

Haltech

ELITE 2500

*Ford Falcon Barra 4.0 (FG)
Terminated Engine Harness
(HT - 141389)*

QUICK START GUIDE



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Haltech Off-Road Usage Policy

In many states It is unlawful to tamper with your vehicle's emissions equipment.

Haltech products are designed and sold for sanctioned off-road/competition non-emissions controlled vehicles only and may never be used on public road or highway. Using Haltech products for street/road use on public roads is prohibited by law unless a specific regulatory exemption exist (more information can be found on the SEMA Action Network website www.seman.com/emissions for state by state details in the USA). It is the responsibility of the installer and/or user of this product to ensure compliance with all applicable local and federal laws and regulations. Please check with your local vehicle authority before purchasing, using or installing any Haltech product.

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Haltech Limited Warranty

Unless specified otherwise, Haltech warrants its products to be free from defects in material or workmanship for a period of 12 months from the date of purchase, valid in the original country of purchase only. Proof of purchase, in the form of a bill of sale or receipted invoice, which indicates that the product is within the warranty period, must be presented to obtain warranty service. Haltech suggests that the purchaser retain the dealer's dated bill of sale/receipt as evidence of the date of retail purchase. If the Haltech product is found to be defective as mentioned above, it will be replaced or repaired if returned prepaid along with proof of purchase. This shall constitute the sole liability of Haltech. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations, either expressed or implied, including any implied warranty of merchantability or fitness. In no event shall Haltech, be liable for special or consequential damages.

Product Returns

Please include a copy of the original purchase invoice along with the unused, undamaged product and its original packaging. Any product returned with missing accessory items or packaging will incur extra charges to return the item to a re-saleable condition. All product returns must be sent via a freight method with adequate tracking, insurance and proof of delivery services. Haltech will not be held responsible for product returns lost during transit. The sale of any sensor or accessory that is supplied in sealed packaging is strictly non-refundable if the sealed packaging has been opened or tampered with. This will be clearly noted on the product packaging. If you do not accept these terms please return the sensor in its original unopened packaging within 30 days for a full refund.

Returning a sensor or accessory product within 30 days of purchase: Product may be returned for credit or full refund. (Any sealed packaging must not have been opened or tampered with)

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Haltech Ford Falcon Barra 4.0 **Terminated Engine Harness** **Quick Start Guide**

Congratulations on purchasing a Haltech Engine Management Terminated Engine Harness. This *Plug and Play* product allows you to be up and running in a few hours.

The Harness when installed in conjunction with a Haltech Elite 2500 ECU opens the door to virtually limitless performance modification and tuning of your vehicle. Programmable systems allow you to extract all the performance from your engine by delivering precisely the required amount of fuel and ignition timing that your engine requires for maximum output under all operating conditions.

This quick start guide will walk you through the installation of the Haltech Ford Falcon Barra 4.0I Terminated Engine Harness into a vehicle. This guide is accompanied by the full service manual located on the software CD/USB provided with the ECU that you or your tuner will need to refer to before completing your installation and configuration. The manual can also be downloaded from the Haltech website www.haltech.com

Supported Engine

The Haltech Ford Falcon Barra 4.0I Terminated Engine Harness supports the following engine configurations:

- Ford Falcon Barra 4.0I (FG)

Supported ECU

- Haltech Elite 2500

Included in this package

- HT-141388 - Ford Falcon Barra 4.0 Terminated Engine Harness
- HT-130347 - Ford Falcon Barra 4.0 FG Terminated Ignition Harness
- Connector Pack

Optional Accessories (Sold Separately)

- Haltech HPI 6 Ignition Module (HT-020036)
- Haltech Knock Sensor (HT-011100)
- Haltech Flex Fuel Sensor (HT-011000)
- 150PSI "TI" Fuel/Oil/Wastegate Pressure Sensor (HT-010904)

Harness Overview

The Haltech Ford Falcon Barra 4.0 Terminated Engine Harness is a plug and play solution for wiring a Ford Barra 4.0l Engine.

Installation is simple and easy as the harness is designed for the engine, all lengths are correct and all wires are clearly labelled.

Notes on installation:

- Make sure your Engine is grounded. A ground / earthing strap should be used to ground your engine to the chassis of the vehicle. The Haltech Terminated Engine Harness **does not** ground your engine.
- Keep All wires away from exhaust

WARNING!
Damage can occur to your harness and / or ECU if you do not ground your engine properly. Please ensure heavy gauge cable is used.

- The Harness is designed to be used with OEM Ignition Coils.
- A Haltech HPI6 (HT-020036) is required.

The Harness includes:

- Integrated HPI6 connection
- Integrated alternator connection
- Integrated starter motor solenoid connection
- Integrated OEM MAP/IAT sensor connection
- Integrated intake and exhaust solenoid connection

WARNING!
Please keep all wires away from exhaust manifold!

