REBEL LS
TERMINATED HARNESS
FOR NEXUS REBEL LS ECU

QUICK START GUIDE

HT-186500

9 356450 013932

HARNESS OVERVIEW

Congratulations on purchasing a Nexus Rebel LS terminated wiring harness! This specialized harness is intended for seamless integration with a Nexus Rebel LS Engine Control Unit (ECU), and is compatible with GM LS engines featuring either Gen III cable throttle or Gen IV Drive By Wire (DBW) throttle systems.

In conjunction with a Nexus Rebel LS ECU, your Gen III or Gen IV GM LS engine will have an extensive range of performance and tuning capabilities.

This Quick Start Guide will walk you through the installation of this terminated harness along with the options of adding sub-harnesses and other devices.

Harness Features:

Nexus Rebel LS ECU connectors

Terminated connections for both the engine bay and cabin

Connection to Haltech CAN devices (e.g., dash displays, keypads, etc.)

Connection to sensors (e.g., crank, cam, MAP, temperature, fluid pressure, position, speed, etc.)

Bosch LSU 4.9 wideband lambda sensor control

Two Gen IV style knock sensor connectors

Direct connection to the OEM ignition sub-harness

Connection to 8x injectors (refer to sub-harness options)

Connections for thermofan and fuel pump control

Compatibility with DBW or Cable throttle systems (refer to adapter options)

Connection for alternator control

Connection for transmission wiring

Spare high current output (25A)

Spare inputs and outputs

GENERAL INSTALLATION WARNING:

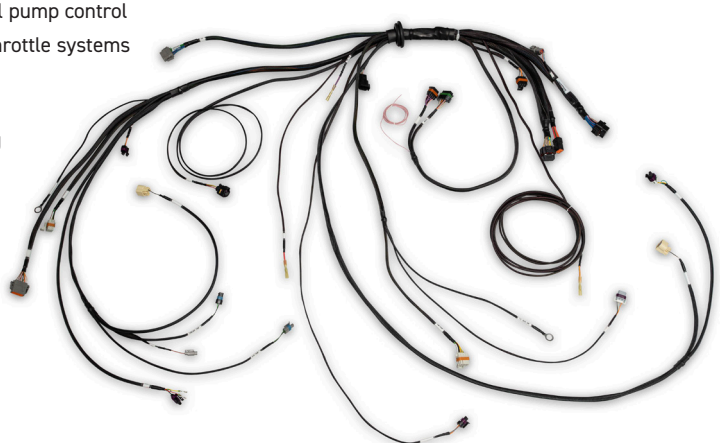
A Nexus series ECU or VCU allows connection to your laptop via the Nexus Software Programmer (NSP) using the included USB cable, without the need for +12V power. This feature conveniently lets you set up your ignition, injector, and various other outputs before initially powering up the control unit using this harness. Turning on the control unit with incorrect configurations can lead to damage to both the engine and control unit components.

This wiring harness is not designed to provide grounding for your engine. Ensure your engine is adequately grounded using a grounding or earthing strap to connect your engine to the battery.

Avoid creating sparks or using electrical devices near flammable substances. Always disconnect the battery cables when working on the electrical systems of your vehicle. Make sure all fuel system components and wiring are installed away from heat sources, properly shielded if necessary, and in well-ventilated areas.

After installation, double-check for any fuel leaks and ensure that no wiring is left exposed or uninsulated to avoid the risk of a fire from a spark or short circuit.

Do not charge or disconnect the battery while the engine is running. Doing so could expose the control unit to an unregulated power supply, which might lead to control unit failure.



What's in the bag?

- Nexus Rebel LS terminated harness (HT-186500)
- Pack of connectors and pins set to terminate to spare inputs and outputs
- 2 and 4 pin alternator adapter harnesses

Available adapters and sub-harnesses (sold separately)

Injector sub-harness:

HT-186501 - Nexus Rebel LS - EV1 injector sub-harness

HT-186502 - Nexus Rebel LS - EV6 injector sub-harness

HT-186503 - Nexus Rebel LS - Multec 2 injector sub-harness

Throttle / Pedal adapters:

HT-186505 - Nexus Rebel LS - 6-pin DBW adapter harness

HT-186506 - Nexus Rebel LS - 8-pin DBW adapter harness

HT-186512 - Nexus Rebel LS - Bosch pedal adapter harness

HT-186507 - Nexus Rebel LS - Corvette pedal adapter harness

HT-186504 - Nexus Rebel LS - TPS + IAC sub-harness

Transmission sub-harness:

HT-187003 - Nexus Rebel LS - T56 transmission sub-harness

Sensor adapters:

