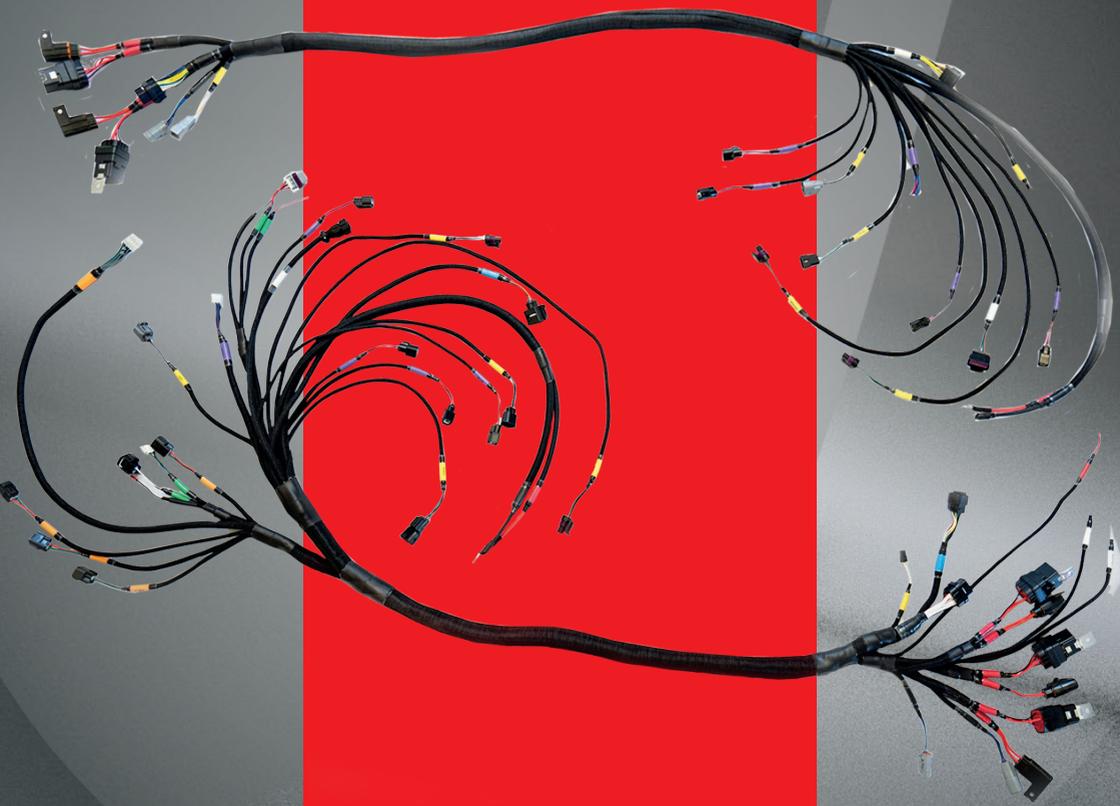


FuelTech



OWNER'S MANUAL

WIRING HARNESS
PROBIKE

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PROBIKE harness

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2. Presentation

The FuelTech PRO BIKE A harness was developed to be installed on a 4 cylinder motorcycle and it's based on stock Hayabusa connectors and sensors. This harness has the basic components needed to make easy installation on an engine with a standard sensor, injector and coil setup. When using a FT450 ECU the use of sensors might be limited. The insulation and connectors are moisture, heat and oil resistant. This harness was not designed to drive by wire control, and consider only TPS sensor for the bottom throttle blades of the stock throttle body.

Specifications

- 4 injector outputs (PROBIKE A harness) / 8 injectors output (PROBIKE B expansion harness)
- 1 FuelTech Peak and Hold driver ready (PROBIKE A harness)
- 2 FuelTech Peak and Hold driver ready (PROBIKE B expansion harness)
- FuelTech SparkPRO-4 connector to use stock coils
- FuelTech EGT-8 ready (EGT-8 and thermocouples are sold separately)
- FuelTech WB-Nano O2 ready (WB Nano and O2 sensor sold separately)
- Pressure sensor ready for fuel, oil, pan vac, wastegate, nitrous / another 0-5V sensor
- Extra input and output connector for generic use
- Speed sensor and gear position (PROBIKE B expansion harness)
- Crank and Cam connectors (hall and VR options)

3. Warnings and Warranty Terms

The use of this equipment implies in total accordance with the terms described in this manual and exempts the manufacturer from any responsibility regarding to product misuse.

