



**FORD PERFORMANCE**

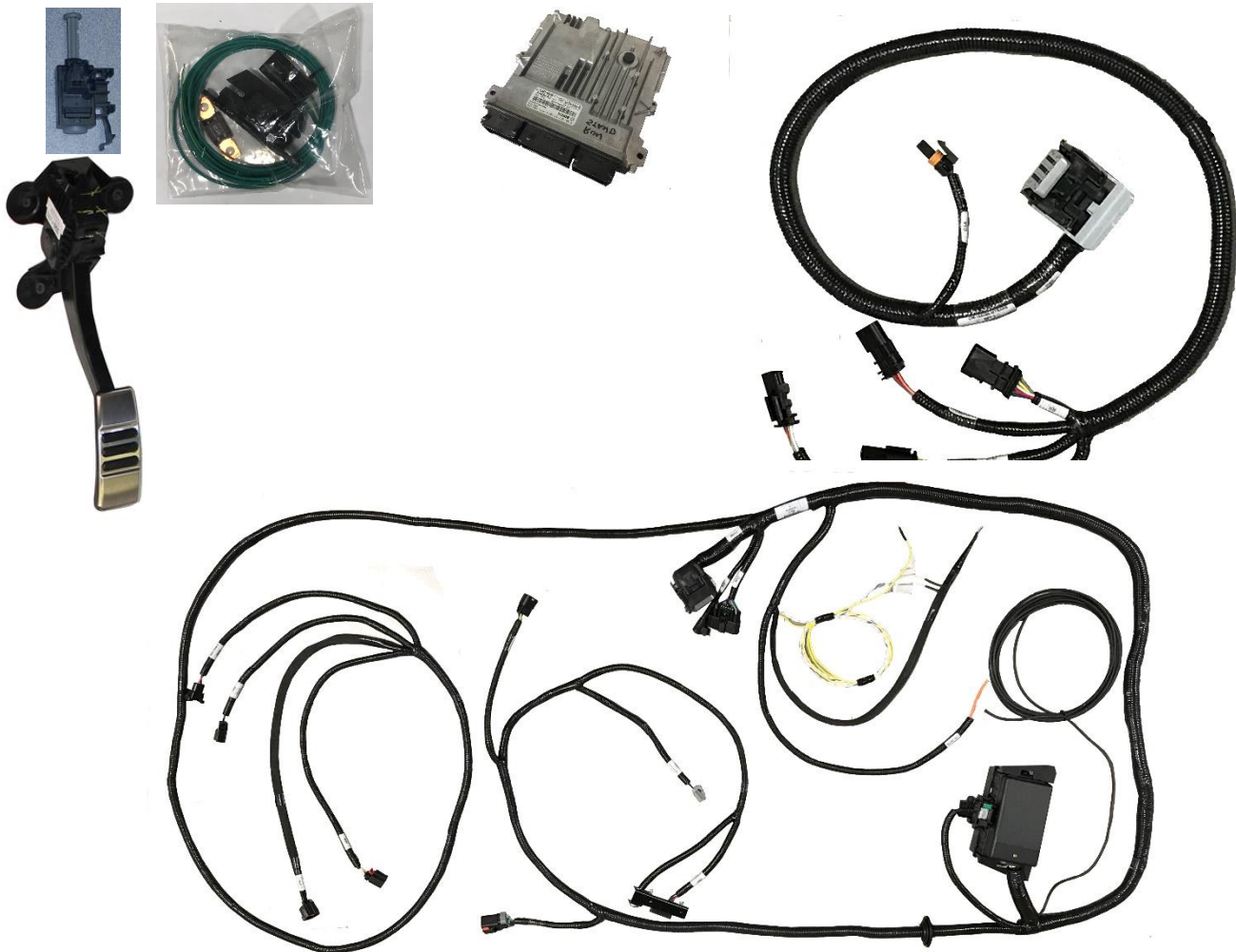
## **Instruction & Installation Manual M-6017-M50B Control Pack – 2018 Coyote 5.0L Manual Trans**

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Please visit [www.performanceparts.ford.com](http://www.performanceparts.ford.com) for the most current instruction and warranty information.

**PLEASE READ ALL OF THE FOLLOWING INSTRUCTIONS CAREFULLY PRIOR TO INSTALLATION. IF AT ANY TIME YOU DO NOT UNDERSTAND THE INSTRUCTIONS, PLEASE CALL THE FORD PERFORMANCE TECHLINE AT 1-800-367-3788**

# **2018 5.0L Control Pack Instruction & Installation Manual**



Factory Ford shop manuals are available from Helm Publications, 1-800-782-4356



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### 1.0 Introduction

This kit was developed by Ford Performance in order to allow performance enthusiasts the ability to install our 5.0L Coyote Gen3 Mustang Crate Engine (Ford Performance P/N: M-6007-M50C) into the application of their choice. The system supports use of manual transmission only.

Note: Cruise control is not available with this system

### 2.0 Overview

This booklet provides a step by step guide for the preparation and installation of the Control Pack. Please read the instructions thoroughly before starting the installation. If you have any questions, contact Ford Performance Technical Support at (800) 367-3788.

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### 3.0 Included/Potentially Required Components

#### 3.1 Powertrain Control Module (PCM)- CM-12A650-AKANP

- The PCM is the central processing unit for engine operation. Input data/engine operation feedback is provided from each of the engine's sensors connected to the PCM via wiring leads. This input data is used to perform calculations that in turn adjust fuel quantity and spark timing according to varying driver demand (ie – accelerator pedal input)
- The wiring that plugs into the PCM is integral to the wiring harness that was included with your 5.0L crate engine, the length of these wiring leads dictate that mounting location be in close proximity to the engine itself.
- The PCM in this Control Pack has a custom software and calibration dataset which were specifically modified/developed by Ford Performance engineers to provide peak performance and reliability with the 5.0L Coyote Gen3 Mustang Crate Engine (Ford Performance P/N: M-6007-M50C)



Figure 1 – PCM

#### PCM Calibration Application Notes:

- The calibration provided in this PCM will NOT work with the 'Returnless' fuel system as used on factory Mustang vehicles. Use of a return style fuel system is required. Refer to Section 8 of this manual for more information on fuel system requirements for this PCM.
- The Air Filter Assembly with Integral Mass Air Flow Sensor included with this kit must be used to achieve acceptable engine performance. If air filter assembly provided is not used, calibration will be required. Refer to Section 3.6 for more information about Air Inlet System requirements.
- Premium Fuel Only (91 Octane or higher).

**NOTE: Due to the fuel system requirement described above, installation of this PCM in ANY Production Mustang vehicle will result in a no-start condition!**

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### 3.2 Accelerator Pedal Position Sensor (APPS) – CR3Z-9F836-C

- The accelerator pedal assembly includes a pair of integrated pedal position sensors (APPS1/APPS2). This pedal has electrical properties designed specifically for correct interface with PCM and is required for proper engine operation.



Figure 2 – Accelerator Pedal

### 3.3 Clutch Pedal Position Switch: Bottom Travel (CBT) - 6G9Z-11A152-A (Gray Plunger)



Figure 3– Clutch Position Switch

Note: Clutch switch is intended for manual transmission use ONLY. For automatic transmission use please cut off the CBT connector C257 and seal the wires. Refer to section 4.4 for more details on how to cap off unused connectors.

- The switch translates the clutch pedal position to the PCM.
- The bottom travel switch also acts as a starter safety interlock. The starter motor will not energize until the clutch has been fully depressed.
- CBT switch is Normally Open (IE – Clutch Pedal NOT fully depressed); Closed with Clutch Pedal fully depressed
- Clutch pedal assembly P/N: BV61-7B633-AA is available through an Authorized Ford Parts dealer. Includes a clutch pedal and mounting bracket with provisions to hold both the Top and Bottom of Travel switches in the appropriate locations.

