



GO EFI 2-Barrel 400HP System Installation Guide



GO EFI 2-Barrel (400HP 39001)

11/12/2019

Congratulations on your purchase of the GO EFI 2-Barrel 400HP System. Every FiTech system is meticulously tested for functionality before it leaves our Riverside, California facility.

If you experience any technical difficulties or need assistance, please feel free to contact our technical support department at (951)340-2624 Monday-Friday 7:00am-12:00pm and 1:00pm-5:00pm PST and Saturday at 8:00am-12:00pm PST or email us at techmail@fitechefi.com.



WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

FiTech GO EFI 2-Barrel 400HP System Installation Guide

WARNING!

This installation guide must be read and fully understood before beginning installation.

If the installation guide is not fully understood, do not attempt to start this installation. Failure to follow this installation guide can possibly result in system failure and potentially serious personal injury and/or property damage. Please keep this installation guide. For the safety and protection of you, your vehicle, and others, only a trained and FiTech approved mechanic with adequate experience should perform the installation, adjustment, and repair.

Caution must be observed when installing any product . Work in a well ventilated area with an approved fire extinguisher readily available. Eye protection and other safety apparel should be worn to protect against debris and sprayed gasoline. Ensure to disconnect the negative terminal of the battery before beginning. We recommend having this installation performed by an experienced, qualified, and FiTech approved automotive technician, a list can be found on <https://fitechefi.com/support/distributors/> Lastly, ensure the engine has had sufficient time to cool! Engine may still be hot. Disregarding any of this information can result in serious property damage, injury, and/or death.

If this installation guide is not followed, any component damaged will not be covered by FiTech's warranty. Should any one component fail, it will not constitute or justify a warranty of the entire FiTech EFI system. Replacement and accessory items are available for purchase from FiTech EFI. If assistance is required or if you need further warranty clarification, please call FiTech EFI (951) 340-2624 or email warranty@fitechefi.com.

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Introduction and System Requirements

This installation guide is designed to get you up and running with your Go EFI 2-Barrel System. This System is the industry's most advanced throttle body EFI system and also the easiest to install. It includes a very advanced handheld controller but it is also capable of being far more tunable than any competitors product that utilizes a handheld controller. **Please read the full instruction manual before beginning your installation.** For technical assistance with your Go EFI 2-Barrel System, call (951)-340-2624, go online to www.fitechefi.com under "tech center", or email us at techmail@fitechefi.com.

Emissions Equipment:

Not legal for use on pollution controlled vehicles. FiTech's Go EFI 2-Barrel System is not CARB approved for use on emission controlled vehicles. This system is designed for engines retrofit into older vehicles that do not require emission controls.

Unleaded Fuel use Only:

DO NOT use leaded fuel as it will degrade the O₂ sensor and void your warranty.

Engine Requirements

Before starting your installation, please confirm that your vehicle meets the conditions stated below:

- Engine is in sound mechanical condition
- Engine horsepower is between 75-400
- Engine is naturally aspirated (no supercharger, turbo charger, nitrous, etc..)
- Unleaded fuel only

Tools required for Installation

- Standard and Metric wrench set
- Factory Service manual for your vehicle
- #2 Phillips screwdriver
- Terminal crimping tool
- Standard and Metric Allen Wrench Set
- Digital Voltmeter

Dimensions

- Each throttle body is 3 7/8" tall
- Each throttle body is 8 1/4" wide

Before you get started!

FiTech highly recommends that the following items are checked and/or corrected before beginning the installation.

For optimal performance out of your FiTech Go EFI 2-Barrel 400HP System please verify the condition of the complete engine system. FiTech highly recommends to checking and ensuring that there are **no vacuum leaks, the ignition timing is set properly, and the engine is mechanically sound.** If your engine has preexisting underlying issues, converting to EFI will NOT cure them.

Fuel System Requirements





The FiTech Go EFI 2-Barrel System requires a fuel pump operating at 43 psi and 150 liter/hr or more. Ensure the pump and hose are EFI rated when selecting the fuel delivery system. FiTech EFI offers a plethora of fuel delivery systems including fuel pumps, hoses and accessories. For optimal performance, FiTech strongly recommends an in-tank pump, because the pump will run quieter, cooler, and have less chance of cavitation. If an inline pump is the only option due to not being able to install a pump in the tank then it must be as close as and below the tank as possible. Fuel pressure needs to be at 43 psi from the inlet side of the FiTech Go EFI System once the fuel system is installed.

Special Notes




- Before starting the install ensure the RTV silicon sealer is sensor compatible. This information can be found on the RTV package.
- Ensure to disconnect the negative terminal of the battery before beginning.
- Ensure the engine has had sufficient time to cool before starting your installation!
- An assistant is necessary for some installation and adjustment procedures and should be present for safety reasons.
- Cranking and hard throttle hits will not learn, but they can be tuned under Go-EFI Tuning in the handheld controller.
- Only the steady state fuel “learns”.
- Selecting the right “cam” and engine CID (cubic inch) will get the learning closer.
- Do not use solid core ignition wires, racing coils or 7 and 8 series boxes!
- Only use unleaded fuel to ensure a longer lasting oxygen sensor. Leaded fuel will lead to improper exhaust gas oxygen readings, potentially damage the sensor, and could possibly void your warranty.
- The Go EFI 2 Barrel systems are intended for use with unleaded pump gas up to 15% ethanol content.
- If using a Frame Mount Inline Fuel Pump, it should be mounted below the bottom level of the fuel tank and as close to the tank as possible, no more than two feet away from the tank. This type of pump is designed to push fuel, not draw, and works best when gravity fed.
- 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.
- Fuel return line must be minimum 3/8” or -6.
- Only use EFI rated **psi fuel hose or hard fuel lines, NO ALUMINUM LINES!**
- FiTech does not recommend aluminum fuel lines EVER! Use the supplied EFI high pressure fuel hose supplied in your Fuel Delivery Kit or purchase our stainless steel braided hose kit.
- The Accel Pump will often need tuning depending on your engine combination.
- Your system will be running at 43 psi so consult a FiTech approved professional if you are not certain about this portion of your installation.
- Leaving the Handheld plugged in while the vehicle is off will drain the battery because the handheld will enter a sleep mode but does not turn off.
- **VERY IMPORTANT NOTE: your fuel tank must have a vent to prevent pressure building up inside the tank.**
- **An external regulator must be used; such as the Tightfit regulator P/N 44120.**

39001 Kit Contents

- (1) 2-Barrel Throttle Body-Carburetor Gold Finish
- (1) Harness (plug-in pigtail user harness)
- (1) ECU (Mounted on throttle body)
- (1) Set of four injectors (installed in Throttle Body)
- (1) Idle Air Control (installed on Throttle Body)
- (1) Throttle Position Sensor (installed on Throttle Body)
- (1) Handheld Controller w/ billet case
- (1) Wide Band O₂ Sensor
- (1) Wide Band O₂ Sensor bung kit
- (1) TMAP Sensor (installed on throttle body)
- (1) TMAP Sensor Adapter (installed on throttle body)
- (1) 4+2 Pin Connector
- (1) Fuel pressure regulator (installed on throttle body)
- (1) Coolant Temperature Sensor
- (1) Gasket Kit
- (3) -6 AN Inlet Fittings (installed on Throttle Body)
- (1) Data Com Cable for the Handheld Controller
- (1) Handheld cable
- (1) 4 gigabyte SD Card (installed in the Handheld)
- (1) 3/8 NPT Reducer
- (1) Installation Guide

Service P/N	Image	Description	Quantity	Notes
N/A		Throttle Body	1	<ul style="list-style-type: none"> • Carburetor gold finish • Injectors preinstalled • Regulator preinstalled • TPS preinstalled • -6AN fittings all preinstalled • Vacuums ports plugged
60017		Bosch Wide Band Oxygen Sensor	1	<ul style="list-style-type: none"> • Use of leaded fuel will degrade sensor and will require periodic replacement • Mounting Procedure on page 11 is critical for system performance
60012		Oxygen Sensor Bung Kit	1	<ul style="list-style-type: none"> • Requires 3/4" hole to be drilled • Mounting procedure on page 11 is critical for system performance • In order to help prevent condensation in exhaust from damaging the sensor, ensure that the sensor is instead with at least 10° vertical angle
60027		4+2 Pin Connector harness	1	<ul style="list-style-type: none"> • Connects from the throttle body harness to the vehicle side harness

Service P/N	Image	Description	Quantity	Notes
60021		Coolant Temperature Sensor	1	<ul style="list-style-type: none"> • 3/8" NPT threads- Adapter to 1/2" NPT are available • Must be installed in a coolant passage in either the intake manifold or cylinder head. Do not install in thermostat housing!
60018		Coolant Temperature Sensor adapter	1	<ul style="list-style-type: none"> • Used to reduce a 3/8" NPT thread to a 1/2" NPT thread.
39610-3		Throttle Body Gasket Set	1	<ul style="list-style-type: none"> • Throttle body to manifold gaskets.
60019		10mm return line block off	1	<ul style="list-style-type: none"> • Blocks the return line for use with externally regulated fuel systems ONLY
60014		Handheld Cable	1	<ul style="list-style-type: none"> • Cable connects the handheld and the system.
60016		Windshield Mount	1	<ul style="list-style-type: none"> • Mount for Handheld controller.
60015		Mini USB cable	1	<ul style="list-style-type: none"> • Connects to handheld and a USB.
60013-39610		Handheld Controller	1	<ul style="list-style-type: none"> • Highly advanced, joy stick and touch screen controller.