HT-186510 - Nexus Rebel LS - Gen IV Oil pressure sensor adapter harness

HT-186511 - Nexus Rebel LS - MAP sensor adapter harness

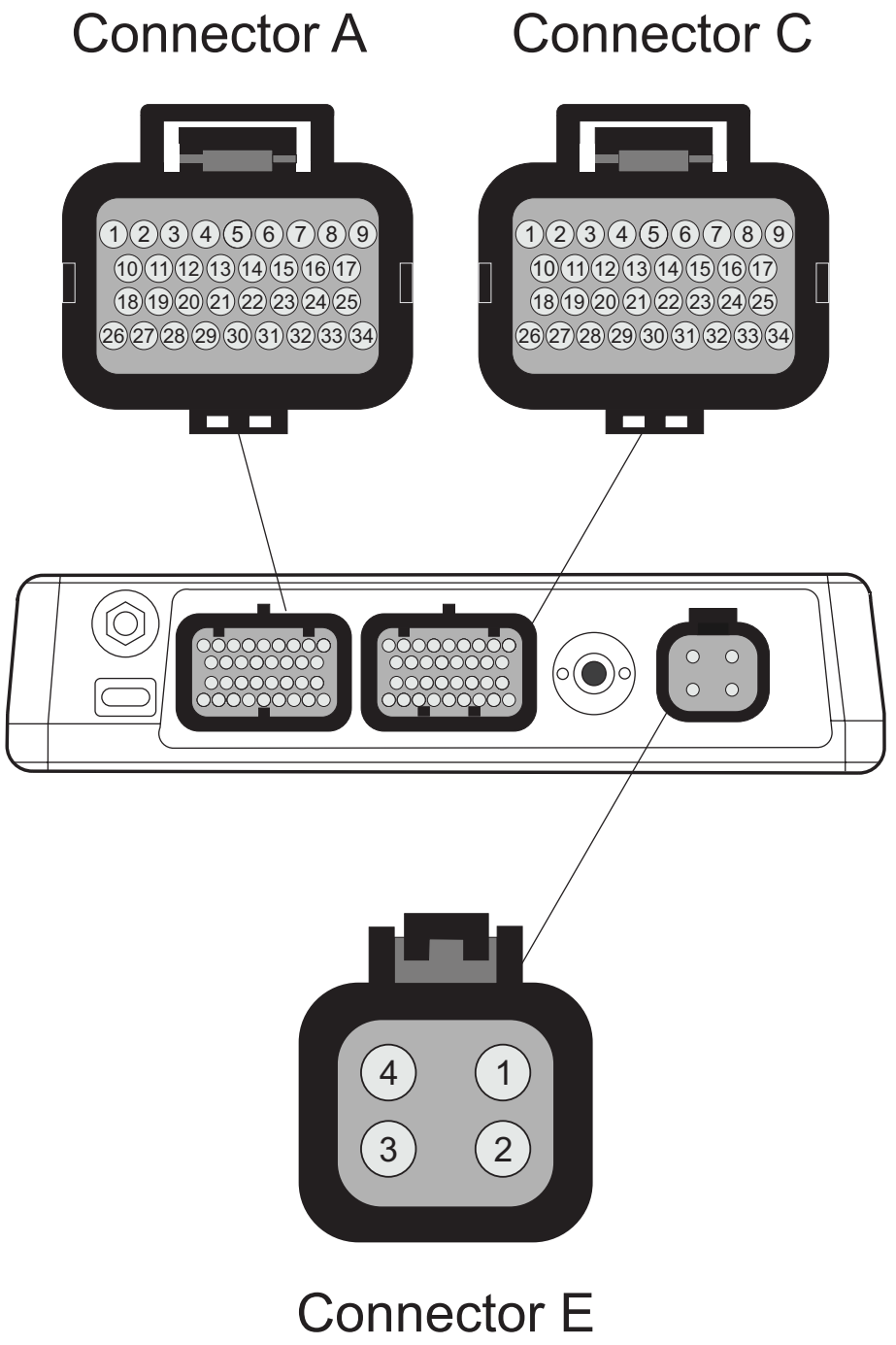
HT-186508 - Nexus Rebel LS - Gen III Knock sensor sub-harness