**WARNING: DO NOT BYPASS THE STARTER INTERLOCK. DOING SO CREATES A HAZARD TO THOSE IN AND AROUND THE VEHICLE AS THE STARTER CAN OPERATE WITH THE TRANSMISSION IN GEAR AND THE CLUTCH PEDAL ENGAGED.**

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### 3.4 O2 Sensors, Upstream JR3A-9Y460-BC

- Two O2 sensors provide wide range feedback to the PCM for closed loop air fuel ratio control by measuring the quantity of oxygen present in exhaust leaving the combustion chamber.
- Each sensor is supplied with a light coating of anti-seize lubricant on its threads.
- Tighten to 48 Nm (35 lb-ft).

**NOTE:** Do not splice, lengthen or otherwise modify the sensor wiring. Doing so will adversely affect the sensor performance & reliability of the signal.



Figure 4– O2 Sensors

The engine harness and Control Pack M-6017-M50B is designed to operate with the upstream O2 sensors in the 2018 Mustang stock locations. Moving the sensors to alternate locations can result in the need to recalibrate the PCM.

Here are some tips if sensors have to be relocated:

The best option is to locate the sensor so it is sampling from all 4 cylinders and at a distance that does not require modification of the UEGO harness.

**NOTE:** Modification of the harness can affect function of O2 sensors.

If your header design will not allow you to sample all 4 cylinders without harness modifications, a better alternative is locating the UEGO sensor to sample from a single cylinder. The cylinders that have (on average) the closest A/F ratio to the bank average are cylinder #4 (on bank 1) and cylinder #7 (on bank 2). If that's not possible due to packaging constraints, the next best choices are cylinder #3 (on bank 1) and cylinder #8 (on bank 2). Calibration required! See Figure 5 below.

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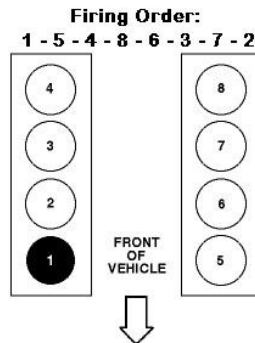


Figure 5– Firing Order Diagram

### 3.5 Plastic Bag of Assorted Items

- Inline Fuse
- Fuse Holder
- 6-way IP Pigtail



Figure 6– Assorted Components

### 3.6 Air Cleaner Assembly with Integral Mass Air Flow Sensor – FR3Z-9600-B, FR3Z-9B659-C, FR3Z-9F763-B



Figures 7a, 7b, and 7c– Air Inlet

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**IMPORTANT NOTE:** The calibration of the PCM you have received requires use of this air box/MAF sensor system exactly as received. Any changes to the air inlet system will result in changes to how the air entering the engine is measured and will require modification to the PCM's calibration.

Ford Performance recognizes that it may not be practical to package this Air Box/MAF sensor system in some vehicle applications. The recommendations listed below are intended to serve as guidelines for designing an air inlet system that will provide operation once the control system calibration has been modified to work with the new air inlet system.

An optimal air inlet system includes the following:

1. **Flow Profile:** the MAF sensor should be located on a straight section of zip tube where the flow profile is generally uniform. If the sensor cannot be located on a straight section put the sensor on the outside radius of the inlet so the sensor is located in the higher flow velocity area.
2. **Flow Area:** Keep the cross sectional area of the MAF sensor tube as close as possible to the cross sectional area of the original induction system.
3. **Flow quality:** minimize flow direction changes and maintain smooth tubing to minimize air flow disturbances and turbulence.
4. **Flow pulsation:** install sensor at least 6 to 8 inches upstream of the throttle body.
5. **Transient performance:** installing the sensor too far upstream of the throttle body (>24 inches) will result in transient lean/rich spikes due to the additional amount of time required for the measured air flow to travel from the MAF sensor to the intake manifold.
6. **MAF sensor contamination:** A) install sensor in upper half of cross sectional area to minimize possibility of condensation coming in contact with the MAF sensor element. In other words, if a clock is superimposed on a cross section of the zip tube, the sensor should be installed somewhere equal to or above the 9:00 and 3:00 positions. Most OEM applications have the sensor located at the 9:00 or 3:00 location. B) Sensor must be installed downstream of air filter and upstream of crank case ventilation inlet. Ideally, sensor should be located 3 inches upstream of the crank case ventilation inlet.

### **3.7 Control Pack Wiring Assembly – CM-14A006-50B and Manual Transmission Harness - CM-14A006-MTRANS**

- Connects to vehicle battery and inline connector on engine harness
- Contains Ford Performance Power Distribution Box (FPPDB) and High Power inline fuse
- Electrical connections to Accelerator Pedal (APPS) and Clutch Switch (CBT)
- Wire leads for Ignition Switch & Starter,
- Data Link Connector for reading Diagnostic Trouble Codes (DTCs)
- Check Engine/Malfunction Indicator Lamp (MIL) for visual indication of engine control system fault code presence
- MIL will stay illuminated when the ignition is ON and the engine is NOT running; therefore this condition does not indicate a system fault; Not all DTCs will cause the MIL to illuminate
- MIL on stock instrument panel will not work—only the MIL included in this kit will illuminate if a fault exists.
- **CM-14A006-MTRANS harness if for manual transmission ONLY**

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### **4.0 Pre-Installation of Harness and Parts**

#### **4.1 Planning**

The following is a list of key factors to consider before any installation takes place:

- PCM mounting location is limited by the lengths of the corresponding leads into which the PCM is connected. These leads are an integral part of the CRATE ENGINE HARNESS (not included with Control Pack)
- Ford Performance PCM/Power Distribution Box must be mounted within vicinity of the vehicle battery as dictated by the Battery+/Ground/Power Distribution Box Lead Lengths of the Control Pack wiring harness
- Lay out the harness and components first in order to ensure that the wiring leads will reach everywhere you intend them to. This is a good reality check before you drill any holes or mount any components.

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## 4.2 Connector ID Chart

Item	Connector #	Description	Item	Connector #	Description
A	-	FPPDB	O	C132	Ambient Air Temperature Sensor
B	-	Ground	P	C400	Intercooler Pump
C	C160A	Inline to IP Pigtail	Q	C90	PCM Trans connector
D	C2040	APPS	R	C1A	Inline to Control Pack Harness
E	C257	CPP-BT	S	C1571	O2 sensor Upstream-RH
F	C251	Data Link Connector & MIL	T	C1572	O2 sensor Upstream-LH
G	-	Optional EPAS connection	U	C141	Not used RH
H	-	Starter Solenoid	V	C142	Not used LH
I	-	Cooling Fan Feed	-	-	-
J	C146	Auxiliary Inline to Engine	-	-	-
K	C1B	Inline to Trans Harness	-	-	-
L	C175B	PCM vehicle connector	-	-	-
M	C128	Mass Air Flow Sensor	-	-	-
N	C102A	Alternator	-	-	-

