



79-93 FORD MUSTANG EFI HARNESS KIT 558-513 & 558-128 (Main Harness only)

Included with 550-937F, 550-943F, & 550-949F Terminator X and X Max Kits

Kit Contents:



Main Harness



Power Harness



Injector Harness



TFI Harness

Important Wiring “Do’s and Don’ts”

An EFI system depends heavily on being supplied a clean and constant voltage source. The grounds of an electrical system are just as important as the power side.

Holley EFI ECU’s both contain multiple processing devices that require clean power and ground sources. The wiring harnesses for them must be installed in such a manner that they are separated from “dirty” power and ground sources.

DO’S

- **Install the main power and ground directly to the battery.**
- Keep sensor wiring away from high voltage or “noisy/dirty” components and wiring, especially secondary ignition wiring, ignition boxes and associated wiring.
- Use shielded/grounded cable that is supplied for wiring crankshaft and camshaft signals.
- Use quality connectors or solder and heat shrink any wire connections.
- It is critical that the engine has a proper ground connection to the battery and chassis.

DON'TS

- DO NOT EVER run high voltage or “noisy/dirty” wires in parallel (bundle/loom together) with any EFI sensor wiring. If wires need to cross, try to do so at an angle.
- Do not let Crank and Cam signal wiring near spark plugs and coil wires.
- Do not run non-shielded/grounded wire for crankshaft and camshaft signals, especially magnetic pickups.
- Do not run the USB Communications cable near or with any noisy wires.
- Do not exceed the current limits provided for the various outputs. If current levels exceed these, use the appropriate relay or solenoid drivers.
- Do not use improper crimping tools.
- Don’t use things like “t-taps”, etc. Use quality connectors or solder and heat shrink.
- It is never recommended to splice/share signal wires (such as TPS, etc) between different electronic control units.
- Don’t wire items that require “clean” ground or power to the same points.

Main Harness

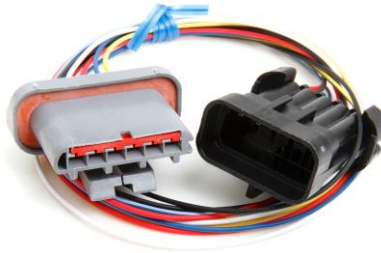
The following guide overviews all connections on the “Main Harness”. The Main Harness supports all the primary engine sensors, fuel and ignition for 8 cylinder engines, the #1 wideband oxygen sensor, and the first four programmable input and output channels. There are two connectors for this harness designated as “J1A” (pin designations below that start with an A) and “J1B” (pin designations below that start with a B).

The following descriptions indicate the name of the item and the name as labeled on the harness is shown in parenthesis. The pinout for the ECU is then shown. The connector pinout is given as well.

Ignition

The included TFI adapter harness will plug into the ignition connector on the main harness and into a TFI distributor. The loose white wire in the **adapter harness** will either be connected to the negative side of the coil or to a CD box. See ignition wiring diagrams at the end of this manual for more information.

A30 – Crank Input (**Pin A**)
A22 – Cam Input (**Pin B**)
A14 – IPU Ground (**Pin C**)
N/A – Ground (**Pin D**)
A10 – Switched +12V (**Pin E**)
A27 – Bypass Out (**Pin F**)
A14 – IPU Ground (**Pin G**)
A28 – EST/Spout Out (**Pin H**)
A14 – IPU Ground (**Pin J**)
A14 – IPU Ground (**Pin K**)



Primary Sensor Connectors

Throttle Position Sensor (TPS)

Holley EFI systems work with any 0-5V throttle position sensors. See the Harness Routing and Installation section below for more information on the TPS connector for this application.

NOTE: This connector is not used with a Drive-By-Wire throttle body

A18 – Sensor Ground (**Pin A**)
A5 – TPS Signal (**Pin B**)
A26 – Sensor +5V Reference Out (**Pin C**)

Manifold Air Pressure Sensor (MAP)

Holley EFI systems work with 1 to 5 Bar MAP sensors. Make sure to select the proper sensor used in the handheld or software.

NOTE: Terminator X and X Max ECU's have an internal 1 bar MAP sensor. For naturally aspirated & nitrous engines, you can connect the 1 bar MAP sensor located on the ECU to an available intake manifold port by using the appropriately sized quick-turn adapter. Other MAP sensors can be used by plugging the MAP sensor connector into the sensor or using an adapter harness.