HARNESS PINOUT DIAGRAM

CONNECTOR A (KEYWAY TYPE 1)		
Pin	**Function**	**Color**
A1	Injector 1	Blue
A2	Injector 2	Blue/Black
A3	Injector 3	Blue/Brown
A4	Injector 4	Blue/Red
A5	Injector 5	Blue/Orange
A6	Injector 6	Blue/Yellow
A7	Injector 7	Blue/Green
A8	Injector 8	Blue/Violet
A9	Outputs / DPO 1	Violet/Black
A10	Power Ground Output	Black
A11	Power Ground Output	Black
A12	Outputs / DPO 2	Violet/Brown
A13	Ignition Switch Input	Pink
A14	Outputs / DPO 3	Violet/Red
A15	Outputs / DPO 4	Violet/Orange
A16	Outputs / DPO 5	Violet/Yellow
A17	Tacho Output	Violet/Green
A18	Transmission Supply	Pink/Red
A19	Throttle / IAC 1	Brown/Black
A20	Throttle / IAC 2	Brown/Red
A21	Throttle / IAC 3	Brown/Green
A22	Throttle / IAC 4	Brown/Pink
A23	CAN H	White
A24	CAN L	Blue
A25	CAN Supply	Pink/Brown
A26	Unused	Unused
A27	Ignition 1	Yellow/Black
A28	Ignition 2	Yellow/Red
A29	Ignition 3	Yellow/Orange
A30	Ignition 4	Yellow/Green
A31	Ignition 5	Yellow/Brown
A32	Ignition 6	Yellow/Blue
A33	Ignition 7	Yellow/Violet
A34	Ignition 8	Yellow/Gray

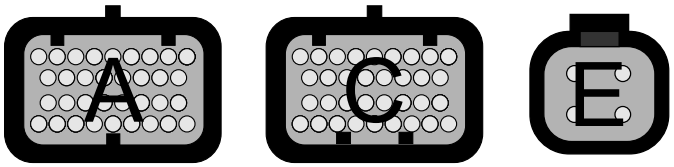
CONNECTOR C (KEYWAY TYPE 2)		
Pin	**Function**	**Color**
C1	Crank	Yellow
C2	Unused	Unused
C3	Cam	Yellow
C4	Unused	Unused
C5	Inputs / SPI 1	Gray/Brown
C6	Inputs / SPI 2	Gray/Red
C7	Inputs / SPI 3	Gray/Orange
C8	Inputs / SPI 4	Gray/Yellow
C9	Crank / Cam Supply	Orange/White
C10	Inputs / AVI 1	White
C11	Inputs / AVI 2	White/Yellow
C12	Fuel pressure	White/Gray
C13	Oil pressure	White/Violet
C14	MAP	White/Green
C15	Throttle TPS 1	White/Orange
C16	Throttle TPS 2	White/Black
C17	APP 1	White/Brown
C18	APP 2	White/Red
C19	Transmission	Gray/Pink
C20	Transmission / VSS	Gray/L.Green
C21	Unused	Unused
C22	Unused	Unused
C23	Knock Odd	Black/Blue
C24	Knock Even	Black/Green
C25	+5V Sensor Supply	Orange
C26	Sensor Ground	Black/White
C27	Coolant temperature	L.Green
C28	Air temperature	L.Green/Black
C29	WBI 1 Heater +	Gray
C30	WBI 1 Input	Yellow
C31	WBI 1 Pump	Red
C32	WBI 1 Nernst	Black
C33	WBI 1 Heater -	White
C34	WBI 1 Cal	Green

CONNECTOR E		
Pin	**Function**	**Color**
E1	AX25+ (Auxiliary 25A)	Red/Blue
E2	Fuel Pump	Red/Yellow
E3	Fan	Red/Orange
E4	Inj/Ign Supply	Red/Green



Nexus Rebel LS ECU Connection

With the unit powered off, connect the 3 ECU plugs on the main harness to the Nexus Rebel LS ECU.



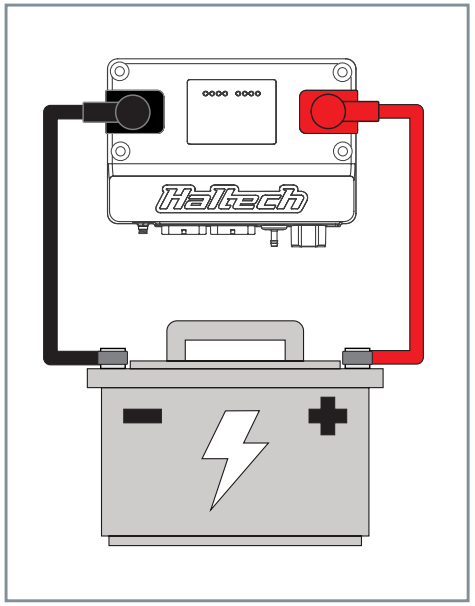
Connector A:
34-pin, Keyway Type 1
Connector C:
34-pin, Keyway Type 2
Connector E:
4-pin, DTP

Battery Positive and Battery Negative (Nexus Rebel LS ECU)

For correct operation, the battery positive and battery negative must be connected to the Nexus Rebel LS ECU at all times.

