

OWNERS MANUAL

Model ETM51

Electronic Throttle Module

for

2005+ Ford Gas & Diesel Engines

***Supported Through
the 2019 Model
Year Only!***



Introduction

Model ETM51 Electronic Throttles are designed to support 2005+ Ford trucks and vans equipped with the Ford Stationary Elevated Idle Control (SEIC) and one of the following engines:

6.4 Liter <i>Power Stroke</i> Diesel	6.8 Liter <i>Triton</i> Gas
6.0 Liter <i>Power Stroke</i> Diesel	5.4 Liter <i>Triton</i> Gas
6.7 Liter <i>Power Stroke</i> Diesel	6.2 Liter <i>Triton</i> Gas

Modules come with four modes of fast idle control: Three user-adjustable preset speeds and one variable input based on a remote variable resistor. The ETM51 installation requires customer-supplied control wiring to select the required mode of operation and to connect to the Ford SEIC wiring. Ford provides blunt-cut wires, and these may be connected to the ETM51 module via 0.25 inch Faston blade terminals (may require extensions of the wires).

The ETM51 kit includes a three foot data cable with a 16-pin connector plug for the OBDII data link connector (DLC) on one end and two faston terminals at the other. The DLC is usually located at the lower part of the dash on the driver's side.

Operation

When the vehicle is parked and Chassis Ready Conditions are satisfied, the engine idle speed may be controlled by selection of one of the four available modes: three presets and one variable RPM. The preset RPM modes may be adjusted via three calibration potentiometers on the top of the ETM51 unit.

Chassis Ready Conditions

1. Parking brake is set
2. Gear shift lever is in PARK (automatic only) or NEUTRAL (F750)
3. Foot is off the service brake
4. Foot is off accelerator pedal
5. Vehicle is stationary
6. Engine is started and idling below 900 RPM
7. Coolant temperature >140°F (Gas), 120°F (Diesel)
8. Transmission temperature 20°F to 240°F

Important Note:

While the engine is in high idle, should one of the Chassis Ready Condition inputs change state, the engine will return to normal idle speed.

In 2010 and earlier diesel engines, if the Chassis Ready Condition input is restored to satisfactory conditions, the engine will automatically return to fast idle after three seconds. However, in gas and 2011 and later diesel engines, the engine will not automatically return to fast idle. Instead, the Ford SEIC must be manually reset by turning the Fast Idle switch off and then back on. With ETM51 revision H and later, software will auto restart diesel engine high idle whenever chassis ready conditions are correct. **NOTE: For 2 wire Gas PTO Interfaces on the 2011-2016 F-Series, the ETM51 will require the addition of an optional relay circuit shown on page 16 to automatically restart the PTO.**

Modes of Operation

Preset RPM High Idle Modes: (3 total)

Function:	Increase idle to a preset RPM value
Terminals:	RPM1, RPM2 and RPM3
Activation:	Apply +12V to terminal
Range of Calibration:	
Gas:	900-2250 RPM
2005-2010 Diesel:	1200 to 2300 RPM
2011+ Diesel:	900 to 3000 RPM
Adjustment:	Three potentiometers accessible from the top of the module

Optional Variable RPM Mode:

Function:	Varies RPM as a function of voltage on the VRPM input terminal
Terminal:	VRPM
Adjustment:	10K Ohm potentiometer between the VRPM terminal and ground
Enable:	Turn potentiometer down to zero resistance, then slowly increase until desired RPM is reached
Disengage:	Turn potentiometer down to zero and RPM will drop to standard idle speed
RPM Range:	
Gas:	900-2250 RPM
2005-2010 Diesel:	1200 to 2300 RPM
2011+ Diesel:	900 to 3000 RPM

Mode Priorities:

RPM1:	Highest
RPM2:	Second
RPM3:	Third
Variable RPM:	Lowest - will only activate when other modes are off

Status Indicators

A ten segment LED provides status and problem detection information. Refer to the following table for coding of these functions.

LED	Status	Indication
BUSS	On Solid	Module ON & Functioning
	Flashing	Module ON, problem detected
GEAR	On Solid	Gear = Park
	Flashing	Transmission not in Park
PK BRK	On Solid	Park Brake set
	Flashing	Park Brake not set
SR BRK	On Solid	Service Brake at rest / not activated
	Flashing	Service Brake activated
VSPEED	On Solid	Vehicle Stationary
	Flashing	Vehicle Moving
RPM1	On Solid	RPM1 terminal +12V, engine at RPM1
	Flashing	RPM1 terminal +12V, engine at low idle *
RPM2	On Solid	RPM2 terminal +12V, engine at RPM2
	Flashing	RPM2 terminal +12V, engine at low idle *
RPM3	On Solid	RPM3 terminal +12V, engine at RPM3
	Flashing	RPM3 terminal +12V, engine at low idle *
VRPM	On Solid	VRPM terminal activates by transition from 0V to 0.8V, engine at high idle, Unit turns on above 0.8V, above 1V increases Eng RPM
	Flashing	VPRM Terminal Activated by a transition from 0.8V, but engine at low idle.
APDL	On Solid	Accelerator pedal at rest position
	Flashing	Accelerator pedal actuated (not at rest position)

* The Ford Powertrain Control Module (PCM) High Idle is not active and indicates one or more of the SEIC ready conditions are not being fulfilled.

