



**REMOTE ENGINE THROTTLE
MODEL: ETA400**



**ETA500 FIELD
PROGRAMMING
UNIT**



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INTRODUCTION

Overview

The **infinityPRO** series of remote engine throttles use optical technology. There is no potentiometer, electromechanical switch, or mechanical stop. The engine RPM control signal will be set at idle when power is applied regardless of the control knob position.

The throttle uses an Infrared Encoder (IRE) to detect the direction and speed of the control knob when it is rotated. The electrical signal from the encoder is interpreted by the microprocessor and the engine RPM control signal is adjusted. The **infinityPRO** will respond to how fast the control knob is rotated and will increase or decrease the engine RPM proportionally.

Pressing the idle button immediately sets the engine RPM to idle.

The **infinityPRO** is programmed to interface with a specific type of engine. It can be preprogrammed from the factory or programmed at installation as required with an FRC field programming unit.

Features

- Always Starts From Idle RPM
- No Mechanical Stops
- Senses How Fast the Control Knob is Rotated
- Interlock Signal Recognition
- Provides Throttle Enable Signal
- Idle Button
- Field Programmable for Engine Type
- Multiple Remote Throttles (Optional)

FIELD PROGRAMMING UNIT

The **infinityPRO** is programmed to interface with a specific type of engine. It can be preprogrammed from the factory or programmed in the field for some engines as required.

The FRC programming unit (P/N ETA500) can be used to check or program the **infinityPRO** for the following engine types.

<u>MODEL</u>	<u>ENGINE</u>	<u>PROGRAM CODE</u>
ETA400	Generic	19
ETA401	Cummins IS Series	1
ETA402	Detroit Diesel (Series 50 and 60)	2
ETA404-A	Navistar	13
ETA404-D	Navistar MaxxForce	4
ETA405	Caterpillar	5
ETA406-A	Ford 7.3L	6
ETA406-B*	Ford 6.0L, 6.4L	12
ETA407	Mack	7
ETA408-B	Scania P, R, and T series	6
ETA409*	GMC	9
ETA410-A	Mercedes	10

* **Note:** An adapter and cable assembly replaces the basic infinityPRO cable when connecting the throttle to a Ford 6.0 or GMC engine.

The following engine types are not programmable and must be set at FRC.

ETA408-A Scania

ETA410-B Mercedes Euro

ETA418 Iveco

Program Check/Change

1. Connect the programming unit cable to the ETA400 throttle.
2. Press the power button to ON .
3. The throttle programmed model number will show in the display.
4. Press the IDLE button on the throttle to change the model number and program it for the correct engine.
5. Press the power button to OFF and disconnect the throttle.

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INSTALLATION

There are three screws in the knob. One slotted head screw is the detent adjustment for the knob and is set at the factory. This screw should not be adjusted in the field. The two socket head set screws are used to secure the control knob on the outer shaft.

Refer to Figure 1 for component nomenclature and dimensions.

Tools Required

Drill Motor (with 7/8" bit)

3/32 Inch Hex Wrench

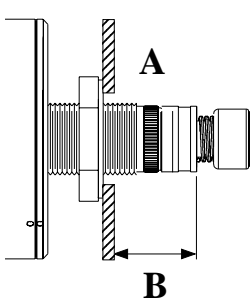
1-1/8 Inch Open End Wrench

Pre-Installation

1. Mark location for mounting hole. (The decal supplied with the infinityPRO is 3.25-in. high by 3-in. wide. Allow for clearance around the mounting hole location.)
2. Drill a **0.875" (7/8")** diameter hole in mounting surface.
3. Remove control knob by loosening two set screws.
4. Remove outer nut from nipple.

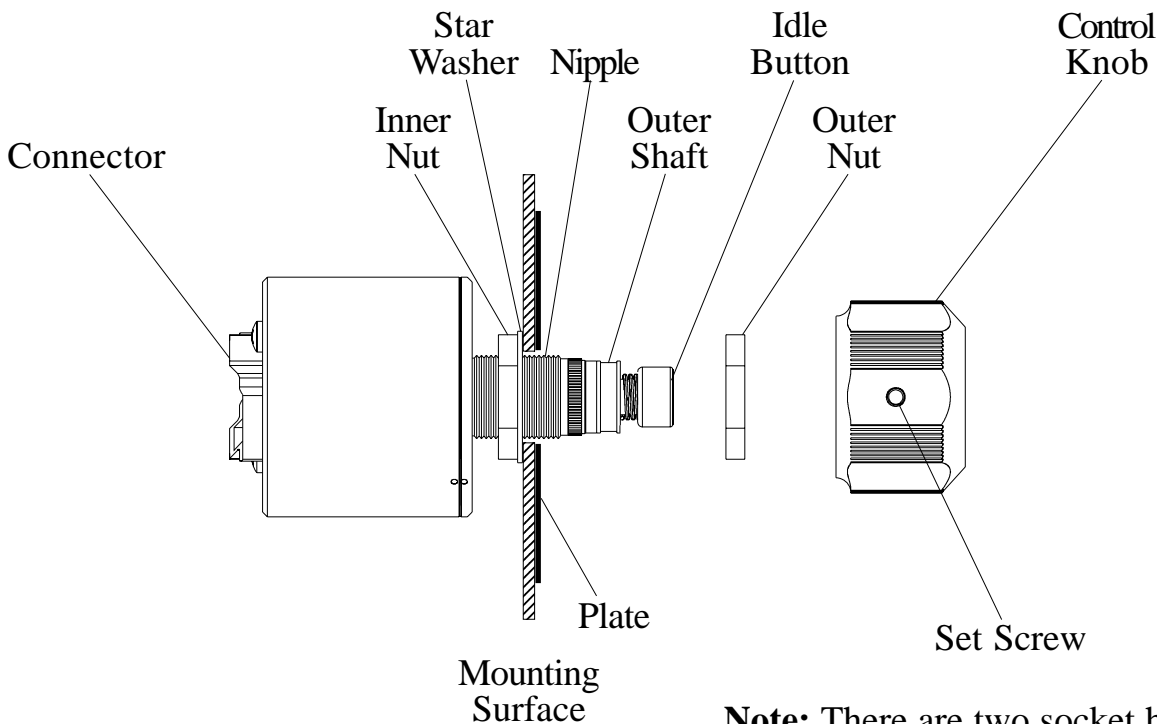
Install Remote Throttle

1. Set inner nut and star washer to allow 0.85-inch (approximately one thread) to be exposed after outer nut is tightened.
2. Install InfinityPro plate, install and tighten outer nut.
3. Slide control knob over idle button and onto outer shaft. Ensure that there is clearance between the back of the knob, nut, and mounting surface. (The knob should spin freely.) If there is any rubbing, reset the position of both nuts per step 1.
4. Tighten two socket head set screws.
5. Connect cables. (Refer to Wiring section.)



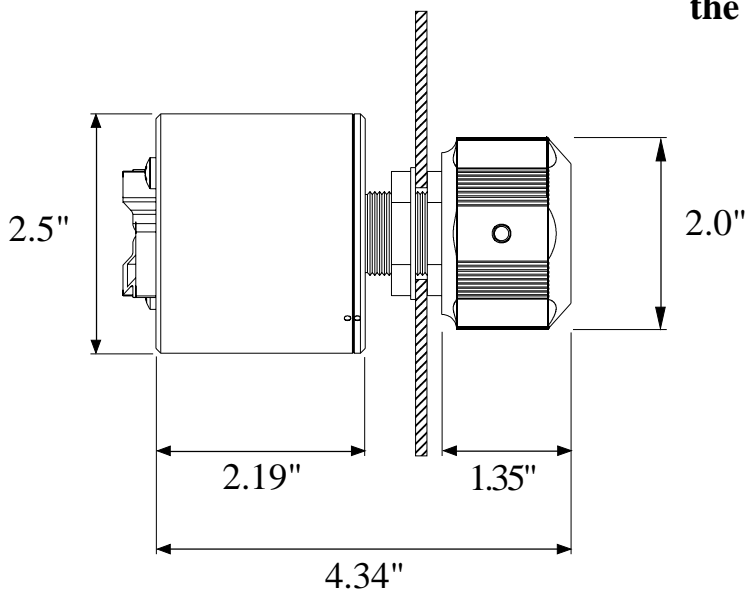
A
Drill a 0.875" hole in the mounting surface.

B
Position the inner nut so that this dimension is 0.85". This will leave approximately one thread exposed after the outer nut is tightened.



Note: There are two socket head set screws 120° apart that hold the control knob on the outer shaft.

Do not adjust the slotted head screw.



Note: The panel decal for the infinityPRO is 3.25" high by 3" wide.

Figure 1. ETA Nomenclature and Dimensions

OPERATION

The **infinityPRO** throttle will always start from idle when the pump interlock signal is recognized regardless of the control knob position. It will sense how fast the control knob is rotated and increase or decrease the engine RPM proportionally.

If the control knob is rotated quickly; the RPM will change quickly.

If the control knob is rotated slowly; the RPM will change slowly.

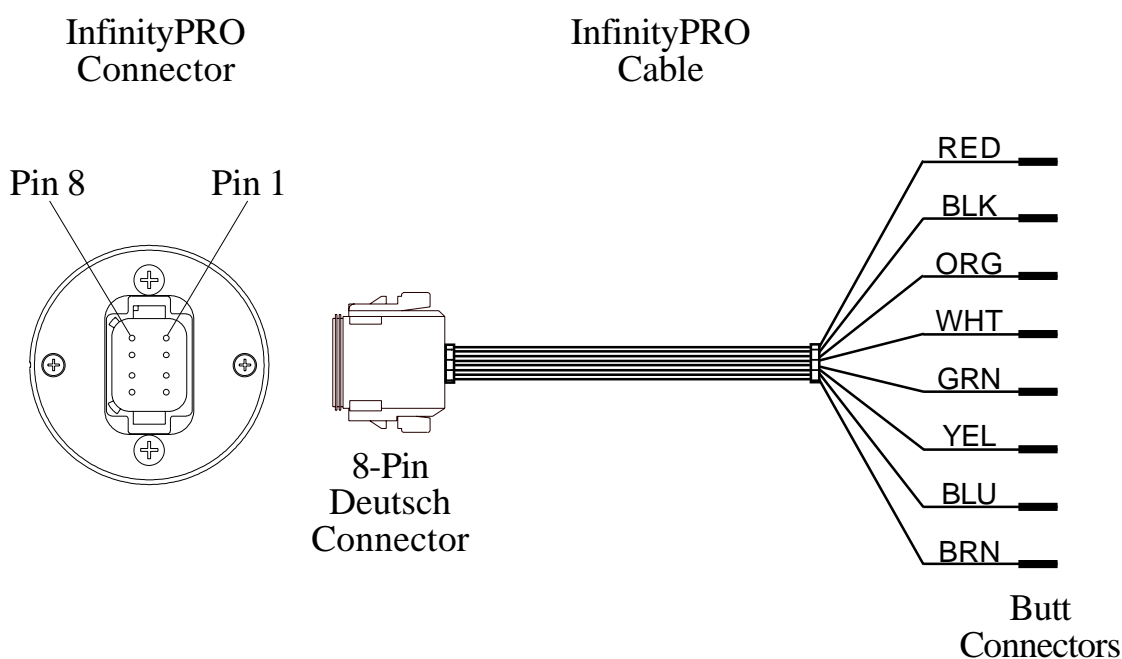
- Rotate the control knob clockwise to increase engine RPM.
- Rotate the control knob counterclockwise to decrease engine RPM.
- Press the red IDLE button to immediately return the engine to idle.