Connect the positive (+) terminal of the battery to the Nexus Rebel LS ECU's positive (Red) terminal. Use the supplied ring terminal and Red boot, along with a Red 4AWG battery cable (sold separately) for the connection.

Connect the negative (-) terminal of the battery to the Nexus Rebel LS ECU's negative (Black) terminal. Use the supplied ring terminal and Black boot, along with a Black 4AWG battery cable (sold separately) for the connection.



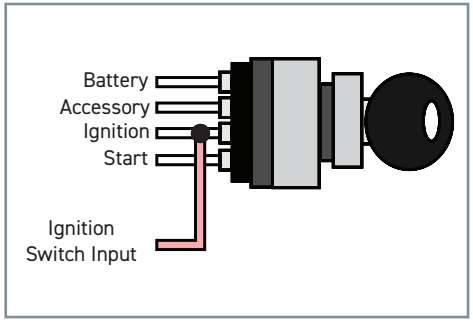
Ignition Switch

(Label: Ign Sw)

The ignition switch input (pink) wire must be connected to a switched +12V source to turn the Nexus Rebel LS ECU on.

When connecting this wire to the ignition key switch, it is important to make sure to use the main ignition wire (i.e., not accessory) so it doesn't lose power when the key is in the "Start" position, causing the ECU to momentarily turn off.

The pink wire is the flying lead (unbraided) coming out of the in-cabin inputs and outputs connector branch.



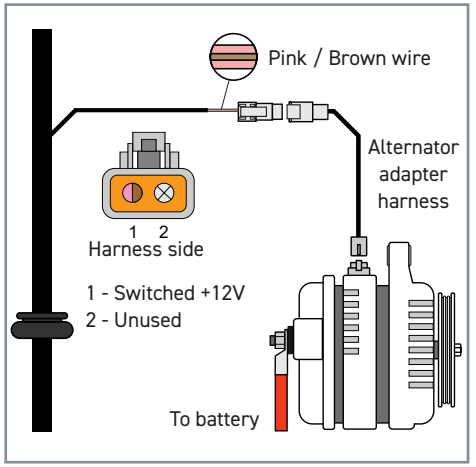
Alternator

(Label: Alt)

This harness is equipped with a DTM-2 plug to provide switched +12V power to alternators with built-in regulators. Additionally, the harness includes alternator adapter harnesses suitable for typical LS engine alternators with 2-pin Bosch or Yazaki connectors, as well as those with 4-pin Delco connectors:

- HT-186123 LS 2-pin Bosch alternator adapter
- HT-186124 LS 4-pin Delco alternator adapter
- HT-186125 LS 2-pin Yazaki alternator adapter

Using the adapter harnesses above excites the alternator using a 470-ohm inline resistor, serving as a replacement for the charge indicator light.



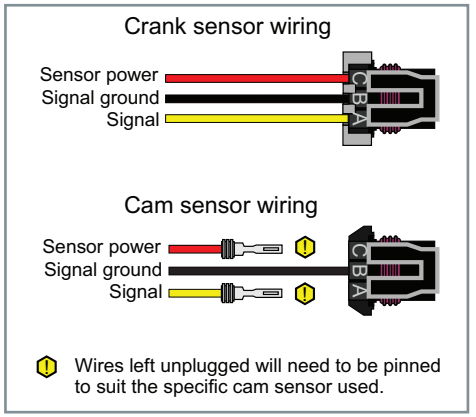
Crankshaft and Camshaft Position Sensors

(Label: Crank, Cam)

The crank position sensor plug connects directly to the engine's crank angle sensor.

The cam position sensor plug connects directly to the sensor. However, note that the wiring varies between models for the GM LS engines. Hence, the plug has the signal wire (yellow) and sensor power wire (red) both unplugged, and is left for the installer to "pin" into the connector to suit what the cam sensor requires.

Refer to the table below for the pinout and insert the pins into the connector until they lock.



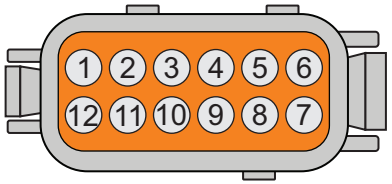
CAM SENSOR PLUG PINOUT WIRING			
PIN	LS1 CAM SENSOR	LS2/LS3 CAM SENSOR	LS2/LS3 CAM (WIRING TO PIGTAIL HARNESS)
A	Signal (Yellow)	Sensor power (Red)	Signal (Yellow)
B	Signal ground (Black)	Signal ground (Black)	Signal ground (Black)
C	Sensor power (Red)	Signal (Yellow)	Sensor power (Red)

Fuel Injector Breakout
(Label: INJ)

This Rebel LS terminated harness uses an injector breakout connector to plug into multiple types of injector sub-harnesses (sold separately). The choice of sub-harness will depend on the type of injector connectors that are used.