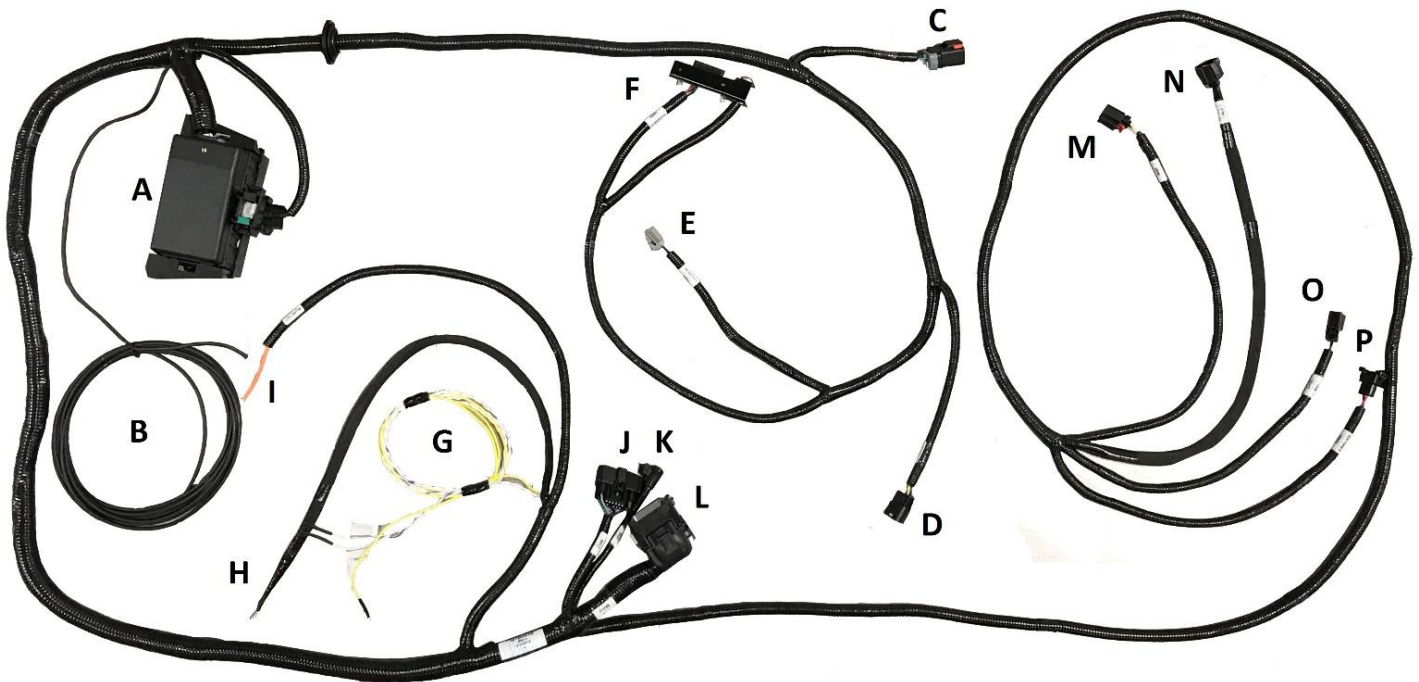


Figure 8 – Control Pack Wiring Harness Components

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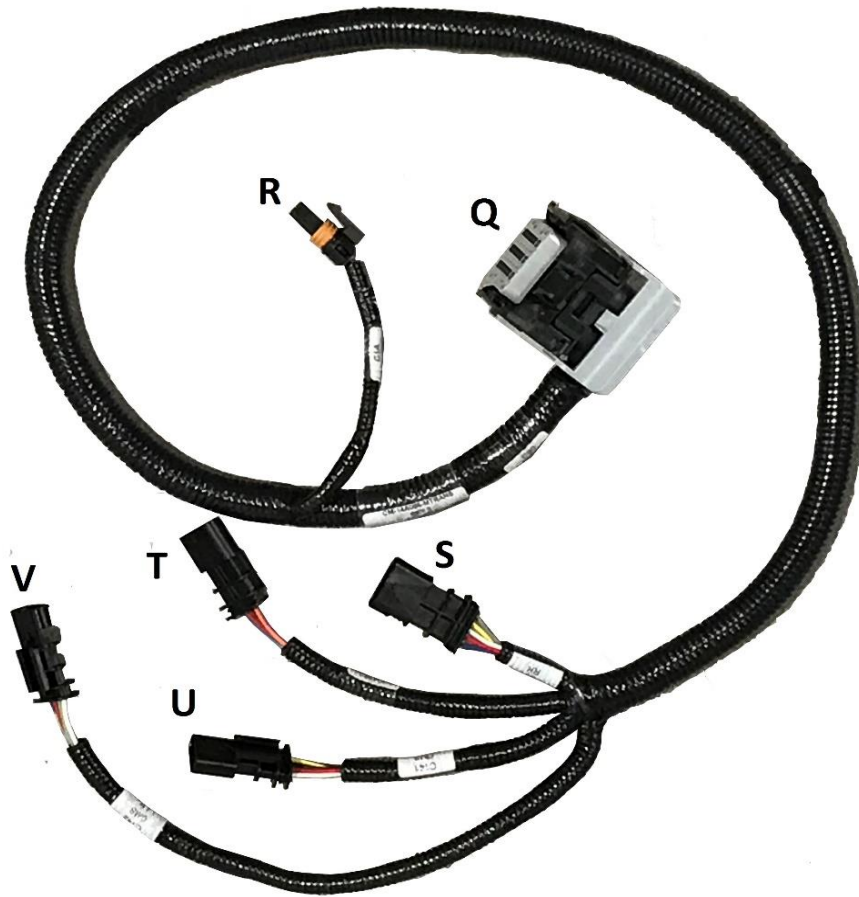


Figure 9 - Control Pack Wiring Harness Components

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### 4.3 Tools Required

- Wire Cutter/Stripping Tool
- Crimper
- Digital Volt/Ohm Meter
- Solder Gun / Solder
- Center Punch
- Cordless Drill / Drill bits / Hole saw / Screwdriver bits

### 4.4 Cap off the Unused Supercharger Intercooler Connector if Applicable

If your vehicle is not supercharged, locate the 2-way ICP (Item P, Connector C400, Control Pack Wiring Harness) and cut the wires leading to the connector and tape each wire, or place shrink tube over it, INDIVIDUALLY. This is very important in order to ensure that you do not inadvertently short a hot and ground lead together, causing damage to your PCM and/or other sensitive electronics.

### 4.5 Engine Harness Routing(Manual)

Rear View of Engine:

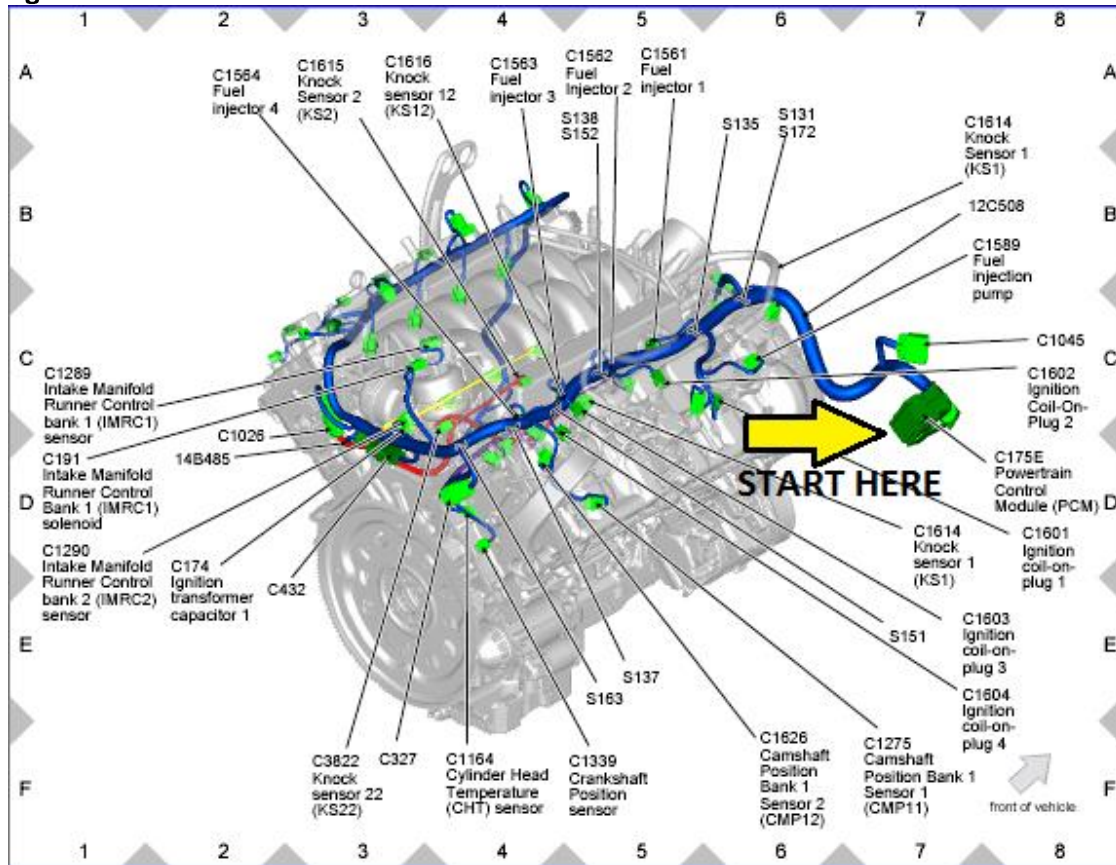


Figure 10 – Rear View of Engine.

Note: The wire harness shown in blue above is the ENGINE harness that comes standard with the Crate Engine (Ford Performance P/N: M-6007-M50C); THIS IS NOT THE CONTROL PACK WIRING HARNESS.

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## Front View of Engine:

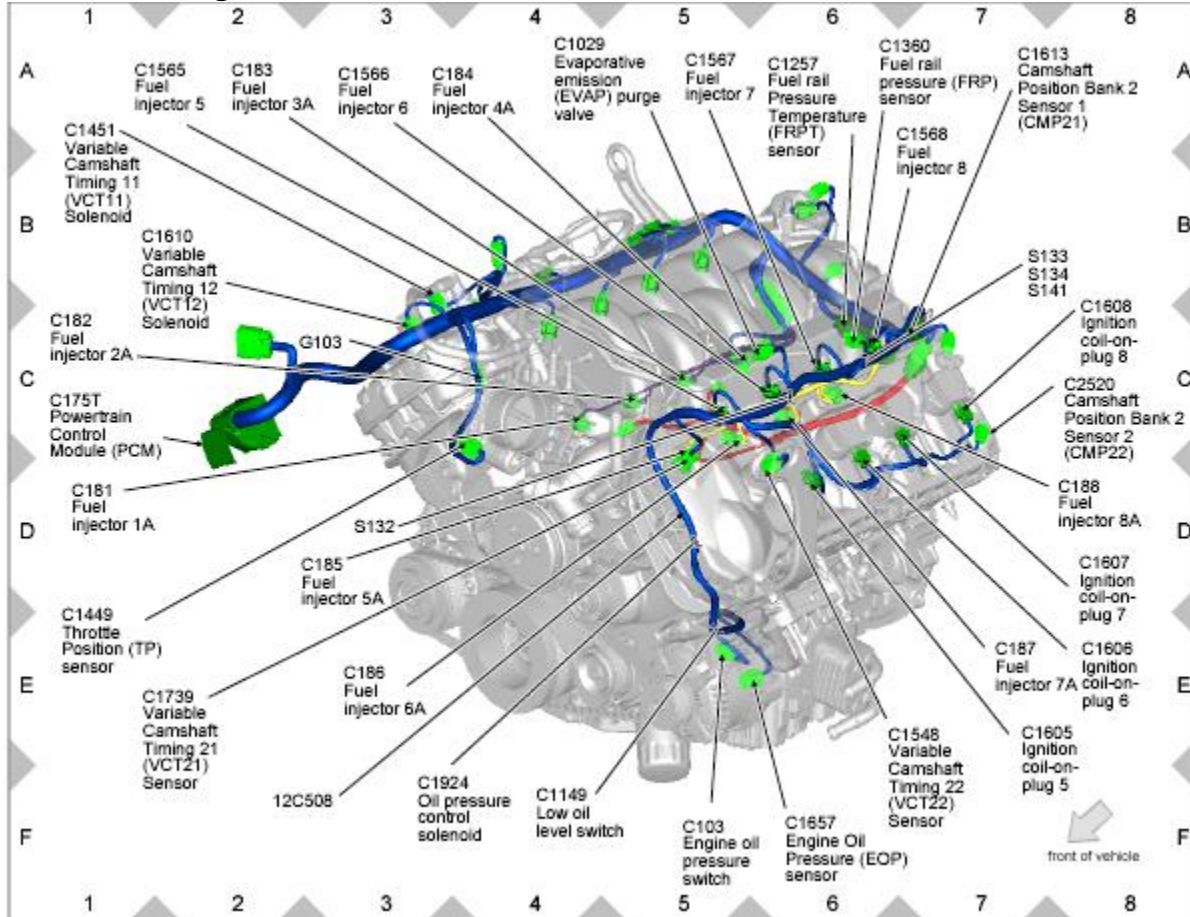


Figure 11 – Front View of Engine.

Note: The wire harness shown in blue above is the ENGINE harness that comes standard with the 5.0L Coyote Gen3 Mustang Crate Engine (Ford Performance P/N: M-6007-M50C); THIS IS NOT THE CONTROL PACK WIRING HARNESS.

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### 5.0 Control Pack Harness Installation Instructions

**NOTE:** To avoid electrical shock and/or damage to sensitive electrical control system components, before beginning any work, remove the vehicle's Negative Battery Terminal and place a rag or towel between it and the Battery Negative Post. The Negative Battery Terminal is not to be reinstalled until the last step of installation.

1. Identify proper mounting location for the PCM, Power Distribution Box (Item A) & Inline Fuse Holder. Locate the PCM connector (C175E) on the engine harness as indicated in Figures 2 and 3 by the "START HERE" arrow.
2. If a stock PCM is present (crate engines do NOT include a stock PCM, only the Control Pack PCM), unplug it and store it in a cool, dry place in case it is needed in the future.
3. Plug C175E (from the engine harness), C175B (Item L from the Control Pack harness) and C90 (Item Q from transmission harness) into the Control Pack PCM; once plugged-in, use a zip-tie to tie the bundle of wires exiting each connector back together. Route the transmission harness so that all 4 O2 sensors connectors (C1571, C1572, C141, C142) are able to reach their corresponding sensors. Connect the O2 sensors and 1-way inline connectors (C1A, C1B). In the steps that follow, we will be repeating this process of using zip-ties to piggy-back/tie the harness to the existing engine harness approximately every 200 mm or so along the engine harness.
4. Connect the in-line connector (C146) from the Control Pack harness to the mating connector on the engine harness.
5. Connect Alternator Connector (C102A), Mass Air Flow (MAF) Sensor Connector (C128), Ambient Air Temperature Sensor Connector (C132) and Intercooler connector for supercharger (C400) to their respective locations being sure to avoid any pinch-points or exhaust hot-spots.
6. Connect Blunt-cut orange 10AWG cooling fan lead and Starter Lead Eyelet to their respective locations.
7. The grommet needs to be properly installed in the firewall of your vehicle so as to protect the Control Pack harness routing that passes through to the passenger compartment. All connections previously mentioned are located under hood; all connections mentioned from this point on are located in the passenger compartment.
8. Identify proper mounting location for the Accelerator pedal, Clutch Bottom of Travel (purchased separately) and Ignition Switch (purchased separately).
9. Identify mounting location for the Bracket with OBDII connector and Malfunctioning Light.
10. Connect the ground eyelet (Item B) to a reliable ground point on the chassis or engine block, away from dirt and water.
11. Route C160A to approximately the base of the steering wheel to be connected later.
12. Connect each of the connectors to their respective locations mentioned above (C2040, C257).
13. Locate the 6-way I/P Pigtail connector with blunt leads (C160B) and continue to Section 6.

