



Technocarb
Alternative Fuel Power

LPG Converters

EFS600 Fuel Management System
Installation and Operation



WITH TECHNOCARB LPG CONVERTERS MODEL B2

Contents

Overview	1
Installation.....	1
Pre-Conversion Check.....	1
Electronics.....	1
Mounting the EFS600 Controller.....	1
Wiring.....	2
20 Pin Connector Wires	2
Eight Pin Connector Wires.....	3
Four Pin Connector: White	4
Four Pin Connector: Red.....	4
Four Pin Connector: Black.....	4
Wiring an Injector Disabling Harness.....	5
Wiring Recommendations.....	5
Hardware	6
Mounting the Digital Power Control Motor	6
Mounting the Venturi Mixer	6
Mounting the Converter and Fuel Lock	7
Connecting the Water Hoses	7
Fuel Lines and Hoses	7
Set-up	7
Requirements.....	7
Technocarb 210 Scantool.....	7
Inputs.....	8
Initial Data Acquisition (Learn Procedure).....	9
System Adjustments and Checks	10
Starting	10
Ram Air.....	10
Theory of Operation.....	11
Engine Start-up.....	11
Fuel Control	12
Throttle Inhibitor Relay	12
Manifold Purge.....	13
LPG Converter	14
Installation Information.....	17
Notes.....	18

Overview

The EFS600 fuel management system is an integrated fuel control system designed to meet the requirements of today's automotive conversion industry. Designed to be tamperproof, the EFS600 uses feedback from the oxygen sensor and input from other engine sensors to maintain a stoichiometric fuel mixture in order to achieve the most effective reduction and oxidation of exhaust emission gases.

Consisting of a programmable microprocessor equipped electronic controller, an engine specific fuel mixer and the associated conversion support and fuel supply components (injector simulator, fuel lock-off, regulator/converter etc.) the EFS600 controls the air/fuel ratio using two digital control motors. Based upon the input from several engine sensors and the oxygen sensor the EFS600 fuel controller uses the digitally controlled stepper motors to increase or decrease the fuel supply to the engine.

Use of a programmable microprocessor permits each engine family to be individually tuned to achieve optimal performance and emissions control.

Installation

Pre-Conversion Check

Before proceeding with any conversion, the vehicle must be inspected to ensure there are no existing faults, whether electrical, electronic or mechanical. This is especially important for older vehicle conversions that may have weak ignition systems, vacuum leaks or other mechanical conditions which gasoline fuel systems can mask. The air filter should be inspected and a new filter installed if warranted as part of the conversion prior to the initial set-up of the EFS600.

Electronics

Mounting the EFS600 Controller

The EFS600 controller is enclosed in a plastic housing. It should not be installed into an engine compartment. It should be mounted under the dashboard or in an equally protected location safe from water entry. If the conversion is for a bi-fuel vehicle mount the fuel selector switch into or under the dashboard. Try to use a location easily visible by the driver.

The wiring harnesses should be routed into the engine compartment through an appropriately sized hole drilled into the engine compartment. Care should be taken to ensure the wires are not routed near any sources of electromagnetic interference such as a two-way radio. Use the supplied grommet to ensure the harness wires do not chaff where they pass through the hole into the engine compartment.

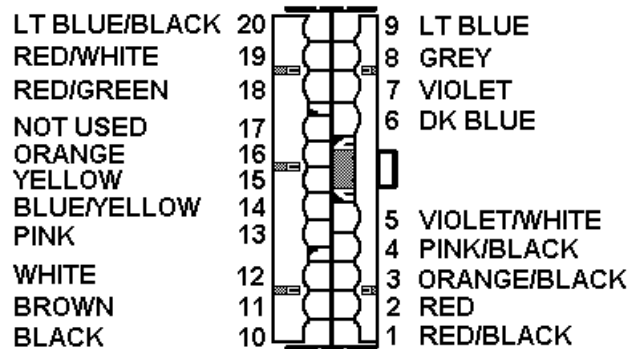
When mounting the under-hood wiring harnesses and electronic components ensure that they are not routed near any sources of electromagnetic interference. The harness and the digital control motors should have at least 2 inches clearance from sources such as the alternator or the ignition system (spark plugs, wires and ignition coils).

Solder all the wire connections. Locate a good chassis ground for the EFS600. The auxiliary battery ground strap to the fender if available is excellent. If not use a ground point on the firewall.