A18 – Sensor Ground (**Pin A**)
A23 – MAP Sensor Signal (**Pin B**)
A26 – Sensor +5v Reference Out (**Pin C**)

Coolant Temperature Sensor (CTS)

Holley EFI systems work with any 2 wire thermistor style coolant temperature sensors. Make sure to select the proper sensor in the software.

A19 – Coolant Temp In (**Pin A**)
A18 – Sensor Ground (**Pin B**)

Manifold Air Temperature Sensor (MAT)

Holley EFI systems work with any 2 wire thermistor style manifold air temperature sensors. Make sure to select the proper sensor in the software.

A11 – Manifold Air Temp In (Pin A)

A18 – Sensor Ground (Pin B)

Wide Band Oxygen Sensor (WB02)

HP and Dominator EFI systems can work with either a Bosch (PN 554-101) or NTK (PN 554-100) wide band oxygen sensor. These sensors must be purchased from Holley as they are calibrated specifically for use with Holley EFI systems. Terminator X and X Max systems require a Bosch 4.9 (PN 554-155) wide band oxygen sensor and require the adapter harness included with the Terminator X be used.

A34 – WB1 HTR+ (Pin A)

A9 – WB1 HTR - (Pin B)

A16 – WB1 COMPR1 (Pin C)

A7 – WB1 CCOMPR2 (Pin D)

A17 – WB1 VS-/IP- (Pin E)

A33 – WB1 IP+ (Pin F)

A25 – WB1 VS+ (Pin G)

A8 – WB1 Shield (Pin H)

Fuel Pressure (Fuel)

A fuel pressure input is a standard feature on Holley EFI. A connector is installed that is plug-and-play with Holley 100 PSI pressure transducer (PN 554-102). A different 0-5V transducer can be used, but the calibration must be set up as a custom sensor in the software. If these are not connected to a pressure transducer, the Fuel and Oil Pressure will read “LOW Err” in the data monitor. This will not cause any issues.

A18 – Sensor Ground (Pin A)

A26 – Sensor +5V Reference Out (Pin B)

A31 – Fuel Pressure Signal (Pin C)

Oil Pressure (Oil)

An oil pressure input is a standard feature on Holley EFI. A connector is installed that is plug-and-play with Holley 100 PSI pressure transducer (PN 554-102). A different 0-5V transducer can be used, but the calibration must be set up as a custom sensor in the software. If these are not connected to a pressure transducer, the Fuel and Oil Pressure will read “LOW Err” in the data monitor. This will not cause any issues.

A18 – Sensor Ground (Pin A)

A26 – Sensor +5V Reference Out (Pin B)

A20 – Oil Pressure Signal (Pin C)

CANbus (CAN)

All harnesses have a CANbus communications connector. This is used to communicate with CANbus devices, such as the 7” digital dash or Terminator X handheld. If these devices or any other CANbus device is not being used, there is no need to do anything with this connector.

A10 – Switched 12V (Pin 1)

A32 – CAN Hi (Pin 2)

A24 – CAN Lo (Pin 3)

B14 – Ground (Pin 4)

Primary Outputs

Idle Air Control (IAC)

The terminated IAC connector is for a 2 wire PWM (Pulse Width Modulated) IAC.

B20 – 12V (Pin A)

B3 – PWM (-) #4 Out (Pin B, Uses 1 of the 4 available outputs in Terminator X, Terminator X Max, and HP ECUs)

Fuel Injector Outputs (Injectors)

All terminated harnesses have a fuel injector connector. Various fuel injector harnesses plug into this connector. It is essential these harnesses are used so that injector firing sequence is maintained.

Note that for engines with different firing orders, you do NOT change these pins. The engine's firing order is input in the software itself. Pin's A-H are routed to the cylinder number designation for the engine (i.e. A goes to cylinder #1, B goes to cylinder #2, etc). V8 harnesses offered by Holley are labeled for GM, Ford, and Chrysler engines.

B19 – Injector A (**Pin A**)
B26 – Injector B (**Pin B**)
B25 – Injector C (**Pin C**)
B13 – Injector D (**Pin D**)
B7 – Injector E (**Pin E**)
B4 – Injector F (**Pin F**)
B5 – Injector G (**Pin G**)
B6 – Injector H (**Pin H**)
+12V Power – (**Pins J/K**)

Power Tap

The "Power Tap" connector is a convenient place to connect to power and grounds when adding additional sensors or actuators.

Power Tap Pin A – Chassis ground
Power Tap Pin B – Sensor ground
Power Tap Pin C – Sensor 5V
Power Tap Pin D – Output from fuel pump relay (battery voltage when engine is running)

Loose Wires

The following loose wires in the main wiring harness should be connected as follows on all systems. All of these wires come out of the harness about 40" from the ECU connectors.

