



Any maintenance, service or repair should be performed by trained and experienced service technicians. Proper tools and equipment should be used to prevent injury to the servicing technician, property or system components. Service repairs should always be performed in a safe environment and the technician should always wear protective clothing to prevent injury.



Chapter I

ITK-4 Test Kit Contents

The ITK-4 Test Kit (figure #1) was designed to replace both the ITK-2 and ITK-3 test kits and can be used on both Spectrum Series II and Series III systems. The ITK-4 Test Kit incorporates a new dongle (ECOM Cable P/N E2046002) to connect your Diagnostic Scan Tool (DST) to a Series II or Series III equipped vehicle. The ECOM Cable is equipped with a Spectrum III DLC connector for direct series III connection. To connect the ECOM Cable to a series II vehicle DLC you will need to use the adapter cable (E1557400) included in the kit (refer to chapter II for complete instructions). The ECOM Cable is Controller Area Network (CAN) enabled for high-speed connection to CAN enabled systems.

The ITK-4 Test Kit contains all items listed in table #1. If your kit is missing any component, or has any damaged items, please call your OEM technical support group for instructions.

ITEM	DESCRIPTION	QTY USED	IMPCO PART NUMBER
1	Case, Metal, 14.25 x 9 x 4.25	1	C9-50724-001
2	Gauge, Test Gasoline Fuel System	1	TG-31119-001
3	Test Kit Gauge 0-5 PSID (2-5205)	1	TG-005
4	Test Kit Gauge 0-10" WC (2-5010)	1	TG-010
5	ASM, CAN Dongle (ECOM Cable)	1	E2046002
6	Fitting Assembly, Test Cap (System II LPR Secondary Pressure Test Adapter)	1	AF4-31105
7	Assembly, Fitting Test Cap $\frac{3}{4}$ " (System III EPR Secondary Pressure Test Adapter)	1	AF4-50254-002
8	Tool, 20 IPR Torx-Plus Bit	1	T7-50172
9	Pin, Retainer	10	P1-30559
10	Fitting, 1/8" NPT / 3/16" HS Nip Brass	2	F4-4
11	Harness Adaptor, Spectrum II DLC to Spectrum III Diagnostics Cable	1	E1557400
12	Fitting, 1/8" NPT $\frac{1}{4}$ " HS El Nylon	2	F4-8
13	Hose, 3/16" ID Vacuum, Bulk	4 ft	H1-11
14	Fitting, $\frac{1}{4}$ UNF, $\frac{1}{4}$ HS Vac Nip	1	F4-2
NA	User's Manual, ITK-4 Test Kit	1	PPI-105

Table #1



Chapter II

ECOM Cable and DST Software Installation

A. Software Minimum Hardware Requirements:

Supported operating systems are:

Windows Vista
Windows XP
Windows 2000

Minimum processor speed:

Pentium II: 450 MHz
Pentium III: 1.0 GHz (Vista)

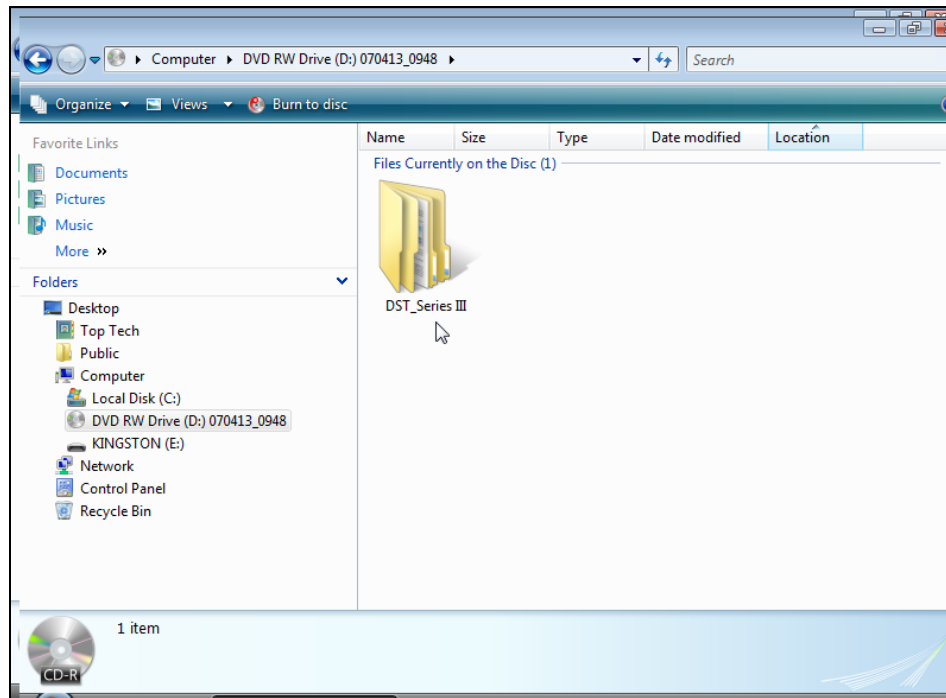
Minimum RAM requirement:

Windows Vista: 512 MB
Windows XP: 256 MB
Windows 2000: 128 MB
PC/laptop must have at least one available USB port (ECOM cable supports USB port only).

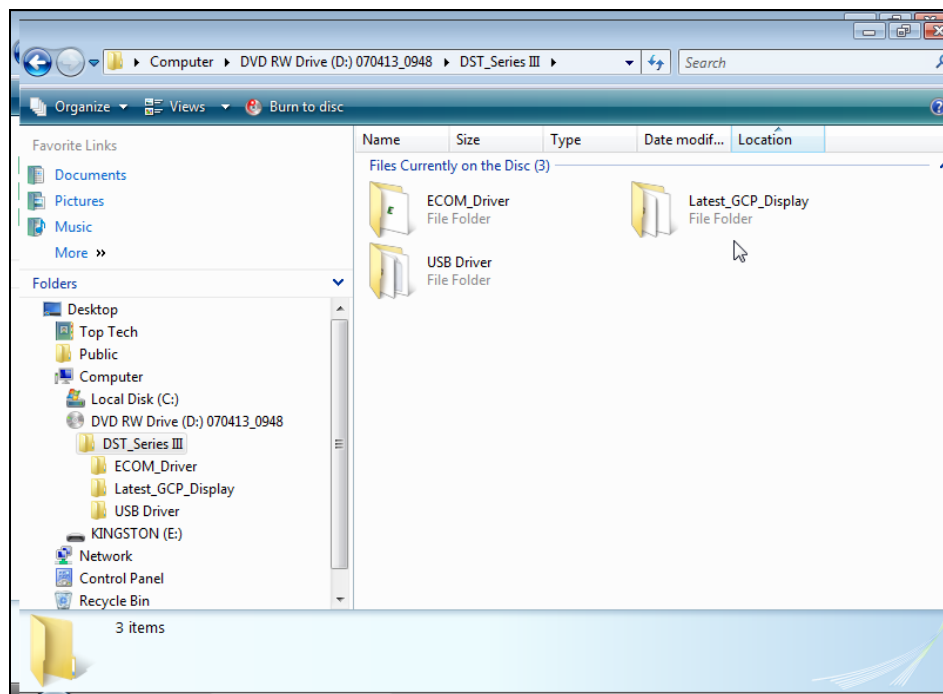
B. DST Software Installation:

NOTE: Before installing the DST software, close all other programs to ensure the installation process will not be interrupted.

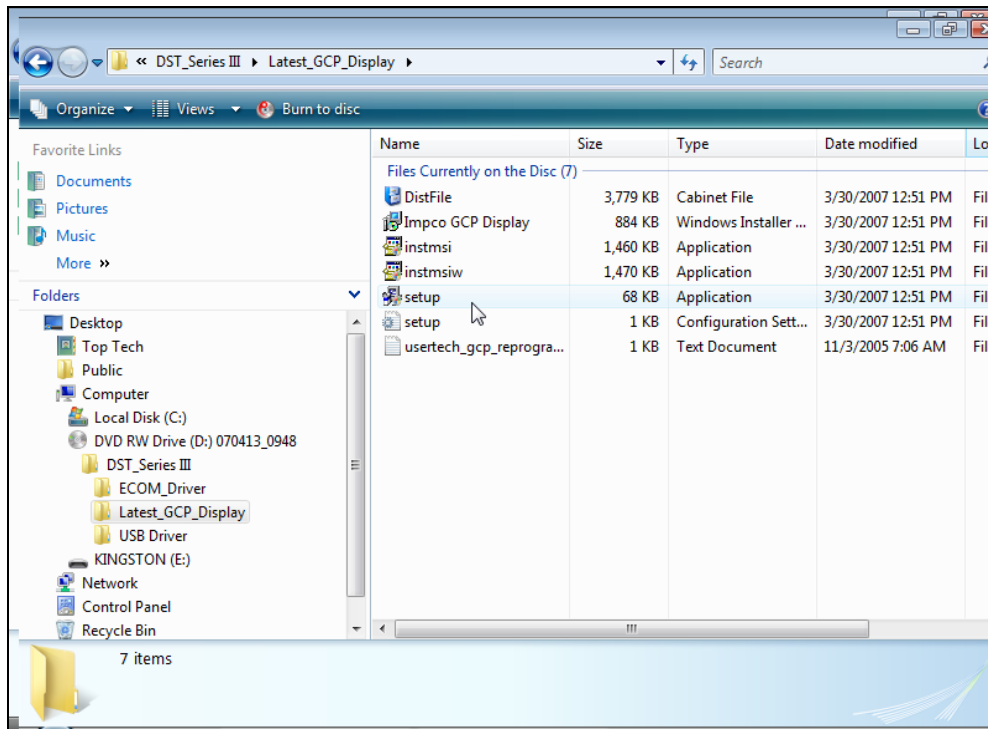
The ECOM software will be provided to you by your OEM supplier, internet download, CD, etc.. Regardless of the source, you must navigate to the DST_Series II or DST_Series III folder. Follow the directions starting on the next page.