WIRING

The following figures include the schematics, wiring diagrams, block diagrams, and cable for the **infinityPRO** remote throttle.

Connector and Cable

Note: An adapter and cable assembly replaces the basic **infinityPRO** cable when connecting the throttle to a Ford 6.0 or GMAC engine. Refer to the engine specific wiring diagram.



InfinityPRO Connector/Cable		
Pin	Wire Color	Description
1	Red	Supply Voltage (9 - 30 VDC)
2	Black	Ground
3	Orange	+5 VDC Reference From ECM
4	White	Throttle Signal To ECM
5	Green	Signal Return From ECM
6	Yellow	Interlock Input (12 or 24 VDC)
7	Blue	Throttle Enable Signal (or IVS)
8	Brown	Foot Pedal Signal Input

Note: Not all wires are used for all engines. Refer to the engine specific wiring diagram for InfinityPRO interface connections.

Figure 2. ETA Connector and Cable

Cummins Harness Connections

Interface Information

The ECM Remote Accelerator (Throttle) Option has to be set to ON. The diagnostic tool cannot be used to do this, an Insight service tool must be used. Refer to an authorized dealer to program this option.

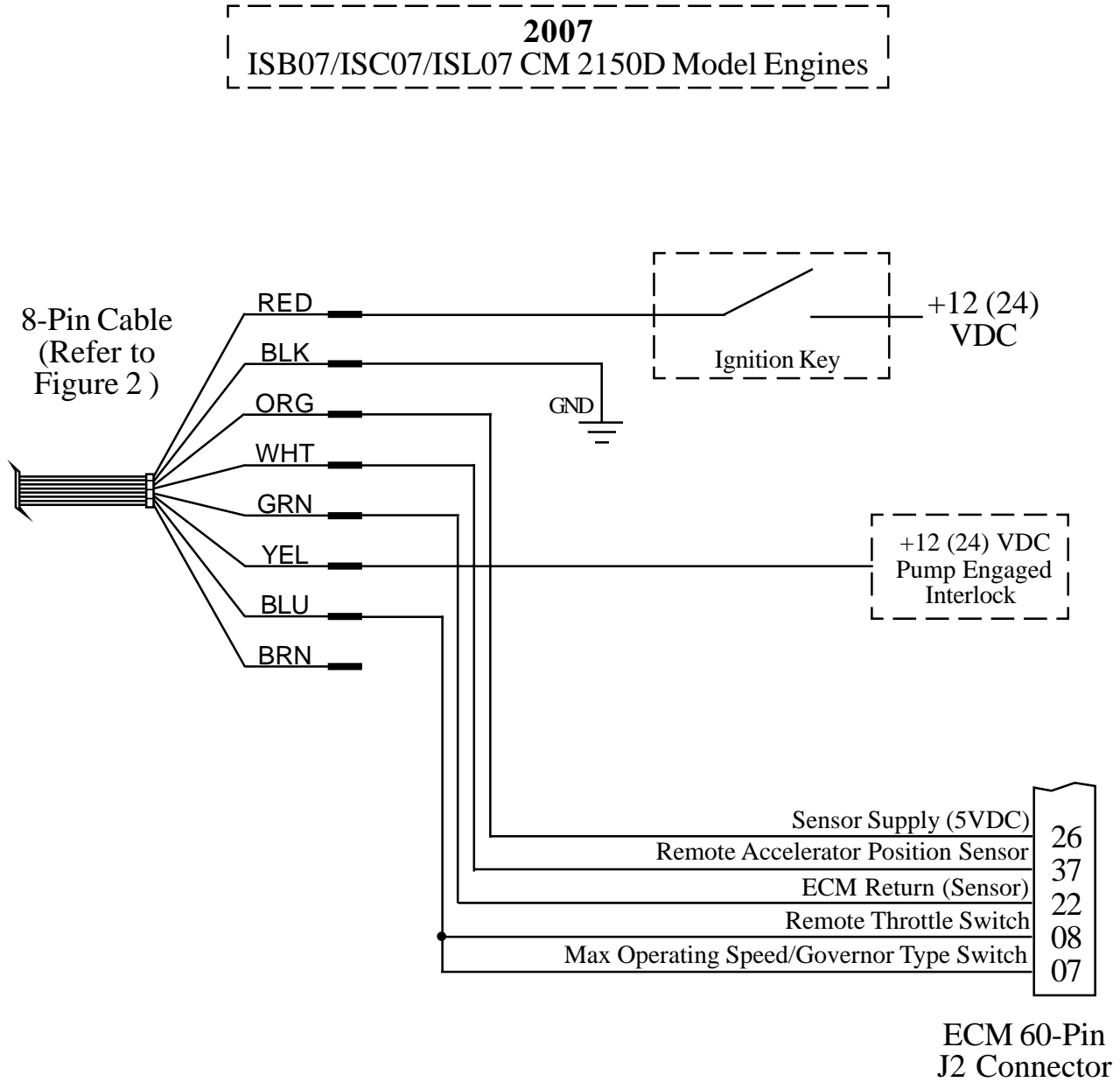


Figure 3. Cummins ETA401 Wiring (Sheet 1 of 2)

2007
 ISM07 CM 876 Model Engines
2004 to 2006
 ISB02/ISC03/ISL03-CM850 Model Engines
 ISM02-CM870 Model Engines

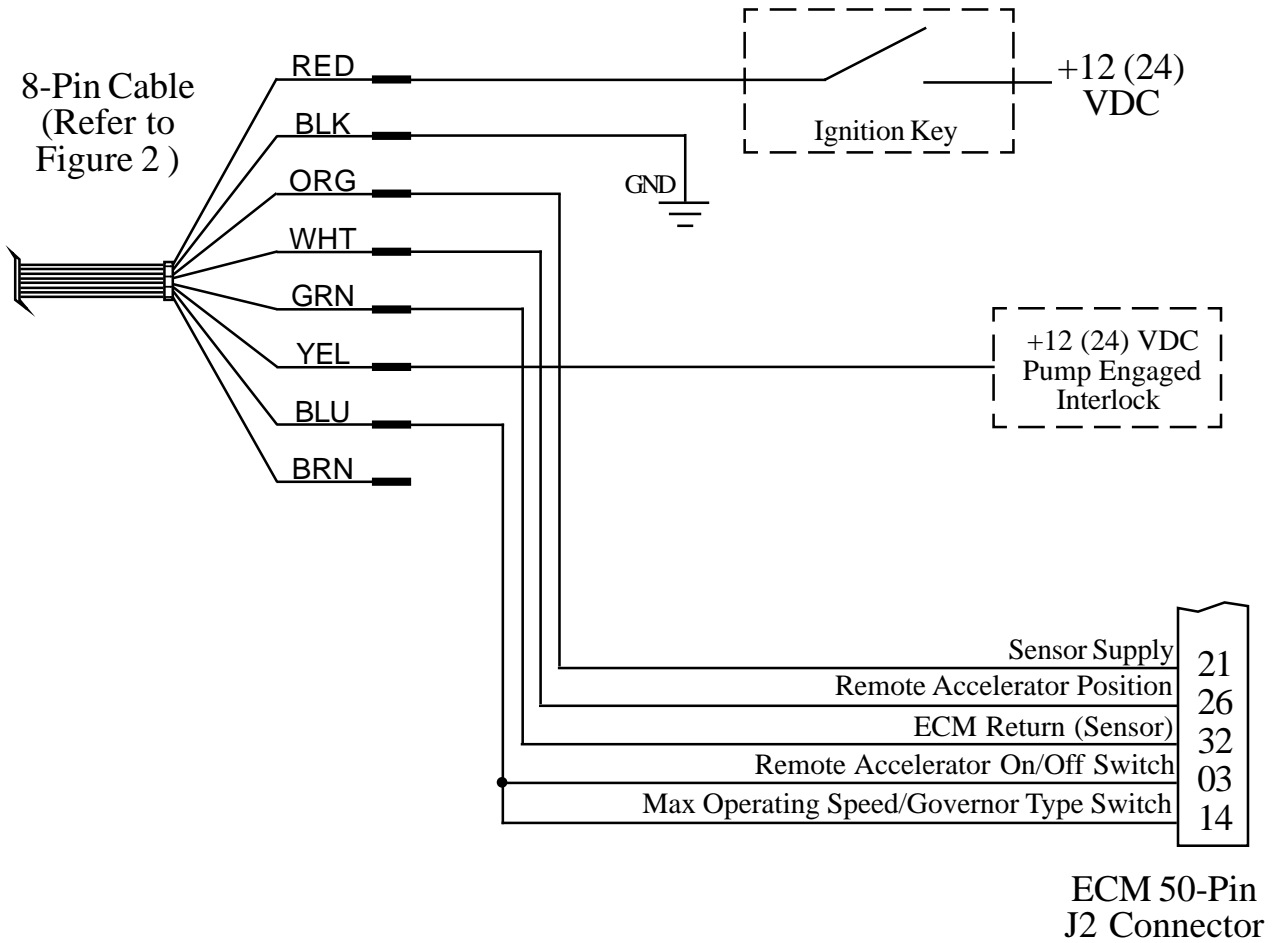


Figure 3. Cummins ETA401 Wiring (Sheet 2 of 2)