[Required] 12V Switched – Color = Red/White – Should be connected to a clean +12 volt power source. Power source should only be active when the ignition is on. Make sure source has power when engine is cranking as well. Not all sources apply power when the ignition switch is in "cranking" position. **DO NOT connect to a "DIRTY" source like an ignition coil!**

[Required] 12V Battery – Color = Red – Should be connected directly to the battery. This powers the fuel pump and fuel injectors. This wire is protected by a fuse in a sealed fuse holder. A fuse is pre-installed (20A).

[Optional] 12V Fuel Pump – Color = Green - Used to directly power a fuel pump (+12 volt). Do not use this wire to power fuel pumps that require over 15 Amps. Refer to your fuel pump manufacturer for amperage ratings. For high current pumps, use this wire to trigger a separate relay and use larger gauge wire to feed the pump - 10 gauge is recommended.

[Optional] Points Output – Color = White – Used to trigger a CD ignition box in certain applications. This will not be used with a TFI distributor. If using a TFI distributor and a CD ignition box, you will connect the white points output wire from the TFI **adapter harness** to the CD box. See ignition wiring diagrams at the end of this manual.

[Required] Chassis Ground – Color = Black – Connect to a ground point that has excellent connectivity with both the engine and the battery. There must be good continuity between the connection point and the battery when checked with a digital volt ohm meter (DVOM). This ground should not be connected at the same location as other grounds.

ECU Mounting

The main harness is designed for the ECU to be mounted under the passenger's seat using the following application specific brackets:

554-156 – DOMINATOR ECU MOUNT (79-98 MUSTANG)

554-157 – HP, TERMINATOR X, AND TERMINATOR X-MAX ECU MOUNT (79-04 MUSTANG)

If you choose not to mount the ECU under the passenger's seat, please keep the following in mind when mounting the ECU elsewhere:

- The ECU should be located such that it isn't being directly hit by water or road debris.
- It should also be located such that it isn't extremely close to exhaust manifolds or headers.
- It should be mounted such that it is as far away from spark plug wires, CD ignition boxes, or other "electrically noisy" devices as is reasonably possible.
- Make sure the connector end of the ECU is pointed DOWN such that water can't make its way into the ECU terminals.

Do not over-tighten the ECU mounting hardware, especially when it is not mounted on a flat surface.

Sensor Installation

NOTE: Replacing sensors and plugging in certain components will require removal of the upper intake manifold.

Fuel Pressure Sensor

If using a Holley fuel pressure transducer (PN 554-102), an adapter can be purchased (PN 16785NOS) to allow the transducer to be installed in place of the factory schrader valve, as shown **Figure 1**.

Oil Pressure Sensor

If using a Holley oil pressure transducer (PN 554-102), we recommend an adapter that will retain the stock sending unit (for factory gauges), as shown in **Figure 2**.