Service P/N	Image	Description	Quantity	Note
70050-13		IAC Motor	1	<ul style="list-style-type: none"> Pre-installed on throttle body. Can be installed on any Throttle Body as long as the empty hole is plugged.
60022		TPS	1	<ul style="list-style-type: none"> Pre-installed on throttle body
-6		Injectors	1 set of 4	<ul style="list-style-type: none"> Pre-installed in each throttle body. -6 injectors are capable of 55 lb of flow.

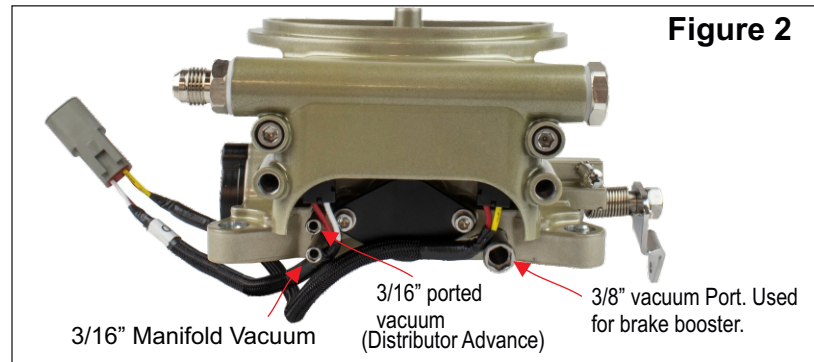
Warning: Before starting any installation, disconnect the ground connection on the battery. Be very careful when disconnecting any fuel lines to let the fuel drain into a receptacle or a dry cloth. Do not allow raw fuel to collect in the engine as this is a fire hazard. Please observe extreme caution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

Installing the throttle body

1. Start by labeling all vacuum lines for easy identification. If any lines seem damaged now is the time to replace them! Next, remove the carburetor and clean the gasket mating surface.
2. Place the gaskets on top of the manifold. Then, place the Go EFI 2-Barrel throttle bodies on top of the new flange gaskets on the manifold. Ensure there are no clearance issues before proceeding. Install the washers and hold down nuts, and snug down progressively in a “criss-cross” pattern (120 in/lb or 10 ft/lb). Depending on your application, this is also the time to install your throttle bracket and transmission kickdown brackets. You may be able to re-use the stock style throttle stud or transmission studs from your carburetor.



3. Reconnect the throttle and if applicable transmission kick-down linkage as in figure 1. Be sure to check for any binding conditions and correct before proceeding. Poorly routed throttle cables and linkages can cause throttle pedal issues and poor transmission response.
4. Reconnect the appropriate vacuum hoses to the Go EFI 2 Barrel throttle body. Be sure to plug any vacuum sources not used on both the Go EFI 2-Barrel throttle body and on the engine. See figure 2 for vacuum port identification.



Coolant Temperature Sensor Installation

The Coolant Temperature Sensor should be threaded into one of the front ports in the intake manifold or cylinder head. The sensor threads are 3/8-NPT. Some manifolds have 1/2-NPT parts, in this instance use the supplied adapter. Use Teflon tape or a quality pipe sealant on both the pipe reducer (if used) and on the temperature sensor. Connect the Yellow/Black wire lead from the throttle body to the sensor. Snap the connector into the sensor. Do not over tighten or damage to the cylinder head or intake manifold may occur. It is best to drain some of the coolant before the sensor is installed. Do not install the sensor in the thermostat housing, or in an area that will not see a constant flow of coolant.



Oxygen Sensor Installation

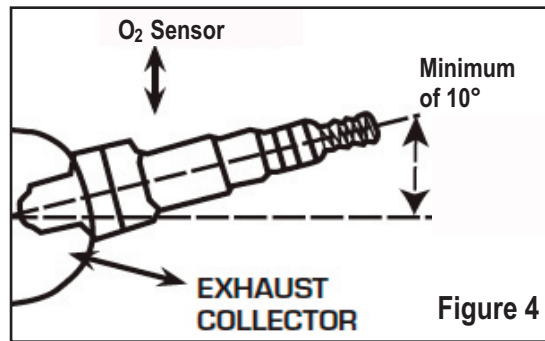
Your vehicle may already have an O₂ sensor bung welded into the exhaust. This bung location needs to be verified before using it with the oxygen sensor included in the Go EFI 2 Barrel. Ideally the bung will be 2-4 inches after the collector or in the collector for a true reading of all cylinders. You must have a minimum of 18" length of exhaust pipe past the sensor location. The bung also must be on the top side of the tube so moisture cannot collect on the oxygen sensor.

The O₂ Sensor must be at least 18-inches from the exhaust tip and port. It will not work on "zoomie" style headers. The supplied O₂ Sensor can be installed in either exhaust bank. The sensor cable connects to the O₂ cable on the harness. Before starting this installation please verify that the harness will reach the sensor or an extension harness (Part number 70050-7) can be purchased by calling FiTech EFI at (951) 340-2624.

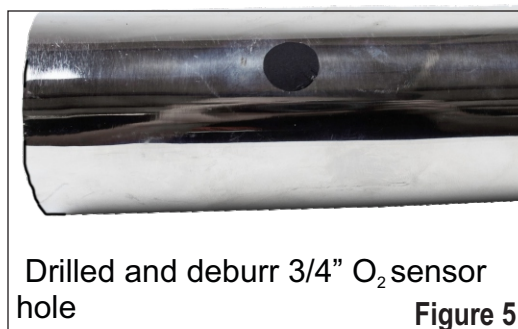
- A. The ideal location for the sensor is 2-4 inches after the exhaust collector or inside the collector. Locate a position for the oxygen sensor as close to the engine as possible. The oxygen sensor should be mounted at a point where it can read a good average of all the cylinders on one bank. This would be slightly after all the cylinders merge. You must have at least 18" of exhaust pipe after the sensor.
- B. The clamp-on kit installation requires a 3/4" hole to be drilled in the exhaust system.

NOTE: Verify that the O₂ cable is supported correctly and away from heat sources such as the exhaust. If the O₂ cable has melted it is not fixed under warranty and will require the harness to be replaced at the customer's cost.

- C. The sensor should be at least 10° above horizontal (see figure 4) to allow condensation to run off. If this is not adhered to, the sensor is susceptible to water damage and will lead to a premature life of the sensor. Improper installation will void warranty.



- D. Never position the sensor on the outside of a bend in the tubing.
- E. Mark the center of the casting on the exhaust tube and drill a 3/4" diameter hole in the desired location.
- F. Deburr the hole after drilling.



G. The supplied bung kit can either be welded in place or clamped onto the pipe, see figure 6. 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. Place the gasket on the tube, then the casting on the tube. Slip a clamp on one side and lightly tighten. Slip the second clamp on and lightly tighten on the opposing side. It is necessary to use a small amount of anti-seize on the threads of the T bolt clamps to prevent thread damage.

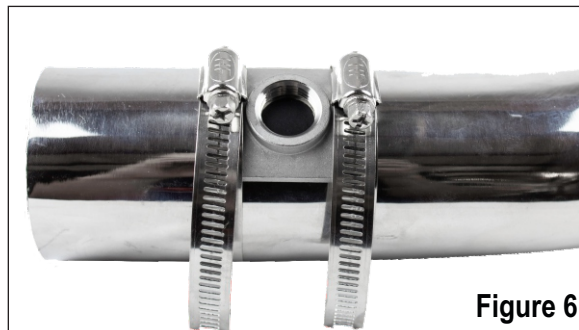


Figure 6

H. Install the sensor into the bung, see figure 7. Apply a small amount of anti-seize on the threads of the O₂ sensor. Be very careful not to get any anti-seize on the tip of the sensor itself because it will cause it to prematurely fail.

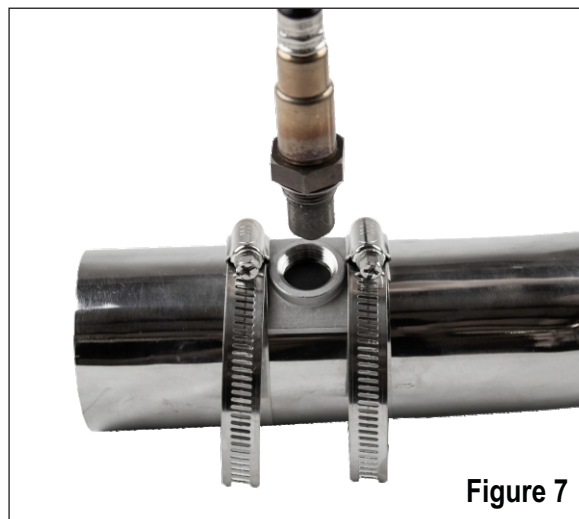


Figure 7

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.

NOTE: Never run the engine without the oxygen sensor installed if it is not plugged in and powered by the ECU, or it will be damaged. If you need to plug the hole temporarily, use an O₂ sensor plug or a spark plug with an 18mm thread.

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 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 FiTech's warranty. Make sure your exhaust is leak free. **THIS IS VERY IMPORTANT.**

Fuel System Connections

Connect fuel feed and return hose. It is mandatory that a bypass regulator and a regulated fuel delivery system is used as seen in figure 9 through 11. There is no return fitting so the three inlet fittings, see figure 8, will have to be connected to a bypass regulator if using an external regulator, such as a Tight Fit Fuel Pressure Regulator, part number 44120 as seen in figure 9, or to a regulated fuel delivery system like the FiTech Regulated G-SURGE (40009) as seen in figure 11 or the Command Center 2 (40004) in figure 10. The inlets are indicated (see figure 8).

