
MY 2011 - Present (Manual # 99905297)

Engine Function Module (EFM) Manual

Model Year 2011 - Present

Revised 20140609



IOWA MOLD TOOLING CO., INC.

PO Box 189

Garner, IA 50438

Tel: 641-923-3711 FAX: 641-923-2424

Website: <http://www.imt.com>

Copyright © 2014 Iowa Mold Tooling Co., Inc.
All rights reserved

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of Iowa Mold Tooling Co., Inc.

Iowa Mold Tooling Co., Inc. is an Oshkosh Corporation Company.

Contents

Revisions	ii
EFM Kits & Vehicle Installation	3
EFM (70146433)	3
EFM Installation Kit (51717388).....	5
Cat CT660/680 (99905582)	6
Cummins / Paccar Engines (MY2011 – MY2012) (99904944)	7
Cummins / Paccar Engines (MY2013 – present) (99905765)	9
Dodge 4500/5500 (MY2012) (99905317)	11
For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, automatic transmission	11
For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, manual transmission.....	12
For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, automatic transmission, installed on an IMT Predator body.....	13
Dodge 4500/5500 (MY 2011) (99904929)	14
For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, automatic transmission	14
Dodge 4500/5500 (MY 2013) (99905633)	15
2013 Dodge 4500/5500 (Auto/Man Tran)	15
Dodge 4500/5500 (MY 2014 – present) (99905766).....	16
2013 Dodge 4500/5500 (Auto/Man Tran)	16
2014 to present Dodge 4500/5500 (Auto/Man Tran) Remote Start.....	17
Ford Superduty (MY2012 - present) (99905321)	18
Ford SD - Diesel Automatic with Upfitter Switches (MY2012-present) (99905321-1).....	19
Ford SD - Diesel Automatic without Upfitter Switches (MY2012-present) (99905321-2).....	20
Ford SD - V10 Gas Automatic with Upfitter Switches (MY2012 - present) (99905321-3).....	21
Ford SD - V10 Gas Automatic without Upfitter Switches (MY2012 - present) (99905321-4).....	22
Ford SD Installation Photos (99905321-5).....	23
Ford Superduty (MY2011) (99904889).....	24
Ford SD - Diesel Automatic with Upfitter Switches (MY2011) (99904889-1)	25
Ford SD - Diesel Automatic without Upfitter Switches (MY2011) (99904889-2)	26
Ford SD - V10 Gas Automatic with Upfitter Switches (MY2011) (99904889-3).....	27
Ford SD - V10 Gas Automatic without Upfitter Switches (MY2011) (99904889-4)	28
Ford SD Installation Photos (MY2011) (99904889-5).....	29

Revisions

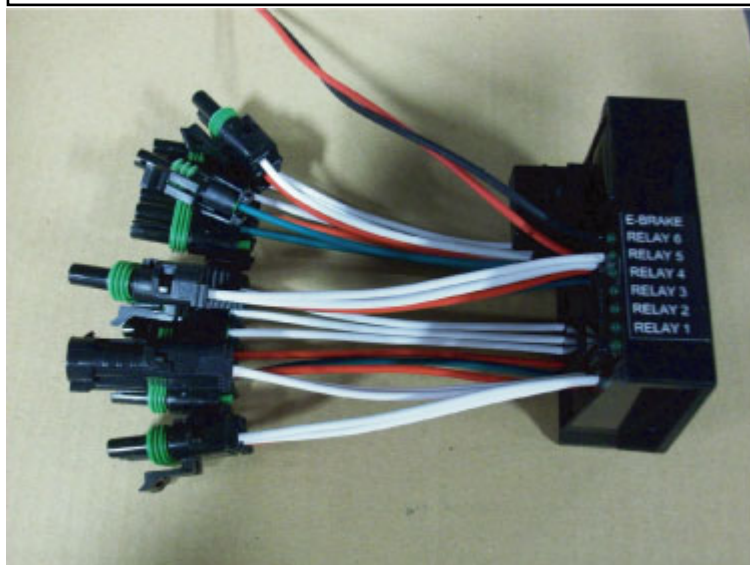
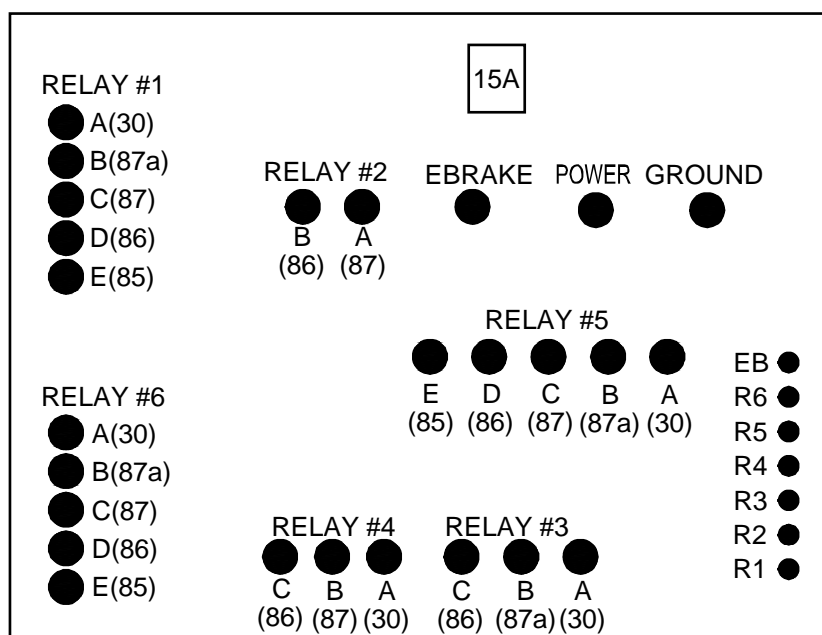
DATE	LOCATION	DESCRIPTION
20111026		Added 99905321, 99905317 - new drawing for 2012 models.
20120215	99905321-3,4	ECN 9000- Update ETM 51and relay 1 wiring.
20130418	99905582	Engineering markup; added page 6.
20130607	99905633	Added sheets 2 and 5 of 99905633
20140407	Throughout	Added MY2014 for Dodge, corrections for Cummins MY2013
20140609	99905765	Engineering markup, Pin 5 was Pin 3

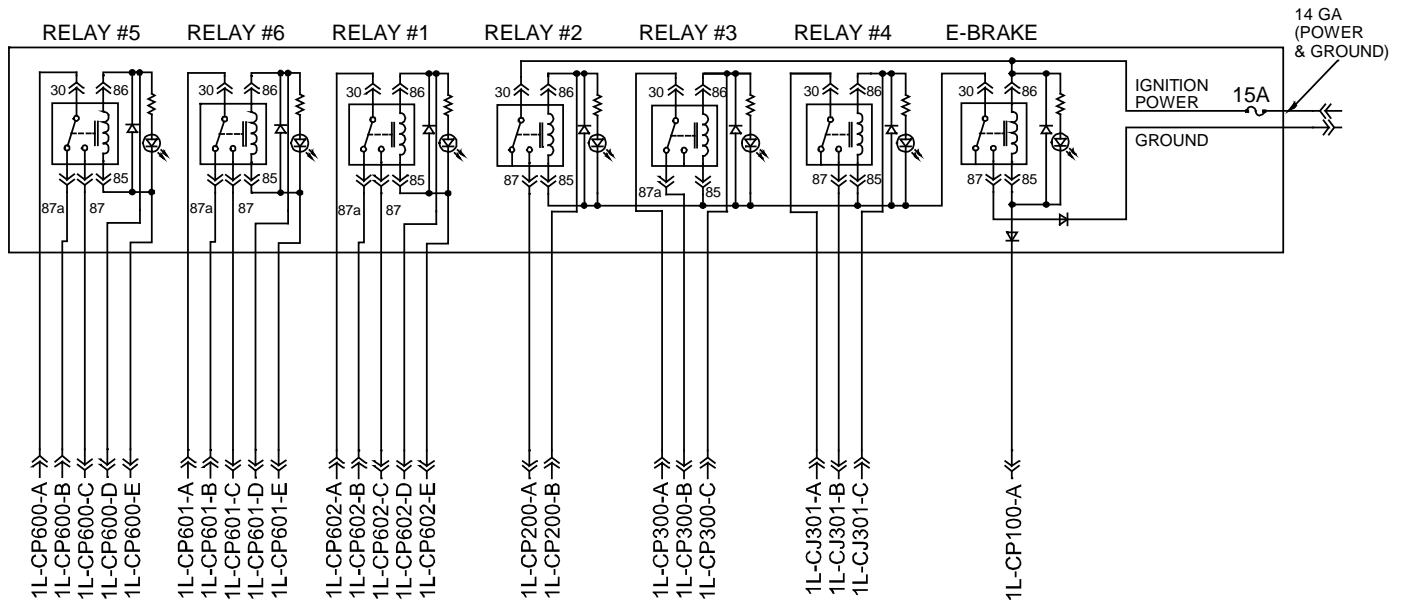
SECTION 1

EFM Kits & Vehicle Installation

EFM (70146433)

EFM Layout



EFM Wiring

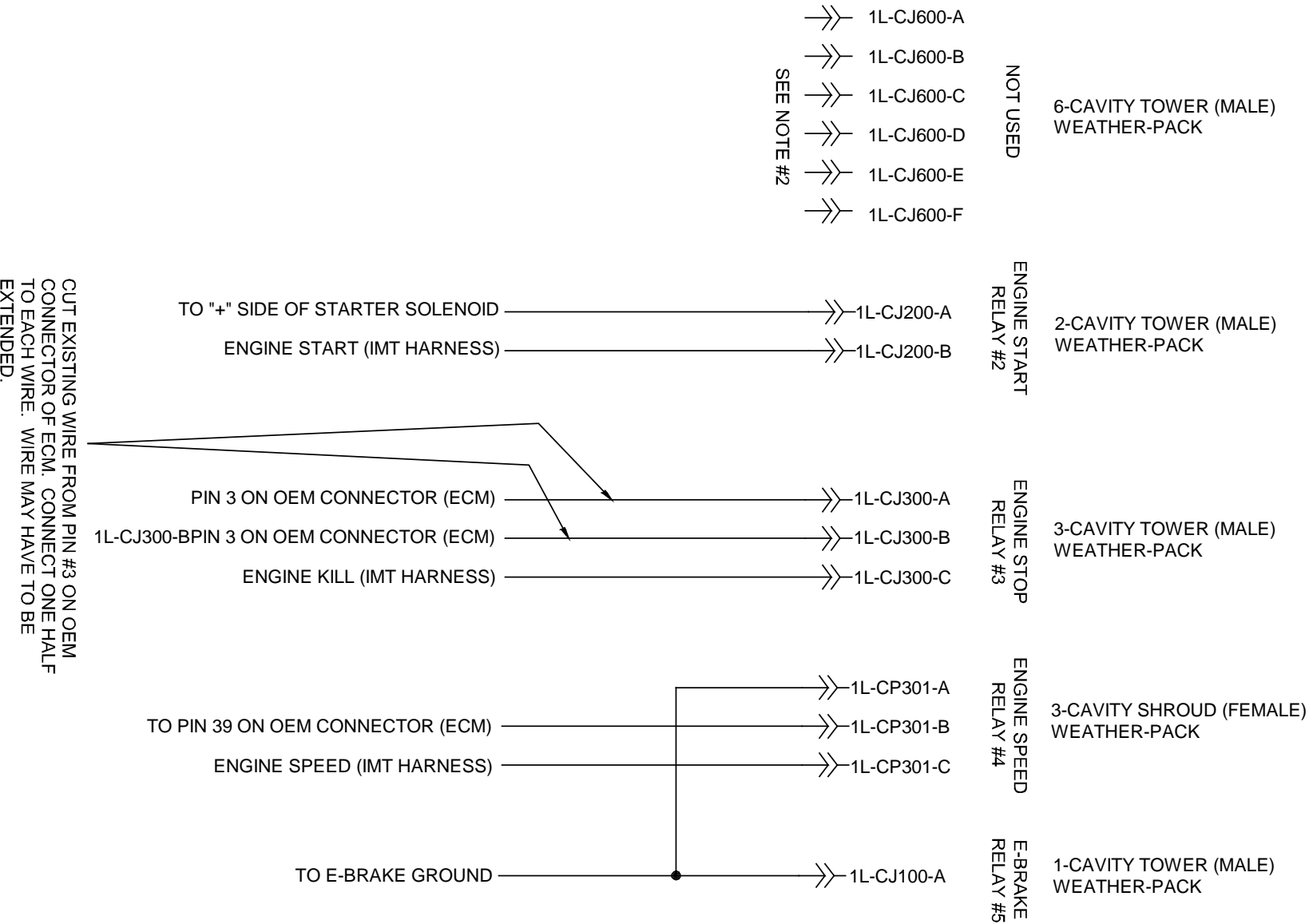
EFM Installation Kit (51717388)

