



# Engine Function Module

MODEL YEAR 1998 - 2010

**IOWA MOLD TOOLING CO., INC.**

BOX 189, GARNER, IA 50438-0189  
TEL: 641-923-3711

MANUAL PART NUMBER 99903412

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

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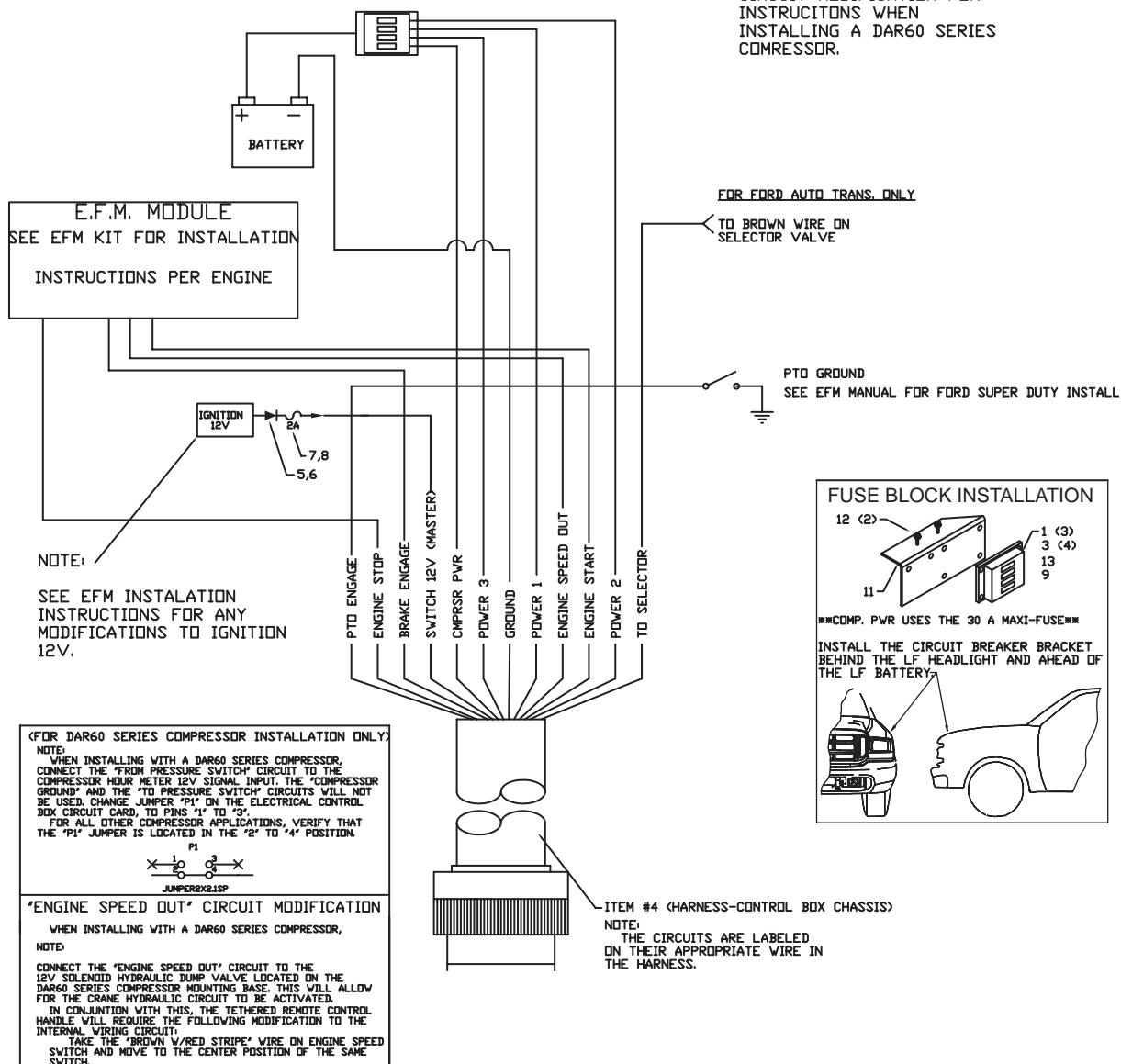
<b>DATE</b>	<b>LOCATION</b>	<b>DESCRIPTION</b>
4-15-02	4 6,8,10,12,14, 17-19	ECN 8903 - ADDED COMMANDER IV WIRING ECN 8905 - EDITS TO WIRING DESCRIPTIONS
4-22-02	12,14	ECN 8911-ADDED DIODES TO WIRING DIAGRAMS FOR FORD SUPER-DUTY
5-14-02	6 13,15	ECN 8925 - ADDED POWER & GROUND CONNECTIONS ECN 8911 - UPDATED FORD SUPER DUTY WIRING FOR AUTO & MANUAL TRANSMISSIONS
8-30-02	10,12,13,15-17	ECN 8981, 9004 - UPDATES TO FORD SUPERDUTY WIRING, REPLACEMENT OF HI-COUNTRY TEK SPEED CONTROL WITH INPOWER CANBUS SPEED CONTROL
11-4-02	22-23	RLS. ECN 9004 CHANGES ECN 9045 - MERCEDES BENZ EFM OPTION
2-10-03	21 5	ECN 9126- CORRECTED MISLABLED CIRCUIT IN MERCEDES BENZ OPT. ADDED EFM KIT # TO 99903391
5-5-03	21	ECN 9176 - UPDATED VCU CONNECTOR INFO.
7-7-03	13-21	ECN 9195 - EDITED HEADINGS ON 2001 FORD SUPER DUTY, ADDED 2002 FORD SUPER DUTY (99903353-99903356)
10-1-03	7	ECN 9277 - UPDATE TO CAT EFM KIT FOR GMC 6500/7500
11-3-03	9-10	ECN 9300 - ADDED 2004 TO CURRENT CUMMINS KIT (99903584), RENAMED 99903394 TO PAST YEARS
4-22-04	1,2,5,30-33	ECN 9410 - ADDED DURAMAX CHEVY 4500/5500 INFO. ECN 9428-3 - CHANGE TO 99903390, 99903160
5-20-04	3, 4	CORRECTED PART NUMBERS
8-30-04	19-22	ECN 9578 - CHANGE TO 99903392 DWG. ECN 9577 - CHANGE TO 99903579 DWG.
9-20-04	7-8 30-31	ECN 9574 - UPDATE TO INT'L TRUCKS (99903397 AND 99903607)
9-30-04	26-31	ECN 9616 - UPDATE FORD SUPER DUTY
12-8-04	6, 20-23 10-15	ECN 9603 - ADDED ISL ENGINE, UPDATED CUMMINS ISC ENGINE
4-13-05	38-40 36	ECN 9673 - ADDED 99903649 DURAMAX INSTALLATION ECN 9721 - CHANGE TO 99903587 DURAMAX INSTALLATION
9-26-05	24-28 34-36 46	ECN 9723 - ADDED 99903648 FORD SUPER-DUTY 2005-PRESENT ECN 9723 - REV B 99903607 ECN 9917 - ADDED PAGE 4 TO 99903649
20060313	43-47	ECN 10065 - ADDED RELAYS TO BRAKE CIRCUITS
20060720	6,35	ECN 10117-UPDATED CONNECTION INFORMATION ON 51717388, 99903607-2
20070329	COVER	UPDATED OWNERSHIP STATEMENT
20070522	10-14 28-35	ECN 10470 - ADDED 99904245, 2008 MODEL YEAR CUMMINS INFORMATION, CHANGED DATE REFERENCE ON 2004-PRESENT. ADDED 99904249, 2008 MODEL YEAR FORD INFORMATION, CHANGED DATE REFERENCE ON 2005-PRESENT.
20071012	10-11	ECN 10601 - ADDED PACCAR ENGINE INFORMATION TO 99904245
20080515	55	ADDED 2007 TO PRESENT GHM 4500/5500 PTO INSTALLATION WITH 6.6 DURAMAX ENGINE, ALLISON 1000 TRANSMISSION, INPOWER SPEED CONTROL
20080605	44	ECN 9000 - 99904382 NOTE 3 MODIFICATION.
20100302	37-40 60-71	ADDED HINO 338 EFM DRAWINGS 99904477 & 99904847 ADDED DODGE EFM DRAWING 99904296
20100507	36-40	ADDED FORD 2011 DRAWING 99904889
20100519	36-40	99904889 REV. A
20100819	11-12	99904944 - NEW 2011 CUMMINS/PACCAR WIRING
20110829	COVER	UPDATED TITLE FOR 99904312 TO BE "MY 1998-2010". MANUAL 99905297 FOR MY2011 - PRESENT RELEASED 8-29-11.

