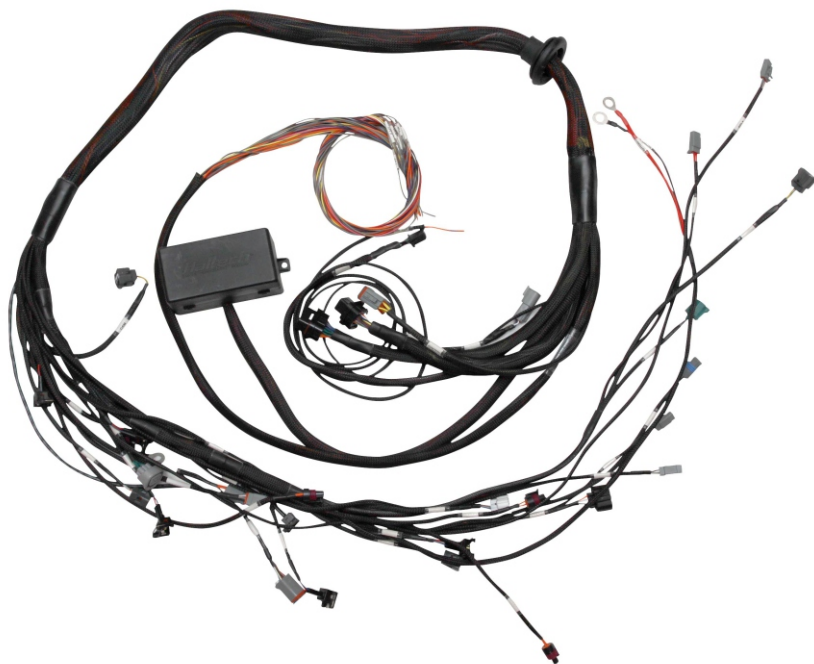




ELITE 2000/2500
Toyota 2JZ Series
Terminated Engine Harness
(HT - 130318)
QUICK START GUIDE



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 a public road or highway. Using Haltech products for street/road use on public roads or highways is prohibited by law unless a specific regulatory exemption exists (more information can be found on the SEMA Action Network website www.semasan.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.

Installation of Haltech Products

No responsibility whatsoever is accepted by Haltech for the fitment of Haltech Products. The onus is clearly on the installer to ensure that both their knowledge and the parts selected are correct for that particular application. Any damage to parts or consequential damage or costs resulting from the incorrect installation of Haltech products are totally the responsibility of the installer.

Always disconnect the battery when doing electrical work on your vehicle. Avoid sparks, open flames or use of electrical devices near flammable substances. Do not run the engine with a battery charger connected as this could damage the ECU and other electrical equipment. Do not overcharge the battery or reverse the polarity of the battery or any charging unit. Disconnect the Haltech ECU from the electrical system whenever doing any welding on the vehicle by unplugging the wiring harness connector from the ECU. After completing the ECU installation, make sure there is no wiring left un-insulated. Uninsulated wiring can cause sparks, short circuits and in some cases fire. Before attempting to run the engine ensure there are no leaks in the fuel system. All fuel system components and wiring should be mounted away from heat sources, shielded if necessary and well ventilated. Always ensure that you follow workshop safety procedures. If you're working underneath a jacked-up car, always use safety stands!

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)

Returning a sensor or accessory product after 30 days of purchase: Product may be returned for credit only (no refunds given) and is subject to a 10% Restocking fee. (Any sealed packaging must not have been opened or tampered with)

Haltech 2JZ 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.

This Harness when installed in conjunction with a Haltech Elite 2000 / 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 2JZ terminated engine harness into a vehicle. This guide is accompanied by the comprehensive help menu located within the ESP software that you or your tuner will need to refer to before completing your installation and configuration. The ESP software is located on the Haltech Resource Centre CD/USB provided with the ECU. The latest version of the software can also be downloaded from the Haltech website www.haltech.com

Supported Engine

The Haltech 2JZ terminated engine harness supports the following engine configurations:

- Toyota 2JZ-GTE - VVTi,
- Toyota 2JZ-GTE - Non-VVTi

Supported ECU

- Haltech Elite 2000
- Haltech Elite 2500

Included in this package

- Haltech 2JZ terminated engine harness
- Connector pack

Optional Accessories (Sold Separately)