Harness Connections

Main Power

The main power connections supply power through the harness and labelled as “**Battery +**” and “**Battery -**”. Please ensure these connections are connected after all other connections have been completed and all unused in cabin wiring insulated. The ECU main power consist of the following:

Injection Battery +

The Injection Battery + (Red) connection will supply +12V DC to the injector relay within the harness. Please connect this cable directly to the battery (+) terminal.

ECU Battery + (R/W)

The ECU Battery + (Red / White) connection will supply +12V DC to the ECU relay within the harness. Please connect this cable directly to the battery (+) terminal.

Battery + (R/G)

The Battery + (Red/Green) connection will supply +12V DC to the ignition and fuel pump relay within the harness. Please connect this cable directly to the battery (+) terminal.

Battery + (R/O)

The Battery + (Red/Orange) connection will supply +12V DC to the thermofan relay within the harness. Please connect this cable directly to the battery (+) terminal.

Battery Ground (B)

The Battery Ground (Black) connection supplies battery ground for the harness. The battery ground lug consists of one cable terminated with a 10mm ID eyelet. Please connect this cable directly to the Battery (-) Supply terminal.

WARNING!

Please make sure your engine block is grounded to the battery of the vehicle by a correctly sized grounding strap. This harness will not ground your engine. Damage can occur to this harness and / or your ECU if your engine is not properly grounded.

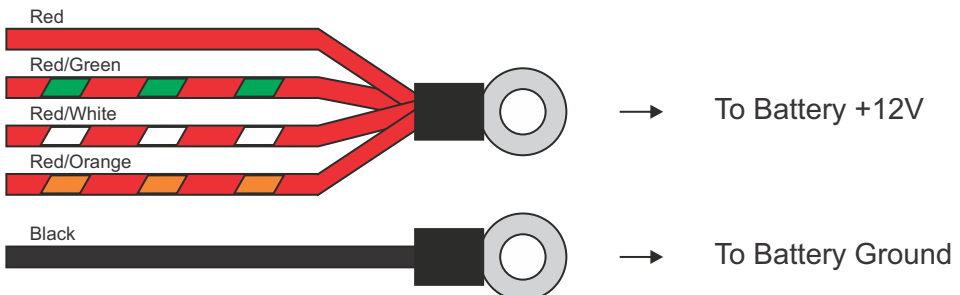


Figure 1 - Main Power Connections

Termination Description

Injection 1 - 6 (INJ1, INJ2, INJ3, INJ4, INJ5, INJ6)

The injector outputs connect directly to the injectors.

Please ensure the correct injector output is connected to the corresponding injector in the engine. Refer to the label on the harness for correct injector allocation.

Ignition Output Connector

The Haltech Elite 2500 Ford Falcon Barra 4.0 Terminated Engine Harness is provisioned with with a Haltech HPI 6 ignition module connection which allows the utilization of an OEM ignition coils. This module can be purchased separately from www.haltech.com. For more information on setup please see the quick start guide that is included with the device.

The ignition output connector comprises of the following connections:

- Ignition Inputs (IGN1 - IGN 6)**
 These wires are the ignition outputs from the ECU and are connected to the Haltech High Power Igniter (HPI) to control the ignition.
- Ignition Outputs (IGN1 - IGN 6)**
 These wires are the ignition outputs of the HPI 6 Module, and are terminated, ready to be connected to the coils to control the ignition.
- Battery Ground (B)**
 This wire supplies battery ground to the HPI 6 modules and ignition coils.

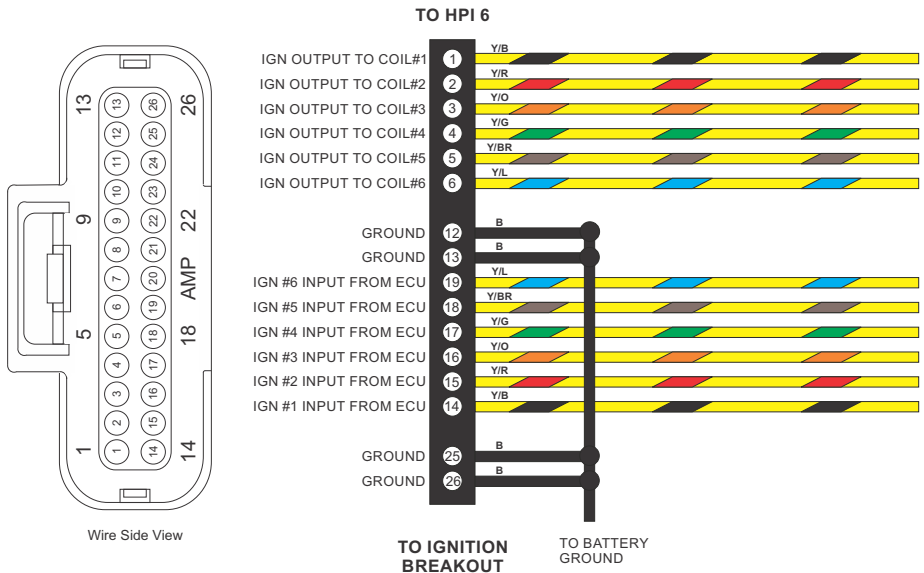


Figure 2 - High Power Ignition Module Wiring

The Haltech Ford Falcon Barra Terminated Engine Harness incorporates the use of a Haltech High Power Igniter unit for ignition.