## FRONT END WIRING - DOMINATOR (99903390)

- |   |    |
|---|----|
| 1. 77044635 FUSE-MAXI 20 AMP<br>(WAS 77044747)                | 3  |
| 2. 77441110 CABLE POWER RED #6 X 16<br>(WAS 77040060)         | 8  |
| 3. 72060835 SCR-SELF-TAP #8-18X3/4 HHZINC 4<br>(WAS 72061099) |    |
| 4. 77044939 HARNESS-CTRL BOX POWER                            | 1  |
| 5. 77044556 DIODE 2.2 AMP                                     | 1  |
| 6. 70145421 HEAT SHRINK 3/16 DUAL WALL                        | 8" |
| 7. 77044728 FUSE-ATC 2AMP                                     | 1  |
| 8. 77044764 FUSE HOLDER                                       | 1  |
| 9. 77044636 FUSE-MAXI 30AMP<br>(WAS 60250624)                 | 1  |
| 10. 72061739 SCR-TEK #12-14 X 100 HWH                         | 2  |
| 11. 60251088 BRKT-RELAY & MAXI FUSE BLK<br>(WAS 77041553)     | 1  |
| 12. 51717388 EFM KIT (WAS 99903391)                           | 1  |
| 13. 77041678 FUSE BLOCK                                       | 1  |

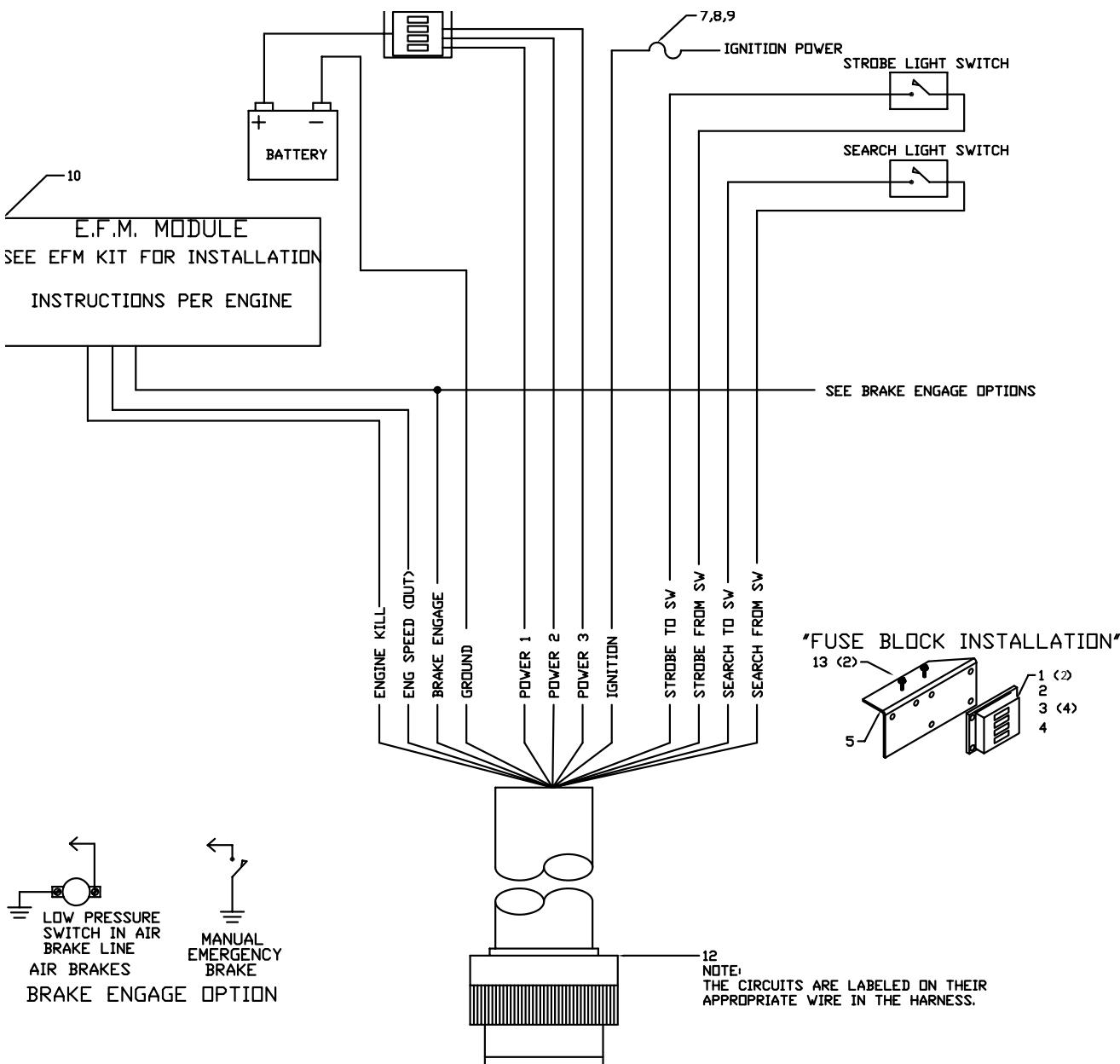
LUCATE FUSE BLOCK PER "FUSE BLOCK INSTALLATION" DETAIL AT THE LOWER RH NOTE PORTION OF THIS DRAWING.  
ROUTE WIRES AS SHOWN.

SEE "ENGINE SPEED OUT" CIRCUIT MODIFICATION FOR INSTRUCTIONS WHEN INSTALLING A DAR60 SERIES COMPRESSOR.



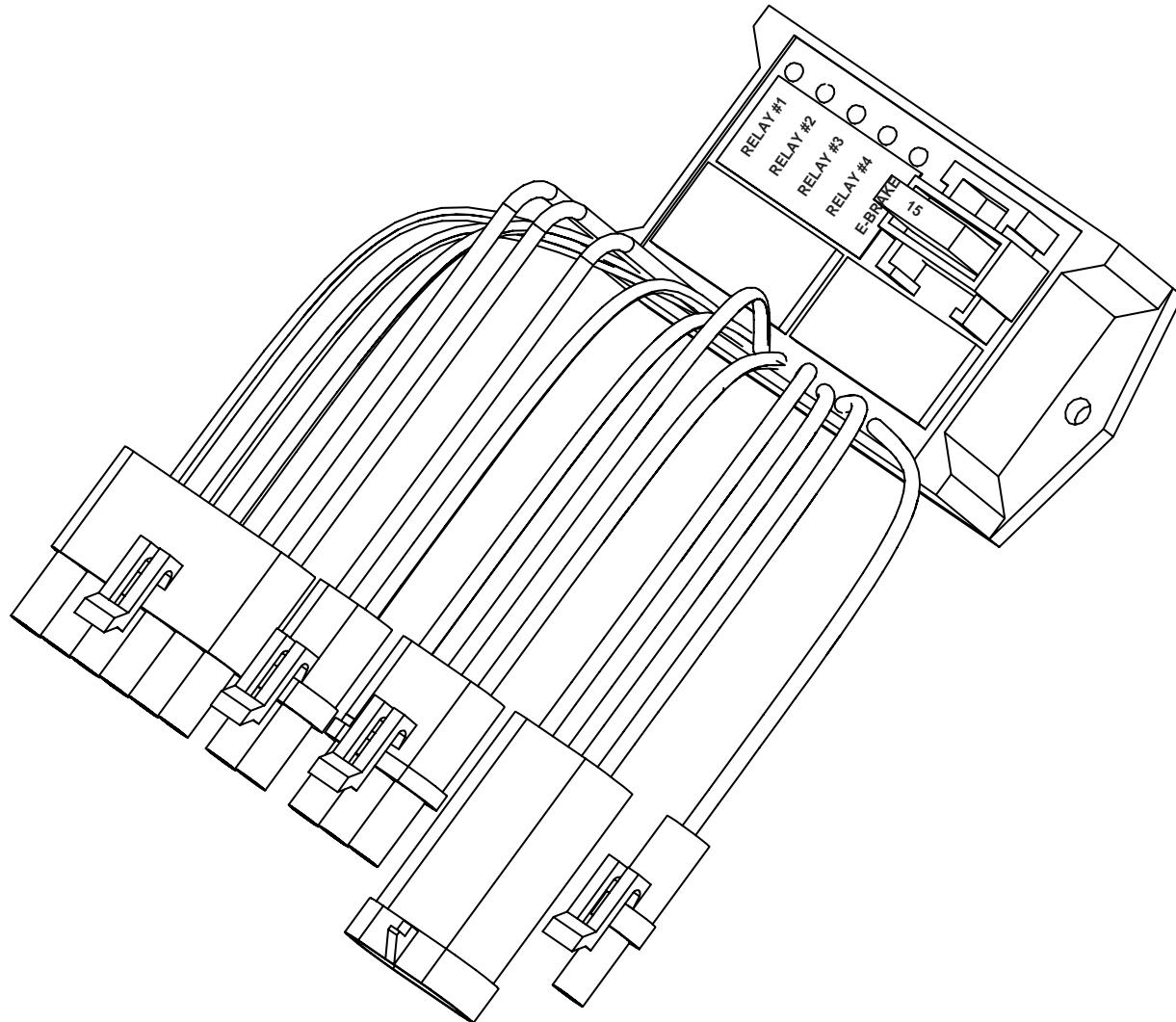
## CHASSIS WIRING - COMMANDER IV (99903160)