Wiring

20 Pin Connector Wires

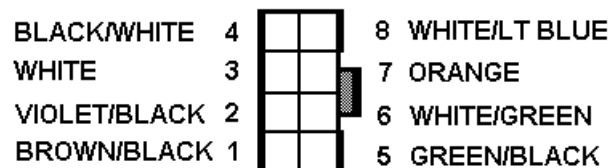
20 Pin Connector



- 1) **RED/BLACK:** +12V from battery. Constant power input to EFS600.
- 2) **RED:** +12V input from ignition system to the EFS600. This wire is used as a power input during start-up and run, and as an output during the manifold purge function on engine shut down.
- 3) **ORANGE/BLACK:** Control wire for throttle inhibitor relay. This wire is a +12V output when the throttle inhibitor relay is not actuated and a ground when the throttle inhibitor function is actuated. The starter will be disabled until the fuel control stepper motors have moved to their default positions on start up or if the throttle is depressed during engine cranking.
- 4) **PINK/BLACK:** EFS600 output from MAP sensor to OEM computer. Used when MAP timing processor is utilized.
- 5) **WHITE/VIOLET:** +12V power output from the EFS600 to the OEM fuel pump. The power input from the yellow wire is routed to the fuel pump via this wire.
- 6) **BLUE:** +12V output from the EFS600 to the fuel lock-off. The power input from the yellow wire is routed to the LPG/CNG lock-off via this wire.
- 7) **VIOLET:** Oxygen sensor input to the EFS600.
- 8) **GREY:** Oxygen sensor output from the EFS600 to the OEM computer. Oxygen sensor simulations are outputted on this wire.
- 9) **LIGHT BLUE:** Paired with light blue/black wire. Used for ECT sensor or fuel injector simulation, depending on vehicle application.

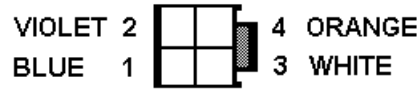
- 10) **BLACK:** EFS600 ground. The preferred location is the OEM computer ground connection on the engine block or the battery negative auxiliary ground cable. A sheet metal screw through the body is **not** an acceptable ground location.
- 11) **BROWN:** RPM/timing input to the EFS600.
- 12) **WHITE:** Timing output from the EFS600 to the vehicle. The LPG/CNG timing advance signal is supplied to the vehicle via this wire.
- 13) **PINK:** MAP sensor input to the EFS600. Used when MAP timing processor is utilized.
- 14) **BLUE/YELLOW:** TPS signal input to EFS600. Used in conjunction with other sensors for fuel and timing control, also monitored for throttle inhibitor functions.
- 15) **YELLOW:** +12V fuel pump power input to the EFS600. By utilizing the OEM fuel pump power source the OEM safety strategies are retained in LPG/CNG mode and the OEM fuel pump is turned off in LPG/CNG mode
- 16) **ORANGE:** EFS600 output to Knock sensor. Used on certain pre 1996 GMC vehicles. Supplies required simulation to satisfy OEM computer.
- 17) Not used.
- 18) **RED/GREEN:** Input to the EFS600 for circuit monitoring. This wire is used for monitoring different circuits, depending on the vehicle and year of manufacture.
- 19) **RED/WHITE:** +12V input to the EFS600. This wire is used as a trigger for the EFS600 functions i.e.: engine cranking, engine running. Therefore the power on/off sequence **must** be obtained from whatever source wire utilized, typically an accessory source such as the wiper motor positive.
- 20) **LIGHT BLUE/BLACK:** Paired with light blue wire. Used for ECT sensor or fuel injector simulation, depending on vehicle application.

Eight Pin Connector Wires



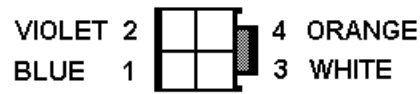
- 1) **BROWN/BLACK:** Injector disabling circuit or clear memory circuit depending on vehicle application. Pairs up with green/black wire.
- 2) **VIOLET/BLACK:** Injector disabling circuit. Pairs up with white/green wire.
- 3) **WHITE:** Input from LPG tank fuel level sender to EFS600
- 4) **BLACK/WHITE:** EFS600 output to OEM fuel gauge.
- 5) **GREEN/BLACK:** Injector disabling circuit or clear memory circuit depending on vehicle application. Pairs up with brown/black wire.
- 6) **WHITE/GREEN:** Injector disabling circuit. Pairs up with violet/black wire.
- 7) **ORANGE:** +12 v output from EFS600 to primer solenoid. Used on some mono fuel applications.
- 8) **WHITE/LIGHT BLUE:** Input from OEM fuel level sender to EFS600.

Four Pin Connector: White



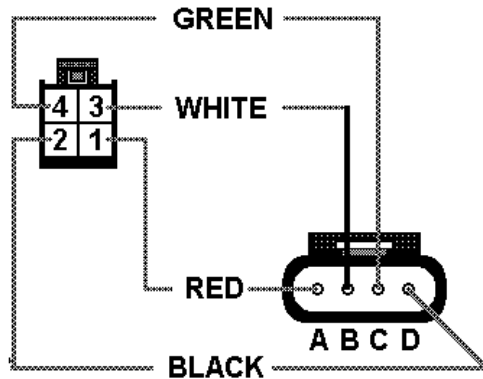
This is the Power Mixture Control Stepper Motor harness connector to the EFS600. There is a black marker on the stepper motor connector end. Ensure the stepper motor connector end has its weather-tight seal in place. **WARNING:** Do not probe any of the wires in this harness or damage to the EFS600 controller could occur.

