



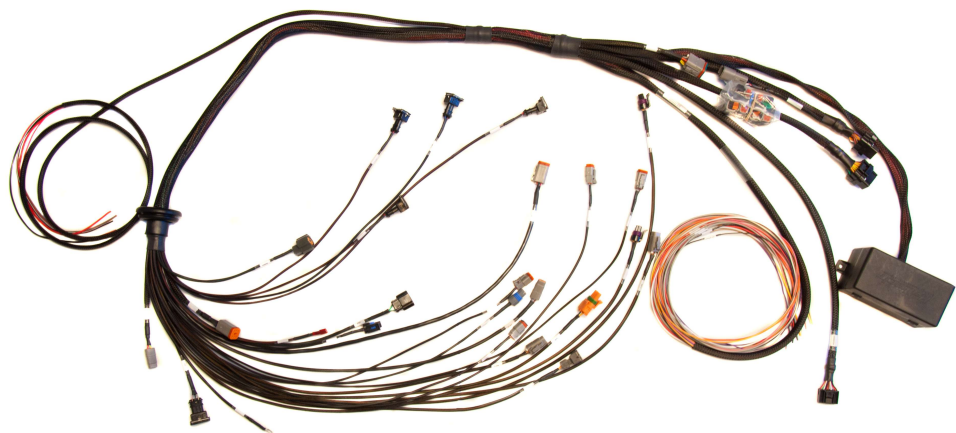
ELITE 1500

**Mitsubishi 4G63 Terminated
Engine Harness**

QUICK START GUIDE

HT-140930

**Suits 1G Cam Angle Sensor
and EV1 Injector Connectors**



LIMITED WARRANTY

Lockin Pty Ltd trading as Haltech warrants the Haltech™ Programmable Fuel Injection System to be free from defects in material or workmanship for a period of 12 months from the date of purchase.

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. Lockin Pty Ltd trading as Haltech suggests that the purchaser retain the dealer's dated bill of sale as evidence of the date of retail purchase.

If the Haltech™ Programmable Fuel Injection System 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 Lockin Pty Ltd trading as 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 Lockin Pty Ltd trading as Haltech, be liable for special or consequential damages.

DISCLAIMER

Haltech will not be held responsible for any damage caused by the incorrect installation or tuning of this product. It is the installers responsibility to ensure the wiring connections and pinouts match that of the vehicle the unit is being installed into.

Haltech has taken all care to make sure the connections match the specified vehicles listed, but variations in wiring and connections on vehicles can occur and therefore this should be checked BEFORE the unit is installed.

Haltech highly recommends installation and tuning of this product is to be carried out by a professional, with an understanding on installing and tuning engine management systems. Misuse of this product can destroy your engine.

WARNING

This ECU is designed and sold for Racing use only. Using this product for street / road use may be prohibited by law. Please check with your local vehicle authority before using this product.

GENERAL INSTALLATION WARNING

Avoid open sparks, flames or operation of electrical devices near flammable substances. Always disconnect the battery cables when doing electrical work on your vehicle.

Do not charge the battery with a 24 Volt truck charger or reverse the polarity of the battery or any charging unit. Do not charge the battery with the engine running as this could expose the ECU to an unregulated power supply that could destroy the ECU and other electrical equipment.

All fuel system components and wiring should be mounted away from heat sources, shielded if necessary and well ventilated. Disconnect the Haltech ECU from the electrical system whenever doing any arc welding on the vehicle by unplugging the wiring harness connector from the ECU.

After completing the installation, make sure that there are no fuel leaks, and no wiring left un-insulated in case a spark or short-circuit occurs and causes a fire. Also make sure that you follow all proper workshop safety procedures. If you're working underneath a jacked-up car, always use safety stands!