Each injector plug is labeled accordingly to easily identify which injector on the engine it connects to. Refer to the diagram on page 9 for LS engine cylinder number identification.

NOTE: The Nexus Rebel LS ECU only supports high impedance injectors.



Main harness side view

FUEL INJECTOR BREAKOUT CONNECTOR		
PIN	FUNCTION	COLOR
1	Injector 1	Blue
2	Injector 2	Blue/Black
3	Injector 3	Blue/Brown
4	Injector 4	Blue/Red
5	Injector 5	Blue/Orange
6	Injector 6	Blue/Yellow
7	Injector 7	Blue/Green
8	Injector 8	Blue/Violet
9	Injector supply	Red/Green
10	Injector supply	Red/Green
11	Injector supply	Red/Green
12	Injector supply	Red/Green

HT-186501 - Nexus Rebel LS EV1 injector sub-harness

HT-186502 - Nexus Rebel LS EV6 injector sub-harness

HT-186503 - Nexus Rebel LS Multec 2 injector sub-harness

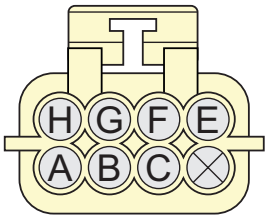
Ignition Coil Breakout
(Label: IGN Odd, IGN Even)

This harness is designed to plug into the OEM ignition sub-harness and therefore no ignition sub-harness is supplied.

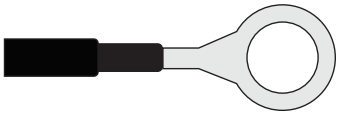
Ensure the correct ignition breakout connector is connected to the corresponding ignition coil sub-harness bank on the engine. Refer to the diagram below to identify the odd and even banks on a GM LS engine.

The harness also has two 13mm ignition coil ground ring terminals that will need to be bolted onto each of the engine heads to provide ground to the coils.

NOTE: The factory LS ignition coils come with built in igniters. Should you choose to switch to a different kind of ignition coil, it's crucial to confirm that the new coils also have built-in igniters prior to connecting them to the ignition breakout connectors. Using ignition coils that do not have igniters built-in will cause harm to the ECU.

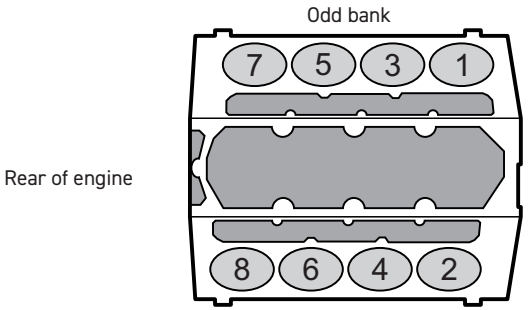


Ignition coil breakout connector (Main harness side view)



Ignition ground ring terminal

IGNITION COIL BREAKOUT CONNECTOR					
IGNITION ODD			IGNITION EVEN		
PIN	FUNCTION	COLOR	PIN	FUNCTION	COLOR
A	Ground	Black	A	Ground	Black
B	Ignition 7	Yellow/Violet	B	Ignition 2	Yellow/Red
C	Ignition 5	Yellow/Brown	C	Ignition 4	Yellow/Green
D	Unused	Unused	D	Unused	Unused
E	Ground	Black	E	Ground	Black
F	Ignition 3	Yellow/Orange	F	Ignition 6	Yellow/Blue
G	Ignition 1	Yellow/Black	G	Ignition 8	Yellow/Gray
H	Ignition supply	Red/Green	H	Ignition supply	Red/Green

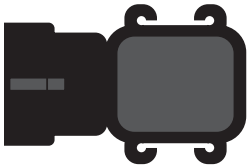


Cylinder numbers of a GM LS engine

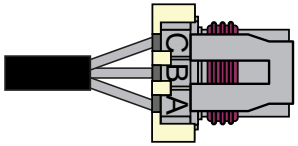
Manifold Absolute Pressure (MAP) Sensor
(Label: MAP)

The MAP sensor connector on the harness plugs into a Gen III style sensor as shown below.

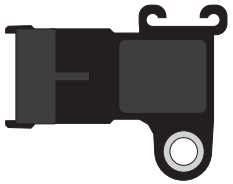
If you are using a Gen IV MAP sensor from a later model engine, a HT-186511 MAP sensor adapter harness can be used to suit (sold separately).