51717388 PARTS LIST				
ITEM	PART #	DESCRIPTION	DETAILS	QUANTITY
1.	70146433	ENGINE FUNCTION MODULE		1
2.	77044575	CONNECTOR	PACKARD WP 6CAV MALE/SHR	3
3.	77044573	CONNECTOR	PACKARD WP 2CAV MALE/SHR	1
4.	77044558	CONNECTOR	PACKARD WP 3 CAV MALE/SHR	1
5.	77044557	CONNECTOR	PACKARD WP 3CAV FEM/TWR	1
6.	77044690	CONNECTOR	PACKARD WP 1 CAV MALE/SHR	1
7.	77045888	TERMINAL	PACKARD WP 14-16GA FEM	3
8.	77045887	TERMINAL	PACKARD WP 14-16GA MALE	23
9.	77044676	PLUG	PACKARD WP/METRIPACK	15
10.	79085317	TOOL-CONT. REMOVAL		1
11.	51714048	WIRE ASSEMBLY	16GA WHT X 72.0	1
12.	51715791	WIRE ASSEMBLY	16GA RED X 72.0	1
13.	89044235	WIRE	14GA WHT STRD GPT	5 FT
14.	72533495	TEE	FEMALE BRANCH	1
15.	77040051	TERMINAL	SPRSPADE I 8STUD	2
16.	77041008	SWITCH-PRESSURE CONTROL		1
17.	70394092	DECAL-CAUTION BRK/COMP		1
18.	70394069	CABLE SEAL	PACKARD WP/MP	26
19.	77044556	DIODE	2.2 AMP/247V	2
21.	99903412	MANUAL - EFM INSTALLATION KIT		1
22.	77044341	TERMINAL BLOCK-4 CONTACT		2
23.	77040130	JUMPER BAR-TERMINAL		4
24.	77441059	TERMINAL	MBE	1
25.	77044565	TERMINAL	16-18 GA MALE	3
26.	77045924	CONNECTOR PIN, INT'L EFM		2
27.	99905297	MANUAL-EFM (MY11+)		1
28.	70399247	DECAL-EFM 2011		1
REV J 20111026				

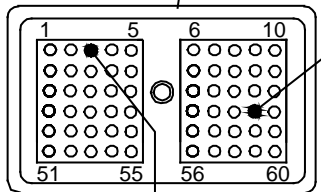
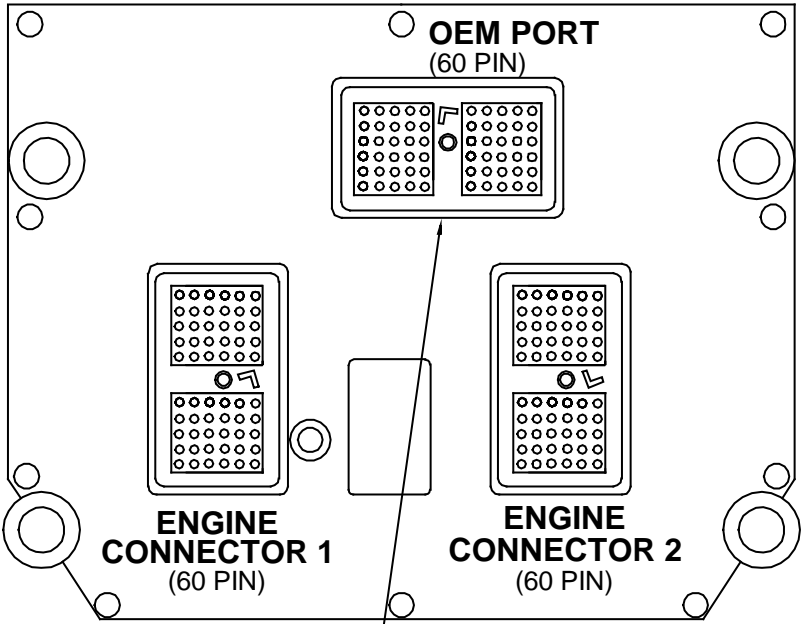
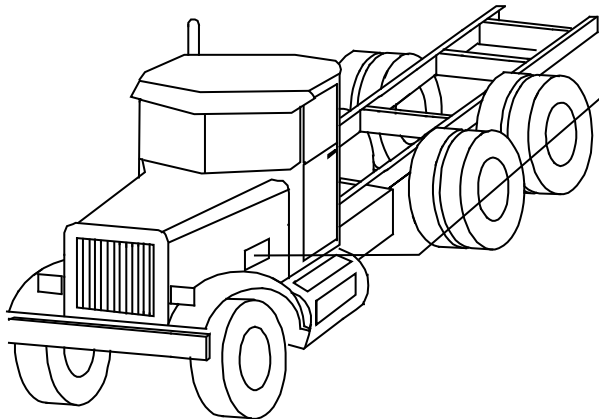
Cummins / Paccar Engines (MY2011 – MY2012) (99904944)

NOTES:

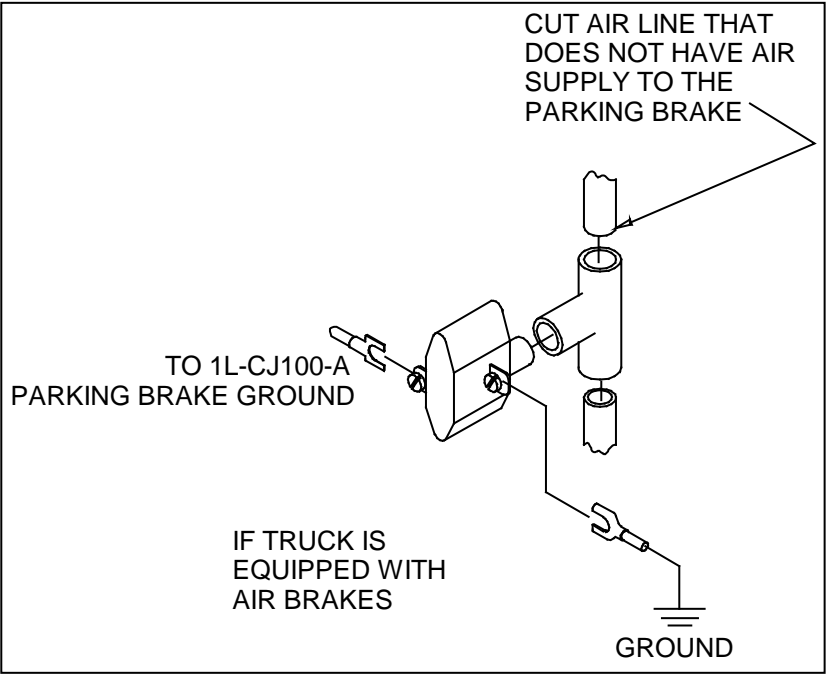
- 1 Engine start not used on Predator.
- 2 Plug all unused cavities with Packard plug #12010300 (IMT # 77044893). Cap all unused connectors on EFM.



USE A PC EQUIPPED WITH CUMMINS "INSITE" SOFTWARE OR CONTACT A CUMMINS DEALER TO CONFIGURE ECM PARAMETERS. INTERFACE HARDWARE BETWEEN THE PC AND THE ECM MUST BE ABLE TO COMMUNICATE USING A J-1939 CAN PROTOCOL.



OEM PORT
(60 PIN CONNECTOR ON ECM)
CONNECTOR VIEW IS FROM THE
BACK SIDE OR WIRE INSERTION
SIDE OF THE CONNECTORS.



CUT AIR LINE THAT
DOES NOT HAVE AIR
SUPPLY TO THE
PARKING BRAKE

1L-CJ300-B → TO PIN #3
1L-CJ300-A →

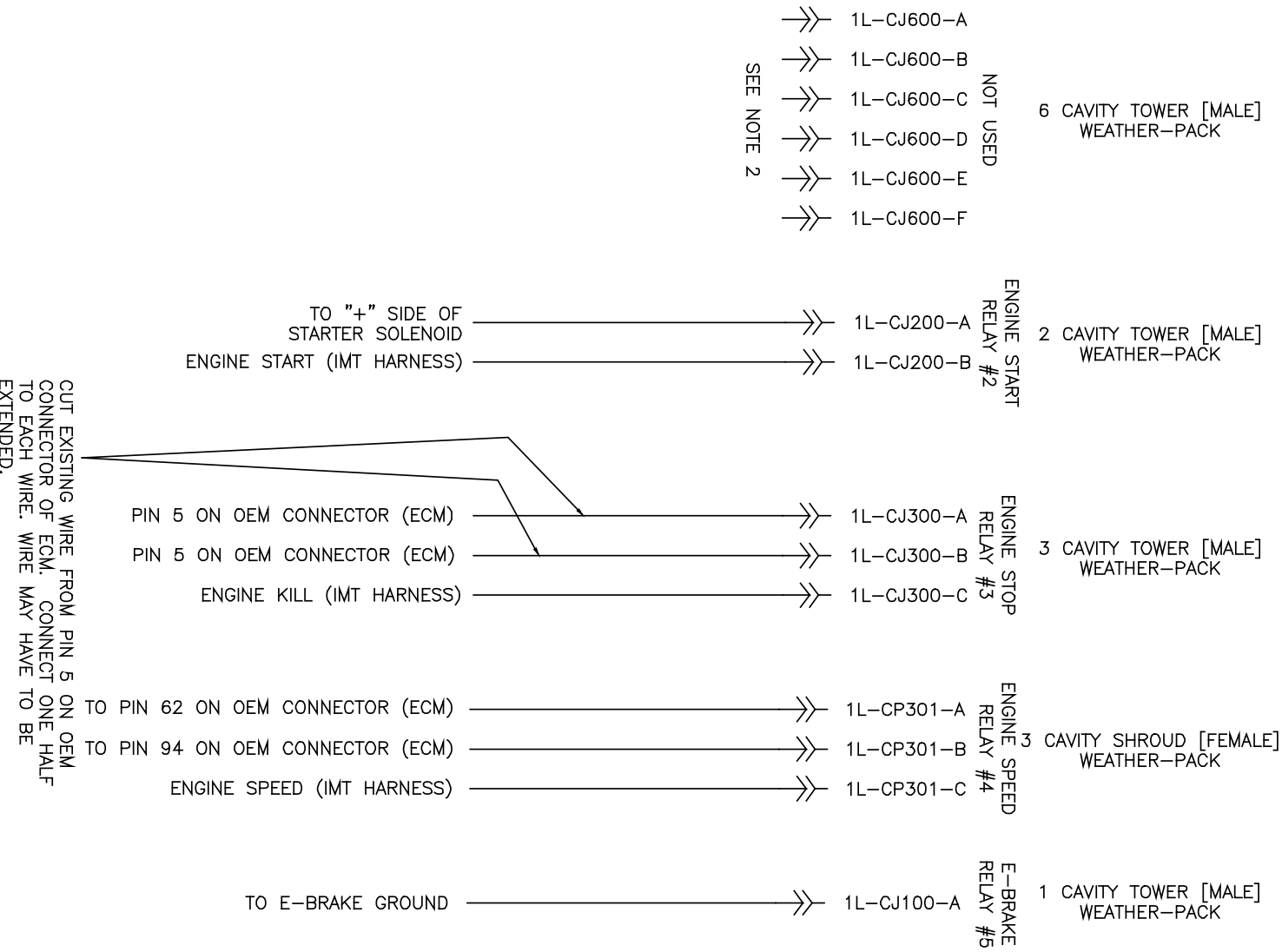
CUT EXISTING WIRE RUNNING TO
PIN #3 IN TWO. CONNECT TO
ENGINE FUNCTION MODULE.