Elite 1500 Mitsubishi 4G63 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 Mitsubishi 4G63 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 Mitsubishi 4G63 Terminated Engine Harness supports the following engine configurations:

- Mitsubishi 4G63 1G Engines

Supported ECU

- Haltech Elite 1500
- Haltech Elite 2500 (Supports 4 additional Staged Injectors)

Included in Haltech ECU Kit (HT-150930)

- Haltech Elite 1500 ECU
- Mitsubishi 4G63 Terminated Engine Harness with EV1 Injector connectors
- Deutsch Connector Pack
- Built in Wideband Controller Harness

Optional Accessories (Sold Separately)

- Single Channel Wideband Controller (HT059970)
- O2 Sensor LSU4.2 (HT010714)
- O2 Sensor Bung (HT010702)
- DTM4 CAN Cable (please specify length when ordering)
- Mitsubishi 4G63 Staged Injector Sub-Harness

Harness Overview

The Haltech Mitsubishi 4G63 Terminated Engine Harness is a plug and play solution for wiring a 4G63 1G and 2G DSM 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 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.
- The harness is designed to plug directly into the OEM ignition loom and therefore no ignition loom is supplied.
- Base maps are available on the website www.haltech.com or by emailing sales@haltech.com.au or usasupport@haltech.com.

WARNING!

Haltech Harnesses feature Shielded cables in both a 4 Core and 1 core design. The shielding is grounded within the harness at the ECU end and does NOT require grounding at the sensor end. The shielding wire can sometimes get tangled in the signal wire and ground out the signal, so care must be taken to ensure the shield wire is properly cut back and does not contact the inner signal wires(s).

Terminology and Descriptions

Analogue Voltage Inputs (AVI): The Analogue Voltage Inputs can accept variable voltage inputs from 0V to 5V.

Digital Pulsed Outputs (DPO): These are “pull to ground” style PWM channels that can control pulsed width modulated wave form devices and switched style discrete outputs on/off type devices.

Synchronized Pulsed Inputs (SPI): These are digital inputs that can be used for frequency based sensors like speed sensors, or switched activation inputs.

Manifold Absolute Pressure Sensor (MAP, AVI 9, in Engine Bay)

The Manifold Absolute Pressure Sensor is located on the intake manifold. Connect the MAP labeled connector directly to the sensor. The harness is fitted with a connector to be used with either a 2-4bar GM Style sensor. The MAP sensor measures changes in the intake manifold pressure so the ECU knows the manifold pressure.

Throttle Position Sensor (TPS, AVI 10, in Engine Bay)

The TPS labeled connector connects directly to the throttle sensor on the engine. This will enable the user to know the current throttle position of the engine.

Engine Coolant Temperature Sensor (ECT, AVI 8, in Engine Bay)

The Engine Coolant Temperature Sensor input connects directly to the OEM engine coolant temperature sensor located towards front of the head of the left bank. 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, AVI 7, in Engine Bay)

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 Sensor (Knock 1, in Engine Bay)

The knock sensor inputs connect directly to the OEM knock sensors. This signal is used by the ECU Knock Control function to detect knock events within the engine.

Fuel Pressure Sensor (Fuel Press, AVI 3, in Engine Bay)

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 Press, AVI 4, in Engine Bay)

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.

Cam Angle Sensor CAS (Crank and Cam Trigger) Connector

The 1G Mitsubishi Cam Angle Sensor (CAS) is located on the Cylinder head on the Intake Cam opposite the Cam Gear. The Haltech ECU uses this signal to measure Crankshaft position and speed. The Haltech ECU Trigger and Home Inputs, along with power and ground, are pinned to a DTM 4 Pin connector:

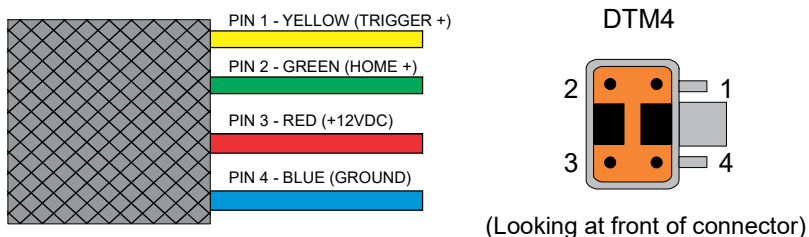


Figure 1 - Trigger and Home Breakout Connector and Crank Sensor Leads

Camshaft Position Sensor Connector

The DTM 4 Pin connector connects to the Mitsubishi 1G CAS adapter sub-harness which is included with this kit:

