Haltech
ENGINE MANAGEMENT SYSTEMS

ELITE 2500

Ford Coyote 5.0L

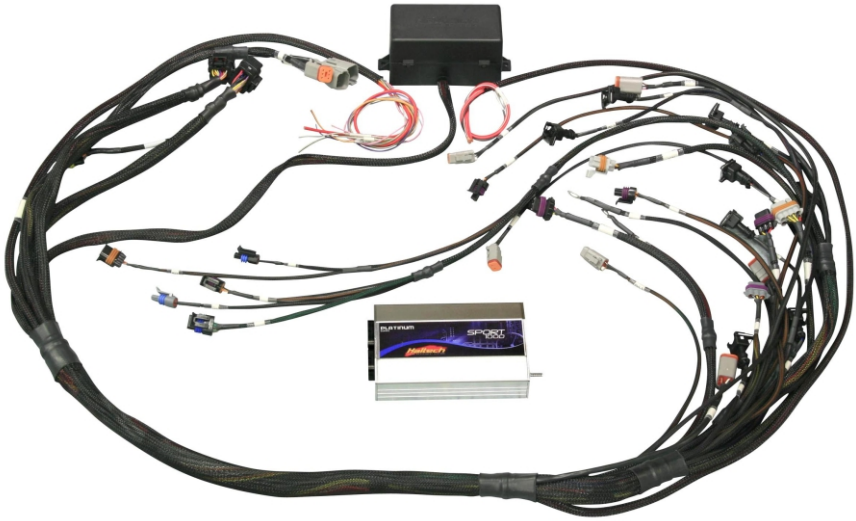
Terminated Engine Harness

QUICK START GUIDE

HT-141381

Suits – OEM Injector &

Early Style Cam Solenoid Connectors



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

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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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Elite 2500
Ford Coyote 5.0L
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 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 installation of the Haltech Ford Coyote 5.0L Terminated Engine Harness into a vehicle. This guide is accompanied by the full service manual located on the USB key 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 Coyote 5.0L terminated engine harness supports
Ford Coyote 5.0L engine produced before 2013.
(Early CAM Solenoid connectors – Small single keyed connector)

Supported ECU

- Haltech Elite 2500

Included in Haltech ECU Kit (HT-151381)

- Haltech Elite 2500 ECU
- Ford Coyote 5.0L Terminated Harness
- Deutsch Connector Pack

Optional Accessories (Sold Separately)

- Dual Channel Wideband Controller inc 2 Sensors and weld on bungs (HT010706)

Harness Overview

The Haltech Ford Coyote 5.0L Terminated Engine Harness is a plug and play solution for wiring a Ford Coyote 5.0L, Drive By Wire Engine.

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

Notes on installation:

- Make sure your Engine is grounded directly to the chassis of the vehicle.
  A heavy gauge 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.

> 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.

- Keep all wires away from the exhaust manifold and extreme sources of heat.

- Base maps are available on the website www.haltech.com.au
  or by emailing sales@haltech.com.au or usa@haltech.com

Termination Descriptions

Analogue Voltage Inputs

The Analogue Voltage Inputs can accept variable voltage inputs from 0V to 5V. These inputs can also accept switch inputs that change between two different voltage levels. The on voltage and off voltage define what the thresholds are between the on and off states. The voltage can be viewed as a channel within Haltech ESP Software to determine thresholds for a switched input.

Fuel Pressure Sensor (Fuel-P)

The Fuel-P labeled connector connects directly to the fuel pressure sensor on the engine. This will enable the user to know the current fuel pressure of the vehicle.

Oil Pressure Sensor (Oil-P)

The Oil-P labeled connector connects directly to the oil pressure sensor on the engine. This will enable the user to know the current oil pressure of the vehicle.

A/C Request (A/C Request)

The A/C Request labeled connection connects to the A/C Switch within the cabin to allow the ECU to control the air conditioning functions of the vehicle.

Engine Coolant Temperature Sensor (ECT)

The Engine Coolant Temperature Sensor input connects directly to the OEM engine coolant temperature sensor.

The Engine Coolant Temperature Sensor provides the ECU with a signal that allows the ECU to know the current engine temperature.

Intake Air Temperature Sensor (IAT)

The Intake Air Temperature Sensor input connects to a temperature sensor located in the intake air stream.

The Intake Air Temperature Sensor provides the ECU with a signal that allows the ECU to know the current intake air temperature.