Four Pin Connector: Red

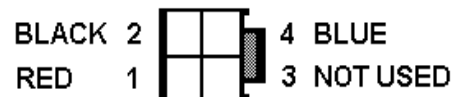


This is the Idle Mixture Control Stepper Motor harness connector to the EFS600. There is a red marker on the stepper motor connector end. **WARNING:** Do not probe any of the wires in this harness or damage to the EFS600 controller could occur.

Four pin red and white connectors manufactured after August 2001.



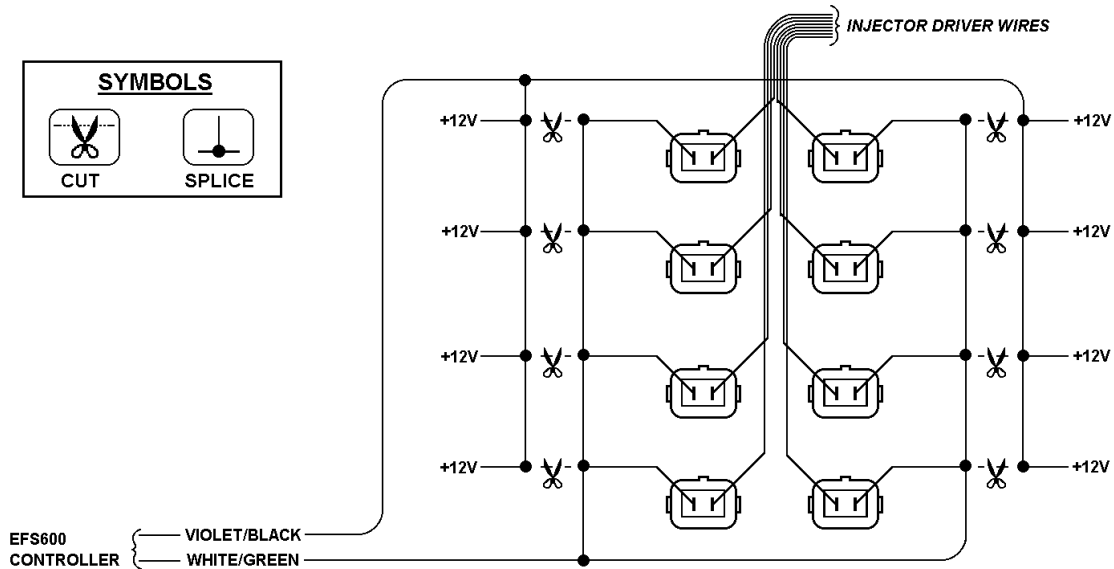
Four Pin Connector: Black



- 1) **RED:** +12V output from the EFS600 to the dual fuel switch.
- 2) **BLACK:** Ground from the dual fuel switch to the EFS600.
- 4) **BLUE:** +12V input to the EFS600 from the dual fuel switch. 0 volts on this wire is gasoline mode, 12 volts on this wire is LPG/CNG mode. Note: This wire is **GREEN** on the TC660 switch.

Wiring an Injector Disabling Harness

Injector disabling harnesses are available for most vehicles manufactured prior to 1999. Vehicles manufactured later usually do not have a disabling harness available for them. Wiring the injector power supply through an injector-disabling relay will disable the injectors.