The Haltech HPI 6 Ignition Harness connects to the standard coils of the engine

Installation of this harness is as follows:

- Position the harness in the engine bay / cabin
- Connect the Haltech HPI 6 Ignitor to the Haltech Ford Falcon Barra Terminated Engine Harness by the 26-pin connector
- Connect the factory coils to the ignition harness. All outputs are labelled on the harness and must be connected to their respective cylinder / coil
- Mount the HPI 6 Unit on the vehicle. Do not mount the unit where it will be exposed to water or other liquids. Select a location away from excessive heat.
- Connect the Main Power Ground to a clean chassis ground

Please Refer to the included HPI 6 Quick Start Guide for more information

Manifold Pressure / Intake Air Temperature Sensor (MAP/IAT) - AVI 9 / AVI 7

An Air Temperature sensor is a required sensor used in Volumetric Efficiency (VE) tuning to compensate for changes in air density due to air temperature. Cold air has a higher density than warm air and therefore requires a greater volume of fuel to maintain the same air/fuel ratio.

The MAP sensor measures changes in the intake manifold pressure which result from engine load and RPM changes and converts these into a voltage output so the ECU knows the manifold pressure. The terminated harness is provisioned with the ability to connect a factory MAP/IAT sensor

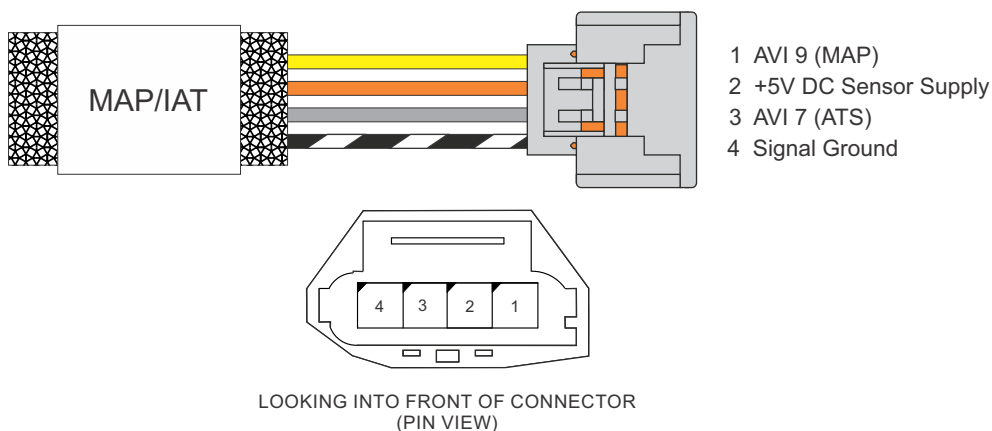
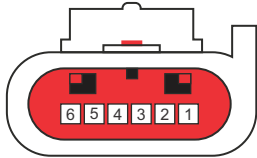


Figure 3 - MAP and IAT Wiring

Electronic Throttle Control (DBW/TPS) - DBW 1, DBW 2, AVI 2, AVI3

The Drive By Wire (DBW/TPS) function allows your Elite ECU to accept an input from the Accelerator Pedal Position (APP) sensor and use this to control the output to the DBW Throttle Body. The Haltech Ford Falcon Barra 4.0 Terminated Engine Harness comes with a pre-terminated Drive By Wire connection, to be plugged into the electronic throttle body. This type of control allows mapping of the throttle body opening curve, idle control, and lift-off anti-lag control.



LOOKING INTO FRONT OF CONNECTOR
(PIN VIEW)

Connector Pin	Colour	Description
1	BRN/BLK	DBW1
2	BRN/RED	DBW2
3	ORG/BLK	AVI2
4	BLK/WHT	SIGNAL GND
5	ORG	+5V DC
6	ORG/RED	AVI3

Figure 4 - Electronic Throttle Body Wiring

Engine Coolant Temperature Sensor (CTS) - AVI 8

The Engine Coolant Temperature Sensor provides the ECU with a signal that allows the ECU to know the current engine coolant temperature. This harness has been fitted with an OEM Coolant Temperature Sensor connector.