Knock Sensors (Knock 1 , Knock 2)

The knock sensor inputs connect directly to the OEM knock sensor connector at the rear of the engine.
This signal is used by the ECU Knock control function to detect knock events within the engine.

Manifold Absolute Pressure Sensor (MAP)

The manifold absolute pressure sensor is located on the intake manifold.
Connect the MAP labeled connector directly to the sensor.

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.

Vehicle Speed Sensor Input (VSS-Input) (optional)

The vehicle speed sensor provides information on vehicle speed to the Haltech ECU which can be used to display vehicle speed, detect gears or controlling of switches etc.

Connections on the plug are as follows

Pin# 1: Red/White - +12V Sensor Power
Pin# 2: Grey/Red (Shielded) – Sensor Signal (SPI 4)
Pin# 3: Black/White - Sensor Ground

Starter Signal (STS)

The starter signal is used to engage the starter motor solenoid to start the engine.
Connect the in-cabin side of this cable to the ignition barrel or momentary starter button that supplies 12V when in the start position only.

Connect the engine bay side of this cable directly to the starter motor solenoid.

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

DBW Throttle (DBW)

The Drive By Wire (DBW) 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.
This type of control allows mapping of the throttle body opening curve, idle control, and lift-off anti-lag control.

Crank Angle Sensor (CRANK)

The Crank signal connects directly to the engine Crank Angle Sensor.
The Haltech ECU uses this signal to accurately measure crankshaft position and engine speed.

Camshaft Position Sensor Input (CAM)

The camshaft position sensor is used in conjunction with the crank angle sensor to determine crankshaft position and stoke of the engine.

Camshaft Intake and Exhaust Control Solenoids

The camshaft intake and exhaust solenoids are used to control the camshaft positions.
Two different types of connectors were used in this engine and are shown below.
The HT-141381 harness is fitted with the Pre 2013 style of connector.

Early CAM Solenoid Connector (Pre 2013)

Late CAM Solenoid Connector (Post 2013)

Figure 1 – Alternate CAM Solenoid Connectors

Ignition 1-8 (IGN1, IGN2, IGN3, IGN4, IGN5, IGN6, IGN7, IGN8)

The ignition outputs connect directly to the factory ignition coils.
Ensure the correct ignition output is connected to the corresponding coil on the engine.
Please refer to the label on the harness for correct cylinder bank allocation.

Injection 1-8 (INJ1, INJ2, INJ3, INJ4, INJ5, INJ6, INJ7, INJ8)

The injector outputs connect directly to the injectors.
Please ensure the correct injector output is connected to the corresponding injector in the engine. Please refer to the label on the harness for correct injector allocation.

Digital Pulsed Outputs

The Digital Pulsed Outputs are capable of producing pulsed waveforms with varying duty and frequency. When a DPO is activated by the ECU the output switches to ground. DPO's are limited to 800mA Max current draw.
Allocation of the Elite ECU's DPO's within the terminated harness are outlined below.

DPO 1 (Tacho)

DPO 1 is used to supply the dash with a RPM reference for the engine.
Connect this output to you Tachometer in the vehicle.

DPO 2 (Thermofan 1)

DPO 2 is used to control the thermofan relay.
Connect this output to the thermofan relay in the vehicle.

DPO 3 (Alternator Control)

DPO 3 connects directly to the OEM Alternator so the charging system of the vehicle can be controlled by the Elite ECU.
The +12V signal and alternator excite wires are pre-wired into the loom.

DPO 4 (A/C Relay)

DPO 4 connects directly to the A/C Relay (R6) to enable the A/C Compressor Clutch when A/C has been activated.

DPO 5 (Fuel Pump Relay)

DPO 5 connects directly to the Fuel Pump Relay (R4) to enable the Fuel Pump when the engine is running.

DPO 6 (Engine Control Relay)

DPO 6 connects directly to the Main Relay's within the Haltech Fuse Box (R1,R2,R3,R5) to control power to the engine and accessories. It is activated when the Ignition switch input is active.

Wideband O2 Inputs (Wideband Controller, O2-1, O2-2)

Wideband O2 sensors accurately measure the Air/Fuel ratio of the engine which is required for precise tuning and control of the engine.

The Terminated harness has been integrated with the Haltech WBC2 wiring harness allowing a quick installation of a Haltech WBC2 and Wideband O2 Sensors.