Installation

1. Getting Started

We recommend installing the ETM51 system under the dash due to the proximity of the wiring connections and cable length. The unit should not be located in the engine compartment or any other location that is not protected.

You will need a crimping tool for the 0.25 inch Faston blade terminals and a wire stripping tool. Be sure to follow the crimping tool instructions for the proper wire size and terminals. Do not lengthen the DLC Cable. Disconnect the battery before making any electrical connections.

WARNING!

Do not connect any 12 volt power source to the ETM51's PTO terminal wiring.

2. Mounting

Mount the ETM51 Module under the dash or on a flat surface using the two mounting holes. Ensure that you have sufficient distance to install the 36 inch DLC cable.

3. Installing the DLC Cable

Connect the two Faston terminals on the DLC cable to the ETM51 module terminals (Yellow wire to CANH terminal and Green wire to CANL terminal). Route the cable to the OBDII Data Link Connector and plug it in. The OBDII connector is usually located on the lower part of the dash on the driver's side. Using a cable tie, secure the plug to the OBDII connector so that it will not vibrate out. We recommend routing the DLC cable across the bottom of the plug/connector and looping the cable tie around the plug, socket and cable to keep it out of the way.

4. Wiring the Mode Selection and SEIC Controls

The ETM51 module must be wired to the Ford SEIC blunt-cut wires and to the customer-supplied Mode Selection controls. The wiring is different for diesel and gas applications, so please refer to the appropriate wiring diagrams on pages 6 through 16. You will also need a good quality chassis ground (battery negative) signal and a +12 volt supply fed from the Ignition Switch.

Note that on gas engine installations, Ford requires the +12 volt supply to be "clean" - i.e. it should have no other loads on the same circuit that could generate electrical noise.

4A. High Idle Speed Mode Controls

Determine the combination of fast idle speed modes you will need (up to three fixed preset speeds and/or an optional variable RPM control). If you need the optional variable RPM Control, you will need a 10k Ohm potentiometer (VRPM). For each desired RPM1, RPM2, and RPM3 setting, you need one switch or relay contact to select them. You will also need to implement a Fast Idle On/Off switch.

Wire these devices as shown in the Wiring Diagram for your respective engine: Diesel (page 6-8) or Gas (page 9-16). Make sure to have a good quality chassis ground and a +12 volt fused supply fed from the Ignition Switch. Refer to the most current applicable Ford Body Builders Bulletin for location of these circuits.

Note on Variable RPM control: We recommend a three or up to a ten turn 10K potentiometer such as those available from Digikey (www.digikey.com).

4B. Ford SEIC Wiring

Install the wires between the ETM51 module and the Ford SEIC as shown in the wiring diagrams. On most F-250 to 550 trucks from 2005 to 2016, the SEIC wires are located above the parking break pedal, and in the case of 2017 and after, they are located on the Passenger Side. On F650 and F750 chassis, they are located under the hood on the passenger side. Refer to the Ford SEIC documentation for more details.

WARNING: Please refer to most current Ford Body Builder's Bulletin for applicable year wire colors for your vehicle.

Setup and Calibration

The only calibration required is to select each of the three preset modes (RPM1, RPM2 and RPM3) and adjust the three respective ten turn potentiometers on the ETM51 to the desired RPM. This will be 900 to 2250 RPM on gas engines and 1200 to 2300 RPM on the 2005-10 diesel engines, and 900 to 3000 RPM on the 2011+ diesel engines. Each complete turn of the potentiometer will increase or decrease the idle speed by roughly 300 RPM. Adjustments may be made with a 1/16" (1.6mm) or smaller flatblade screwdriver.

Specifications

Electrical

Input Voltage (+12V Terminal): 8 Minimum to 16 V Maximum
Input Current (+12V Terminal): 37mA approx.

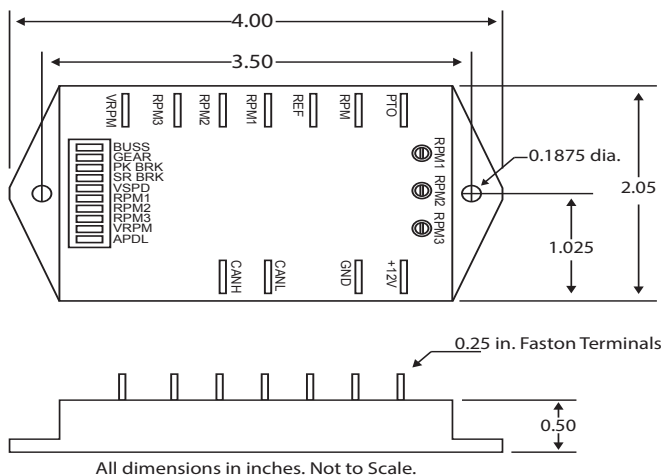
Mechanical

Weight: 0.17lbs
Connections: Faston 0.25 inch terminals
Case Material: Cyolac thermoplastic (UL 94VO)
Encapsulation Material: Epoxy potting compound, resistant to most fuels, oils, acids and cleaning agents.