- Open the DST_Series II or DST_Series III folder



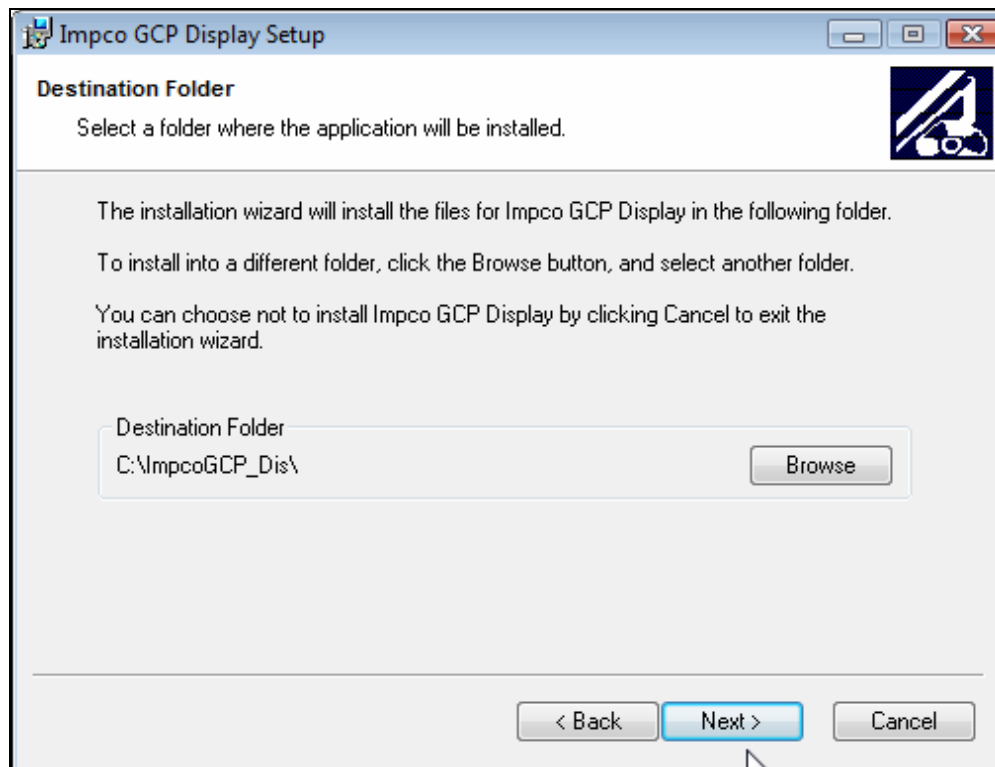
- Open the Latest_GCP_Display folder



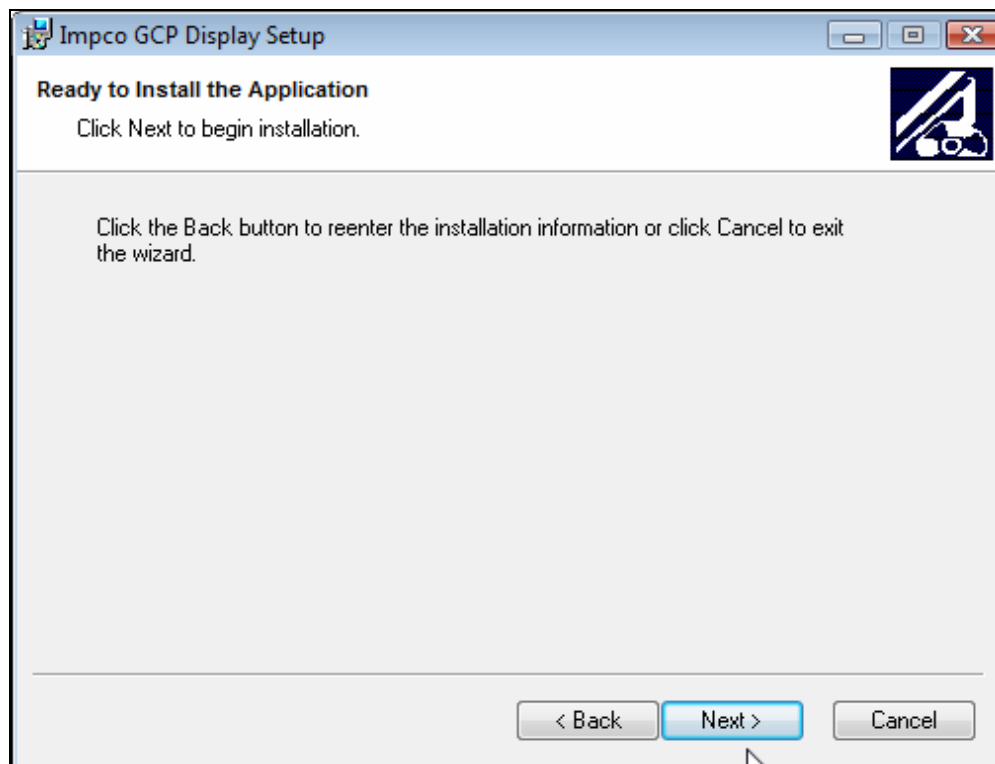
- Double click on “setup.exe” (application file) to start the windows installer. If a previous version of the GCP software is installed, the uninstaller may remove the previous version and exit. You will be required to start the installer again to install the new version.



- Click “Next” to continue



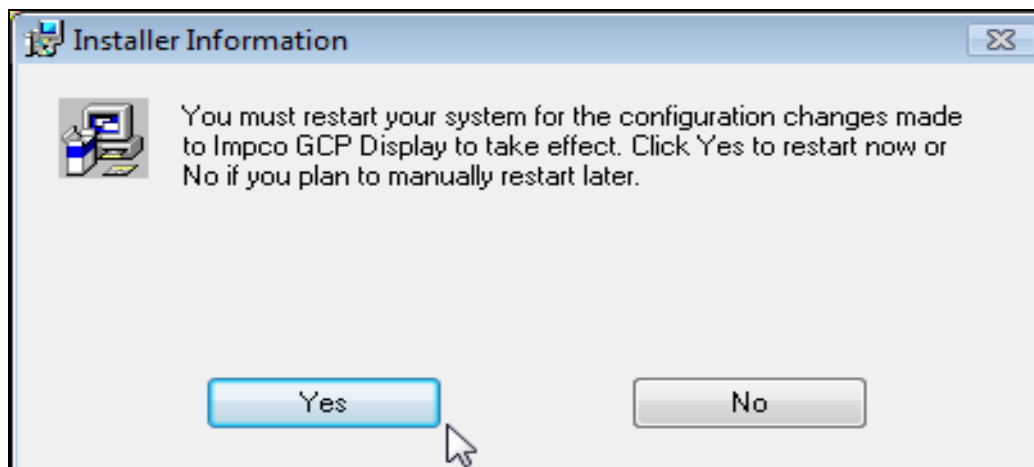
- Click "Next" to continue



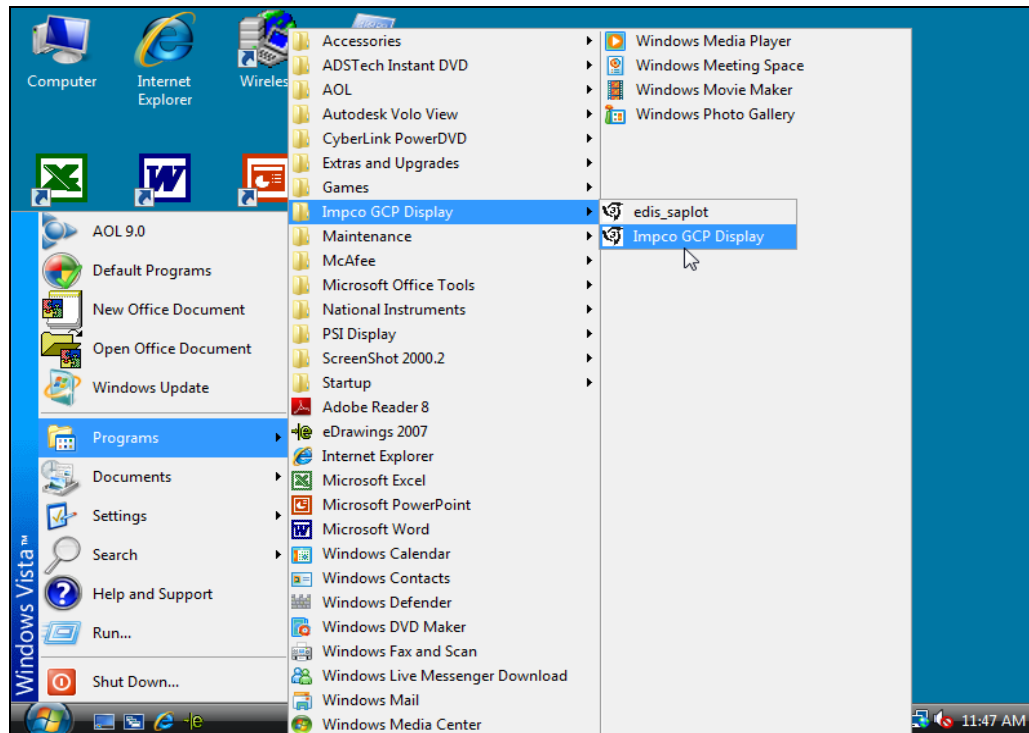
- Click "Next" to continue



- Click the “Finish” box to complete the installation.