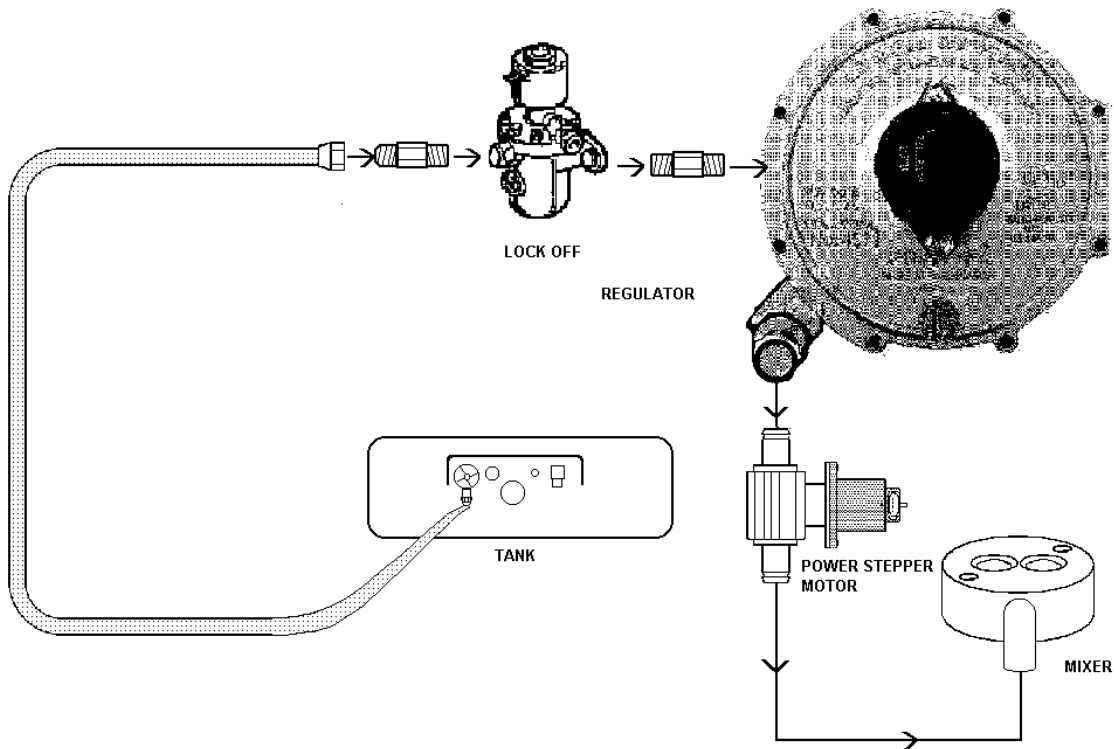


Wiring Recommendations

- 1) Solder all wire connections.
- 2) Do not route any wires or harnesses near sources of electromagnetic interference such as secondary ignition leads, alternator or ignition coil. Oxygen sensor input/output wires and stepper motor harnesses are especially sensitive to EMI. Allow at least 2 to 3 inches clearance.
- 3) Do not locate stepper motors near any source of electromagnetic interference such as secondary ignition leads, alternator or ignition coil. Allow at least 2 to 3 inches clearance.
- 4) Mount the EFS600 control module under dash, ***NOT*** in engine compartment.
- 5) Do **not** operate engine with either stepper motor disconnected, damage to the EFS600 can occur.

Hardware

INSTALLATION LAYOUT



Mounting the Digital Power Control Motor

Using no more than three feet of vapour hose between the mixer and the converter allow at least 6 inches between the mixer and the digital power stepper motor. The stepper motor should be located closer to the mixer than the converter. Install the power control motor in an upright position only.

Mounting the Venturi Mixer

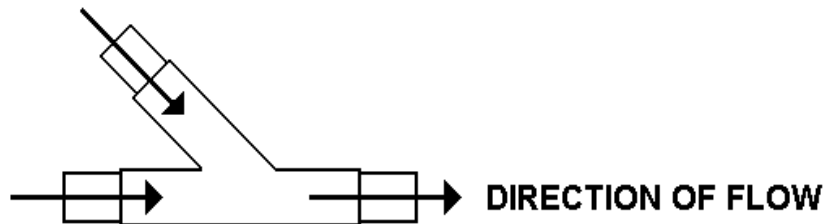
As each venturi mixer is designed for a specific engine application most venturi mixers will have only one installation location as indicated in the mixer installation guide. The detailed instructions will include relocation instructions for the crankcase ventilation system whenever required due to the location of the mixer. Whenever the crankcase vent intake is located downstream from the mixer it will have to be relocated to a fuel free source of filtered air.

Mounting the Converter and Fuel Lock

The converter should be installed below the level of the radiator in an upright position, parallel to the fender-line, and the LPG lock-off solenoid must be hard-piped to the regulator. Never install the regulator perpendicular to the fender-line or flat on its back, as poor driveability will result from this action.

Connecting the Water Hoses

The water flow through the converter should enter through the lower water port and exit through the upper most water port. This will help prevent the converter from becoming air locked. When using water “Y” fittings you must install them in the correct direction of flow. Failure to install them correctly can result in low flow or no flow conditions.



Fuel Lines and Hoses

Try to install your fuel lines or hoses in protected areas of the frame and secure them to the vehicle with rubber-coated hose or tube clamps. Ensure your installation meets all federal, provincial/state regulations pertaining to your jurisdiction.

Set-up

Requirements

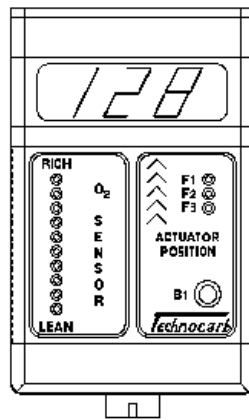
Technocarb 210 Scan tool

The use of a Technocarb 210 Scan tool is required for the EFS600 set up and learn procedure. The scan tool supplies the visual prompts required to proceed with each step of the learning process. It facilitates troubleshooting during the learn procedure should it be required.

Once the vehicle has successfully completed the set-up procedure the TC210 scan tool functions as follows:

- 1) The nine LED's, three green, three yellow and three red indicate oxygen sensor voltage: 0v to 0.9v in 0.1v increments.
- 2) The three digit numerical screen indicates the position of the stepper motors: 0 to 255 counts.