Reference:

See www.fordbbas.com

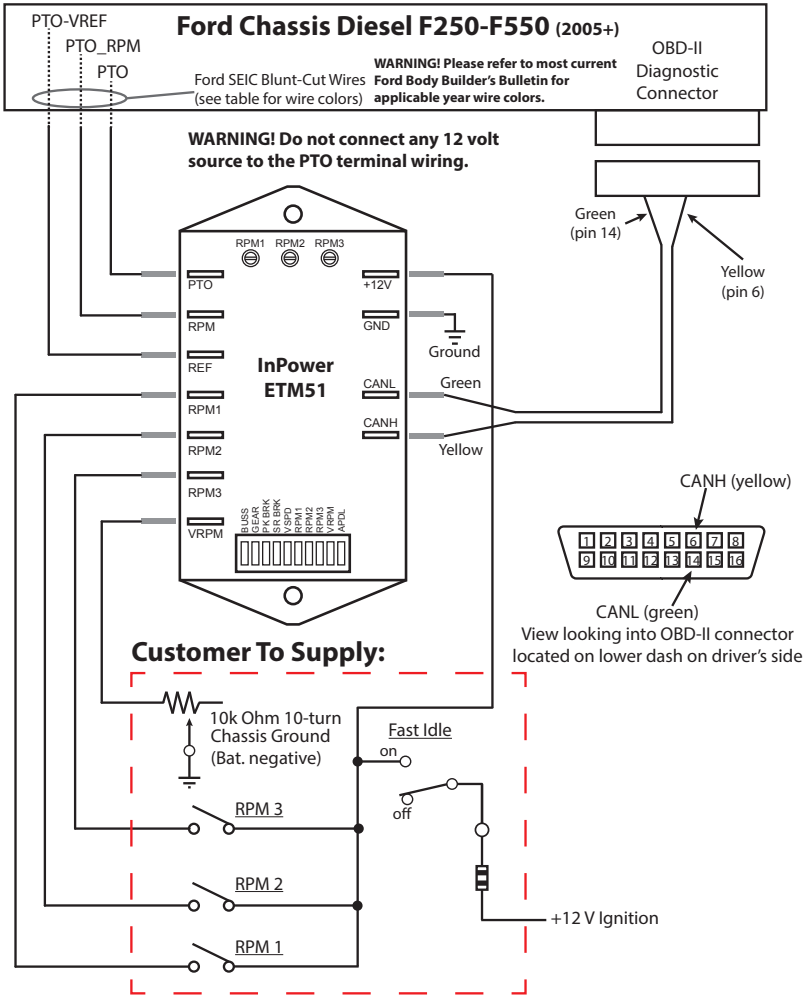
Mechanical Drawing



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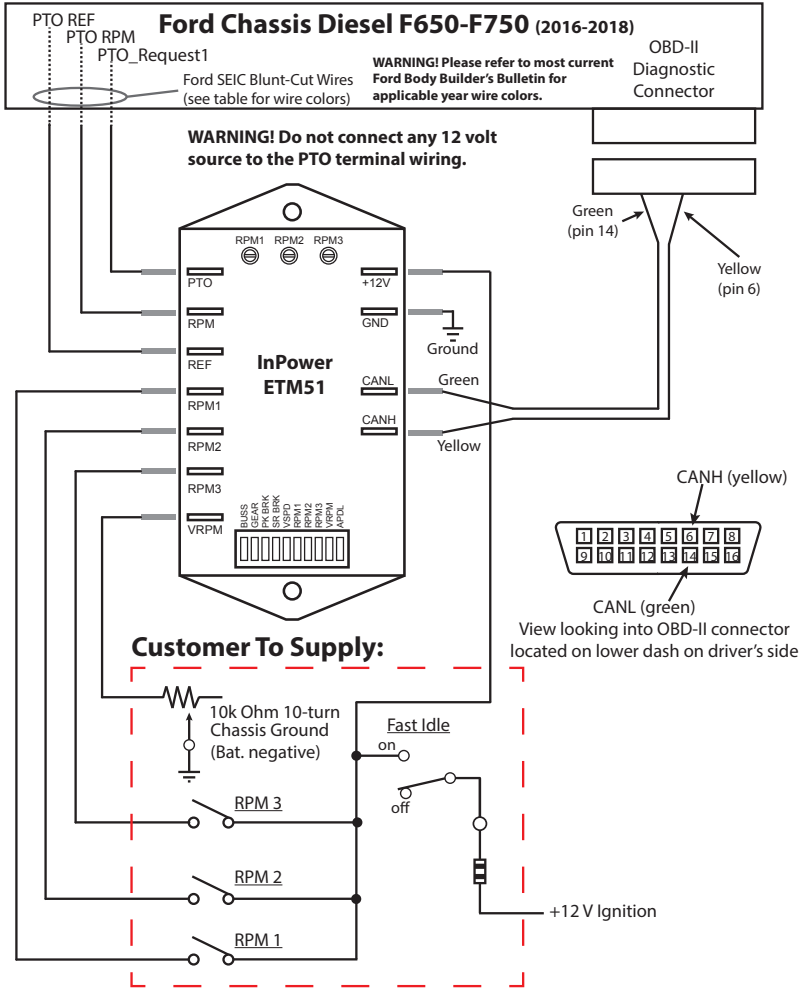
Diesel Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