- Click “Yes” to restart your computer

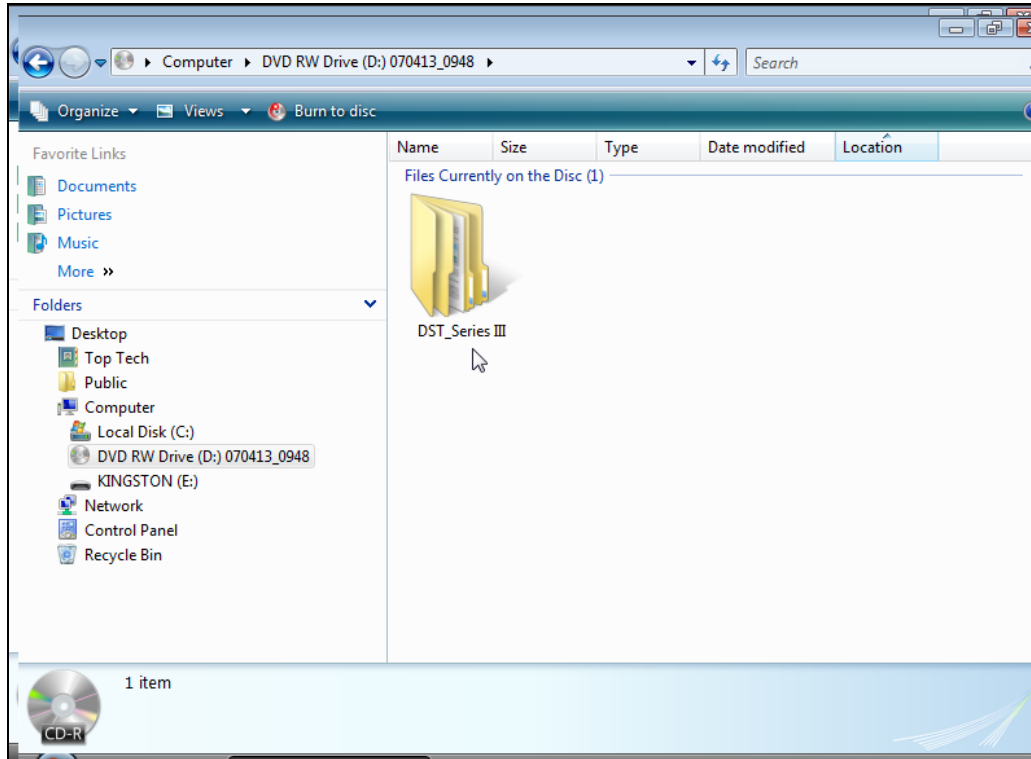


- Once installed, the software can be accessed from Start Menu→Programs→Impco GCP Display→Impco GCP Display

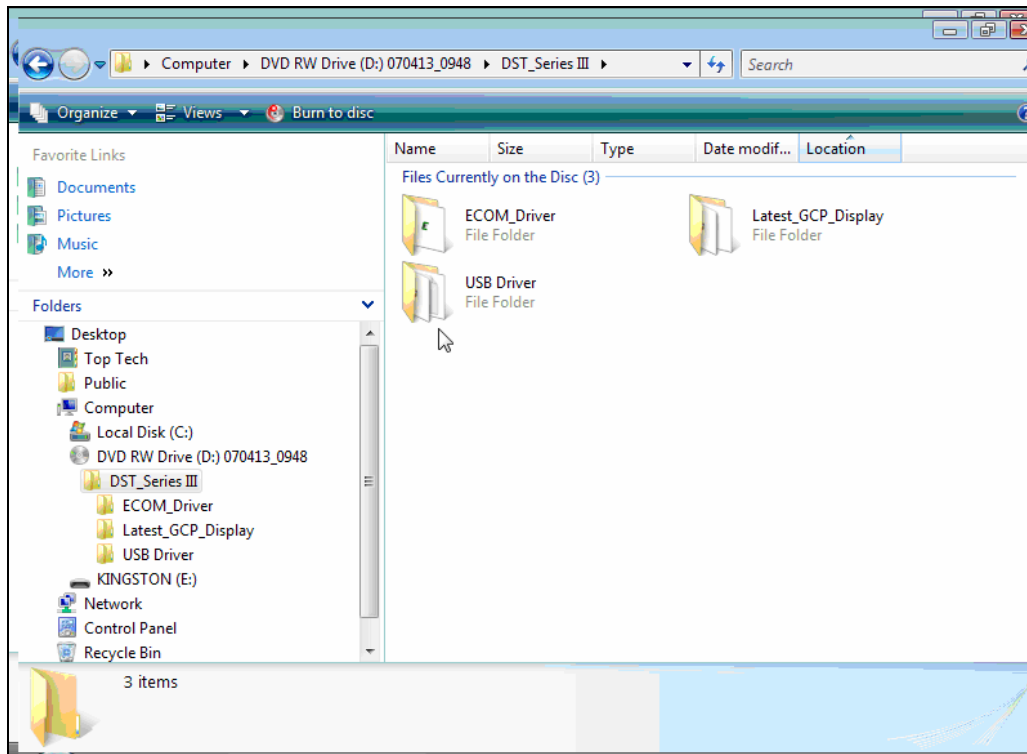


INSTALLING THE USB ADAPTER DRIVER

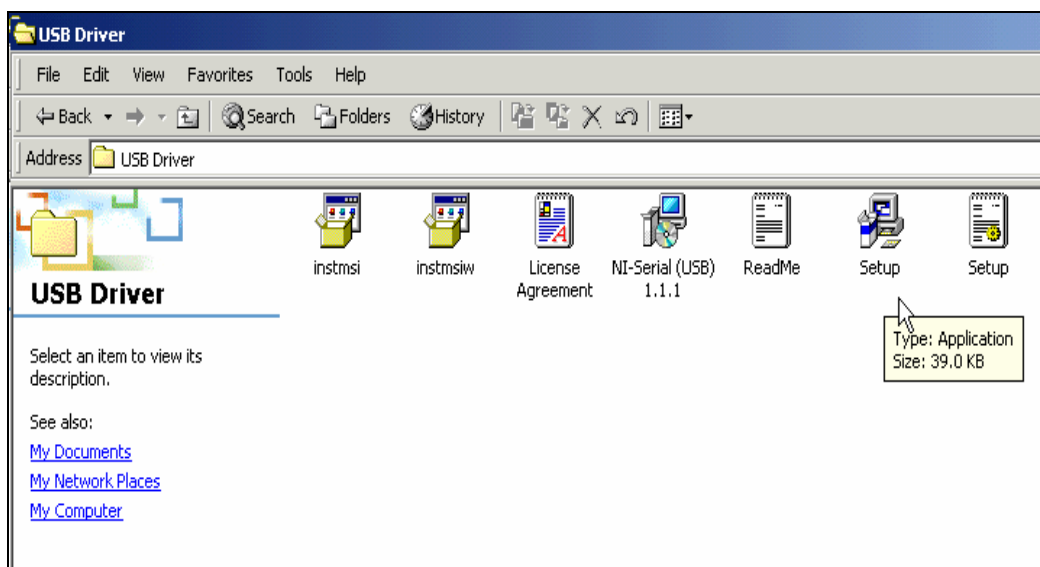
If your computer does not have an RS232 serial port you will need to install the USB adapter driver. You do not need to install this driver if you plan to use the ECOM DLC cable.