Gen III style MAP sensor



MAP sensor connector



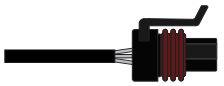
Gen IV style MAP sensor

HT-186511 - MAP sensor adapter harness

Oil and Fuel Pressure Sensors
(Label: Oil Press / Fuel Press)

This harness plugs directly into the factory oil pressure sensor using the early style 3-pin connector shown below. If you are using a later model Gen IV type of oil pressure sensor, a HT-186510 Oil pressure adapter harness can be used.

The harness also comes with an early style 3-pin pressure sensor connector that is compatible with Haltech fuel pressure sensors, should you choose to install one.

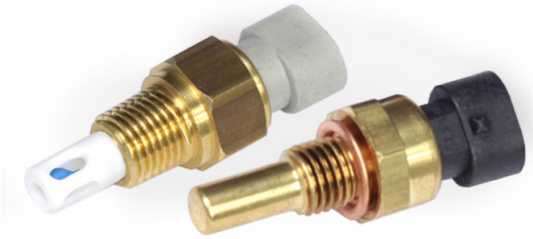


Early style 3-pin Pressure sensor connector

HT-186510 - Oil pressure sensor adapter harness

Coolant Temp, Intake Air Temp
(Label: Coolant Temp / Air Temp)

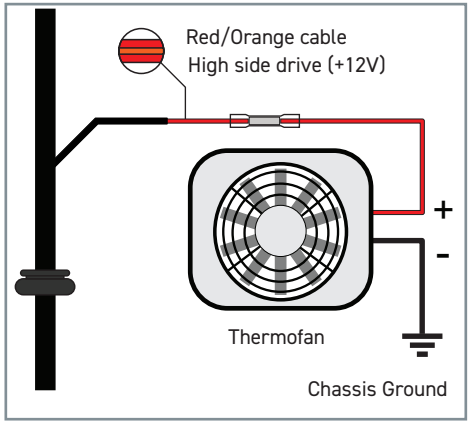
This harness is equipped with connectors compatible with the 2-pin GM LS intake air and coolant temperature sensors, as shown below.



Thermofan Control
(Label: Fan)

This harness provides direct thermofan control using the Red/Orange 12AWG cable terminated with a butt splice connector.

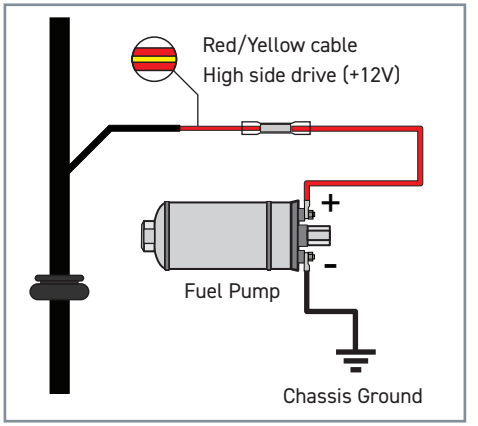
Use this cable to supply +12V power directly to the thermofan and leverage ECU functions, such as setting the fan's on/off temperature threshold, activating the fan with air-conditioning, or deactivating the fan when the vehicle reaches a specified speed (vehicle speed sensor is required).



Fuel Pump Control
(Label: F.Pump)

The harness also provides direct fuel pump control using the Red/Yellow 12AWG cable terminated with a butt splice connector.

Utilize this cable to supply +12V power directly to the fuel pump, allowing the ECU to prime the pump when the system is turned on and to implement safety functions, such as automatically turning the pump off when the ECU no longer detects an RPM signal.

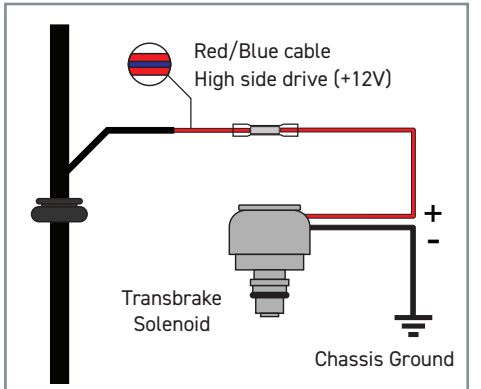


Auxiliary High Current Output (25A)
(Label: AX25+)

This harness also provides a spare high current output that can supply +12V, rated at 25A.

This is the Red/Blue 12AWG cable branching out of the main harness junction near where the grommet is.

The function of this output can be assigned in the software to control multiple items such as transbrake or nitrous solenoids, a second stage fuel pump or thermofan, or simply as a switched +12V supply to provide power to an auxiliary device.