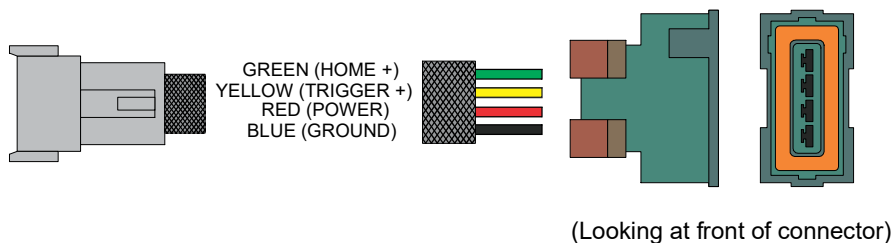


Figure 2 - OEM Cam Angle Sensor Connector

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

The injector outputs connect directly to the main 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.



For convenience, a Secondary Injector Breakout DTM6 connector has been added with the necessary injector output wires (available when using the Elite 2500). Please specify when ordering additional injector loom PN HT-XXXXXXX.

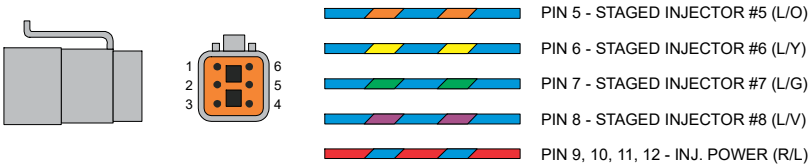


Figure 3 - Injector Wires and Extra Injectors Breakout Connector

Ignition 1-4 (IGN1, IGN2, IGN3, IGN4)

The Ignition outputs, Ignition Switched and Coil Power, Signal and Power grounds are terminated onto an DT 8 Pin connector with the pinout shown below.

The DT 8 Pin Ignition connector connects to the Flying Lead Ignition Sub Harness specific to this kit. Be sure to use an appropriate Ignition Module (igniter), CDI Ignition system, or Coils with internal Igniter with this Flying Lead Ignition Harness. Improper Ignition System connection or components may result in ECU damage.

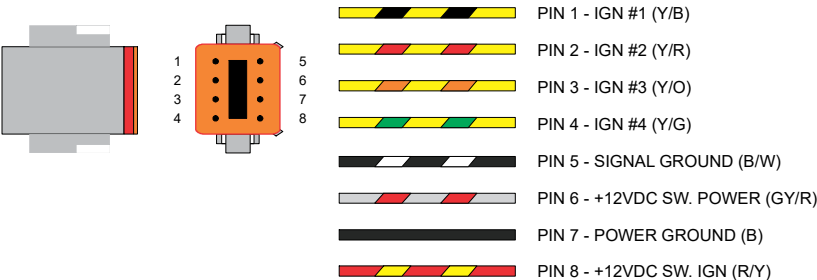


Figure 4 - Ignition Breakout Connector

Spare Analog Voltage Inputs (AVI 2 and AVI 5, in Engine Bay)

The AVI 2 and AVI 5 labeled connector are spare Analogue Voltage Inputs. They are fitted with DTM3 three pin connectors and have the following terminations. Please isolate all unused terminations.

Pin # 1 – Blk/Wht : Sensor Ground
Pin # 2 – Org : +5V Sensor Power
Pin # 3 – Org/Grn : Sensor Signal (AVI 2 or AVI5)

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

- O2 Sensors
- Pressure Sensors
- Temperature Sensors
- Various Switches
- Trim Module

Idle Control Outputs (Stepper 1-4, in Engine Bay). Idle Control output wires fitted with the factory Idle Valve connector to allow connection for a 4 wire Stepper Motor idle control valve. Located in the Engine Bay. (***Note: Stepper outputs can also be used as DPO Lo Side or Hi Side outputs if an idle valve is not being used.**)

Starter Signal (STS, in Engine Bay)

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



Figure 5 - Starter Solenoid Signal Wire

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.