- Open the DST_Series II or DST_Series III folder



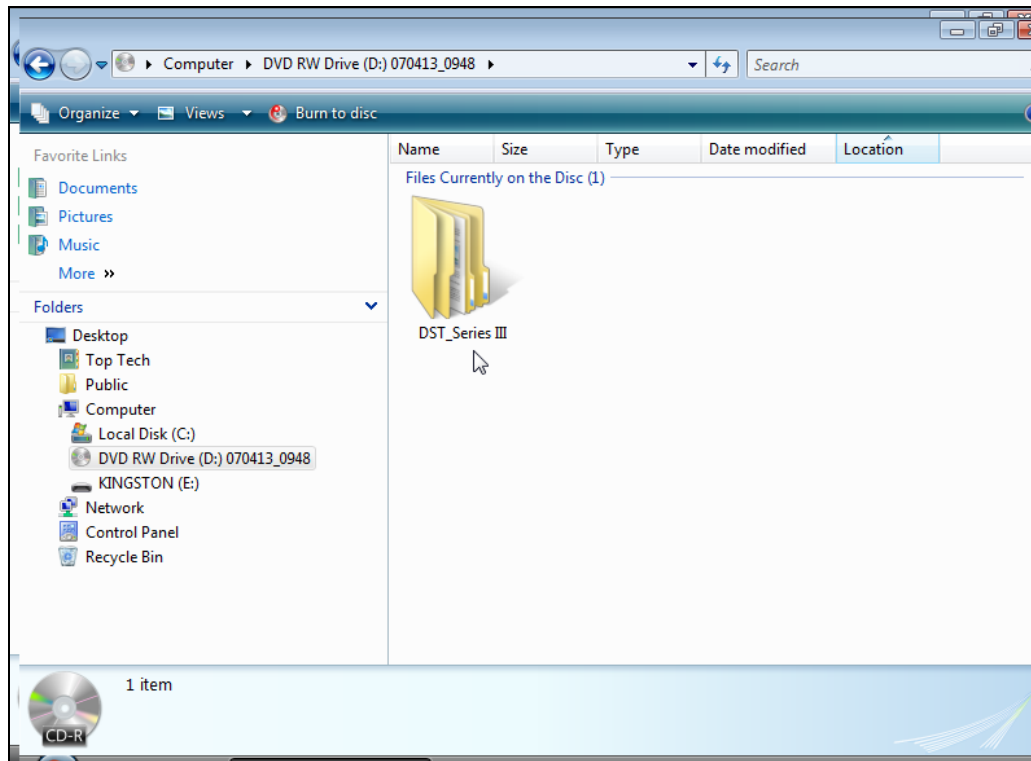
- Open the “USB Driver” folder



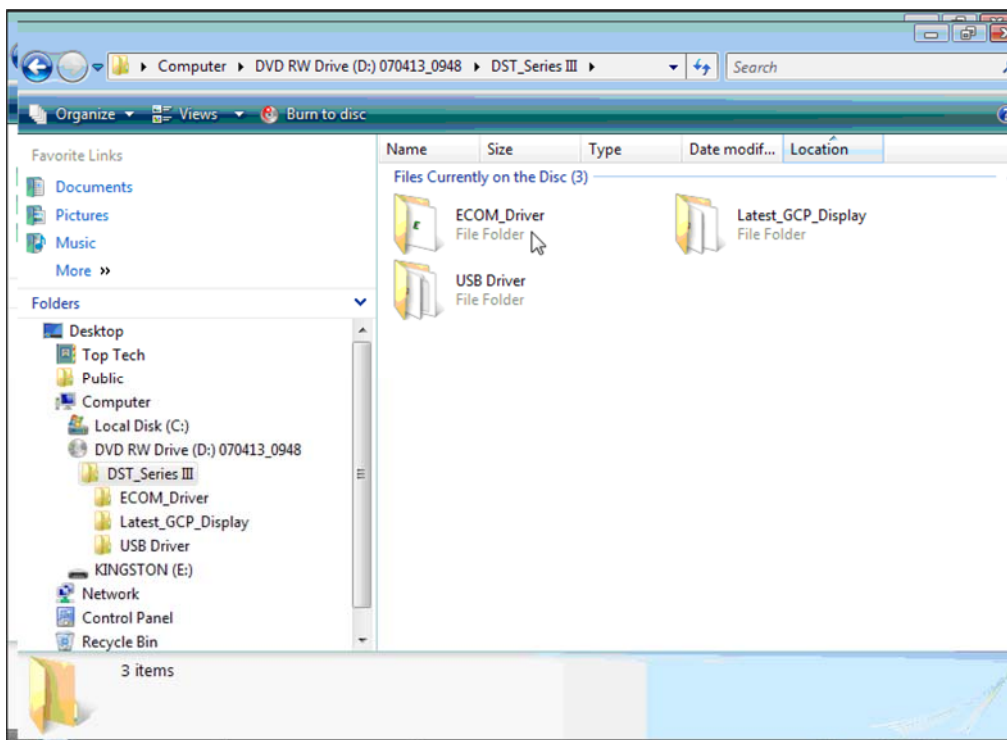
- Double click on “setup.exe” (application file) and follow the on screen prompts.

Installing the ECOM DLC cable driver

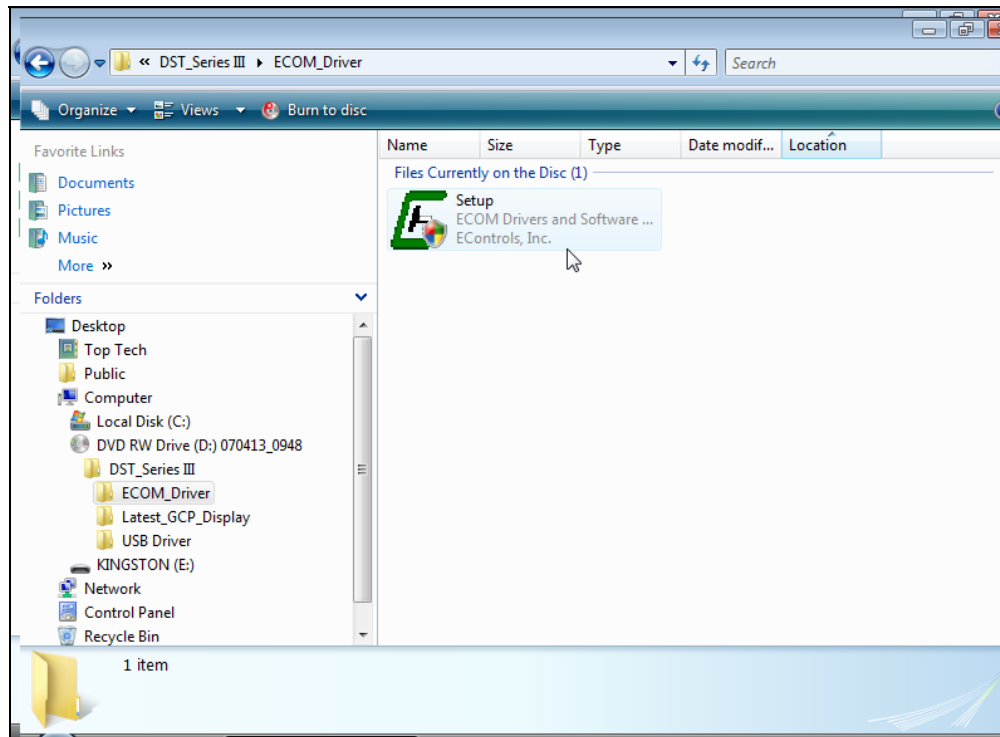
The ECOM USB cable is designed to replace both the serial DLC and the USB adapter cables. It also provides communication to the ECM on the CAN line for systems that are CAN enabled. It requires the installation of the ECOM driver and is compatible with the Series II and Series III DST software programs.



- Open the DST_Series II or DST_Series III folder



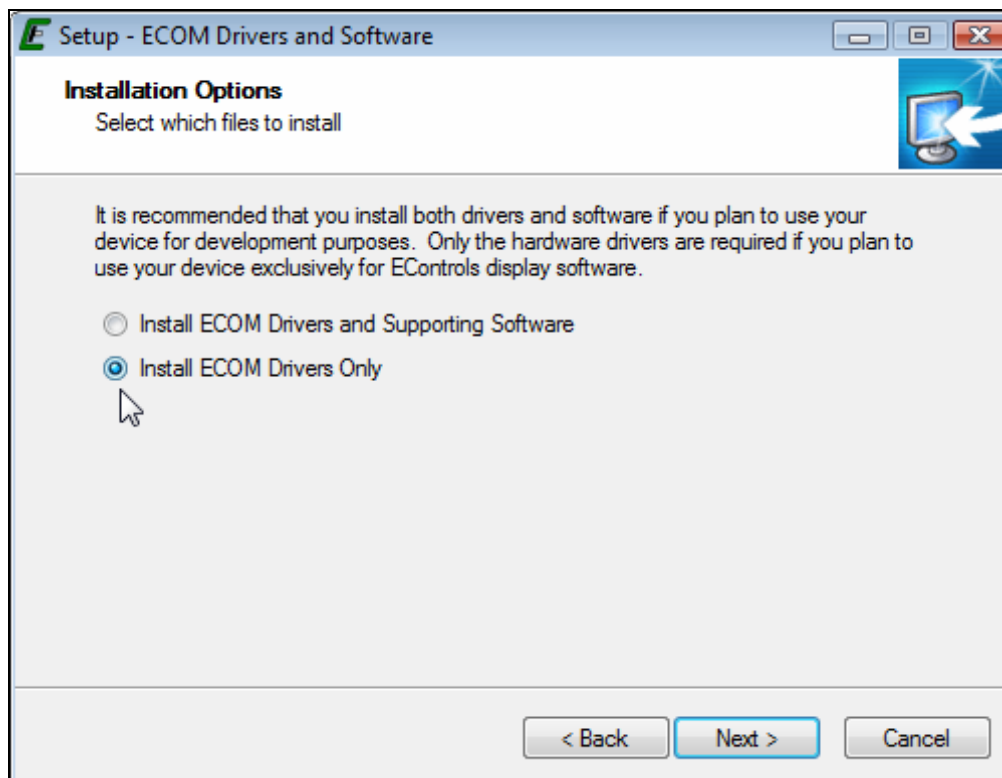
- Double click on ECOM_Driver



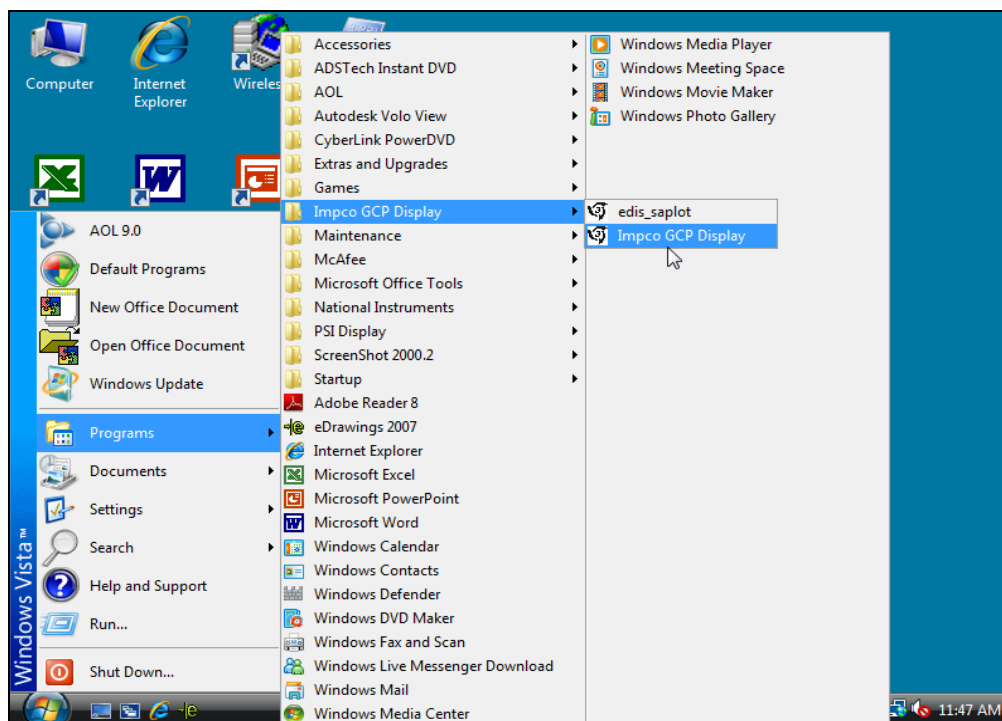
- Double click on “setup.exe” (application file).



- Click “Next” to continue



- Select install ECOM drivers only. Click “Next” and follow the on screen prompts.



- Open the DST software from Start Menu→Programs→Impco GCP Display→Impco GCP Display.



PASSWORD LOGIN

Figure 1 shows the password dialog box, which is displayed when a software session begins. Login can be accomplished in two ways.