NOTE: Fuel pressure should be checked on the inlet fuel line before initial start up during the fuel pump prime. We recommend using a 0-100 psi oil filled gauge, part number 80117, and a -6AN Gauge Adapter, part number 86606, to check fuel pressure.

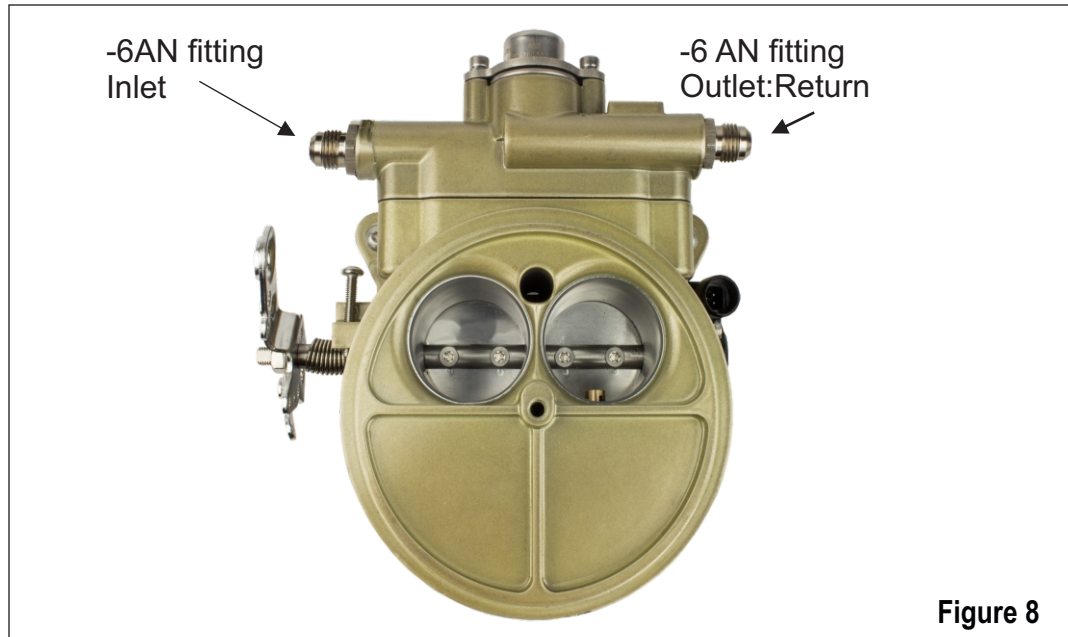


Figure 8

DANGER!

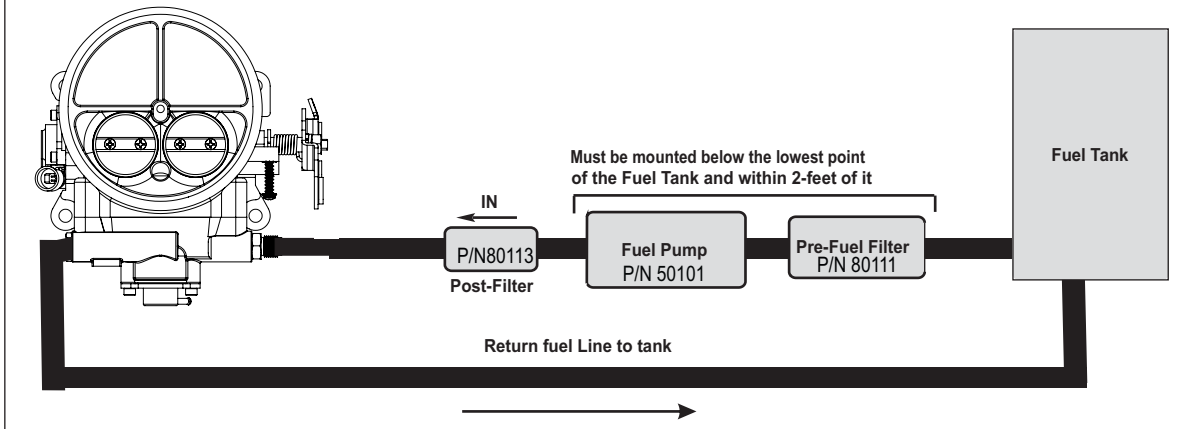
Take precautions to ensure that all fuel components are away from heat sources, such as the engine or exhaust pipe. A fire or explosion hazard could cause serious injury or death!

Before disconnecting or removing fuel lines, ensure the engine is cold. Do not smoke. Extinguish all open flames. An open flame, spark, or extreme heat near gasoline or fumes can result in a fire or explosion causing damage, serious injury, and/or death.

Never get under a vehicle supported by only one jack. Serious injury or death can result from vehicles falling off of jacks. Before working underneath a vehicle, support it solidly with jack stands.

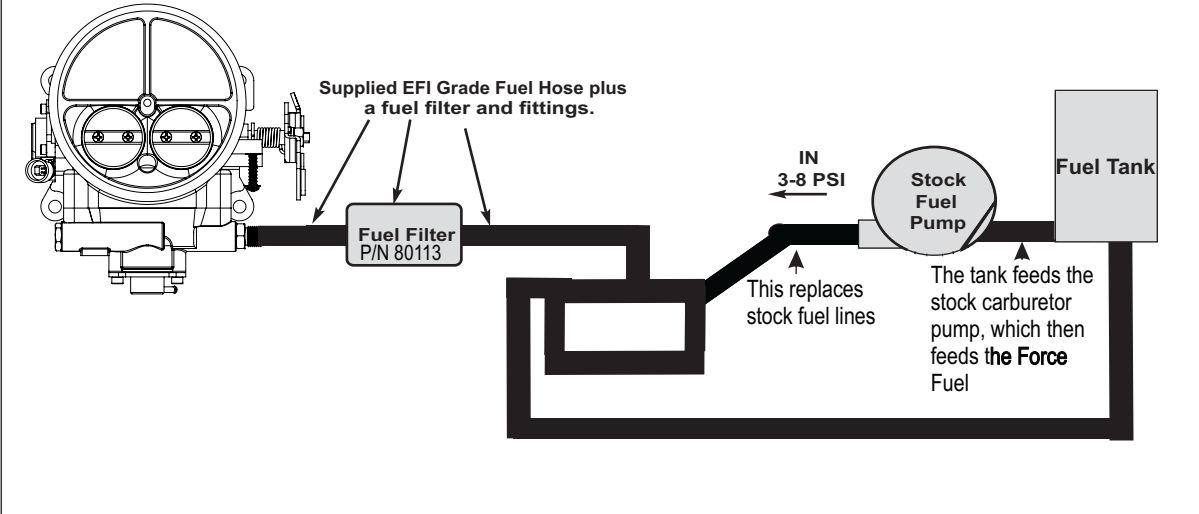
Plumbing Schematic for External Inline Pump - Fuel Delivery Kit #50001
 See separate instruction sheets that were provided with this pump kit for complete details

Figure 9



Plumbing Schematic for Force Fuel - Fuel Delivery Kit #50004
 See separate instruction sheets that were provided with this pump kit

Figure 10



General Wiring Reference

VERY IMPORTANT!

The Go EFI 2-Barrel system highly depends on a clean and constant voltage source. Please ensure when grounding the system it is a clean ground, the ground is just as important as the power side for any electrical system.

The Go EFI 2-Barrel contains many processing devices. These devices require clean power and secure grounds. The wiring of these devices must be separated from “noisy” power and ground sources. This includes not clumping wires together; especially the blue tach in wire from the FiTech unit because it will result in noise interruptions and noise interference. This wire must not be loomed with the main harness or any other wires because false RPM noise and other interference will occur.

Do's

- Install the main power directly to the battery post terminals and connect the ground ring to the engine block, head, or battery. **DO NOT CONNECT TO THE VEHICLE BODY OR CHASSIS. DO NOT CONNECT THE MAIN POWER TO ANY OTHER SOURCE.**
- Keep blue tach in wire and crank signal (distributor) wiring away from high voltage or “noisy/dirty” components and wiring, especially secondary ignition wiring (plug wires), ignition boxes, fans and other associated wiring. Do not let any EFI wires contact any plug wires because noise will be created.
- Properly crimp or crimp and solder any wire connections. Apply quality heat shrink over any of these connections.
- A proper ground connection from the battery to the chassis, and the battery to the engine is crucial
- Make sure battery is fully charged

DON'TS

- **NEVER** run high voltage or “noisy/dirty” wires in parallel (bundle/ loom together) with any EFI sensor wiring. If wires need to cross, try to do so at an angle. This is crucial especially for the tach wire (blue wire off the FiTech harness)
- **DO NOT** use the electric fan outputs to directly power a fan. They must only be used to trigger a relay ground ground.
- **DO NOT** use improper crimping tools.
- **DO NOT** use anything like “t-taps” etc. Use proper crimper/solder and heat shrink.
- It is **never** recommended to splice/share signal wires between different electronic control units (i.e “piggyback”).
- **DO NOT** connect the Red in sheathing battery switched +12V wire to “noisy” sources. It can **ONLY** be connected to the battery positive terminal.
- **NEVER** start an engine with a battery charger attached.

Warning! Any modifications of the supplied FiTech wiring harness can result in a possible void of warranty.