	F250-550 Series Diesel 2005-2019			
Function	2005-2007 6.0 L	2008-2010 6.4L	2011-2016 6.7L	2017-2019
PTO	Orange (PTO)	Yellow/Green (PTO)	Yellow/Green (PTORS1)	Yellow/Green (PTO1)
PTO-VREF	Orange/Red (PTO-VREF)	White/Brown (PTO VREF)	White/Brown (PTOREF)	White/Brown (Diesel PTO REF)
PTO_RPM	Orange/Yellow (PTO RPM)	Green (PTO RPM)	Green (PTO RPM)	Green (PTO RPM)

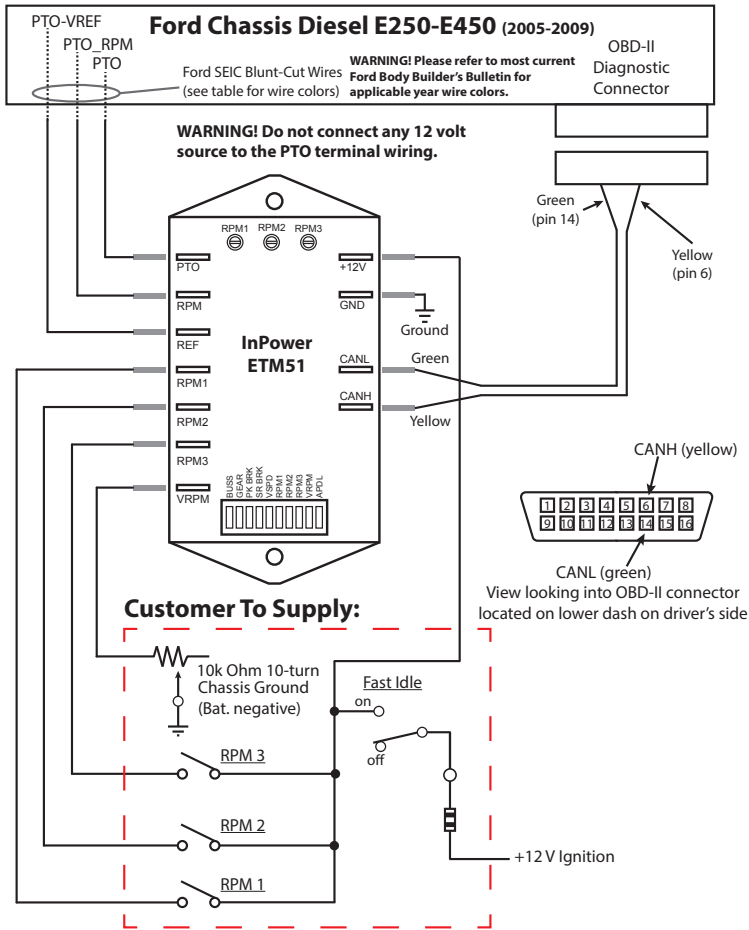
Diesel Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

Function	F650/F750-Series Diesel 2016-2018	
	2016 F650 F750	F650 F750 2017-2018
PTO_Request1	Yellow/Green (PTO Request1)	Yellow/Green (PTO REQ1)
PTO REF	Brown/White (PTO REF)	Brown/White (PTO REF)
PTO RPM	Green (PTO RPM)	Green (PTO RPM)

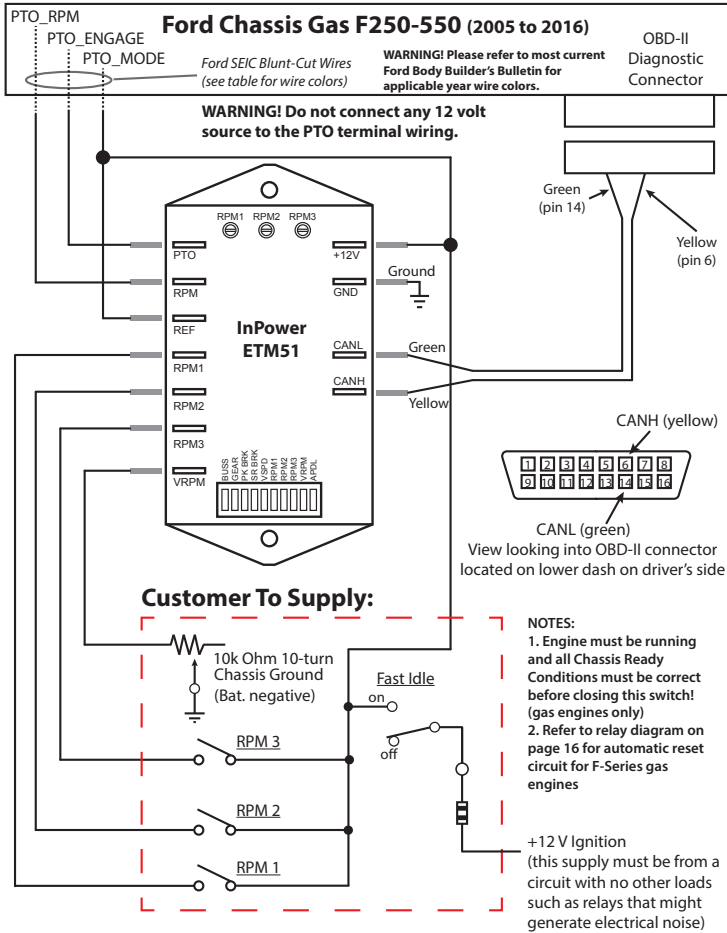
Diesel Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