Read all the information in this manual before starting the product installation.

This product must be installed and tuned by specialized auto shops and/or personnel with experience on engine tuning.

Before starting any electrical installation, disconnect the battery.

The inobservance of any of the warnings or precautions described in this manual might cause engine damage and lead to the invalidation of this products warranty. The improper adjustment of the product might cause engine damage.

This product does not have a certification for the use on aircrafts or any flying vehicles, as it was not designed for such use or purpose. In some countries where an annual inspection of vehicles is enforced, no modification in the OEM ECU is permitted. Be informed about local laws and regulations prior to the product installation.

Limited Warranty

All products manufactured by FUELTECH are warranted to be free from defects in material and workmanship for one year following the date of original purchase. Warranty claim must be made by original owner with proof of purchase from an authorized reseller. This

warranty does not include sensors or other products that FUELTECH carries but did not manufacture. If a product is found defective, such products will, at FUELTECH's option, be replaced or repaired at no cost. All products alleged by Purchaser to be defective must be returned to FUELTECH, postage prepaid, within the one year warranty period.

This limited warranty does not cover labor or other costs or expenses incidental to the repair and/or replacement of products or parts. This limited warranty does not apply to any product which has been subject to misuse, mishandling, misapplication, neglect (including but not limited to improper maintenance), accident, improper installation, tampered seal, modification (including but not limited to use of unauthorized parts or attachments), or adjustment or repair performed by anyone other than FUELTECH.

The parties hereto expressly agree that the purchaser's sole and exclusive remedy against FUELTECH shall be for the repair or replacement of the defective product as provided in this limited warranty. This exclusive remedy shall not be deemed to have failed of its essential purpose so long as FUELTECH is willing and able to repair or replace defective goods.

FUELTECH reserves the right to request additional information such as, but not limited to, tune up and log files in order to evaluate a claim.

Seal violation voids warranty and renders loss of access to update releases.

Manual version 1.0 –
April/2020

4. Overview

The FuelTech PROBIKE A harness is a terminated wiring solution to be used with FT450 or FT550 ECU. It has all connectors, relays and fuses directly built-in and can be used with nearly any motorcycle application with 4 injectors and 4 coils, and up to 8 injectors when using the PROBIKE B expansion harness.

4.1 FuelTech PROBIKE A harness

This harness was designed for motorcycles with up to 4 injectors (FT450) or 8 injectors (FT550), SparkPRO-4 and a FuelTech Wideband Nano O2 with Bosch LSU 4.2 sensor (when using FT450), or sequential when using FT550 with the expansion harness. Ignition is sequential for both cases.

It is already wired for FuelTech Peak and Hold drivers when using 4 low impedance injectors.

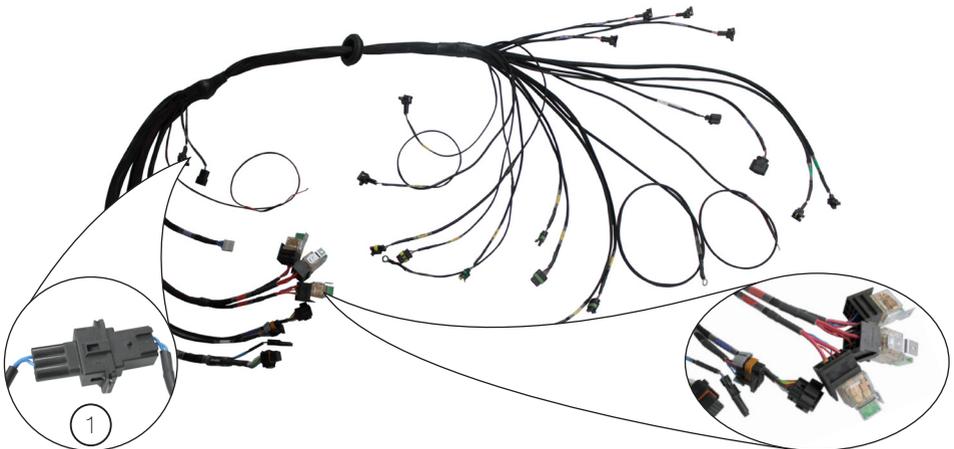
When using high impedance injectors, a Peak and Hold driver is not needed and in this case, only a bypass connector (jumper wires sold separately) is required.