TO PIN #39 ← 1L-CP301-B

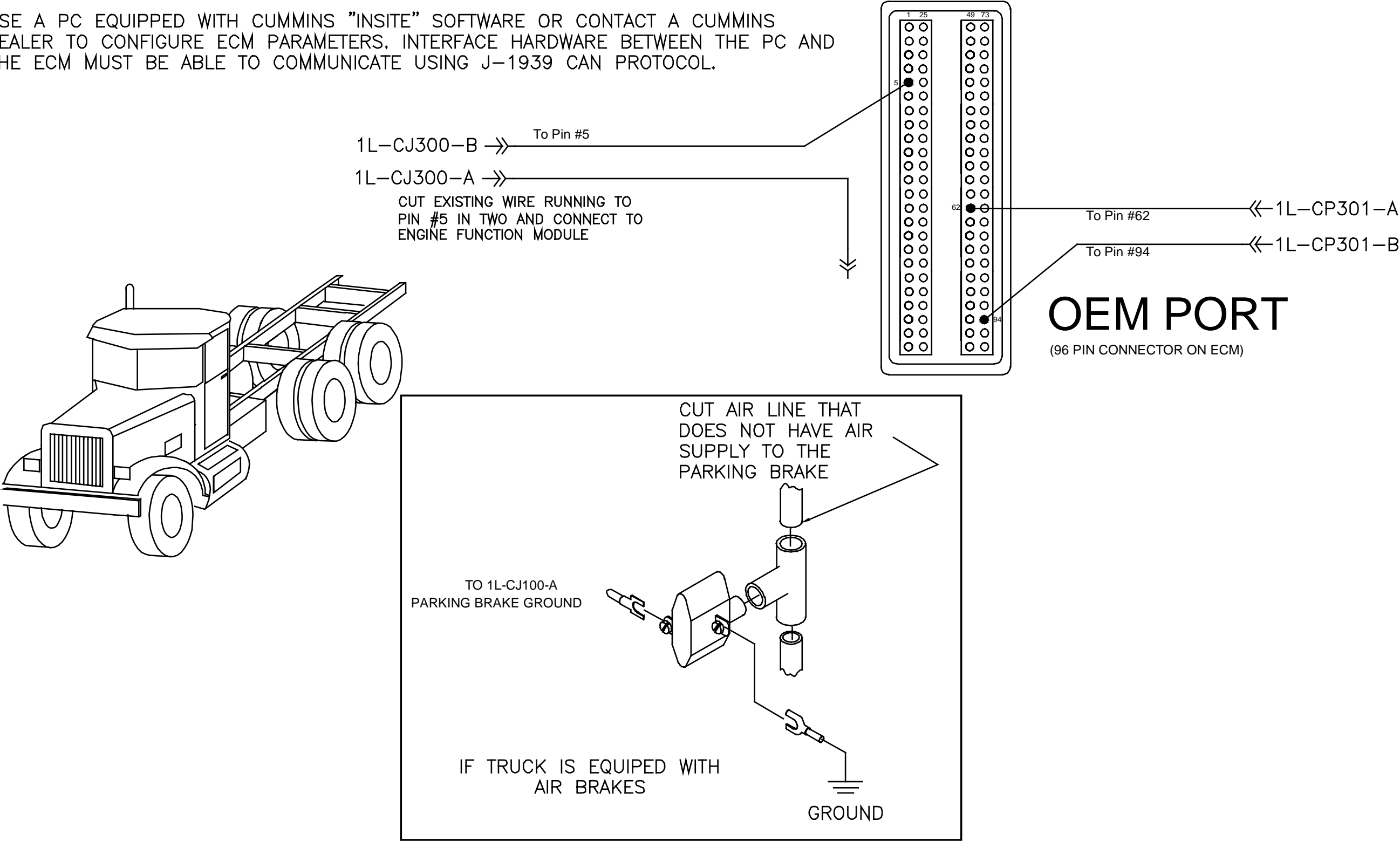
Cummins / Paccar Engines (MY2013 – present) (99905765)

NOTES:

- 1 Engine start not used on Predator.
- 2 Plug all unused cavities with Packard plug #12010300 (IMT # 77044893). Cap all unused connectors on EFM.

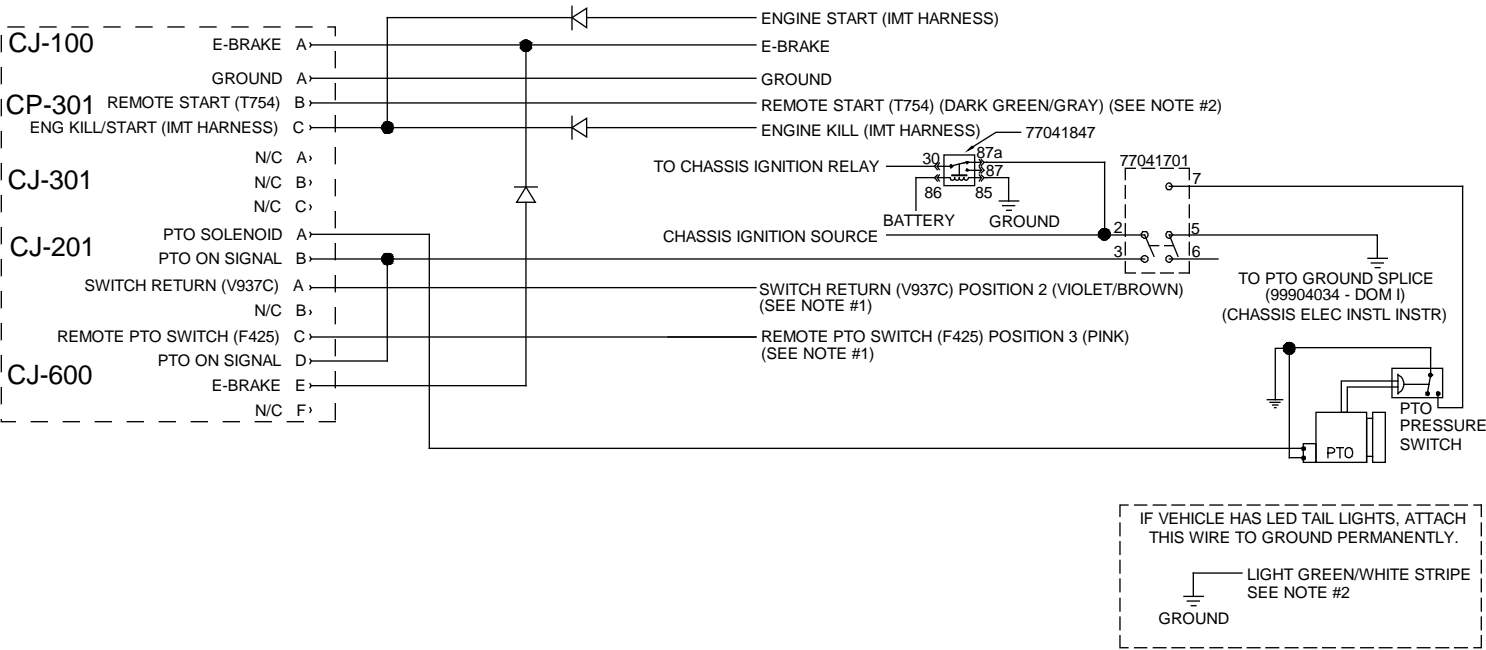


USE A PC EQUIPPED WITH CUMMINS "INSITE" SOFTWARE OR CONTACT A CUMMINS DEALER TO CONFIGURE ECM PARAMETERS. INTERFACE HARDWARE BETWEEN THE PC AND THE ECM MUST BE ABLE TO COMMUNICATE USING J-1939 CAN PROTOCOL.



Dodge 4500/5500 (MY2012) (99905317)

For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, automatic transmission



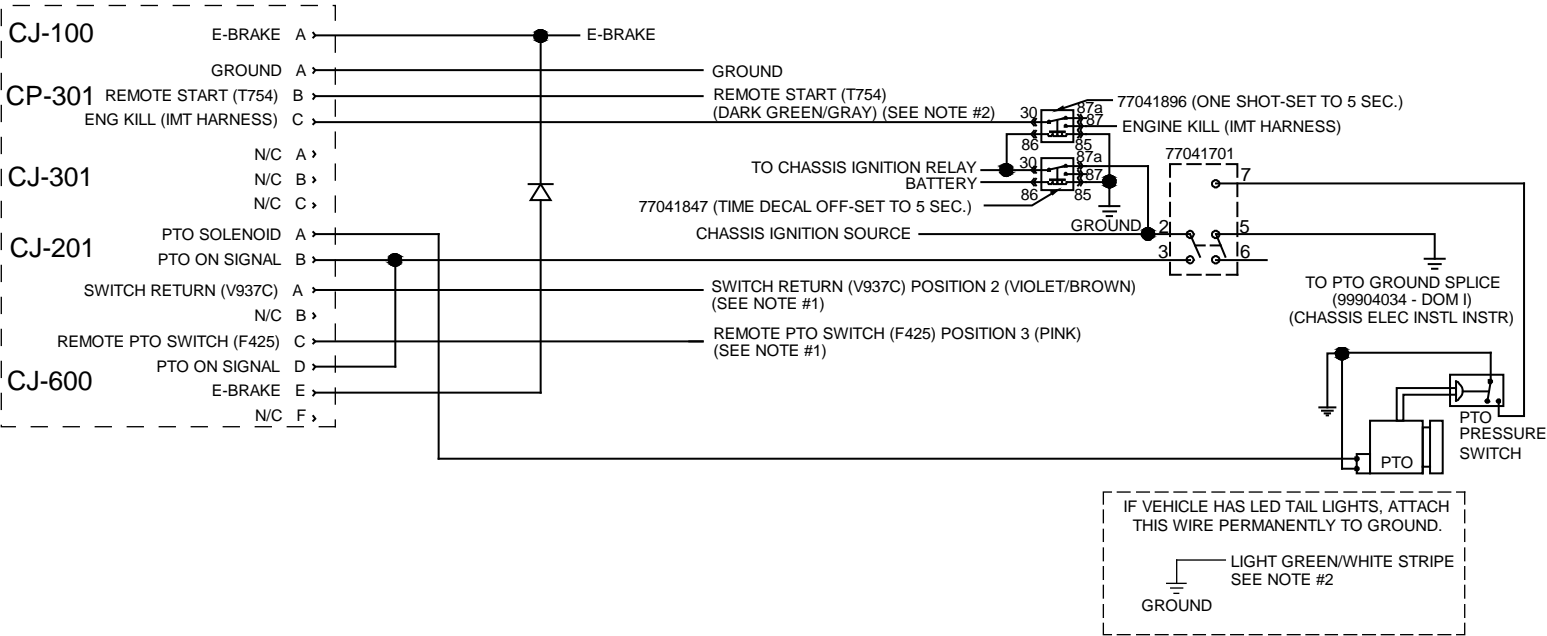
WARNING:

- 1 Disconnect battery cables (negative first, then positive) before doing any electrical work on vehicle.