Connect your optional Haltech wideband sensors (HT010714) directly to the supplied connectors labeled O2 in the engine bay. Mount the sensors in the exhaust manifolds.

Connect the Haltech WBC2 to the allocated corresponding connector located near the main ECU connectors labeled O2,

Connect the Haltech WBC2 to the Haltech Elite ECU directly via the supplied CAN Cable.

Enable the Haltech WBC2 in your map using ECU manager software.

Your Haltech ECU will now have access to correct Air /Fuel Ratio readings allowing precise tuning and control of your engine.

Engine Ground (GND)

The Ground cable connects directly to the engine head.

Warning this in **NOT** the earth cable for the engine, please ensure that you earth the engine with an earth strap from the block of the engine to the chassis of the car. Ensure that the chassis of the car is connected to the battery negative (-) terminal with heavy gauge cable or earthing strap.

Damage to the ECU and or terminated harness may result if this is not done.

Battery Connections

Battery +

Connect the cable labeled as “Battery +” directly to the battery + terminal.
This is the main power connection for the ECU and engine sensors.

Battery -

Connect the cable labeled as “Battery - ” directly to the battery – terminal.
This is the main ground connection for the ECU and engine sensors.

In Cabin Wiring

The cabin wiring is made up of multiple inputs and outputs.
Correct connection of these cables is essential for proper operation of the harness.
All wires have been labeled and required cables should be connected as outlined below.

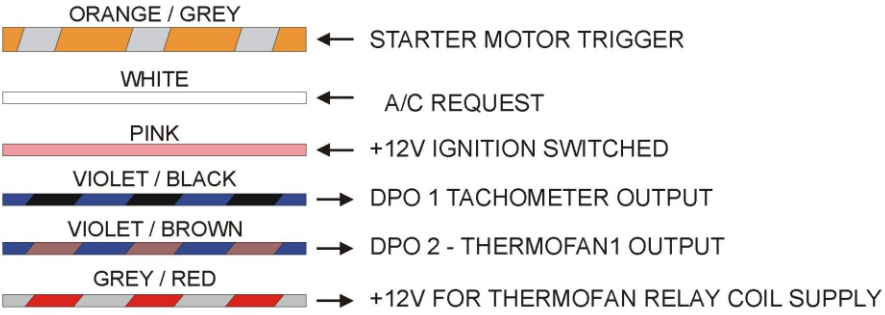


Figure 2 – Harness Cabin wiring

Accelerator Pedal Position

The following cables will connect directly to the accelerator pedal and are located with the in cabin wiring .
Wiring is dependent upon the pedal used, please refer to your pedal manufacturers specification for wiring information. Connections are outlined below.

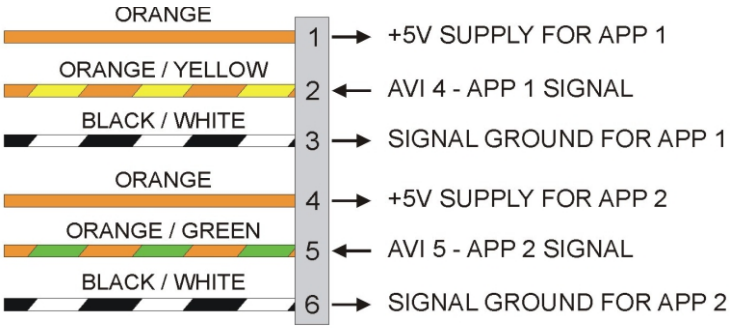


Figure 3 – Accelerator Pedal Position Sensor Wiring

Fuel Pump Output

The fuel pump output connection can be connected directly to the positive side connection on the fuel pump and is capable of handling up to 20A.

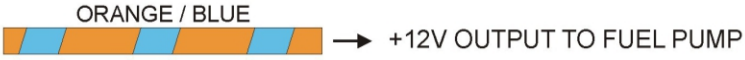


Figure 4 – Fuel Pump Output Wiring

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 etc).

The Haltech fuse box can handle a maximum continuous current draw of 70AMP, 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 current limits.