Detroit Diesel (Series 50 and 60) Harness Connections

Interface Information

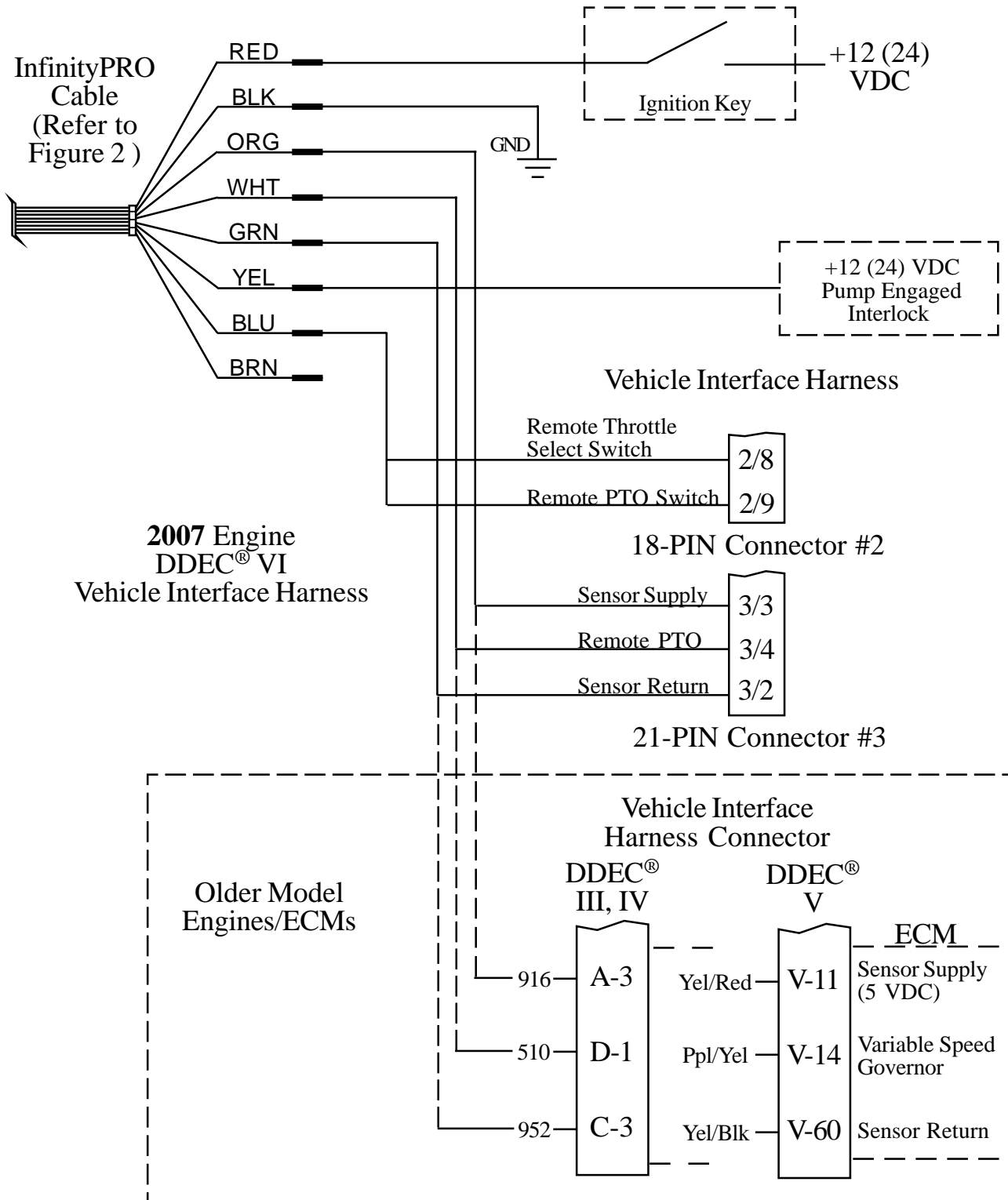


Figure 4. Detroit Diesel (Series 50 and 60) ETA402 Wiring

Navistar Harness Connections

Interface Information

The ECM must be programmed for a remote throttle input. When using code 12VZA or 12VXY, the following parameters need to be set:

- PTO-REMOTE-PEDAL to 1-Yes; PTO-REM-PEDAL-RTZ to 1-RTZ-not;
- PTO-DISABLE-CAB-INTERFACE to 1-Yes; DRIVELINE-MODE to 1

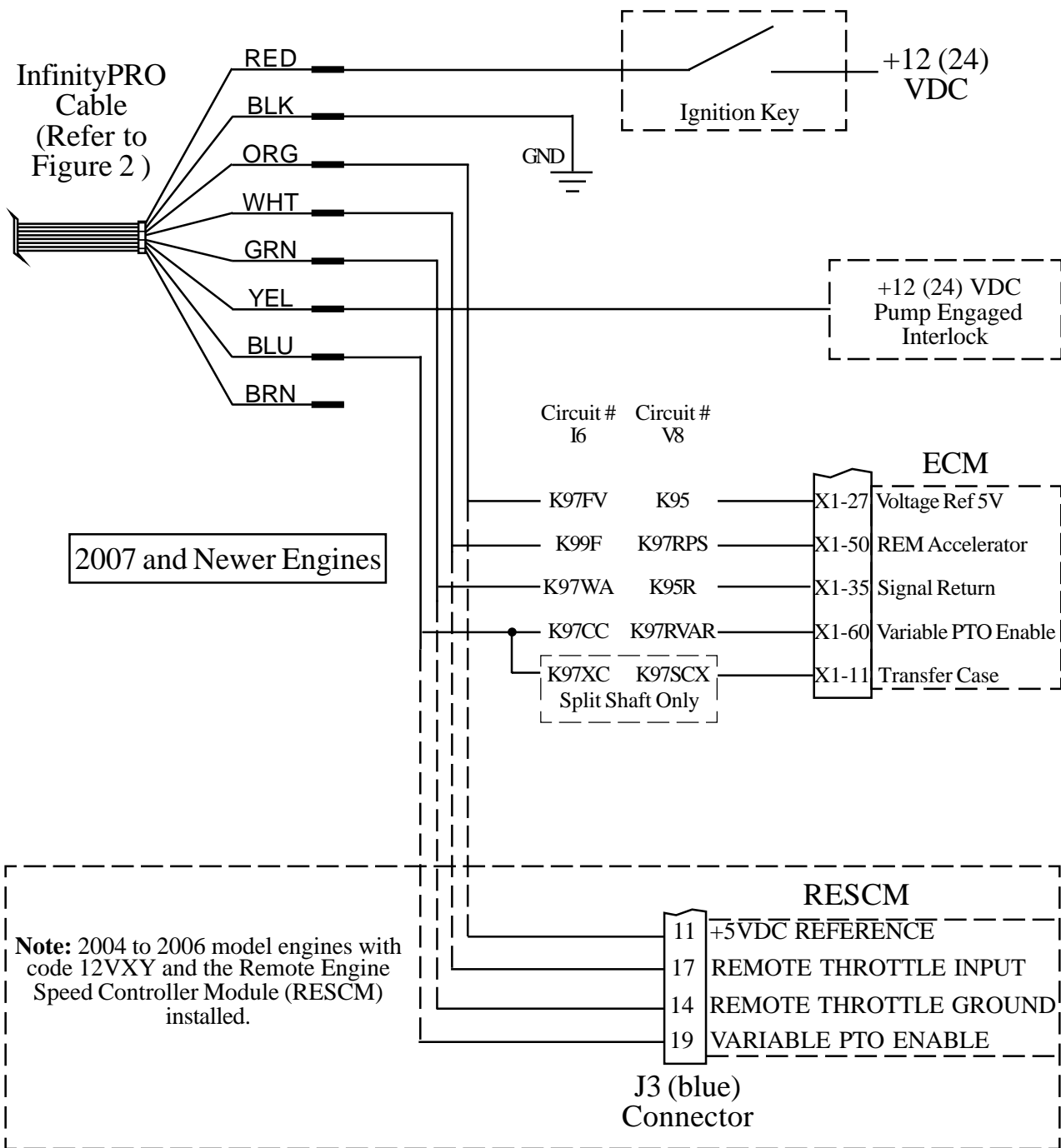


Figure 5. Navistar ETA404 Wiring

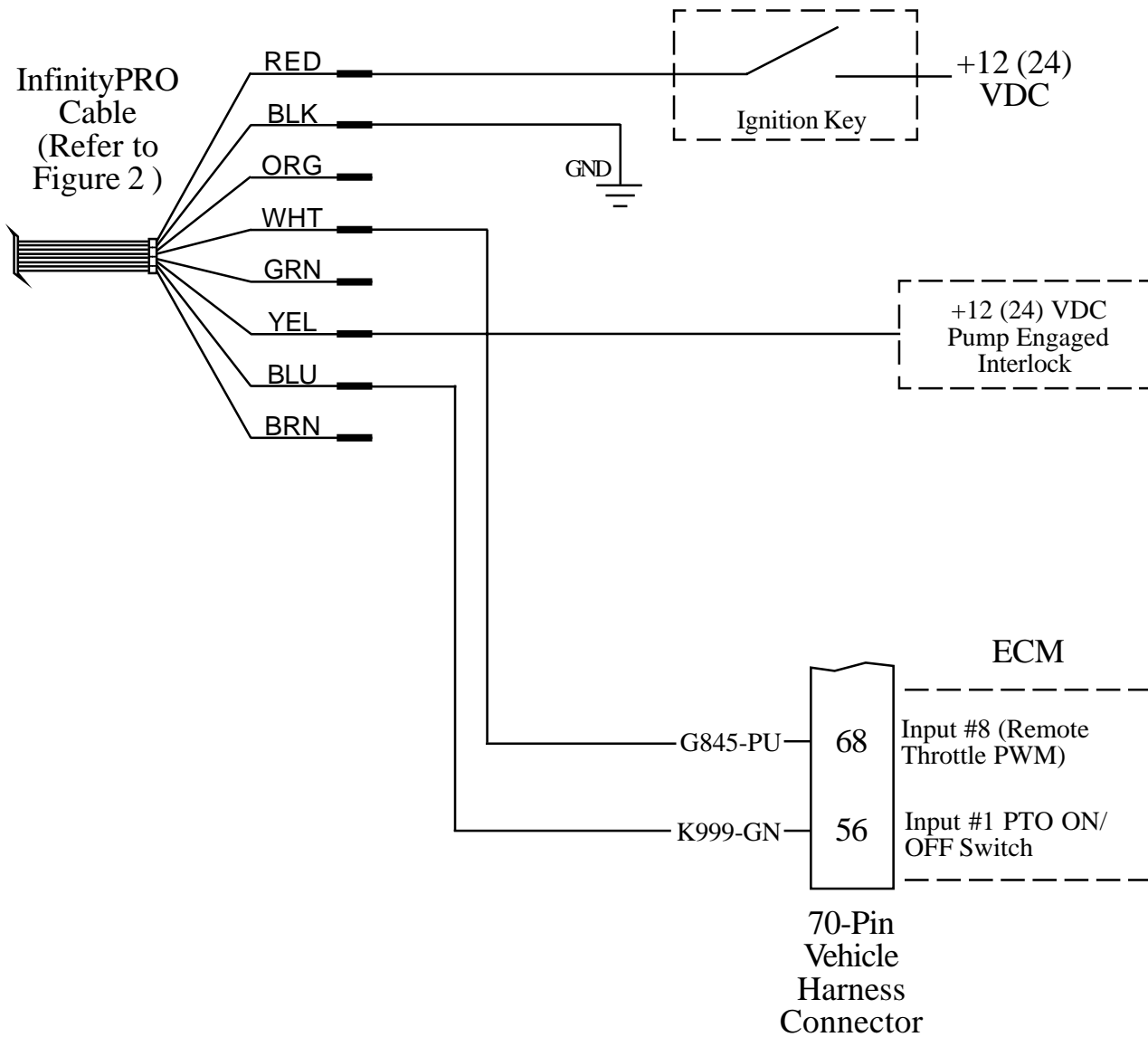
Caterpillar Harness Connections

Interface Information

The ECM Remote Throttle Option has to be enabled. Refer to an authorized dealer to program this option.