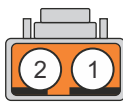
Knock Sensor (KNOCK1, KNOCK2)

The knock sensor inputs Knock1/2 connect to the relevant OEM knock sensors mounted to the block of the engine. The signal is used by the ECU Knock control function to detect knock events within the engine. An additional or an OEM replacement sensor (HT-011100) can be purchased from www.haltech.com

Dual Intake Runner Solenoid (DUAL INTAKE) - STEP1 P2

Variable Length Intake Manifold is an internal combustion engine manifold technology which adjust the length of the intake runner tract in order to optimise power and torque across the range of engine speed operation as well as help provide better fuel efficiency.

This harness has been provisioned with a 2 pin Dual Intake Runner Solenoid connection.



LOOKING INTO FRONT OF CONNECTOR
(PIN VIEW)

Connector Pin	Colour	Description
1	RED/BLU	+12V DC
2	GRN/BLK	STEPPER 1 P2

Figure 5 - Dual Intake Runner Solenoid Wiring

Spare Digital Pulsed Outputs - INJ7

There is one spare Digital Pulsed Output connector located on the Haltech Ford Falcon Barra 4.0 Terminated Harness. (INJ7). This connection consist of:

- +12V Injector Power
- Digital Pulsed Output

When the output is activated by the ECU, the output will switch to ground. Solenoid valves, Shift Lights and etc can be run directly from the output, however high current devices such as Thermofans and additional fuel pumps must be activated through a relay. A relay can be wired between the DPO and the supplied +12V DC on this connector. This way the output is only switching the relay and not a high current draw device.

The Digital Pulsed Outputs are limited to 1A Max current draw.

This output can be programmed within the ESP Software to control auxiliaries such as:

- A/C Output
- Aux Fuel Pump
- Boost Control
- Check Engine Light
- Intercooler Spray
- Shift Lights
- Thermofans

For a full list of output options and explanations please go to the help section within the ESP Software.

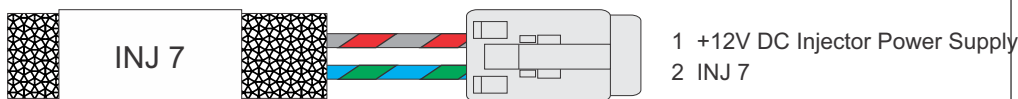


Figure 6 - Spare INJ 7 output

Spare Synchronised Pulsed Inputs (FLEX, VSS) - SPI1, SPI3

There are two Synchronised Pulsed Input connectors located on the Haltech Ford Falcon Barra 4.0 Terminated Harness. (SPI1, SPI3). These connections consist of:

- +12V DC Sensor Supply
- Signal Ground
- Synchronized Pulsed Input

Spare SPI1 / SPI3 come pre-terminated with 3 pin connectors.

These inputs can be programmed within the ESP Software to read inputs such as:

- Vehicle Speed Sensor
- A/C Request Switch
- Flex Fuel Composition Sensor
- Fuel Flow Sensor
- Clutch Switch

For a full list of output options and explanations please go to the help within the ESP Software.

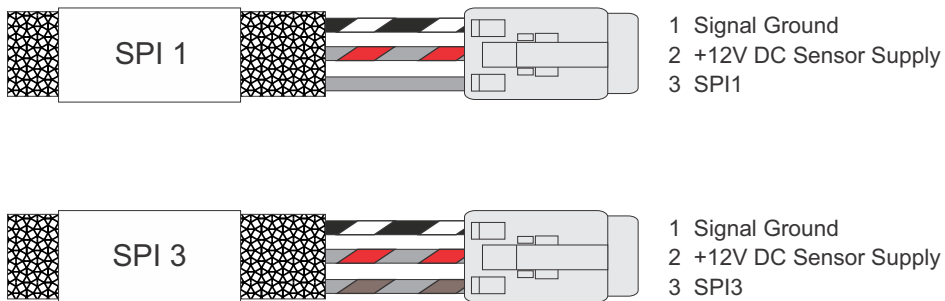


Figure 7 - Spare SPI1 / SPI3 inputs

Fuel Pressure Sensor (Fuel-P) - AVI 1

The Fuel-P labelled connector connects directly to a Haltech Fuel Pressure Sensor. This will enable the user to know the current fuel pressure of the vehicle. An optional fuel pressure sensor may be fitted.

This connection consist of:

- Signal Ground
- +5VDC Sensor Supply
- Analogue Voltage Input

AVI1 comes pre-terminated with 3 pin Delphi connector.

For a full list of input options and explanations please go to the help section within the ESP Software.