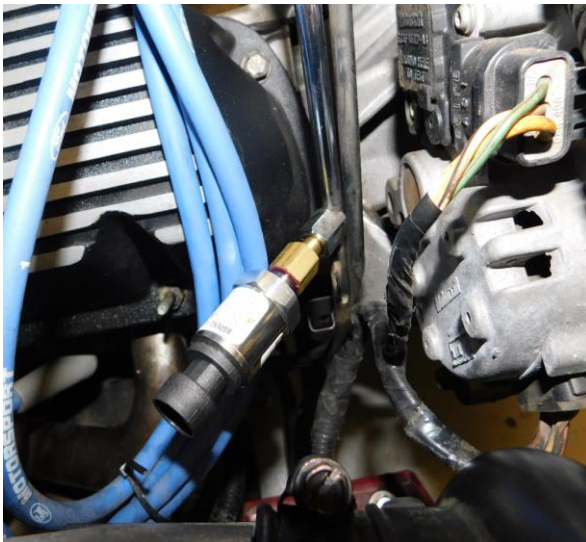


Figure 1

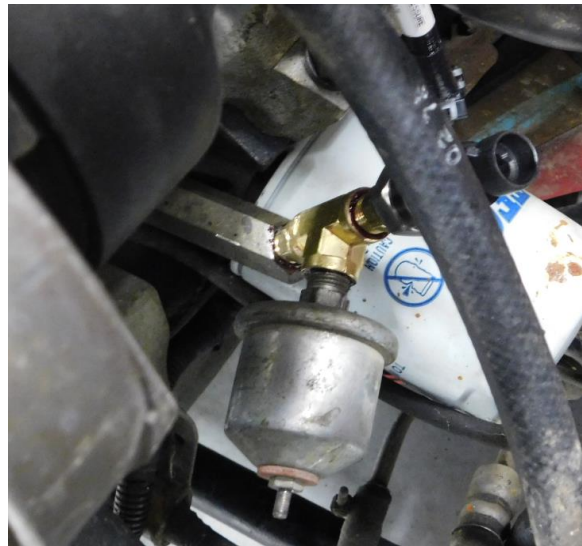


Figure 2

Coolant Temperature Sensor

Replace the factory coolant temperature sensor with a Holley sensor (PN 534-10), as shown in **Figure 3**.

Leave the factory coolant temperature sending unit in place to retain stock gauge functionality.



Figure 3

Manifold Air Temperature Sensor

Replace the factory manifold air temperature sensor with a Holley sensor (PN 534-20), as shown in **Figure 4**.



Figure 4

Manifold Air Pressure Sensor (MAP)

Holley EFI systems work with 1 to 5 Bar MAP sensors. Make sure to select the proper sensor used in the handheld or software.

NOTE: Terminator X and X Max ECU's have an internal 1 bar MAP sensor. For naturally aspirated & nitrous engines, you can connect the 1 bar MAP sensor located on the ECU to an available intake manifold port by using the appropriately sized quick-turn adapter. Other MAP sensors can be used by plugging the MAP sensor connector into the sensor, or using an adapter harness.

NOTE: Holley part number 558-466 will adapt the MAP connector on this harness to plug into any of our stainless steel MAP sensors.

Hook the map sensor up using the appropriate vacuum hose to a vacuum source in the intake manifold. This source must be after the throttle body.

On 87-93 fuel injected cars, you can use an empty or splice into one of the ports on the vacuum tree which is located on the firewall, as shown in **Figure 5**.

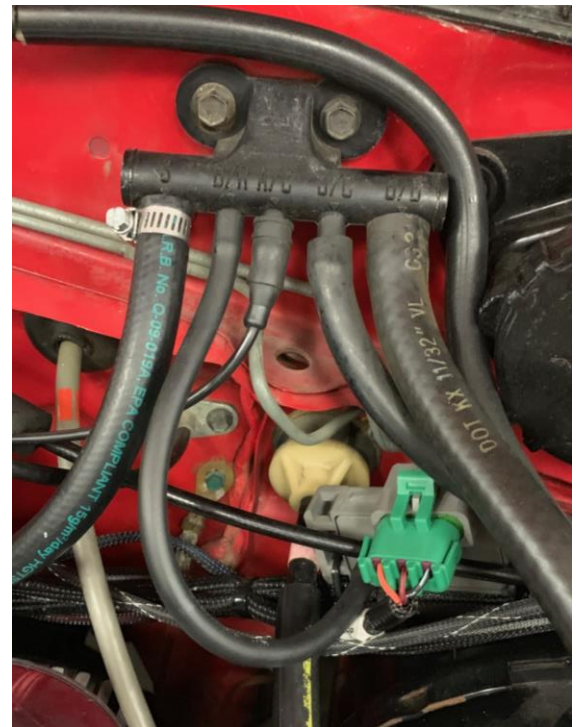


Figure 5

Wide Band Oxygen Sensor

NOTE: Never run the engine with the oxygen sensor installed if it is not plugged in and powered by the ECU, or it will be damaged. If you need to plug the hole temporarily, use an O2 sensor plug or a spark plug with an 18mm thread.

NOTE: Someone with experience in welding exhaust systems should install the oxygen sensor boss. Any competent exhaust shop will be able to perform this task at a minimum cost. (Note: If you weld on the car, make sure all wiring to the ECU is disconnected, and it's best to remove the ECU from the vehicle when welding). If you do not have an existing O2 bung in the proper location and you do not wish to weld a bung in the exhaust, Hooker BlackHeart offers different diameter Clamp-On O2 Bung kits:

2.25" Diameter: 71014303-RHKR

2.50" Diameter: 71014302-RHKR

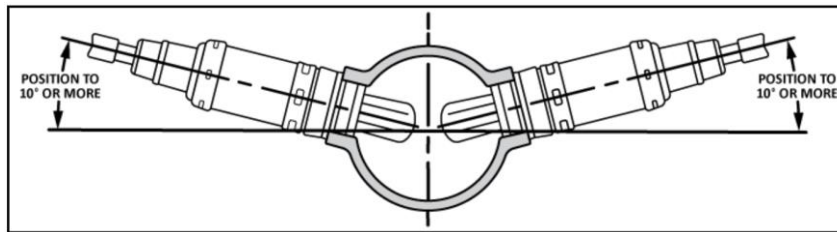
3.00" Diameter: 71014301-RHKR

WARNING! Use of leaded fuel will degrade an oxygen sensor. Prolonged use is not recommended unless periodic replacement is performed.