1. Enter an “All S/N Password” which is a password applicable to all ECMs of a given original equipment manufacturer (OEM).
2. Enter a “Single S/N Password” and corresponding ECM serial number for a single ECM. A Single Serial Number password is unique to a specific ECM serial number and permits authorized service personnel to make changes or view information for a specific ECM.
3. In most instances the top “all” serial number boxes should be used for password entry. In this case, do not check the single serial number box. Each password is a 16-character alpha-numeric string specific to each Spectrum customer and determines which pages and variables are visible through the software. Passwords are assigned by the OEM support group and may change periodically. Check the “save password” box to automatically retain the password for future use.

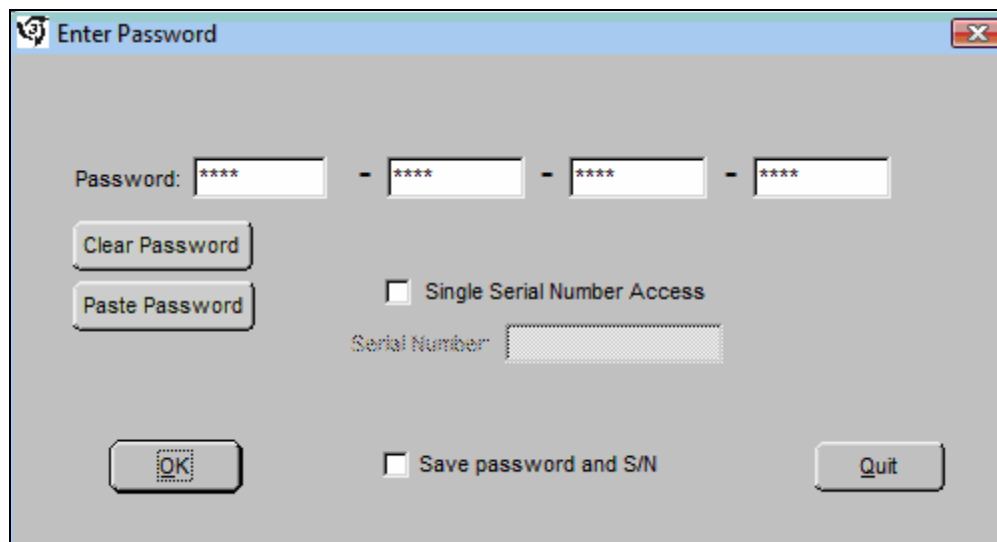


Figure 1: Populated Password Dialog Box



PASSWORD DIALOG BOX FUNCTIONS

- **Clear Password Button** Erases the current password from the password field.
- **Paste Password Button** Allows the user to copy a 16-character string from any word processor and paste the string in the password field.
- **Single Serial Number Access Checkbox** Tells the software that the password is applicable for single serial number access.
- **Serial Number Field** Only applicable when Single Serial Number Access Checkbox is checked. The entry field must be populated for the 6-digit serial number for which the Single Serial Number Access password applies (NOTE: Leading zeros included in the serial number are not required).
- **Save Password and S/N Checkbox** Retains the password, and serial number (if applicable) for the next software session.

Should an invalid password be entered, the error prompt shown in figure (2) will be displayed and the software will not load. This prompt signifies the following:

- The All S/N password is invalid.
- The Single S/N password is incorrect for the Single Serial Number entered.
- An All S/N password is entered for Single Serial Number use.
- The Single Serial Number password is valid; however, the Single Serial Number Access Checkbox is not checked.

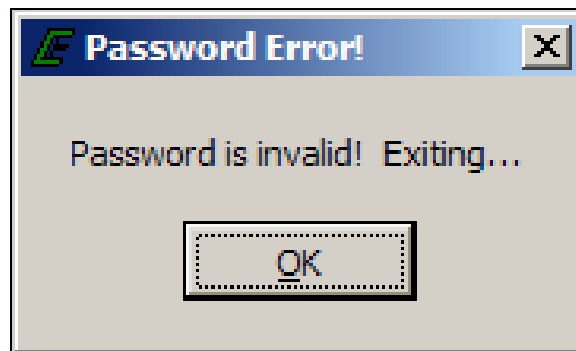


Figure 2: Password Error Prompt



If the Single S/N password entered is correct for the software but does not match the entered S/N of the targeted ECM, the prompt in Figure 3 will be displayed.

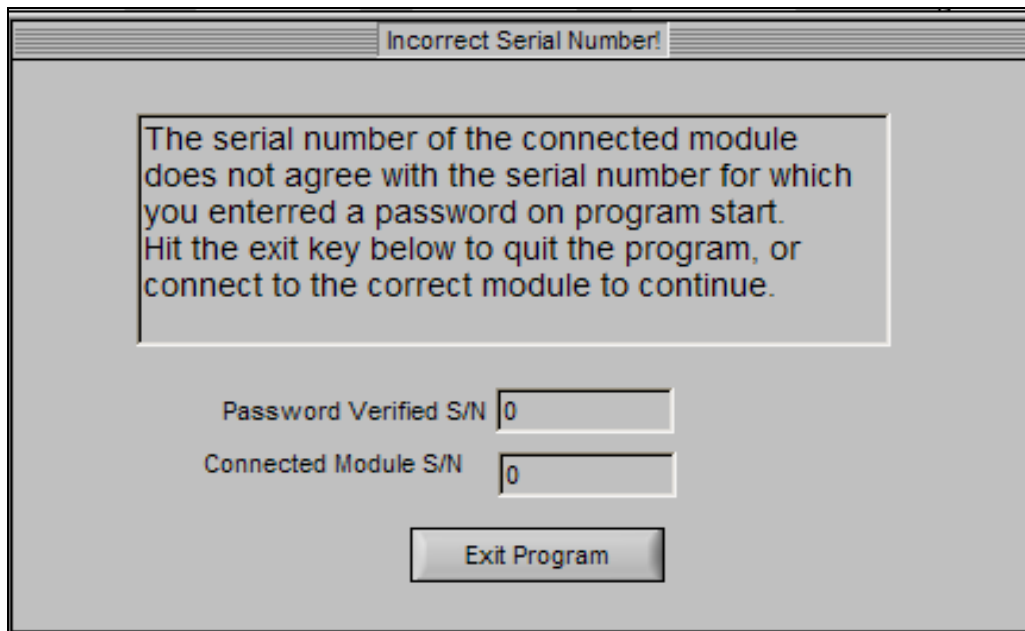


Figure 3: Incorrect Serial Number Message

Figure 4 shows the communication status if a valid software password is entered when attempting to connect to an ECM with a different key. In this instance the software will load but will not connect to the target (ECM).

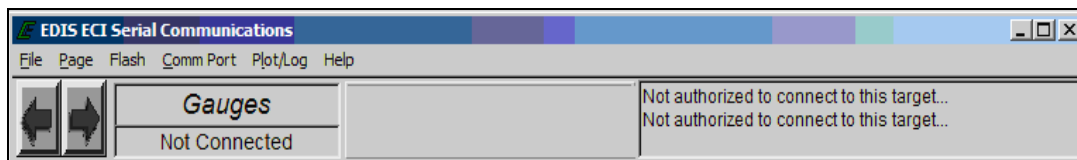
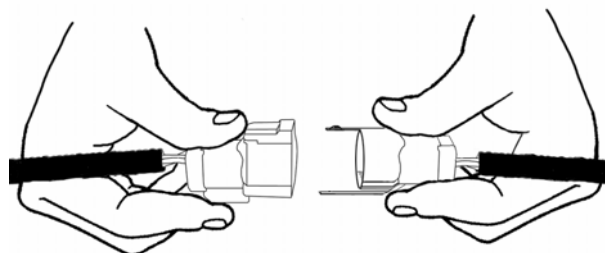


Figure 4: Not Authorized to Connect Message

In the event you receive this error message call your OEM support group for more information.

Connecting The PC To The Spectrum Fuel System



Connecting the DST cable



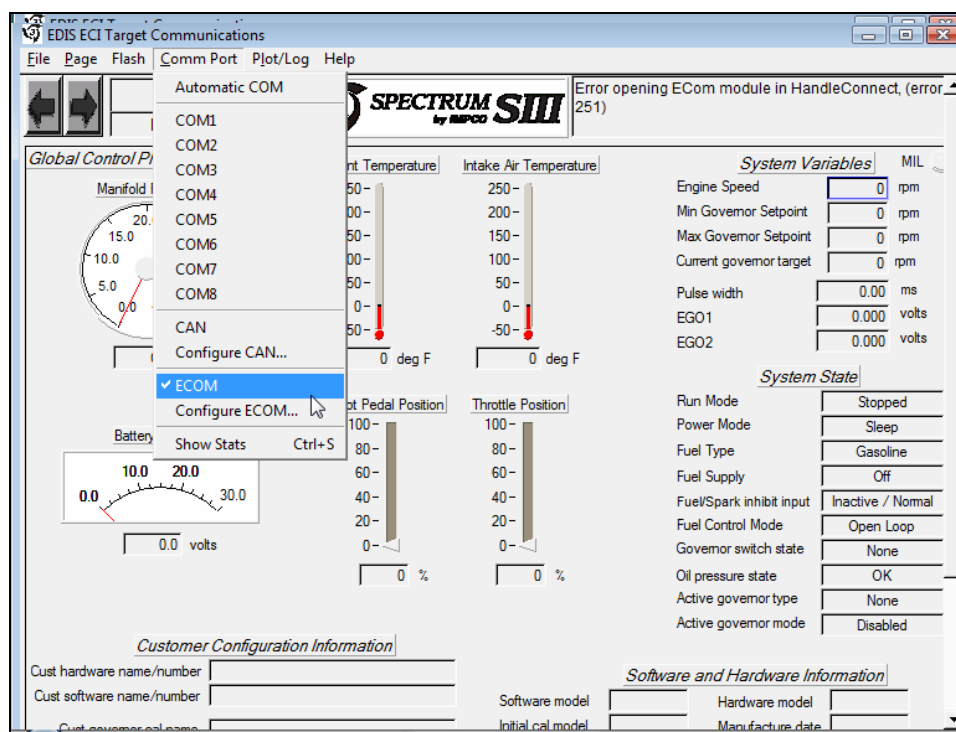
A laptop computer, with the diagnostic cable and software is the required tool for performing proper diagnostic testing of the Spectrum fuel system. It is also used to monitor sensor and actuator values and to read and clear Diagnostic Trouble codes. The DST software also performs several special tests.