NOTES:

- 1 PTO Connector (Under dash white connector) - The mating connector is part of the Dodge upfitter kit.
- 2 The blunt cut wire with heat shrink is located near the auxiliary box in the engine compartment.
- 3 Wait 10 seconds between engine start and engine stop.
- 4 See the Dodge BodyBuilder website to program with engine start/stop and engine speed functions. WWW.DODGE.COM/BODYBUILDER/YEAR.PDF

For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, automatic transmission, installed on an IMT Predator body



WARNING:

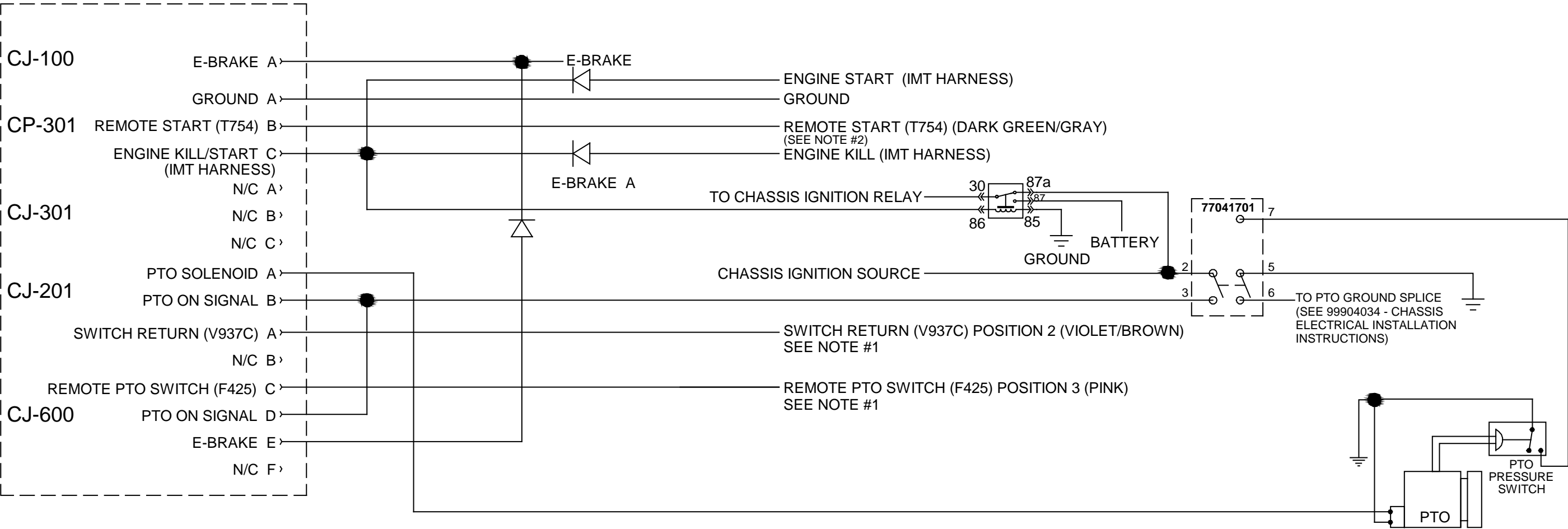
- 1 Disconnect battery cables (negative first, then positive) before doing any electrical work on vehicle.

NOTES:

- 1 PTO Connector (Under dash white connector) - The mating connector is part of the Dodge upfitter kit.
- 2 The blunt cut wire with heat shrink is located near the auxiliary box in the engine compartment.
- 3 Wait 10 seconds between engine start and engine stop.
- 4 See the Dodge BodyBuilder website to program with engine start/stop and engine speed functions. WWW.DODGE.COM/BODYBUILDER/YEAR.PDF

Dodge 4500/5500 (MY 2011) (99904929)

For Dodge 4500/5500 4 x 2 with 6.7 L Cummins engine, automatic transmission



WARNING:

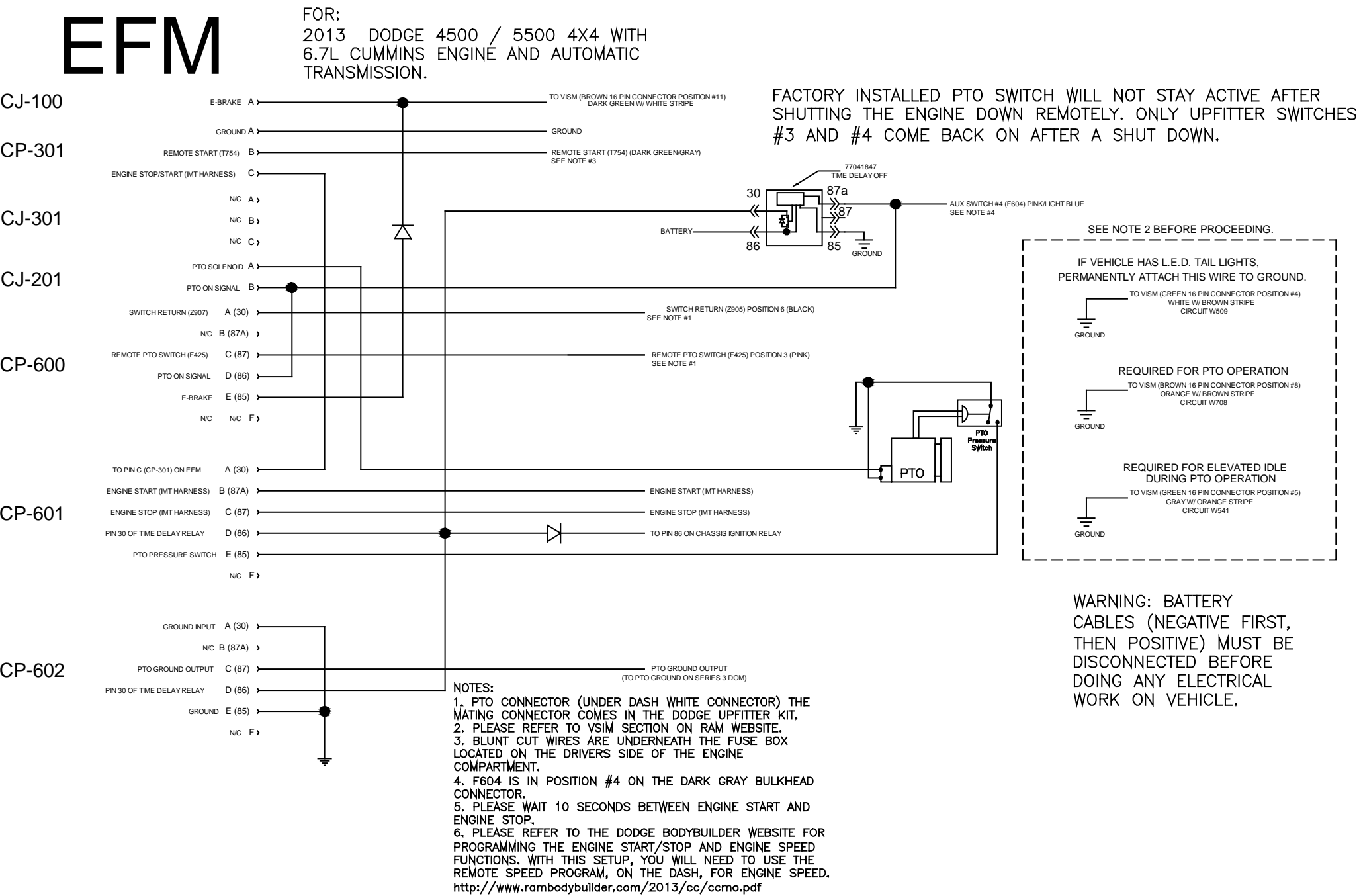
- 1 Disconnect battery cables (negative first, then positive) before doing any electrical work on vehicle.

NOTES:

- 1 PTO Connector (Under dash white connector) - The mating connector is part of the Dodge upfitter kit.
- 2 The blunt cut wire with heat shrink is located near the auxiliary box in the engine compartment.
- 3 Wait 10 seconds between engine start and engine stop.
- 4 See the Dodge BodyBuilder website to program with engine start/stop and engine speed functions. WWW.DODGE.COM/BODYBUILDER/YEAR.PDF