WARNING! Use of some RTV silicone sealers will destroy the oxygen sensor used with this product. Ensure the RTV silicone sealant you use is compatible with oxygen sensor vehicles. This information should be found on the RTV package.

Your vehicle may already have an O2 sensor bung welded into the exhaust. This bung location needs to be verified before using it with the Holley oxygen sensor. Ideally the bung will be 6-10 inches after the collector for a true reading of all cylinders and have a minimum of 18" length past the sensor location. If the vehicle is equipped with a catalytic converter, the bung must be between the engine and the catalytic converter. The bung also must be on the top side of the tube so moisture cannot collect on the oxygen sensor. If there is an acceptable bung already present, go ahead and tighten the Holley oxygen sensor in the bung. If there is not an acceptable bung already in the exhaust, please plug all poorly placed bungs.

1. Locate a position for the oxygen sensor as close to the engine as possible. If your vehicle has catalytic converters, the oxygen sensor **MUST** be located between the engine and the catalytic converters.



NOTE: The oxygen sensor should be mounted in such a way that the condensation in the exhaust tubing will not enter the sensor. Mount the O2 sensor in the upper half of the exhaust tubing, with the angle "x", shown above, being greater than 10°. Figure 1 indicates that the sensor can be mounted on either side of the exhaust tubing.

2. Drill a 7/8" hole in the location picked for the sensor. Weld the threaded boss into the 7/8" hole. Weld all the way around the boss to insure a leak proof connection. Install the oxygen sensor into the threaded boss and tighten securely. It is a good idea to add anti-seize to the threads to aid in removal. Do not get any anti-seize on the tip of the sensor.
3. On vehicles equipped with an AIR pump, the oxygen sensor must be mounted before the AIR injection into the exhaust, or the AIR pump must be disconnected. Holley recommends that if the AIR is injected into both exhaust manifolds, mount the oxygen sensor into the pipe immediately after the exhaust manifold. Disconnect the AIR pump tube from the exhaust manifold and plug both ends. Check with local ordinances for the legality of this procedure in your area.

WARNING! Failure to disconnect the AIR pump or locating the oxygen sensor downstream from AIR injection will result in an extremely rich mixture, which could cause drivability problems and severe engine damage. If disconnecting AIR pump, check with local ordinances for the legality of this procedure in your area.

Harness Routing and Installation

1. Disconnect the battery and remove the existing OEM main wiring harness, injector harness, and ECU. Consult the factory service manual for details on proper removal. Replacing sensors and plugging in certain components will require removal of the upper intake manifold. We suggest replacing the upper to lower intake manifold gasket before reassembly.
2. Locate the factory firewall wire grommet (**Figure 6**) and cut it (**Figure 7**).



Figure 6

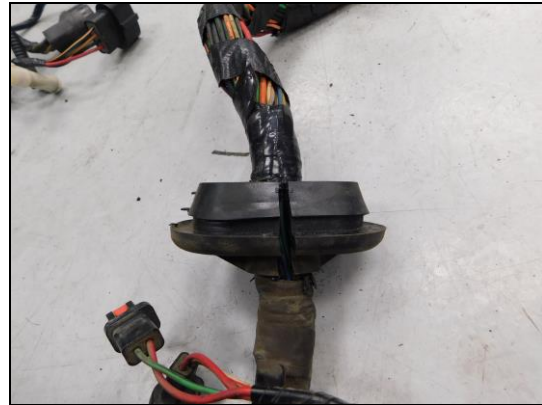
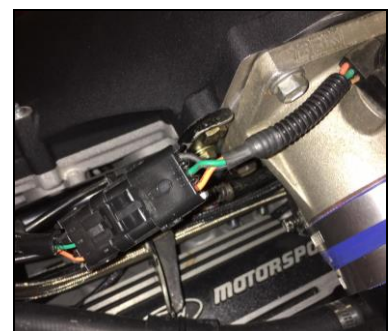
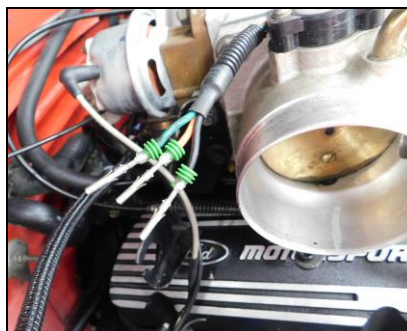
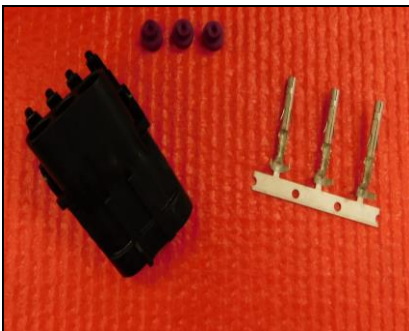