- Connect the system diagnostic cable to the RS232 port on the back of the computer. If you do not have a RS232 port, use the USB to RS232 adapter supplied in the IMPCO ITK test kit. Be sure to install the USB driver to enable the USB adapter for use with your computer.
- Connect the diagnostic cable to the DLC (diagnostic link connector) labeled in the electrical schematic. The DLC is located on the engine harness. The new 8 pin DLC requires the use of the 4 to 8 pin adapter included in the late model ITK test kits.
- Turn the computer ON.
- Start Windows.
- From the start menu select Programs→Impco GCP Display→Impco GCP Display
- Place the ignition key in the ON position.

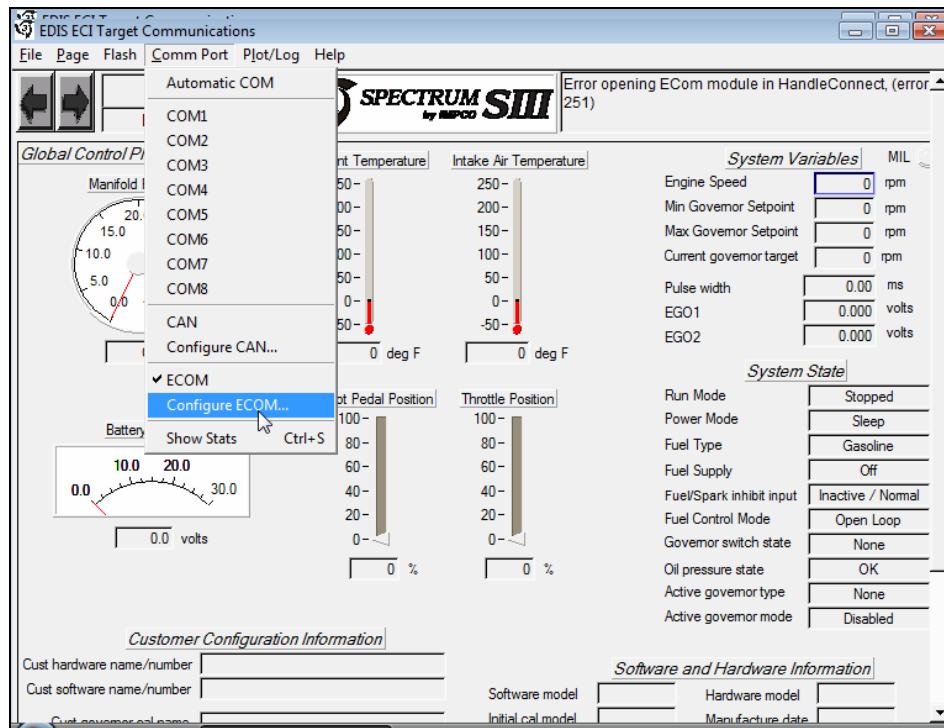


Within several seconds the system Gauge screen should now appear and a green banner in the upper left hand will read "Connected."

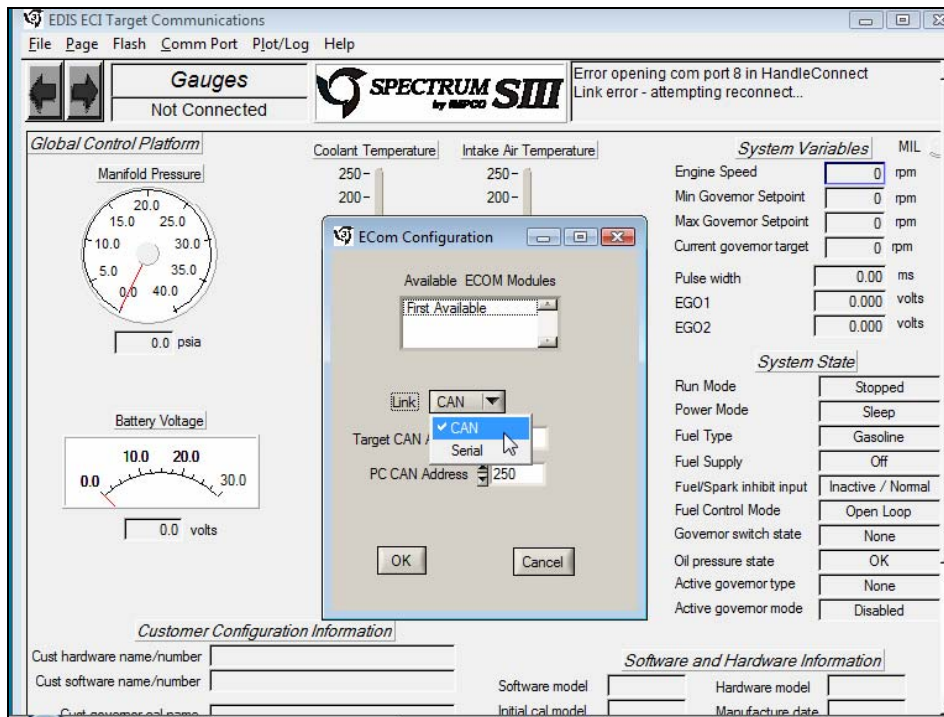
Connecting to the PC using the ECOM cable



- To connect using the ECOM cable you must select ECOM from the COM Port drop down menu.



- You will now need to configure the ECOM communication protocol.



- Select the CAN for systems with CAN enabled or serial for all others. Then select OK. You are now ready to connect using the ECOM USB DLC cable.



Chapter III Tool Usage Instructions

A. Fuel Pressure Gauge (TG-31119-001):

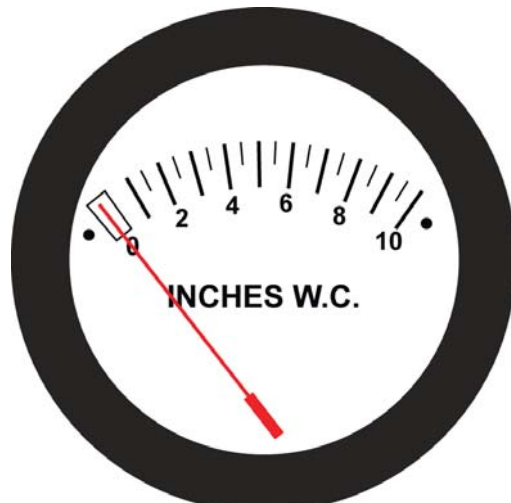
Refer to the fuel pressure gauge instruction booklet included in the ITK-4 Test Kit.

B. Differential Pressure Test Gauges (TG-005 & TG-010):

- Both the TG-005 (0-5 PSI) and the TG-010 (0-10" WC) are differential pressure gauges. This means they can be used to measure the difference in pressures between two separate areas or they can be used to measure either positive pressure or negative pressure (vacuum).



TG-005

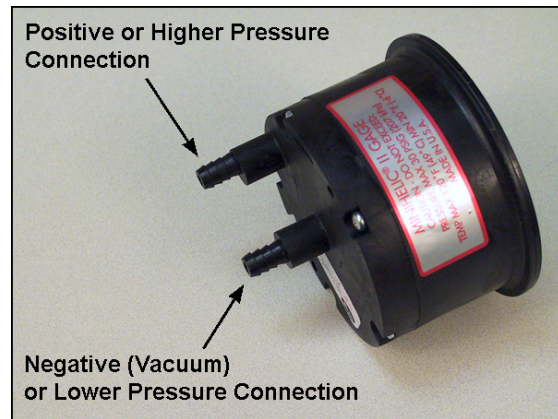


TG-010

- Before using either of the differential pressure test gauges, they should be calibrated against a manometer or known calibrated gauge.

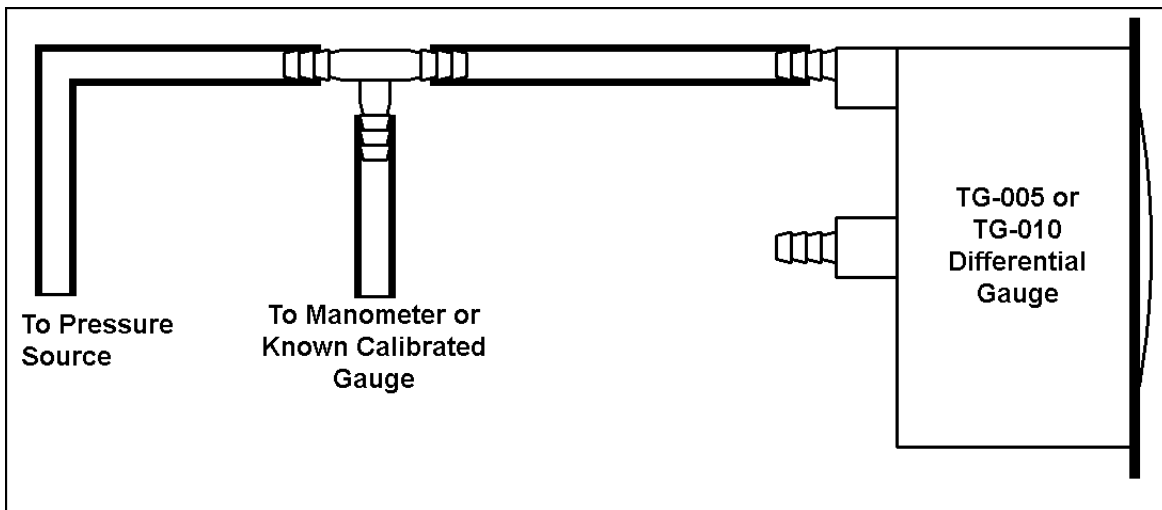
To calibrate a gauge:

Remove the front cover by unscrewing it in a counter-clockwise direction. You may need to use a pair of channel lock style pliers (be careful as the cover is made of plastic). DO NOT use any clamping tool on the body of the gauge.