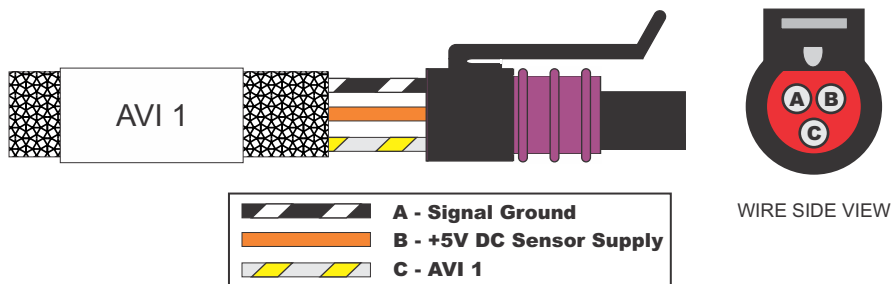


Figure 8 - Fuel Pressure Sensor Wiring

Oil Pressure Sensor (Oil-P) - AVI 10

The Oil-P labelled connector connects directly to an OEM Oil Pressure Sensor. This will enable the user to know the current oil pressure of the vehicle. An Oil Pressure Sensor is allocated to Analogue Voltage Input (AVI10).

Alternator Control (ALT)

The Haltech Ford Falcon Barra Terminated harness is provisioned with a 3-pin alternator control connector. This connector consists of the following connections:

- DPO 2
- ECU Injector Power (Connected to Injector Relay Output)

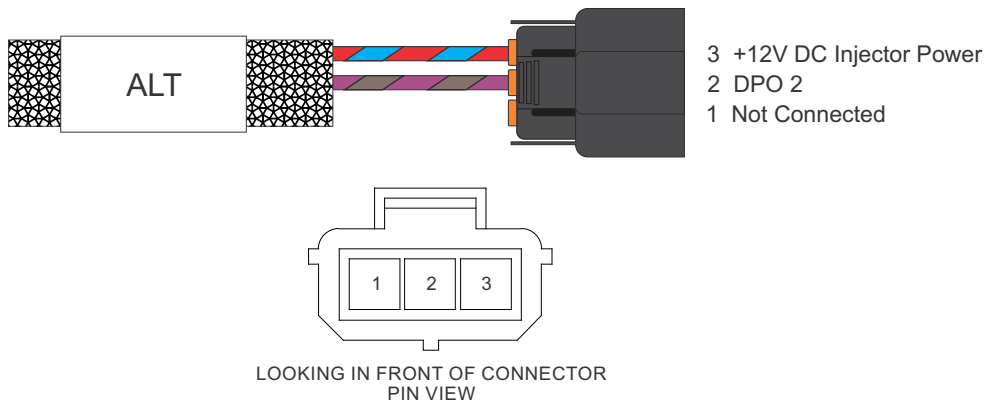


Figure 9 - Alternator Control Connection

Starter Motor Solenoid (STS)

The Starter Signal connects directly to starter motor solenoid. This will supply +12V to the solenoid on receiving a start signal from the ignition switch when in the start position.

Please insure you supply main power connection to the starter motor and a main earth strap to the engine to insure correct operation of the starter motor and to avoid damage to your terminated harness and ECU.

For the full list of input options and explanations please go to the within the ESP Software.

Intake Camshaft Position Sensor (INT CAM) - HOME +

The Intake Camshaft Position Sensor is used to determine the intake camshaft position. This harness comes pre-terminated with an OEM Intake Camshaft Position Sensor connector.

Exhaust Camshaft Position Sensor (EX CAM) - SPI 4

The Exhaust Camshaft Position Sensor is used to determine the exhaust camshaft position. This harness comes pre-terminated with an OEM Exhaust Camshaft Position Sensor connector.

Crankshaft Position Sensor (CRANK) - TRIGGER +

The Crankshaft Position Sensor is used to determine crankshaft position and stroke of the engine. This harness comes pre-terminated with an OEM Crankshaft Position Sensor connector.

VCT Solenoid (VCT 1, VCT 2)- STEP1 P3, STEP1 P4

VCT or Variable Camshaft Timing, is a variable camshaft timing technology developed by Ford. It allows for more optimum engine performance, reduced emissions, and increased fuel efficiency compared to engines with fixed camshafts. This harness comes pre-terminated with an OEM VCT solenoid connectors.

A/C Pressure Switch (A/C-P SWITCH) - AVI 6

The Air Conditioner Pressure Sensor is a pre-terminated connection that connects to the OEM A/C Pressure Sensor located on the A/C compressor.

