEL - RETURN LINE (USE AS PRESSURE LINE ON SOME RANGERS AND BRONCOS)
ADAP FUEL,MALE RETURN LINE ASSY  6004-04-01-3	1	3/8" MALE SPRING LOCK PORT FUEL - RETURN LINE (USE AS PRESSURE LINE ON SOME RANGERS AND BRONCOS)
ADAP FUEL,M14-1.5 X 90 MALE RETURN SIDE ASSY  6005-12-02-3	1	TBI AND/OR PORT FUEL RETURN LINE - MALE M14 X 1.5
ADAP FUEL,M16-1.5 X 90 MALE INLET SIDE ASSY  6005-13-02-3	1	TBI AND/OR PORT FUEL RETURN LINE - MALE M16 X 1.5
ADAP FUEL, 1/4" FEMALE SNAP LOCK ASSY  6006-01-01-0	1	1/4" QUICK DISCONNECT PORT FUEL AND TBI

PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,1/4" MALE SNAP LOCK ASSY  6006-02-01-3	1	1/4" MALE LATE MODEL VEHICLES TBI AND/OR PORT FUEL
ADAP FUEL, 5/16" FEMALE SNAP LOCK X 90 ASSY NO TOOL REQUIRED – "PRESS" TO RELEASE  6006-03-01-0	1	5/16" QUICK DISCONNECT PORT FUEL AND TBI FORD 5 LITER
ADAP FUEL, 3/8" FEMALE SNAP LOCK X 90 ASSY NO TOOL REQUIRED – "PRESS" TO RELEASE  6006-05-01-0	1	3/8" QUICK DISCONNECT PORT FUEL AND TBI
6310-10-08-3  USE WITH 6006-03-01-0 AND 6006-05-01-0	1	ADAPTER 3/8" MALE X 5/16" MALE SNAP LOCK
ADAP FUEL, M8 BANJO BOLT (LONG) 6007-08-20-3 	1	8MM DOUBLE BANJO BOLT USE WITH 6008-08
WASHER, M8 COPPER 1602-08-00-2	3	

PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,M10 BANJO BOLT (LONG) 6007-10-20-3  WASHER, M10 COPPER 1602-10-00-2	1 3	10MM DOUBLE BANJO BOLT USE WITH 6008-10
ADAP FUEL,M12 BANJO BOLT (LONG) 6007-12-20-3  WASHER, M12 COPPER 1602-12-00-2 NUT, M12 CAP 1414-98-00-3	2 6 2	CONNECTS 12MM BANJO FITTING FOR DIAGNOSTICS AND/OR CREATING A LOOP
ADAP FUEL, M14 BANJO BOLT (LONG) 6007-14-20-3  WASHER, M14 COPPER 1602-14-00-2 NUT, M14 CAP 1419-98-00-3	1 3 1	CONNECTS 14MM BANJO FITTING FOR DIAGNOSTICS AND/OR CREATING A LOOP
ADAP FUEL, M8 BANJO FITTING ASSY  6008-08-21-3	1	8MM BANJO FITTING EFI SYSTEMS OR COLD START INJECTOR USE WITH 8MM BANJO BOLT
ADAP FUEL, M10 BANJO FITTING ASSY  6008-10-21-3	1	10MM BANJO FITTING EFI SYSTEMS OR COLD START INJECTOR USE WITH 10MM BANJO BOLT
ADAP FUEL, M12 BANJO FITTING ASSY  6008-12-21-3	1	12MM BANJO FITTING CIS OR EFI SYSTEMS USE IN CONJUNCTION WITH 6007-12, 1602-12 & 1414-98

PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL,M12 X 90 BANJO FITTING ASSY  6008-12-91-3	1	12MM 90° BANJO FITTING CIS OR EFI SYSTEMS USE IN CONJUNCTION WITH 6007-12, 1602-12 & 1414-98
ADAP FUEL, M14 BANJO FITTING ASSY  6008-14-21-3	2	14MM BANJO FITTING BMW AND LATE MODEL VW PRESSURE LINE
ADAP FUEL,M11 MALE MITSUBISHI ASSY  6009-02-01-3	1	PRESSURE SIDE ON HYUNDAI AND MITSUBISHI EFI SYSTEMS
ADAP FUEL, M14 FEMALE SWIVEL ASSY  6010-14-01-3	2	17MM WRENCH SIZE WITH 14MM THREADS - EUROPEAN CARS INLET AND/OR RETURN MAY BE USED WITH 2152-16-14-3 CIS SYSTEMS, MERCEDES
ADAP FUEL, M16 FEMALE SWIVEL ASSY  6010-16-01-3	2	19MM WRENCH SIZE WITH 16MM THREADS - EUROPEAN CARS INLET AND/OR RETURN MAY BE USED WITH 2152-16-14-3
ADAP FUEL,1/8" NPT MALE HOSE ASSY  6012-52-01-3	2	1/8" NPT MALE FORD TBI THREADED DIRECTLY INTO THE THROTTLE BODY