- Haltech Toyota 2JZ Terminated HPI6 Ignition Harness (HT-130319)
- Haltech Toyota 2JZ Terminated Power Select 6 CDI Ignition Harness (HT-130320)
- Haltech Universal Inline 6 Cylinder High Output IGN-1A Ignition Harness (HT-130337)
- Haltech Power Select 6 CDI Ignition Module (HT-020207)
- Haltech HPI 6 Ignition Module (HT-020036)
- Haltech "TI" 5 Bar Map Sensor (HT-010110)
- Haltech Air Temperature Sensor - Small thread (HT-010200)
- Haltech 150PSI "TI" Fuel/Oil/Wastegate Pressure Sensor (HT-010904)

Harness Overview

The Haltech 2JZ terminated engine harness is a plug and play solution for wiring a Toyota 2JZ-GTE engine.

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

Suits both VVT-i and non VVT-i engines. If your engine is fitted with the factory electronic ETCS-i throttle body, it will require a "Throttle Converter Kit" or conversion to a cable operated mechanical throttle body

Notes on installation:

- Make sure your engine is grounded to the battery. A ground wire / earthing strap should be used to ground your engine to the battery 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.

- The harness is designed to be used with the front or rear cam sensor. **Please note that the map supplied by Haltech for the Non-VVT model is for use with rear cam sensor only. If front cam sensor is instead used, the TDC offset then must be changed from 5 to 365.**
- Integrated alternator connection
- Integrated starter motor solenoid connection
- Keep all wires away from the exhaust manifold.
- Ignition harness sold separately.
- Internal 3 bar or external Haltech 5 bar "TI"MAP sensor required for use.

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 + (R)

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 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.

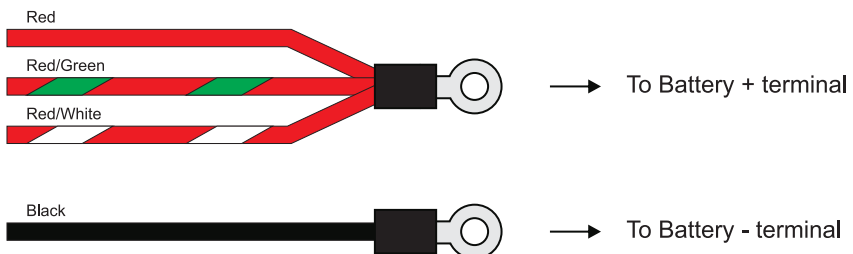


Figure 1 - Main Power Connections

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 2000 / 2500 2JZ terminated engine harness is setup to be used with either a Haltech HPI 6, Haltech Power Select 6 CDI ignition module or IGN-1A ignition coils. These harnesses can be purchased separately from www.haltech.com. For more information on setup please see the quick start guide that is included with the ignition system.

The ignition output connector comprises of the following connections:

- **Ignition Outputs (IGN1 - IGN6)**

These wires are the ignition outputs of the ECU and can be connected to the Haltech High Power Igniter (HPI) / CDI or IGN-1A coils to control the ignition.

- **Battery Ground (B)**

This wire supplies battery ground to the HPI 6 / CDI 6 modules and IGN-1A ignition coils.

- **+12V DC Switched (R / Y)**

This wire supplies a switched +12V DC to the coils from the ignition relay (R3) located inside the fusebox.

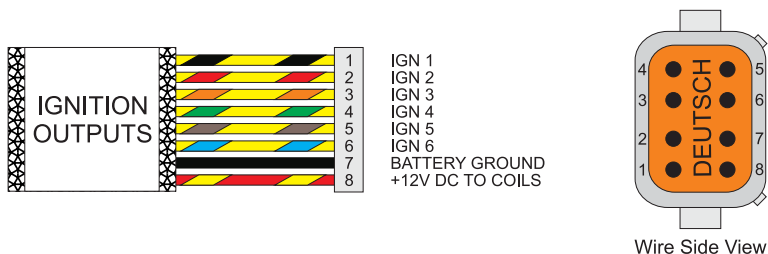


Figure 2 - Ignition Output Connector

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 temperature. This harness has been fitted with an OEM coolant temperature sensor connector.

Knock Sensor (KNOCK1, KNOCK2)

The knock sensor input connects to the relevant OEM knock sensor mounted to the block of the engine. The signal is used by the ECU knock control function to detect knock events within the engine.