- |   |     |
|---|-----|
| 1. 77041616 FUSE-MAXI 40 AMP<br>(WAS 77044672)                | 2   |
| 2. 77041678 FUSE BLOCK- 4 POSITION<br>(WAS 77040060)          | 1   |
| 3. 72060835 SCREW-SELF-TAP #8-18X3/4 HHZ 4<br>(WAS 72061099)  |     |
| 4. 77041619 FUSE-MAXI 60 AMP                                  | 1   |
| 5. 60251088 BRKT-RELAY & MAXI FUSE BLK<br>(WAS 77041628)      | 1   |
| 6. 77441110 CABLE POWER RED #6X16<br>(WAS 77040049)           | 1   |
| 7. 77041606 FUSE AGC 7.5                                      | 1   |
| 8. 77044691 FUSE HOLDER                                       | 1   |
| 9. 77040048 TERM-BUTT CONN                                    | 6   |
| 10. 51717388 KIT-EFM  | 1   |
| 11. 70145421 HEAT SHRINK (NOT SHOWN)<br>(WAS 60250624)        | 12" |
| 12. 77044915 HARNESS  | 1   |
| 13. 72061739 SCR-TEK 12-14 X 1.00 HWH (N/S)<br>(RMV 77041615) | 2   |



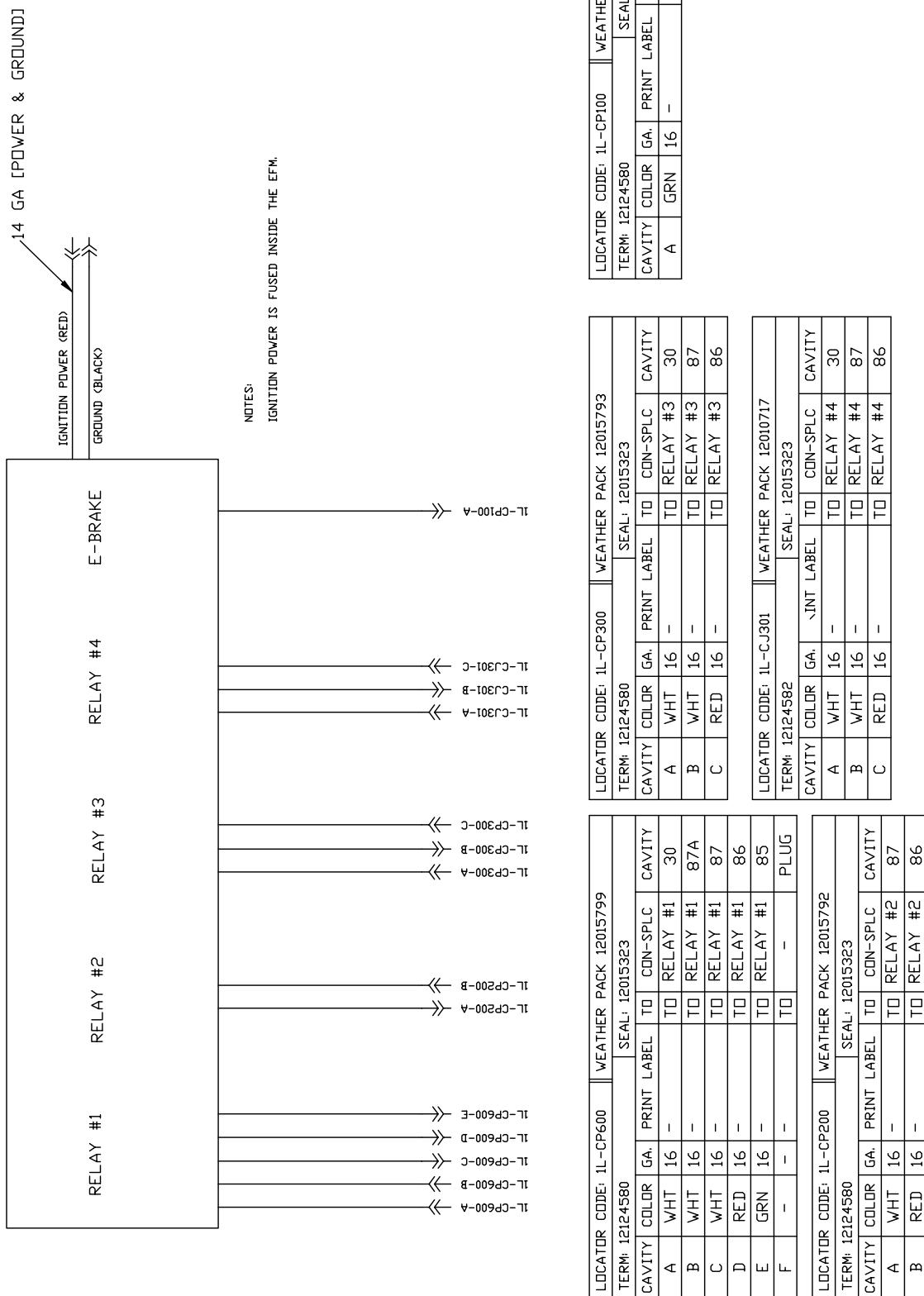
**EFM INSTALLATION KIT (51717388)**

1. 70146433	ENGINE FUNCTION MODULE	1	15. 77040051	TERM-SPRSPADE 18STUD	2
2. 77044575	CONN-PKD WP 6CAV MALE/SHR	1	16. 77041008	SWITCH-PRESS CTL	1
3. 77044573	CONN-PKD WP 2CAV MALE/SHR	1	17. 70394092	DECAL-CAUTION BRK/COMP	1
4. 77044558	CONN-PKD WP 3 CAV MALE/SHR	1	18. 70394069	CABLE SEAL-PKD WP/MP	14
5. 77044557	CONN-PKD WP 3CAV FEM/TWR	1	19. 77044556	DIODE-2.2 AMP/247V (WAS 1)	2
6. 77044690	CONN-PKD WP 1 CAV MALE/SHR	1	21. 99903412	MANUAL - EFM INSTALLATION KIT	1
7. 77045888	TERM-PKD WP 14-16GA FEM	3	22. 77044341	TERMINAL BLOCK-4 CONTACT	2
8. 77045887	TERM-PKD WP 14-16GA MALE	11	23. 77040130	JUMPER BAR-TERMINAL	4
9. 77044676	PLUG-PKD WP/METRIPACK	15	24. 77441059	TERM-MBE	1
10. 79085317	TOOL-CONT. REMOVAL	1	25. 77044565	TERMINAL - 16-18 GA MALE	3
11. 51714048	WIRE ASM-16GA WHT X 72.0	1	26. 77045924	CONNECTOR PIN, INT'L EFM	2
12. 51715791	WIRE ASM-16GA RED X 72.0	1	51717388	EFM KIT	REF
13. 89044235	WIRE-14GA WHT STRD GPT	5FT			
14. 72533495	TEE-FEM BRANCH	1			