ATTENTION! VERY IMPORTANT!

DO NOT resort to any of these “wiring” methods!

- **DO NOT SHORTEN OR LENGTHEN ECU HARNESS**
- **DO NOT Twist Wires Together**
- **DO NOT use Wire Nuts**
- **DO NOT use Mismatched Connectors**
- **DO NOT use T-Taps!**
- **DO NOT Jam Wires into a Fuse**
- **DO NOT use Broken Butt Connectors**
- **DO NOT use Bare Wires!**
- **DO NOT use Electrical Tape on Bare wires**
- **DO NOT get the cheapest crimpers available**
- **DO NOT USE ROMEX**




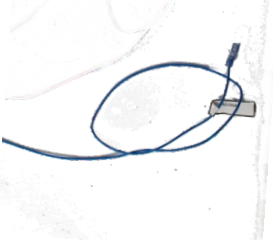




ONLY THESE APPLICATIONS ARE ACCEPTABLE




- OEM Automotive Quality Connectors and wires
- Soldered Connection w/ adhesive heat shrink

NOTE: Improper wiring modifications will void warranty. If any extensions are necessary install terminals to the desired wire.

Wiring Chart

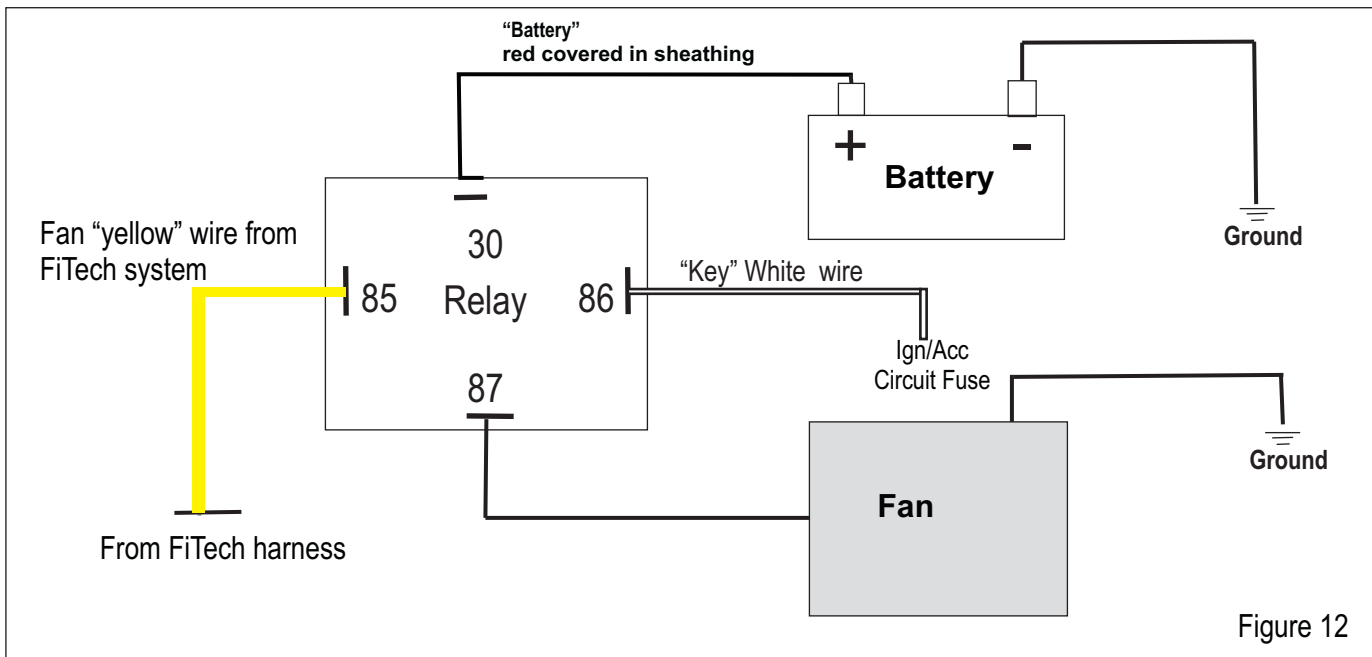
The chart below lists all of the wires in the FiTech Go EFI 2-Barrel System. The wires are color coded and labeled.

Required/Optional	Wire Color	Label Name	Image	Description
Required	Orange	Fuel Pump		This wire provides 12V to the fuel pump and connects to the positive (+) terminal on the pump. No relay is required when using a FiTech pump.
Required	Black	AC in		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	Red	Battery		Connects to battery. Must have a clean source of power. DO not loom with other wires. ONLY CONNECT DIRECTLY TO BATTERY.
Required when using TACH signal for RPM	Blue	Tach in		This tach input wire triggers the system. It connects to the negative terminal of a 12v coil. This is how the system receives RPM signal from the system. Isolation of this wire is crucial. DO NOT loom with harness or any other wires
Optional	Yellow	Fan		This wire sends the ground signal to a relay to activate the fan. See figure 12 below.
Required	White	Key		This goes to the ignition switch. It is what will tell the system if it is on or off. It needs a clean 12V while cranking and key one. But, no voltage with key off.
Required	Red	Battery +		This wire needs a clean power source. Connect it directly to positive side of battery. Do not connect to alternator, starter or any other source of positive power!
Required when using timing control	Blue in green sheathing	2-Wire		This is used only for timing control and plugs into the distributor 2-wire connector

Required/Optional	Wire Color	Label Name	Image	Description
Required	Covered in black sheathing	CTS		This connects to the CTS on the manifold or the block. Crucial for optimal performance from the Fitech EFI System. Please ensure it has a secure connection.
Required	Covered in black sheathing	O ₂		Large 6 wire connector. Connects the O ₂ sensor. Crucial for optimal performance from the FiTech EFI System. Please ensure it has a secure connection.
Required	Covered in black sheathing	Handheld		The handheld connector connects to the handheld. One cable is to supply power and one is a data cable. Ensure handheld is securely connected. The handheld can be removed once initial programming has had a hard save. If the handheld is removed ensure the cable is secure and not near any heat source. If there is heat damage to the wire it will void your warranty.

Fan Circuit Connection

The fan wire is a ground side trigger and must go to a relay to trigger the fans on. Traditionally replaces the thermal switch from a fan controller. The trigger circuit (86) connects to the 12 v “key” (white wire). The “yellow” wire from the EFI system connects to the relay (85). The red wire covered in sheathing labeled Battery from the FiTech harness goes from the 30 relay to the positive terminal of the battery. Lastly, the (87) the yellow wire on the relay goes to the fan. It is crucial that the battery and the fan are grounded. See figure 12.



Timing Control with CDI Box

Timing control using a CDI box is a plug and play setup. Before beginning this installation ensure your CDI box is set up and running correctly according to your manufacturer’s specification. All that needs to be done is plug the two pin connectors from the harness, labeled crank, into the distributor and then connect the yellow wire, labeled coil, to the points input wire from the CDI Box. The points input wire is usually a white wire but it can vary depending on the brand of your CDI box. To enable this feature in the handheld go to engine set up and enable VR input. Then go to ignition setup and select coil drive.

Selecting the correct wiring schematic:

Review Figures 13 through 17 and select the schematic that suits your particular application. Figure 14 shows how to connect a ready-to-run distributor. Figure 14 is for an HEI distributor. Figure 15 is for a system with an external CDI box. Figure 16 is when an external CDI Box with timing control. Figure 17 is used with a CDI and a crank trigger wheel. One of these configurations will suit your vehicle.