Intake Air Temperature Sensor (ATS) - 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. For this reason an air temperature sensor (HT-010200) can be used as a substitute to the factory air temperature sensor. The sensor needs to be mounted after any turbo / intercooler in the moving airstream to give fast response times and reduce heat soak effects.

Manifold Pressure Sensor (MAP) - AVI 9

A MAP sensor is required when tuning an engine to compensate for changes in air density due to pressure. The MAP sensor is used to convert the pressure of air in the intake into an electrical signal for the ECU to use as a reference for engine load. The sensor works in absolute pressures, thus its calibration is not affected by changes in barometric pressure.

This harness is provisioned with the ability to connect an external Haltech 5 bar "TI" MAP Sensor (HT-010110) via a pre-terminated connector. This sensor may be purchased separately from www.haltech.com.

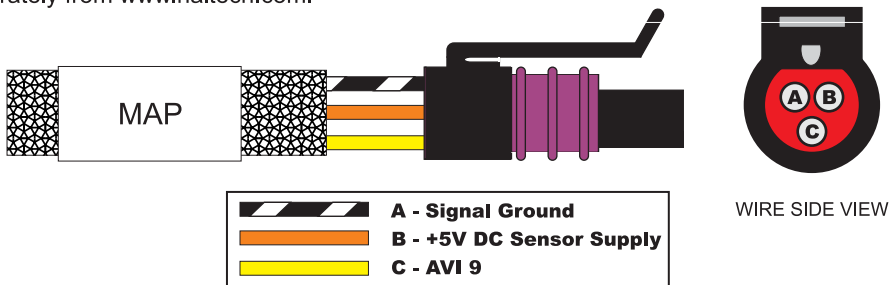


Figure 3 - Manifold Pressure Sensor Connector

Fuel Pressure Sensor (Fuel-P) - AVI 3

The Fuel-P labelled connector connects directly to an optional Haltech 150PSI "TI" pressure sensor (HT-010904). This will enable the user to know the current fuel pressure of the vehicle. This sensor may be purchased separately from www.haltech.com.

Spare Digital Pulsed Outputs (DPO3, DPO4)

There are two spare Digital Pulsed Output (DPO) connectors located on the Haltech 2JZ terminated engine harness. (DPO3 and DPO4). These connections consist of:

- +12V DC Sensor Supply
- Digital Pulsed Output

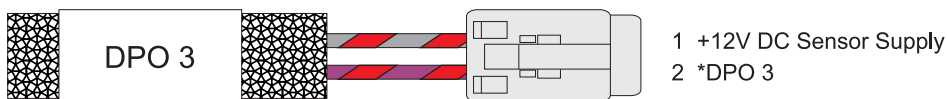
When the output is activated by the ECU, the output will switch to ground. Devices such as solenoid valves and shift lights can be run directly from the output provided that they do not exceed the maximum current draw of 1A, however high current devices such as thermofans and additional fuel pumps must 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.

These outputs 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.



***DPO3**

This output is pre-configured for Boost Control Solenoid but disabled within the supplied basemap. Please enable / reconfigure if required.

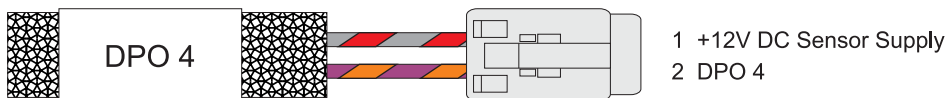
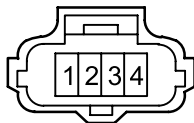


Figure 4 - Spare DPO3 / DPO4 outputs

Throttle Position Sensor (TPS) - AVI 10

The Throttle Position Sensor measures the throttle butterfly rotation. This harness has been fitted with an OEM TPS connector.



LOOKING INTO FRONT OF CONNECTOR
(PIN VIEW)

Connector Pin #	Colour	Description
1	ORG	+5VDC
2	WHT	AVI 10
3	-	-
4	BLK/WHT	Signal Ground

Oil Pressure Sensor (Oil-P) - AVI 4

The Oil-P labelled connector connects directly to an optional Haltech 150PSI "TI" pressure sensor (HT-010904). This will enable the user to know the current oil pressure of the vehicle. This sensor may be purchased separately from www.haltech.com.

Idle Control (IDLE)

The idle control function allows your Haltech ECU to control the engine idle speed. This harness has been fitted with an OEM idle control motor connector.