PART NO.& DESCRIPTION	QTY	APPLICATION
ADAP FUEL, 1/4" NPT MALE HOSE ASSY  6012-56-01-3	2	1/4" NPT MALE FORD TBI THREADED DIRECTLY INTO THE THROTTLE BODY
ADAP FUEL,FLARE HOSE ASSY (VOLVO)  6013-01-01-3	1	AUDI AND VOLVO RETURN LINES
ADAP FUEL, SCHRADER VALVE ASSY (SMALL)  6014-01-01-3	1	"TEST PORT /SCHRADER VALVE" CONNECTION - FORD NOTE: THE SCHRADER VALVE CORE MUST BE REMOVED
ADAP FUEL, SHRADER VALVE X 30 DEG ASSY (LARGE)  6014-03-01-3	1	"TEST PORT/ SCHRADER VALVE" CONNECTION -- G.M.
MITSUBISHI (16MM) MALE ASSY  6009-03-01-3	1	PRESSURE SIDE ON HYUNDAI AND MITSUBISHI EFI SYSTEMS
M11 FEMALE MITSUBISHI ASSY  6009-12-01-3	1	RETURN SIDE ON HYUNDAI AND MITSUBISHI EFI SYSTEMS
M16 FEMALE MITSUBISHI ASSY  6009-13-01-3	1	RETURN SIDE ON HYUNDAI AND MITSUBISHI EFI SYSTEMS

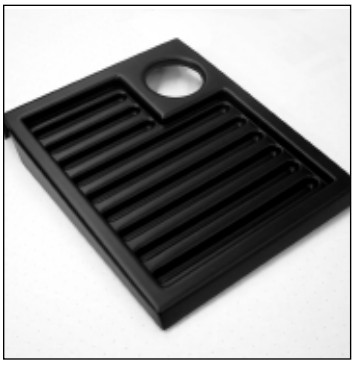
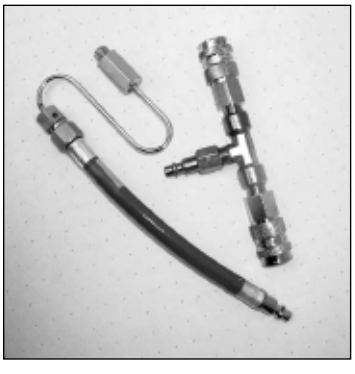
5.02 OPTIONAL ADAPTERS

PART NO. & DESCRIPTION	QTY	
6023-14-01-3 *M14 MALE SWIVEL CONE ASSY (MBENZ)*	*1*	
6024-14-01-3 *M14 FEMALE CONE ASSY (MBENZ)*	*1*	
6027-14-01-3 *M14-1.5 MALE FLARE ASSY (TOYOTA)*	*1*	
6028-14-01-3 *M14-1.5 FEMALE FLARE ASSY (TOYOTA)*	*1*	
6013-02-01-2 *AUDI & VOLVO RETURN LINE ASSY*	*1*	
6026-03-01-1 *10' EXTENSION HOSE ASSY FOR THROTTLE BODY MISTER*	*1*	
6008-14-12-4 *6008-14-12-4, HONDA STEP BANJO M12-M14*	*1*	

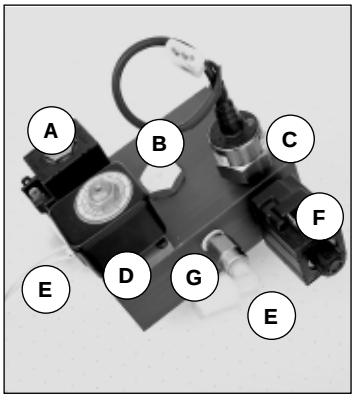
ORDERING ADAPTERS AND REPLACEMENT PARTS
1-877-906-1395 (U.S. AND CANADA)

APPENDIX B - REPLACEMENT PARTS

6.01 REPLACEMENT PARTS

		
0901-54-90-1 Hose, 10’ Return	**0901-54-90-2** Hose, 10’ Pressure	**0904-53-10-1** Hose, 10’ Vacuum
		
1624-30-01-2 Tray, Upper - FUEL PRO	**1624-31-11-2** Drawer Assembly - FUEL PRO	**1631-09-61-2** Wheel, 9’ OD
		
1635-44-40-4 Wheel , Swivel Locking Caster 4” OD	**6026-02-11-2** Adapter, Throttle Body Mister	**6026-00-01-2** Adapter, Throttle Body Mister Addition For Twin Nozzle Apps.