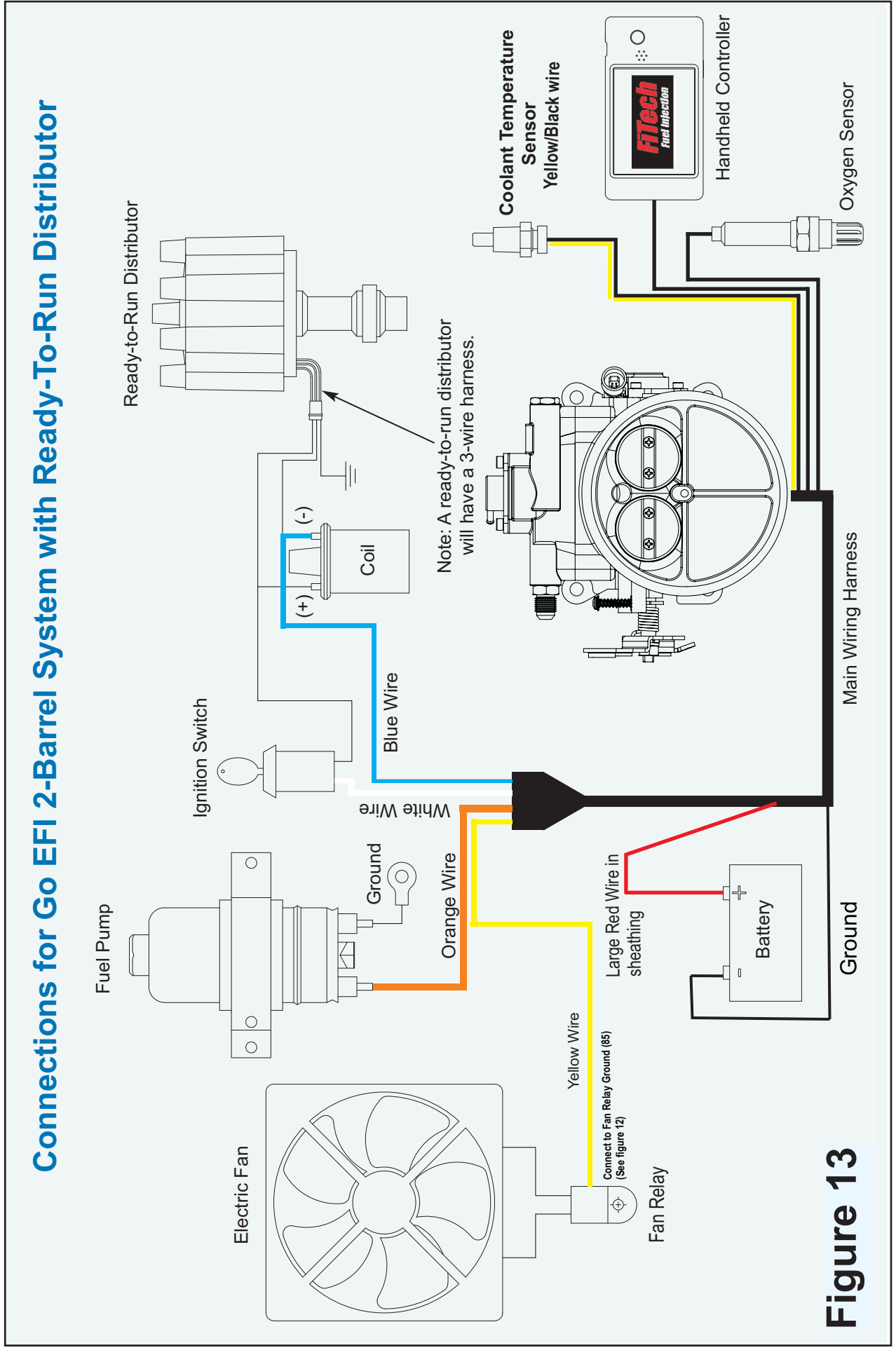


Figure 13

Wiring Connections for Go EFI 2-Barrel System with HEI Distributor

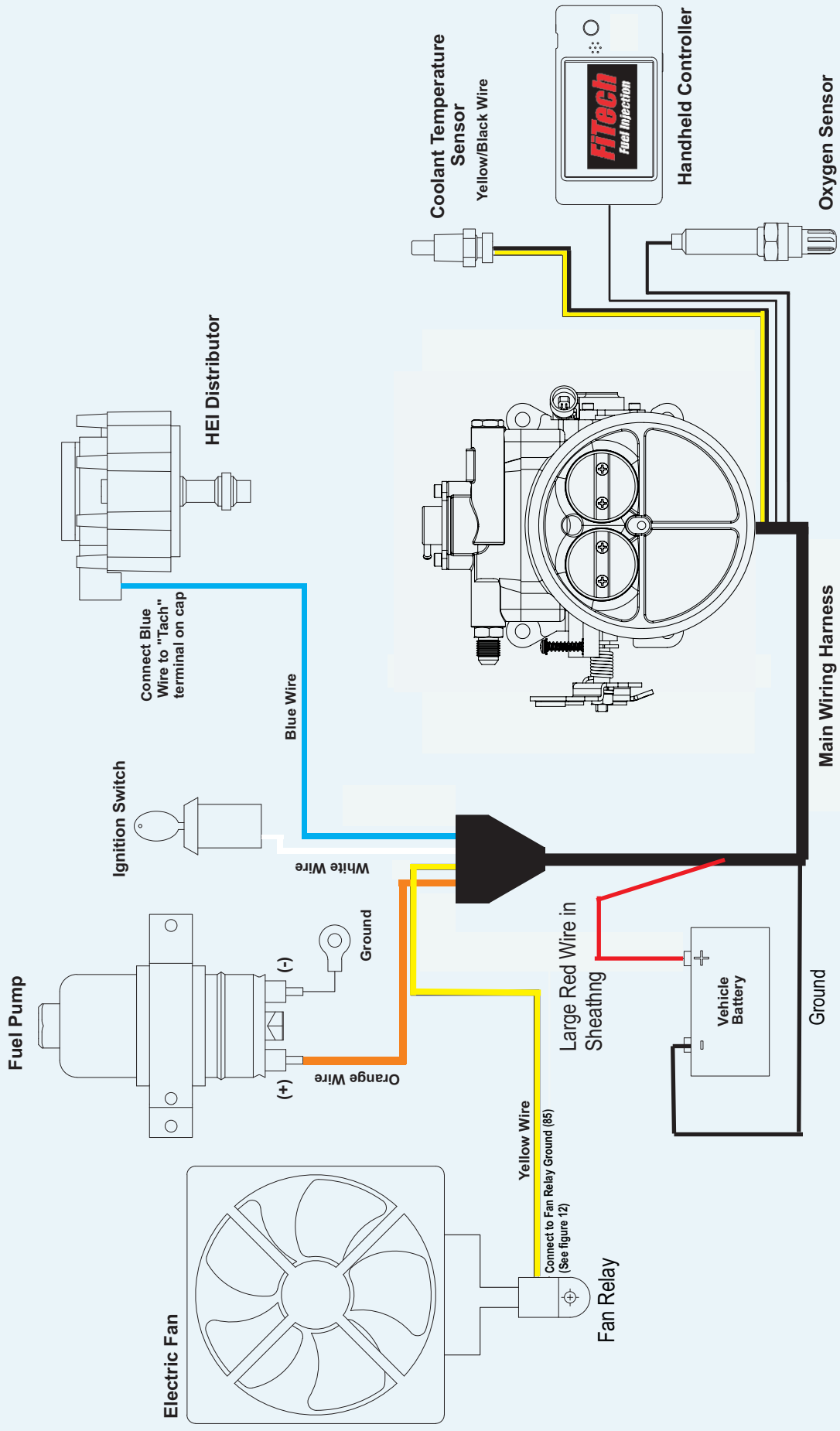


Figure 14

Use this wiring schematic if you are utilizing an HEI distributor without an external CDI box.

Wiring Connections for Go EFI 2-Barrel System with External CDI Box

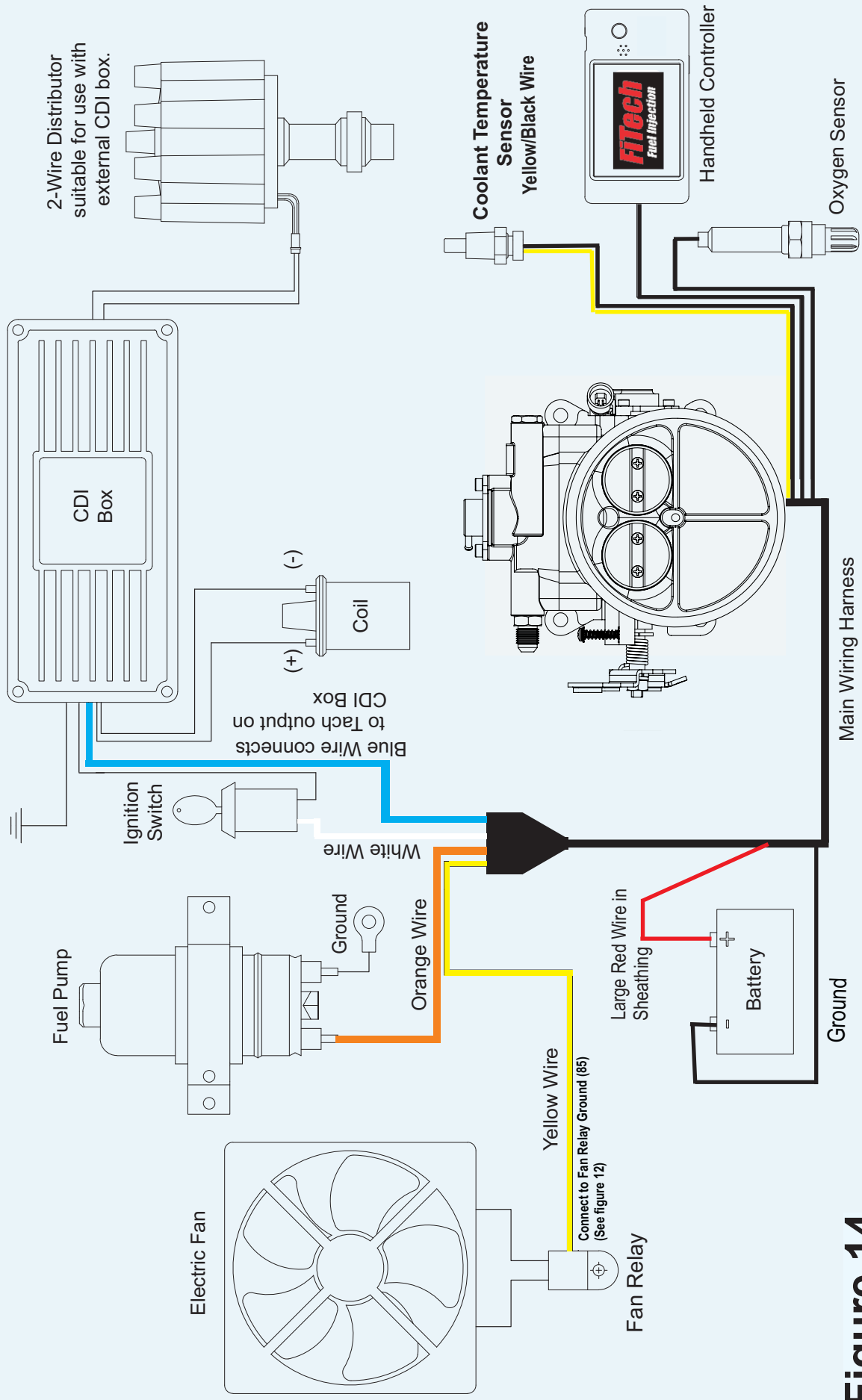


Figure 14

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 Capacitive Discharge Ignition (CDI) box.