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

Spare Digital Pulsed Outputs (DPO2 and DPO3, in Engine Bay): The DPO 2 and DPO 3 labeled connector are spare Digital Pulsed Outputs. They are fitted with DTM2 two pin connectors and have the following terminations. Please isolate all unused tions.



Figure 6 - Spare Digital Pulsed Outputs

Vehicle Speed Sensor Input (VSS-Input, SPI 1, in Engine Bay)

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: Blk/Wht – Sensor Ground

Pin# 2: Gry/Red - +12V Sensor Power

Pin# 3: Grey (Shielded) – Sensor Signal (SPI 1)

Digital Pulsed Inputs (SPI 2 and SPI 4, in Cabin Harness)

Spare in the Cabin Harness. These inputs can be programmed within the ESP Software to perform auxiliaries such as:

- Air Con Input Switch
- Aux RPM Limit
- Switched Inputs
- Flex Fuel Sensor
- Vehicle/Driveshaft Speed Sensors
- Trans Brake Input Switch
- Launch Control Switch
- Flat Shift Switch
- Trans Brake Bump/Creep Control

Digital Pulsed Input (SPI 3, in Engine Bay)

Spare in the Engine Bay. This input can be programmed within the ESP Software to perform auxiliary functions such as:

- Flex Fuel Sensor
- Vehicle/Driveshaft Speed Sensors
- Trans Brake Input Switch
- Launch Control Switch
- Flat Shift Switch
- Trans Brake Bump/Creep Control

Spare Analog Voltage Input (AVI 1 and 6, In Cabin Harness)

AVI inputs 1 and 6 are spare Analogue Voltage Input that can be programmed within the ESP Software to do the following options:

- Trim Module Input
- Various Switches
- 0-5V Analog Voltage Input
- Pressure Sensor
- Temperature Sensors

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

Cabin Wiring

The Cabin Wiring is made up 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.

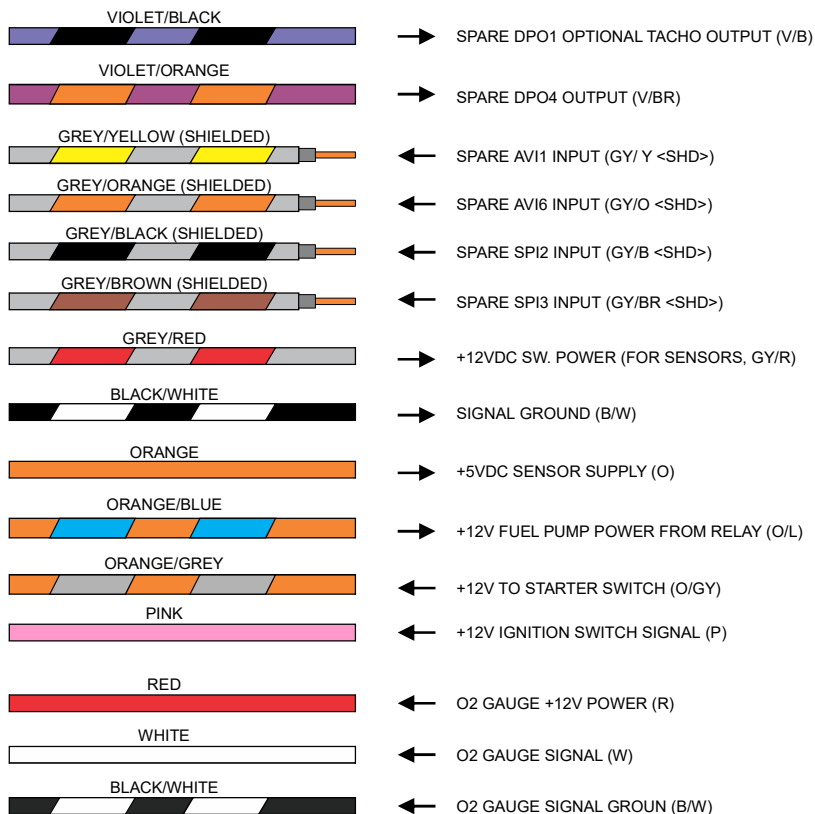


Figure 7 - Cabin Harness Wiring

IMPORTANT NOTE:

Crank Input, Cam Input, SPI Inputs 1-4 and AVI inputs 1 & 6 use single or multi-core shielded cables to protect the signal wires from interference. These are indicated with a '<SHD>' note above. The shielding wire is grounded internally inside the harness. Take care during installation that this shielding wire is NOT connected to the signal wire and does NOT make contact with the ECU +5v, +8v or any switched or constant battery power.