C7,C9,C10,C11,C12,C13,C15 Engine Interface

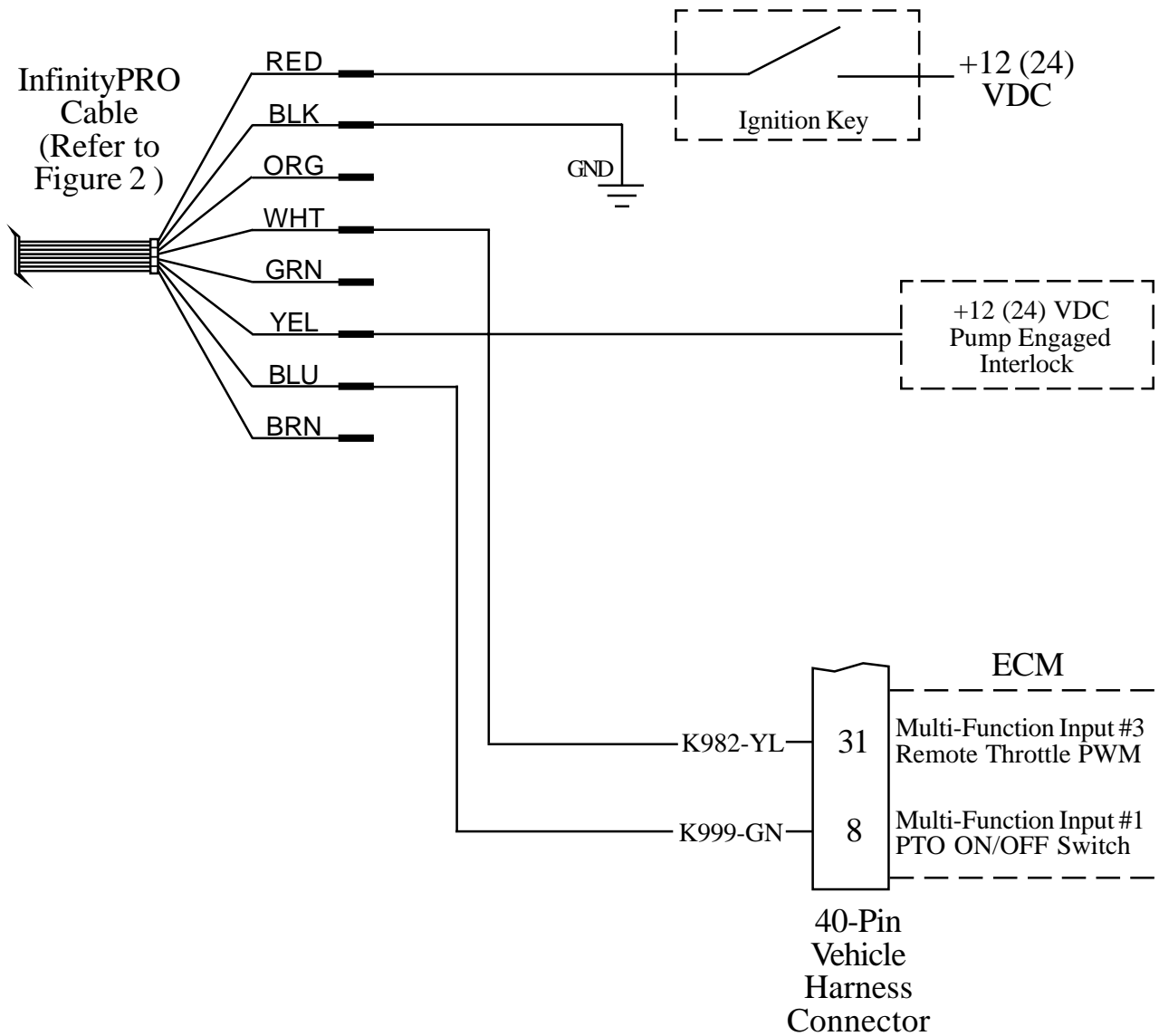
Engines with 70-pin OEM connector.



**Figure 6. Caterpillar ETA405 Wiring
(Sheet 1 of 3)**

C10, C12 Engine Interface

Engines with 40-pin OEM connector.



**Figure 6. Caterpillar ETA405 Wiring
(Sheet 2 of 3)**

Ford Harness Connections

7.3L Power Stroke Engine Interface

The infinityPRO cable needs to be wired to the cab foot throttle harness. Use a voltmeter to determine which pins are 5 V Reference, Idle Validation, and Engine Control Signal.

Idle Validation will be at ground. When the foot pedal is pressed it will rise to 12 VDC.

Engine Control Signal will be 0.6 volts at idle and rise to approximately 2.7 volts as the foot pedal is pressed.

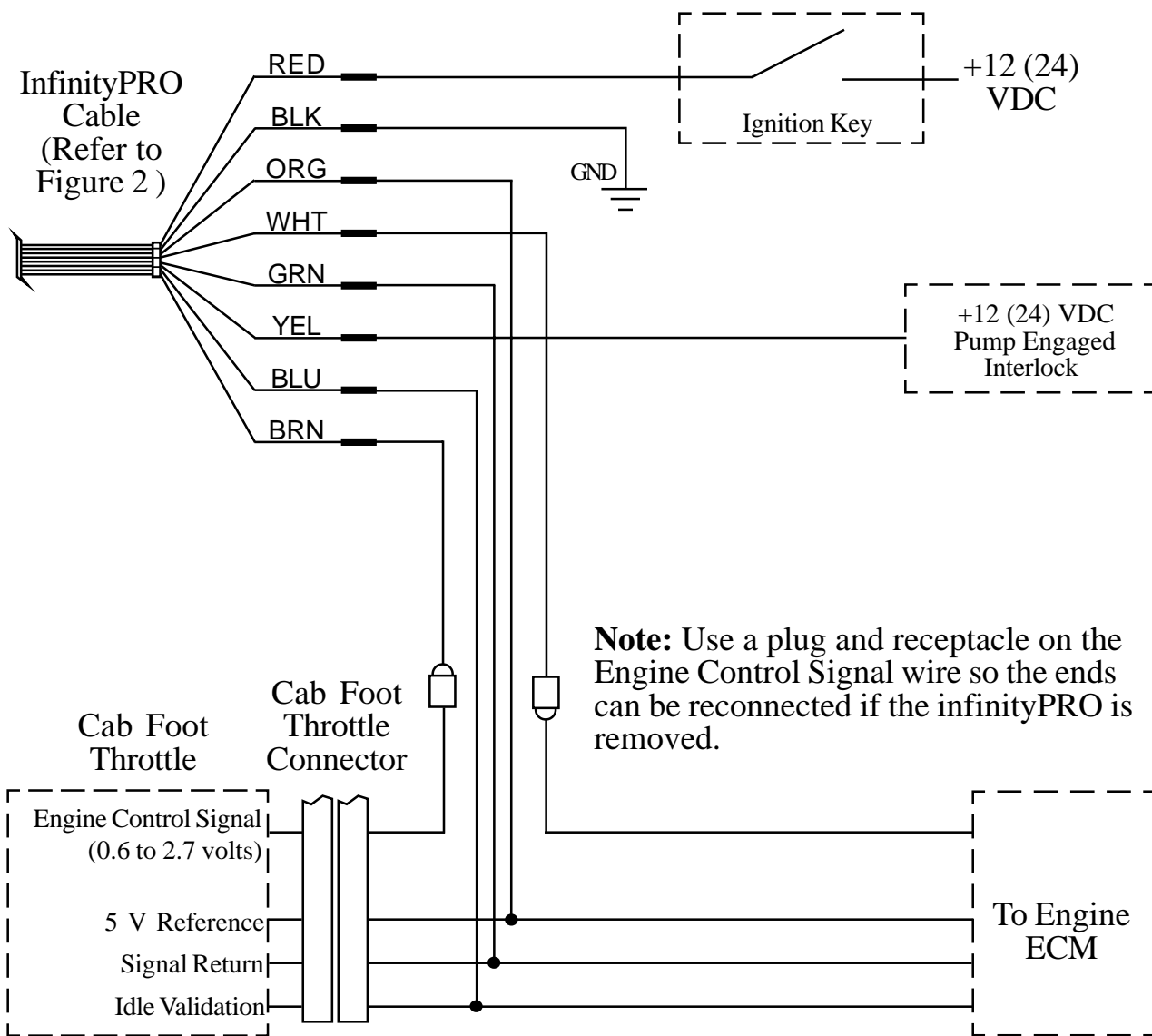


Figure 7A. Ford 7.3L ETA406-A Wiring

6.0L and 6.4L Diesel Engine Interface

An adapter and cable assembly is needed to interface the ETA406-B with the Ford engine. Two 6 pin connectors are provided and need to be spliced into the harness between the cab foot throttle and the ECM.