**\* Removal Procedures for Unused Connectors:**

If 100% sure connector is not currently needed and will not be needed in the future, cut routing leading-up to unused connector and individually heat shrink each wire herein. To ensure that the wires are completely isolated from one another and the outside environment, you may also want to wrap the heat-shrunked wire in electrical tape to provide an additional layer of protection from moisture and dirt.

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## 6.0 6-way I/P Pigtail Connection Details



Figure 12 – Pigtail Connector

The 6-way pigtail is to be connected according to the chart below. See also the diagrams on the following pages for illustrations of wire connection points, based on the ignition/starter switches that you intend to use. Setup A uses separate toggle switches for ignition and starter inputs, while Setup B uses an ignition cylinder with a key.

Cavity	Lead Label	Wire Color	Description
1	Fuel Pump Relay Out	GN	Provides +12V to the fuel pump
2	-	-	-
3	Starter Motor Request (SMR)	Light Blue	Apply +12V to send a request to the PCM to energize the starter solenoid
4	-	-	-
5	Ignition Relay Trigger	Light Green	Apply +12V to energize the ignition relay/wake-up the system
6	-	-	-

6.1 Locate each of the Blunt Leads. This is where you will need to make all of the soldered connections for the harness. Before soldering any wires, however, you must first decided which set-up you will pursue by referencing Set-up A and Set-up B on pages 19 and 20. Once you've decided on your set-up, continue to Step 6.2.

6.2 Connect the following REQUIRED blunt leads as follows:

6.2.1 **Blunt Lead 1 – Fuel Pump Relay Out (Dark Green):** Connect to Fuel Pump positive. Separate ground for fuel pump must be provided. The fuel pump will start running any time key is on, then if you don't start the engine the computer will turn it off after a couple of seconds.

6.2.2 **Blunt Lead 3 – Starter Motor Request (Light Blue):**

Set-up A: Connect to input node of starter momentary switch so that 12 volts is provided when engine starting is requested.\*See figure 14a below

Set-up B: Connect to 'Start' output node of ignition cylinder so that 12 volts is provided when engine starting is requested.\*See figure 14b below

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- 6.2.3 **Blunt Lead 4 – Malfunction Indicator Light (Blue):** Connect this blunt lead to the negative (black) lead on the MIL (provided in the kit bag).
- 6.2.4 **Blunt Lead 5 – Ignition Relay Trigger (Light Green):**  
Set-up A: Connect this wire to the output side of the ignition toggle switch so that 12 volts is provided when the key is in the 'Start' (cranking) and 'Run' positions. It is imperative that this circuit be reliable, the PCM will interpret an intermittent voltage on this signal as a request to shut down the engine! (Hint, if your engine shuts down after a hard launch check here first). \* See figure 14a below  
  
Set-up B: Connect to the 'Start/Run' output node of ignition cylinder so that 12 volts is provided when engine starting is requested. It is imperative that this circuit be reliable, the PCM will interpret an intermittent voltage on this signal as a request to shut down the engine! (Hint, if your engine shuts down after a hard launch check here first). \* See figure 14b below
- 6.2.5 **Blunt Lead 6 – MIL Power B+ (RED):** Connect this blunt lead to the positive (red) lead of the MIL.
- 6.2.6 **Blunt Lead 8 – Hot At All Times (Red):**  
Set-up A: Connect this lead to two different locations as needed: 1) the input node of the Starter momentary switch, and 2) the input node of the Ignition toggle switch. \* See figure 14a below  
  
Set-up B: Connect this lead to locations as needed: 1) the input node of the ignition cylinder. \* See figure 14b below
- 6.3 Once all of the blunt lead connections have been soldered onto their appropriate location, insert the 16-way I/P Pigtail connector into C160A.

### \* Important Note on the Starting System

This kit includes connections and installation instructions for PCM controlled engine starting; however, it is not required that the customer utilize this option. Customers may choose to use their existing non-PCM controlled starting system if desired. If non-PCM controlled starting is used, Step 6.2.2 may be omitted, and any unused blunt leads should be cut to ~2" length and sealed using heat shrink.

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### 7.0 Ford Performance Power Distribution Box Installation

- 7.1. Before you start, you should have your two battery jumper cables at hand (purchased separately, 4 AWG recommended), one from Battery to fuse holder, the other one from fuse holder to FPPDB.
- 7.2. Carefully remove the nut and washers on both terminals of the in-line fuse holder and set aside.
- 7.3. Use one of your battery cables and place the eyelet onto one of the two in-line fuse holder terminals, then one of the washers, and then tighten down with one of the two nuts.
- 7.4. Locate the power terminal of the side of FPPDB, notice there is a battery positive blunt lead eyelet already attached to it. Attach the other eyelet to this power terminal by tightening the nut down on top of the eyelet. The order of installation on the power terminal should be a washer, the battery cable eyelet, then the blunt lead eyelet, another washer, and then the nut. Avoid sharp points and using zip-ties to secure the cable (approximately every 200 mm) along the way. **DO NOT CONNECT ANYTHING TO THE BATTERY YET.**
- 7.5. Place the Buss 250A fuse onto the fuse holder terminals.
- 7.6. On the opposite in-line fuse holder terminal, place one eyelet of your second battery cable, then the other remaining washer, and then tighten down with the remaining nut.
- 7.7. Close the cover of the in-line fuse holder.
- 7.8. Being careful not to inadvertently complete the circuit, connect the opposite end of the battery cable to the positive terminal of the vehicle battery.

Note: This lead **MUST** be hot at all times (HAAT). If this lead is connected through a switch, the Keep Alive Memory (KAM) of the PCM will be cleared whenever the switch is opened. This will result in loss of diagnostic trouble codes, adaptive fuel parameters, and other information stored in KAM by the PCM.

- 7.9. Install and tighten the Negative Battery Terminal (not included in kit) onto the Vehicle Battery. Attach the ground blunt lead to the Negative Battery Terminal (you will need to provide the eyelet). Verify that you have a good reliable (dry and clean) ground path from the battery negative post to the chassis ground. In general, the resistance from the battery ground to this chassis location should be less than 0.1 ohm.

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### 8.0 Fuel System

The PCM is calibrated for a return style fuel system as shown below.

- Set regulator to maintain 65 psi delta fuel pressure across injector (55 psi at fuel rail with engine off):
- Use only AN type fuel fitting to interface with OEM fuel rail.
- Fuel pressure regulator must have reference to manifold vacuum.