Wiring Connections for Go EFI 2-Barrel System with External CDI Box with timing control

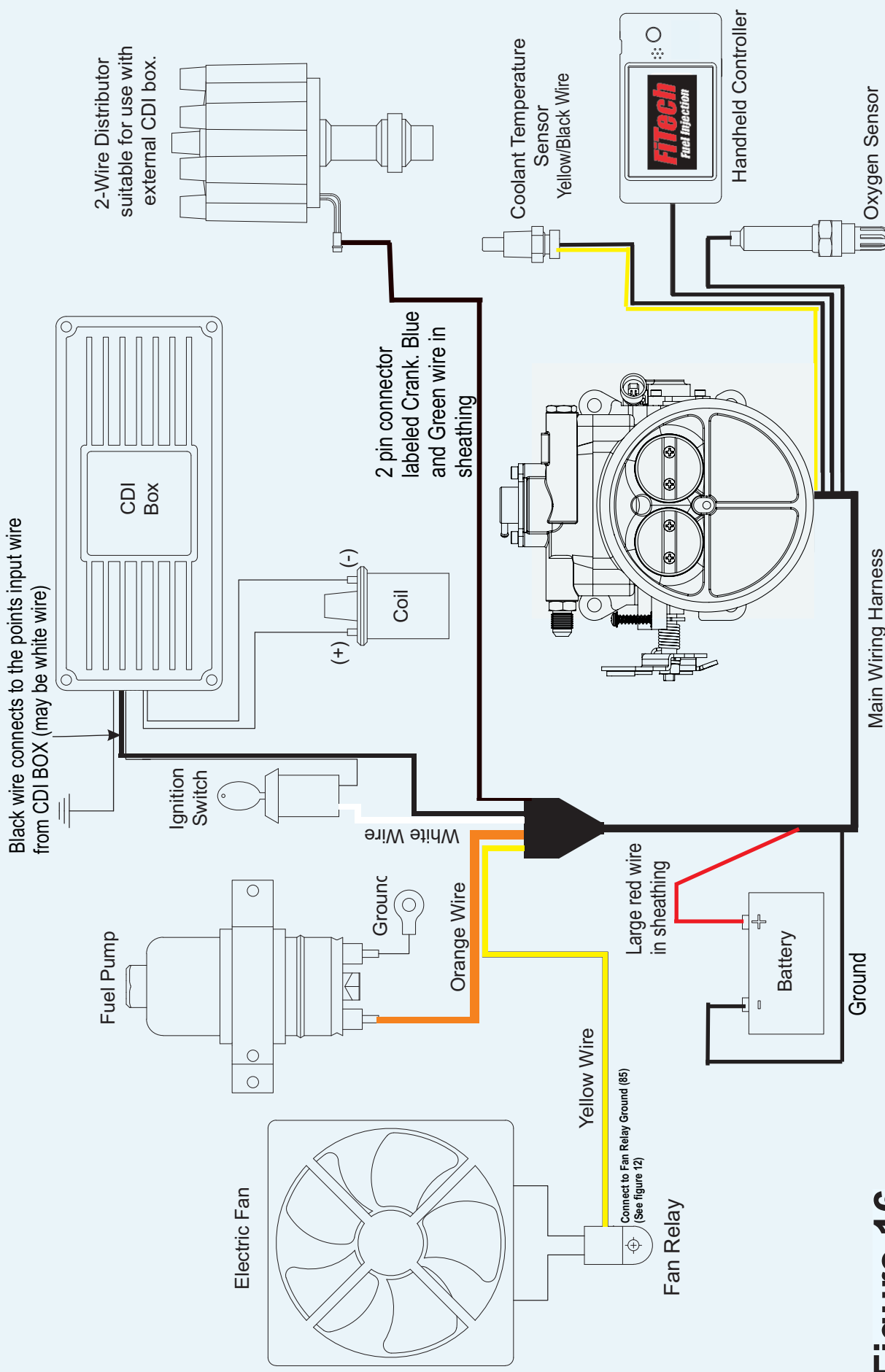


Figure 16

Use this schematic if you are utilizing a conventional two-wire distributor with an external CDI box, such as a MSD 6AL or similar aftermarket Capacitive Discharge ignition (CDI) Box with timing control. In the handheld under initial set up set tach or 2 wire +coil to "VRCoil"

Wiring Connections for Go EFI 2-Barrel System with External CDI Box with timing control

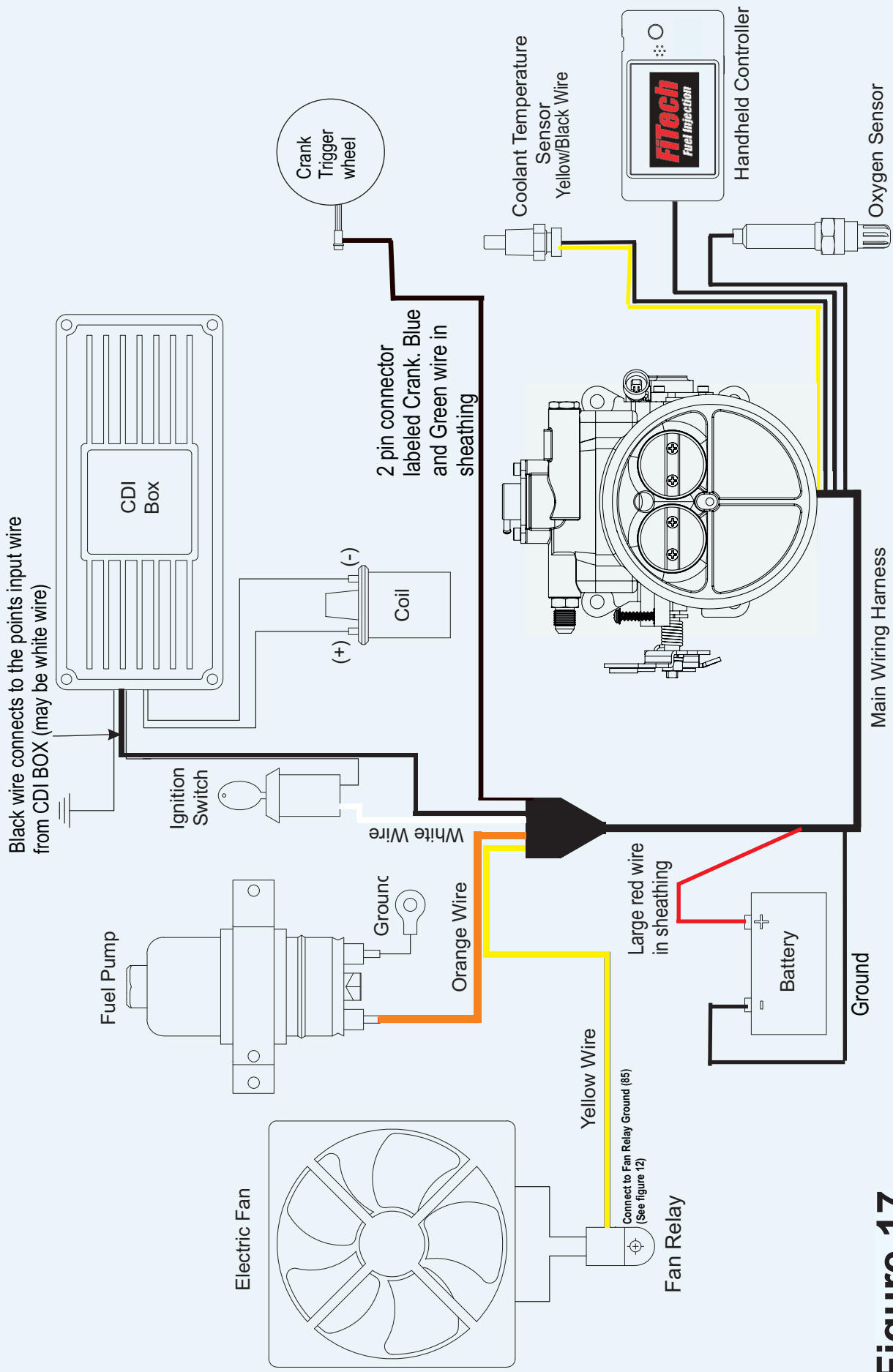


Figure 17

Use this schematic if you are utilizing a conventional two-wire distributor with an external CDI box, such as a MSD 6AL or similar aftermarket Capacitive Discharge ignition (CDI) Box with a crank trigger wheel and timing control. In the handheld under initial set up set tach or 2 wire +coil to "VRCoil"

Final Steps

- 1 Reattach the air inlet tube, all vacuum hoses, and electrical connectors on the new throttle body.
- 2 Reconnect the negative battery terminal.
- 3 Turn key but do not crank, pressurize the system and check for any fuel leaks.
- 4 Start the engine and check for loose connections or vacuum leaks, etc.
- 5 After the engine is warmed up, check the idle speed (refer to owner's manual). Double-check all fasteners clamps, and electrical connections to ensure they are all secure.