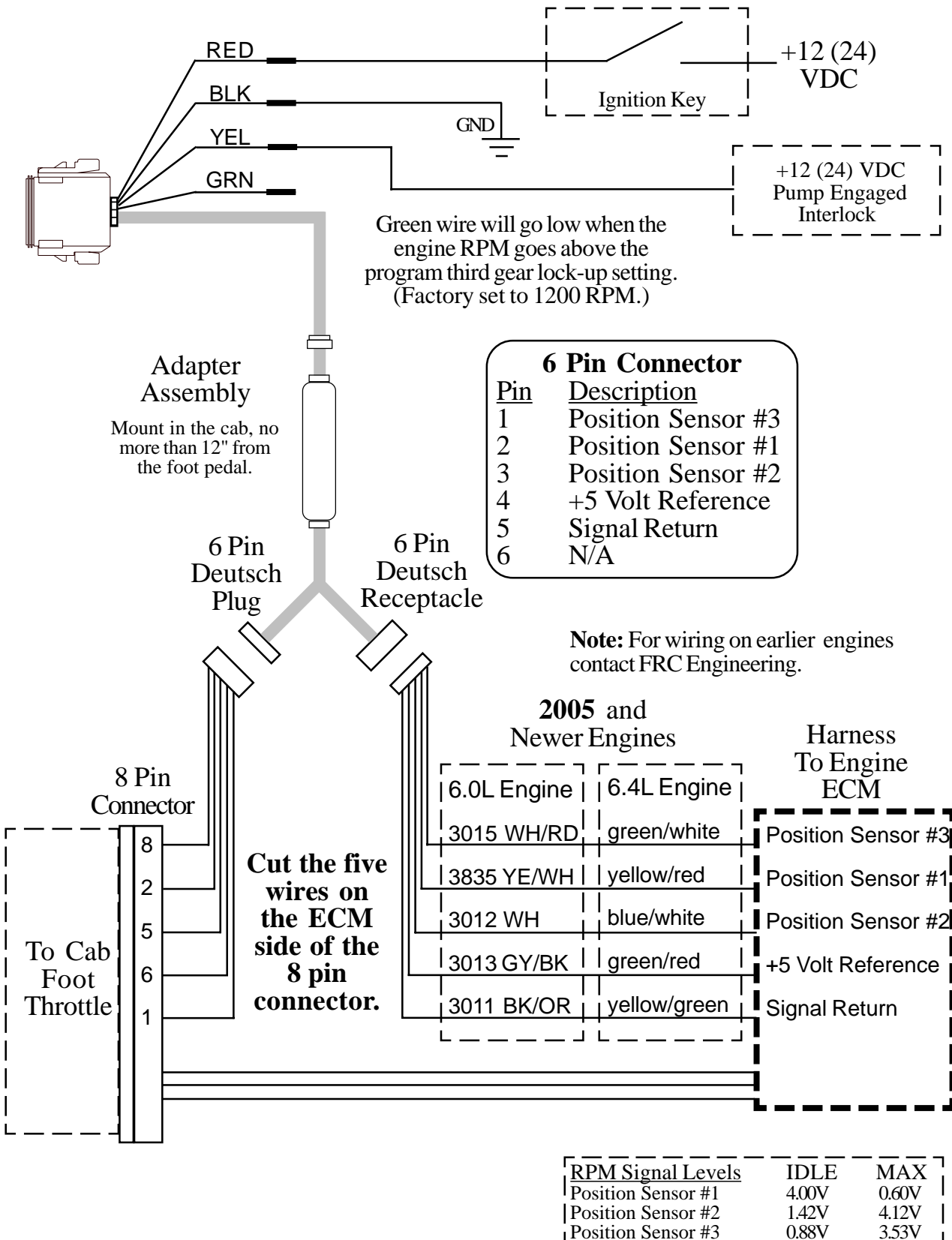


Figure 7B. Ford 6.0L and 6.4L ETA406-B Wiring

Mack Harness Connections

Interface Information

The infinityPRO cable needs to be wired to the cab foot throttle harness. Use a voltmeter to determine which pins are 5 V Reference and Engine Control Signal.

Engine Control Signal will be 0.7 volts at idle and rise to approximately 3.8 volts as the foot pedal is pressed.

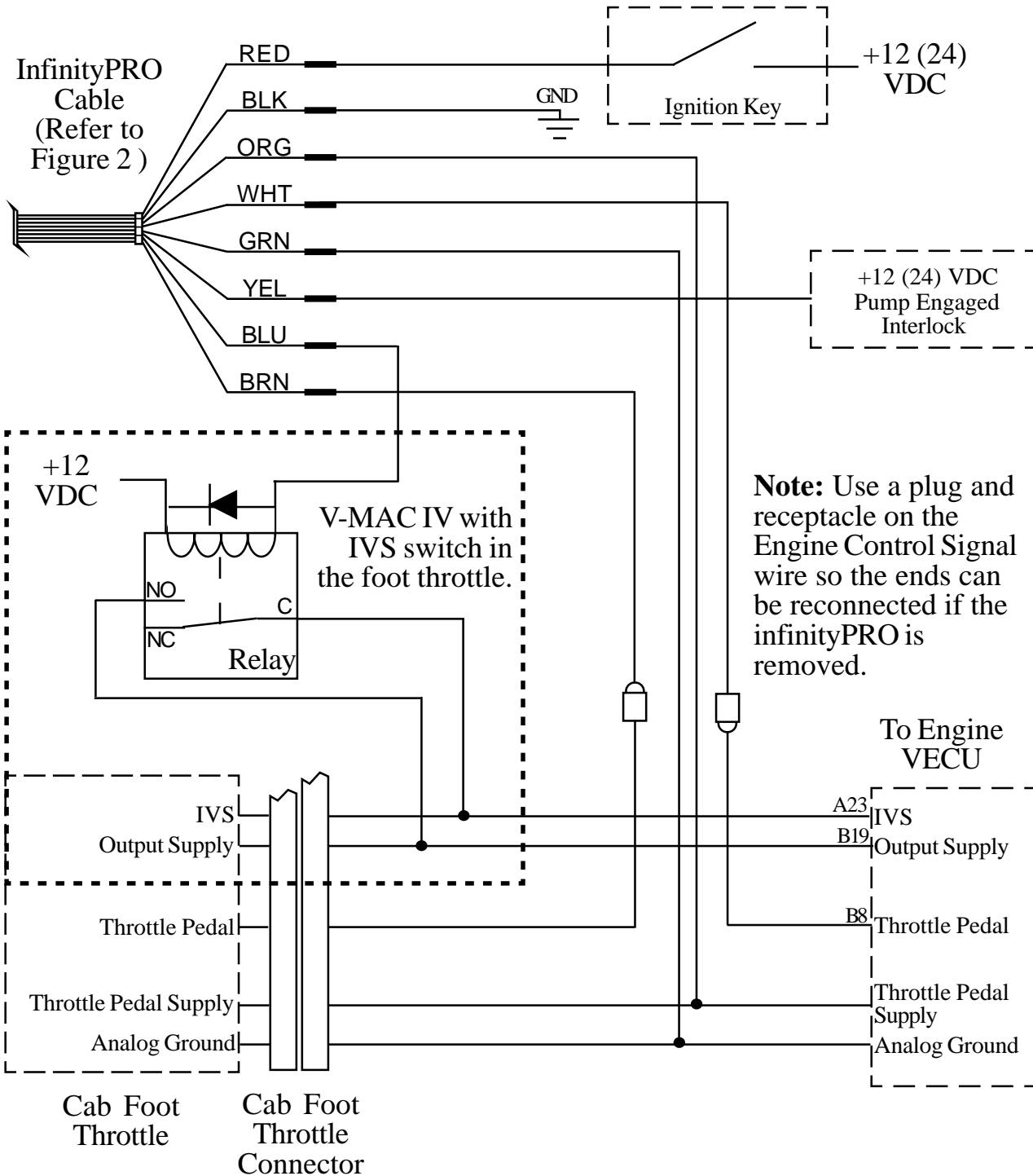


Figure 8. Mack ETA407 Wiring

Scania Harness Connections ETA408-A

Interface Information

The infinityPRO cable needs to be wired to the cab foot throttle harness. Use a voltmeter to determine which pins are 5 V Reference, Idle Validation Switch, and Engine Control Signal.

Idle Validation Switch (white wire) will be at 24 VDC. When the foot pedal is pressed it will drop to ground.

Engine Control Signal will be 0.4 volts at idle and rise to approximately 3.1 volts as the foot pedal is pressed.

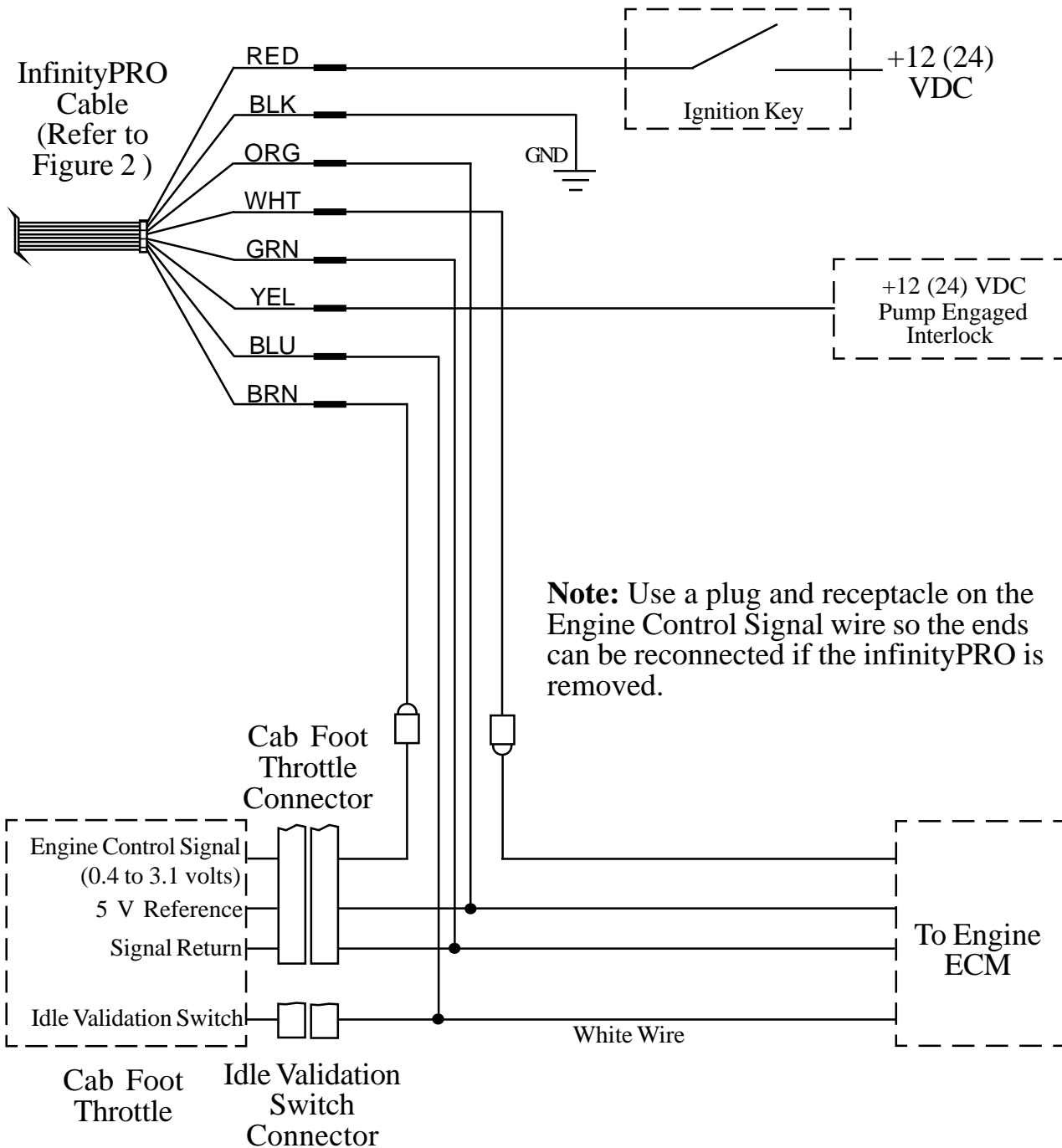


Figure 9A. Scania ETA408-A Wiring

Scania IVS Set Point Adjustment ETA408-A

This procedure is provided as instructions for changing the IVS set point. The set point will establish the voltage level on pin 4 (white wire) that will cause the IVS output at pin 7 (blue wire) to be set to ground.