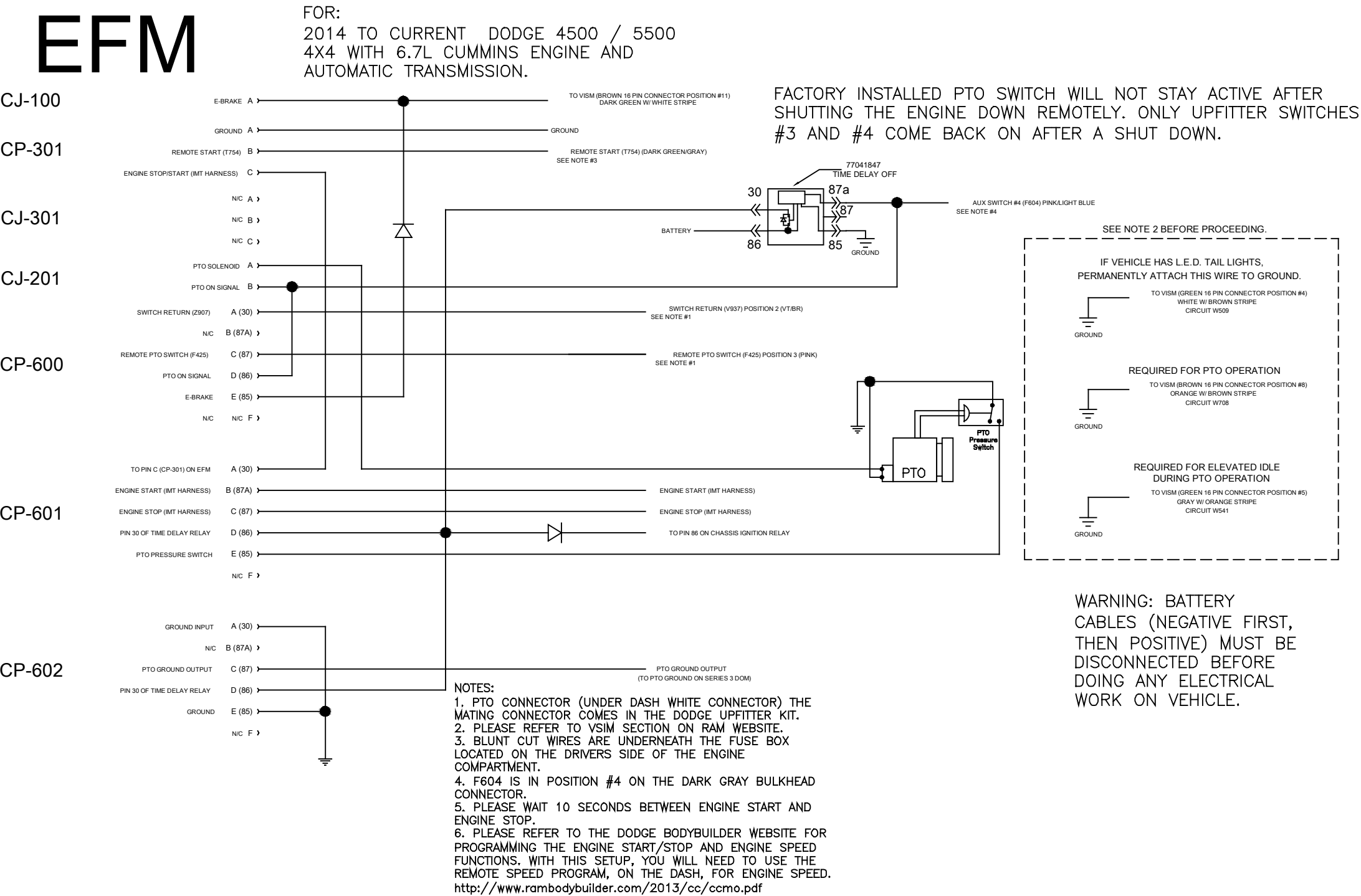
Dodge 4500/5500 (MY 2013) (99905633)

2013 Dodge 4500/5500 (Auto/Man Tran)



Dodge 4500/5500 (MY 2014 – present) (99905766)

2013 Dodge 4500/5500 (Auto/Man Tran)



2014 to present Dodge 4500/5500 (Auto/Man Tran) Remote Start

Connect Wired Remote Start (WRS) button (or jumper wire) to allow opening/shorting the up-fitter circuit connected to RFHM

For rotary ignition system insert a valid FOB/IK into the IG/M and turn it to the RUN position

For Keyless Go ignition system turn the ignition to RUN state by pushing the Start/Stop button

Press and hold brake pedal

Move the shifter out of Park

Press and hold ?WRS? button

Move the shifter to Park

Release ?WRS? button

Within 30 seconds of releasing ?WRS? button:

Move the shifter out of Park

Press and hold ?WRS? button

Move the shifter to Park

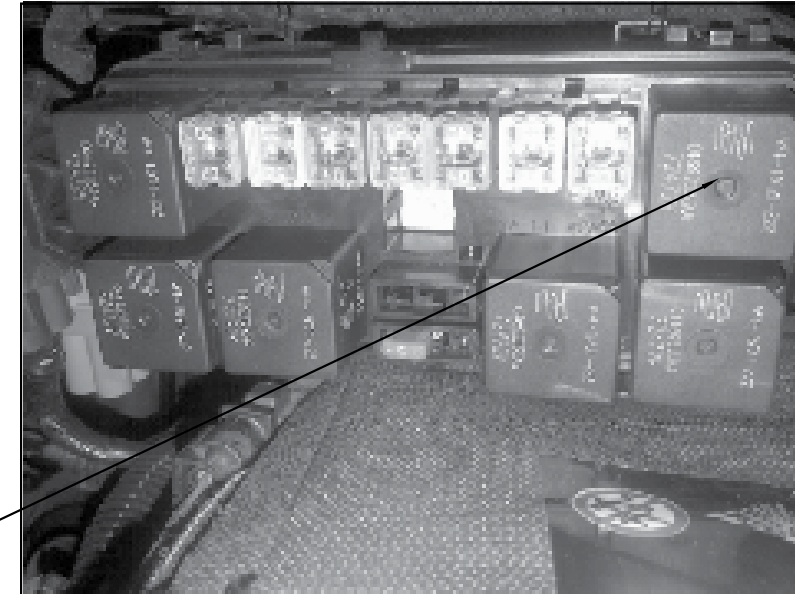
Release ?WRS? button

Release the brake pedal

For rotary ignition system turn the FOB/IK back to Off position and remove it

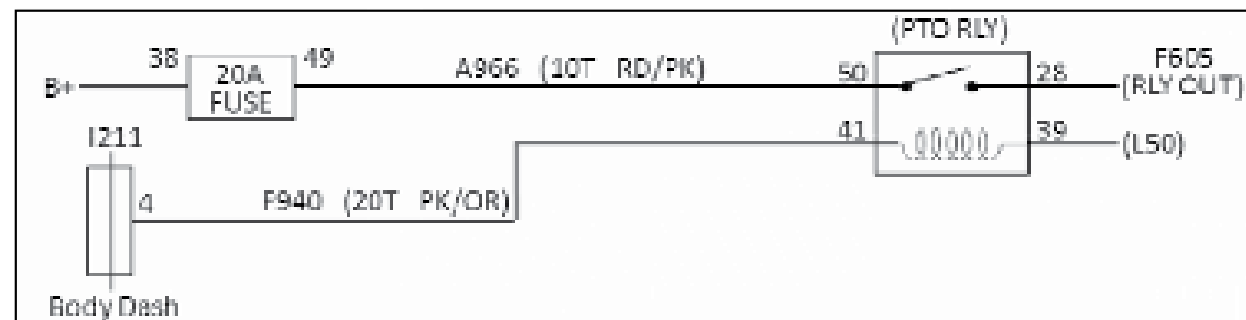
For Keyless Go ignition system turn the ignition Off by pressing Start/Stop button

Once the brake pedal is released, the state of the wired remote start feature will toggle (i.e., if previously disabled it will now be enabled, or if previously enabled it will now be disabled). The immobilizer telltale in the cluster will blink at one Hz rate to indicate the status of the Wired Remote Start feature. If the procedure enabled the feature, the telltale will blink for four seconds; if the procedure disabled the feature, it will blink for two seconds. The RFHM will control this blinking by setting the RFHUB_A2|ImmHMIReq = 3h for four or two seconds depending on the feature is enabled or disabled.

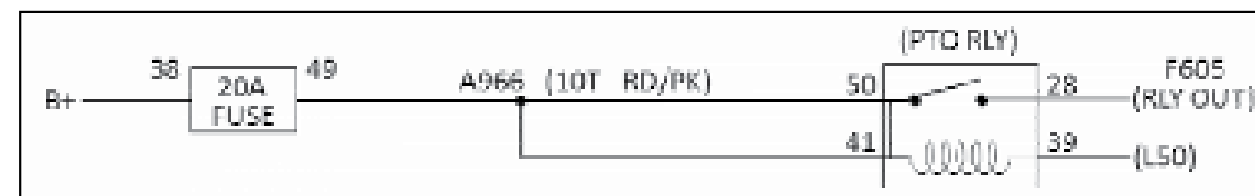


PTO RELAY
DRIVER SIDE RELAY/FUSE BOX

REQUIRED WIRING CHANGE FOR REMOTE START/STOP BEFORE



AFTER

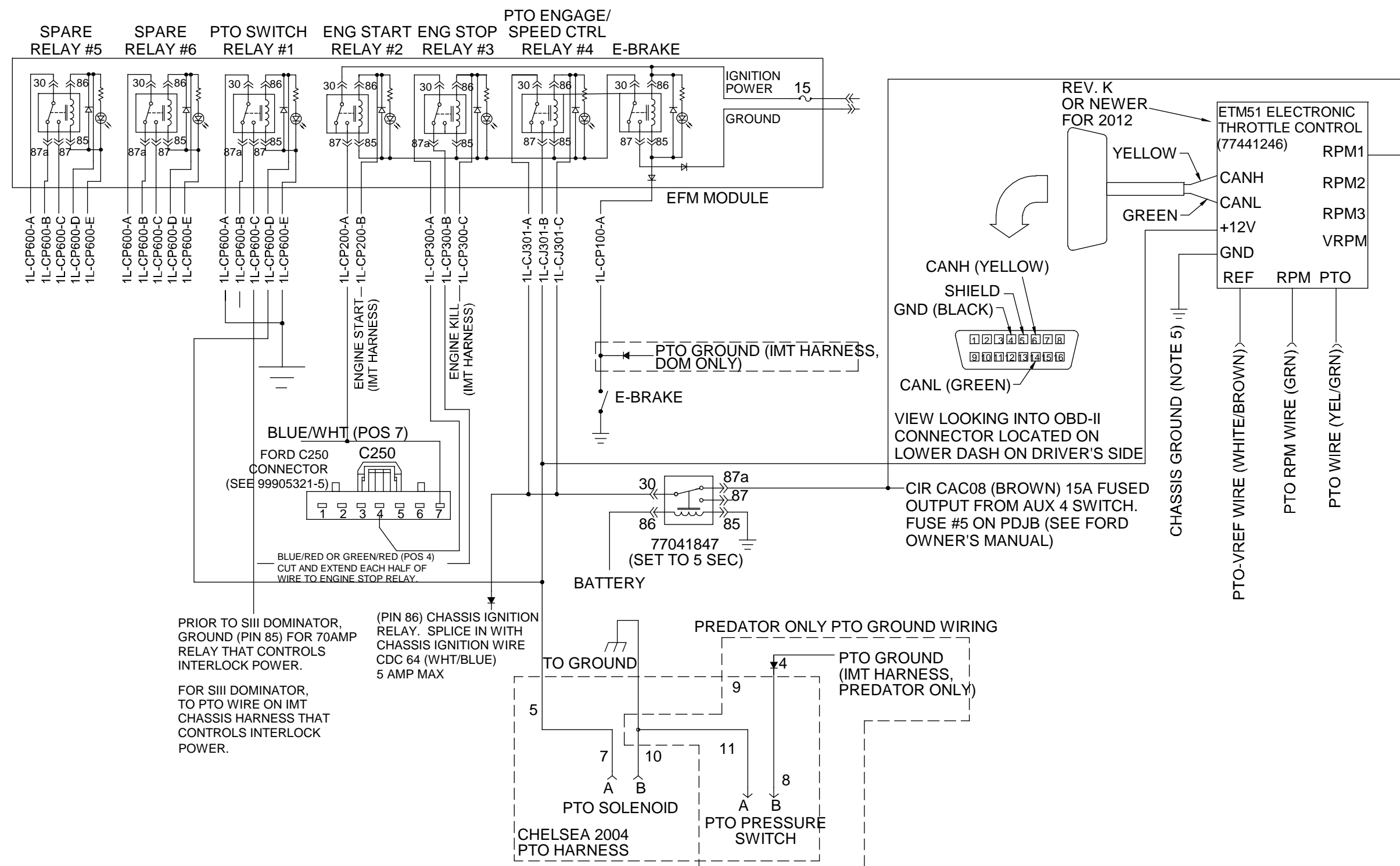


Ford Superduty (MY2012 - present) (99905321)