LOOKING INTO FRONT OF CONNECTOR
(PIN VIEW)

Connector Pin #	Colour	Description	ECU Pin #
A	GRN/RED	STEP1 P4	A34
B	GRN	STEP1 P1	A31
C	-	-	-
D	-	-	-
E	GRN/BRN	STEP1 P3	A33
F	GRN/BLK	STEP1 P2	A32

Spare Synchronised Pulsed Inputs (SPI1, SPI4)

There are two Synchronised Pulsed Input (SPI) connectors located on the Haltech 2JZ terminated engine harness. (SPI1, SPI4). These connections consist of:

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

Spare SPI1 / SPI4 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.

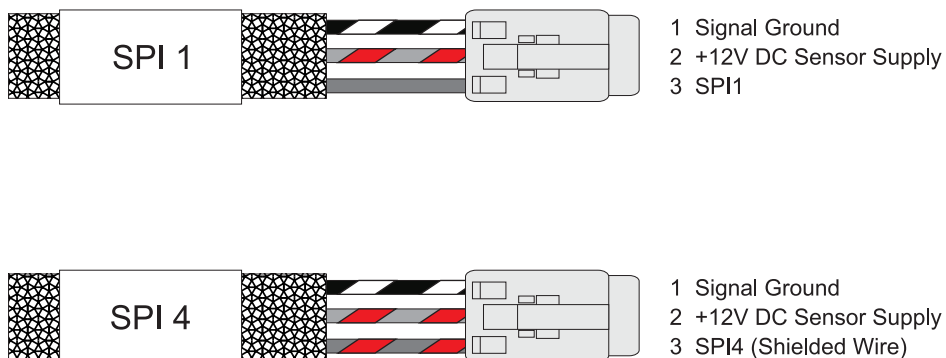


Figure 5 - Spare SPI1 / SPI4 inputs

Spare Analogue Voltage Inputs (AVI2, AVI5)

There are two spare Analogue Voltage Input (AVI) connectors located on the Haltech 2JZ terminated engine harness. (AVI2, AVI5). These connections consist of:

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

Spare AVI2 / AVI5 come pre-terminated with two connector types.

- 3 pin Amphenol Connector - AVI 2
- 3 pin Delphi Connector - AVI 5 (Spare Pressure Sensor Input). For the list of available pressure sensors please visit www.haltech.com.

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

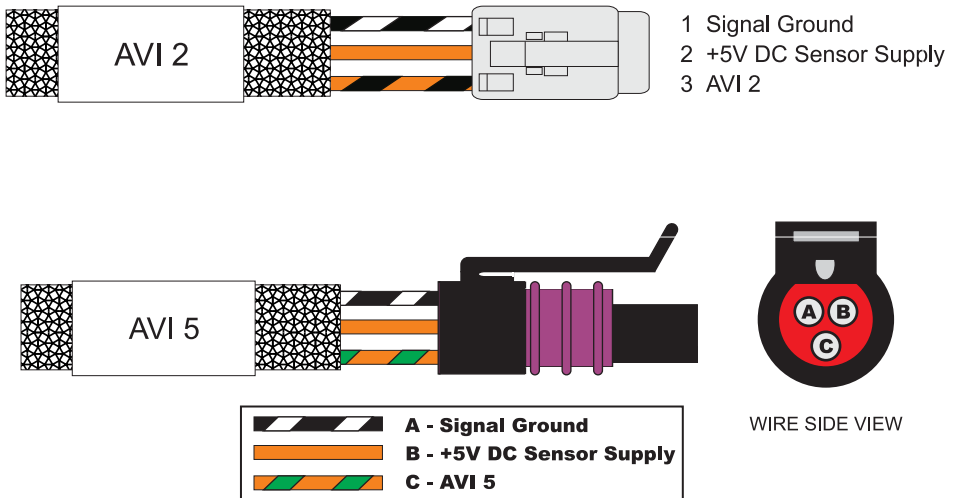


Figure 6 - Spare AVI2 / AVI5 Input

Alternator Regulation (ALT)

The Haltech 2JZ terminated engine harness is provisioned with an alternator regulator control connector. This connector consist of the following connections:

- +12V DC (Connected to Ignition Relay Output)
- ECU Injector Power (Connected to Injector Relay Output via 470R Resistor Load)
- ECU Injector Power (Connected to Injector Relay Output)

Alternator regulator connection comes pre-terminated with 3 pin connector.