**ENGINE FUNCTION MODULE (EFM)  
(70146433-1)**

# ENGINE FUNCTION MODULE (EFM)

## (70146433-2)

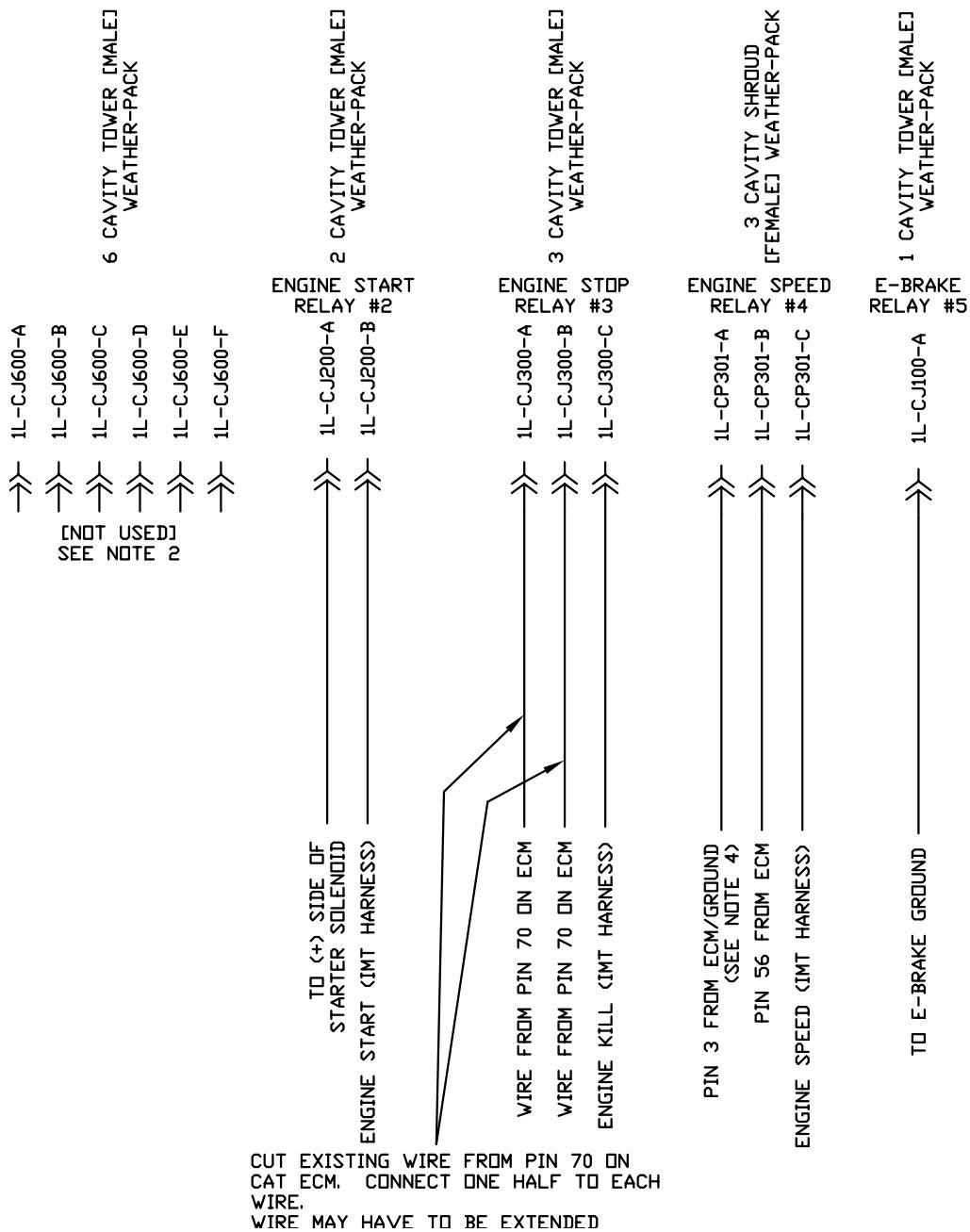


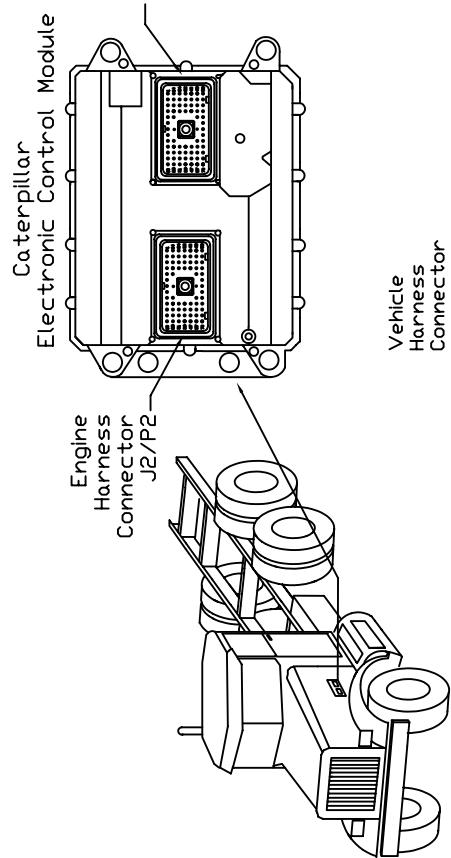
**CAT SERIES EFM (99903392-1)**

FOR: 2001 TO PRESENT CAT 3126E, C7,  
C10, C12, C15, AND C16

## 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. WIRES TO PIN 3 AND 56 ON CAT ECM MAY HAVE TO BE INSTALLED. THERE MAY ALSO BE EXISTING WIRES IN PIN 3 AND 56. IF SO USE THE REMOVAL TOOL TO EXTRACT THESE WIRES AND REINSTALL NEW WIRES FROM THE KIT.
4. GMC 6500 / 7500 WITH CAT ENGINE USES CHASSIS GROUND IN PLACE OF PIN 3 ON ECM. THE GM DASH SWITCH IS NOT USED.





STARTER SOLENOID

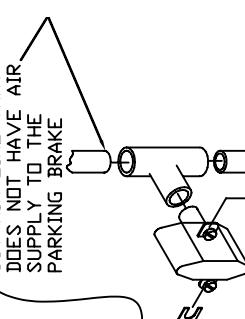
ATTACH WIRE FROM 1L-CP200-A TO THE (+) SIDE OF  
THE STARTER SOLENOID COIL.  
BE SURE TO GET THE (+) SIDE OF THE STARTER  
SOLENOID. USE A MULTIMETER TO CHECK IF UNSURE.

TO 1L-CJ300-A

PARKING BRAKE GROUND

IF TRUCK IS EQUIPPED WITH  
AIR BRAKES

GROUND

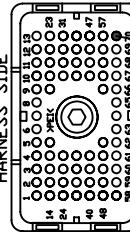
CUT AIR LINE THAT  
DOES NOT HAVE AIR  
SUPPLY TO THE  
PARKING BRAKE

USING MPSI PRO-LINK 9000 OR CAT ET SOFTWARE, CHANGE  
TO THE FOLLOWING PARAMETERS IN THE ECM.

PTO CONFIGURATION: REMOTE SWITCHES  
PTO TOP ENGINE LIMIT: [END USER TO DETERMINE] \*  
PTO ENGINE RPM SET SPEED: [END USER TO DETERMINE] \*  
PTO TO SET SPEED: YES  
PTO CAB THROTTLE RPM LIMIT: TEL  
IDLE/PTO RPM RAMP RATE: 500 RPM/SEC  
IDLE/PTO RPM BUMP RATE: 500 RPM