6.01 REPLACEMENT PARTS

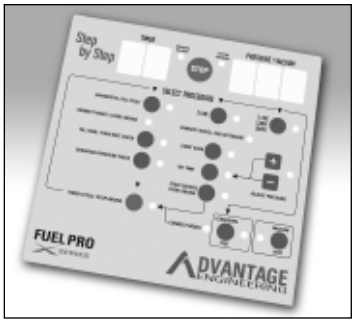


2141-98-22-0
Manifold Block Assembly
(ver.2), red
(Block Plus Items/Qty. Below)

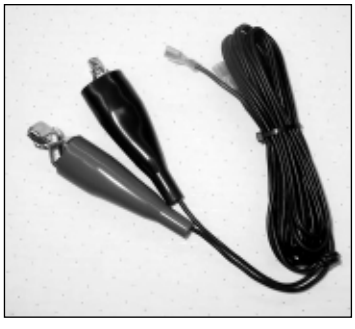
- **A. 2136-30-20-3**
  Valve, Assy. - Return
- **B. 2140-01-20-5**
  Valve, Check Assy. (ver.2)
- **C. 3109-54-31-2**
  Transducer
- **D. 2136-00-21-4**
  Valve, Bypass Assy. (ver.2)
- **E. 2354-21-10-6** (2X)
  Fitting
- **F. 2135-30-20-3**
  Valve, Assy. - Pressure
- **G. 2140-39-20-1**
  Valve, Check

2246-22-12-0
Pump Assembly (ver.2)
w/ barb fitting

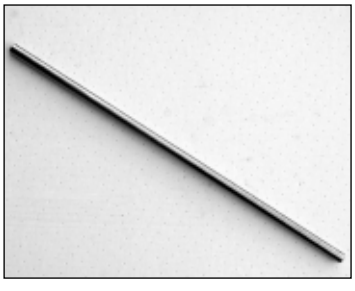
2262-44-12-1
Tank, 1 gallon Assembly
(ver.2) w/ barb fitting



3030-01-01-0
Display/Control Panel
FUEL PRO

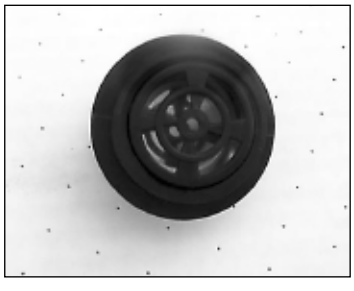


3075-12-22-7
Cord/Clamp Assembly, 12'
Black/Red



5120-11-00-2
Axle, 18

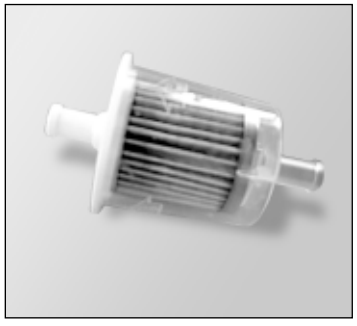
0500-01-01-2
Filter Kit - 4 pcs. total,
2 pcs. spin-on (shown),
2 pcs. inline (not shown)



3160-68-12-1
Audio Signal
3-28VDC

ORDERING ADAPTERS AND REPLACEMENT PARTS
1-877-906-1395 (U.S. AND CANADA)

6.01 REPLACEMENT PARTS DIAGRAM

 **0600-01-00-0** Filter, Fuel System Inline, 3/8" barb X 3/8" barb (Also in Filter Kit 0500-01-01-2)		

ORDERING ADAPTERS AND REPLACEMENT PARTS
1-877-906-1395 (U.S. AND CANADA)

APPENDIX C - MAINTENANCE

CAUTION

- **Frequently inspect and clean any tools used, and lubricate all non-sealed ratchet mechanisms with light oil.**
- **The use of any other accessories not specified in this manual may create a hazard.**
- **Read, understand and follow Safety Instructions in the front pages of this manual and on product safety labels.**

7.01 MAINTENANCE PROCEDURES

The following maintenance procedures should be performed on a routine basis:

1. Drain the unit's fuel reservoir and replace the reservoir fuel filter and return fuel filter after every 50 cleaning services, as described in the next section.
2. Clean the exterior with a plastics cleaning agent or similar product to keep the cabinet looking new.
3. Check all hoses and wires for cuts or frays.
4. Check O-rings and condition of adapters.