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 Wideband O2 Controller	10A
F6	R6	+12V Output to A/C Compressor Clutch	10A

Figure 5 – Haltech fuse box relay allocation table

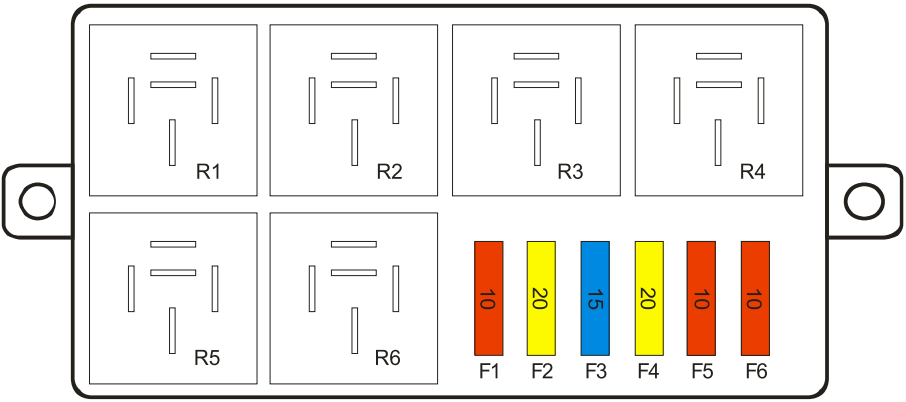


Figure 6 – Haltech fuse box layout

Initial Setup

When installation is complete it is now time to upload the basemap to your ECU.
Connect to the ECU using the Haltech Elite Software Programmer (ESP).
When connected navigate through the software to file>Upload map>Base Maps and select the basemap that suits your application.
ESP will now upload the selected basemap to your ECU.
When upload is complete it is now time to check and setup any non OEM performance parts and accessories (ie injector size, boost control etc) that your engine may require.
At this time it is important to calibrate your DBW throttle.
To do this please go to the Drive By Wire function in the setup page and follow the prompts to calibrate the throttle.
Once complete you are now able to start your engine and proceed to check timing and tune.
Please refer to the help file located within the ESP software for more information on setup and tuning.

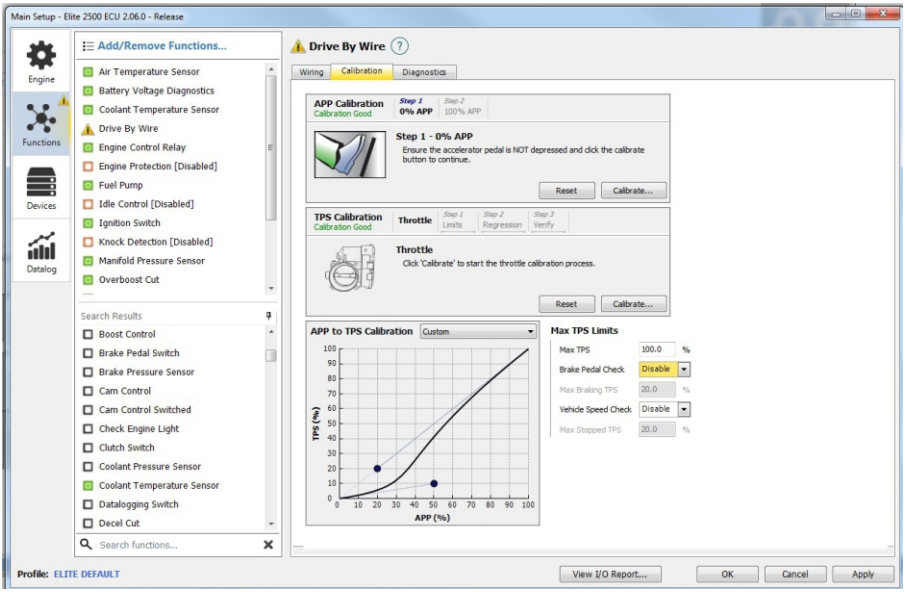
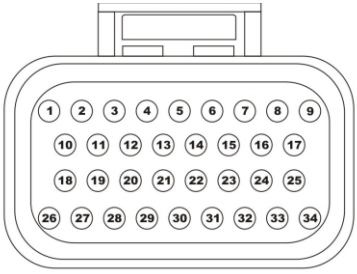


Figure 7 – Calibration of the DBW throttle

Harness Pinout



ECU CONNECTOR (34 PIN)
REAR VIEW (WIRE SIDE)