There are 3 separate relays to power the whole system, separating the injectors and coils from the electronics.



NOTE

For the correct operation of the PROBIKE A harness, connectors M and F must be connected to each other. When using the PROBIKE B expansion harness, plug the male connector from the main harness to the female connector on the expansion harness. In this case the female connector of this main harness is left disconnected.



4.2 FuelTech PROBIKE B expansion harness

The PROBIKE B expansion harness consists of another 26 way connector with additional wires and connectors to complement the basic bike harness. This extension must be used with the PROBIKE A harness.

The PROBIKE B expansion harness connector and will add more inputs and outputs, it adds extra inputs and outputs connectors, gear position, rear shock, IAT stock Hayabusa connectors and 4 more injectors.

When installing the expansion harness make sure to follow:

- 1- Unplug EXPANSION FT550 FEMALE connector on the main harness.
- 2- Plug this connector into EXPANSION FT550 MALE connector.

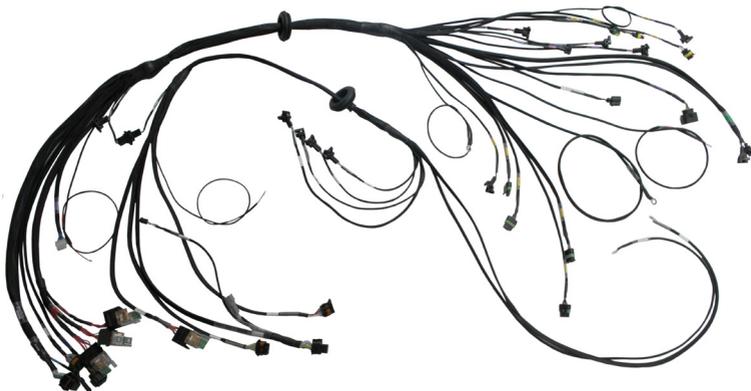
This allows the connection between both harnesses making it full sequential fuel injection. Bank B of the injectors are wired individually to allow sequential operation. There is a Peak and Hold connector to use low impedance injectors, if the injectors are high impedance jumper harness (sold separately) is required.



NOTE

In order to change injectors outputs settings, it's required to have Fuel Injection Pins Assignment mode as Manual. To set it this way, go to Engine Setting menu, then Advanced map options.

Doing this procedure, the harness and the ECU will be ready to run 4 low impedance injectors.