If utilizing a positive pressure to calibrate the gauge, make the connections as illustrated. If using a negative pressure source (vacuum), connect the hose to the center nipple on the gauge.

NOTE: The applied pressure should ideally be between 50-80% of the gauge capacity.





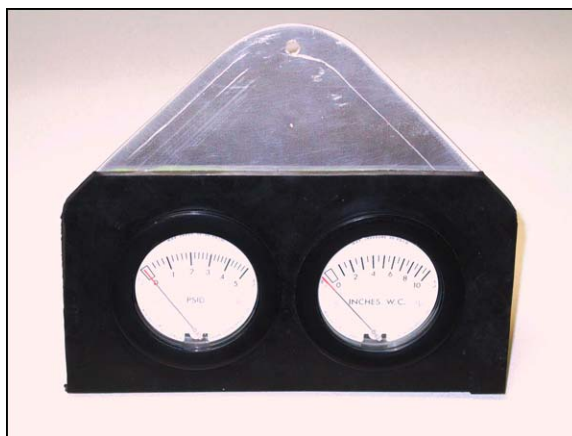
If the gauge needs to be calibrated, insert the provided Allen wrench into the adjusting screw and make adjustments as necessary.



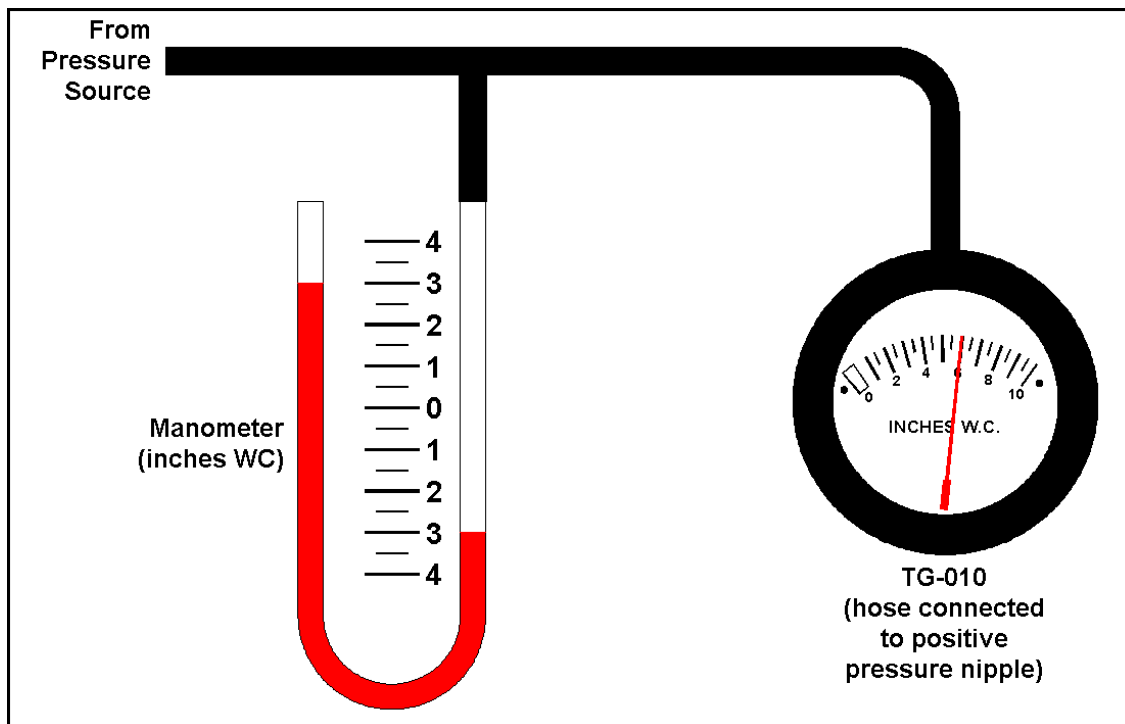
- Replace the cover.
- Repeat steps as necessary until the gauge is properly calibrated.

NOTES:

- Cover must be installed (with o-ring) when in use. Pressure will discharge from front of gauge without a cover in place.
- Gauge must be calibrated in the upright position and maintained in this position when in use. A bracket can be made to hold the gauges in the upright position.

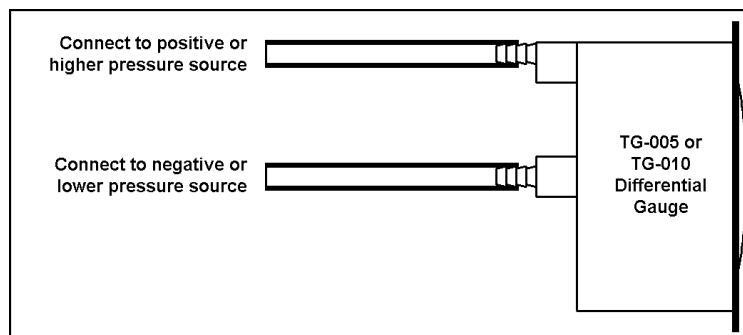


- If you do not have access to a manometer or a known calibrated gauge, make sure the gauge is “zeroed” and the needle is not indicating a pressure or “pinned” when sitting idle.



A properly calibrated TG-010 Gauge

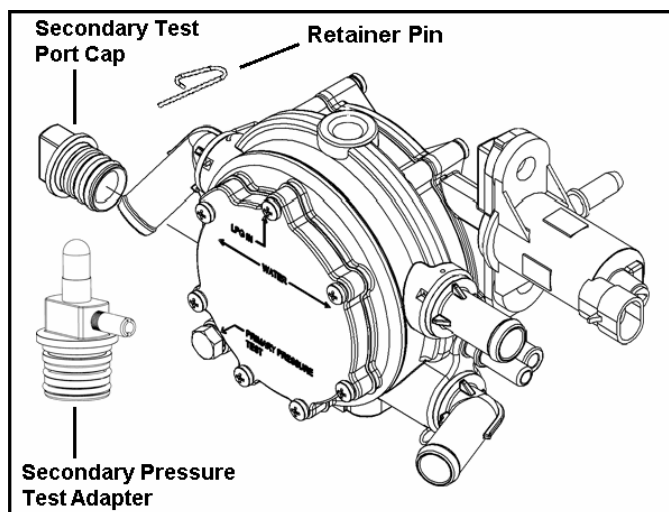
- If you need to measure the differential pressure between two chambers or compartments, make the connections as illustrated. Make sure the expected pressure differential does not exceed the gauge's limits before connecting.



C. Series II LPR Secondary Pressure Test Adapter (AF4-31105) and Series III EPR Secondary Pressure Test Adapter (AF4-50254-002):

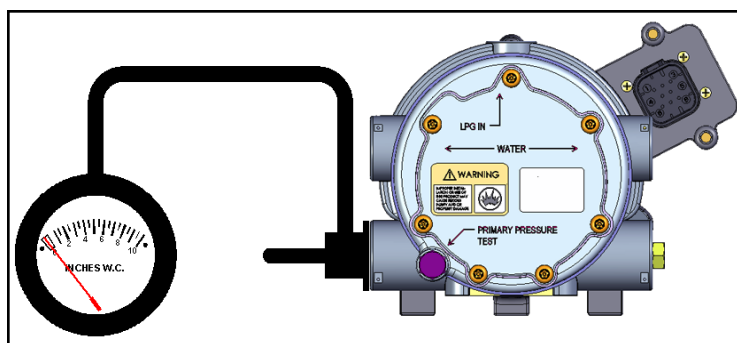
To connect the secondary pressure test adapter to the Series II LPR or Series III EPR:

- Shut off the LPG tank manual shut-off valve.
- Start the engine and let it run until it dies.
- Turn off the ignition key.
- Remove the Secondary Test Port Cap retainer pin and pull the cap out of the LPR / EPR.



Series II LPR

- Install the pressure test adapter (make sure to reinstall the retainer pin before starting the engine).
- Connect one end of a section of 3/16" vacuum hose (H1-11) to the hose nipple on the pressure test adapter and the other to the center hose nipple on differential gauge TG-010 (see section B in this chapter for gauge connections).

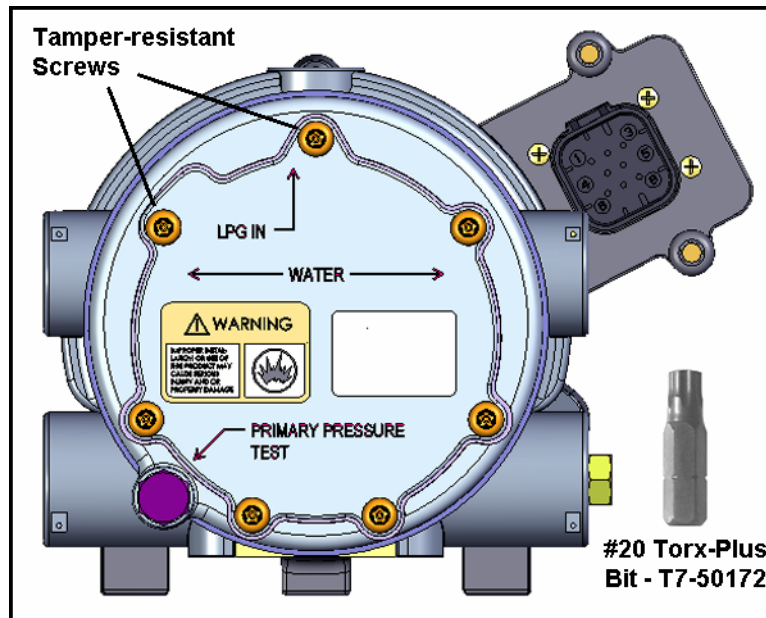


Series III EPR Illustration

- Test for leaks before opening the LPG tank manual shut-off valve.
- When reinstalling the test port cap, examine the o-rings for any cuts, splits or abrasions. Replace any that are damaged. Apply a little clean engine oil to the o-rings before inserting the cap into the test port.
- Inspect the test port cap retaining pin for deformation and install it making sure the turned-down end of the pin is securely seated in its hole (see section E in this chapter).
- Test for leaks before opening the LPG fuel tank shut-off valve.