	E250-E450 Series Diesel 2005-2009	
Function	2005-2008 E250-E450	2009 + E250-E450
PTO	Purple/Lt Blue (PTO)	Yellow/Green (PTORS1)
PTO-VREF	Orange/Red (PTO-VREF)	White/Brown (PTO_VREF)
PTO_RPM	Orange/Yellow (PTO_RPM)	Green (PTO_RPM)

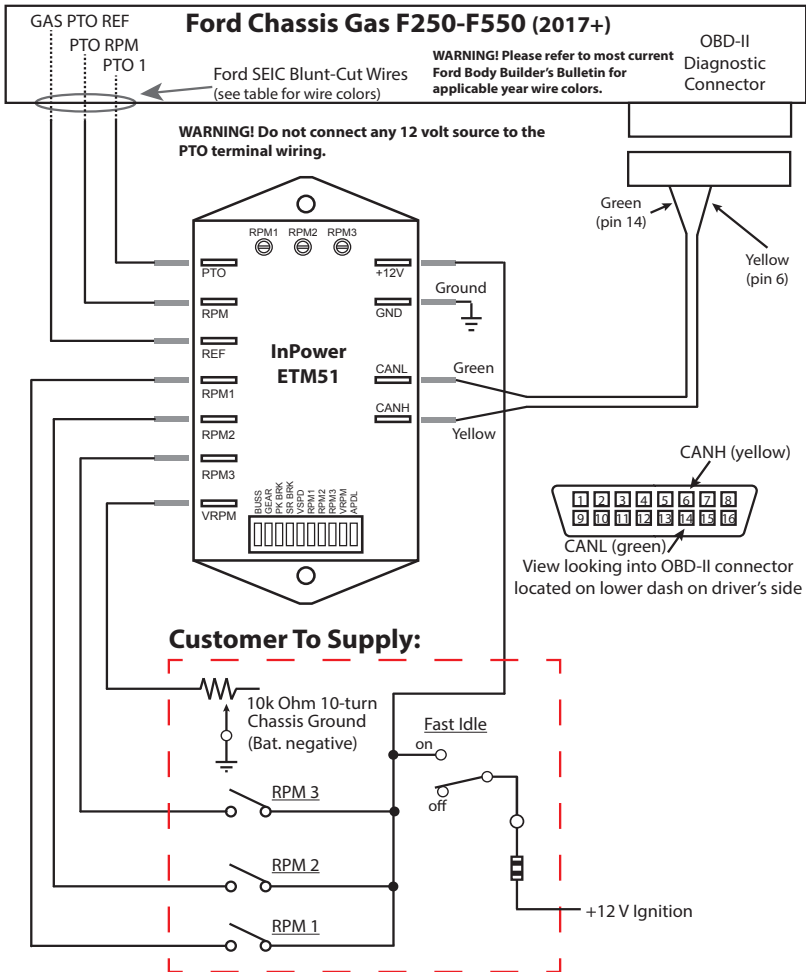
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

F250-550 Series Gas 2005-2016			
Function	2005-2007 F250-F550	2008-2010 F250-F550	2011-2016 F250-F550
PTO_MODE	Orange (PTO_MODE)	Yellow/Green (PTO)	Yellow/Green (PTORS1/PTO_REQ)
PTO_ENGAGE	Orange/White (PTO_Engage)	Blue/Green (PTO_Engage)	Blue/Orange (PTORS2/PTO_EN)
PTO_RPM	Orange/Yellow (PTO_RPM)	Green (PTO_RPM)	Green (PTO_RPM)