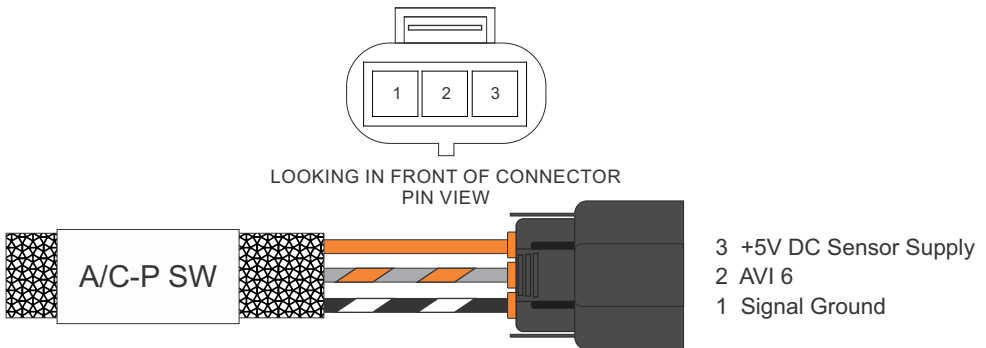


Figure 10 - A/C Pressure Switch Connection

A/C Clutch Control (A/C CLUTCH) - IGN 7

The Air Conditioner Clutch Control is a pre-terminated connection that connects to the OEM A/C Compressor and allows its activation/deactivation.

Thermofan Control (T/FAN) - INJ 8

Injector 8 controls the Thermofan Relay within the Haltech Fuse Box. This harness has been provisioned with the flying lead connection, to allow the end user alternative options for their thermofan connection.



Figure 11 - Thermofan Output wire, 25A Max Continuous Current

In Cabin Harness

The In Cabin Harness wiring is made up of multiple inputs and outputs. Correct connection of these wires is essential for proper operation of the harness. Any unused connections should be insulated. All available In Cabin connections are outlined below:

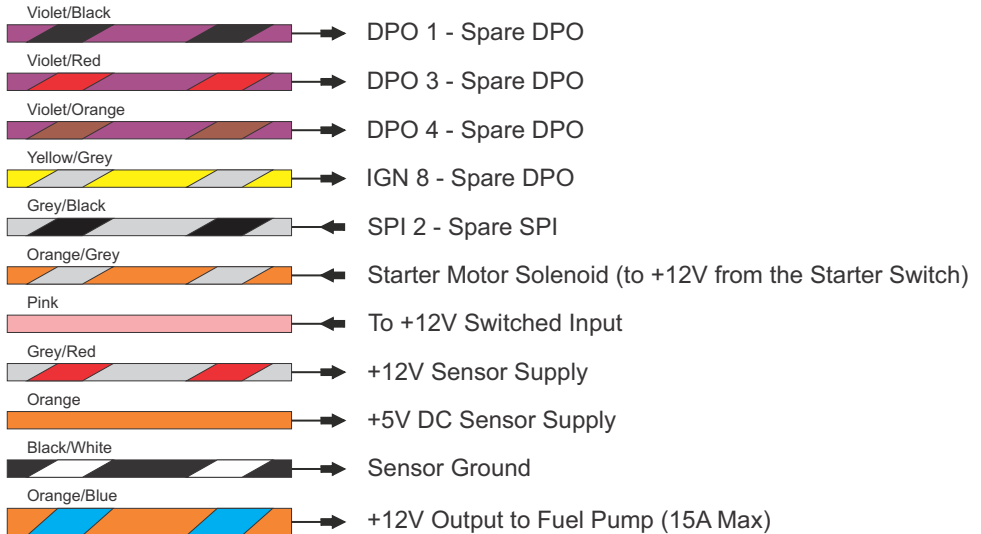


Figure 12 - In Cabin Harness Wiring

Spare Digital Pulsed Output (DPO1, DPO3, DPO4, IGN8)

Spare Digital Pulsed Outputs are located throughout the terminated harness. When the output is activated by the ECU, the output will switch to ground. Solenoid valves, shift lights, etc can be operated directly from these outputs, however high current devices such as Thermofans and additional Fuel Pumps must be activated through a relay.

A relay can be wired between the DPO and the supplied +12V DC on the connectors. This way the output is only switching the relay and not a high current draw device.

The Digital Pulsed Outputs are limited to 1A Max current draw.

Synchronised Pulsed Inputs (SPI2)

The Synchronised Pulsed Input (SPI) is a digital or retractor input that can vary in duty and/or frequency. This type of input can be either 0V, 5V, 8V, 12V only. These inputs can be programmed within the ESP Software to read inputs such as:

- Vehicle Speed Sensor
- Crank Angle Sensor
- Cam Angle Sensor
- Fuel Flow Sensor

For a full list of output options and explanations please go to the help section within the ESP Software.

+12VDC Switched Input

This input must be connected to a +12VDC Switched Ignition Source.

This is required to turn on the Haltech ECU and all relays contained within the Fuse Box.

Fuel Pump Output (Fuel Pump +12V DC)

The Fuel Pump Output supplies a continuous +12V DC supply to the fuel pump when the engine is running.

This output wire is rated for a max continuous current draw of 15A .

The Fuel Pump Output wire can be connected directly to the positive side of the fuel pump, providing the pump in use will draw less than 15A of current under full load.

If your pump will draw more than 15A or if dual pumps are to be used, it is recommended that you use this wire to control a relay to turn on the fuel pumps.