Battery Connections

The following cables will connect directly to the battery on the vehicle:

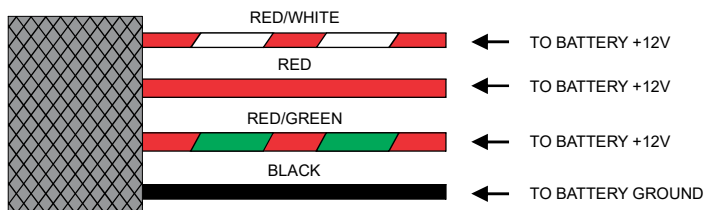


Figure 8 - Battery Wiring (In Engine Bay)

Ground (GND)

The Ground cable connects directly to the Battery. 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.

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.

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.

*** Please refer to our software Help Guide using F1 on your Keyboard for additional information.**

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:

Position	Connection	Wire Color	Function
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 for Accessories	10A
F6	R6	Unpopulated	-

Figure 9 - Haltech Fuse Box Relay Allocation Table

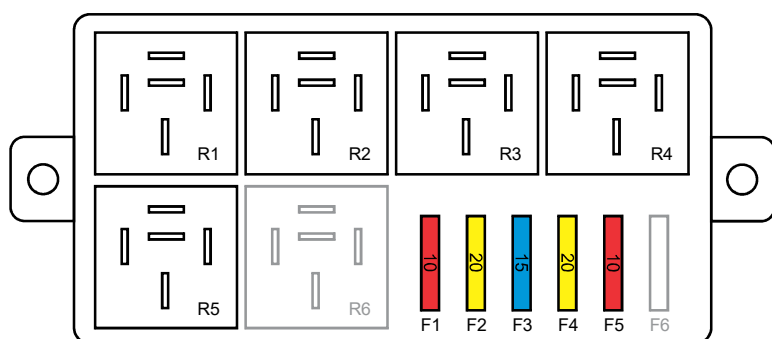
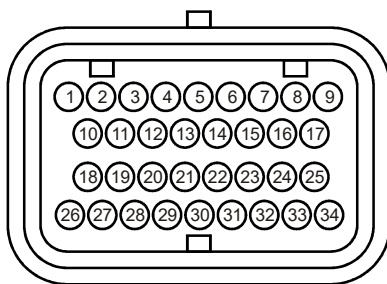


Figure 10 - Haltech Fuse Box Layout

Notes:

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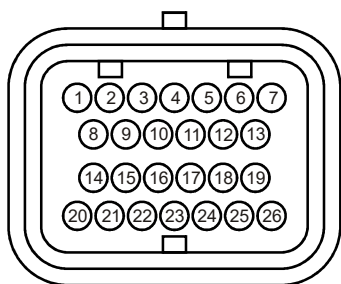
Harness Pinout