Figure 7

3. Remove grommet and save for later, the Holley Harness will be run through this same grommet.
4. Remove fuses, fuse covers, and relay from Holley EFI Main Harness. This is necessary to get the harness through the firewall.
5. Route the main harness through the firewall into the vehicle, along with the power harness. Reinstall the factory grommet.
6. Plug the injector harness into the main harness. Plug each injector connector (numbered) into the corresponding injector for each cylinder.
7. Plug the TFI adapter harness into the main harness and connect the other end into the distributor. There is a loose white wire in the **adapter harness** that will need to be connected to the negative side of the coil or to a CD box (see ignition wiring diagrams at the end of this manual). Do not use the loose white wire from the main harness.
8. Plug all connectors into their designated sensors (except TPS).
9. The Holley EFI main harness has a 3 pin Weather Pack connector on the TPS end of the harness. There is a mating connector, terminals, and seals included with the harness. Use a quality crimper such as MSD PN 3511 to crimp the terminals on the TPS wires as shown below: The colors of the wires on an OEM TPS should match the color of wires in the Holley EFI Harness. Verify that the connector is pinned correctly by looking at the wire colors.



10. Connect all loose wires in the Holley EFI main harness per the instructions above. The **Red/White** switched 12v wire can be connected to the fuse box in cavity 18 using a fuse tap as shown below:



11. The factory fuel pump wire can be cut or removed from the relay and connected to the loose **Green** fuel pump wire in the Holley main harness. Be sure to heat shrink the ends of any exposed wires. The relay may be in different locations depending on year.

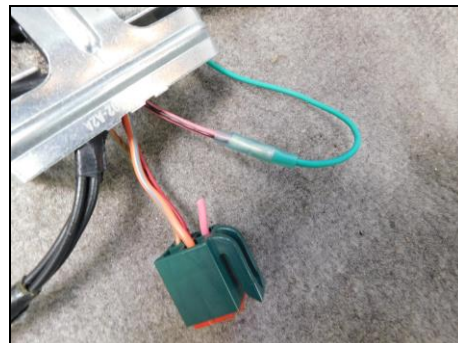
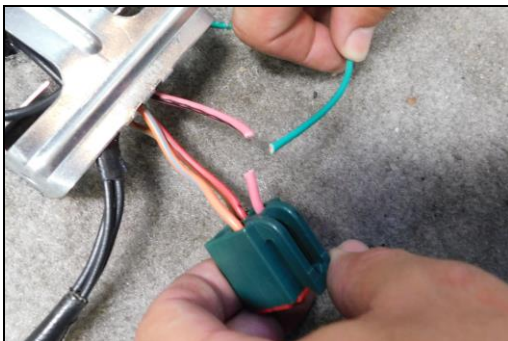
Fuel Pump Relay Locations:

86-91 – Under Driver's Seat

92-93 – Passenger's Side Inner Fender

If vehicle was not originally fuel injected, you can run the green wire directly to the fuel pump.

NOTE: Do not use this wire to power fuel pumps that draw over 15 Amps.



12. Connect the loose **Black** wire in the Holley EFI main harness to a ground point that has excellent connectivity with both the engine and the battery.
13. The loose **Red** wire in the Holley EFI main harness will be connected directly to the battery along with the heavy (10 gauge) main Power (**Red**) and Ground (**Black**) wires. These should be cut to length with terminals installed, but not connected until vehicle is ready for startup.

Retaining OE Gauges

If the factory coolant temp and oil pressure sending units are left in place, you can retain all of the stock gauge functionality. The following chart will help you locate the appropriate wires going to the instrument cluster, so you can run new wires from the sending units to the wiring harness between the strut tower and firewall on the driver's side. Using quality connectors and crimpers, tie the wire you run from the sending unit to the factory harness into the wire described below. Because of year variations, we cannot guarantee the wire colors match in all vehicles, refer to an OEM wiring diagram for the particular year vehicle being working for verification.