Handheld controller

Here are two ways to navigate the handheld controller, you can use the touchscreen with your finger or move the joystick up, down, left, or right. The joystick is the black button on the right hand side of your controller, it can be used to view the displays on the controller by moving the button up and down or side and side, pressing the joystick = enter

1. When making the changes to the ECU through the handheld make sure that the key is on.
2. Once the changes are made turn the key off, wait 12 to 20 seconds until the values disappear under the "dashboard" feature. Doing this will ensure that your changes were saved to the ECU and will be received as a hard save.
3. Once the hard save is completed if desired the battery can be disconnected without inference with the calibrations. For handheld controller definitions visit www.fitechefi.com under "support" subtab under tech center.



Figure 18



Figure 19

*note: pictures may not represent your exact handheld

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

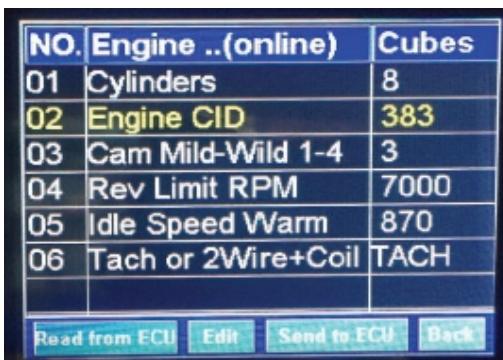
Initial programming

This simple procedure is performed using the Handheld controller. A laptop computer is NOT required

1. Connect the ECU to the main harness and supply power but do not crank
2. Input Cubic Inch Displacement, Cam size, Target Idle speed warm, RPM limit, ignition selection, crankshaft sensor, injector flow rate, and max rev limit.
3. The Handheld controller can be removed or left connected. When connected, there is a dashboard and gauges screen that will show the engine parameter in real time

Handheld Options

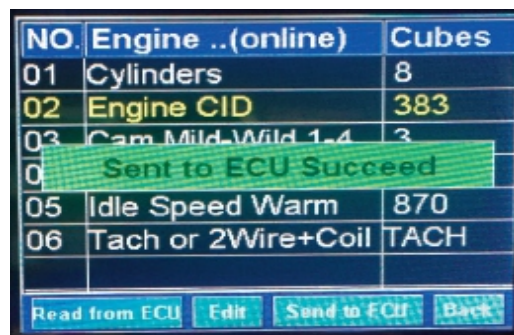
- 1 Cylinders - Factory preset is 8 and shouldn't need to be changed for most installations.
- 2 Engine CID – Factory preset is 350 CID. To change value you can use touchscreen buttons (Edit, CLR value from screen, Enter your number now , press OK, then depress joystick button to enter). Sent and Succeed 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. 1- Cylinders - Factory preset is 8 and shouldn't need to be changed for most installations. Engine CID. This entire step can also be performed using the joystick.



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

Figure 20



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

Read from ECU Edit Send to ECU Back

Figure 21

Fan 1 Setup

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 approximately 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.

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 2 or the G-SURGE 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.

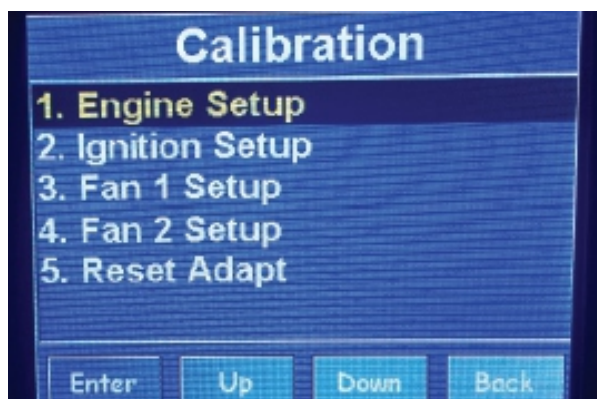


Figure 23

IAC Setup/Setting you Idle

The idle screw on the throttle body needs to be adjusted. This needs to be set so that the IAC value is nearly closed when fully warmed up and in idle 0-10 IAC Steps are recommended for a fully warm engine, out of gear, at idle. When the engine is at idle, the IAC will learn the necessary position to maintain the RPM at the Target Idle Speed. When loads are placed on the engine, or when the throttle is open, the IAC steps will move around, this is normal. It's best to adjust this screw from a more open position to start with. This will allow the engine to start at a high idle, which will make adjusting the IAC easier.

1. Start engine and in your handheld go under initial set-up
2. Then go to idle setup and find idle set mode and turn on.
3. Now start the vehicle and find IAC steps in dashboard. This number needs to be within 3-10 at operating temperature. If the number reads zero then slowly turn the screw OUT (counterclockwise) until the IAC steps are between 3-10
4. If the number is above 10 then turn the screw IN as stated above and repeat the process until the IAC steps are between 3-10
5. When finished turn key off and allow the system to save (30 seconds of key off), the system will automatically shut off idle set mode.

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 throttle body mounted ECU that has timing control without the need for an external CDI box.

1. When using timing control, the distributor still needs to be moved and synced to the ECU with a timing light mated to the Spark Advance in the Dashboard. Timing control is not self-learning and is not mandatory when installing your Go EFI System.
2. The values in the timing map are the final numbers you should see at the timing light. Cranking has double spark, so most timing lights will not show accurate numbers. Idle has a stability control algorithm, so the timing will bounce around the Idle Advance by +/- 6° or so.
3. A new feature is lock-out option for setting the timing to that the ECU assumes there is no conflict when working with lock spark advantage. Settings are available for idle timing, as well as complete timing control using your handheld controller, The base timing at cranking should be 13 and the distributor set to 30°.
 1. Start the engine and apply locked mode. The ECU will assume the distributor is at 30°.

2. Set the distributor to match the handheld. We recommend maintaining the value at 30°.
3. Synchronizing timing light to what the handheld says
4. Adjust VR drift value to 4000, if this value throws off the 30 values on the handheld either increase or

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. Locking the distributor consists of removing the counterweights and springs and following the manufacturer'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 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 the correct 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. Follow these steps and you will be assured success.

- 1) Connect black wire to the "Points" input wire on the MSD harness. The CDI output wires going to the coil need to be the only things going to the coil, and need to be separated from all of the other wires. Separating the wires is very important! If the wires touch it will cause false RPM noise or interference.
- 2) Use a LOCKED OUT distributor. Follow the manufacturers lock out instructions for your distributor.
- 3) Connect the distributor 2-wire to the FiTech unit's 2-wire distributor input.
- 4) In the handheld go under "Go-EFI Initial Setup" with the key on, but do not crank, change "Tach or 2Wire+Coil" to "VRCoil" (VR means variable reluctor – i.e. magnetic pickup). Click the button / joystick to "Send to ECU" Turn the key off after doing this step, and wait 15-30 seconds for the system to save that into permanent memory.
- 5) In the handheld go to "Distr Base Timing", this is the spark timing that the engine will be cranking at, and also represents the minimum spark advance the system can allow. Strictly in the handheld change it to 10 degrees as a starting point.
- 6) Remove your distributor cap, but leave the spark plug wires attached. If the timing is set and the engine is in mechanically sound condition mark the cap where the rotor is pointing to ensure the timing will be set after phasing it.
- 7) With a phaseable rotor, advance it about $\frac{3}{4}$ of the width of the brass tip. Use thread locking compound to keep the screw tight – it will back out if you don't.
- 8) Put the engine at about 10 degrees BTDC, and move the distributor with the cap off to see that a tooth on the trigger lines up with the pickup sensor.

- 9) Start the engine, with a timing light connected, and the distributor clamp loose enough to adjust but not moving by itself.
- 10) With the engine running and looking at the handheld under the “Initial setup” menu, find the option for “Ignition Setup” and select it. Once in this menu locate “Lock Timing to set”, it will be set to unlocked, push right with the joy stick button to change it to Locked and then push the joystick button in. The screen will say send to ECU successful and the engine will change pitch indicating that the timing has changed.
- 11) With the handheld in view showing the dashboard screen, find spark advance, open the throttle so it's not in idle – 2000 RPM is OK, use the timing light and move the distributor to make the spark advance at the engine match what the handheld says which in this case will be 30 degrees.
- 12) Once matched up, lock the distributor clamp down.
- 13) Now you can use the handheld to put in other spark advance values in the “SPARK MAP” under Go-EFI Tuning.
- 14) If the engine needs more or less advance at cranking, you would need to change the “Distr Base Timing” and also repeat the above procedures for moving the distributor.
- 15) VR Drift at 4000 is to compensate for some lag in the magnetic pickup. It's only useful if the spark advance matches at low RPM, but not high RPM. The default value is close enough in most cases.
- 16) Idle advance is the median spark advance at idle. There is a stability function in the software that automatically adds or subtracts timing JUST AT IDLE to try to keep the RPM stable at the Target Idle RPM.
- 17) WOT means full throttle (wide open). 45kPa is a very light cruise load.

MOST IMPORTANTLY – Ignition timing has NO LEARNING. It will do what you tell it to do, and if the engine knocks, the computer DOES NOT KNOW – you need to reduce the timing with the handheld SPARK MAP to make it go away. Most Engines are OK with 3000 45kPa Cruise spark advance in the high 30's to low 40's, and WOT timing at 1100 being around 10-15 (but listen for knock at these low RPMs and adjust accordingly), and WOT at 3000 to be around 28-32 degrees, and WOT 6000 at 30-36 degrees.

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!