There are three types of alternators that are commonly used for this application.

Please refer to wiring diagrams below for connection information.

Please note OEM connector is not supplied.

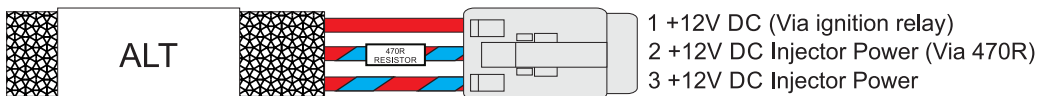
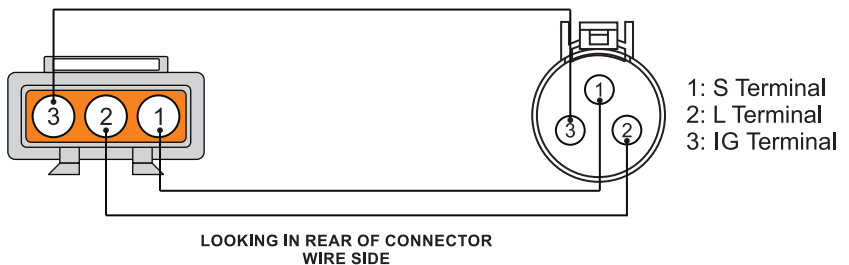
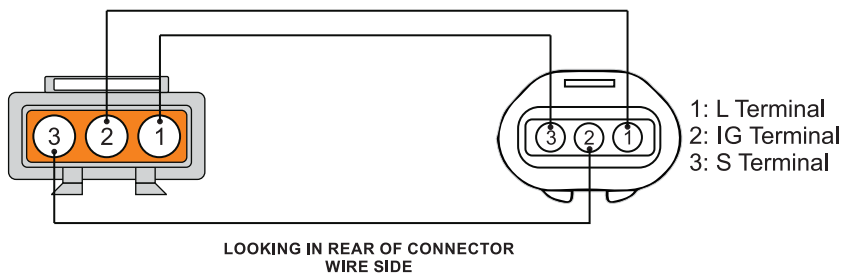


Figure 7 - Alternator Input

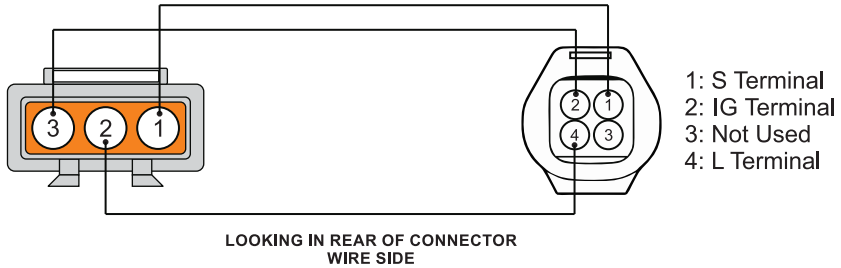
Alternator Adaptor Type 1 Wiring (Early Model DENSO)



Alternator Adaptor Type 2 Wiring (Late Model BOSCH)



Toyota Tundra Alternator Plug Wiring



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 ensure you supply 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.

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

Camshaft Position Sensor (CAM)

The camshaft position sensor is used to determine the camshaft position. This harness comes pre-terminated with an OEM camshaft position sensor connector and can be used with either front or rear sensor.

Crankshaft Position Sensor (CRANK)

The crankshaft position sensor is used to determine the engine speed and engine position. This harness comes pre-terminated with an OEM crankshaft position sensor connector.

VVTi Solenoid - INJ 7 (VVTi)

This harness comes pre-terminated with an OEM VVTi solenoid connector. VVTi, or Variable Valve Timing with Intelligence, is a variable valve timing technology developed by Toyota which varies the timing of the intake valves by adjusting the relationship between the camshaft drive (belt or chain) and intake camshaft. Engine oil pressure is applied to an actuator to adjust the camshaft position. Adjustments in the overlap time between the exhaust valve closing and intake valve opening result in improved engine efficiency and performance.

OEM Coolant Temperature Sensor Gauge (CTS-GAUGE)

The coolant temperature sensor gauge wire connects directly to an OEM cluster temperature gauge. A wire has been run from the gauge sensor to the in cabin harness labelled "CTS-Gauge". This must be connected to an OEM coolant gauge sensor and the dash cluster for correct operation of the cluster gauge.