1. Connect a voltmeter to ETA408 pin 4 (white wire) to monitor the Engine Control Signal output voltage level from the ETA408 to the ECM.
2. Have the engine running and the pump engaged interlock circuit closed.
3. Press and hold the IDLE button, wait for 10 seconds.
4. Hold the IDLE button in and rotate the control knob to obtain the desired output voltage level at pin 4.
5. Release the IDLE button to store the new IVS set point in the memory.

Scania Harness Connections ETA408-B

Interface Information

For use on P, R, and T-series trucks equipped with a bodywork control unit (BWS). Connector C259 is available on all vehicles ordered with any of the bodywork options. It is located on the plate for the electrical bodywork interface for body builders. Connector C259 is white and has 21 pins. (February 2005 and newer.)

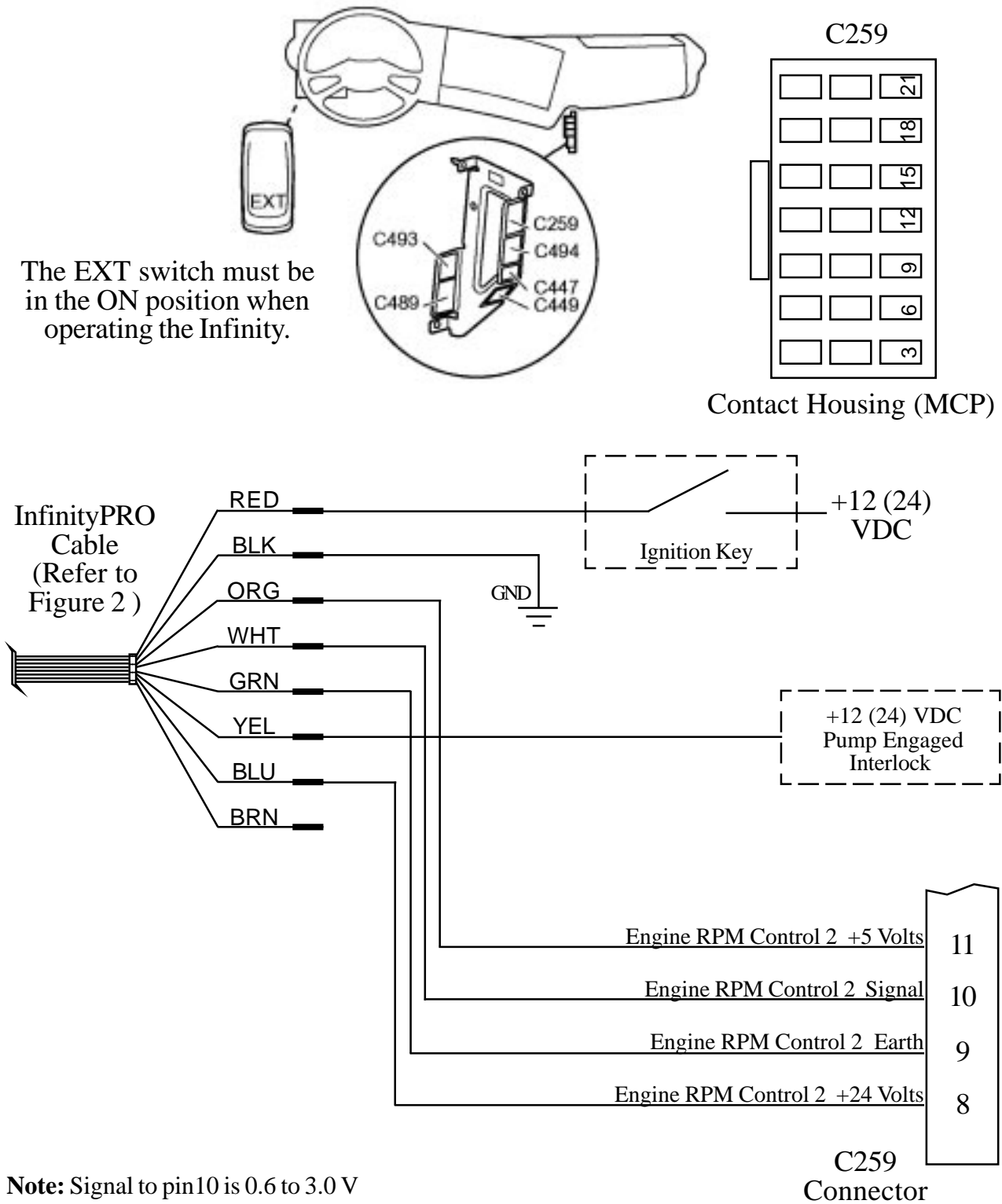


Figure 9B. Scania ETA408-B Wiring

GMC Harness Connections

Interface Information

An adapter and cable assembly is needed to interface the ETA409 with GMC engines. There are multiple types available for diesel or gas in variations that depend on the model and year of the engine.