5. Diagrams

5.1 FuelTech PROBIKE A connector

FT450	Color	Pin	Connector	Function
#1	Blue #1	#4	Peak and Hold #1	Injection output #1 - Fuel Primary
		#1	FT550 Expansion M	Injection output #4 - Fuel Primary
#2	Blue #2	#2	Peak and Hold #1	Injection output #2 - Fuel Primary
		#2	FT550 Expansion M	Injection output #3 - Fuel Primary
#3	Blue #3	A	Extra Output A	Auxiliary Output - Free
#4	Blue #4	B	Extra Output A	Auxiliary Output - Free
#5	Blue #5	C	Extra Output A	Auxiliary Output - Free
#6	Blue #6	D	Extra Output A	Auxiliary Output - Free
#7	Black/White	-	(-) BAT ground	Power ground
#8	Gray #1	#4	SparkPRO-4	Ignition output #1
#9	Gray #2	#2	SparkPRO-4	Ignition output #2
#10	Gray #3	#5	SparkPRO-4	Ignition output #3
#11	Gray #4	#1	SparkPRO-4	Ignition output #4
#12	Black	-	(-) BAT signal	Signal Ground
#13	Red	-	87 main relay	12V input from relay
#14	Green/Red		TPS / Oil pressure / Extra / Fuel pressure	5V output sensors
#15	Blue/Yellow	#3	CAN Female	CAN A (LOW)
		#12	WB-O2 NANO	
#16	White/Red	#4	CAN Female	CAN A (HIGH)
		#6	WB-O2 NANO	
#17	White	-	CAM Hall / CAM VR	Cam Sync signal input
#18	White	-	CRANK VR	RPM reference input
#19	Red	-	CRANK VR / Hall	RPM signal input
#20	White #1	-	Flying lead	White input #1 Generic input / Flying lead
#21	White #2	-	2-STEP	White input #2 (2-Step / clutch switch)
#22	White #3	#3	TPS	White input #3 (TPS)
#23	White #4	C	Oil pressure	White input #4 (Oil pressure)
#24	White #5	#1	H ₂ O temperature	White input #5 (H ₂ O temperature)
#25	White #6	C	Fuel pressure	White input #6 (Fuel pressure)
#26	White #7	#1	Speed	White input #7 (Speed sensor)

5.2 FuelTech PROBIKE B connector

FT550	Color	Pin	Connector	Function
#1	Black/White	-	(-) BAT ground	Power ground
#2	Black/White	-	(-) BAT ground	Power ground
#3	Blue/Yellow	1	CAN Female (B)	CAN LOW (B)
#4	White/Red	2	CAN Female (B)	CAN HIGH (B)
#5	White #8	-	Intake air temperature IAT	White input #8 - Intake air temperature (IAT)
#6	White #9	C	Pan Vac / Back pressure	White input #9 - Pan Vac / Back pressure
#7	White #10	C	Wastegate / Nitrous press	White input #10 - Wastegate / Nitrous
#8	Blue #7	2	FT550 expansion F	Injection output #3 - Fuel Primary
#9	Blue #8	1	FT550 expansion F	Injection output #4 - Fuel Primary
#10	Gray #5	A	Extra outputs	Gray #5 - Free
#11	Gray #6	B	Extra outputs	Gray #6 - Free
#12	White #11	A	Extra inputs	White #11 - Free
#13	White #12	B	Extra inputs	White #12 - Free
#14	Blue #9	4	Peak and Hold #2	Injection output #1 - Fuel Secondary
#15	Blue #10	2	Peak and Hold #2	Injection output #2 - Fuel Secondary
#16	Gray #7	C	Extra outputs	Gray #7 - Free
#17	Gray #8	D	Extra outputs	Gray #8 - Free
#18	White #13	-	Gear position	White input #13 - Gear position sensor
#19	White #14	2	Rear shock	White input #14 - Rear shock sensor
#20	Blue #11	5	Peak and Hold #2	Injection output #3 - Fuel Secondary
#21	Blue #12	1	Peak and Hold #2	Injection output #4 - Fuel Secondary
#22	Yellow #1	E	Extra outputs	Yellow #1 - Free
#23	Yellow #2	F	Extra outputs	Yellow #2 - Free
#24	Yellow #3	G	Extra outputs	Yellow #3 - Free
#25	Yellow #4	H	Extra outputs	Yellow #4 - Free
#26	Green/Black	C	Extra inputs	Sensor Ground