\* MUST BE THE SAME VALUE

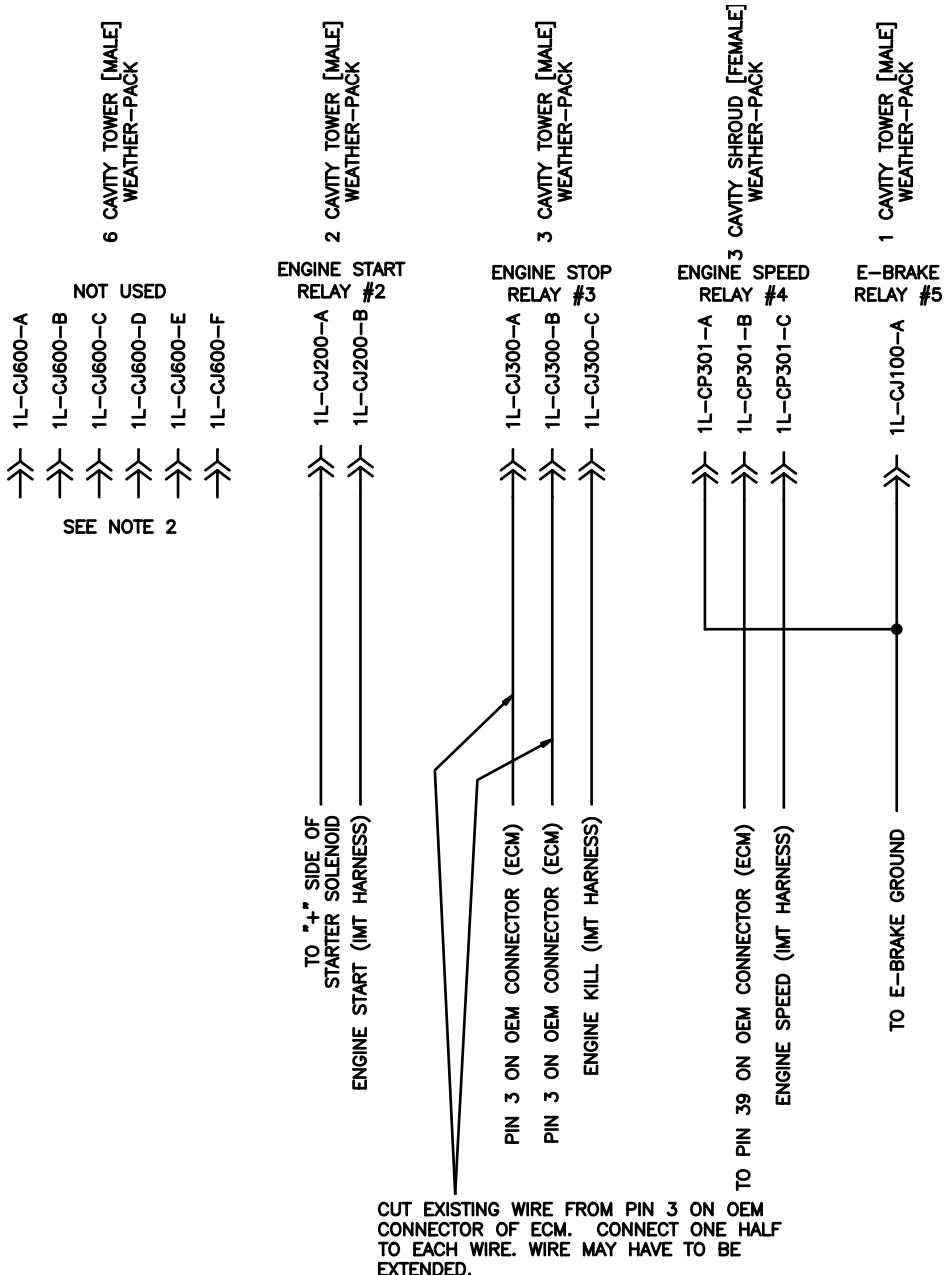
1L-CJ300-A →  
CUT EXISTING WIRE RUNNING TO  
PIN #70 IN TWO AND CONNECT  
TO ENGINE FUNCTION MODULE  
HARNESS SIDE

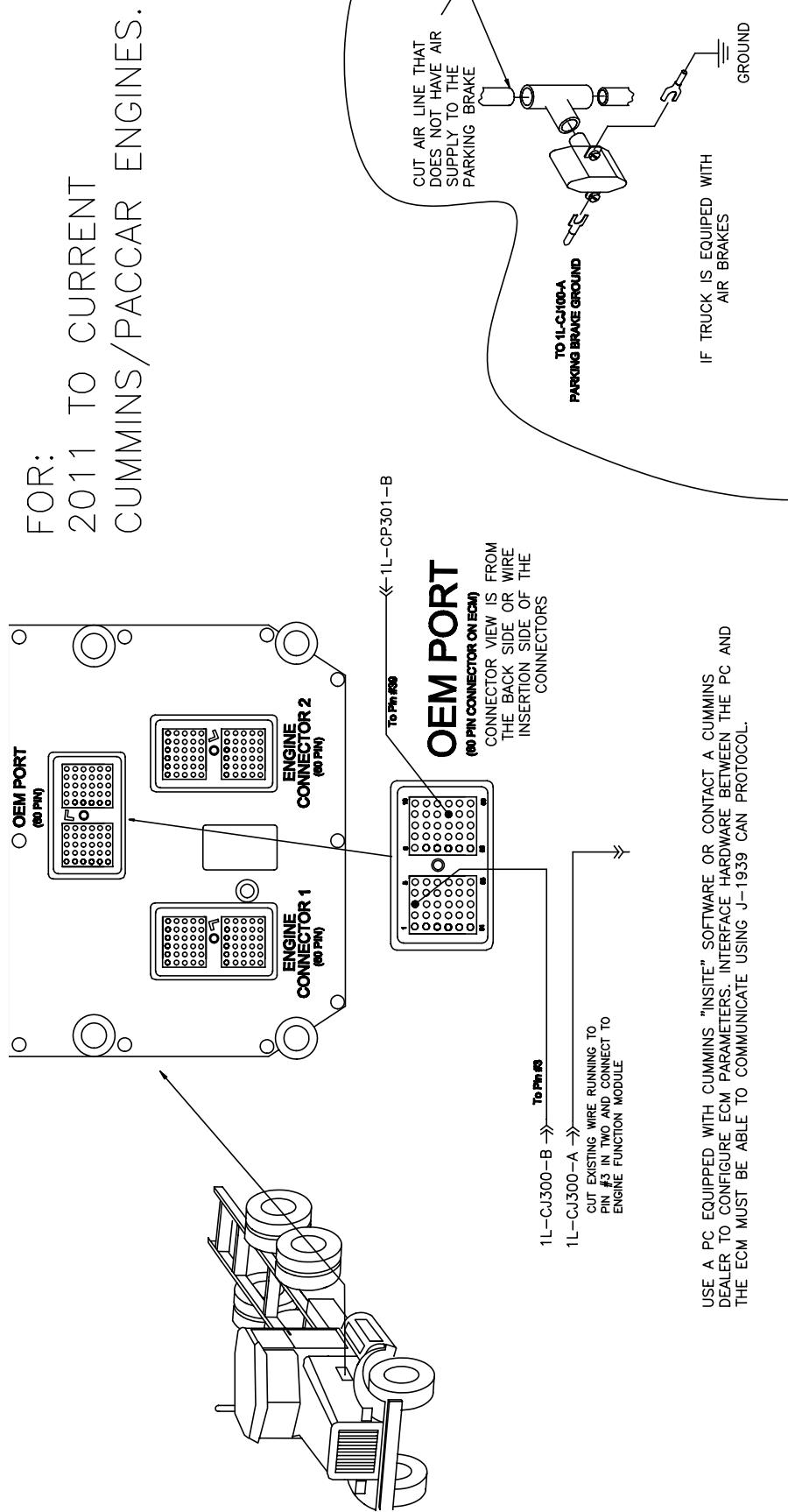


1L-CJ300-B ← To Pin #70

**CUMMINS & PACCAR SERIES EFM (2011 TO PRESENT) (99904944-1)****FOR: 2011 TO PRESENT CUMMINS/PACCAR ENGINES****NOTES:**

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



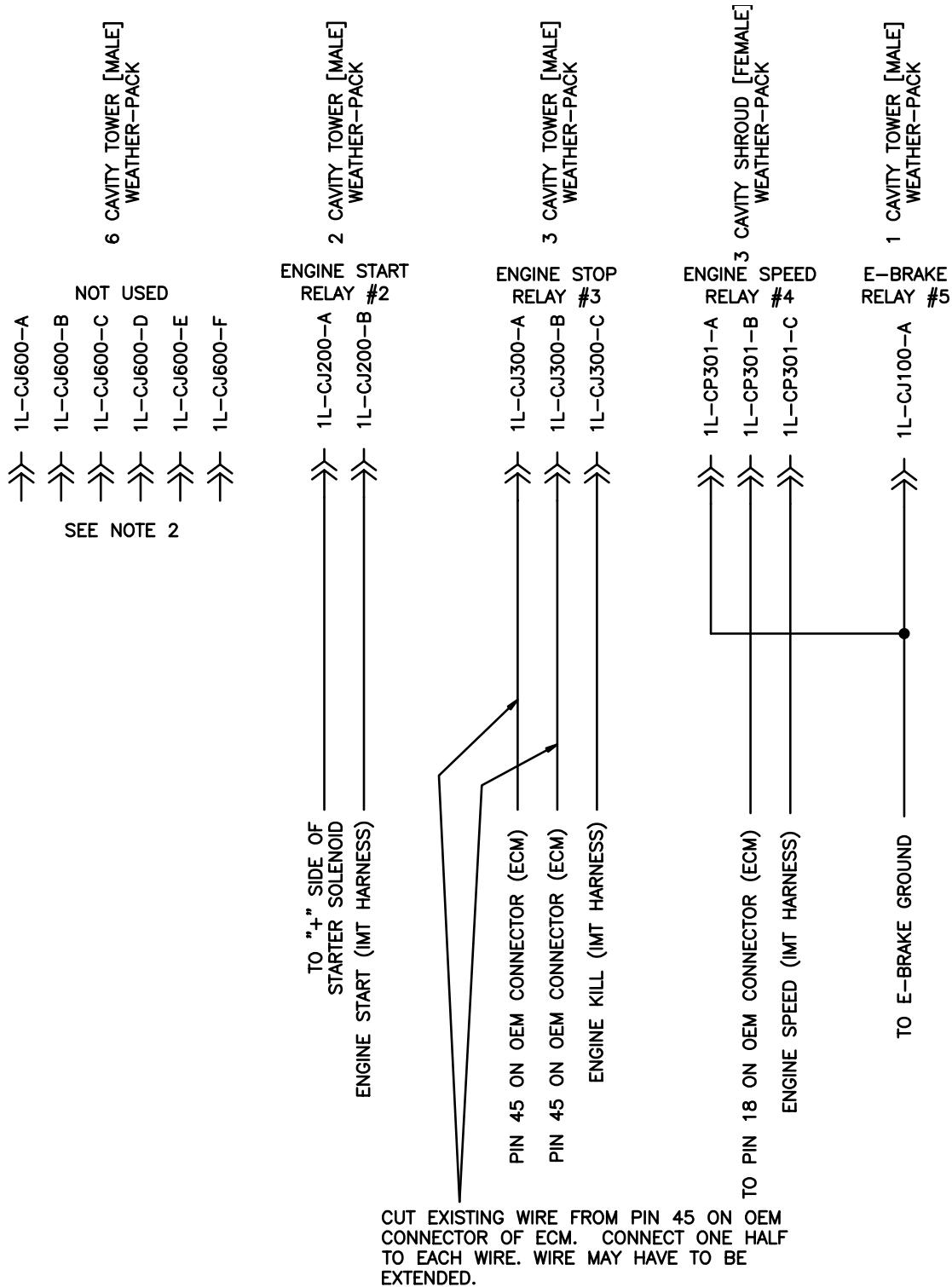
**CUMMINS & PACCAR SERIES EFM (2011 TO PRESENT) (99904944-2)**