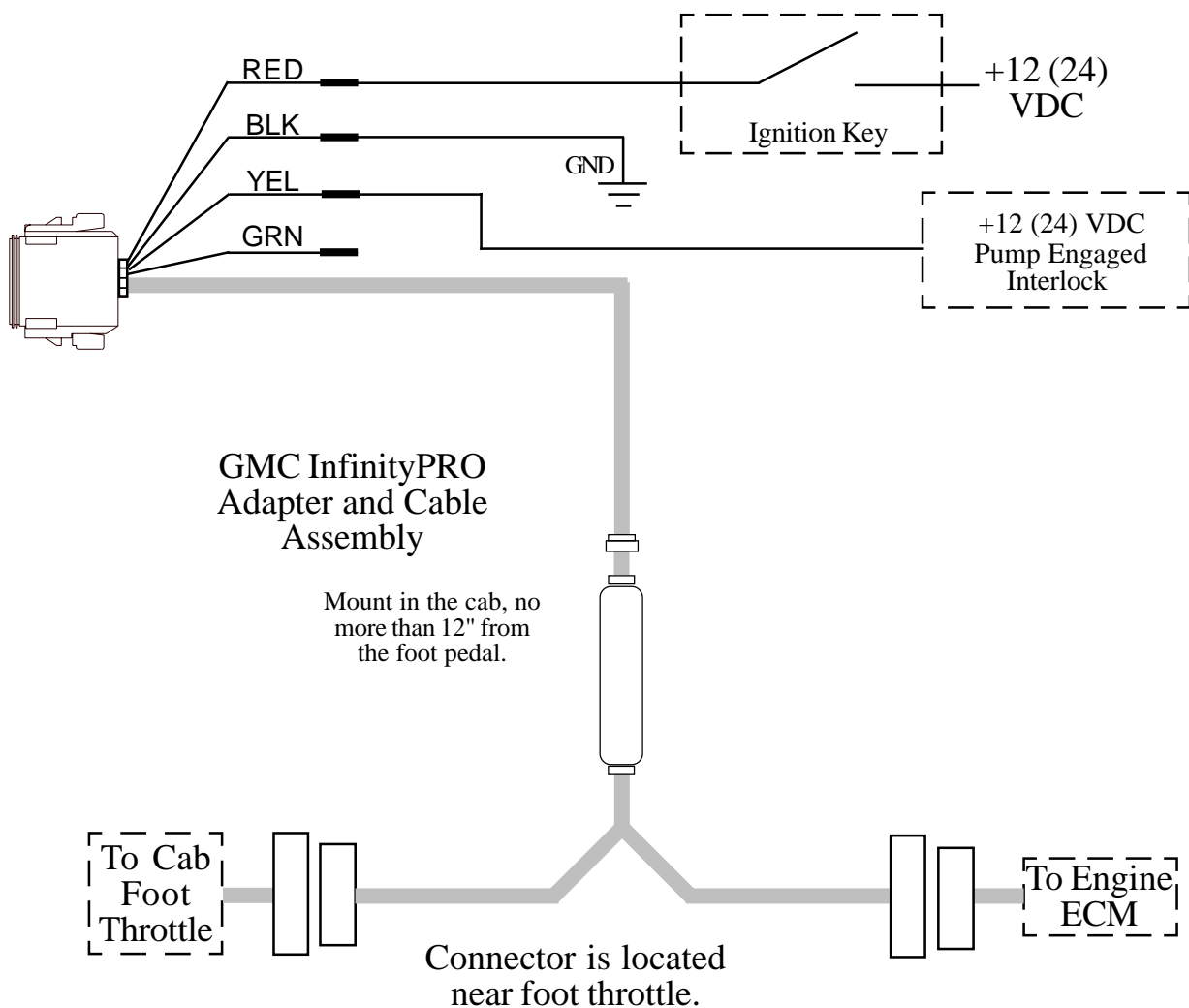


Figure 10. GMC ETA409 Wiring

Mercedes Harness Connections

ETA410-A Interface Information

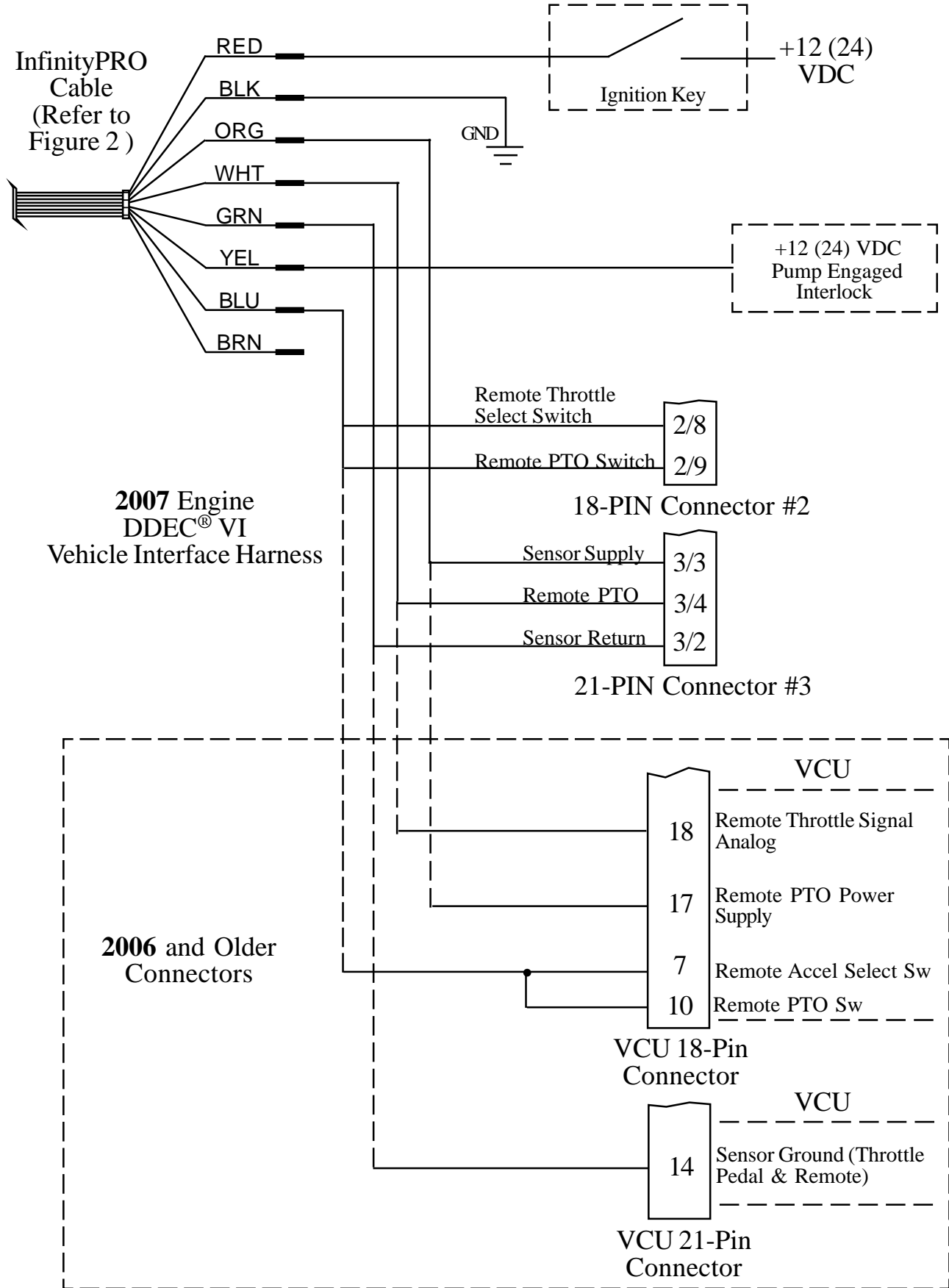


Figure 11A. Mercedes ETA410-A Wiring

ETA410-B Euro Version Interface Information

It is required that parameter 500 output from the manual throttle actuator speed has YES stored as a parameter.

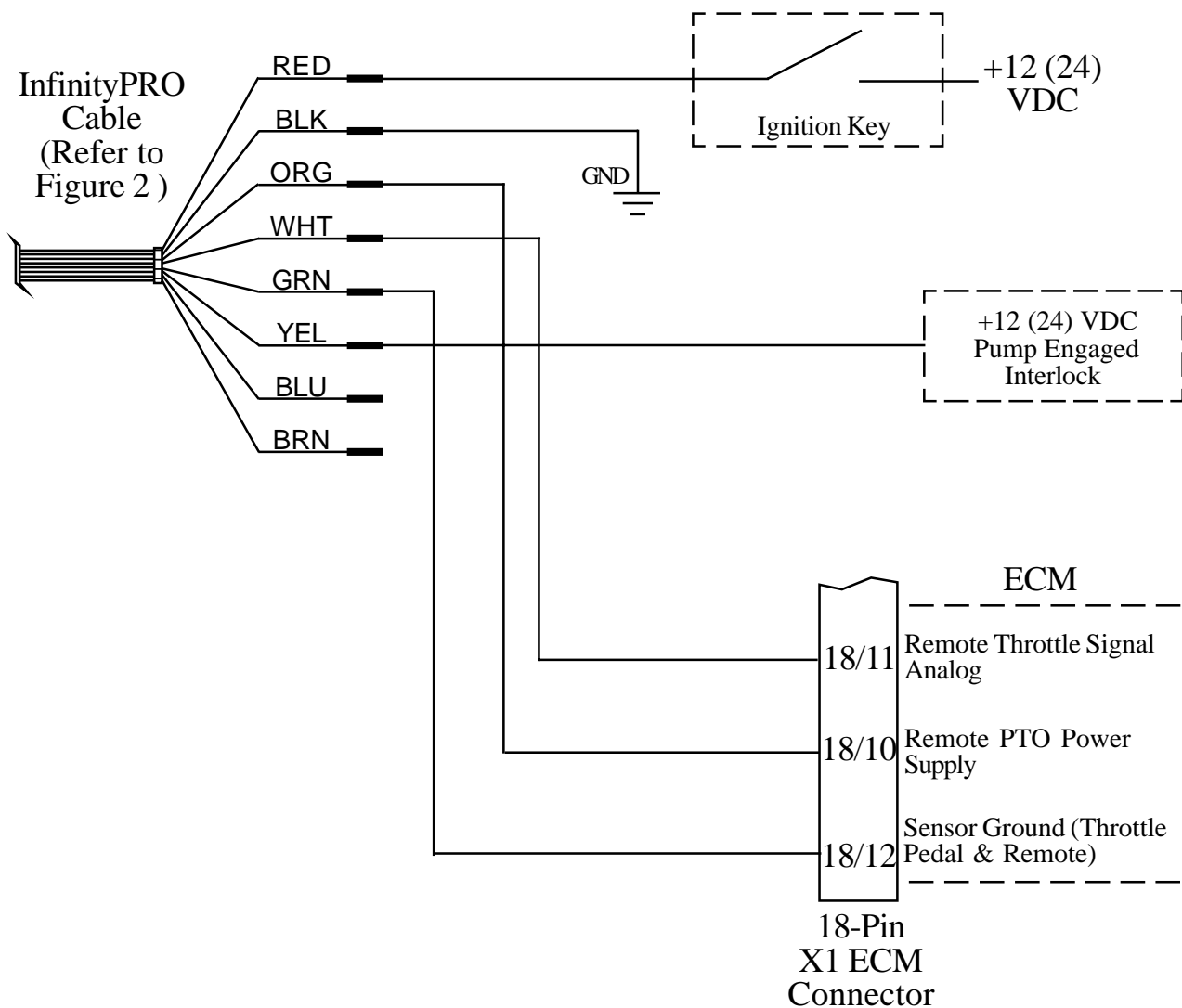


Figure 11B. Mercedes ETA410-B Wiring

Iveco Harness Connections

Interface Information

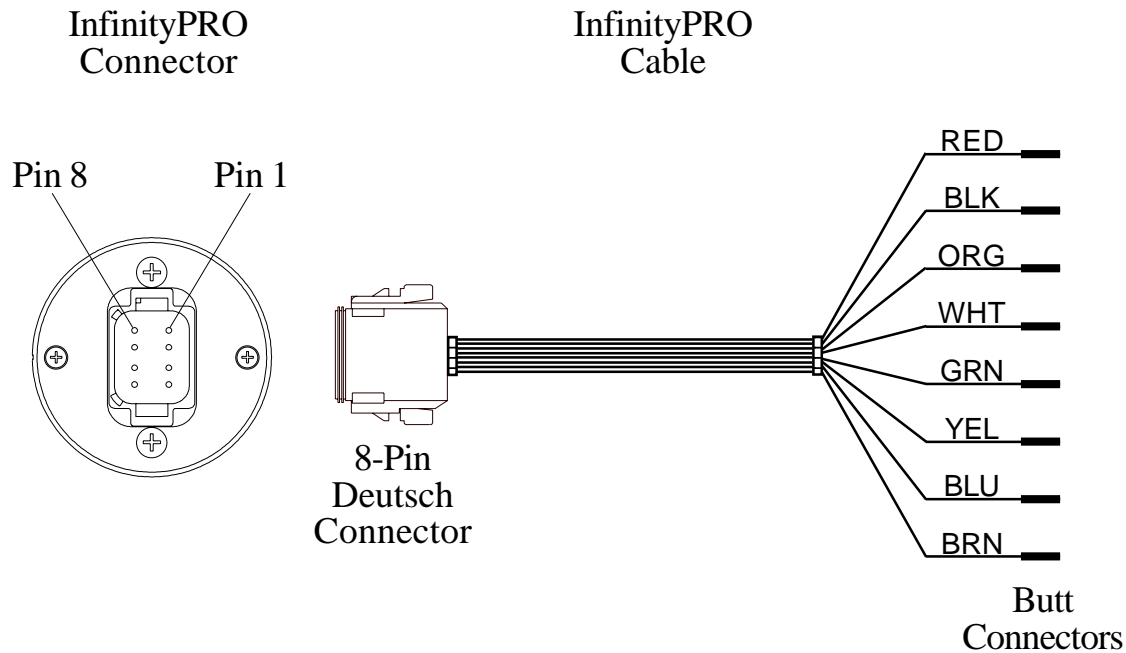
Programming by IVECO service is not required

Enable EDC mode-3 when throttle is active.

(Use external relay to short pin 19 to pin 16 on 20-Way Connector.)

Default setting in EDC mode-3 are:

Min\Max RPM	1900\700
RPM ramp rate	250RPM/s
TAP function	Enabled.



InfinityPRO Connector/Cable for Iveco Engine			
<u>Pin</u>	<u>Wire Color</u>	<u>Description</u>	<u>To 20-Way Connector</u>
1	Red	Supply Voltage (+12/24 VDC)	Pin 3
2	Black	Supply Ground	Pin 9
3	Orange	N/C	
4	White	SET + Output To ECM	Pin 14
5	Green	Ground	Pin 9
6	Yellow	Interlock Input (Supply +12/24 VDC to Activate Throttle)	
7	Blue	SET - Output To ECM	Pin 13
8	Brown	N/C	

Figure 12. Iveco ETA418 Wiring

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OPTIONAL MULTIPLE REMOTE THROTTLES

A throttle that is to be used for multiple throttle configurations will have a short cable adjacent to the 8-pin Deutsch connector. This is the datalink cable and is used to interconnect the primary remote throttle to any secondary remote throttles.

The primary remote throttle 8-pin Deutsch connector cable is for wiring to power, interlocks, and the engine interface. Refer to the engine specific wiring diagram for interface connections.

All secondary remote throttle 8-pin Deutsch connector cables are only wired to power and ground.