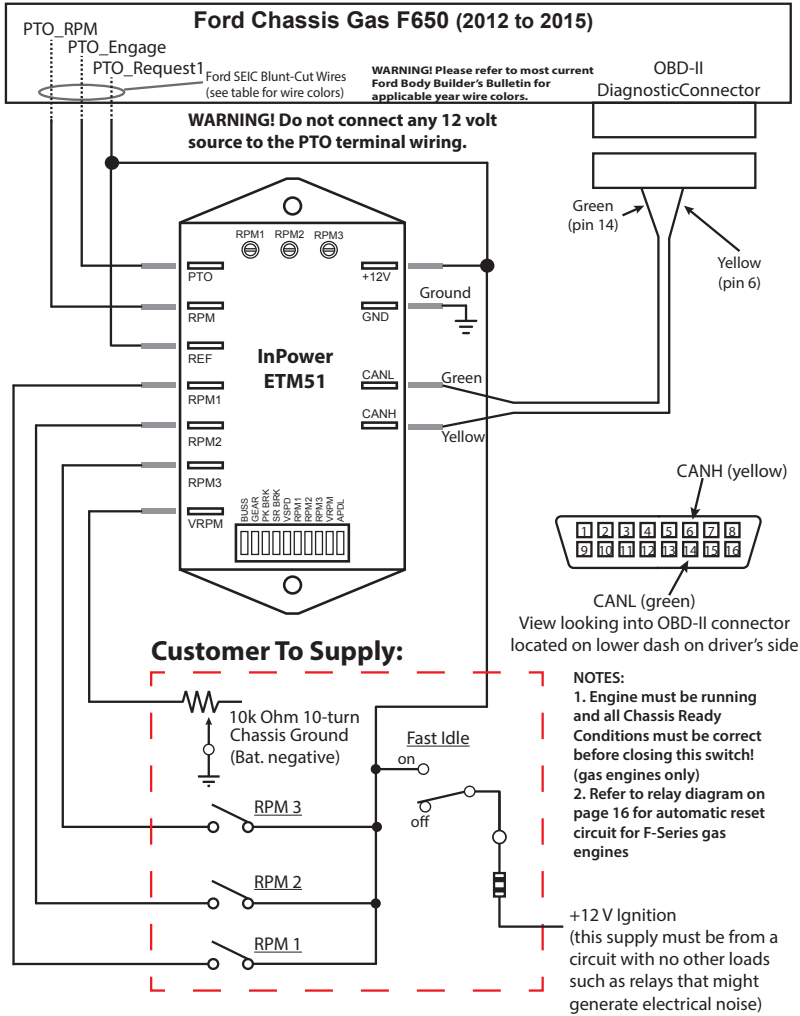
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

F250-F550 Gas Series	
Function	2017+ F250-F550
PTO 1	Yellow/Green (PTO 1)
GAS PTO REF	Yellow/Green (GAS PTO REF)
PTO RPM	Green (PTO RPM)

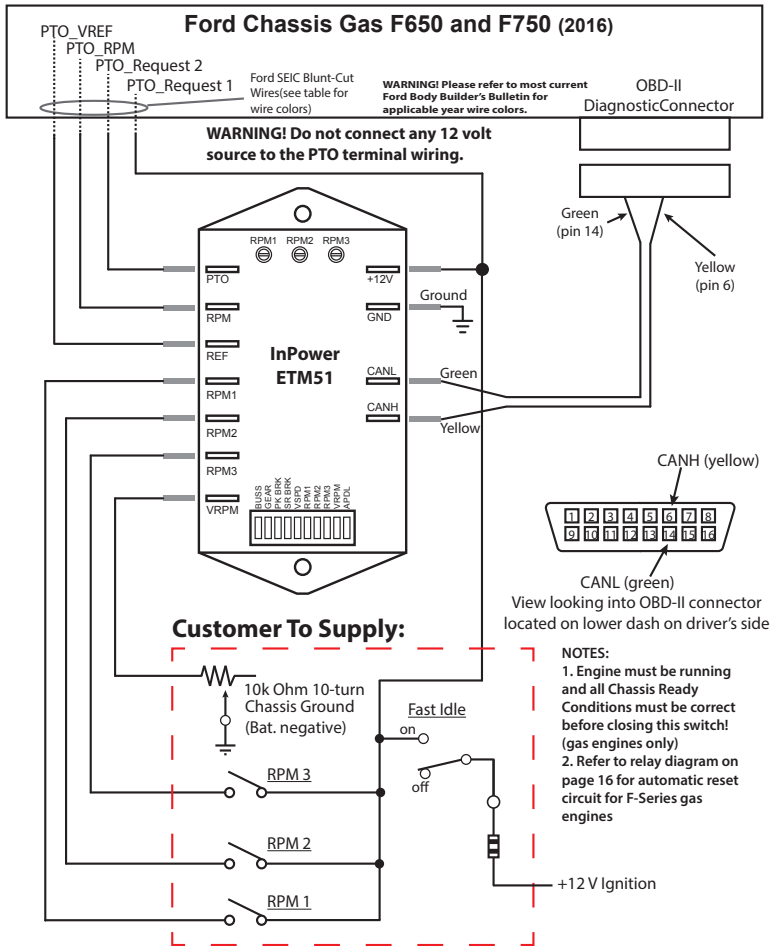
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

F650 Gas Series	
Function	F650 2012-2015
PTO_Request1	Yellow/Green (PTO_Request1)
PTO_Engage	Blue/Orange (PTO_Engage)
PTO_RPM	Green (PTO_RPM)