**CUMMINS & PACCAR SERIES EFM (2008  
TO 2010) (99904245-1)**

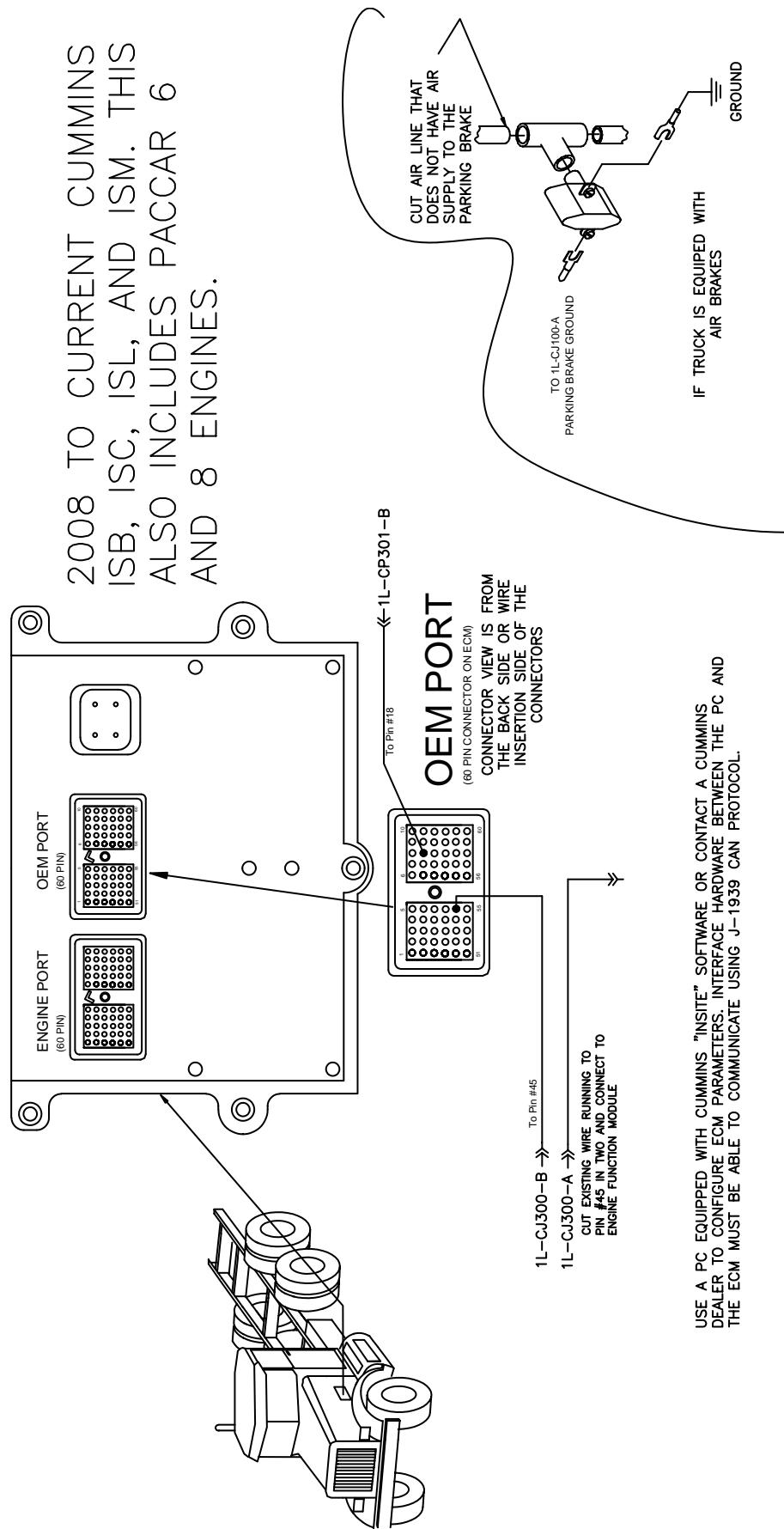
**FOR: 2008 TO PRESENT CUMMINS ISB, ISC, ISL AND ISM ENGINES; AND  
PACCAR 6 & 8 ENGINES**