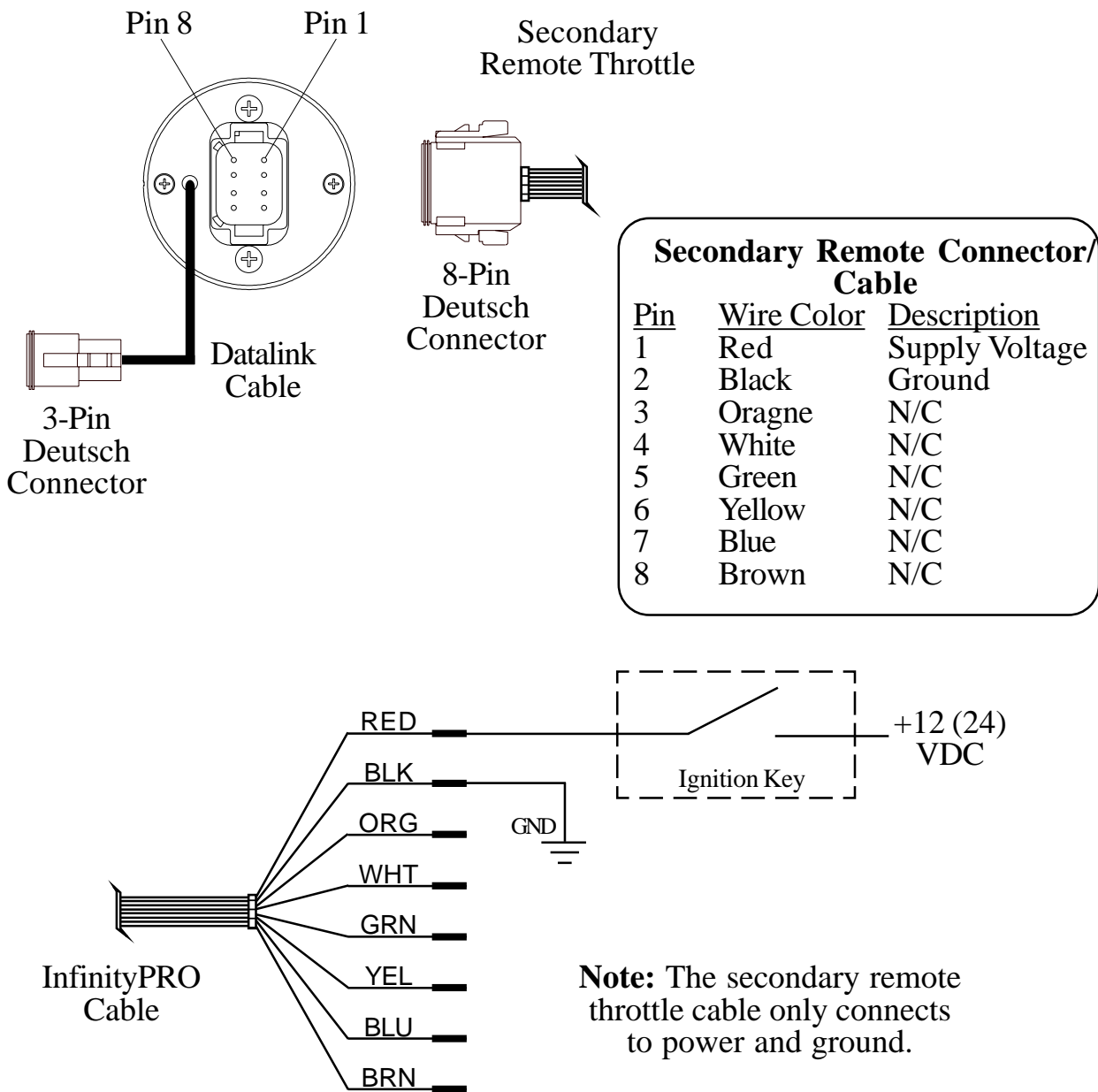
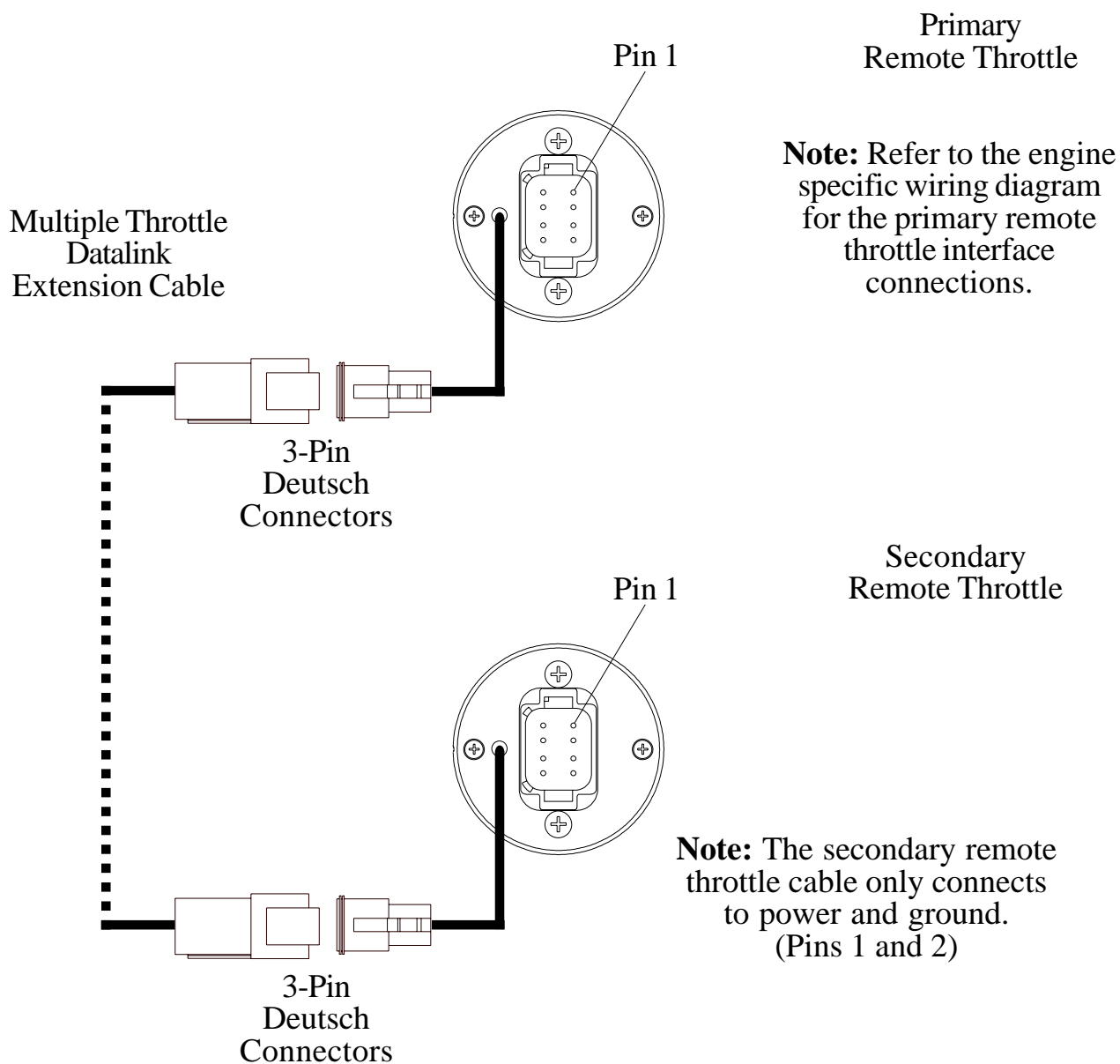


Figure 13. Multiple ETA Remote Throttles Wiring (Sheet 1 of 3)

Primary Remote Throttle With One Secondary Remote Throttle



**Figure 13. Multiple ETA Remote Throttles Wiring
(Sheet 2 of 3)**

Primary Remote Throttle With Two Secondary Remote Throttle

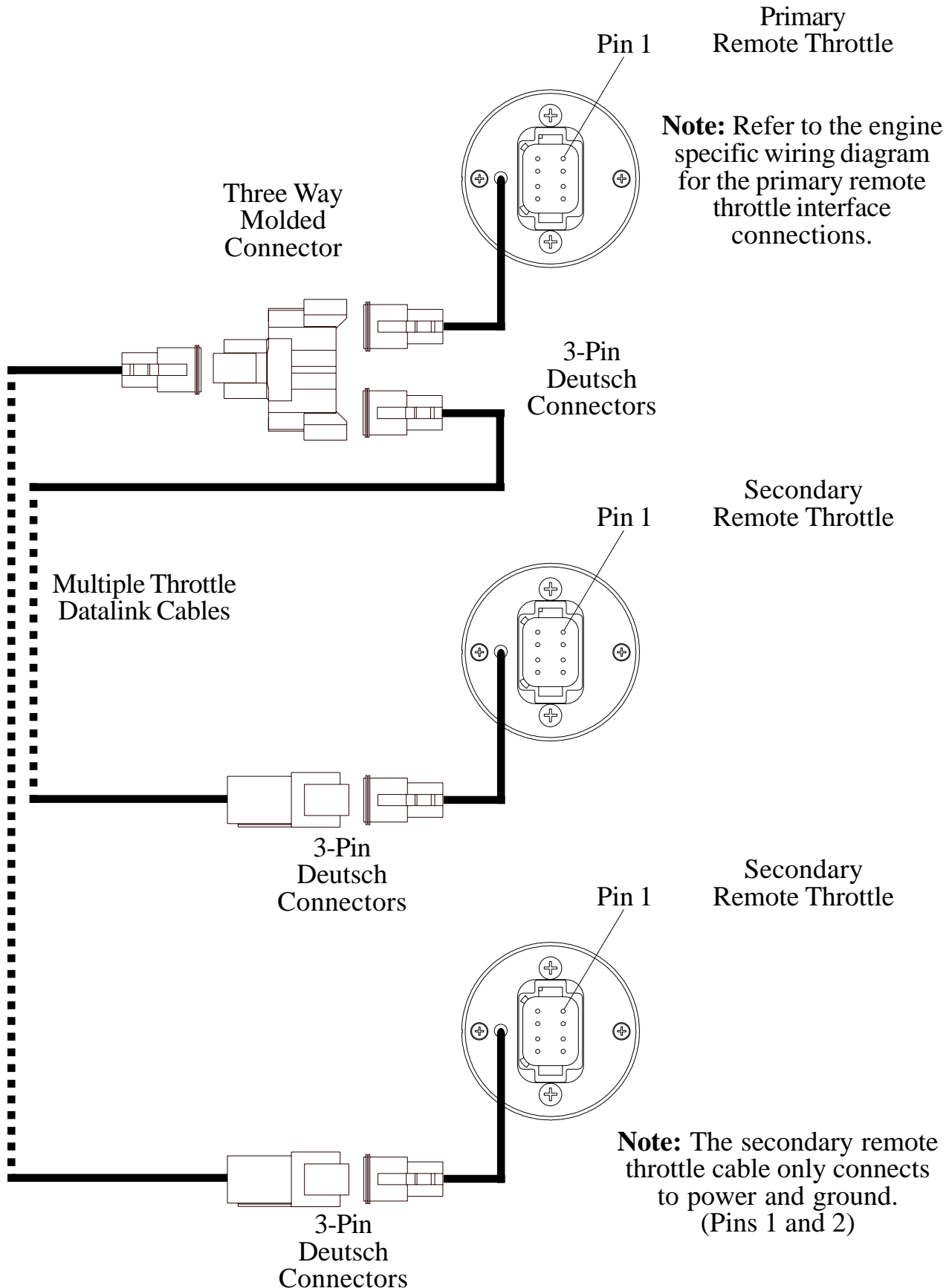


Figure 13. Multiple ETA Remote Throttles Wiring
(Sheet 3 of 3)