5.3 Harness components

- **FuelTech FT450/FT550 A connector:** Direct connection to FT450 or FT550.
- **FuelTech Peak and Hold:** This is the driver needed to fire low impedance injectors. When the system uses high impedance injectors, jumper wires are required. If a Peak and Hold or the jumper wires are not being used, the injectors will not fire.
- **FuelTech Wideband Nano O2:** This connector goes to a FuelTech Wideband Nano O2 module, it's capable of reading the Bosch O2 sensor and send the information to log in the ECU.
- **5x 40A Relay:** The complete harness has 5 relays with built in 40A fuse to power everything. The Main Relay powers the ECU, Wideband Nano O2, Peak and Hold drivers, sensors and extra connector. The Injector Relay powers the primary injectors. The Coils Relay supplies power to the coils. The Expansion harness has one relay to supply power to Secondary Injectors and one relay for the Peak and Hold and for the extra connectors 12V outputs.
- **+12V Switched wire:** This wire goes to the ignition key and is responsible for powering the relays.
- **Battery ground and battery positive:** It's the system power supply and must be connected exactly as the following: Battery (+) goes directly to the battery's positive or kill switch. Battery (-) MUST GO ONLY on the battery's negative terminal
- **CAN A and B Connector:** CAN A can operate FT CAN 1.0, FT CAN 2.0 or CAN OEM. Both protocols work with any FuelTech module that communicates over CAN bus and are able to broadcast data for external data loggers or dash.
- **Extra Input Connector:** The extra connector has 2 white inputs, 5V, ground for sensors and power ground.
- **Output A Connector:** The extra connector has 4 blue outputs, 12v and ground wires.
- **Extra Output Connector:** The extra connector has 4 gray outputs, 4 yellow outputs, 12v and ground wires.
- **Throttle position sensor:** The TPS measures the throttle position. The harness has the stock Hayabusa TPS connector.
- **Fuel pressure sensor:** This input can be used to read fuel pressure using a FuelTech PS sensor or SSI P51 Packard sensor.
- **Oil pressure sensor:** This input can be used to read oil pressure using a FuelTech PS sensor or SSI P51 Packard sensor.
- **Back Pressure / Pan VAC:** This input can be used to read back pressure or pan vacuum pressure using a FuelTech PS sensor or SSI P51 Packard sensor.
- **Wastegate/ Nitrous pressure:** This input can be used to read wastegate or nitrous pressure using a FuelTech PS sensor or SSI P51 Packard sensor.
- **Crank trigger sensor (Hall effect or variable reluctance):** VR crank connector is the stock one from Hayabusa (2 pin connector). Hall effect connector is a FuelTech general connector if needed.
- **Cam sync sensor (Hall effect or variable reluctance):** This harness has VR and Hall effect Hayabusa connector, depending of the year of the bike will change between both.
- **Speed:** Hayabusa stock speed connector
- **Rear Shock:** Specific connector Tyco 3 ways for travel sensor, wired for FuelTech travel sensor.
- **5V power supply.**

PROBIKE harness

- **IAT:** Stock Hayabusa IAT connector.
- **Gear position:** Stock Hayabusa connector to read gear position sensor.
- **Bosch wideband O2 sensors:** Designed for Bosch LSU 4.2 O2 sensor.
- **8x fuel Injector outputs:** 4 injector outputs which allows semi-sequential or multipoint fuel injection and individual fuel cylinder trim.
- **2-step wire:** White input number 2, can be used on a 2-step button or another switch.
- **FuelTech Peak and Hold:** This driver is required to fire low impedance injectors. When the system uses high impedance injectors, jumper wires are needed. If a Peak and Hold or the jumper wires are not being used, the injectors will not fire.
- **FuelTech SparkPRO:** This is the coil driver required to fire stock Hayabusa coils. If using SmartCoils a jumper harness is needed (sold separately - 2001000071)

6. Harness Connectors

FT450 - Outputs A connector

Pin	Color	Function
A	Blue #3	Blue output #3 - Free
B	Blue #4	Blue output #4 - Free
C	Blue #5	Blue output #5 - Free
D	Blue #6	Blue output #6 - Free
E	Red	12V
F	Black/White	Ground
G	-	-
H	-	-