Figure 13 - Fuel Pump Output wire, 15A Max Continuous Current

Accelerator Pedal Position (AVI 4, AVI 5)

The following cables will connect directly to the Haltech Ford Falcon Barra Terminated Engine Harness accelerator pedal position sensor termination, and are located with the in-cabin wiring. The receptacle connector is supplied, and must be wired to the Ford Accelerator Pedal Position Sensor.

Wiring is dependant on the pedal used; please refer to your pedal manufacturers specification for wiring information.

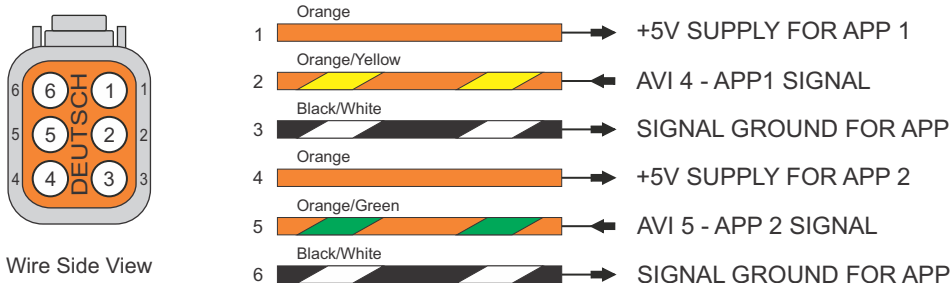


Figure 13 - Accelerator Pedal Position Harness Breakout Wiring

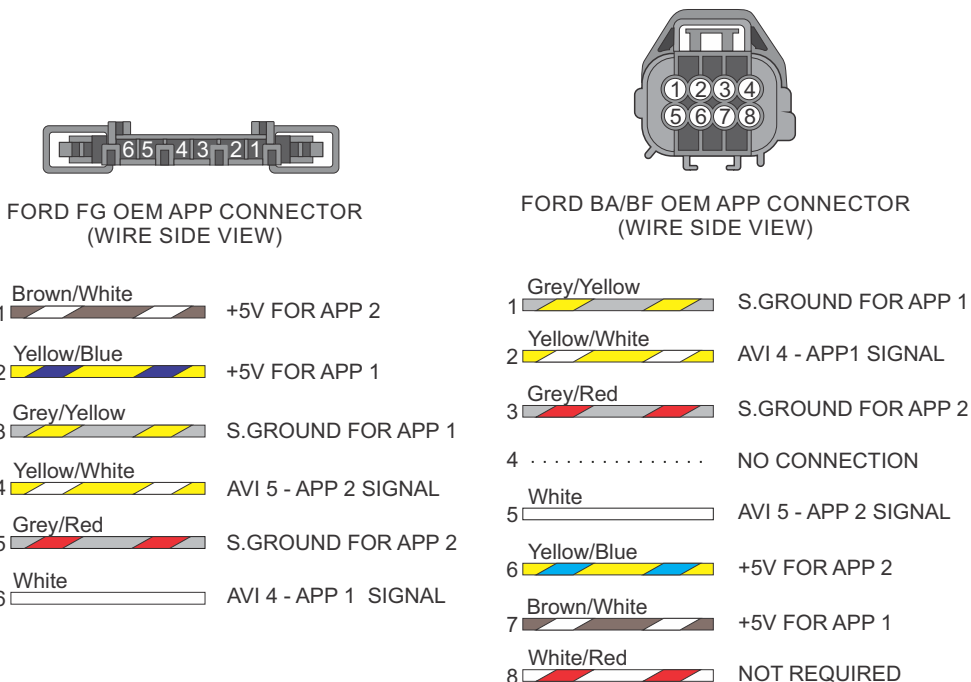


Figure 14 - Ford BA/BF/FG OEM Accelerator Pedal Position Connector Wiring

Fuse Box

The Haltech fuse box is connected to the harness.

Contained within the Haltech Fuse box is 6 fuses and 6 relays.

Each fuse protects the corresponding relay output (ie fuse #1 protects relay output #1, fuse #2 protects relay output #2 and so on).

The Haltech fuse box can handle a maximum continuous current draw of 70A.

Exceeding this value may cause damage to the fuse box, therefore please ensure all auxiliary devices, fans and fuel pumps connected **do not** exceed the supplied fuse box current limit.