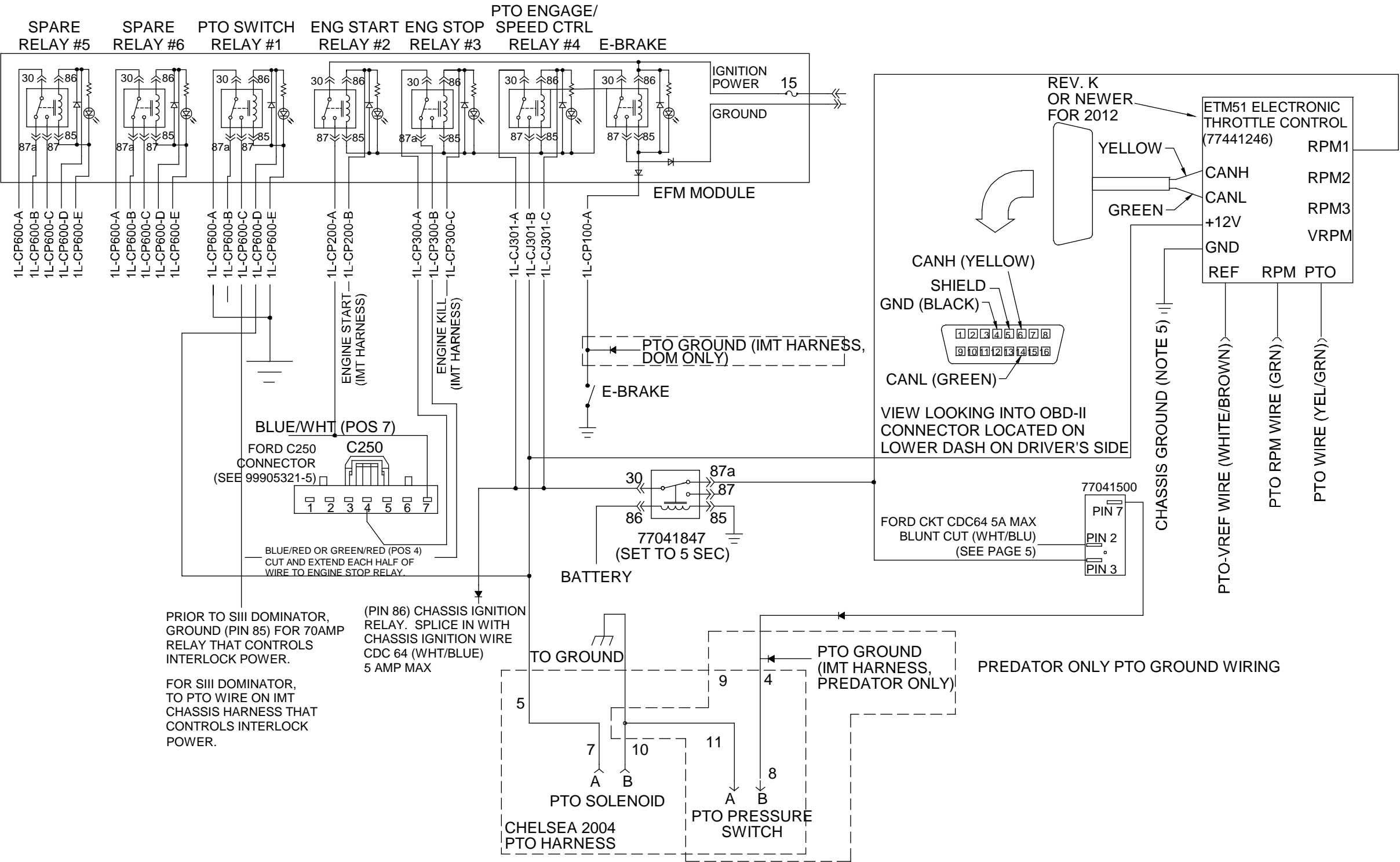
NOTES:

- 1 Engine start not used on Predator.
- 2 Plug all unused cavities with Packard plug # 12010300 (IMT # 77044893). Cap all unused connectors on EFM.
- 3 PTO switch is interlocked with the parking brake. If the parking brake is disengaged, the PTO will disengage.
- 4 See 99904889 - 5 (photos) for Ford connector C250 location and wire locations.
- 5 For ground connection to 77045925, use chassis ground only.
- 6 The engine must be at lease 20 degrees F before speed control will work on a *diesel* engine, and 140 degrees before speed control will work on a *gas* engine.
- 7 The transmission oil must be at least 20 degrees F before speed control will work.
- 8 If any driver controls are activated (for example, the service brake is bumped with in SEIC mode), the engine must be shut off and restarted for SEIC to work again.

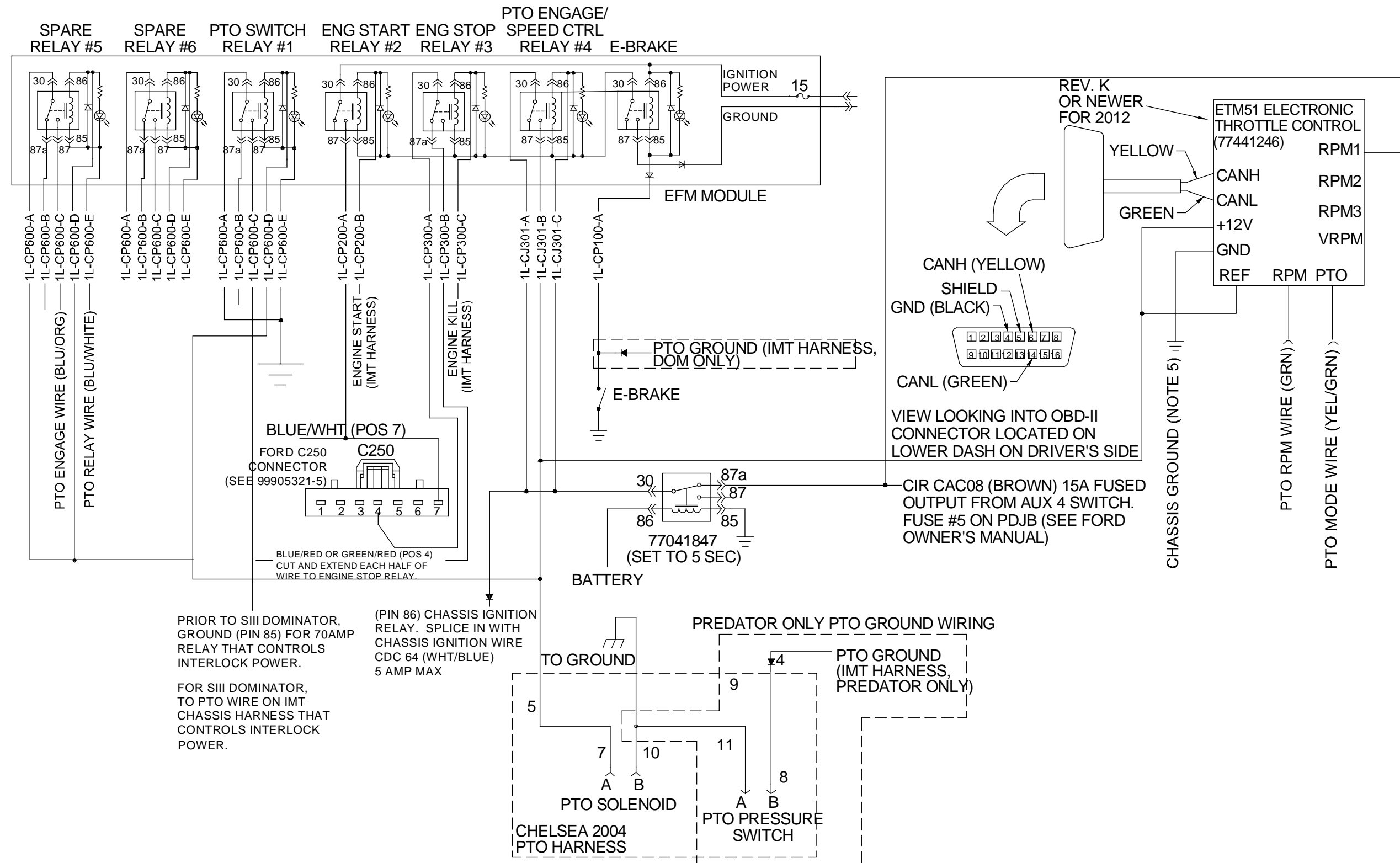
Ford SD - Diesel Automatic with Upfitter Switches (MY2012-present) (99905321-1)



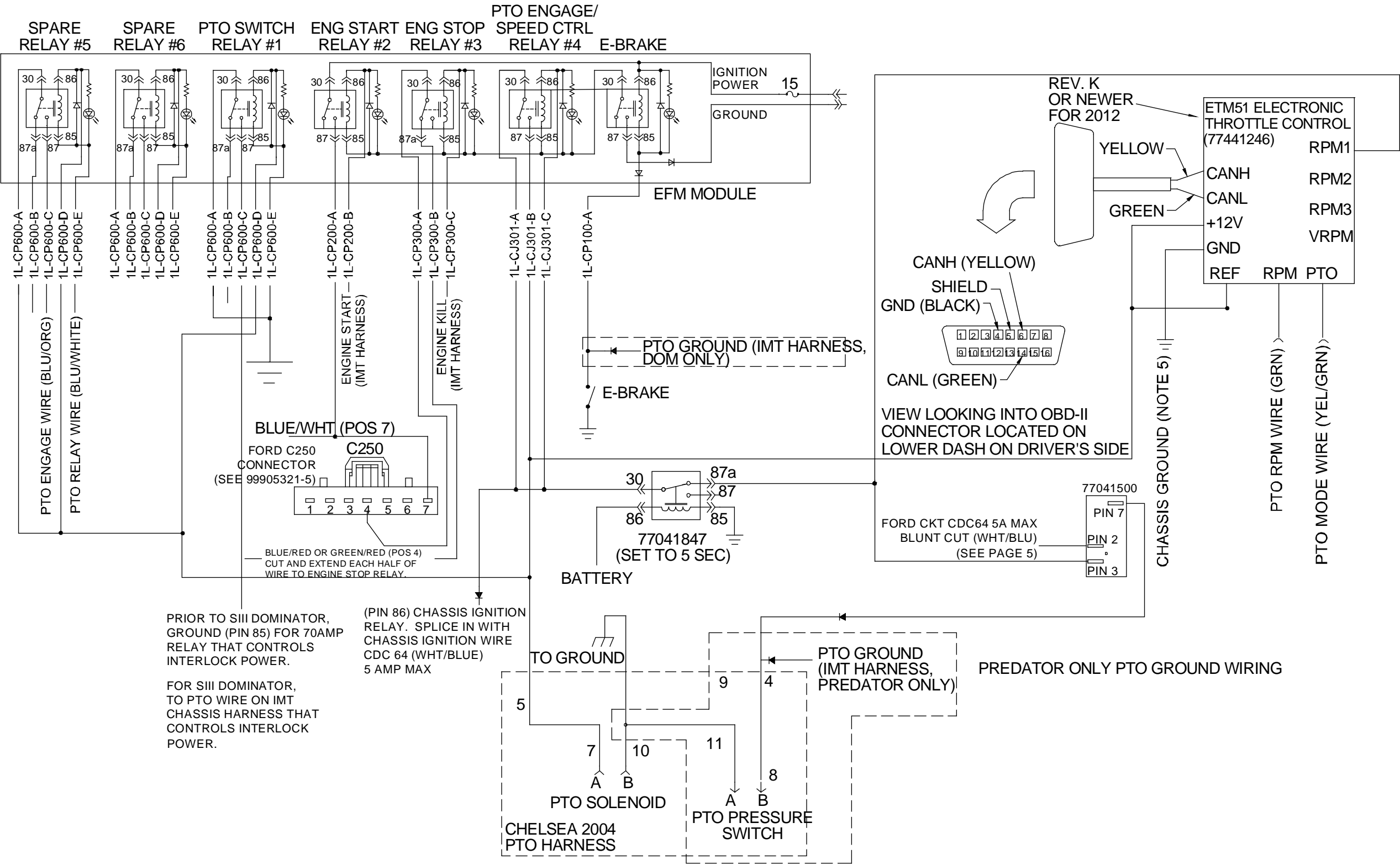
Ford SD - Diesel Automatic without Upfitter Switches (MY2012-present) (99905321-2)