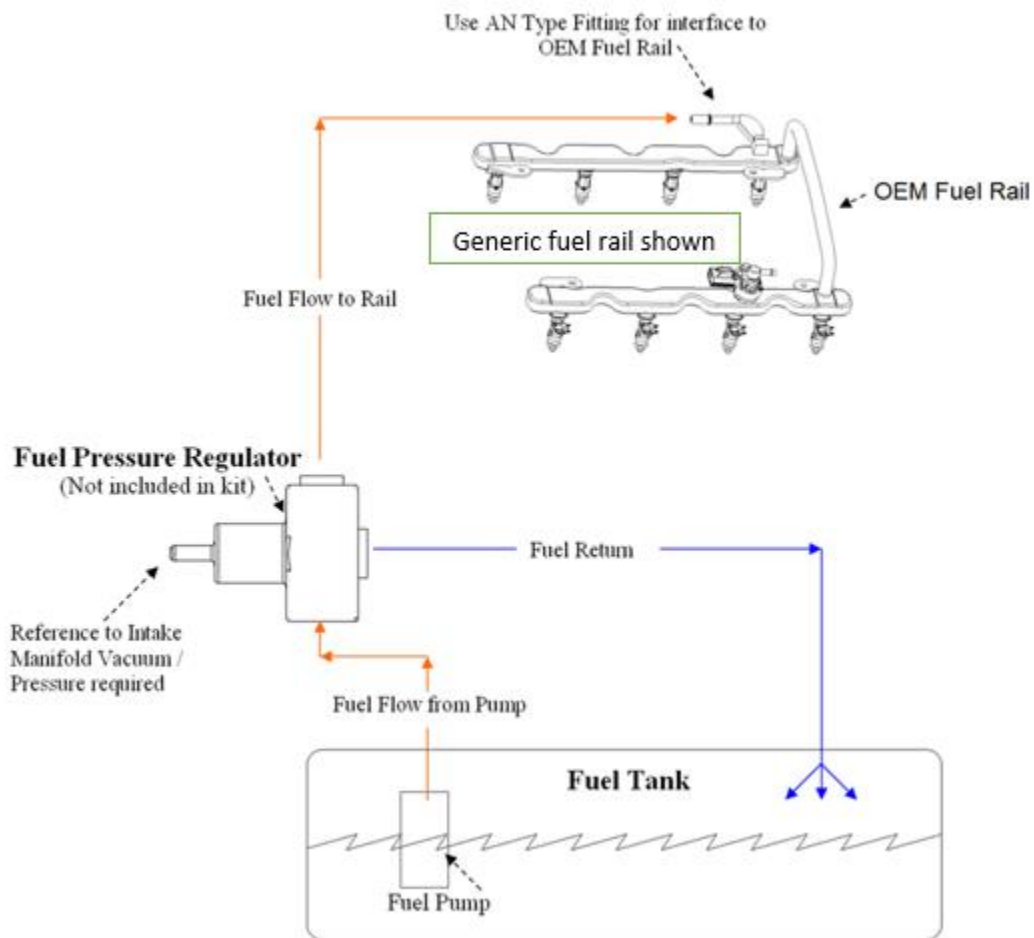


Figure 13 – Fuel System Diagram

NOTE-Fuel pump requirements: 165L/hr minimum at 65psi



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### Fuel pump location

A common and often overlooked problem is the location of the fuel pump or pumps. Optimally, the fuel pump should be mounted IN THE TANK to reduce the possibility of pump cavitation. Cavitation is essentially localized boiling caused by a reduction in pressure, generally occurring on the inlet side of a pump. This localized boiling results in fuel vapor bubbles which will reduce the volume of fuel the pump is capable of delivering to the engine. Any reduction in pressure or increase in temperature at the inlet side of the pump increases the chances that cavitation will occur. For this reason, it is always best to either have the pump inside the tank immersed in fuel or (in the case of an external pump) gravity fed, which will increase the pressure on the inlet side of the pump. If the fuel pump has to “pull” the fuel, this will result in a reduction in pressure at the fuel pump inlet potentially allowing cavitation and, thus, vapor bubbles to develop. These vapor bubbles are then drawn into the fuel pump and exit the high-pressure side of the fuel pump as compressed vapor. They travel the entire length of the fuel system and are expelled through the fuel injector. This can cause issues ranging from stumbles and hesitations to engine damage due to insufficient fuel delivery and lean A/F ratios. Sometimes this problem can characterize itself by only appearing when the weather gets warmer, which can confound the diagnosis of the issue. In certain cases, it may seem to only develop when driving on certain surfaces, because pavement reflects more heat than an off-road 4x4 trail. Remember, more heat and lower pressure on the inlet side of the pump means a greater chance of cavitation, which is to be avoided whenever possible. If you are using an external mounted fuel pump, you should run a very coarse (typically around 100 micron) filter on the inlet side of the fuel pump, and a finer (typically around 10 micron) filter on the outlet side of the pump. A paper filter is NOT recommended on the inlet of the fuel pump because it can cause a restriction in fuel flow which, as mentioned previously, can lead to cavitation.

**Warning:** It is highly recommended that an inertia switch is incorporated into the fuel pump wiring to turn off the fuel pump in event of an accident.

## 9.0 Initial Start-Up

Note: The following information assumes completion of each of the previous steps of this installation manual.

- 8.1. Check all fluid levels, electrical and fluid connections.
- 8.2. Pressurize the fuel system by turning the key on. Inspect the entire fuel system (from tank to engine) for leaks.

**!!! NOTE: If any leaks are found, do not proceed further until these have been remedied !!!**

- 8.3. Start Engine.
- 8.4. Check for leaks and/or noises that may indicate a problem.

**CAUTION:** Be certain to run the vehicle in a well ventilated area.

Factory Ford shop manuals are available from Helm Publications, 1-800-782-4356



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## 10.0 Wire Usage Schematics

The following two pages detail the two most common wiring configurations—please choose one to complete installation of your Control Pack kit. You will need to provide 12V HAAT wire yourself.