If you **are not** using a capacitive discharge box, you can connect the tachometer to the negative side of the coil. If you **are** using a capacitive discharge box, connect the tachometer to the tachometer output from the capacitive discharge box.

1987-1989	
Gauge	OE Wire Color
Coolant Temp	Red/White
Oil Pressure	White/Red
Tachometer	Dark Green/Yellow

1990-1993	
Gauge	OE Wire Color
Coolant Temp	Red/White
Oil Pressure	White/Red
Tachometer	Tan/Yellow

Retaining OEM Coil

If the OEM coil is being retained, 12V must be provided to the + side of the coil. Find a switched 12V source that is active while the key is in the "Run" and "Crank" position, use that source to trigger a relay that provides full battery power to the coil. Connect the switched 12v to Pin 86 on the relay, run a ground to pin 85 on the relay, pin 87 will be connected directly to the battery and pin 30 of the relay will be connected to the coil + side. Use a minimum of 12 gauge wire on posts 87 and 30 on the relay, and minimum of 18 gauge wire for pin 85 & 86.

ECU Pinout

The following is a pinout of the J1A and J1B connectors for HP, Dominator, Terminator X, and Terminator X Max ECU's:

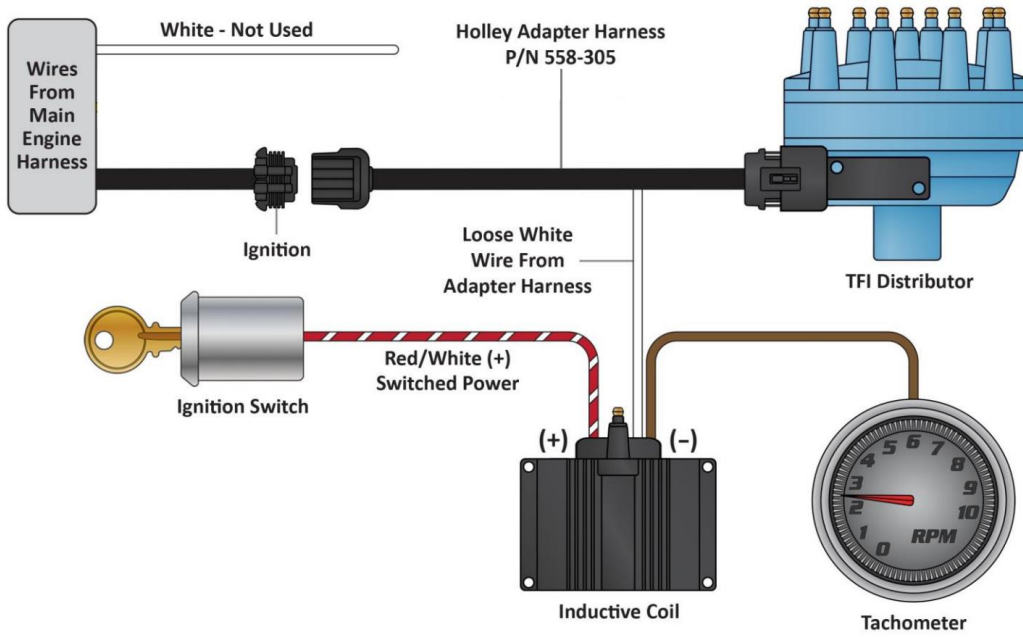
J1A Connector

Pin	Function
A1	Coil - Input
A2	Fuel Pump Out (+12v) (10A Max)
A3	Input #2 (F52THG)
A4	Input #4 (F5G)
A5	TPS Input
A6	Points Trigger Output
A7	WB1 COMPR2
A8	WB1 Shield
A9	WB HTR -
A10	Switched +12v Input
A11	Manifold Air Temp Input
A12	Input #1 (F52THG)
A13	Input #3 (F5G)
A14	Cam/Crank Ground
A15	Gauge Digital Output
A16	WB1 COMPR1
A17	WB1 VS-/IP+
A18	Sensor Ground
A19	Engine Coolant Temp Input
A20	Oil Pressure Input
A21	Knock #2 Input
A22	Cam Sync Input / Ignition Bypass Output
A23	Map Sensor Input
A24	CAN Lo
A25	WB1 VS+
A26	Sensor +5v
A27	NOT USED
A28	EST/Spout Output
A29	Knock #1 Input
A30	Crank Speed Input
A31	Fuel Pressure Input
A32	CAN Hi
A33	WB1 IP+
A34	WB HTR +