- 3) The **B1** button changes the numerical display of the stepper motors from the idle motor to the power motor when depressed momentarily and erases the EFS600 memory when depressed and held for 10 to 15 seconds.
- 4) **F1** - red L.E.D. indicates the transition of the fuel control from the idle stepper motor to the power stepper motor. When **F1** is lit, the idle stepper motor is controlling the fuel, when **F1** is out the power stepper motor is controlling the fuel.
- 5) **F2** - amber L.E.D. not used with EFS600.
- 6) **F3** - green L.E.D. indicates which stepper motor the numerical screen is displaying. When **F3** is lit the idle motor position is being displayed on the numerical screen. When **F3** is out the power motor position is being displayed on the numerical screen.
- 7) Whenever **B1** is depressed and held for 10 to 15 seconds (with the key in the on/run position) to erase the memory, **F1** will flash once and then **F3** will flash once. This indicates the erase procedure is complete.



Inputs

For the set-up procedure to function correctly the following inputs are required.

- 1) RPM input on the brown wire. For the power setting - above 2700 RPM. For the idle setting - below 1100 RPM.
- 2) Valid oxygen sensor signal, must be greater than 0.6v and less than 0.3v.
- 3) Idle TPS voltage aquired before power stepper motor learn procedure is performed.
- 4) Idle TPS voltage must be below 1.2v.
- 5) The EFS600 will not learn if the idle or power counts are above 220 or below 30. This is to prevent a learned default value that does not have any range for adjustment of the fuel. Should you have a count exceeding these values you must determine why the condition exists and then perform the appropriate correction. A high count indicates a lack of fuel condition and a low count indicates an excess fuel condition. (See **Installation Information**)

Note

Fixed venturi mixers are designed to operate with the restriction of the OEM air filter, therefore you must have the air filter installed in order for the vehicle to start and run properly. For a successful installation and learn procedure please ensure that the inputs and learn procedures and requirements as explained in the set-up instructions are satisfied.

Initial Data Acquisition (Learn Procedure)

After wiring the EFS600 harness as per specific instructions, ***and verifying that all connections are correct***, proceed as follows.

STEP 1 - *With key off/engine off*, connect all harnesses to the EFS600 control box. ***Connect the 20-pin harness connector last.***

STEP 2 - Observe the green and the red L.E.D.s on the EFS600 control box. They should flash one time each and then go out. This indicates that the system is ready to acquire data.

NOTE: Programs issued before Dec/22/97 will cycle the red and green L.E.D.s alternately in endless loop. Some vehicles manufactured up to 1995 require programs that still cycle the red and green L.E.D.s alternately in an endless loop

STEP 3 - Connect the 210 scan tool. F1 and F3 will flash with the same pattern of the L.E.D.s in the EFS600 control box.

STEP 4 - (Applies only to programs that are cycling in an endless loop, otherwise go to step 5.) Turn the ignition key on ***without starting the engine***. F1 and F3 will cycle one more time, then they will both go out. A relay "click" from within the EFS600 control box may be audible. ***Do not start the engine unless F1 and F3 are out.***

STEP 5 - Start the engine. F1 will be lit. Immediately rev the engine to 1500 to 2000 rpm. Allow the engine to stabilize for a moment and then momentarily release the throttle. (This is to allow the EFS600 to acquire an idle TPS voltage.) Immediately rev the engine to 2800 to 3000 R.P.M.; when the correct R.P.M. is reached, F1 flashes rapidly. Maintain R.P.M. for as long as F1 flashes. When the power default is acquired, F1 goes out, and F3 flashes rapidly, indicating the need to return to idle. ***NOTE: the EFS600 unit will not acquire data for as long as the O₂ sensor is cold.***

STEP 6 - Return to idle ***very slowly***, or engine stalling and flooding may occur. When entering the idle acquisition area, F1 will come back on continuously and F3 will flash slower. Gently release the throttle. F3 will flash for 2-3 minutes, waiting for idle stabilization to occur; during this time the idle may be erratic.

Note: do not touch the throttle during this time, or the internal clock of the EFS600 will reset, and the idle acquisition procedure will automatically start again.

STEP 7 - As soon as the idle position is acquired, F3 will be on steadily, indicating the end of setup procedure. The engine can now be turned off, if desired.

NOTE: if the data acquisition is not successful for any reason, clear the memory by turning the key to the on/run position and press the B1 button of the 210 Scantool for about 10 seconds. F1 and F3 will flash once each, indicating that memory has been cleared. In models

sold prior to November 1995 either disconnecting the harness connector at the control box, or removing the memory retention fuse located in the red/black wire will also delete the memory. Repeat the data acquisition procedure.

PLEASE NOTE: after this procedure, the EFS600 has learned just the basic information to keep the engine running. In order to obtain full performance, and because of its complex adaptive learn capabilities, the vehicle *must be driven for at least five minutes through all driving modes* (mild acceleration, hard acceleration, deceleration, full stop, idle, cruise, etc.)

System Adjustments and Checks

Starting

A low **minimum idle air** adjustment on the throttle body may contribute to poor starts. This can also cause a stalling condition. A small increase in the throttle plate angle may be required.

Note: If the vehicle RPM does not return to the normal idle RPM range within 5 to 15 seconds after the adjustment procedure, the adjustment has exceeded the vehicle's idle TPS voltage range. Reduce the adjustment slightly until the RPM returns to normal idle RPM. This adjustment is best done with an OBD scan tool monitoring the OEM idle control motor counts to insure the adjustment does not reduce the idle control motor count to zero. There should always be some counts on the idle control motor.

Ram Air

Check for ram air stalling. This occurs during high-speed deceleration. It is caused by a high-pressure build up ahead of the throttle plates which forces the fuel back into the mixer resulting in a lean engine stall. To check a vehicle for this condition, drive at 70 - 100 kph/45 - 65 mph take your foot off the throttle and shift the vehicle into neutral. The engine should not stall. If stalling occurs, the cold air induction system will have to be modified to prevent the build up of pressure at the throttle plates. There are several solutions to remedy this problem. The easiest method is to ensure that the incoming air must enter the induction system at a 90-degree angle to the air induction port. This can be accomplished by:

- Installing a baffle in front of the air induction port.
- Sealing the air induction port and cutting a new entrance port at a 90-degree angle to the original port.
- Putting an air gap between the air filter canister and the air induction piping so that so that pressure cannot build up within the system.

A more complex method is the installation of a 3/8" I.D. balance line between the incoming airside of the air filter canister and the balance port of the converter. If you are unfamiliar with this procedure contact Technocarb for assistance.

Theory of Operation

Engine Start-up

Legend

KOEO.....	Key on engine on
KOEC.....	Key on engine cranking
KOER.....	Key on engine running
KOFF.....	Key off engine shutdown

Single Fuel Operation

KOEO: EFS600 controller turns on the alternate fuel lock-off, pressurizing the converter/regulator. The idle actuator then extends to the learned idle value plus the programmed prime value. This primes the vapour hose. The actuator then retracts to the learned idle value plus the program rich/lean pre-set. The OEM vehicle computer will have timed out the lock-off power source (the vehicle fuel pump relay) by this time and the lock-off will turn off.

KOEC: The OEM vehicle computer turns the lock-off back on and the engine starts.

KOER: The EFS600 controller recognises RPM and begins to control the fuel. Until the oxygen sensor warms up and responds to the exhaust gases the EFS600 controller will remain in an open loop fuel control state. Once the oxygen sensor has reached its' operating temperature the EFS600 will control the fuel based on the responses from the oxygen sensor, RPM reference and TP sensor voltage

KOFF: Engine shutdown. The lock-off power source switches to the gasoline fuel pump position turning off the alternate fuel lock-off. The manifold purge function then occurs. The power actuator assumes its' learned value. The idle actuator retracts to a fuel off position.

Dual Fuel Operation

KOEO: EFS600 controller turns on the alternate fuel lock-off, pressurizing the converter/regulator. The OEM vehicle computer times out the lock-off power source (the vehicle fuel pump relay) by this time and the fuel lock-off will turn off.

KOEC: The EFS600 controller switches the fuel pump power source back to the fuel pump and turns the gasoline fuel injectors on. The engine then starts on gasoline.

KOER: The EFS600 controller switches the fuel pump power source back to the alternate fuel lock-off. The gasoline fuel injectors are kept operating for a programmed time duration. During the injector on time the idle actuator extends to the learned idle value plus the programmed rich/lean pre-set value and the power actuator retracts to its' learned value. The gasoline fuel injectors then time out and turn off. The EFS600 controller recognises RPM and begins to control the fuel. Until the oxygen sensor warms up and responds to the exhaust gases the EFS600 controller will remain in an open loop fuel control state. Once the oxygen sensor has reached its' operating temperature the EFS600 will control the fuel based on the responses from the oxygen sensor, RPM reference and TP sensor voltage

KOFF: Engine shutdown. The lock-off power source switches to the gasoline fuel pump position turning off the alternate fuel lock-off. The manifold purge function then occurs. The power actuator extends to close the vapour hose. The idle actuator retracts to a fuel off position.

Fuel Control

The EFS600 controller uses an embedded micro-controller to monitor the input from several engine sensors to determine the fuel control strategy to use for the indicated operating state of the engine. Fuel supply is adjusted by the use of two digital stepper motors. The two stepper motors make possible more sophisticated fuel control and permit tamper proofing the system.

The motors consist of a stepper motor, a pintle and a valve body. The stepper motors can be controlled from a position of 0 (fully closed) to 255 (fully open). Using the 210 scan tool the motors positions can be viewed on the digital display (see Technocarb 210 Scan tool section).

The EFS600 controls the fuel supply by opening and closing the stepper motors. Utilizing pre-programmed fuel control values and the input from the engine sensors the EFS600 will attempt to modulate the fuel supply by opening or closing the stepper motors. Opening the stepper motors (increasing the value towards 255) indicates the requirement for more fuel and closing the stepper motors (decreasing the value towards 0) indicates the requirement for less fuel.

There are several fuel strategies programmed into the EFS600 controller. Engine load and rpm determine which strategy will be used. All fuel strategies maintain a closed loop fuel control once the oxygen sensor is on line (warmed up). The purpose of the fuel control strategies is to maintain a stoichiometric air/fuel mix in order for the catalytic converter to operate efficiently.