REPLACE THE FUEL FILTERS

1. Unscrew the old fuel filter from the mounting station on the back of the unit's cabinet.
2. Lightly grease the seal of the new filter and hand-tighten it onto the mounting head.
3. Loosen clamps securing in-line filter.
4. Install new in-line filter. Secure clamps.
5. Dispose of used filters properly.
6. Enter your initials, the date and a check mark in the appropriate boxes of the Maintenance Record.
7. Check the filters for leaks when starting next service.

The unit is now ready for the next cleaning service.

APPENDIX D
MATERIAL DATA SAFETY SHEET

Material Safety Data Sheet
May be used to comply with
OSHA s Hazard Communication Standard
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
PETROL FUEL SYSTEM CLEANING SOLUTION

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer s Name AEC GROUP	Emergency Telephone Number 714/444-1395
Address (Number, Street, City, State, and ZIP Code) 3600 W. Carriage Drive	Telephone Number for Information 714/444-1395
Santa Ana, CA 92704	Date Prepared 07/01/05
	Signature of Preparer (optional)

Section II - Hazardous Ingredients/Identify Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
CLEANER, FUEL ADDITIVE, ORGANIC SOVENT BASED DETERGENT				
CAS#: Mixture, no single CAS number applies.				
This chemical is subject to the trade secret reporting requirements of Section 313 of Sara Title III.				
Additive mixture proprietary 100 100-ppm				
SYNONYMS: N/A				

Section III - Physical/Chemical Characteristics

Boiling Point	250-380° F	Specific Gravity (H_20 = 1)	.90 @ 15° C	
Vapor Pressure (mm Hg.)	ND	Melting Point	NA	
Vapor Density (AIR = 1)	>1	Evaporation Rate (Butyl Acetate = 1)	.1	
Solubility in Water	not soluble	ph	NA. No water present	
Appearance and Odor	Amber, Ammoniacal Liquid	Percent Volatile	90%	
VOC (G/L)	711.3			

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	192° F (COC)	Flammable Limits	(estimated values)	LEL ND	UEL ND

Extinguishing Media: Use water, fog foam, dry chemical or C02. Do not use a direct stream of water; product will float and possibly re-ignite.

Special Fire Fighting Procedures: Do not enter fire area without a NIOSH approved full-face self-contained breathing apparatus.

Unusual Fire and Explosion Hazards: containers exposed to intense heat from fires should be cooled with water to prevent vapor pressure build-up, which could result in container rupture.

(Reproduce locally) 7/1/2005 OSHA 174, Sept. 1985

PETRO FUEL SYSTEM CLEANING SOLUTION

Section V - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials to Avoid): May react with strong oxidizers.

Reactivity: Will not occur.

Hazardous Decomposition or Byproducts: Carbon monoxide and unidentified organic compounds may be formed during combustion.

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VI - Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	X	X	X

Health Hazards (Acute and Chronic)

EYES: Liquid or vapor contact may cause irritation.
SKIN: Prolonged and repeated contact can cause defatting and drying of the skin which may result in skin irritation and dermatitis.
INHALATION: May be slightly irritating to mucous membranes.
INGESTION: May result in vomiting. Aspiration of vomitus into lungs may result in chemical pneumonitis and pulmonary edema/hemorrhage.
HMIS HAZARD CLASS: Health = 1, Flammability = 2, Reactivity = 0, Other = none
Ranking: 0 = Least, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	None present	None present	None present

Signs and Symptoms of Exposure: Inhalation: Respiratory tract irritation. Skin: Smarting, redness, and irritation.

Medical Conditions Generally Aggravated by Exposure: Many petroleum hydrocarbons and synthetic lubricants pose potential health risks which vary from person to person. As a precaution, exposure to liquids, fumes, mists and vapors should be minimized.

Emergency and First Aid Procedures
EYE CONTACT: Flush with water for 15 minutes while holding eyelids open. Call physician.
SKIN CONTACT: Remove contaminated clothing/shoes and wash skin with soap and water. Do not reuse clothing until cleaned. If irritation persists, call physician.
INHALATION: Remove victim to fresh air and provide oxygen, if breathing is difficult. Give artificial respiration if breathing has stopped.
INGESTION: Do not induce vomiting. If vomiting occurs, keep head below knees to prevent aspiration of liquid into lungs. Get medical attention.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

SMALL SPILLS: Take up with absorbent material and place in non-leaking container for proper disposal.