Position	Connection	Function	Notes
A1	DPO2	Thermofan	In Cabin Harness
A2	AVI 4	APP1 Signal	In Cabin Harness
A3	IGN 1	Ignition Output 1	To Ignition Output # 1
A4	IGN 2	Ignition Output 2	To Ignition Output # 2
A5	IGN 3	Ignition Output 3	To Ignition Output # 3
A6	IGN 4	Ignition Output 4	To Ignition Output # 4
A7	IGN 5	Ignition Output 5	To IgnitionOutput # 5
A8	IGN 6	Ignition Output 6	To Ignition Output # 6
A9	5v DC	5v Sensor Power	5V Supply to Sensors
A10	Battery Ground	Battery Ground	Battery Ground Terminal
A11	Battery Ground	Battery Ground	Battery Ground Terminal
A12	8v DC	-	-
A13	Ignition Input	Ignition Input	In Cabin Harness
A14	AVI 10	A/C Request	In Cabin Harness
A15	AVI 9	MAP Signal	In Engine Bay (MAP)
A16	AVI 2	TPS 1 Signal	In Engine Bay (DBW)
A17	AVI 3	TPS 2 Signal	In Engine Bay (DBW)
A18	DPO 1	Tacho	In Cabin Harness
A19	INJ 1	Injection Output 1	To Injector # 1
A20	INJ 2	Injection Output 2	To Injector # 2
A21	INJ 3	Injection Output 3	To Injector # 3
A22	INJ 4	Injection Output 4	To Injector # 4
A23	DPO 3	Alternator Control	In Engine Bay
A24	DPO 5	Fuel Pump Relay	To Fuel Pump Relay Control
A25	DPO 6	ECR	To Fuse Box Engine Control Relays
A26	Injector Power Input	Injector Power Input	+12V From Fuse Box Injection Relay
A27	INJ 5	Injection Output 5	To Injector # 5
A28	INJ 6	Injection Output 6	To Injector # 6
A29	INJ 7	Injection Output 7	To Injector # 7
A30	INJ 8	Injection Output 8	To Injector # 8
A31	STEP 1 / DPO	Cam Ctrl B1 Intake Sol 1	In Engine Bay
A32	STEP 2 / DPO	Cam Ctrl B1 Exhaust Sol 1	In Engine Bay
A33	STEP 3 / DPO	Cam Ctrl B2 Intake Sol 2	In Engine Bay
A34	STEP 4 / DPO	Cam Ctrl B1 Exhaust Sol 2	In Engine Bay

Figure 8 – 34 Pin Harness Connector Pin Allocation

ECU CONNECTOR (26 PIN)
REAR VIEW (WIRE SIDE)

Position	Connection	Function	Notes
B1	Trigger +	Cam / Ref Signal +	In Engine Bay
B2	Home +	Cam Ctrl B1 Intake Angle	In Engine Bay
B3	AVI 7	IAT Signal	In Engine Bay
B4	AVI 8	ECT Signal	In Engine Bay
B5	Trigger -	Cam / Ref Signal -	In Engine Bay
B6	Home -	-	-
B7	SPI 4	VEHICLE SPEED SENSOR	In Engine Bay
B8	SPI1	Cam Ctrl B2 Intake Angle	In Engine Bay
B9	SPI2	Cam Ctrl B1 Exhaust Angle	In Engine Bay
B10	SPI3	Cam Ctrl B2 Exhaust Angle	In Engine Bay
B11	ECU Power	12v Input ECU Power	12V Supply From Fuse Box ECU Relay
B12	AVI 6	Fuel Pressure Sensor	In Engine Bay
B13	AVI 1	Oil Pressure Sensor	In Engine Bay
B14	Signal Ground	Signal Ground	To Sensor Grounds
B15	Signal Ground	Signal Ground	To Sensor Grounds
B16	Signal Ground	Signal Ground	To Sensor Grounds
B17	IGN 7	Ignition Output 7	To Ignition Output #7
B18	IGN 8	Ignition Output 8	To Ignition Output #8
B19	DPO 4	A/C Relay Control	To A/C Relay in Fuse Box
B20	AVI 5	APP 2 Signal	In Cabin Harness
B21	Knock 1	Knock Sensor 1	In Engine Bay
B22	Knock 2	Knock Sensor 2	In Engine Bay
B23	CAN High	CAN Communicaions	To CAN Connector
B24	CAN Low	CAN Communicaions	To CAN Connector
B25	DBW1	Drive By Wire	In Engine Bay
B26	DBW2	Drive By Wire	In Engine Bay

Figure 9 – 26 Pin Harness Connector Pin Allocation

Installation Notes

Need more help?

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