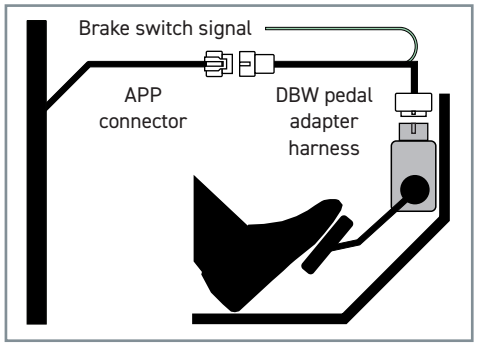


Example use of the Auxiliary High Current Output (25A)

Accelerator Pedal Position
(Label: APP)

Use this connector to connect to a Rebel LS accelerator pedal adapter harness if your application requires Drive-By-Wire (DBW) or Electronic Throttle Control. A list of available adapter harnesses is provided on page 3.

The adapter harness also includes a wire designed for connection to a brake pedal switch or brake light signal, as part of the DBW control strategy. This brake input signal is expected to read +12V whenever the brake pedal is engaged.



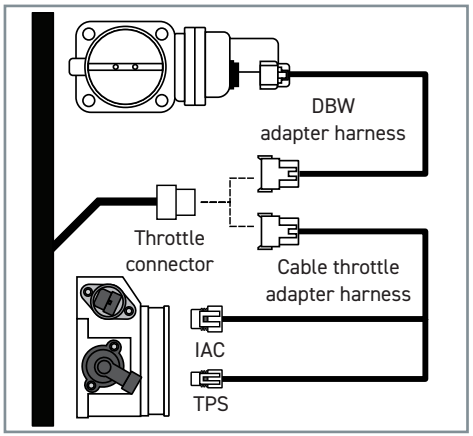
Main harness side view

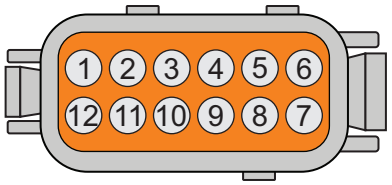
APP PLUG PINOUT		
PIN	FUNCTION	COLOR
A	Sensor Ground	Black/White
B	APP 1	White/Brown
C	+5V	Orange
D	Sensor Ground	Black/White
E	APP 2	White/Red
F	+5V	Orange
G	Brake	L.Green/Brown

Throttle Breakout Connector
(Label: Throt)

Use this connector to plug into a Nexus Rebel LS throttle adapter for either electronic or cable throttle applications (see diagram below).

A list of available sub-harnesses can be found on page 3.





Main harness side view

THROTTLE BREAKOUT CONNECTOR PINOUT		
PIN	FUNCTION	COLOR
1	IAC 3	Brown/Green
2	IAC 4	Brown/Pink
3	IAC 1	Brown/Black
4	IAC 2	Brown/Red
5	Sensor Ground	Black/White
6	+5V	Orange
7	Throttle TPS 1	White/Orange
8	Throttle TPS 2	White/Black
9	Brake	L.Green/Brown
10	Unused	Unused
11	Unused	Unused
12	Unused	Unused

Wideband Lambda Sensor
(Label: WBO2)

This harness is equipped with a connector that plugs directly into a Bosch LSU 4.9 wideband lambda sensor (HT-010718).

Using a wideband lambda sensor allows the ECU to leverage functions such as closed-loop fuel control, where the ECU actively targets the desired fuel mixtures for any RPM and engine load combination. With a wideband lambda sensor, the ECU can also implement engine protection strategies when it detects that the fuel mixtures are running too lean.

HT-010718 - Bosch LSU 4.9 wideband lambda sensor

Knock Sensor Inputs
(Label: Knock Odd, Knock Even)

The Rebel LS terminated harness uses Gen IV style knock sensor connectors, which plug into each sensor located on opposite sides of the engine.

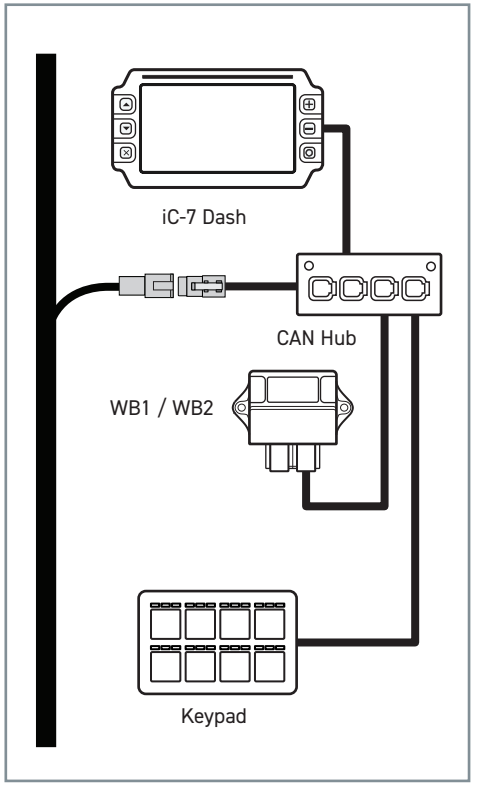
If you have the earlier style knock sensors located in the valley of the engine, a Gen III knock sensor adapter harness can be used.