Ford SD - V10 Gas Automatic with Upfitter Switches (MY2012 - present) (99905321-3)



Ford SD - V10 Gas Automatic without Upfitter Switches (MY2012 - present) (99905321-4)

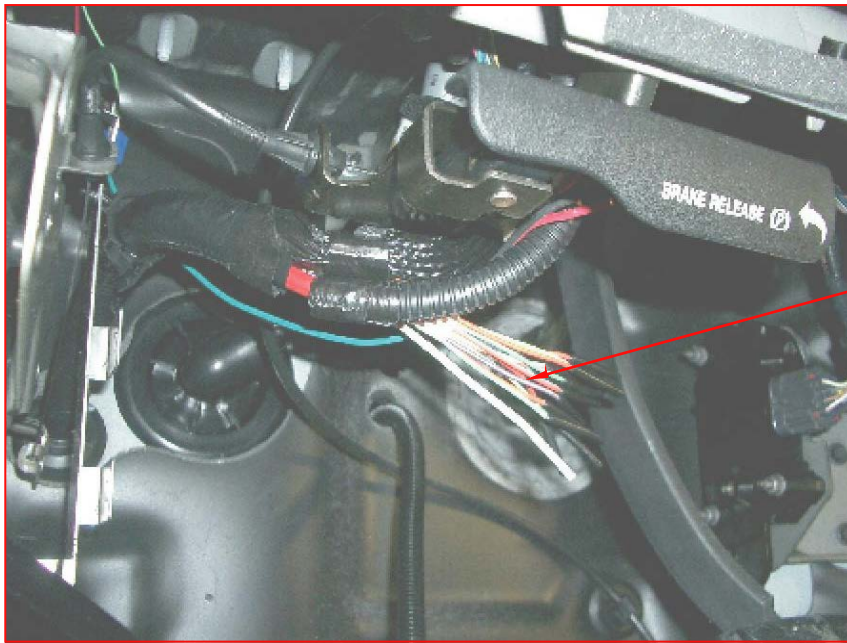


Ford SD Installation Photos (99905321-5)



1. LOOSEN SCREWS UNDER STEERING COLUMN.
2. C250 IS LOCATED ON LEFT SIDE OF STEERING COLUMN.

C250 LOCATION



IGNITION: CDC64 (WHT/BLU)
IN CAB UNDER DRIVER'S SIDE
INSTRUMENT PANEL NEAR
ENGINE BULKHEAD

PTO CIRCUITS - DIESEL
PTO RS1 (YELLOW/GREEN)
PTO RS2 (BLUE/ORANGE)
PTO_RELAY (BLUE/WHITE)
PTO_RPM (GREEN)
PTO_REF (WHITE/BROWN)
PTO_RTN (GRAY/VIOLET)
BCP_SW (VIOLET/BROWN)
BCP_LAMP (BROWN)

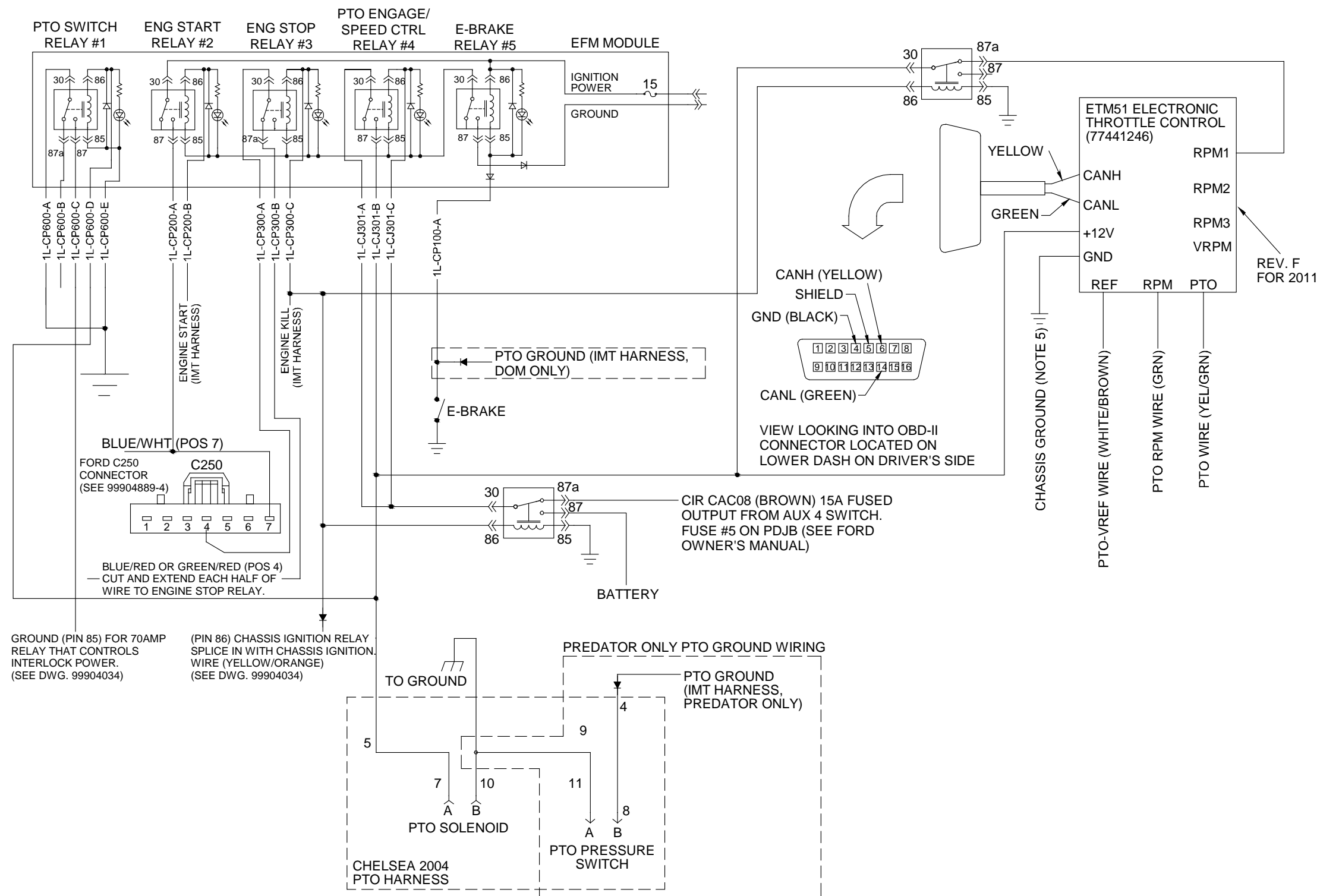
PTO CIRCUITS - GAS
PTO (YELLOW/GREEN)
PTO_OK (BLUE/WHITE)
PTO_RPM (GREEN)
PTO_ENGAGE (BLU/ORG)

Ford Superduty (MY2011) (99904889)

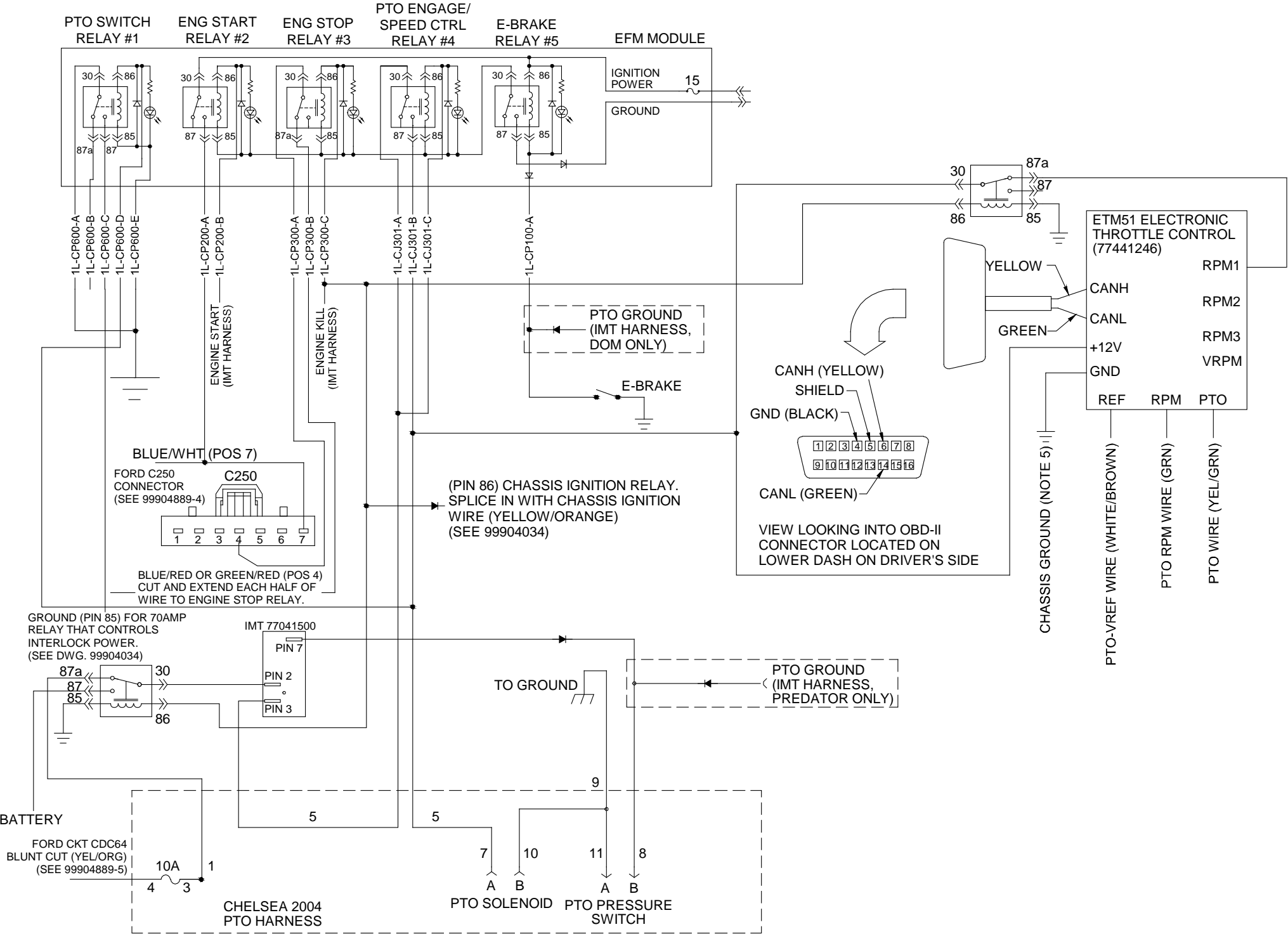
NOTES:

- 1
- Engine start not used on Predator.
- 2
- Plug all unused cavities with Packard plug # 12010300 (IMT # 77044893). Cap all unused connectors on EFM.
- 3
- PTO switch is interlocked with the parking brake. If the parking brake is disengaged, the PTO will disengage.
- 4
- See 99904889 - 5 (photos) for Ford connector C250 location and wire locations.
- 5
- For ground connection to 77045925, use chassis ground only.
- 6
- The engine must be at lease 120 degrees F before speed control will work.
- 7
- The transmission oil must be at least 20 degrees F before speed control will work.
- 8
- If any driver controls are activated (for example, the service brake is bumped with in SEIC mode), the engine must be shut off and restarted for SEIC to work again.