LARGE SPILLS: Eliminate potential sources of ignition. Wear appropriate respirator and other protective clothing. Shut off source of leak only if safe to do so. Dike and contain. Remove with vacuum trucks or pump to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking containers, and seal tightly for proper disposal. Flush area with water to remove trace residue; dispose of flush solution as above.

Waste Disposable Method: Place in a disposal facility approved under RCRA regulations for hazardous waste.

Precautions to Be Taken in Handling and Storing

Storage: Combustible. Keep liquid and vapor away from heat, sparks or flame. Vapors may accumulate and travel to ignition sources distant from the handling site.

Handling: May cause eye and skin irritation. Avoid prolonged breathing or skin exposure. Wash thoroughly after handling.

Other Precautions: Keep away from extreme heat or open flame. Do not reuse soiled clothing without laundering.

Transportation:
ROAD: Petroleum Distillates, Naptha Formulation N.O.S., Class 3, UN1268, Packaging Group III. If shipped in bulk quantities (100 gal. or 454 L or greater), product is considered a Dangerous Good. Not regulated in less than bulk quantities.
MARINE: Not regulated.
AIR: Not regulated.

Section VIII - Control Measures

Respiratory Protection (Specify T ype): Use a NIOSH approved respirator for organic vapors.

Ventilation	Local Exhaust: Use explosion proof ventilation to control vapor concentration.	Special: Use supplied air respirator during fire.	
	Mechanical (General)	Other	

Protective Gloves: Neoprene, polyvinyl or polyethylene

Eye Protection: Wear safety glasses or goggles to avoid eye contact.

Other Protective Clothing or Equipment: Oil resistant or protective garment if needed.

Work/Hygienic Practices: Wash exposed skin with soap and water or waterless skin cleaner.

Page 2

☆ U.S. Government Printing Office : 1987–181-504/54362

LIMITED ONE (1) YEAR WARRANTY
FUEL PRO X-SERIES

AEC GROUP INC. warrants only to the original Purchaser that under normal use, care and service, the Equipment (except as otherwise provided herein) shall be free from defects in material and workmanship for one year from the date of original invoice. External hoses, remote control modules, adapters and all other attachments, supplies and consumables (except as otherwise provided herein) are warranted for 90 calendar days from the date of original invoice. Filter elements are not warranted.

SELLER'S OBLIGATIONS UNDER THIS WARRANTY ARE LIMITED SOLELY TO THE REPAIR OR, AT SELLER'S OPTION, REPLACEMENT OF EQUIPMENT OR PARTS WHICH TO SELLER'S SATISFACTION ARE DETERMINED TO BE DEFECTIVE AND WHICH ARE NECESSARY, IN SELLER'S JUDGEMENT, TO RETURN THE EQUIPMENT TO GOOD OPERATING CONDITION. NO OTHER WARRANTIES EXPRESS OR IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL APPLY AND ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED.

This warranty does not cover (and separate charges for parts, labor and related expenses shall apply to) any damage to, malfunctioning, inoperability or improper operation of the Equipment caused by, resulting from or attributable to (A) abuse, misuse or tampering; (B) alteration, modification or adjustment of the Equipment by anyone other than Seller's authorized representatives; (D) improper or negligent use, application, operation, care, cleaning, storage or handling; (E) fire, water, wind, lightning or other natural causes; (F) adverse environmental conditions, including, without limitation, excessive heat, moisture, corrosive elements, or dust or other air contaminants, radio frequency interference, electric power failure, power line voltages beyond those specified for the equipment, unusual physical, electrical or electromagnetic stress, and/or any other condition outside of Seller's environmental specifications; (G) use of the Equipment in combination or connection with other equipment, attachments, supplies or consumables not manufactured or supplied by Seller; or (H) failure to comply with any applicable federal, state or local regulation.

Repairs or replacements qualifying under this Warranty will be performed on regular business days during Seller's normal working hours within a reasonable time following Purchaser's request. All requests for Warranty service must be made during the stated Warranty period. This warranty is non-transferable.

MAINTENANCE LOG

Use to keep track of maintenance performed on your FUEL PRO system.

Date	Fuel Filter (Changed)	Other Maintenance Performed	Performed by: