



Note: These kits are not legal for use on pollution controlled vehicles

Instruction Manual

for the following Go EFI Systems

30001, 30002, 30004, 30012, 30061, 30062 & 30064

This Quick Start Manual is designed to get you up and running with the Go EFI System Base Kit and either the 40003 Fuel Command Center or the 40005 Inline [Fuel Delivery Kit](#). The FiTech Go EFI System is the industry's most advanced throttle body EFI system and also the eas-i-est to install. It includes a very advanced Handheld Con-troller but is also capable of being far more tunable than

any competitive product that utilizes a Handheld Controller. Please read the full instruction manual before beginning your installation.

These instructions cover the Basic Kit installation and setup as well as instructions for both of the optional Fuel Delivery Kits.

Warning: Caution must be observed when installing any product involving fuel system parts or gas tank modifications. Work in a well ventilated area with an approved fire extinguisher readily available. Eye goggles and other safety apparel should be worn to protect against debris and sprayed gaso-

line. We recommend having this installation performed by an experienced qualified automotive technician. The finished installation must be thoroughly checked for any fuel system leaks. All safety precautions must be observed when working with fuel. **Note: Do not use solid core ignition wires.**

30001/30002/30004/30012/30061/30062/30064 Kit Contents

- | | |
|---|---|
| (1) 4-Injector Throttle Body - Tumbled Polished (30001) or, | (1) Handheld Controller w/billet case |
| (1) 4-Injector Throttle Body - Matte Black Finish (30002) or, | (1) Wide Band O ₂ Sensor |
| (1) 4-Injector Throttle Body - Matte Black Finish (30004) or, | (1) O ₂ Sensor Bung Kit |
| (1) 8-Injector Throttle Body - Matte Black Finish (30012) or, | (1) Fuel Pressure Regulator (Installed in Throttle Body) |
| (2) 4-injector Throttle Bodies - Tumbled Polished (30061) or, | (1) Gasket Kit |
| (2) 4-injector Throttle Bodies - Matte Black Finish (30062) or, | (2) -06 AN Inlet/Outlet Fittings (Installed on Throttle Body) |
| (2) 4-injector Throttle Bodies - Matte Black Finish (30064) | (3) Inlet/Outlet Port Plugs (Two installed on Throttle Body) |
| (1) Harness "A" (Plug-in pigtail user harness) | (1) Data Com Cable |
| (1) ECU (Mounted on Throttle Body) | (1) 8 gigabyte SD Card (Installed in Controller) |
| (1) Set of four or eight injectors pre-installed | (1) 3/8-NPT Reducer |
| (1) Idle Air Control (Installed on Throttle Body) | (1) 10mm Port Plug |
| (1) Throttle Position Sensor (Mounted on Throttle Body) | (1) Instruction Booklet |
| (1) Coolant Sensor | |

About your FiTech Go EFI System

The Fitech Go EFI System will bolt directly to any 4-BBL intake manifold. To fit on a spread bore 4-BBL manifold will require an inexpensive adapter plate to avoid leaks. Note that the FiTech throttle body will bolt directly to a spread bore 4-BBL manifold but may leak without the

adapter plate. Suitable adapter plates are available from several suppliers such as Summit Racing (SUM-G1420).

The Fitech Go EFI System is self tuning once the simple initial setup is performed using the Handheld Controller. When the necessary initial inputs are made with the Hand-

held Controller the Go EFI System creates a base fuel MAP to get the engine running. Then the self tuning programming will fine tune the MAP to produce optimum power and performance. Through the use of a wide band O₂ sensor the system can continuously make adjustments in the fuel delivery to provide the correct air/fuel ratio under all climate and altitude conditions.

The ECU (computer) is mounted on the throttle body thus eliminating the necessity of remote mounting the ECU module and the need for an unsightly harness draped over your engine. Several sensors are also integral to the throttle body assembly including the throttle position sensor (TPS), manifold absolute pressure (MAP), intake air temperature (IAT), and a fuel pressure sensor.

Initial Programming: This simple procedure is performed using the Handheld Controller. A laptop computer is not required. This unit plugs into the throttle body ECU. After a few initial inputs are made the Handheld Controller can be removed or left connected. When connected, there is a dashboard and gauges screen that will show engine parameters in real time.

Fuel Delivery Systems: You may have chosen one of the two optional Fuel Delivery System Kits from FiTech. Instructions come with each kit. If using other fuel delivery components you must use a 30-micron filter ahead of the fuel inlet fitting on the Fitech throttle body.

Wide Band O₂ Sensor: This is the key component of any EFI system. Only one sensor is required. This sensor continuously monitors the exhaust gas mixture and sends the information to the ECU where adjustments are con-

Fuel Delivery Requirements

FiTech offers two different fuel delivery options. One is the 40003 Fuel Command Center. When using this option, you can configure the system to operate on a returnless basis. The other fuel delivery system is the 40005 Frame Mount Inline External Pump. Using this pump the system must have a return line. The Fuel Command Center uses your existing carbureted fuel pump and fuel lines to deliver the fuel to the Command Center which is mounted in the engine compartment. The only plumbing required is from the Center to the EFI.

High pressure hose and fittings are supplied with this kit to plumb from the Command Center to the EFI throttle body. A 340 L/PH EFI pump is submerged in the fuel in the Command Center sump tank. The Center also has a regulator and fuel pressure gauges.

When using the 30001/30002 Go EFI kits, the Command Center is suitable for engines making from 200 HP

stantly made to maintain the air/fuel targets.

Trigger Tach Signal: The FiTech EFI requires an rpm/trigger reference to operate. This is obtained by a connection to the negative post on a 12V coil. On HEI distributors, this connection is made to the "Tach" terminal that is indicated on the HEI distributor cap.

Timing Control: Timing Control, or "spark control" as it is sometimes called, is available on the Go EFI System. Unlike most systems, an external CDI ignition box is not required. In fact, the Go System is the only throttle body EFI with a throttle body mounted ECU that has timing control without the need for an external CDI box. This is a savings of at least \$200. The advance mechanism of the distributor used must be locked out. Settings are available for idle timing, as well as complete timing control using your Handheld Controller.

Rev Limiter: The Go EFI System provides both spark and a fuel controlled rev limiter. When the engine attains the programmed rpm limit, fuel will be cut off to maintain the desired limit. Any external ignition related rpm limiter is independent of the Go EFI System limit.

Power Adders: The Power Adder units are designed to operate in conjunction with wet nitrous systems as well as draw-thru or blow-thru superchargers or turbochargers. The Handheld Controller includes a program for nitrous that allows you to set a target air/fuel ratio when the nitrous is activated plus you can retard the timing (when timing control is active). Nitrous systems require their own fuel pump to supply the added fuel required with nitrous. There is a target air/fuel ratio setting when operating under boost with forced induction applications.

to 600 HP. Either fuel delivery system can be used with these EFI systems. When using the 8-injector 30012 Go EFI System and the Fuel Command Center, the system is suitable for engines making up to 800 HP. When combining the 30012 Go EFI System with the 40005 Inline Pump, it is suitable for engines up to 600 HP.

Note: If you have elected to use the Fuel Command Center and your vehicle currently has a high pressure fuel injection pump, it must be replaced with a low pressure carbureted style pump. Note that vehicles equipped with factory high pressure EFI pumps are not compatible with the Fuel Command Center.

If you choose to use some other fuel delivery system other than FiTech, it is important to make sure that you confirm its compatibility with the FiTech EFI system. Fail-ure to do so can void your warranty.

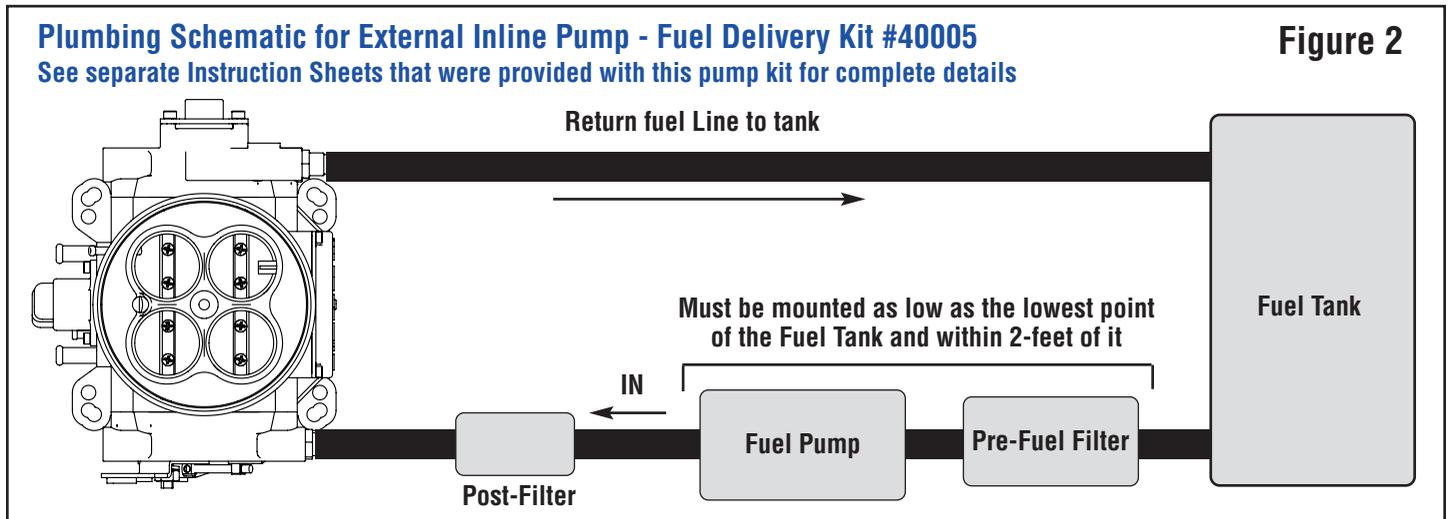
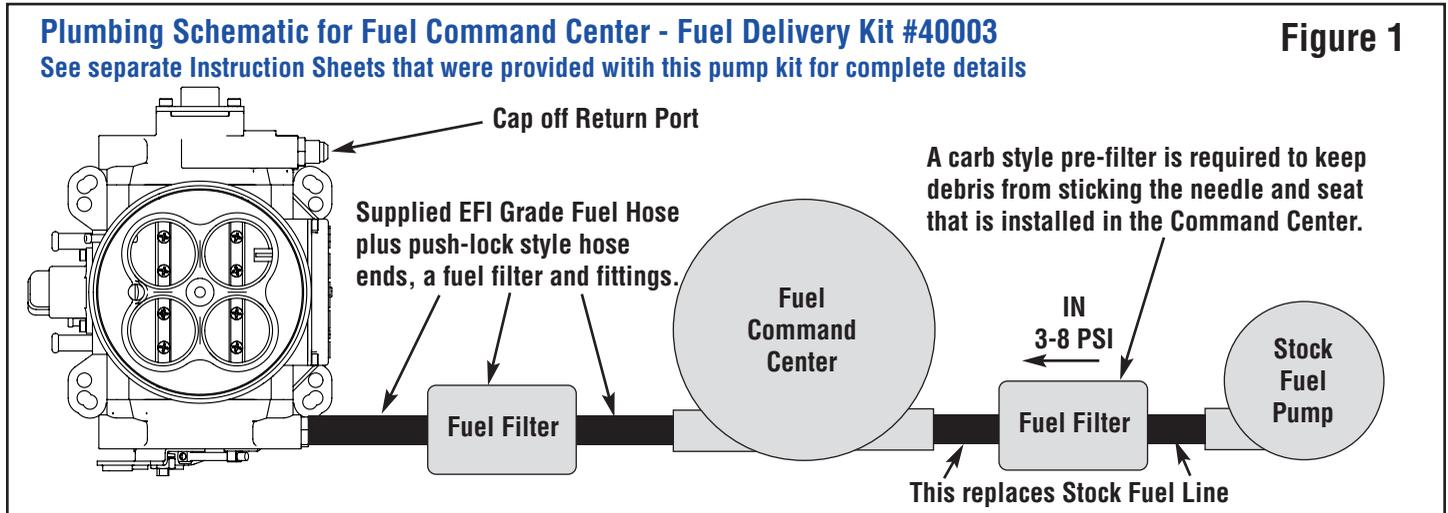
Note the following special instructions:

- We recommend using the Fuel Command Center for all installations. A submerged pump is quieter and lasts longer.
- If using the Frame Mount Inline Fuel Pump, it should be mounted as close to the fuel tank as possible and also as low as possible. It should be within two to three feet of the tank. This type of pump is designed to pump, not draw, and works best when gravity fed.
- Only use hard fuel lines when using proper EFI rated flared fittings. Make sure that you remove ALL low pressure flex joints on factory fuel lines and replace them with EFI rated fuel hose and use proper flared connections and clamps. Be careful not to mix 45° and 37° AN fittings , they look similar but will not work together. 45° fittings

usually come from a hardware store or auto parts store while 37° AN fittings are the ones supplied by Fitech and most speed shops. Remember that your system will be running at 58 PSI so consult a professional if you are not certain about this portion of your installation. Fitech does not recommend aluminum fuel lines EVER! Or you can use the supplied EFI high pressure fuel hose that is supplied in your Fuel Delivery Kit.

- Use the supplied push lock style hose ends only with the supplied hose and vice versa. Intechanging hose ends and hose with other brands could cause leaks.

VERY IMPORTANT NOTE: Your fuel tank must have a vent to prevent pressure building up inside the tank.



Note: Before starting any installation, disconnect the ground connection on the battery. Be very careful when disconnecting any fuel lines to let the fuel drain into a receptacle or a dry cloth. Do not allow raw fuel to collect on the engine as this is a fire hazard. Please observe extreme caution when working with the fuel system.

Oxygen Sensor Installation

The supplied O₂ Sensor can be installed in either exhaust bank. The Sensor cable connects to one of the cables coming out of the ECU on the throttle body.

- A. The ideal location for the Sensor is 2-4 inches after the exhaust collector. It must always be at least 18-inches from the exhaust tip. Where short or open headers are utilized, install the sensor in the primary tube of the rear

cylinder. Must be at least 8-inches from the exhaust port. It will not work on "zoomie" style headers.

- B. The sensor should be at least 10° above horizontal (see figure #3) to allow condensation to run off. If this is not adhered to, the sensor is susceptible to water damage.
- C. Never position the sensor on the outside of a bend in the tubing.

D. The sensor must always be mounted ahead of any catalytic converter if so equipped.

E. Drill a 7/8" diameter hole in the desired location.

F. The supplied bung kit can either be welded in place or clamped onto the pipe. The clamp-on style works well and will not leak. If welded, make sure the bung is welded completely all the way around and does not leak.

G. Install the sensor into the bung. **WARNING:** Do not start the engine without the sensor cable connected to the throttle body and the EFI system is fully operational or damage will occur to the sensor.

AIR LEAKS: It is important that no air leaks exist anywhere in the exhaust system between the sensor and the engine. Any exhaust leaks will cause the unit to receive

Throttle Body Installation

Installing the throttle body is no different than replacing the carburetor. Disconnect the throttle linkage and the fuel line. Remove the existing carburetor from the intake manifold. Clean the gasket surface of the manifold.

Vacuum Ports: Before installing the throttle body determine the engine's need for vacuum accessories. The FiTech throttle body has five vacuum ports including ported and manifold. These ports cover accessories such as power brakes. There are three 3/16" male nipples and two 3/8" male nipple. If you need more vacuum connections than this, you can purchase vacuum tees and vacuum hose at your local auto parts store. See Figures 4, 5, and 6 for location and use of various vacuum nipples.

Throttle Body Installation:

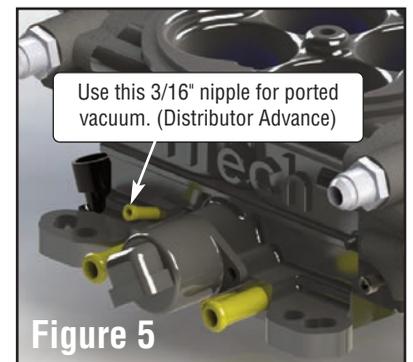
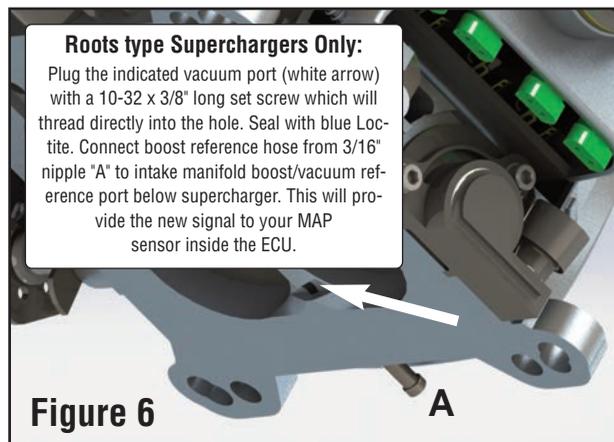
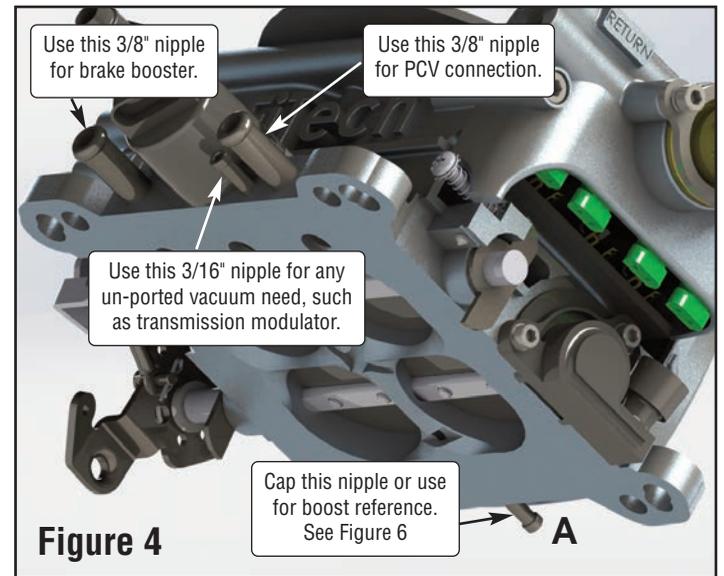
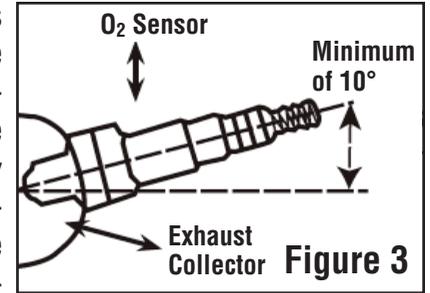
Place the supplied gasket onto the manifold and place the throttle body onto the gasket. The throttle body linkage must be on the driver's side of the engine. Install the original nuts and washers onto the four carburetor studs. Tighten to 16 lb. ft. of torque.

The FiTech throttle body has four fuel ports. Three inlet and one return. Any one of three can be the inlet. The outlet port is marked with the word "Return." On a returnless setup the outlet port is plugged. Three plugs are provided

Coolant Temperature Sensor Installation

The Temperature Sensor should be threaded into one of the ports in the intake manifold or cylinder head. The sensor threads are 3/8-NPT. Some manifolds have 1/2-NPT ports and in this instance use supplied pipe reducer. Con-

nect the Yellow/Black wire lead from the throttle body to the sensor. Snap the connector into the sensor. Use Teflon tape or a quality pipe sealant on both the pipe reducer (if used) and on the temperature sensor. false readings. This will lead to poor engine performance, including misfires, and the inability to properly auto-tune the EFI. Continued running of the system with an exhaust leak can create detonation and possible severe engine damage. Incorrect installation of the sensor, exhaust leaks, and any resulting damage is not covered by the FiTech manufacturer's warranty. Make sure your exhaust is leak-free. This is very important.



in the kit for the unused ports. Two plugs are installed in the throttle body with one loose one in the kit. All three plugs will be used on returnless configurations and only two will be used when the system will have a return line.

nect the Yellow/Black wire lead from the throttle body to the sensor. Snap the connector into the sensor. Use Teflon tape or a quality pipe sealant on both the pipe reducer (if used) and on the temperature sensor.

Wiring the EFI System

The supplied Harness "A" (see Figure 7) plugs into mating Connector "B" from the throttle body mounted ECU. See Figure 8. The various wires will need to be extended to make required connections. See the Wire Chart on page 6 which lists each wire used in the system and what it connects to. It is strongly suggested that any wire extensions are made with the same gauge and color wire as is used in the supplied Harness. Make connections as a soldered joint rather than as a crimped connection. Utilize a shrink wrapped sleeve covering all connections.

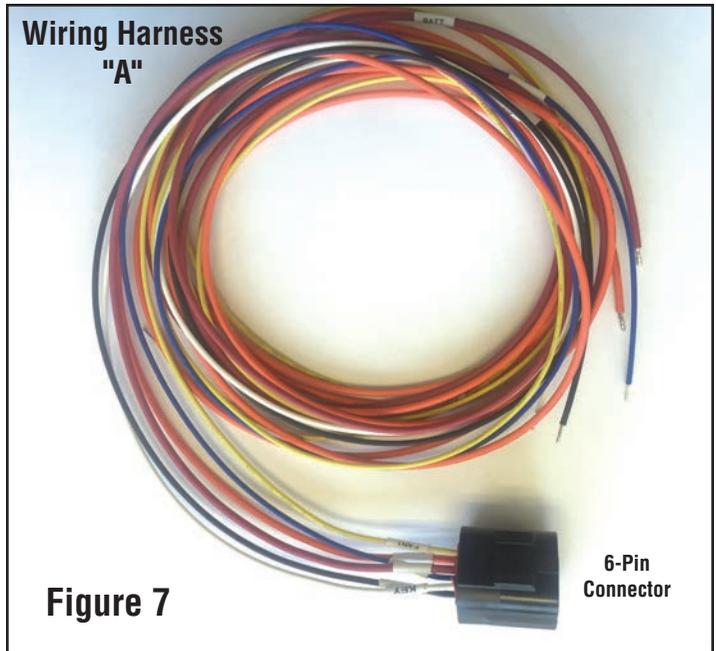
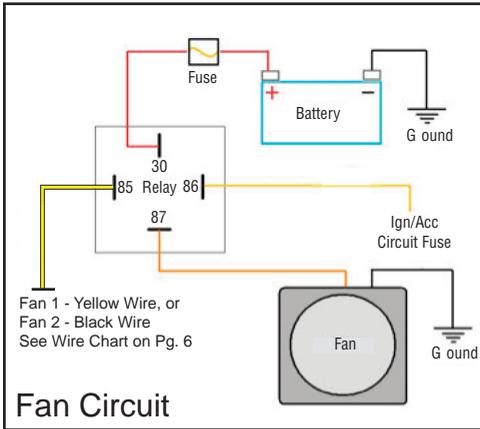


Figure 7

Harness "A" plugs into connector "B" from throttle body mounted ECU. See Figure 8 and page 6 Wiring Chart.

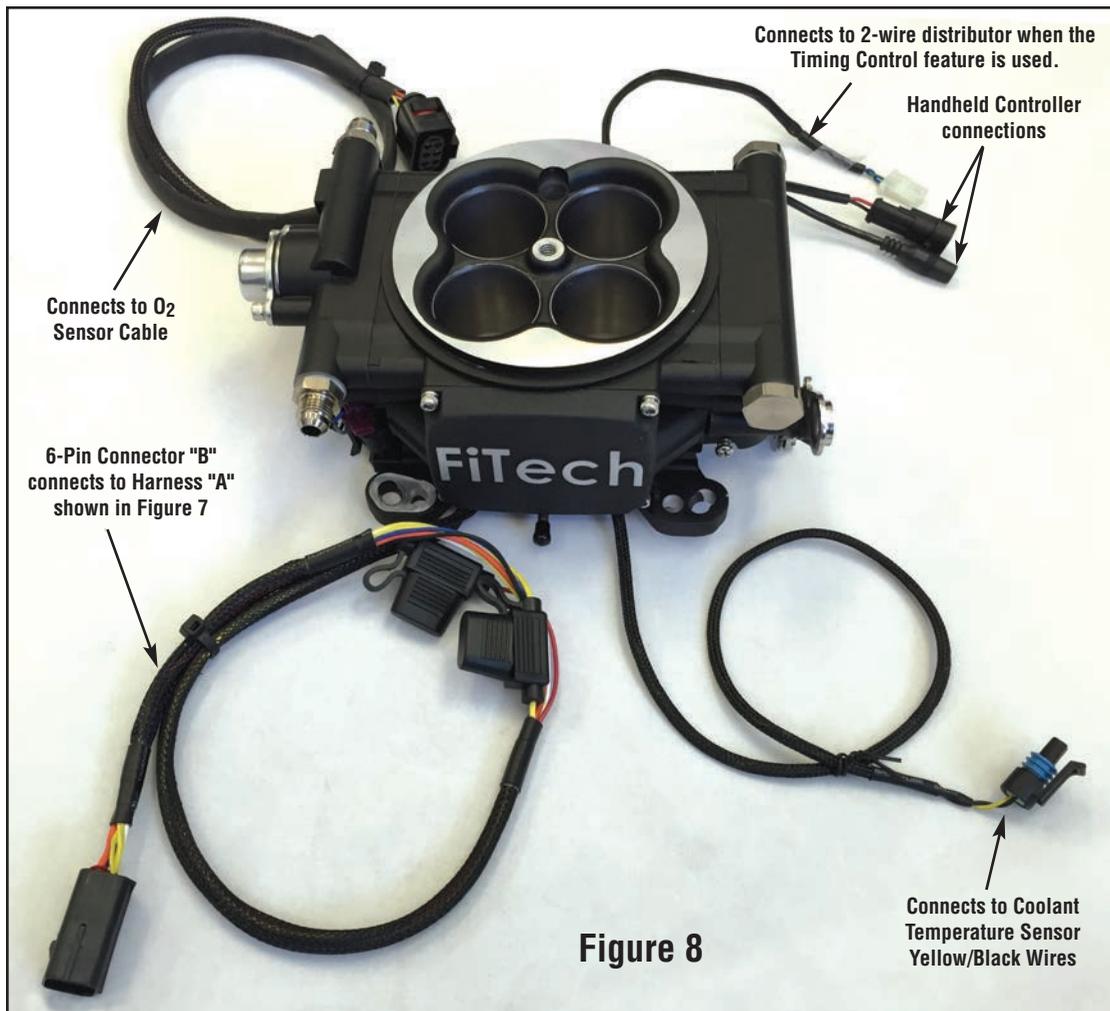


Figure 8

The above photo shows all of the cables that are associated with the FiTech Go EFI System throttle body. The large cable at the bottom left connects to the supplied

Harness "A" which contains the main six wires used in the system. The large coiled cable at top left connects to the supplied Oxygen Sensor cable.

Wiring Chart

The Chart below lists all of the wires in the FiTech Go EFI System. The wires are color coded and the wires that are part of Harness "A" are all marked for where they go. There are six wires in Harness "A." Four of them are required connections and two are optional. One of the op-

tional wires (Black) is required when the Timing Control feature is being used. If Timing Control is not used, then the Blue wire is used in place of the Black wire. More detailed connection information (Figures 9 through 13) is provided on later pages of these instructions.

The Following Wires Are Used In All Systems (6-Pin Connector)		
Req./Opt.	Wire Color	Description
Required	Red (Large)	Main power. Connect this wire directly to the positive (+) terminal of the battery. This circuit needs to be live even when the switch is off so that the self learning files are maintained. This is fused with a 25 amp fuse.
Required	Yellow/Black	This wire connects to the Engine Coolant Temperature Sensor
Required only if Timing Control is not used	Blue	This is the tach input wire which triggers the system. It connects to the 12V Negative terminal of the coil. On HEI distributor it connects to the "Tach" terminal on the distributor cap or connects to a tach output on a CDI box.
Required only if Timing Control is used	Black	This is the coil trigger wire. Connect this wire to the points wire on any external ignition CDI box such as an MSD 6A or to negative coil post if not using a CDI box.
Required	Orange (Large)	Fuel Pump circuit. This wire provides 12V to the fuel pump and connects to the positive (+) terminal on the pump. No relay is required.
Required	O ₂ Harness	This cable from ECU connects to the Wide Band Oxygen Sensor harness.
Required	Wiring Harness A	This connects to Connector "B" from ECU. See Figures 7 and 8 (Page 5).
Required	White	On/Off - Connect this wire to a switched 12V circuit. Must be on during both "Key On" and "Cranking." DO NOT connect to the coil terminal when using an external CDI box such as an MSD 6A or any other CD ignition.
Optional Used with Timing Control	Violet (+) Green (-)	This is the input for a magnetic pickup, such as from an MSD distributor or any other magnetic pickup two-wire distributor. This connection is only used in conjunction with the Timing Control feature.
Optional	Yellow	Fan Circuit #1. This wire goes to the ground terminal of the fan relay.
The Following Additional Wires Are Used In Power Adder Systems (4-Pin Connector)		
Req./Opt.	Wire Color	Description
Optional	Red (Thin)	Air Conditioning
Optional	Black	Fan Circuit #2. This wire goes to the ground terminal of the fan relay.
Optional	White	Nitrous "IN" Signal. This should receive 12V positive when Nitrous arming safety switch is activated.
Optional	Tan	Nitrous "OUT" signal. This is the relay ground for nitrous solenoids. Trigger wire cannot ground the Nitrous solenoid directly. Must use relay.

Wiring Diagrams

On the following five pages are various wiring diagrams that address the most common ignition arrangements that will be found. Each diagram will show you the specifics of how to wire your FiTech Go EFI System for that particular ignition setup. Note that the FiTech Go EFI timing control feature cannot be utilized if you have a

"ready-to-run" distributor or an HEI distributor. It will work with most other aftermarket or stock distributors but in every instance the advance mechanism in the distributor must be locked so it cannot function when using timing control. Most aftermarket distributors provide instructions on how to lock the advance mechanism.

Selecting the correct wiring schematic: Review Figures 10 through 14 and select the schematic that suits your particular application. Note that if you elect to use Timing Control you must select a suitable schematic. Figure 10 shows how to connect a ready-to-run distributor without timing control. Figure 11 is for an HEI distributor without timing control. Figure 12 is for a system with an external CDI box without timing control while Figure 13 is a CDI box with timing control. And Figure 14 is with a conventional 2-wire distributor with timing control. One of these configurations will suit your vehicle.

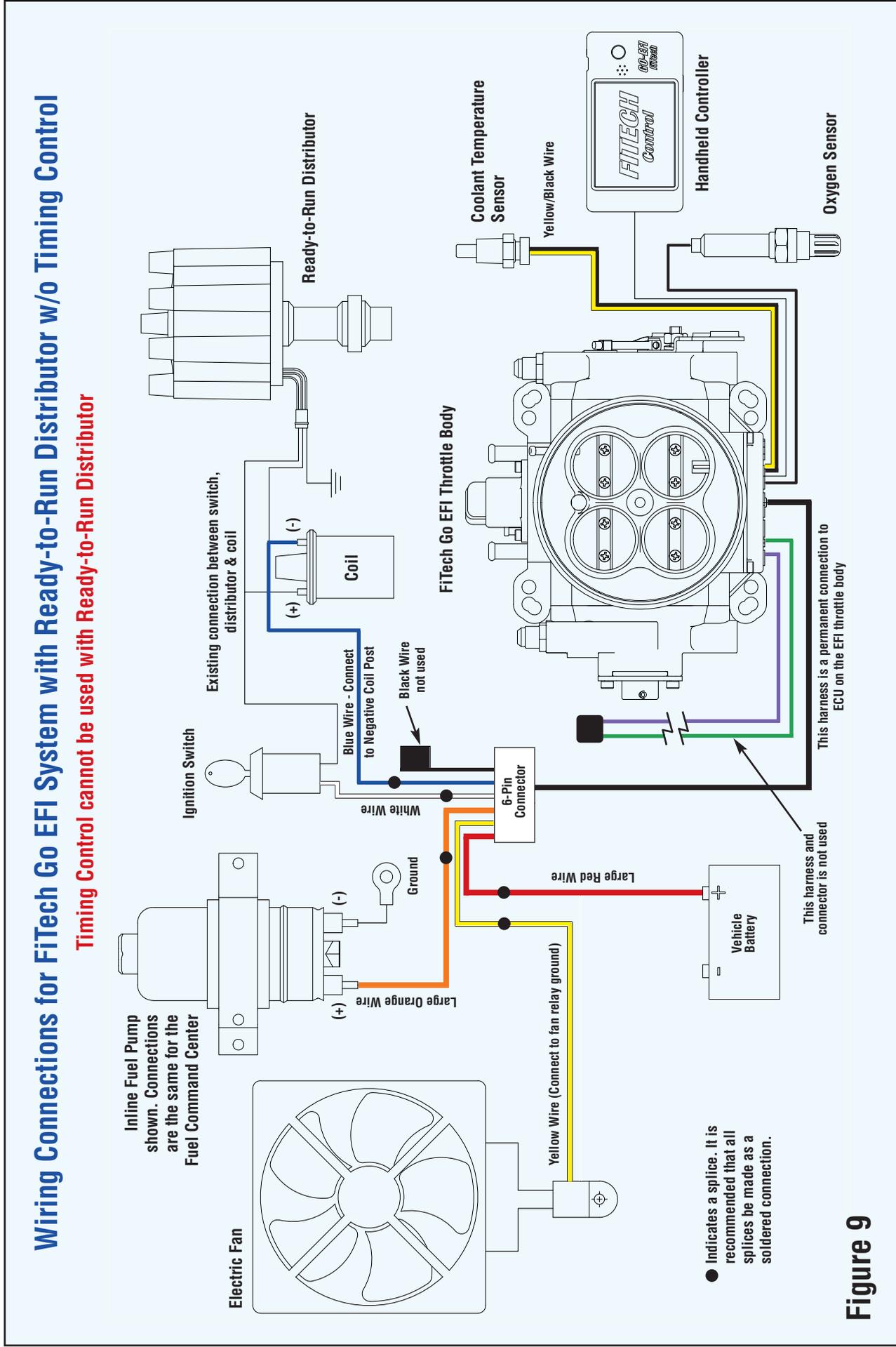


Figure 9

Wiring Connections for FiTech Go EFI System with HEI Distributor w/o Timing Control

Timing Control cannot be used with HEI Distributor

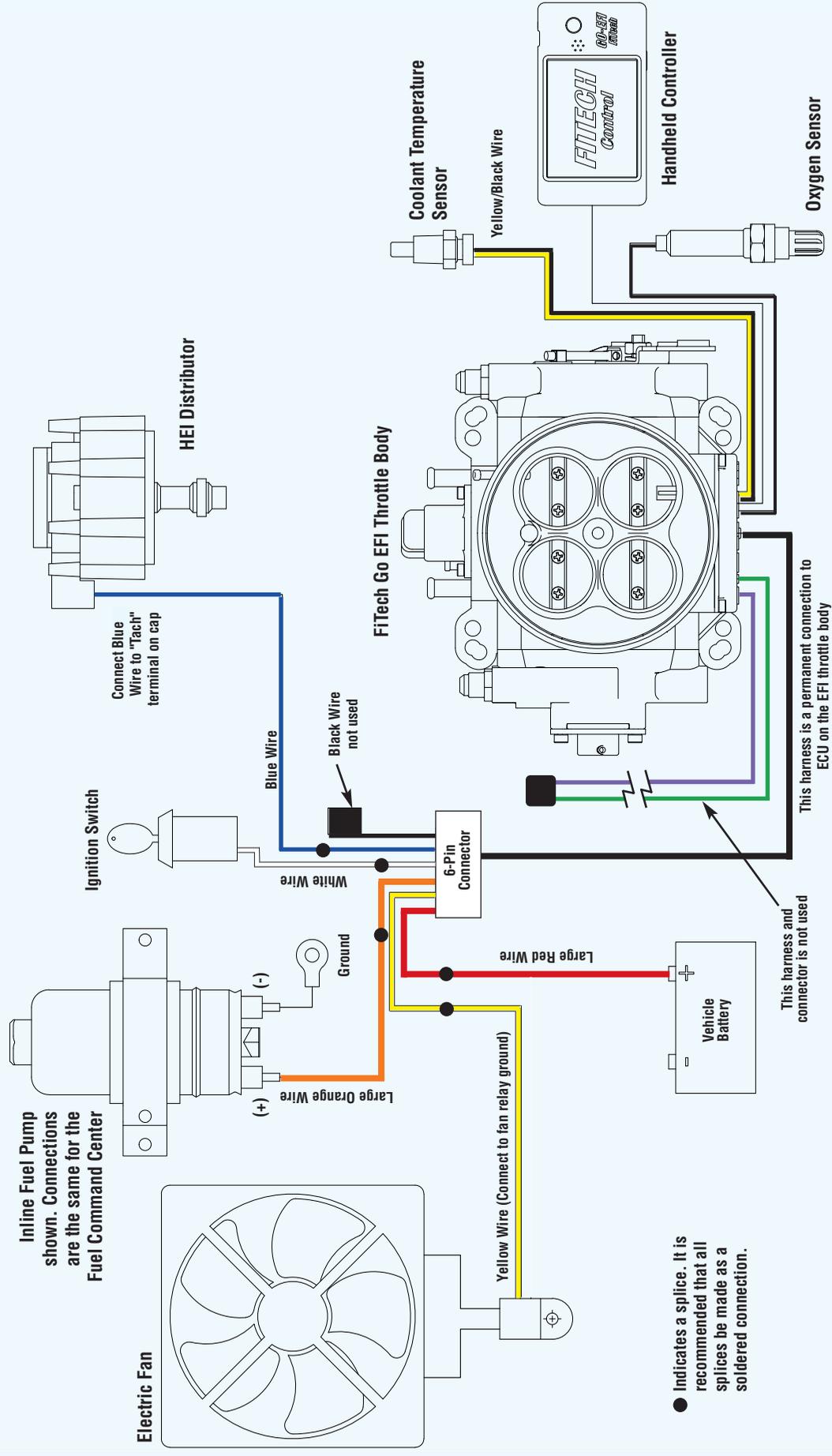


Figure 10

Use this wiring schematic if you are utilizing an HEI distributor without an external CDI box, such as a MSD 6AL or similar aftermarket ignition box. Note that the Fitech EFI Timing Control feature cannot be used with this type of distributor. All other EFI features are compatible.

Wiring Connections for FiTech Go EFI System with External CDI Box w/o Timing Control

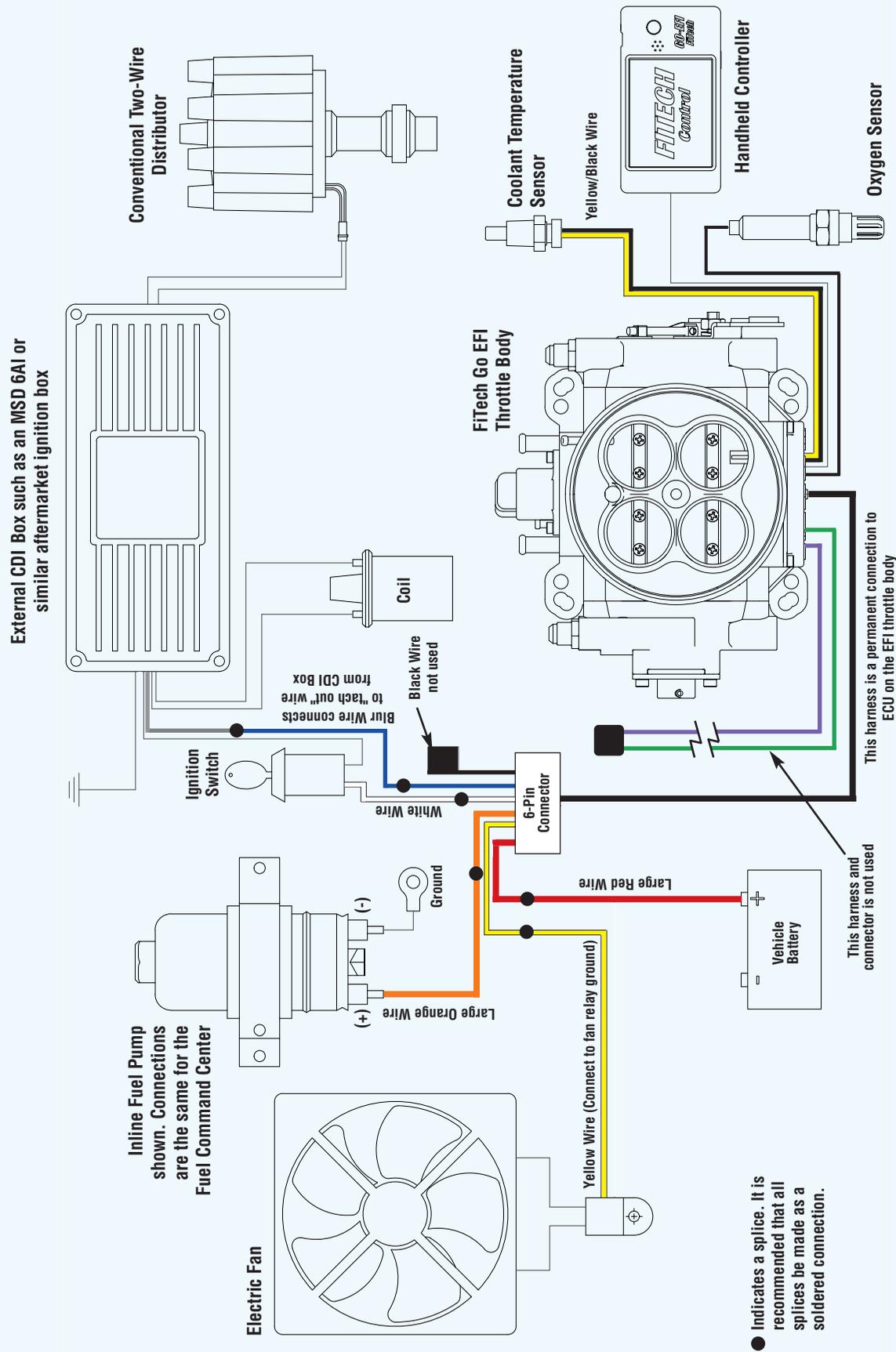


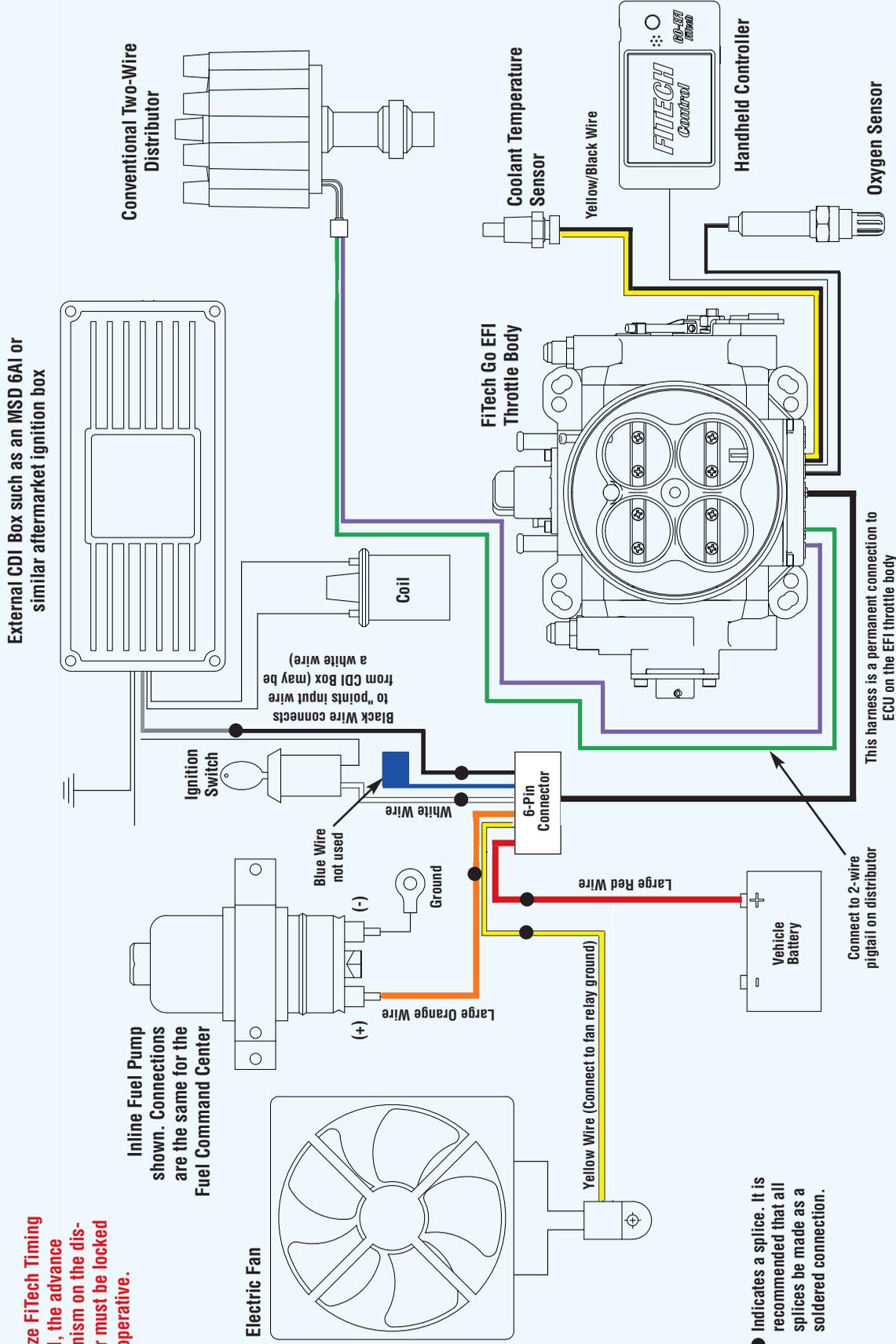
Figure 11

Use this wiring schematic if you are utilizing a conventional two-wire distributor with an external CDI box, such as a MSD 6AL or similar aftermarket ignition box, and you will not be using the FiTech Timing Control feature. See Figure 11 for this configuration with Timing Control.

Wiring Connections for FiTech Go EFI System with External CDI Box with Timing Control

To utilize FiTech Timing Control, the advance mechanism on the distributor must be locked and inoperative.

Inline Fuel Pump shown. Connections are the same for the Fuel Command Center



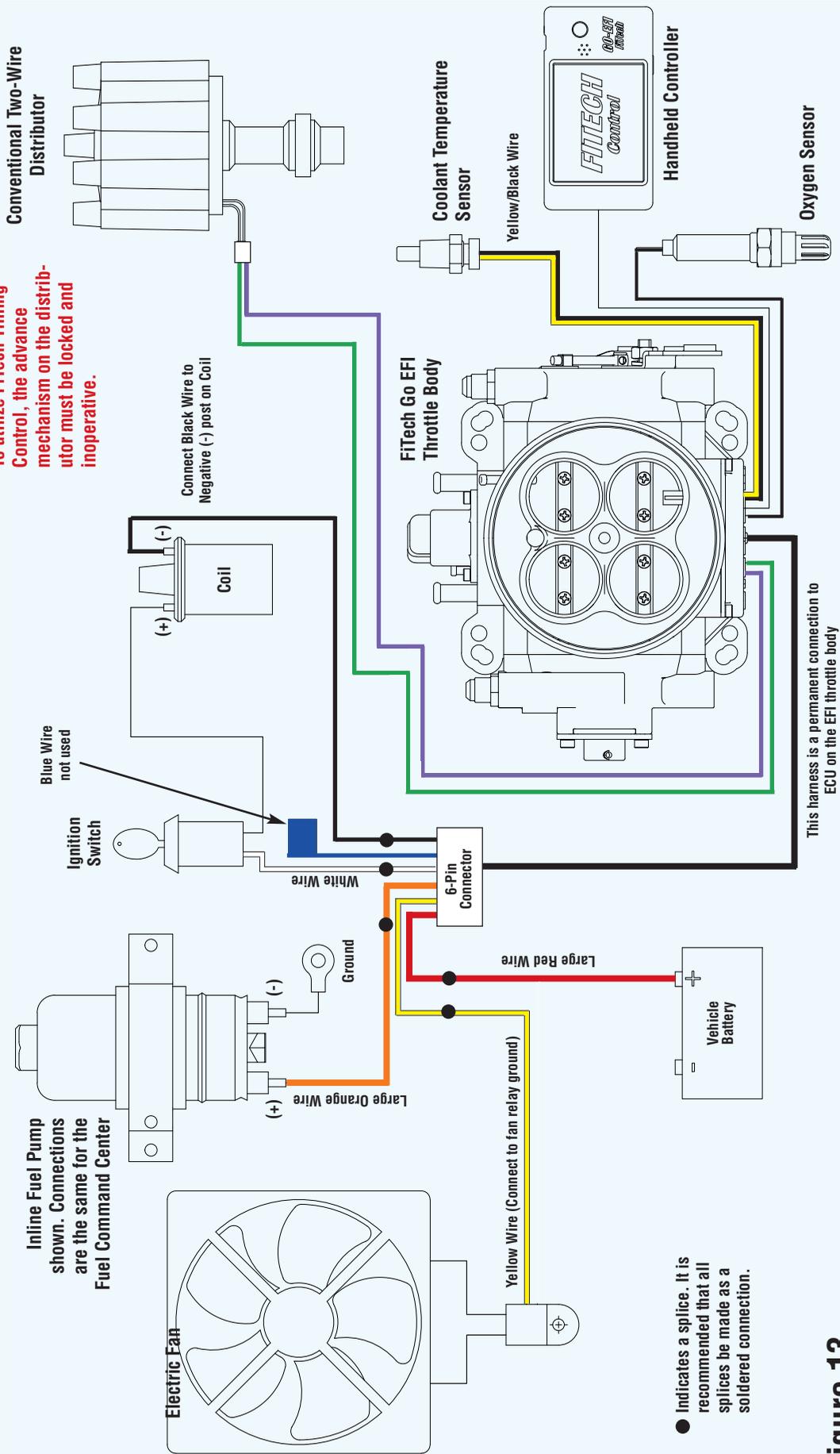
● Indicates a splice. It is recommended that all splices be made as a soldered connection.

Figure 12

Use this wiring schematic if you are utilizing a conventional two-wire distributor with an external CDI box, such as a MSD 6AL or similar aftermarket ignition box, and you want to use the FiTech Timing Control. Note that your mechanical advance mechanism must be locked to use Timing Control.

Wiring Connections for FiTech Go EFI System with Conventional Distributor w/Timing Control

To utilize FiTech Timing Control, the advance mechanism on the distributor must be locked and inoperative.



● Indicates a splice. It is recommended that all splices be made as a soldered connection.

Figure 13

Use this wiring schematic if you are utilizing a conventional two-wire distributor ignition box, and you want to use the FiTech Timing Control. Note that your distributor without an external CDI box, such as a MSD 6AL or similar aftermarket mechanical advance mechanism must be locked to use Timing Control.



Setting the Fuel Pump Pulse Width Modulation

Did you know that you can control the pulse width modulation (speed) of your fuel pump with your hand held controller? Your system comes shipped with the fuel pump control pwm set for frame mounted pumps. If you are using a fuel command center (fcc) you should change the speed of the pump. To do this follow these steps:

Step 1: Plug hand held controller into the ECU on the FiTech Throttle Body. Turn your key on or start your engine to power the system.

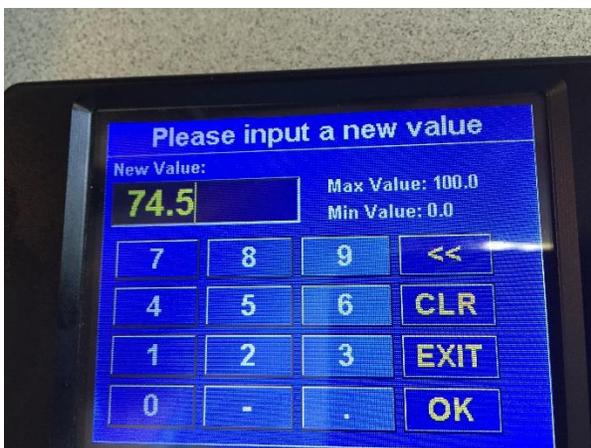
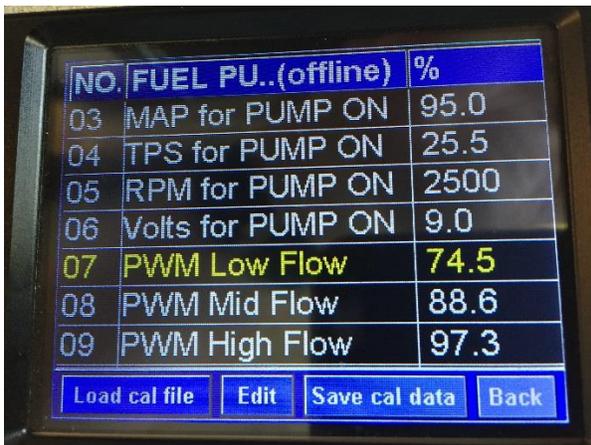
Step 2: Go to the Main Menu. In the Main Menu Scroll down to option 6 Go EFI Pro Tuning. Select Go EFI Pro Tuning.



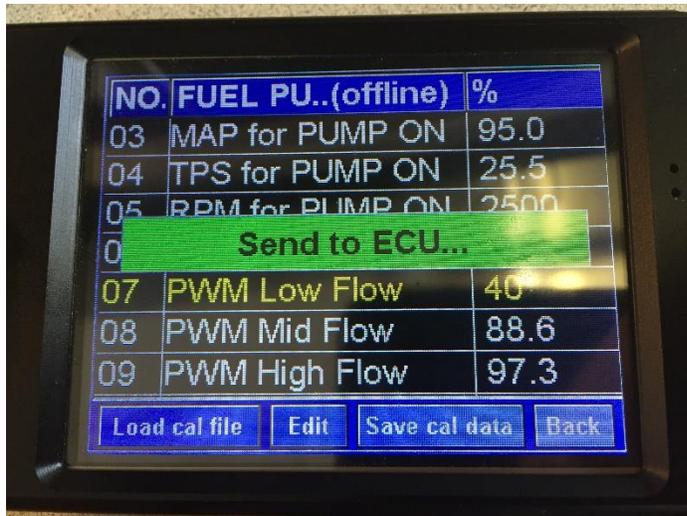
Step 3: In the Go EFI Pro Tuning Menu scroll down to Option 12 Fuel Pump Control. Select Fuel Pump Control.



Step 4: Scroll down to option 7 (PWM Low Flow) select edit. In the edit menu press clear (CLR) enter a new value of 40.



Press ok, then in the Fuel Pump Control Menu press the center of the control stick to send the change to the ECU.



Step 5: If the engine is running the system update should be complete and you are done. If the changes were made with just the key on turn the key off and wait 15 seconds for the system to power down (the screen will flash black) once this is complete you may now start the engine and verify your change.



Handheld Controller Feature Definitions

Basic Settings: These values and options allow

Engine CID = Total Engine cubic inches

Cam Mild-Wild 1-4 = This is the way to select a specific volumetric efficiency table that is specially tailored to the characteristics of typical engine configurations.

Rev Limit RPM = At this RPM, the fuel and spark will be cut off, to limit the engine speed.

Idle Speed Warm = The idle speed of the engine when it's fully warmed up.

Fault Clear = Set this to 1 to clear the recorded faults out of the system.

Reset All Learn = Set this to 1 to set all fuel learning values to 100, and all idle air learning to a default value, and TPS closed position learning to a default position.

Reset Fuel Learn = Set this to 1 to set all fuel learning values to 100

Reset IAC Learn = Set this to 1 to set all idle air learning values to a default value (16 steps)

Reset TPS Learn = Set this to 1 to set the TPS learn value to a high default position (the TPS closed position will re-learn any new value that is consistently lower than this).

AFR Targets: The AFR table is a 3x3 matrix – the AFR is interpolated between these breakpoint values. This means that if you're breakpoints are 45kPa at 14:1 and 95kPa at 12:1, operating at 70kPa will result in 13:1 target.

Idle AFR Target = Target AFR of fuel control when the engine is at Idle. Most engines will tolerate as rich as 12.7:1, and some will "like" 14:1.

1100 45kPa = AFR at 1100 RPM and 45kPa – this is typically just "off-idle" with very low throttle opening. Different cams will require different AFRs at this point. A stock cam will work fine at 14.5:1. A lumpy cam might like 13.3:1 or 14.5:1.



Handheld Controller Feature Definitions

3000 45kPa Cruise = AFR at 3000 RPM and 45kPa – typical of a light cruise, but not, for example, overdrive cruising at lower RPMs and higher loads. Suggested range 13.4 – 14.7:1.

6000 45kPa = AFR at 6000 RPM and 45kPa – this is only used in free-rev, or something like autocrossing in a low gear and throttle is just barely open. Suggested range 12.5 – 13.8:1 (richer to keep parts a little cooler, and so that the tip in to full throttle is starting from rich).

WOT 1100 95kPa = AFR at approximately 25-100% throttle at low RPM. Intake manifolds are not very good at cylinder to cylinder distribution, so, there might not be a “perfect” AFR for here, but, 12.6 is a typical good enough AFR.

WOT 3000 95kPa = AFR at approximately 45-100% throttle at 3000 RPM. Intake manifolds are not very good at cylinder to cylinder distribution, so, there might not be a “perfect” AFR for here, but, 12.6 is a typical good enough AFR.

WOT 6000 95kPa = AFR at approximately 75-100% throttle at 6000 RPM. Intake manifolds are not very good at cylinder to cylinder distribution, so, there might not be a “perfect” AFR for here, but, 12.6 is a typical good enough AFR. But, sustained time at this RPM can put a lot of heat into the exhaust valves, and richer might be needed to keep temperatures in check (at the expense of some horsepower).

Boost 1100 180kPa = This is full throttle but with a supercharger or turbocharger boosting to about 11.6 psi. If no intercooler is used, the engine may require as rich as 11.0:1. If an intercooler, other charge cooling device or a fuel with plenty of octane is used, leaner can be tolerated. Richer than 12.5:1 is recommended.

Boost 3000 180kPa = This is full throttle but with a supercharger or turbocharger boosting to about 11.6 psi. If no intercooler is used, the engine may require as rich as 11.0:1. If an intercooler, other charge cooling device or a fuel with plenty of octane is used, leaner can be tolerated. Richer than 12.5:1 is recommended.

Boost 6000 180kPa = This is full throttle but with a supercharger or turbocharger boosting to about 11.6 psi. If no intercooler is used, the engine may require as rich as 11.0:1. If an intercooler, other charge cooling device or a fuel with plenty of octane is used, leaner can be tolerated. Richer than 12.5:1 is recommended.



Handheld Controller Feature Definitions

SPARK MAP: The spark advance uses a 3x3 matrix table to allow flexible spark advance control. This can allow distributor simulation, locked timing, boost retards, high RPM advancing and other strategies to optimize the ignition spark advance angle. The distributor must be locked out. Spark advance during cranking will happen at or after the VR tooth crosses the sensor. Above cranking, spark advance will only be equal to or more than the base advance, regardless of the value entered in the handheld for timing.

Distrib Base deg = Adjust this to get the timing light timing to match the displayed Spark Advance at low RPM. It's recommended to set this as high as possible, because the amount of advance range from min to max is limited due to the rotor and cap being in a fixed relationship.

VR Advance 4000 = Adjust this to get the timing light timing to match the displayed Spark Advance at 4000 RPM. This is adjustment for the small lag inherent in VR signals. It can add up at high RPM.

Idle Advance = The spark advance desired at idle.

1100 45kPa = Spark advance used just after throttle opens from idle. This value shouldn't be much more than the Idle Advance, for this reason.

3000 45kPa Cruise = Spark Advance used in a light cruise at 3000 RPM and throttle barely open.

6000 45kPa = Spark Advance used in a high free-rev condition, perhaps also seen when autocrossing and just tipping-in in a low gear at high RPM.

WOT 1100 95kPa = Spark Advance at low RPM and "full load" – perhaps the throttle is as low as 20% to see this much load. Spark is based on MAP, and MAP (and thus "load") can get pretty high even with low throttle openings at low RPMs.

WOT 3000 95kPa = Spark Advance at high loads and 3000 RPM. This could easily be deemed "total" timing when comparing to a distributor, but due to the flexibility of a 3x3 matrix, this doesn't limit you as such.



Handheld Controller Feature Definitions

WOT 6000 95kPa = Spark Advance at high loads and 6000 RPM. At high RPM, some engines require more or less spark advance than at 3000 RPM. This allows you to set the timing there.

Boost 1100 180kPa = This is full throttle but with a supercharger or turbocharger boosting to about 11.6 psi. If no intercooler is used, the engine may require very little spark advance. Remember that timing less than the base advance "Distr Base Deg" is not allowed, so choose the base timing carefully.

Boost 3000 180kPa = This is full throttle but with a supercharger or turbocharger boosting to about 11.6 psi. If no intercooler is used, the engine may require very little spark advance. Remember that timing less than the base advance "Distr Base Deg" is not allowed, so choose the base timing carefully.

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ACCEL PUMP: Intake manifolds are going to get wet with fuel while running. This wetness changes with temperature, engine vacuum, and air flow speeds. This wetness also must be supplied in addition to the fuel that is intended to reach the cylinders. This wet film of fuel on the surface is much thicker at cold engine (fuel doesn't evaporate well when cold), and also varies greatly with vacuum (bigger at high loads, smaller at low loads). The software has a strategy to supply that fuel and compensate for the changing size of the film. However, different manifolds have different characteristics, so some adjustments may be necessary to give the proper fuel during a "transient" event (transient is a term used to describe moving the throttle and changing the load). The fuel added during a transient has to be added in a special way to cause the wetness to build correctly over several injections. It starts out large, and decays to 0. The decay adjustments shape that curve. A larger decay value causes the accel "pump" amount to be ended sooner, and a smaller decay value allows the fuel to extend a little longer. It's a fine art of calibration to get this perfect, requiring a super-fast reading of a lambda sensor. It's recommended to only adjust these values when you notice it's a problem. It also shouldn't be adjusted much until the fuel learning has had plenty of time to adapt to the engine. The Accel fuel calculation uses 2 different signals that work mostly independently determine how much fuel to add/subtract. The MAP is directly used for "Accel Pump" fuel. The Alpha-N MAP is used for the "Fast Accel" fuel. Alpha-N uses the TPS and RPM to calculate a secondary "MAP" signal in case of the MAP



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fault. That value is also used to calculate the “Fast Accel” fuel, because it responds slightly faster than the real MAP signal.

Accel Pump 20F = Adjusts the fuel film compensation when very cold. 0 means it uses the default calibration directly.

Accel Pump 65F = Adjusts the fuel film compensation when cold. 0 means it uses the default calibration directly.

Accel Pump 170F = Adjusts the fuel film compensation when warm. 0 means it uses the default calibration directly. The default calibration already has a background table that is set up to work pretty good “out of the box” but it may be too lean or too rich during quick tip-ins for certain engines.

Accel Decay 20F = A larger decay will shorten the amount of time that the injectors are adding fuel during a transient. A smaller decay will extend the time. 0 will use the default values that are in the default calibration.

Accel Decay 65F = Same, but for 65F.

Accel Decay 170F = Same, but for warm engine.

Fast Accel 20F = Adjusts the fuel film compensation when very cold. 0 means it uses the default calibration directly.

Fast Accel 65F = Adjusts the fuel film compensation when cold. 0 means it uses the default calibration directly.

Fast Accel 170F = Adjusts the fuel film compensation when warm. 0 means it uses the default calibration directly.

Fast Decay 20F = A larger decay will shorten the amount of time that the injectors are adding fuel during a transient. A smaller decay will extend the time. 0 will use the default values that are in the default calibration.

Fast Decay 65F = Same, but for 65F.

Fast Decay 170F = Same, but for warm engine.



Handheld Controller Feature Definitions

dTPS Acc Gain = In order to “help” the acceleration fuel be large enough to handle a sudden throttle snap open, the speed of throttle opening is used as a bit of a helper to make it bigger as the speed of the throttle is opened faster. A larger number here will make it more sensitive to throttle opening speed.

dTPS Acc Max = The dTPS fuel gain multiplier is limited to this amount. 100 means that no help is given by this function. 199 means that the Fast Accel fuel is nearly doubled if the throttle is moved quickly enough.

Tipout -20F = “Tipout” is the term used to describe when the throttle is closing. The MAP drops rapidly, which means vacuum increases rapidly, and the fuel suddenly vaporizes off of the wall, and the injected fuel quantity is less. The wall film of fuel will decrease greatly, and thus if the injection rate is kept the same, the engine will be very rich. The software compensates this using a default calibration for the wall film, but the adjustments provided here can allow more precise adjustment for the varying engine configurations.

Tipout 0F = same

Tipout 40F = same

Tipout 70F = same

Tipout 120F = same

Tipout 150F = same

Tipout 185F = same

Tipout 215F = same

FUEL CONTROL: A speed density algorithm is used to calculate the fuel injection pulsewidth. The temperature used is called the “In Cylinder Temperature” which is calculated as being somewhere between the coolant temperature and the air temperature, depending on the air flowrate. However, this may not be perfect for the engine configuration when combined with the “warm up” and “start up” fuel multipliers, and thus the below adjustments are provided to fine tune the system at various



Handheld Controller Feature Definitions

temperatures. The speed density calculation does not apply when the engine is Cranking (speed below about 450 RPM). After combustion starts and the speed picks up above about 500 RPM, the engine begins the speed density calculation, along with the “Warm Up” and “Afterstart” fuel. **Warm Up** fuel is using a default table (more enrichment at colder engine) that can be tweaked here if needed – warm up fuel works at all operating conditions above cranking, but is 0 at a fully warm engine. **Afterstart fuel** enrichment has the special purpose of building the wall fuel films in manifold and cylinder is decreased with the number of revolutions as the film builds and the parts warm up rapidly – most of Afterstart fuel is gone within about 800 revolutions. The adjustments provided here can help fine tune it to the particular application.

Fuel -20F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 5F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 32F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 70F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 85F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 105F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 130F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Fuel 195F Cyl = This affects all of the fuel at this In-Cylinder temperature, except the cranking fuel.

Afterstart 20F = This affects the fuel at this Coolant Temperature, just after cranking, and lasts for just a few seconds.

Afterstart 65F = This affects the fuel at this Coolant Temperature, just after cranking, and lasts for just a few seconds.

Afterstart 170F = This affects the fuel at this Coolant Temperature, just after cranking, and lasts for just a few seconds.

Warmup 20F = This affects all of the fuel at this Coolant Temperature, except the cranking fuel.



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Warmup 65F = This affects all of the fuel at this Coolant Temperature, except the cranking fuel.

REV LIMIT DECEL CUT: During certain situations, the injectors can be turned off. At high RPM, the injectors and spark can be cut off at the **Rev Limit RPM** in order to prevent the engine from over-speeding and causing engine damage. This can be a fairly sudden jerking feeling, and shouldn't be used to hold an RPM point. **DFCO** stands for Deceleration Fuel Cut Off. When decelerating in gear, the MAP is very low, which means the fuel pulsewidths are very small. The engine also has a very high amount of internal EGR, which causes combustion to be very difficult. Also, torque is not even desired, so, fuel can be cut off. This will appear as a very lean condition, but don't worry – it's far from any kind of danger – there's no fuel at all! When the throttle is opened, or the RPMs approach idle, or some other thing causes more load on the engine, the fuel injection returns. Because the manifold will be dried out during the time of no injection, extra fuel "**Dfco Return Fuel**" is needed to re-wet it, to avoid a long lean out period. Because there are distribution rings in the path of the injection spray, the voids in that ring need to be re-filled as well before fuel will flow steadily out of the discharge holes - **Dry Ring Fill PW** is used in this situation.

Rev Limit RPM = Above this engine speed, the fuel and spark will be turned off.

Dfco Enable Temp = Above this temperature, Deceleration Fuel Cutoff can be used.

Dfco Cut Fuel MAP = Below this MAP, Deceleration Fuel Cutoff can be used.

Dfco Return MAP = Above this MAP, Deceleration Fuel Cutoff will be exited, and fuel injection returned.

Dfco Return Fuel = When the fuel injection returns, extra fuel is required to wet the intake manifold walls, to avoid going lean.

Dry Ring Fill PW = The fuel distribution rings need to be re-filled – since they don't change size, this value should be correct in the default calibration.



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Max drpm Drop rate = If the RPM is dropping very quickly, such as when shifting gears or other clutched event in a manual transmission, Deceleration Fuel Cutoff will be exited early, and fuel injection will return.

Fault Rev Limit = In the case of some sensor faults, the rev limit can be reduced to act as a protection and as a warning in case the driver wasn't aware of a fault.

CRANKING FUEL: The fuel requirements during cranking are very far from the speed density calculated amount. Thus, the fuel is not using that equation during the time between stall and about 450 RPM. The main factor determining the amount of fuel needed is the engine temperature (very cold requires several times as much fuel as a warm engine), as the fuel wall film needs to be applied, and the cold engine parts will cause most of the fuel to cling to them as a liquid, and not take part in the in-cylinder combustion. The various intake manifolds and engine sizes are also going to affect the amount of fuel required. In order to help the engine start much more quickly, the system also injects a large squirt "**Prime Shot**" from all of the injectors a few moments after the key is turned on. If the prime shot is not desired, such as if just the radio is to be turned on – pressing the throttle fully open prior to and while the key is turned on and while the fuel pump primes, will cause the Prime Shot to be cancelled.

Prime Fuel Mult = The prime injection will fire the injectors after key on to help make starting much quicker.

Crank Open TPS Mult = If the throttle is opened above this (and below about 50% for clearing flooded engines), the fuel injection is increased. This is to help start the car if the calibration is not yet finalized for starting. Also, the open throttle lets in much more air than just a closed throttle, so the extra fuel is sometimes needed to balance the extra air to deliver a burnable mixture to the cylinders.

Prime Shot Delay = If the engine is not cranked directly after key on, the software will wait a few seconds before injecting the Prime Fuel to allow time for the fuel pump to purge the throttle body of vapors, and get full fuel pressure to the injectors.



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Prime Crank Revs = If the engine is cranked directly after key on, the software will wait a few revolutions to allow time for the fuel pump to purge the throttle body of vapors, and get full fuel pressure to the injectors.

CRANK IAC Mult = The IAC is opened an extra amount during cranking to allow more air into the engine for faster starting, and extra torque to spin the engine against thicker cooler oil. Adjust this to get good starting without excessive overshooting after starting.

Crank Fuel 20F = At cold engines, the default calibration increases the fuel injected by a very large amount. However, different engines and manifolds will show different needs. Adjust this to get good starting response.

Crank Fuel 65F = At cold engines, the default calibration increases the fuel injected by a large amount. However, different engines and manifolds will show different needs. Adjust this to get good starting response.

Crank Fuel 170F = At warm engines, the default calibration decreases the fuel injected by a large amount. However, different engines and manifolds will show different needs. Adjust this to get good starting response.

Afterstart 20F = This is the exact same value that is found in the Fuel Control section. It's here again to help find it quickly when adjusting the fueling just after the engine is started.

Afterstart 65F = This is the exact same value that is found in the Fuel Control section. It's here again to help find it quickly when adjusting the fueling just after the engine is started.

Afterstart 170F = This is the exact same value that is found in the Fuel Control section. It's here again to help find it quickly when adjusting the fueling just after the engine is started.

Warmup 20F = This is the exact same value that is found in the Fuel Control section. It's here again to help find it quickly when adjusting the fueling after the engine is started and the engine is cold.

Warmup 65F = This is the exact same value that is found in the Fuel Control section. It's here again to help find it quickly when adjusting the fueling after the engine is started and the engine is cold.



Handheld Controller Feature Definitions

AFR CLOSED LOOP: The system can sense the lambda in the exhaust system from the wideband sensor. The lambda is converted to an approximate AFR (Air Fuel Ratio) assuming that lambda 1 = 14.7:1 AFR. The AFR Targets are used to give the fuel trim (fast closed loop fuel adjustment) a target and a multiplier. The Fuel Trim will increase or decrease the injected pulse width in response to the sensed AFR – if it senses too rich, it will reduce the fuel, and if too lean, increase the fuel. The Fuel Trim acts extremely quickly. If there is a consistent amount of fuel trim needed in a particular area, the fuel learning will adapt to that amount, so that the Fuel Trim can work near zero adjustment. The Fuel Learn is saved in the computer's memory, and can only be cleared by setting the "Reset Fuel Learn" to 1, and then turning off the engine.

Fuel Trim Max = This limits how much extra fuel can be added by the fuel trim.

Fuel Trim Min = This limits how much fuel can be removed by the fuel trim.

AFR Loop Speed = This adjusts how quickly the fuel trim increases and decreases the fuel to achieve the target AFR.

Idle Trim Rate Pos = At Idle, the fuel trim can be slowed to improve the stability of the AFR and engine speed. This value adjusts how quickly fuel is increased (towards richer).

Idle Trim Rate Neg = At Idle, the fuel trim can be slowed to improve the stability of the AFR and engine speed. This value adjusts how quickly fuel is decreased (towards leaner).

Idle Trim Jump Pos = Fuel trim works in a saw-tooth pattern – for example if the engine is rich, there is a slow decrease until lean, followed by a sudden jump rich. This is to keep the actual AFR close to the target – because the fuel film causes a transport delay of the fuel from the throttle body to the cylinder.

Idle Trim Jump Neg = Fuel trim works in a saw-tooth pattern – for example if the engine is lean, there is a slow increase until rich, followed by a sudden jump lean. This is to keep the actual AFR close to the target – because the fuel film causes a transport delay of the fuel from the throttle body to the cylinder.



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Fuel Learn rate = The fuel learn can be set to quickly or slowly learn the fuel trim adjustments.

Idle fuel Learn rate = At idle, there is a specific learn value that can be learned more slowly than the normal operation learn rate.

Fuel Learn Max = This value limits how much the fuel learn can learn upwards.

Fuel Learn Min = This value limits how much the fuel learn can learn downwards.

Fuel Learn OFF 1 = This control value will disable fuel learning if it's set to 1.

Fuel Loop OFF 1 = This control value will disable fuel trim closed loop if it's set to 1.

Reset Fuel Learn = This control value will reset all fuel learning to 0, if it's set to 1. The clearing of the learn will happen when the key is turned off and the system is allowed to fully power down.

Display AFR filter = The AFR value displayed in the Dashboard and Data Logging is "filtered" meaning that it shows changes a little slower than it really senses them, to make the value appear more smooth. If more resolution is desired, increase this number to make changes appear more quickly. This value only applies to AFR's displayed while the throttle is OPEN.

Disp AFR filt idle = The AFR value displayed in the Dashboard and Data Logging is "filtered" meaning that it shows changes a little slower than it really senses them, to make the value appear more smooth. If more resolution is desired, increase this number to make changes appear more quickly. This value only applies to AFR's displayed while the throttle is CLOSED.

IDLE CONTROL: An Idle Air Control (IAC) stepper motor valve is used to open or close a passage in small increments (called "Steps") that adjusts the amount of AIR going through the throttle. The fuel calculation automatically senses the extra air and AFR, so there's extra torque produced at idle to increase idle speed or decrease idle speed if the RPM doesn't match the Target Idle RPM. The amount of steps needed is also learned, in order to improve the idle control

Warm Idle Speed = This is the Target Idle RPM for when the engine temperature reaches 170 degrees Fahrenheit.



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Reset Idle Learn = The Idle Air Learning can be reset to a default value (16 steps) – by setting this control value to 1, and turning the key off and waiting for the system to completely power down. This can be done if the IAC learned incorrect values from an improper throttle adjustment, or other situation that caused the learning to be wrong.

Idle Learn MAX = This is the maximum number of steps that can be learned up. There is a default base table that is used to automatically increase the IAC when cold. There are also 3 learn values for idle air: 20F, 65F, and 170F – this can help the cold engine idle be correct and

Idle Learn MIN = This is the number of steps that can the learning can learn in the closed direction from the base default table.

Loop Rate UP = The IAC uses a PID (actually just PI) closed loop control that adjusts the steps to achieve the desired idle speed. This value controls how quickly it can open the IAC in response to a lower RPM, using the “I” (integrator) of the PID.

Loop Rate Down = The IAC uses a PID (actually just PI) closed loop control that adjusts the steps to achieve the desired idle speed. This value controls how quickly it can close the IAC in response to a higher RPM, using the “I” (integrator) of the PID.

Fan RPM Adder = When the electric fan(s) is(are) turned on, the RPM can be increased by this amount to help both the coolant flow and the alternator speed to generate more voltage for the electrical system.

Fan Idle Steps = When the electric fan(s) is(are) turned on, the RPM can be increased to help both the coolant flow and the alternator speed to generate more voltage for the electrical system. This adjusts how many IAC steps are automatically added when the fan is on so that the loop and learning don’t need to do the work.

Decel Open IAC = When the throttle is opened, the IAC is also opened by several steps in preparation for when the throttle closes. This open IAC helps reduce engine braking during deceleration which can give a smoother drive feeling. However, too much can cause the RPM to jump a bit too much when the throttle is cracked open, or cause the engine to have positive torque for a moment after the throttle is closed.



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Decel RPM Decay = When the throttle is closed, and the engine is returning to idle speeds, the Idle Closed loop will use Target RPM to control the speed during that period. The Target RPM will decay to the normal idle speed in a controlled manner. A smaller “Decel RPM Decay” value will be SLOWER.

Decel IAC Decay = When the throttle is closed, and the engine is returning to idle speeds, the “Decel Open IAC” steps will need to be removed in a manner that nearly matches the “Decel RPM Decay” of the Target RPM. This value is the fraction of a step that is decayed per 100 milliseconds (10 times per second).

CRANK IAC = Cranking needs extra air to help the engine spin to a higher RPM and to generate very full cylinders for maximum power to fire up the engine against the cold oil. However, at warm engines, the thin oil and easy combustion doesn't need as much air to achieve a successful start, and too much will cause a very large flare of the RPMs just after starting.

FAN SETTINGS: The Electric cooling fans can be controlled separately. Just a reminder – the system only controls a RELAY. DO NOT CONNECT DIRECTLY TO THE FAN – THE ECU COULD BE DAMAGED, AND DEFINITELY THE FAN WILL NOT WORK. The ECU provides a grounding signal for the control solenoid of the relay, which energizes the relay and allows the battery to supply voltage to the cooling fan.

Fan 1(2) ON Temp = Above this temperature, the electric cooling fan will be turned on.

Fan 1(2) OFF Temp = Below this temperature, the electric cooling fan will be turned off. Make sure to set this temperature below the Fan ON Temp.

Option Fan1(2) Enable = If you are not using an electric cooling fan that is controlled by the FiTech ECU, set this to Disabled. If you are controlling the electric cooling fan with the system, set it to Enabled. Leaving the fan in enabled mode, but without connecting a fan relay will result in a Fan Fault Code, and also some minor RPM fluctuations at idle when the ECU attempts to turn on the cooling fan.

FUEL PUMP CONTROL: The FiTech ECU for Go EFI systems has a special driver circuit that will drive the fuel pump directly, which means that an external relay is not needed. This driver circuit allows both



Handheld Controller Feature Definitions

PWM control (pulse width modulated), and direct internal relay drive of the fuel pump. This allows the voltage to be reduced when the fuel demand is low, such as at idle and light cruise.

Pump Prime time = At Key On, the pump is turned on for this much time, which allows the throttle body to be purged of air pockets, and for the pressure to be built up to the normal operating pressure.

TPS for PUMP ON = If the throttle is opened above this position, the internal relay is turned on to supply full power to the fuel pump.

RPM for PUMP ON = If the RPM is above this speed, the internal relay is turned on to supply full power to the fuel pump.

PWM Low Flow = When the fuel flowrate is low, and all of the other conditions for allowing PWM control to be met, this is the percentage of duty cycle that is used. Set this such that fuel pressure doesn't drop below the rated fuel pressure of the system.

LEARN DATA: The ECU has several functions that "Learn" what the required settings are based on sensor signals. The fuel learns how much correction is needed to achieve the target AFR, at steady state.

Cal No-Save 196 = Sometimes, the changes made to the calibration DON'T want to be saved – to prevent saving at Key Off, set this value to 196.

TPS Zero Count = This is FYI only – it's not 'adjustable' in the calibration. It shows the learned value of the TPS when it's fully closed.

Fault Clear 1 = Set this to 1 in order to clear any recorded faults. This can be used if a repair has been made, or perhaps if a false fault has been detected, or fault diagnostics are being done to solve a problem.

Reset All Learn = Set this to 1 to return all learned values to the default values. This clears the fuel learning, idle air learning, and closed throttle position learned value.

Reset Fuel Learn = Set this to 1 to clear the fuel learning.

Reset IAC Learn = Set this to 1 to clear the IAC learning.



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Reset TPS Learn = Set this to 1 to clear the TPS closed position learning.

OPTION Coil Drive: These are the primary things to adjust to set up the ignition control system.

Distrib Base deg = Adjust this so that the displayed timing matches the actual timing seen on a timing light at low RPM, such as idle, or adjust the distributor so that the timing light matches the display. It's important to keep this about 10-25 degrees. At cranking, the spark will happen at this value. The system also cannot advance very many degrees above this value – approximately only 20 degrees advance above this value is available at high RPM.

Tach or 2Wire+Coil = If the RPM signal input is using a 2 wire distributor to control the ignition advance with the FiTech ECU, set this to "VRCoil". The system **MUST BE TURNED OFF AFTER MAKING THIS CHANGE** – special settings are set up at the software initialization, and it will not work without this complete power off to power on cycle. If just using the coil negative from a single fire distributor (non-CDI) or tachometer signal from a distributor or CDI box, set this to "Tach."

VR Advance 4000 = A VR signal, the filtering hardware, and cam chain stretch can lead to some amount of retarding at high RPM. This error can be corrected here, so that the timing light at low RPM matches the displayed value for spark advance, and the spark advance at high RPM, specifically at 4000 RPM matches the timing light.

FiTech EFI Nitrous

Lean disable time = If the AFR is lean for this much time while Nitrous is on, the Nitrous will be disabled to possibly protect the engine.

Lean disable AFR = If the AFR is leaner than this for the prior “Lean disable time” while Nitrous is on, the Nitrous will be disabled.

AFR check delay = After the Nitrous is turned on, a few moments of time are allowed to let the AFR settle, in case there is a quick lean bit at the beginning of Nitrous operation.

N2O re-arm TPS = If the Nitrous is disabled from being too lean, and throttle is closed beyond this, it will be re-enabled again – this is to prevent the nitrous from turning off and on repeatedly while the throttle is held open.

N2O MIN TPS = Above this throttle position, nitrous can be turned on.

N2O MIN Temp = Above this Coolant temperature, nitrous can be turned on.

N2O MAX Temp = Above this Coolant temperature, nitrous will be disabled.

N2O MAX RPM = Above this RPM, nitrous will turn off.

N2O MIN RPM = Above this RPM, nitrous will be turned on.

RPM hysteresis = If the RPM fluctuates with nitrous on or off, it won't flutter on and off unless the RPM varies by this much.

Gear Shift time = If the N2O MAX RPM is used to turn off nitrous, this time will delay the re-enable of nitrous to allow time for the gear shift to complete.

N2O Stage1 FUEL = Fuel can be added or subtracted when nitrous is turned on to help get the AFR closer to optimal. Often times, fuel needs to be removed because it displaces air intake through the throttle.

N2O Stage1 AFR = A richer target should be set with nitrous. This is that target when the nitrous is on.

N2O Stage1 Retard = Spark advance should be retarded when nitrous is on. How much depends on the engine and nitrous combination.

N2O Signal Level = If the signal that tells the ECU to enable nitrous is a +12V signal, or a grounding signal, set this value accordingly

N2O ENABLED = If the ECU is used with a nitrous system, set this accordingly.

N2O Solenoid Control = If the ECU is to be in control of the relay that drives the solenoids, set this accordingly.

Quick Start Guide

Setting Up Your Handheld Controller

By this time you are ready to set your Handheld Controller up to run your engine. This is really easy and can be done by entering in just a few numbers in your Controller. Before you do this you need to check the system for fuel leaks. Remember to check ALL connections in the engine compartment as well as along the frame and back at the tank and pump. Do this process again after the car has been started just to make sure. It is easy to overlook tightening a fitting or two during the installation process. Be sure to re check that all hoses and fittings are secure and clear of heat and all moving components!

When you first power on your key you will hear

your fuel pump cycle on for a few seconds and your injectors will “CLICK” on. This process serves a few purposes. It pressurizes the fuel system getting it ready for the cranking and running conditions and also purges out the trapped air in the system as well as shoots a small amount of fuel into the engine. This is what we call “Prime”. Do this process two or three times and check for fuel leaks BEFORE attempting to crank or run your engine. When this process is done and you are certain that you have no fuel leaks you can leave the key in the “ON” Position and begin to do the Initial Setup required to get your Go EFI system set up for your engine combination.



Quick Start

There are two ways to navigate the Handheld Controller; you can use the Touchscreen with your finger, or the Joystick up and down. Pressing in the Joystick = Enter.

On the first screen - Main Menu, choose **#4 Go EFI Initial Setup** and select **Enter**.



The Calibration screen will appear. On the Calibration screen, select **#1 Engine Setup**.

NO.	Engine ..(online)	Cubes
01	Cylinders	8
02	Engine CID	383
03	Cam Mild-Wild 1-4	3
04	Rev Limit RPM	7000
05	Idle Speed Warm	870
06	Tach or 2Wire+Coil	TACH

Read from ECU Edit Send to ECU Back

NO.	Engine ..(online)	Cubes
01	Cylinders	8
02	Engine CID	383
03	Cam Mild-Wild 1-4	3
04	Sent to ECU Succeed	
05	Idle Speed Warm	870
06	Tach or 2Wire+Coil	TACH

Each time you make a successful entry the green succeed message will appear.

Read from ECU Edit Send to ECU Back

Above is the Main Menu for Setting Up Your Engine

(Note: When changing values on the Handheld Controller, you must depress the joystick button to SEND your info to the ECU. You will then see 'Sent to ECU Succeed' message which is a confirmation

that it was successful. Changing the number alone will NOT change the value in the ECU). Also – all items above have a factory default which may work for you – change only as needed!

- 1- **Cylinders** - Factory preset is 8 and shouldn't need to be changed for most installations.
- 2- **Engine CID** – Factory preset is 350 CID. To change value you can use touchscreen buttons (Edit, CLR value from screen, Enter your number now , press OK, then depress joystick button to enter). **Sent and Succeed message will appear.** This entire step can also be performed using the joystick.
- 3- **Cam Mild-Wild – 1-4** - While not everybody knows the exact specifications of their camshaft, you usually have a pretty good idea of whether your cam is a bone stock , (selection #1) or a full-on race cam (selection #4) or somewhere in between. The Go EFI system is a very powerful self-learning tool, so the exact information isn't necessarily required. A mild performance cam would be considered a #2, while a street strip cam would be a #3. Select the best for your engine, if you're not sure, pick # 2!
- 4- **Rev limit RPM** – This is a fuel and spark cut.

Please set at least 200 RPM above the maximum RPM you wish your engine to run to. This is not a soft touch rev limit and is a built-in safety feature.

5- **Idle Speed Warm** – The idle speed at which you wish your engine to run at 150 degrees and above. If you are using the Go EFI to control your electric fans, your idle speed will increase by 30 rpm, and will be higher when the engine is colder and will taper down to set speed by 150 degrees.

6- **Tach or 2-wire** – Important selection for Go EFI setup! If you are NOT using timing control, such as an HEI or MSD ready to run, or even an MSD 2-wire distributor, or equal, running a CDI box but NOT controlling the timing with the Go EFI you will select the **TACH** option and depress the enter button. If using the timing control option and locking out your distributor, such as outlined in Diagrams 11 &12 in the main Instruction manual, you will select the **2 wire + Coil** option and depress enter and then follow the schematic in the main instruction manual for wiring.

Congratulations. You have completed the Engine Set Up portion of your installation.

NO.	Ignitio..(online)	deg
01	Distr Base Timing	22.5
02	2Wire VR+Coil	TACH

Read from ECU Edit Send to ECU Back

Ignition Set Up

When done with Engine setup, hit the **Back** button and return to the Calibration menu. (If you are NOT running Timing Control, skip this step.)

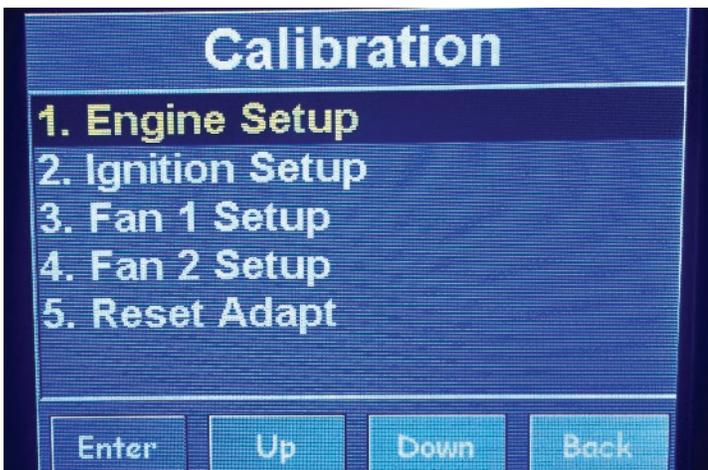
If you are running Timing Control, select **Ignition Setup** from the Calibration screen and enter in the following:

#01) Distributor Base timing. This is the timing you want your engine to idle at (For example, 15 degrees at 750 rpm).

#02) Is redundant from the first page and will show the previously made selection.

Select **Back** button and return to Calibration screen.

Fan Set Up



mately 5 degrees lower than Fan ON temperature, but is up to user preference. Note: Setting must be lower than fan ON temperature for fans to shut off.

At this point you have made all of the selections you NEED to start your engine! BUT WAIT!!!!.

Please turn your key to the OFF POSITION and wait for about 30 seconds for the ECU to store these changes. This is a one-time setup and the changes are permanently stored in the ECU even if you disconnect the battery! They can be changed at any time in the future but no battery power is needed for the ECU to keep these selections in its memory.

Fan 1 Setup (Go EFI 4 #30001 & 30002)

On the Calibration screen, follow these steps:

If using an electric fan, go to option # 3 and select **Enable** , then press Enter or depress the joystick button to **send info to the ECU**. If not using an electric fan, select **Disable** and continue the Enter/Send steps above

Note: This step is important to eliminate a fault code from appearing when not using an electric fan, and also eliminating the idle speed from increasing when the fan "ON" temperature is achieved and no fan is used.

If fan is enabled, follow these next steps:

#1) Fan 1 ON Temp - Enter desired temperature, Enter/ depress to **send to ECU**. Idle speed will increase when fan is activated. Idle speed increase is not user programmable in basic calibration (Go EFI 4)

#2) Fan 1 OFF Temp - This is usually set approxi-

Starting Your Engine:

You are now ready to start your engine for the first time! (Remember that there is air in the fuel lines and you may need to purge that out so it may take a few extra cranks for the engine to start. Also if you have installed the Fuel Command Center you must follow the priming instructions to properly fill your Command Center's fuel tank). Turn your key to the "ON" position and listen for a CLICK, this is the injector squirting a small amount of fuel into the engine and getting the engine ready to go. Now crank the engine and look for an RPM signal on your Dashboard window on the Keypad. Your engine should start right up and begin to run. If it does not, turn the key to the OFF position, wait a few seconds and repeat the process, as there is air

trapped in the lines and that air needs to be purged out. Waiting for the "CLICK" before cranking is a good practice to get into but not 100% necessary. We do recommend it for consistent starting. Closed loop will start correcting your AFR almost immediately and your engine will begin to run smoothly. When your engine reaches 130° F the Go EFI Self Learning feature will begin to take effect and start dialing in your system for your engine! You will not even know this is happening but you can see it by looking at the CL trim And CL Learn values.

Setting Your Idle

If your engine is running too slow and your idle is low you may need to turn in your idle screw (located in the front right of the throttle body) a turn or so to open the butterflies. We recommend that you raise the idle OVER THE DESIRED TARGET IDLE SPEED and then key off the engine. This will reset the throttle position sensor to above the zero position and allow you to lower it to the desired rpm after the restart. The ECU will automatically reset to zero when you key off and does not require any special calibration mode. It is good practice to key off after you change the idle adjustment screw to a HIGHER RPM.

Setting Timing:

If you are using the Go EFI as a FUEL ONLY system (no timing control) please make sure that you set your timing to the manufacturer's specs for your engine. If you do not know what it is supposed to be, consult with your distributor manufacturer. Please confirm this is correct before moving forward. Ignition and fuel go hand in hand and work together to make your engine run smooth and powerful. One cannot compensate for the other.

Phasing your distributor for Programmable Timing

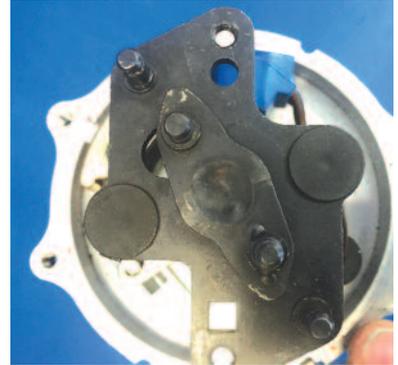
Locking the distributor:

When using the Go EFI internal timing control feature it is important to lock out the distributor advance mechanism and phase the rotor on your distributor. You will need a 2-wire distributor with a magnetic pickup such as an MSD or equal aftermarket brands from Summit or Jeg's. We recommend using an MSD adjustable rotor #84211. Locking the distributor consists of removing the counterweights and springs and following the man-

ufacturer's instructions to eliminate the centrifugal advance mechanism. Videos are usually posted on Youtube showing how to do this, which is a simple process. What you are trying to achieve is a distributor that has the rotor connected directly to the drive gear! The ECU will be controlling the timing not the old fashioned springs and weights.

Phasing the Distributor: (The Easy Way)

Phasing is a term that simply means lining up your rotor with the post on the cap so that when the ECU sends the spark, it will have a nice short direct gap to fire creating a strong spark and little chance for a misfire. This is not necessary with a mechanical advance distributor because the rotor turns with the springs and weights and it always stays aligned in the



center of the post on the cap making for a nice short spark. When switching to computer controlled spark advance, the ECU or computer is telling the distributor when to fire the spark and the distributor is LOCKED in place and does not advance or retard with engine rpm or vacuum. This is why we need to move the rotor to a HAPPY spot in the cap where the spark will be short and strong throughout most of the engine's operating conditions. It is a complicated term but very easy to do so don't be afraid to get in there and try. Follow these steps and you will be assured success.

1- Bring your engine to #1 TDC on the compression stroke and Stop at your desired BASE timing. EXAMPLE 10° BTDC. Check with your engine specs but most performance engines like between 8° and 20°. We will use 10° for our example. Your Buick 430 may like as little as 3°, but that is not rel-



evant for this setup example. Drop your distributor in place like you normally would with the rotor pointing at the #1 spark plug position.

2- On the keypad you will input this number under Ignition Setup Distributor Base Timing This can be done later during the setup mode. We are just showing you where you will be entering this number and where it comes into play.

NO.	Ignitio..(online)	deg
01	Distr Base Timing	10.1
02	2Wire VR+Coil	VRCOIL

Read from ECU Edit Send to ECU Back

Don't be concerned with the decimal point.

3- Make a mark on the distributor housing on the center of the #1 spark plug post and remove the cap. See photo directly below.



4- Line up the center of the re-lector wheel (this is the 8 paddle wheel) with the center of the pickup on the distributor. See the photo at bottom of page. Use a light to make sure you are centered and snug down the distributor. You may need to move the distributor slightly later to get final synchronization with the

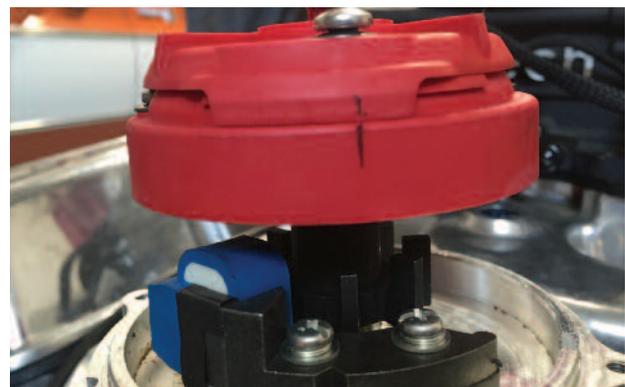


ECU. Make sure the rotor is in the center position and that it is pointed at the mark you made for the #1 spark plug location. Remove the rotor if it helps you see the re-lector position better.



5- With your adjustable rotor installed determine if your distributor rotates clockwise or counter clockwise when the engine is running. (You should know this by the firing order and the direction you will be placing your wires on the cap) If it turns clockwise (Chevy), twist your adjustable rotor to the second long line (from center) clockwise and lock down with the screw. If your Distributor rotates counter-clockwise (small block Ford) twist your rotor to the second long line (from center) counter-clockwise and lock it down with the screw.

This is easier to see when you have the rotor off of the distributor. We like to make a mark so you can line it up easy on the engine as shown below. Be sure to tighten down the Philips screw snug! NOTE: each mark is 1* on the rotor. You will notice that you are only moving the rotor 10*! Don't worry, this is actually 20* of crankshaft timing since the crank turns 2 times for every 1 time the distributor turns.



6- Install your Distributor cap and wires in the correct order and you are ready to go.

Synchronizing your Timing

Start your engine and bring to an idle. Look at the Dashboard of your Handheld Controller to determine the initial timing. You can set your desired distributor BASE timing in the setup menu when you selected the 2-wire option in the ignition setup menu. With a timing light attached to the engine rotate the distributor until the engine timing reads the

same as the timing displayed on the dashboard screen. You may want to do this at 2000 RPM to eliminate the IDLE spark correction feature built into the GO EFI systems since this makes the synchronization at idle a bit difficult . Lock the distributor firmly down and you are done. Final timing adjustments can now be made with the Handheld Controller on the fly!