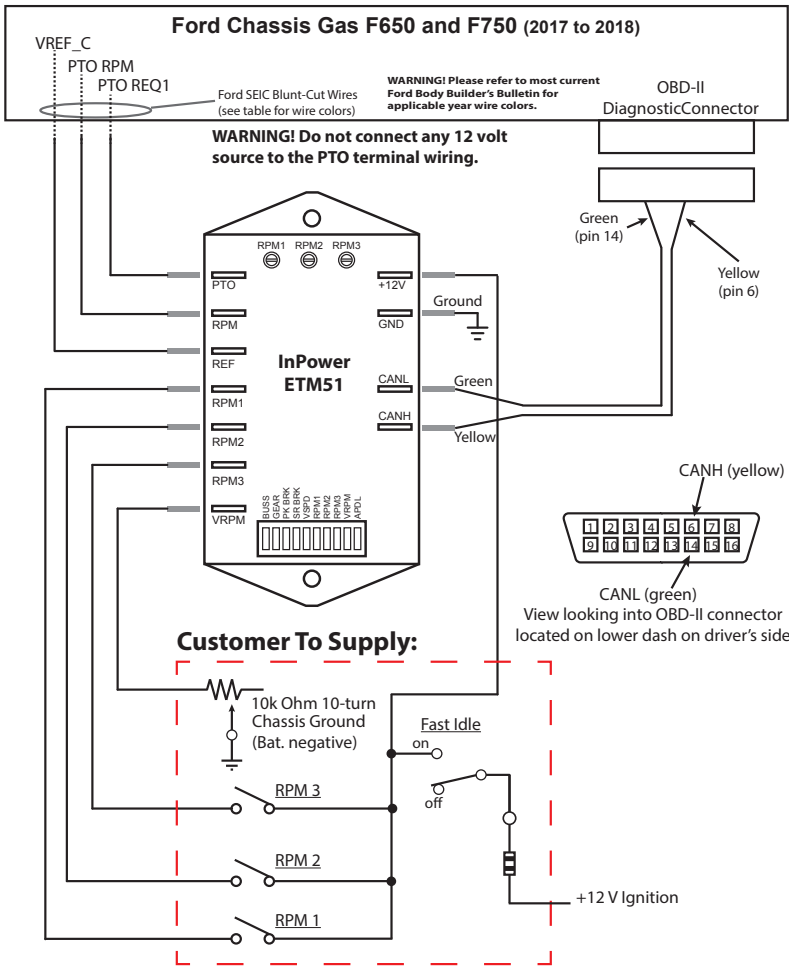
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

F-Series	
Function	2016 F650 & F750
PTO_Request1	Yellow/Green (PTO_Request1)
PTO_Request2	Blue/Orange (PTO_Request2)
PTO_VREF	Yellow/Green (PTO_VREF)
PTO_RPM	Green (PTO_RPM)

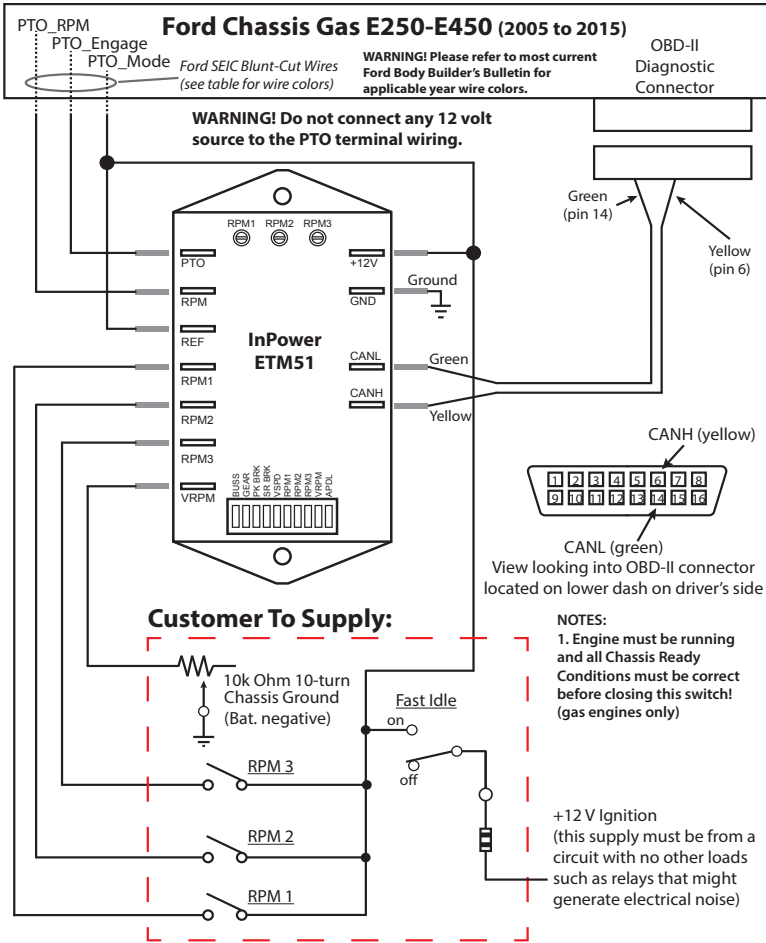
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

F Series	
Function	2017-2018 F650 & F750
PTO REQ1	Yellow/Blue (PTO REQ1)
VREF_C	Yellow/Green (VREF_C)
PTO RPM	Green (PTO RPM)