The functions of each of the relays are outlined below:

Fuse #	Relay #	Function	Fuse Required
F1	R1	+12V Output to ECU	10A
F2	R2	+12V Output to Injectors	20A
F3	R3	+12V Output to Ignition	15A
F4	R4	+12V Output to Fuel Pump	20A
F5	R5	+12V Output to Thermofan	30A
F6	R6	Unpopulated	-

Figure 14 - Haltech fuse box relay allocation table

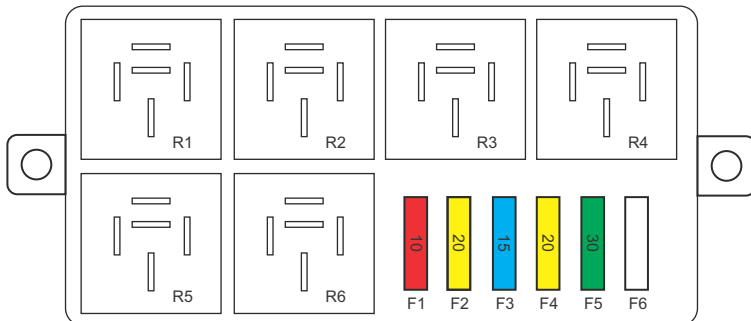
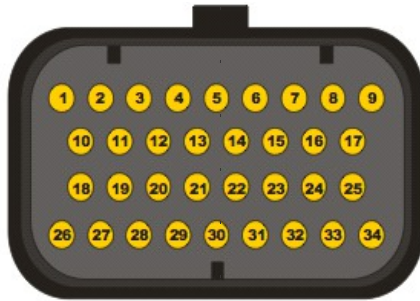


Figure 16 - Haltech fuse box layout

Harness Pinout



(34 Pin Connector)

ECU Connector (34 Pin Plug)	Function	Description
A1	DPO 2	Alternator Control
A2	AVI 4	Accelerator Pedal Position Sensor
A3	IGN 1	Ignition Coil #1
A4	IGN 2	Ignition Coil #2
A5	IGN 3	Ignition Coil #3
A6	IGN 4	Ignition Coil #4
A7	IGN 5	Ignition Coil #5
A8	IGN 6	Ignition Coil #6
A9	+5V	+5V DC Sensor Supply
A10	BATTERY GROUND	Battery Negative
A11	BATTERY GROUND	Battery Negative
A12	+8V	+8V DC Sensor Supply
A13	IGNITION INPUT	Ignition Switch (In Cabin Loom)
A14	AVI 10	Oil Pressure Sensor
A15	AVI 9	Manifold Absolute Pressure Sensor
A16	AVI 2	Throttle Position Sensor
A17	AVI 3	Throttle Position Sensor
A18	DPO 1	Spare Output (In Cabin Loom)
A19	INJ 1	Injector #1
A20	INJ 2	Injector #2
A21	INJ 3	Injector #3
A22	INJ 4	Injector #4
A23	DPO 3	Spare Output (In Engine Bay)
A24	DPO 5	Fuel Pump (+) 15A Max
A25	DPO 6	Engine Control Relay
A26	+12V (INJ)	Fused Power
A27	INJ 5	Injector #5
A28	INJ 6	Injector #6
A29	INJ 7	Spare Output (Boost Control)
A30	INJ 8	Thermofan Control
A31	STEP1 P1	Purge Control Solenoid
A32	STEP1 P2	Dual Intake Runner Control
A33	STEP1 P3	VCT Solenoid 1
A34	STEP1 P4	VCT Solenoid 2



(26 Pin Connector)

ECU Connector (26 Pin Plug)	Function	Description
B1	TRIGGER	Crankshaft Position Sensor (+)
B2	HOME	Cam Position Sensor (+)
B3	AVI 7	Air Temperature Sensor
B4	AVI 8	Coolant Temperature Sensor
B5	TRIGGER -	Crankshaft Position Sensor (-)
B6	HOME -	Cam Position Sensor (-)
B7	SPI 4	Cam Position Sensor (Exhaust)
B8	SPI 1	Spare Synchronised Pulsed Input (In Engine Bay)
B9	SPI 2	Spare Synchronised Pulsed Input (In Cabin Loom)
B10	SPI 3	Spare Synchronised Pulsed Input (VSS) (In Engine Bay)
B11	+12V (ECU)	Fused Power
B12	AVI 6	A/C Pressure Switch
B13	AVI 1	Fuel Pressure Sensor
B14	SIGNAL GROUND	Signal Ground for Input Sensors
B15	SIGNAL GROUND	Signal Ground for Input Sensors
B16	SIGNAL GROUND	Signal Ground for Input Sensors
B17	IGN 7	A/C Clutch Control
B18	IGN 8	Spare Output (In Cabin Loom)
B19	DPO 4	Spare Output (In Engine Bay)
B20	AVI 5	Accelerator Pedal Position Sensor
B21	KNOCK 1	Knock #1 Sensor
B22	KNOCK 2	Knock #2 Sensor
B23	CAN HIGH	Auxiliary CAN Connector
B24	CAN LOW	Auxiliary CAN Connector
B25	DBW 1	Drive By Wire Throttle Control
B26	DBW 2	Drive By Wire Throttle Control

Haltech

V3.2

Need more help?



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