Air Fuel Ratio (AFR)

An approximate value for gasoline “stoichiometric” value is 14.7. A value of 12.5-13.0 is a “rich” value for near best power. For boost conditions (superchargers and turbochargers) 11.8 is a little richer than best power to keep combustion chambers, plugs, and exhaust valves a little cooler. 14.7 is lean and can sometimes be used to better cruise fuel economy, Idle AFR should be set to give a decently stable idle. Many engines prefer between 13.2 and 14.0 AFR.

IMPORTANT! The ECU takes time to learn after engine components have been changed. It is recommended that the vehicle be driven for one to two hours to allow the computer to adjust to this throttle body before moving to the following adjustments. Making adjustments before the computer has gone through a learn cycle can yield inconclusive and inconsistent results. If idle is low or rough, adjust the bleed screw counter-clockwise a half turn at a time. This will increase idle RPM.

On-Engine Adjustments

Start the engine and observe idle. If idle is high, confirm the throttle cable is adjusted to allow the lever arm to rest on the base idle screw (Figure 8) and the cable is not holding the blade open. If idle is acceptable, bring the engine to running temperature and check the idle again. If idle is not desirable, turn the key to the off position for 30 seconds. This allows the ECU to learn the IAC's new position. Restart engine and reevaluate idle.

Resetting to stock calibration

From the main menu go to the very bottom and select Write Cal to ECU. Once in this menu scroll down to the second to last selection, it should say Default v8 T195. Once in this file select it and it will download to 100 percent. After this is done it will revert to the main menu. Now go to Go EFI Initial Setup, then Engine Setup, now input all of the parameters that are needed for your application, making sure to save each one individually. After you have entered your information and saved it go up and select Dashboard. Once in dashboard turn the ignition key off and wait for all of the data to black out. Once this happens turn the ignition key to the on position and start the car.

Reset Learn

All FiTech ECU systems have learning procedures that the system uses to adjust the active fuel table it is using for operation. Sometimes if there are outside problems such as bad misfires, exhaust leaks, or any other situation that could cause poor reading on the O₂ sensor, the system will try to compensate in order to keep the car running. If this happens it alters the fuel map in ways that may not be optimal for proper running the engine normally. To reset learn is a very easy procedure. Go into the Go EFI initial setup then find Reset Learn. Once in that menu find Reset All Learn, highlight this and push on the joy stick to go to #1, then save that to the ECU by pressing IN on the joystick. Once that is saved go back to the main menu, and then up to Dashboard and select it. Once on dashboard turn the key off and wait for the numbers in the value side to go black. This means the system has saved. You have now reset the learn function.

Data Logging

Data Logging is a useful tool for diagnoses and tuning. It allows you to check how the many functions the system can read and go through them point by point. This allows for exact adjustments to be made. When the vehicle is running go onto the dashboard screen and press the joystick on the right of the screen in and a message will pop up saying Data Log On. Now you will drive the car and get it to have the issue you are having. Once you finish the drive you will press the button again and this will save the data log. Then you can turn the vehicle off and wait 15 seconds for the data on the dashboard to go black. Once this happens you can take the handheld to your PC and plug in the USB cable and handheld. The handheld will light up with three menu options, USB mass storage is at the top, select this. You should see a prompt on your PC to open the handheld folder, if not go to My Computer and you should see a removable drive, select it. Once the handheld folders come up on screen find the folder labeled log_file. Select this folder and inside you should see several files inside that say Dashboard, you can click on these and inside you should see several files inside that say Dashboard, you can click on these and they will bring up an Excel file showing the data you have recorded. You can also copy and paste these files and send them to our technicians to look at it as well.

Save your current setting and tune:

To save a tune first turn the key to the On position, not running. Then find Read Cal from ECU on the main menu. Then select it, once in this menu highlight one of the backup files you wish to save to and then either press OK on the screen or push the joystick IN and it will save all your current settings and parameters.

Cranking Fuel Adjustments

With the key on go to the Go EFI Tuning menu, find crank and Warm up. there you will see three cranking fuel selections. For cold starts add or subtract fuel from Crank fuel 65°F, for hot starts add or subtract fuel from crank fuel 170°F. Changing these settings should help with your start up issues along with setting the IAC. A good starting point is to change the setting in intervals to 10 to find which way you need to adjust the system to work better.

Rev Limiter

The Go EFI 2-Barrel System provides 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 2-Barrel System and you should set the EFI related RPM limiter higher than your external rev limiter to prevent a crossover of the two happening at the same time.

Accel pump / Fast Accel Adjustment

If the system is having a hesitation or bogging issue, and your IAC steps are between 3-10 at warm idle, then your next step would be to adjust the accel pump function to increase or decrease the fuel added on acceleration. To start with turn the key to find the on position and then find Go EFI Tuning on the main menu and press enter. Then find Accel pump and press enter. You will see a menu with multiple different setting, you need to focus on the Accel pumps (20°F, 65°F, 170°F) and Fast Accel (20°F, 65°F, 170°F). These setting adjust how much fuel, at varying temperatures, the system injects when you accelerate. Accel pump is used for any normal throttle input, Fast Accel is for any fast throttle inputs or Wide Open Throttle.

Hesitation: If the vehicle has a hesitation (when you step on the throttle and the engine does hangs and/or almost dies and then suddenly takes off) this is normally a lack of fuel so you would fix this by increasing the Accel Pump (for normal throttle input hesitation) or Fast Accel (for fast throttle or WOT inputs). You would make changes starting in increments of 10, to the temp range that you are finding the issue to reside in. **Bogging/engine loads up/slow to respond:** If the vehicle is bogging (when you step on the throttle and the engine is slower/slugging to come up to a higher rpm) this is normally caused bu over fueling. To fix this you would need to reduce the amount of fuel it is injecting as an accel pump shot. To do this decrease the Accel Pump (for normal throttle input hesitations) or Fast Accel (for fast throttle WOT inputs). You would make changes starting in increments of 10, to the temp range that you are finding the issue residing in.

Decel Fuel Cut Off:

When you let off throttle and decel with your vehicle the EFI will reduce fueling to prevent popping and an over rich condition that would occur if the fueling continued as it normally would. Depending on the size of your engine, camshaft specs, engine temp, gearing, and several other factors like environmental conditions, you may have either too much or too little fuel cut on decel. In order to change the amount of fuel it applies you must go to Go EFI Tuning and then find Fuel Cut Control. Inside this menu. In you will see an option called DFCO Return fuel, this number represents the amount of fuel the system will inject when it you start to give the vehicle throttle again. If you are having a hesitation when getting back in the throttle then add tp the DFCO Return fuel to give the engine more fuel when transitioning back to acceleration. You my also need to adjust your accel pump settings to help with this transition as well.

Choosing a cam selection

Cam selection is based on vacuum load of the engine. Cam 1 is for 15Hg or above, Cam 2 is for 10Hg to 15Hg, Cam 3 is 12Hg to 8Hg, and Cam 4 6Hg to 8Hg. These are estimates and you may need to switch between the if the vacuum load is between two different cam settings to get the engine to run better for your application.

Idle Return

If the engine is not returning to idle quick enough for your liking or is dropping too quickly and killing the engine then you may need to adjust the rate at which the injection system comes to an idle. To do so you need to go to Go EFI Tunning, then find and select Idle Control. Once int his menu you will see several settings, the only one we are going to work with is Decel open IAC. This number should be at zero as a base setting, by going negative you are reducing the amount of time it takes to return to idle, and by going positive you are increasing the time it takes. Normal procedure of adjustment is to add or subtract 10 to start with and then adjust it to you liking or what the engine needs. The once the setting is input save it to the ECU by pushing the joystick IN, the handheld will show Send To ECU Successful. once this is done make sure to go back to the dashboard and turn the key off until the numbers clear out on the vehicle side. This shows that the system has saved.

One Year Limited Warranty on FiTech EFI System

FiTech extends the following limited warranty to the original purchaser of a FiTech EFI system. FiTech warrants its products against defects in materials and workmanship or one year from the date of original purchase. This applies only to the original purchaser and the parts must remain installed on the original vehicle of which they were purchased. This warranty is void if the product was improperly installed, was installed on a vehicle which it was not designed and reinstalled on another vehicle.

This warranty shall not apply to any product installed on a racing vehicle properly, or contrary to FiTech's instructions, altered, misused, repaired/damaged from an accident, collision, or willful or negligent act. To make a claim under the terms of this Warranty, the original purchaser must return the product to FiTech along with proof of original purchase. Purchaser must call FiTech (951-340-2624) or email to: Warranty@fitechefi.com, to obtain a Returned Material Authorization (RMA). Proof of purchase must clearly show the place of purchase, purchase price, product purchased and date of purchase.

If, upon inspection, FiTech determines a defect in materials or workmanship, FiTech will refund the returned goods and shipping expense, and replace the defective part or parts with a new part or parts.

FiTech's liability is expressly limited to the payment of shipping costs and replacing the defective part or parts. FiTech will have no liability for the cost of replacing the defective part or parts. FiTech will have no liability for the cost of installation, removal of defective product, for the cost of labor, or any additional parts required to complete the installation of the replacement product.

In no event will FiTech be liable for any indirect, special, incidental, or consequential losses or damages (including but not limited to interruption of business or loss of business or profit) resulting from the use or inability to use the product, any breach of warranty, or any defect in the product, even if FiTech shall have been advised of the possibility of such potential damages or losses. Some states do not allow exclusion or limitations of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights. You may also have other rights which vary from state to state.