FT550 - EXTRA outputs connector

Pin	Color	Function
A	Gray #5	Gray output #5 - Free
B	Gray #6	Gray output #6 - Free
C	Gray #7	Gray output #7 - Free
D	Gray #8	Gray output #8 - Free
E	Yellow #1	Yellow output #1 - Free
F	Yellow #2	Yellow output #2 - Free
G	Yellow #3	Yellow output #3 - Free
H	Yellow #4	Yellow output #4 - Free
J	Red	12V
k	Black/White	Ground

FT550 - EXTRA inputs connector

Pin	Color	Function
A	White #11	White input #11 - Free
B	White #12	White input #12 - Free
C	Green/Black	Sensor Ground
D	Green/Red	5V for sensors
E	Red	12V
F	-	-

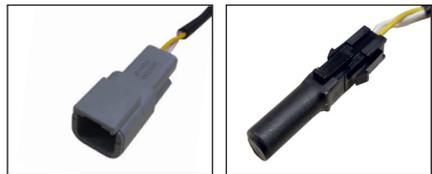
6.1 Relay and Fuses

All relays in the harness are 40A Capacity automotive type with 40A fuse. There is a main relay for the FuelTech units such as ECU, O2 conditioner and sensors, 1 relay is for the fuel injectors and other relay is for the coils. The Expansion harness has one relay to supply power to Secondary Injectors and one relay for the Peak and Hold and for the extra connectors 12V outputs.



6.2 CAN Bus Connector

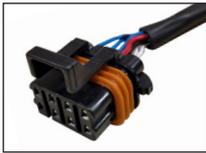
The harness has CAN Bus connection (with terminator) and CAN B.



6.3 Extra Connections

Input: The white inputs can be used to read any 0 to 5V analog sensor. Connector also has a 5V output for sensors (green with red stripe) and a 12V output from the main relay.

Outputs: The grays blues and yellows outputs can be used for almost any kind of purpose, activating solenoids (some need relays), loads and general output.



6.4 TPS

TPS is a potentiometer that informs throttle position. The ECU can read almost any 0-5V TPS. The harness comes with a 3-way stock Hayabusa stock TPS connector.

- Pin A: signal ground
- Pin B: signal output
- Pin C: 5V supply



6.5 H2O and Air Temperature

The Harness has 2 temperature inputs. One input is for the engine temperature (H2O) and the other is for the intake air temperature (AIR). Both sensors are GM style and uses Metri-Pack 150.2 connectors. - Pin A: signal output; - Pin B: battery's negative.

- Pin A: signal output
- Pin B: battery's negative



6.6 Oil, Fuel, Wastegate and Nitrous Pressure

The oil, fuel, Wastegate and Nitrous pressure sensor connectors are designed for the PS150, PS-300 and PS-1500 sensors; ranging from 150 to 1500 psi, with a Packard style 3-way connector. It has a 5V ground and signal.

- Pin A: battery's negative (black)
- Pin B: 5V supply (green/red)
- Pin C: signal output (white)



6.7 Injectors

There are 4 injector outputs available. All injector connectors are stock Hayabusa Sumitomo connectors.



6.8 WB-O2 NANO Connector

The WB-O2 NANO has a 12 connects connector with 3 wire groups. One has the connector for the O2 sensor (Part number 0258007057), the second is for CAN communication and the third is responsible for the power and analog output.



6.9 Coil Connector

This harness is finished to the stock Hayabusa 2 way coil connectors.



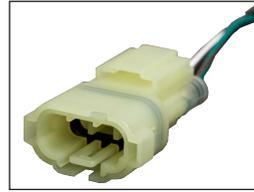
6.10 Speed Connector

Stock Hayabusa speed sensor connector, connects to the sensor with the following pinout:

Pin 1: 5V

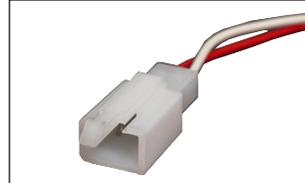
Pin 2: Sensor ground

Pin 3: ECU Signal



6.11 Crank VR

Stock Hayabusa crank connector (VR).



6.12 Crank Hall

There is another option for crank sensor already wired if a different sensor will be used.