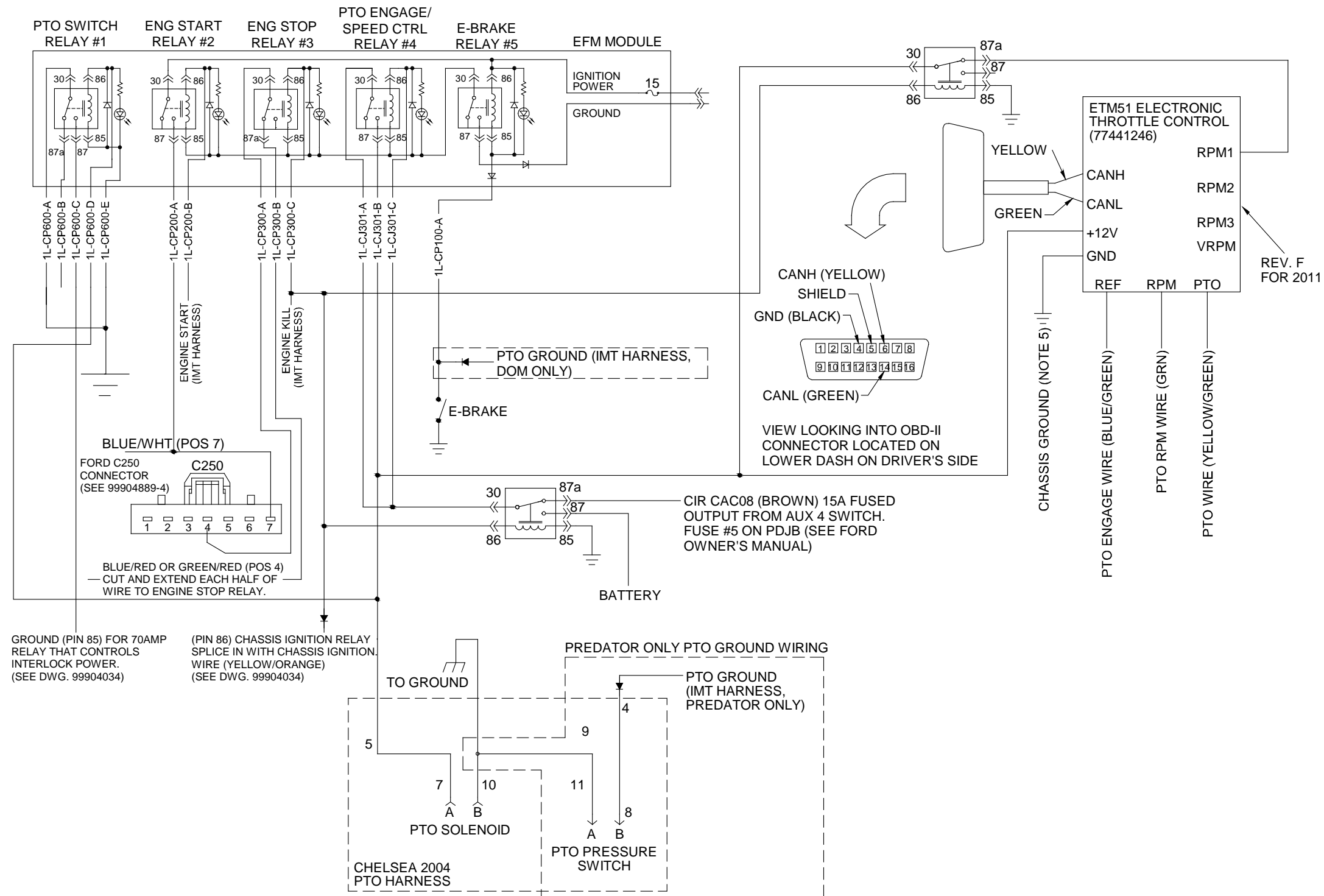
Ford SD - Diesel Automatic with Upfitter Switches (MY2011) (99904889-1)



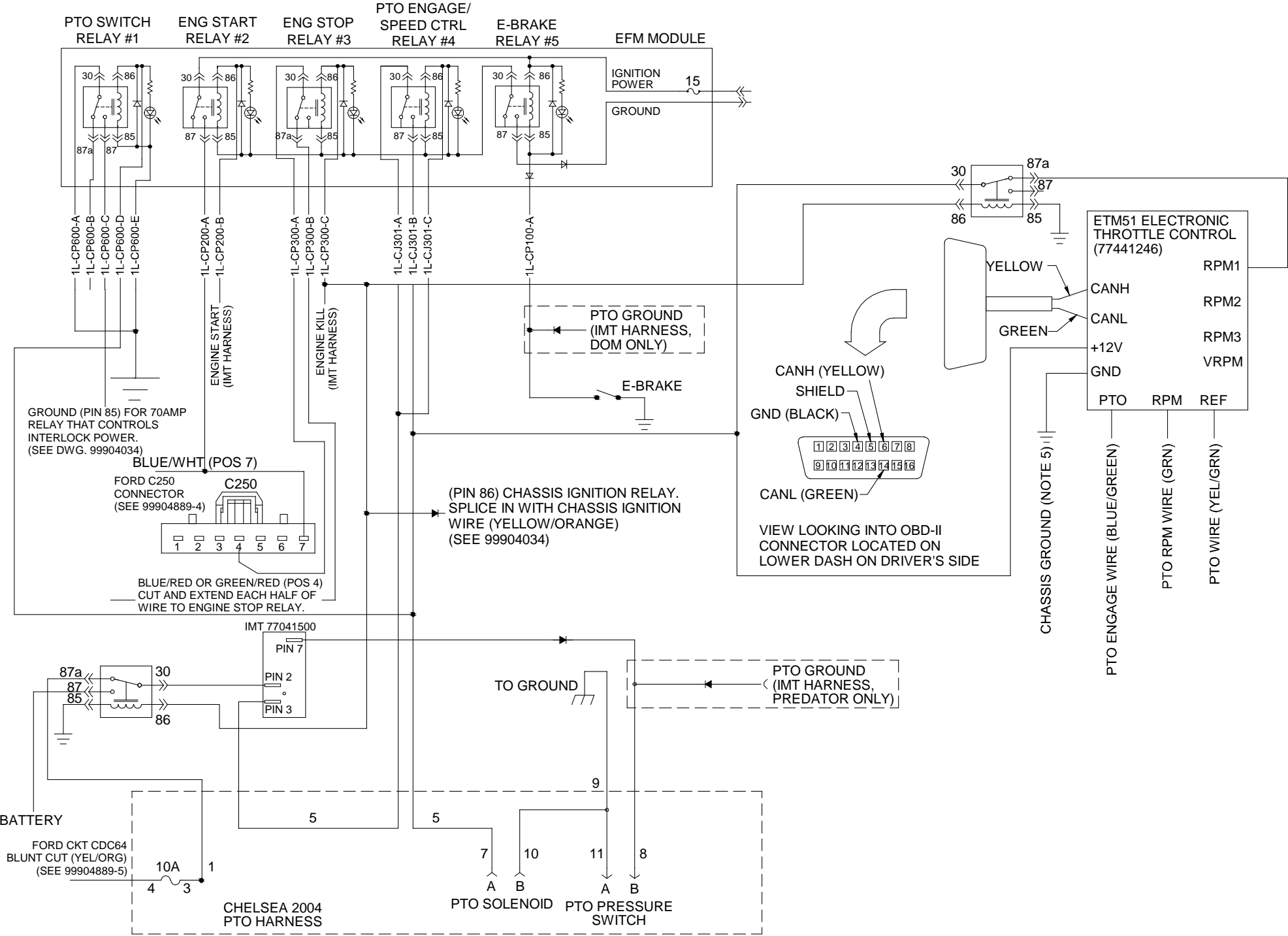
Ford SD - Diesel Automatic without Upfitter Switches (MY2011) (99904889-2)



Ford SD - V10 Gas Automatic with Upfitter Switches (MY2011) (99904889-3)



Ford SD - V10 Gas Automatic without Upfitter Switches (MY2011) (99904889-4)

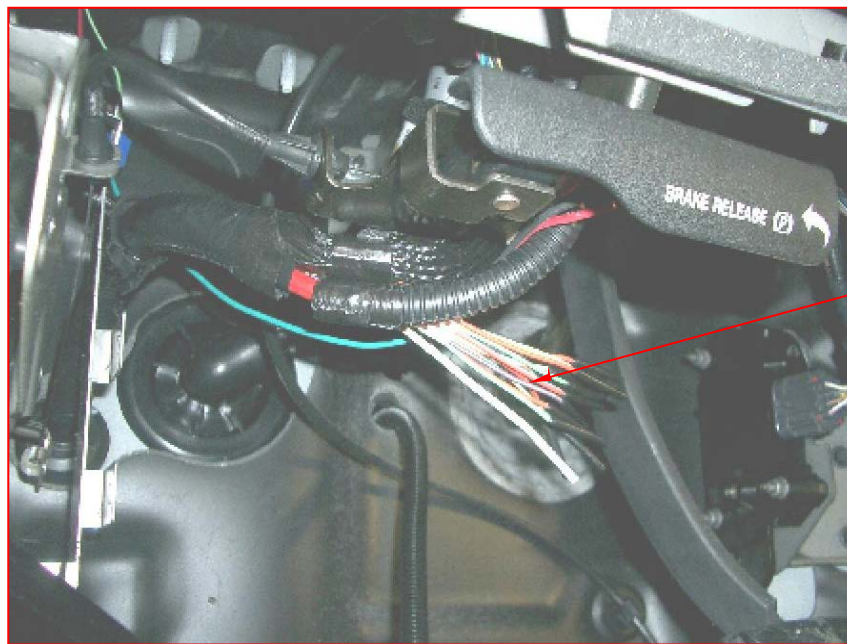


Ford SD Installation Photos (MY2011) (99904889-5)



1. LOOSEN SCREWS UNDER STEERING COLUMN.
2. C250 IS LOCATED ON LEFT SIDE OF STEERING COLUMN.

C250 LOCATION



- PTO CIRCUITS**
- PTO RS1 (YELLOW/GREEN)
 - PTO RS2 (BLUE/ORANGE)
 - PTO_RELAY (BLUE/WHITE)
 - PTO_RPM (GREEN)
 - PTO_REF (WHITE/BROWN)
 - PTO RTN (GRAY/VIOLET)
 - BCP_SW (VIOLET/BROWN)
 - BCP_LAMP (BROWN)
 - IGNITION (YELLOW/ORANGE)