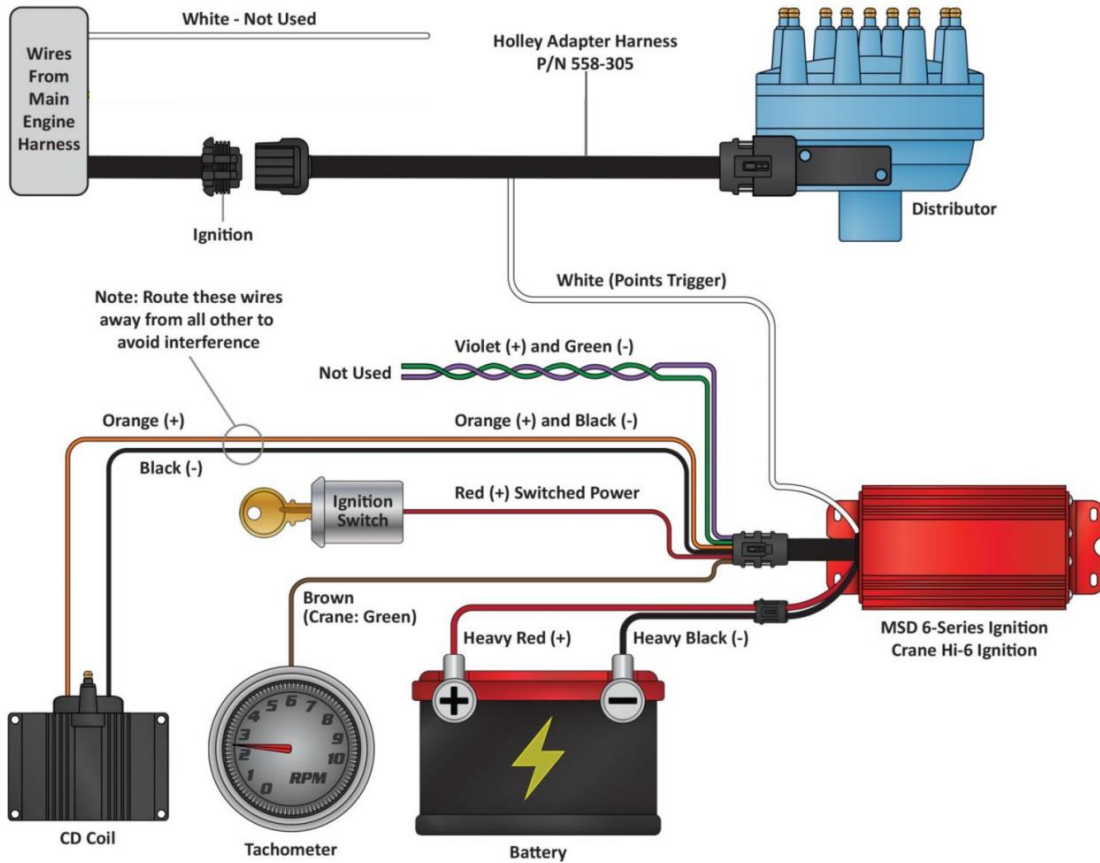
J1B Connector

Pin	Function
B1	IAC A Lo
B2	IAC A Hi
B3	Output #4 (G P-)
B4	Injector F Output
B5	Injector G Output
B6	Injector H Output
B7	Injector E Output
B8	IAC B Lo
B9	IAC B Hi
B10	Output #3 (G P-)
B11	Output #2 (H P+) for HP and Dominator, (G P-) for Terminator X and X Max
B12	Output #1 (H P+) for HP and Dominator, (G P-) for Terminator X and X Max
B13	Injector D Output
B14	EST Ground Output
B15	EST 2 Output (Cylinder #2)
B16	EST 4 Output (Cylinder #4)
B17	EST 6 Output (Cylinder #6)
B18	EST 8 Output (Cylinder #8)
B19	Injector A Output
B20	EST 12V Output
B21	EST 1 Output (Cylinder #1)
B22	EST 3 Output (Cylinder #3)
B23	EST 5 Output (Cylinder #5)
B24	EST 7 Output (Cylinder #7)
B25	Injector C Output
B26	Injector B Output

Ignition Wiring w/ TFI Distributor (No Capacitive Discharge Box)



Ignition Wiring w/ TFI Distributor & Capacitive Discharge Box



Holley Technical Support
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199R11957
Revision Date: 12-5-23