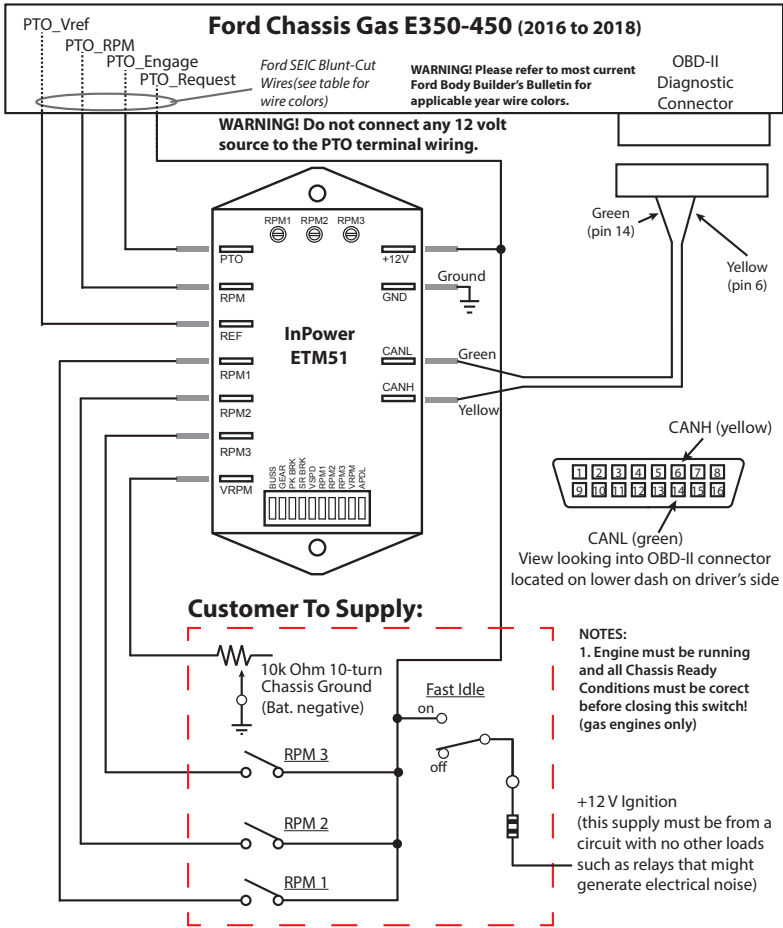
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

Function	E Series	
	E250-E450 2005-2008	E250-E450 2009-2015
PTO_Mode	Orange (PTO_Mode)	Yellow/Green (PTO_Request)
PTO_Engage	Orange/White (PTO_Engage)	Blue/Green (PTO_Engage)
PTO_RPM	Orange/Yellow (PTO_RPM)	Green (PTOIR)

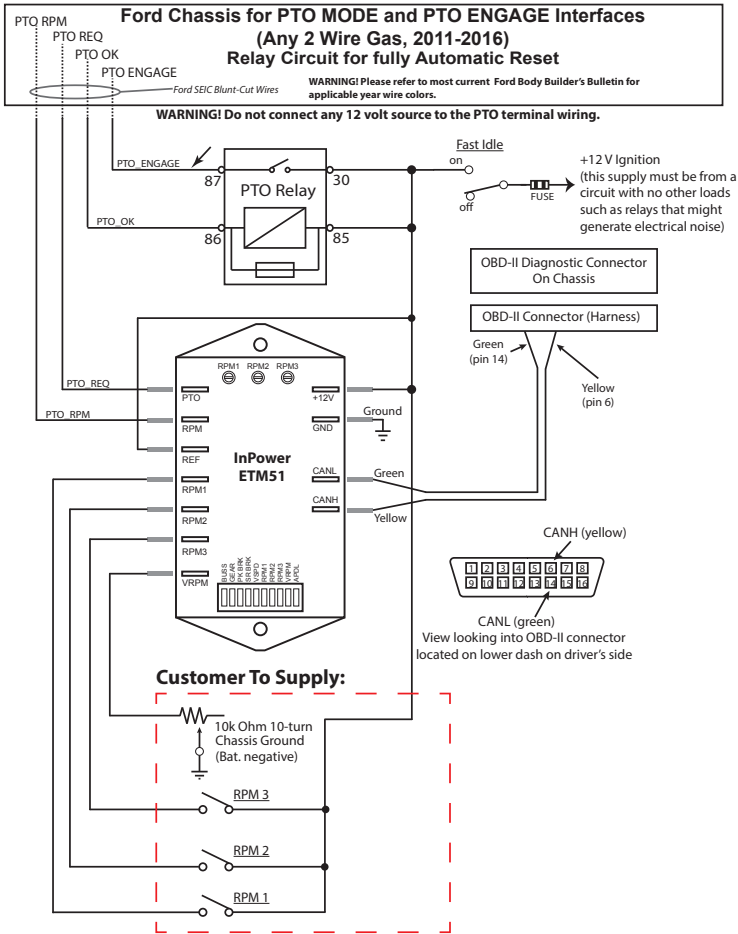
Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

E Series	
Function	2016 + E350-450
PTO_Request	Yellow/Green (PTO_Request)
PTO_Engage	Blue/Green (PTO_Engage)
PTO_Vref	Green/Violet (PTO_Vref)
PTO_RPM	Green (PTO_RPM)

Gas Engine Chassis Wiring Diagram



Ford SEIC Wire Color Chart

F250-F550 Gas Series	
Function	2011-2016
PTO_RPM	Green (PTO_RPM)
PTO_REQUEST	Yellow/Green (PTORS1/PTO_REQ)
PTO_OK	Blue/White (PTO_OK)
PTO_ENGAGE	Blue/Orange (PTORS2/PTO_EN)

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