- Pin A: ECU signal input

- Pin B: Signal ground

- Pin C: 12V



6.13 Cam Hall

Stock Gen 2 Hayabusa connector.



6.14 Cam VR

Stock Gen 1 Hayabusa connector.



6.15 Gear position Connector

Stock Hayabusa Gear Position connector to use the OEM sensor.

Pin 1: Output signal

Pin 2: Battery's Negative

Pin 3: Not used



6.16 Rear Shock Connector

Additional sensor to read the rear shock position. This harness is wired to FuelTech Travel sensor (Sold separately - 5005100209).

Pin 1: Battery's Negative

Pin 2: Output signal

Pin 3: 5V supply



7. Peak and Hold - External Injector Driver

Peak and Hold driver is designed to control the current on low impedance injectors. The FuelTech Peak and Hold has 4 outputs and in the Harness will run one injector per channel. There are 3 different versions of Peak and Hold available to fire different injectors, according to the resistance of the injector. The only differences between the versions are the peak current and the hold current.

Considering one injector per channel application:

- 2A/0.5A – Bosch 1600cc, Ford Racing 1600cc
- 4A/1A – Siemens Deka 225lb/hr, Precision 225lb/hr
- 8A/2A – Precision 550lb/hr, Billet Atomizer, Moran

Some earlier Billet Atomizer and Moran injectors require a 4A/1A driver. Contact FuelTech tech support to confirm correct Peak and Hold drivers before purchasing.

When using high impedance injectors without Peak and Hold drivers, jumper wires must be connected to the Peak and Hold plugs in the harness. If the jumper wires are not being used then the injectors won't fire since there will be no continuity between the FT450 and injectors.



8. Meters and adapter wires

8.1 FuelTech WB-O2 Nano

The WB-O2 Nano has a 12-way connector with 3 wire groups. One of them has the connector for the O2 sensor, the second makes the CAN communication.

By default, the analog output is set to values of 8.7AFR to 16.2AFR Gas, but can be configured to 5.14AFR to 17.6AFR Gas or 9.55 to 19.11AFR or 9.55 to 58.80AFR or yet 9.55 to 146.9AFR (Gas), if necessary. For further information, check the FuelTech WB-O2 Nano manual.



8.2 Bosch LSU 4.2 Wideband O2 Sensor

The BOSCH LSU 4.2 is a wideband O2 sensor that can be used with both the WB-O2 Nano and Alcohol O2. When using LSU 4.2 with our Alcohol O2 reader, an adapter harness is required, as well as free air calibration. Check the Alcohol O2 manual for further instructions.



9. Troubleshooting

Issue	Solution
FT450/FT550 Unit doesn't turn on	1. Check battery voltage
	2. Check power and ground cables
	3. Check Switched 12V cable
	4. Check ECU harness cables
FT450/FT550 doesn't read cranking	1. Check crank trigger and cam sync connections
	2. Check sensor gap
	3. Check diagnostic panel for RPM signal
FT450/FT550 reads RPM but engine doesn't start	1. Check if there is spark and injector pulse
	2. Check fuel pressure
	3. Check crank trigger alignment and TPS calibration
	4. Check if outputs are activated and properly configured
	5. Check the O2 sensor reading
Engine runs but doesn't idle	1. Check TPS calibration
	2. Check timing with a timing light
	3. Check TPS idle table and adjustment
	4. Check O2 sensor reading
Engine spits & sputters	1. Check O2 sensor reading
	2. Check ignition calibration and firing order
ECU won't communicate to PC	1. Ensure your software version is compatible with your FT450 firmware version
	2. Check if read and write buttons get colored when FT450 is connected

10. FuelTech Latest Manuals and Software

You can access all updated manuals and software at the FuelTech website:

www.fueltech.net/manuals

www.fueltech.net/software

FuelTech

455 Wilbanks Dr.
Ball Ground, GA, 30107, USA

Phone: +1 678-493-3835
Toll Free: +1 855-595-3835

www.FuelTech.net

 **FuelTechUSA**