During engine operation the idle stepper motor (mounted on the converter) controls the fuel supply while idling and the power stepper motor (vapour hose location) controls the fuel supply throughout off idle acceleration and deceleration conditions.

Idle is determined by Throttle Position Sensor input (idle voltage range) and RPM input (RPM below a programmed value, normally 1100 RPM).

Off idle (cruise) is determined by input from the Throttle Position Sensor and the programmed hysteresis value for idle.

Deceleration is determined by Throttle Position Sensor input (idle voltage range) and RPM input (RPM above a programmed value, normally 1100 RPM).

Wide-open throttle is a closed loop acceleration mode, which maintains closed loop control with a rich bias. WOT is established by a programmed Throttle Position Sensor voltage value.

Throttle Inhibitor Relay

Anti-backfire logic. When the key is turned to crank the starter will be disengaged until the idle motor has reached the learned idle default position. With the key still held in the crank position, the starter will re-engage once the default position has been reached. The starter is also disengaged if the throttle is depressed more than a preset amount, by monitoring the TPS voltage. If the throttle is depressed fully, the starter will be re-engaged in order to clear any flooding. The

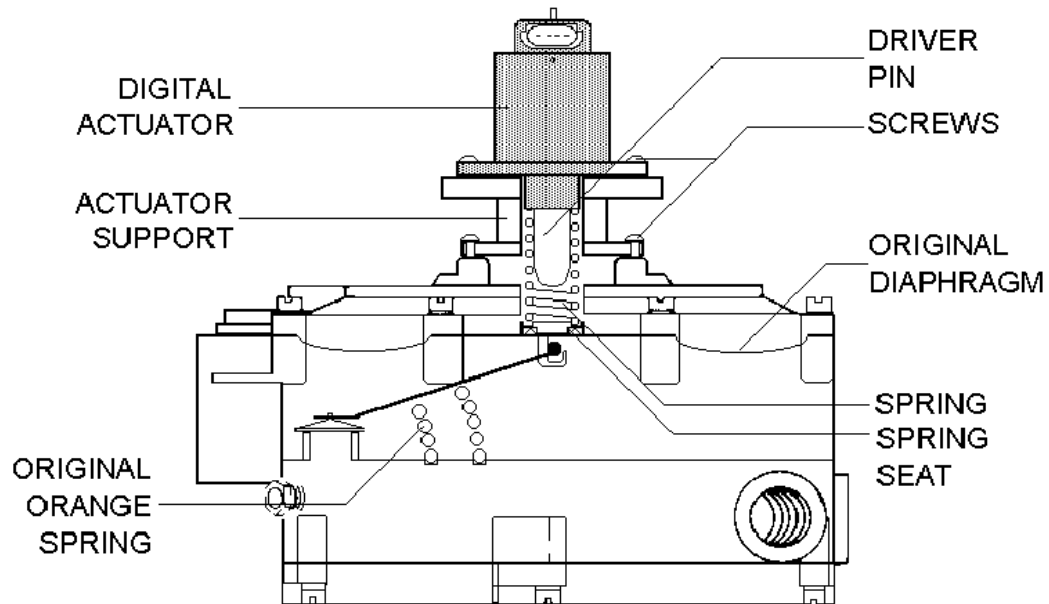
throttle inhibitor function is to prevent lean start conditions produced by depressing the throttle during start-up. On dual fuel conversions, the throttle inhibitor relay is optional. As the vehicle starts on gasoline then automatically switches to LPG; throttle inhibitor functions are not as crucial as on a mono fuel vehicle.

Manifold Purge

After turning the key to the off position the engine will continue to run until the fuel in the manifold, converter and lock off connector is exhausted. This is to prevent flooding on the next start. For the manifold purge to operate correctly the distance from the lock off to the converter must be as short as is practical and should never exceed **six** inches. Whenever possible the lock off should be hard piped directly to the converter.

LPG Converter

The primary stage operation of the B-2 regulator with the Technocarb AK-3 digital idle actuator is not altered. The cover of the B-2 regulator has been modified to accept the AK-3 digital actuator. This enables the second stage operation to be controlled.



THEORY OF OPERATION

During engine start up and operation, the actuator pushes down on a spring that is located on top of the regulator secondary diaphragm. The normal location of the secondary spring (standard "orange" spring) in the unit is maintained. The above combination creates a balance between the orange secondary spring under the lever and the spring that is compressed on top of the secondary diaphragm by the energized AK-3 digital actuator. This balance allows the pressure drop created through the Technocarb venturi mixer to cause the secondary diaphragm to lower, and allows for fuel delivery to the engine.

If no Oxygen Sensor signal is received (sensor cold or malfunctioning) by the EFS600 electronic controller, the idle mixture is maintained by using the RPM. input. When Oxygen sensor input is available, it then becomes the main reference for maintaining the idle mixture. During off-idle engine operation, the AK-3 actuator is inoperative and the power actuator takes over fuel management. On engine shut down the idle actuator retracts completely to index itself to a zero count.