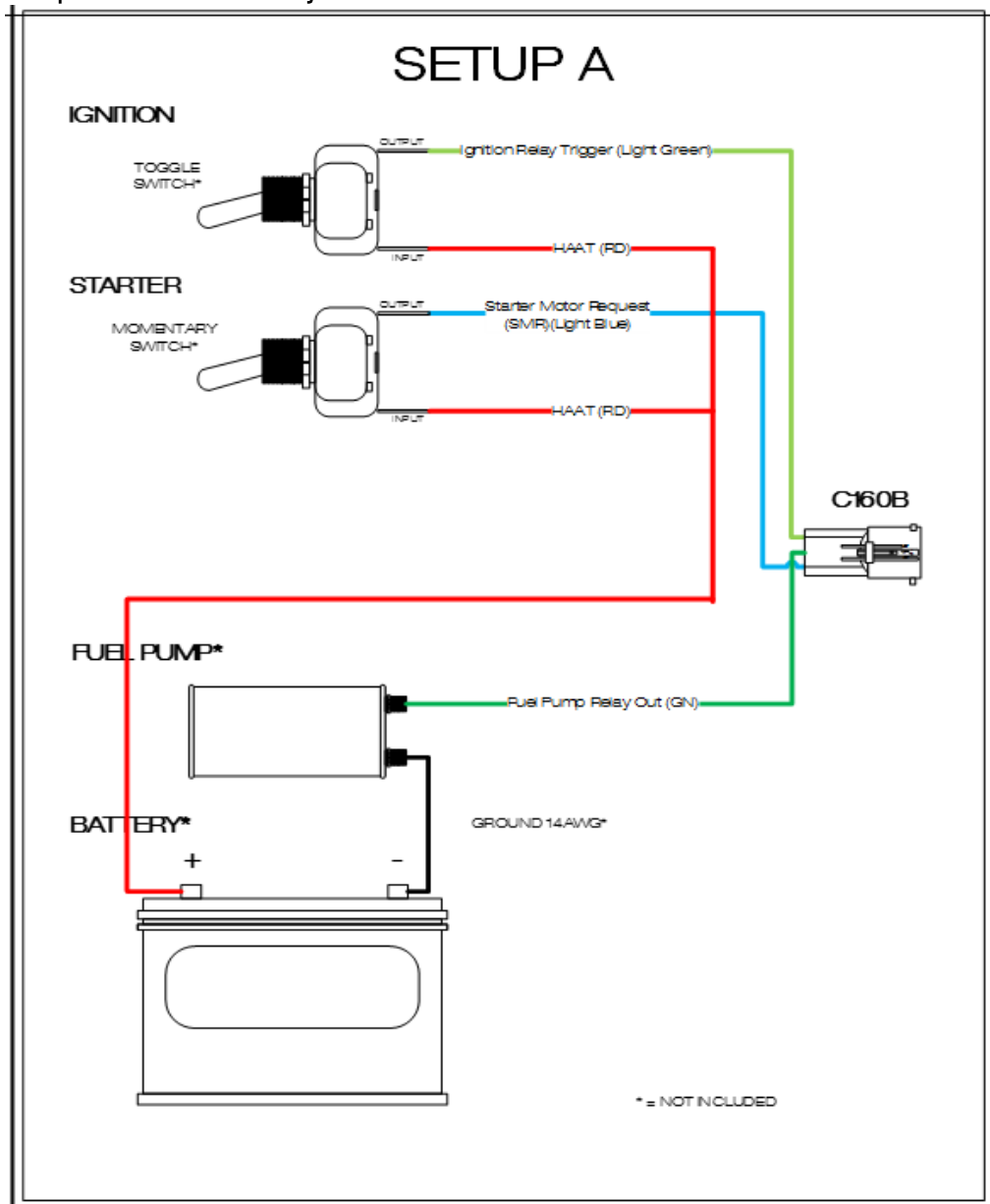


Figure 14a – Setup A

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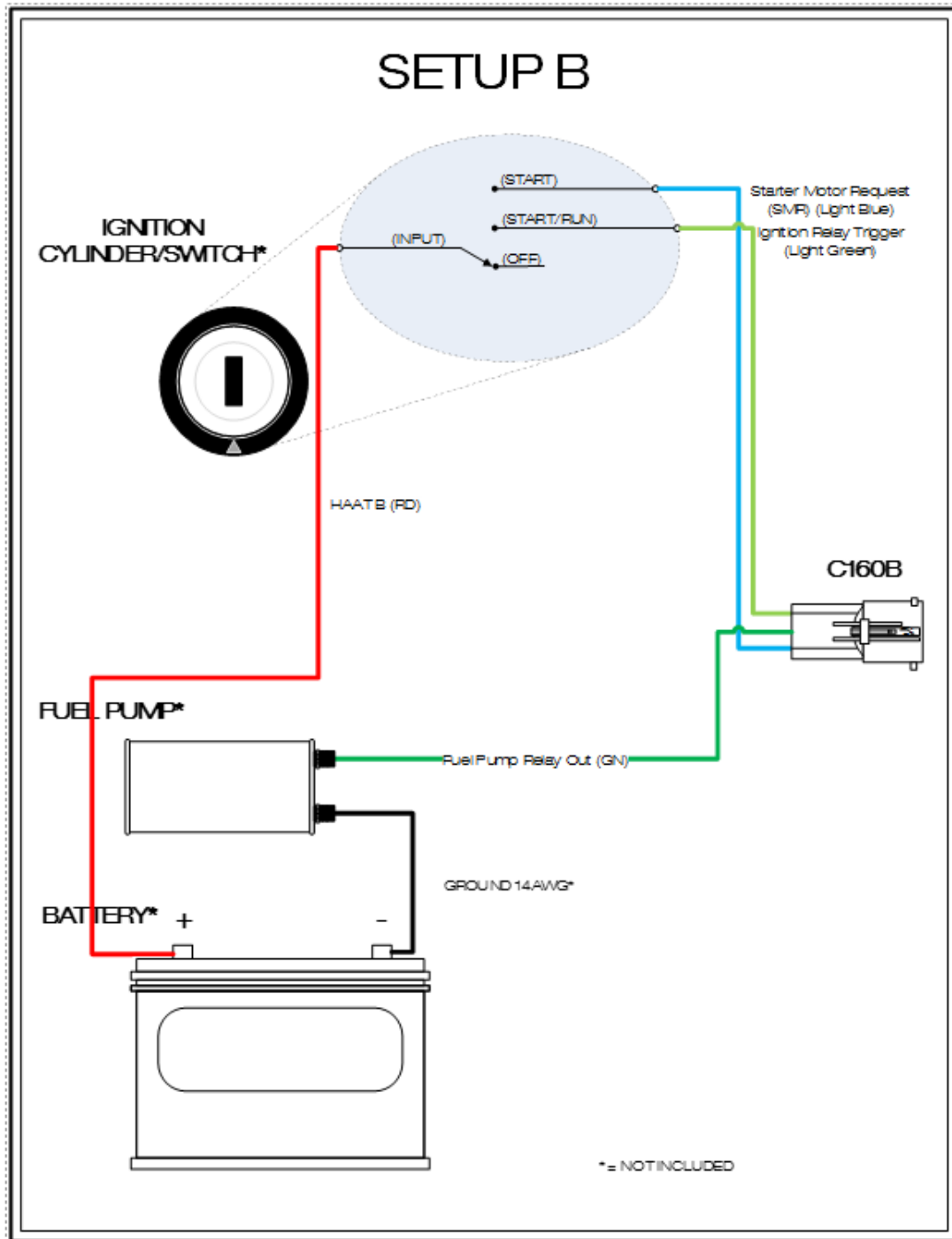


Figure 14b – Setup B

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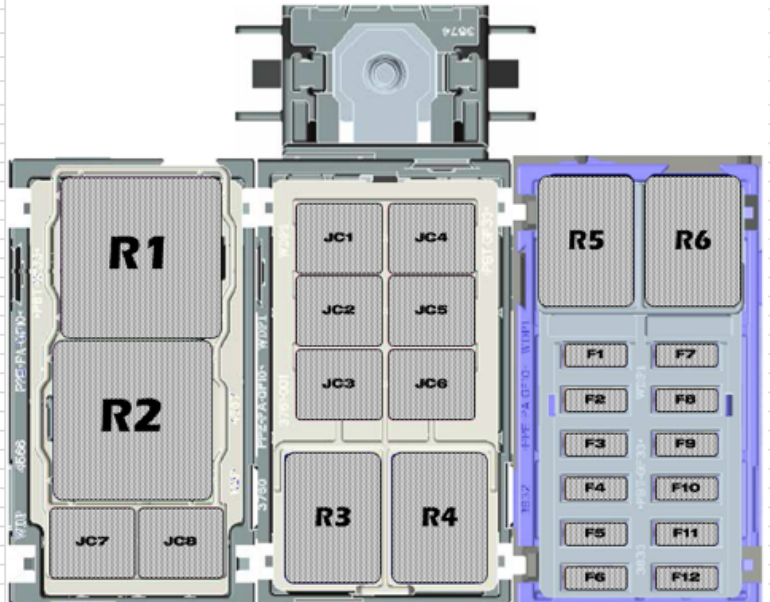
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### 11.0 Fuses & Relays

- The following diagram outlines the array of fuses and relays included in the Control Pack wiring harness, and the function of each.
- NOTE:** Do NOT replace any of the fuses with a higher value than those specified below.