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 8 - In Cabin Harness Wiring

Spare Digital Pulsed Output (DPO1, DPO2, INJ8, IGN7, IGN8, DBW1, DBW2)

Spare Digital Pulsed Outputs (DPO) 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.

Analogue Voltage Inputs (AVI1, AVI6)

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

The AVI-1, AVI-2 and AVI-5 labelled wires are spare Analogue Voltage Inputs. These inputs can be programmed within the ESP Software to read variable voltage inputs such as:

- O2 Sensors
- Pressure Sensors
- Temperature Sensors
- Various Switches

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

Synchronised Pulsed Inputs (SPI2, SPI4)

The Synchronised Pulsed Input (SPI) can accept digital or retractor input that can vary in duty and/or frequency. 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 fusebox.

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 (through relay located inside the fuse box).

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 9 - Fuel Pump Output wire, 15A Max Continuous Current

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 75A, 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	Unpopulated	-
F6	R6	Unpopulated	-

Figure 10 - Haltech fuse box relay allocation table

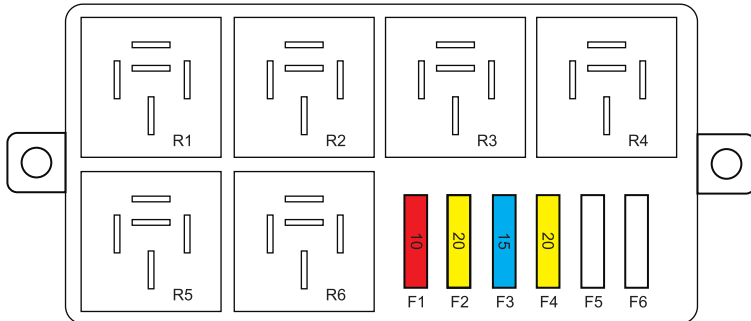
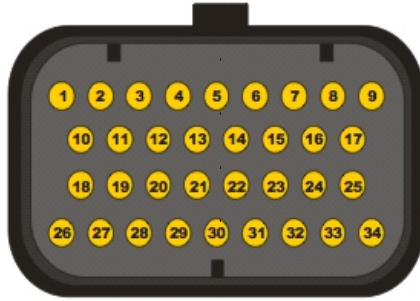


Figure 11 - Haltech fuse box layout

Harness Pinout



(34 Pin Connector)

ECU Connector (34 Pin Plug)	Function	Description
A1	DPO 2	Spare Output (In Cabin Loom)
A2	AVI 4	Oil Pressure Sensor (Fitment of Oil Pressure Sensor Required)
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	Throttle Position Sensor
A15	AVI 9	Map Sensor (Fitment of 5 Bar Map Sensor Required)
A16	AVI 2	Spare Analogue Voltage Input (In Engine Bay)
A17	AVI 3	Fuel Pressure Sensor (Fitment of Fuel Pressure Sensor Required)
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	VVTi Solenoid (CAM Control)
A30	INJ 8	Spare Output (In Cabin Loom)
A31	STEP1 P1	Idle Control Motor
A32	STEP1 P2	Idle Control Motor
A33	STEP1 P3	Idle Control Motor
A34	STEP1 P4	Idle Control Motor



(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 (Fitment of Air Temperature Sensor Required)
B4	AVI 8	Coolant Temperature Sensor
B5	TRIGGER -	Crankshaft Position Sensor (-)
B6	HOME -	Cam Position Sensor (-)
B7	SPI 4	Spare Synchronised Pulsed Input (In Engine Bay)
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 (In Cabin Loom)
B11	+12V (ECU)	Fused Power
B12	AVI 6	Spare Analogue Voltage Input (In Cabin Loom)
B13	AVI 1	Spare Analogue Voltage Input (In Cabin Loom)
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	Spare Output (In Cabin Loom)
B18	IGN 8	Spare Output (In Cabin Loom)
B19	DPO 4	Spare Output (In Engine Bay)
B20	AVI 5	Spare Analogue Voltage Input (In Engine Bay)
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	Spare Output (In Cabin Loom) Available to Elite 2500 only
B26	DBW 2	Spare Output (In Cabin Loom) Available to Elite 2500 only



V3.0

Need more help?



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