SERVICING.

B-2 regulators have been proven very reliable, requiring very little maintenance due to their simple, yet robust construction. Their servicing intervals are based upon the LPG quality, as this may vary between regions and seasons. Regular inspections are recommended whenever the vehicle is in the shop, and may include but not be limited to testing the first-stage pressure, inspecting for oil accumulations and verifying there are no internal or external leaks.

Regulator Overhaul Kits are readily available, and it is recommended that the regulator be completely overhauled whenever large contamination and/or component degradation (particularly diaphragms) is detected.

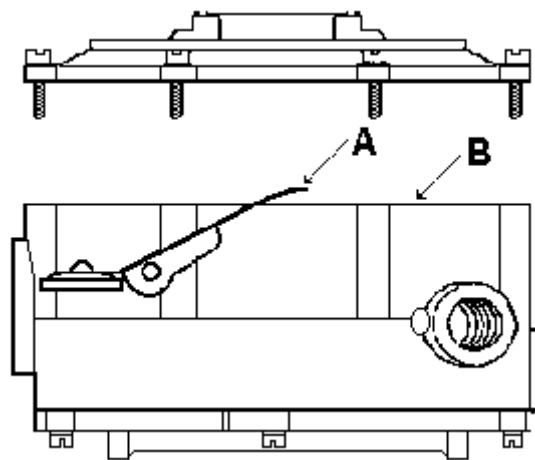
ON-BOARD TESTING

- *Close the valve on the LPG tank, and run the engine until the fuel is fully depleted.*
- *Remove the 1/8" NPT test-plug on the side of the regulator.*
- *Install a low pressure manometer on the test-port, preferably a 0-10psi gauge.*
- *Open the valve on the LPG tank and start the engine.*
- *The manometer should read 1.5 – 2.0 psi.*
- *Accelerate the engine a few times, and return the RPM to idle.*
- *The pressure should remain equal and constant.*
- *If the pressure varies or fluctuates, the regulator must be removed and serviced.*
- *Verify the idle actuator counts (refer to EFS-600 set-up instructions).*
- *Remove the manometer and reinstall the test-plug with an approved thread- sealer.*
- *Check the regulator for leaks.*

DISASSEMBLY, INSPECTION AND CLEANING OF B-2 REGULATORS

- *Close the valve on the LPG tank, and run the engine until the fuel is fully depleted.*
- *Turn the ignition key to the “OFF” position, to ensure that the idle actuator is fully retracted before being disconnected.*
- *Disconnect the propane line from the regulator (or solenoid valve).*
- *Clamp the coolant hoses with an appropriate tool, and remove from regulator.*
- *Drain the excess coolant from the hoses and regulator. If severe rust is detected, the regulator must be fully disassembled and overhauled.*
- *Unfasten the regulator and remove from the vehicle.*
- *On a clean and properly illuminated work-bench, disassemble the regulator.*
- *Remove the solenoid valve, and inspect the inlet port threads.*
- *Plug the inlet-port with a ¼” NPT plug, while working on the regulator (specially if the bottom cover is not removed).*
- *Remove the digital actuator and wipe with a clean cloth.*
- *Inspect the actuator spring for rust or deterioration. Replace if necessary.*
- *Clean the regulator body and covers with a mild solvent (Brake cleaner is recommended).*
- *Clean the primary and secondary valves with soap and water, and inspect for damage. Replace if necessary.*
- *Inspect the primary and secondary diaphragm thoroughly, and replace if necessary. If the water gasket is removed, it must be replaced with a new one.*
- *Reassemble the regulator, ensuring that the secondary lever height is at 0.115 inches above the plane of the converter (see below) or in line with the Technocarb Lever Gauge.*

B-2 REGULATOR



**Lever height is measured from the top of the lever (A),
to the upper plane of the regulator body (B).**

Installation Information

- 1) On single fuel vehicles the EVAP emissions system must be sealed, as it will now be a vacuum leak. Do not unplug the canister purge solenoid, as that will cause OEM computer coding. If the fuel tank is to be removed from the vehicle, ensure that the Fuel Tank Pressure Sensor (1998 and newer vehicles) is left with the vehicle or simulated with the appropriate resistance value.
- 2) On single fuel vehicles that still have the injectors operating ensure that the fuel lines from the gasoline tank are sealed, as the injectors will now become vacuum leaks.
- 3) Installations utilizing a tank-mounted lock off still require a lock off mounted to the converter. This is to meet the requirements for start up and manifold purge.
- 4) Abnormally high or low counts at idle may be caused by an incorrect secondary lever height adjustment.
- 5) Incorrect primary pressure can also cause abnormal counts. Correct primary pressure for the B2 converter is 1.5 to 2 psi at idle and slightly higher at WOT.
- 6) Vacuum leaks anywhere in the air induction system between the air filter canister and the engine block can cause abnormally high counts.
- 7) A faulty Oxygen Sensor will cause abnormal counts.

Notes

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Rev.0405