ID: PDB  
Name: Component ID/Values

Component ID	Type	Value	Name
JC1	J-Case Fuse	50A	PCM Relay Feed
JC2	J-Case Fuse	50A	Cooling Fan Relay Feed
JC3	J-Case Fuse	30A	Starter Relay Feed
JC4	J-Case Fuse	40A	Fuel Pump Relay Feed
JC5	J-Case Fuse	40A	Ignition Relay Feed
JC7	J-Case Fuse	NOT USED	NOT USED
JC8	J-Case Fuse	NOT USED	NOT USED
F1	Minifuse	20A	VPWR1
F2	Minifuse	20A	VPWR2
F3	Minifuse	15A	VPWR3
F4	Minifuse	15A	VPWR4
F5	Minifuse	10A	Ignition Switched A
F6	Minifuse	10A	Ignition Switched B
F7	Minifuse	15A	ICP
F8	Minifuse	15A	Ignition Switched C
F9	Minifuse	15A	VPWR5
F10	Minifuse	10A	HAAT A
F11	Minifuse	10A	HAAT B
R1	Power Mini Relay	70A	PCM Relay
R2	Power Mini Relay	70A	Cooling Fan Relay
R3	High Current Micro Relay	40A	Starter Relay
R4	High Current Micro Relay	40A	Fuel Pump Relay
R6	High Current Micro Relay	40A	Ignition Relay

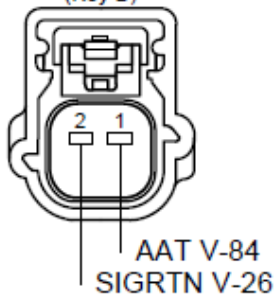


(Top View of PDB - Component ID)

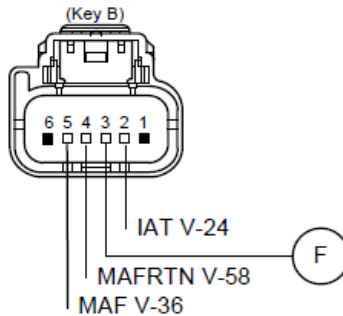
Figure 15 – Power Distribution Box

### 12.0 Connector Faces

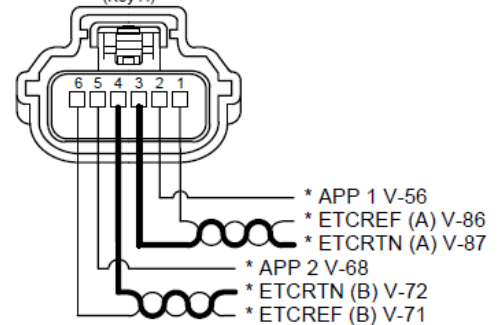
**AAT**  
Ambient Air Temperature  
(Key B)



**MAF/IAT**  
Mass Air Flow Intake Air Temperature Sensor  
(Key B)



**APPS**  
Accelerator Pedal Position Sensor  
(Key A)



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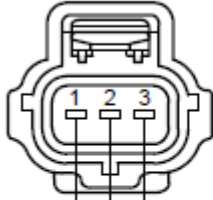


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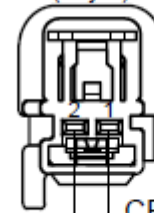
## ALTERNATOR



Battery Sense (B+) Always HOT!  
Regulator Control (ALTCOM) GENRC V-15  
Load Indicator (ALTMON) GENLI V-50

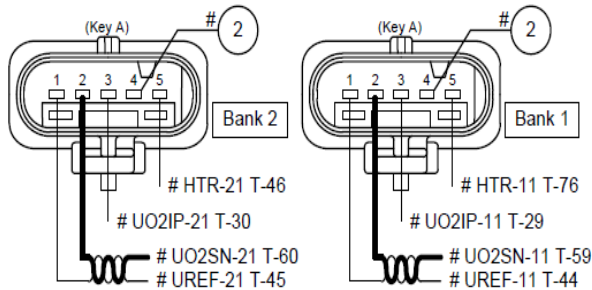
## Clutch Pedal Bottom Travel Switch

(Normally Open)  
(Key A)

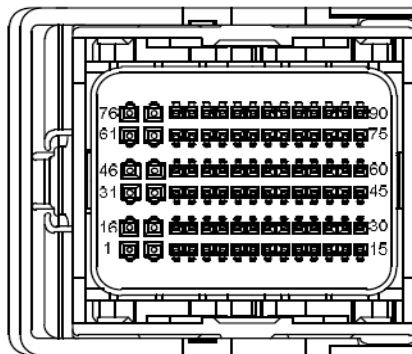
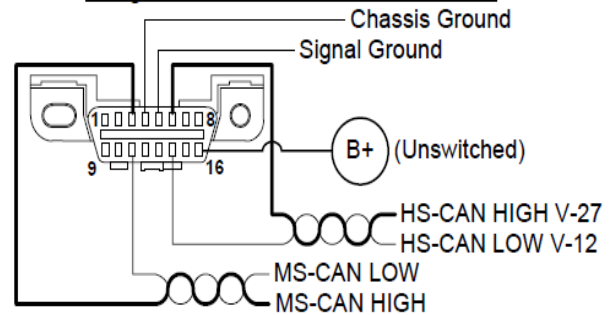


CPP-BT V-65  
PWRGND

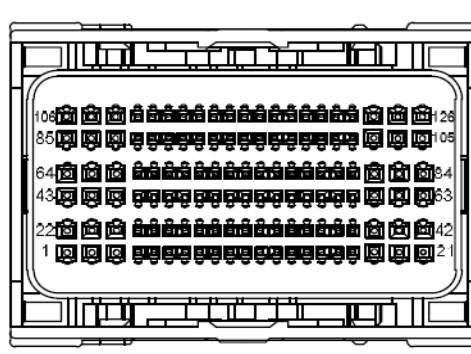
## UEGO Upstream Universal Exhaust Gas Oxygen Sensor



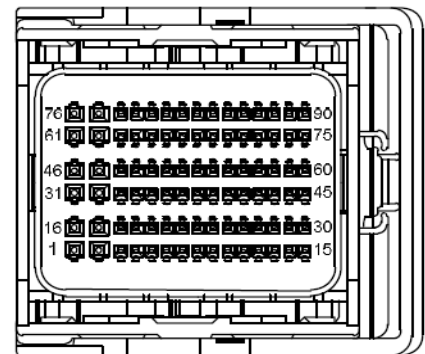
## Diagnostic / Data Link Connector



Transmission  
90 Way



Engine  
126 Way



Vehicle  
90 Way

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### **13.0 Troubleshooting Tips:**

The following troubleshooting tips are intended for you to run a few quick tests to roughly determine what the issues are before calling or to find a solution yourself:

- Always double check all of your grounds. Wiring is extremely sensitive to ground issues. Secure all of the connections from chassis grounds to battery negative. Do a continuity test with your multimeter between all of your ground terminals and battery ground.
- Check that your reference voltage is 5V, make sure connections are not shorted. Use a multimeter to measure the voltage. The reference voltage are sent out from PCM so if the wiring is all correct and still you have a different voltage, the PCM may not be properly calibrated.
- If you don't have any power at all, check for your ignition switch, ignition relay R6 and PCM relay R1 wiring. You should have 12V at both relay outputs once ignition is in the on position, which is fused via F5 and F1 separately. Again use a multimeter to measure the voltage at F5 and F1, 12V expected. There are small holes on the mini fuses for your probe to be placed.
- If ignition circuit functions without cranking, check your starter switch and starter relay R3 wiring. You should have 12V at the relay output WHEN you push the start button/turn the vehicle over. Use a multimeter to measure the voltage at the starter solenoid leads from harness (disconnect from starter), 12V expected WHEN you push the start button/turn the vehicle over.
- If your engine will only crank but not start, a malfunction in the fuel system can be the cause. First make sure that you have 12V at fuel pump + and all injectors with the key in the on position. Measure the pressure at your fuel rail as it should start increase once you hit starter button.

For additional assistance, call the Ford Performance Techline at 1-800-367-3788

Factory Ford shop manuals are available from Helm Publications, 1-800-782-4356