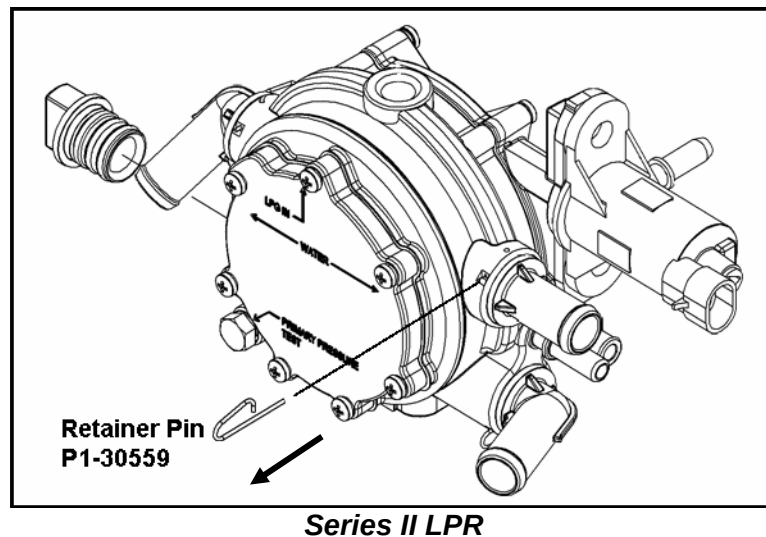
D. #20 Torx-Plus Bit (T7-50172):

This tool is used to remove and install the tamper-resistant screws when rebuilding the Series III EPR.

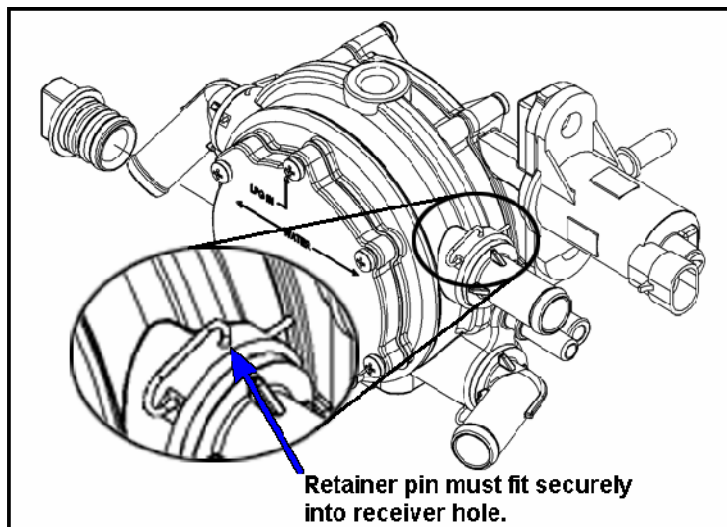


E. Retainer Pins (P1-30559):

- Coolant / low pressure hose adapter retainer pins are included to replace any that have become excessively distorted or lost in the engine compartment. The retainer pins are applicable to both the Series II and Series III systems.
- To remove the pins, lift up on the exposed loop until the turned-down end clears the receiver hole and pull the pin out in the direction of the arrow.



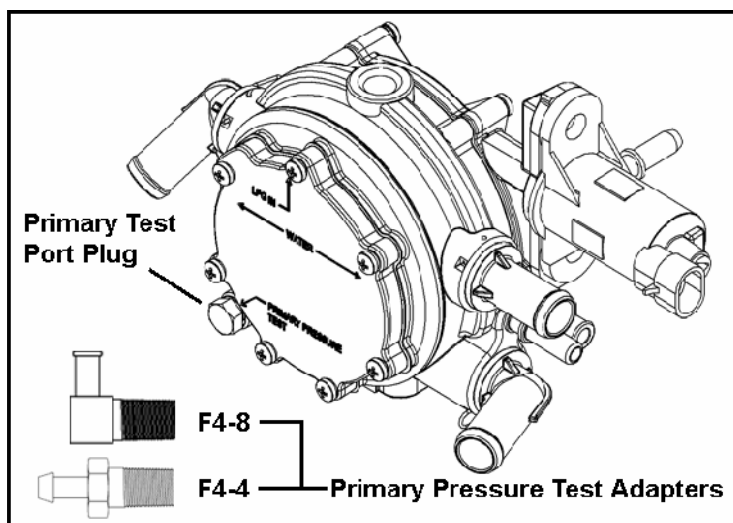
- When reinstalling the retainer pins, make sure the turned-down end of the pin fits securely in its receiver hole.



F. LPR/EPR Primary Pressure Test Adapter (F4-4 & F4-8):

F4-4 is a straight adapter for connections where there are no obstructions in front of the LPR/EPR. F4-8 is a 90° adapter for connections where some obstruction may hinder the use of the straight adapter. To connect the primary pressure test adapter to the Series II LPR or Series III EPR:

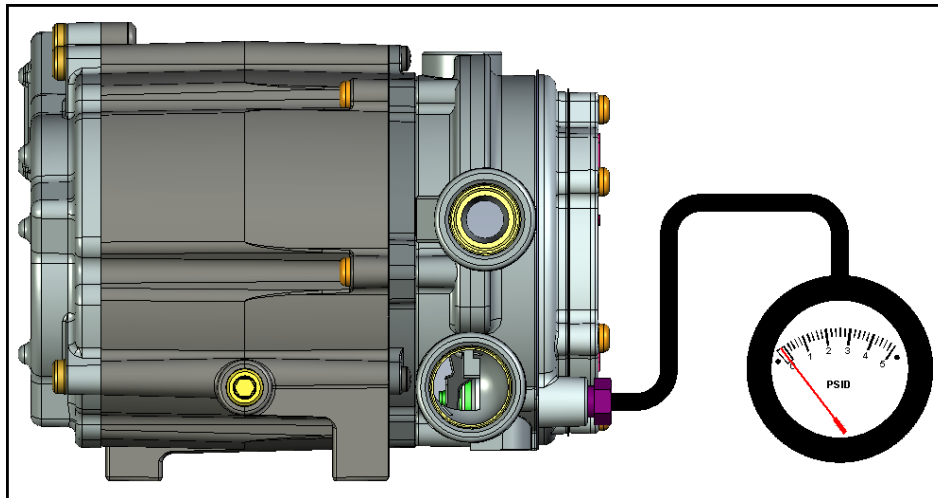
- Shut off the LPG tank manual shut-off valve.
- Start the engine and let it run until it dies.
- Turn off the ignition key.
- Remove the Primary Test Port Plug from the LPR/EPR.



Series II LPR

- Apply a little Loctite™ 567 or equivalent thread sealant on the threads of the pressure test adapter and install it into the LPR/EPR (torque F4-4 to 10 ft-lb, F4-8 to finger tight plus 1 ½ turns).

- Connect one end of a section of 3/16" vacuum hose (H1-11) to the hose nipple on the pressure test adapter and the other to the outside hose nipple on differential gauge TG-005 (see section B in this chapter for gauge connections).



EPR illustrated with F4-4

- Test for leaks before opening the LPG tank manual shut-off valve.
- When reinstalling the test port plug, clean all traces of old sealant from the threads, apply a little Loctite™ 567 or equivalent thread sealant on the plug threads and install it into the LPR/EPR (torque to 10 ft-lb).
- Test for leaks before opening the LPG fuel shut-off valve.



WARNING:

**IMPROPER INSTALLATION OR USE OF THIS PRODUCT MAY CAUSE
SERIOUS INJURY AND/OR PROPERTY DAMAGE.**

SERVICE TECHNICIANS AND USERS

SHOULD CAREFULLY READ AND ABIDE BY THE PROVISIONS SET FORTH IN NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #37 FOR STATIONARY ENGINES, #52 FOR CNG VEHICULAR FUEL SYSTEMS OR #58 FOR LPG SYSTEMS.

INSTALLERS

LPG INSTALLATIONS IN THE UNITED STATES MUST BE DONE IN ACCORDANCE WITH FEDERAL STATE OR LOCAL LAW, WHICHEVER IS APPLICABLE AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #58, STANDARD FOR STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES TO THE EXTENT THESE STANDARDS ARE NOT IN VIOLATION WITH FEDERAL, STATE OR LOCAL LAW.

IN CANADA

REFER TO CAN/CGA PROPANE INSTALLATION CODES.

CNG INSTALLATIONS IN THE UNITED STATES

MUST BE DONE IN ACCORDANCE WITH FEDERAL STATE OR LOCAL LAW AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #52, COMPRESSED NATURAL GAS (CNG) VEHICULAR FUEL SYSTEMS TO THE EXTENT THESE STANDARDS ARE NOT IN VIOLATION WITH FEDERAL, STATE OR LOCAL LAW.

IN CANADA

REFER TO CAN/CGA CNG INSTALLATION CODES.

LPG AND/OR NATURAL GAS INSTALLATIONS ON STATIONARY ENGINES

MUST BE DONE IN ACCORDANCE WITH FEDERAL, STATE OR LOCAL LAW AND NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #37, STATIONARY COMBUSTION ENGINES AND GAS TURBINE ENGINES, TO THE EXTENT THESE STANDARDS ARE NOT IN VIOLATION WITH FEDERAL, STATE OR LOCAL LAW. FAILURE TO ABIDE BY THE ABOVE WILL VOID ANY IMPCO WARRANTY ON THE PRODUCTS AND MAY CAUSE SERIOUS INJURY OR PROPERTY DAMAGE.

DUE TO THE INHERENT DANGER OF GASEOUS FUELS THE IMPCO PRODUCTS SHOULD NOT BE INSTALLED OR USED BY PERSONS NOT KNOWLEDGEABLE OF THE HAZARDS ASSOCIATED WITH THE USE OF GASEOUS FUELS.