**NOTES:**

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



**CUMMINS ISB ISC ISM SERIES EFM (2008  
TO 2010) (99904245-2)**

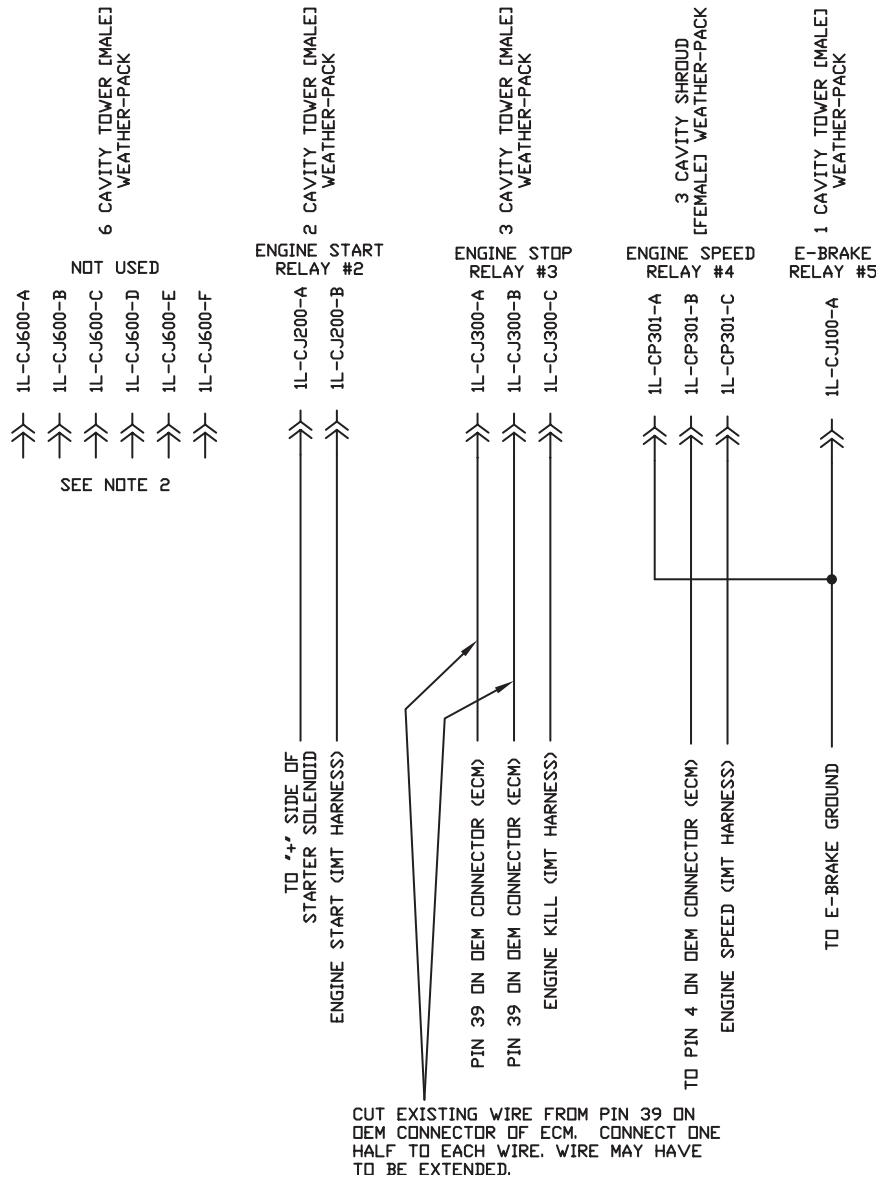


**CUMMINS ISB, ISC, ISL & ISM SERIES  
EFM (2004-2007) (99903584-1)**

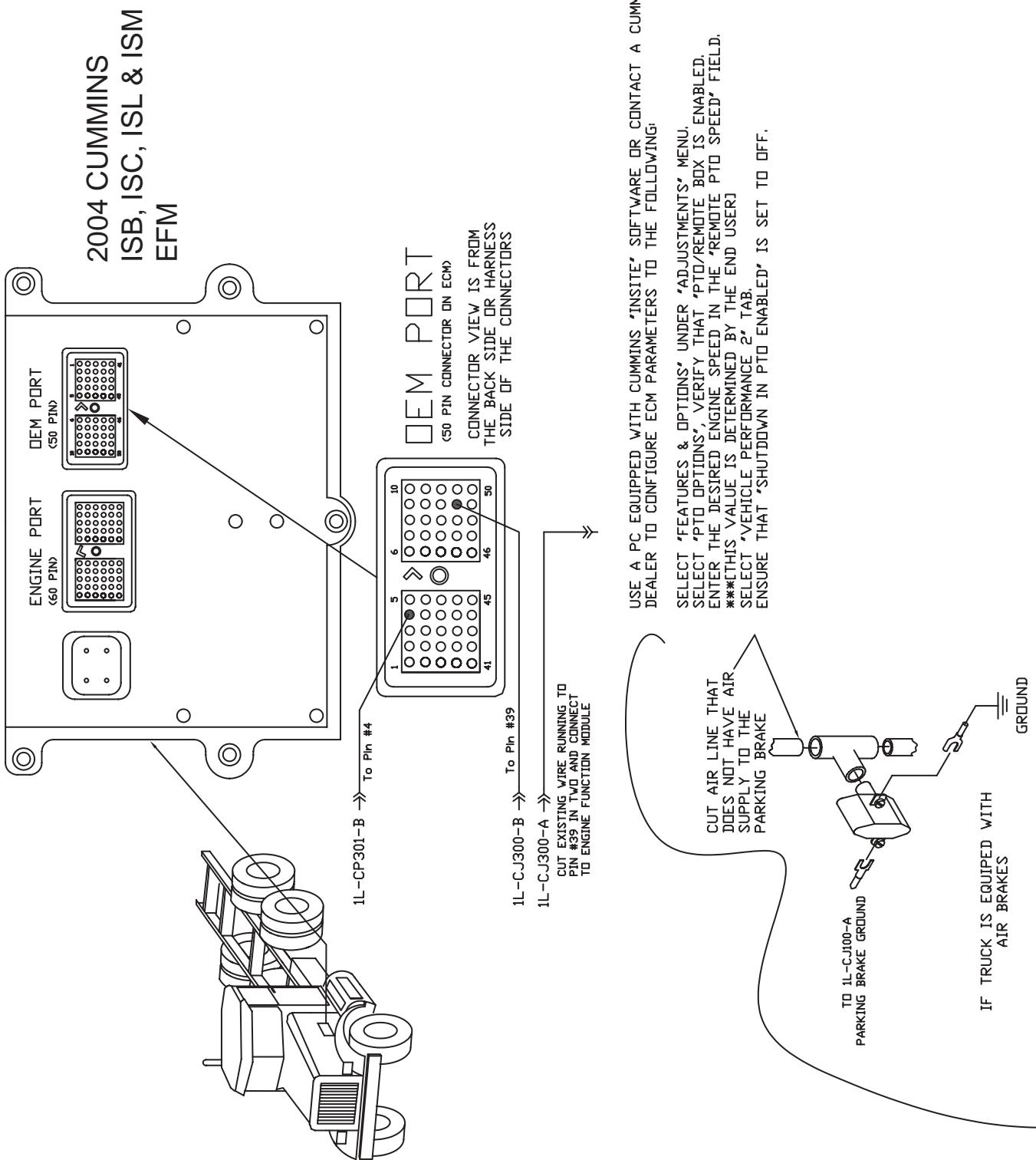
FOR: 2004 TO 2007                    CUMMINS ISB, ISC, ISL  
AND ISM ENGINES.