Utilizing knock sensors allows the Nexus Rebel LS ECU to be configured to detect knock and implement knock control strategies.

Haltech CAN connection
(Label: CAN)

This harness is equipped with a DTM-4 connector, designed for connecting Haltech CAN devices (e.g., Display dash, Keypad, PDM).

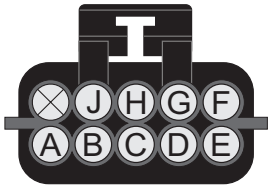
If you are using multiple Haltech CAN devices, a Haltech CAN Hub should be used to expand the number of available ports.



Spare In-Cabin Inputs and Outputs
(Label: Inputs / Outputs)

This harness offers in-cabin breakout connectors populated with spare inputs and outputs available on the Nexus Rebel LS ECU. These spare inputs and outputs can be wired to additional sensors, switches, or used to control relays, solenoids, or warning lights.

Main harness side view



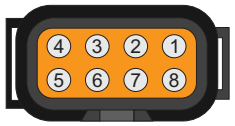
Main harness side view

SPARE IN-CABIN OUTPUTS PINOUT		
PIN	FUNCTION	COLOR
A	Switched +12V	Pink/Brown
B	DPO 1	Violet/Black
C	DPO 2	Violet/Brown
D	DPO 3	Violet/Red
E	DPO 4	Violet/Orange
F	DPO 5	Violet/Yellow
G	DPO 6	Violet/Green
H	Switched +12V	Pink/Brown

SPARE IN-CABIN INPUTS PINOUT		
PIN	FUNCTION	COLOR
A	Switched +12V	Pink/Brown
B	Sensor Ground	Black/White
C	+5V	Orange
D	AVI 1	White
E	SPI 1	Gray/Brown
F	AVI 2	White/Yellow
G	SPI 2	Gray/Red
H	SPI 3	Gray/Orange
J	SPI 4	Gray/Yellow
K	Unused	Unused

Transmission Breakout Connector
(Label: Transmission)

A breakout connector for a transmission sub-harness can be utilized for added functionality. The list of available sub-harnesses can be found on page 3.



Main harness side view

TRANSMISSION BREAKOUT CONNECTOR		
PIN	FUNCTION	COLOR
1	Transmission Supply	Pink/Red
2	Power Ground	Black
3	CAN H	White
4	CAN L	Blue
5	Transmission / VSS	Gray/L.Green
6	Transmission	Gray / Pink
7	+5V	Orange
8	Sensor Ground	Black/White

WARRANTY CERTIFICATE

At Haltech we make every effort to design and manufacture fault-free products that perform up to or above the market expectations. All our products are covered by a Limited 12 Month Warranty.

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.

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. Proof of purchase in the form of a copy of the original purchase invoice, receipt or bill of sale which indicates that the product is within the warranty period, must be presented to obtain warranty service.

Replacement or repair of a defective product 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, receipt or bill of sale 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.

Returns of Products Supplied in Sealed Packaging

The sale of any sensor or accessory 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.

A sensor or accessory product may be returned after 30 days of purchase (with its sealed packaging intact) for credit only (no refunds given) and will be subject to a 10% restocking fee.

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 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.

Haltech Australia
17 Durian Place,
Wetherill Park NSW 2164
Australia
Phone: +61 2 9729 0999
Email: aus@haltech.com

Haltech New Zealand
Grey Lynn Auckland, NZ 1021
Phone: 09 887 0616
Email: nz@haltech.com

Haltech USA East
750 Miles Point Way,
Lexington, KY USA 40510
Phone: (888) 298 8116
Email: usa@haltech.com

Haltech USA West
Race Winning Brands,
10800 Valley View Street,
Cypress, CA 90630
Phone: (888) 298 8116
Email: usa@haltech.com

Haltech UK
Unit 1, Miras Business Estate,
Keys Park Road, Hednesford,
WS12 2FS
Phone: +44 121 285 6650
Email: uk@haltech.com

Haltech Europe
Ottogasse 2A,
2333 Leopoldsdorf, Austria
Phone: +43 720 883968
Email: europe@haltech.com