**ECU CONNECTOR (34 PIN)
(Looking into ECU)**

Position	Connection	Wire Color	Function	Notes
A1	DPO 2	V/BR	Spare Digital Output	In Engine Bay
A2	AVI 4	O/Y	Oil Pressure	In Engine Bay
A3	IGN 1	Y/B	Ignition Output 1	To Ignition Breakout Connector (in Cabin)
A4	IGN 2	Y/R	Ignition Output 2	To Ignition Breakout Connector (in Cabin)
A5	IGN 3	Y/O	Ignition Output 3	To Ignition Breakout Connector (in Cabin)
A6	IGN 4	Y/G	Ignition Output 4	To Ignition Breakout Connector (in Cabin)
A7	-	-	-	-
A8	-	-	-	-
A9	5VDC	O	5V Sensor Power	5V Supply to Sensors
A10	Chassis Ground	B	Chassis Ground	Battery/Engine Ground Terminal
A11	Chassis Ground	B	Chassis Ground	Battery/Engine Ground Terminal
A12	-	-	-	-
A13	Ignition Switch	P	Ignition Input	In Cabin Harness
A14	AVI 10	W	Throttle Position	In Engine Bay
A15	AVI 9	Y	MAP Signal	In Engine Bay
A16	AVI 2	O/B	Spare Analog Input	In Engine Bay
A17	AVI 3	O/R	Fuel Pressure	In Engine Bay
A18	DPO 1	V/B	Spare DPO (Tacho)	In Cabin Harness
A19	INJ 1	L	Injection Output 1	To Injector # 1
A20	INJ 2	L/B	Injection Output 2	To Injector # 2
A21	INJ 3	L/BR	Injection Output 3	To Injector # 3
A22	INJ 4	L/R	Injection Output 4	To Injector # 4
A23	DPO 3	V/R	Spare Digital Output	In Engine Bay
A24	DPO 5	B/Y	Fuel Pump Relay	To Fuel Pump Relay Control
A25	DPO 6	B/R	Engine Control Relay	To Fuse Box Engine Control Relays
A26	Injector Power Input	R/L	Injector Power Input	12V From Fuse Box Injection Relay
A27	INJ 5	L/O	Injection Output 5	Staged Injector # 5
A28	INJ 6	L/Y	Injection Output 6	Staged Injector # 6
A29	INJ 7	L/G	Injection Output 7	Staged Injector # 7
A30	INJ 8	L/V	Injection Output 8	Staged Injector # 8
A31	IDLE 1	G	Idle Control Output	In Engine Bay
A32	IDLE 2	G/B	Idle Control Output	In Engine Bay
A33	IDLE 3	G/BR	Idle Control Output	In Engine Bay
A34	IDLE 4	G/R	Idle Control Output	In Engine Bay

Figure 11 - 34 Pin Harness Connector Pin Allocation



**ECU CONNECTOR (26 PIN)
(Looking into ECU)**

Position	Connection	Wire Color	Function	Notes
B1	Trigger +	Y <SHD>	Crank / Ref Signal	In Engine Bay
B2	Home +	G <SHD>	Cam / Sync Signal	In Engine Bay
B3	Air Temp	GY	IAT Signal	In Engine Bay
B4	Coolant Temp	V	ECT Signal	In Engine Bay
B5	-	-	-	-
B6	-	-	-	-
B7	SPI 4	GY/R	Spare Digital Input	In Cabin Harness
B8	SPI 1	GY	Vehicle Speed Sensor	In Engine Bay
B9	SPI 2	GY/B	Spare Digital Input	In Cabin Harness
B10	SPI 3	GY/BR	Spare Digital Input	In Engine Bay
B11	ECU Power	R/W	12V Input ECU Power	12V Supply From Fuse Box ECU Relay
B12	AVI 6	GY/O	Spare Analog Input	In Cabin Harness
B13	AVI 1	GY/Y	Spare Analog Input	In Cabin Harness
B14	Signal Ground	B/W	Signal Ground	To Sensor Grounds
B15	Signal Ground	B/W	Signal Ground	To Sensor Grounds
B16	Signal Ground	B/W	Signal Ground	To Sensor Grounds
B17	-	-	-	-
B18	-	-	-	-
B19	DPO 4	V/O	Spare Digital Output	In Cabin Harness
B20	AVI 5	O/G	Spare Analog Input	In Engine Bay
B21	Knock 1	GY/G	Knock Sensor	In Engine Bay
B22	-	-	-	-
B23	CAN Hi	W	CAN Communications	To CAN Connector / In Cabin
B24	Can Lo	L	CAN Communications	To CAN Connector / In Cabin
B25	-	-	-	-
B26	-	-	-	-

Figure 12 - 26 Pin Harness Connector Pin Allocation

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