## NOTE:

1. ENGINE START NOT USED ON PREDATOR.
2. PLUG ALL UNUSED CAVITIES WITH #77044893.  
CAP ALL UNUSED CONNECTORS.



**CUMMINS ISB, ISC, ISL & ISM SERIES  
EFM (2004-2007) (99903584-2)**

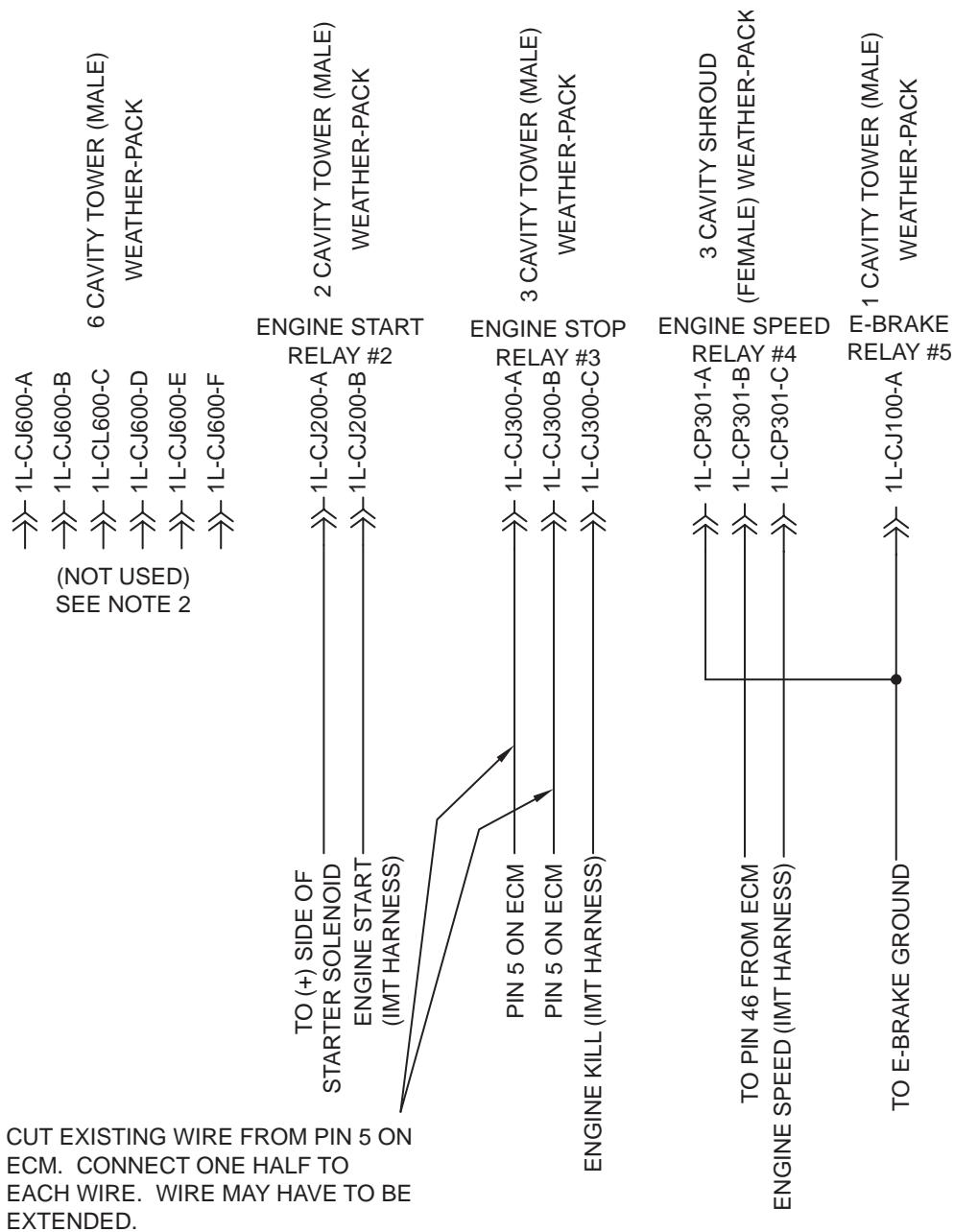


# CUMMINS ISB & ISC SERIES EFM (1998-2003) (99903393-1)

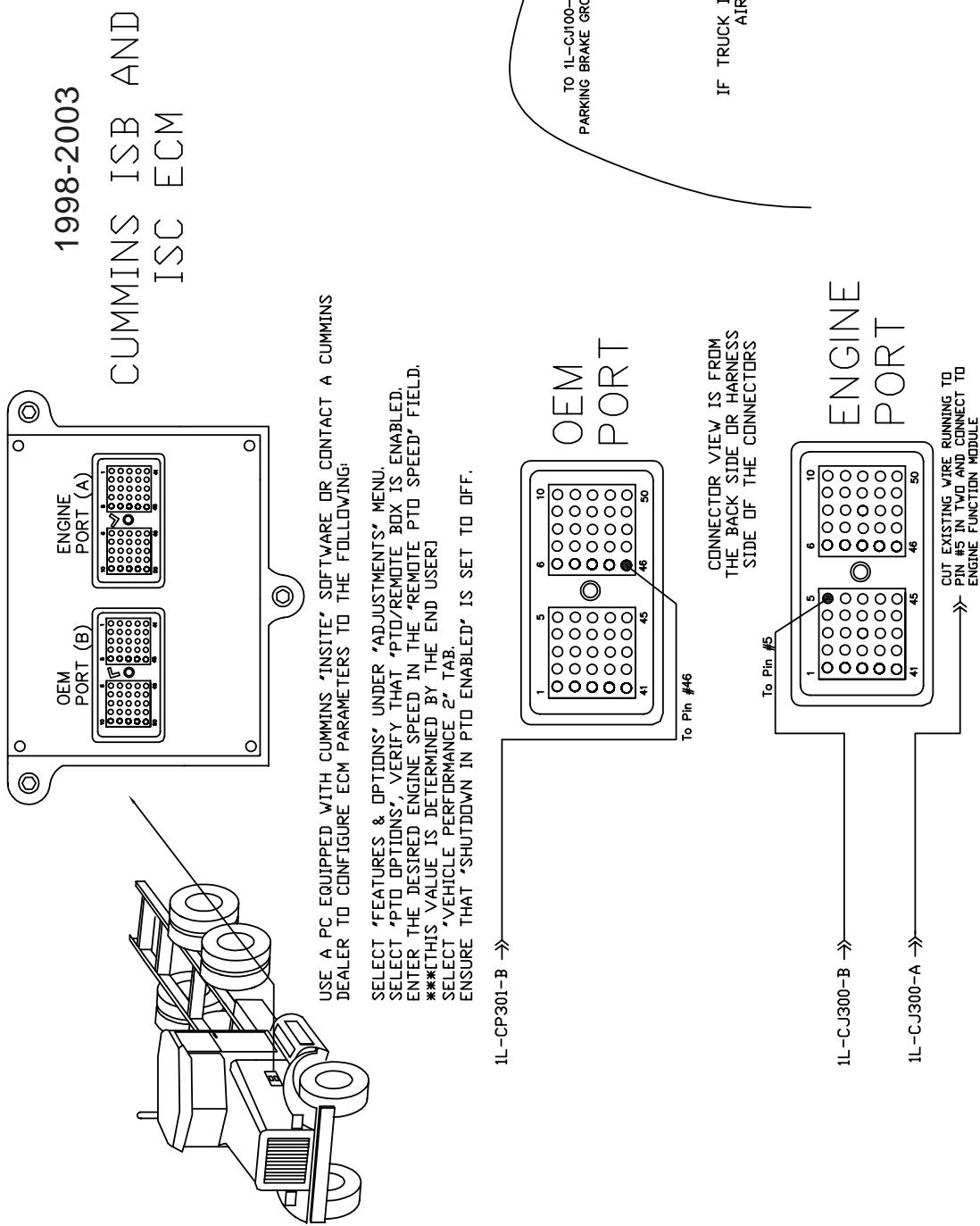
## FOR: 1998 TO 2003 CUMMINS ISB & ISC ENGINES

### NOTES:

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

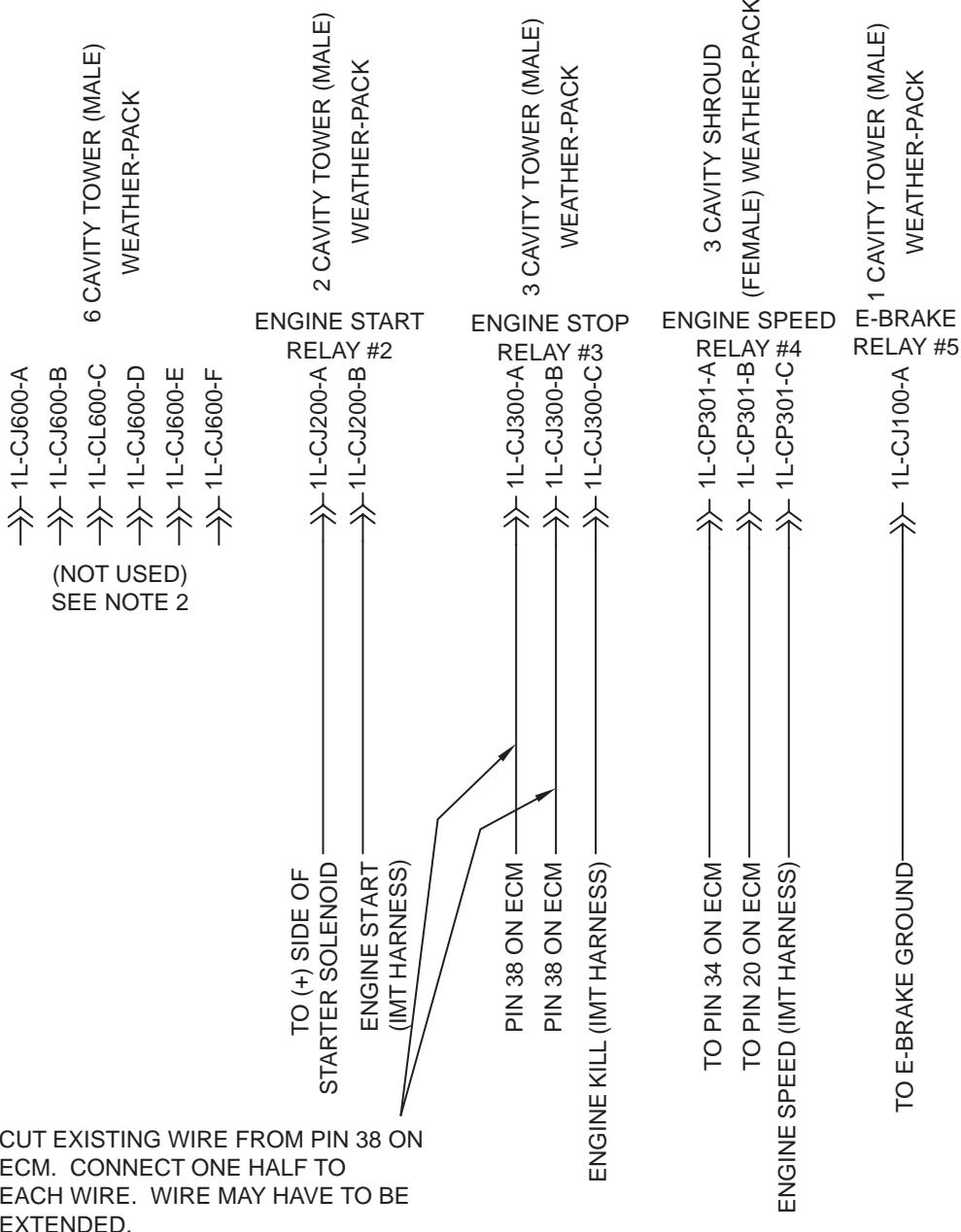


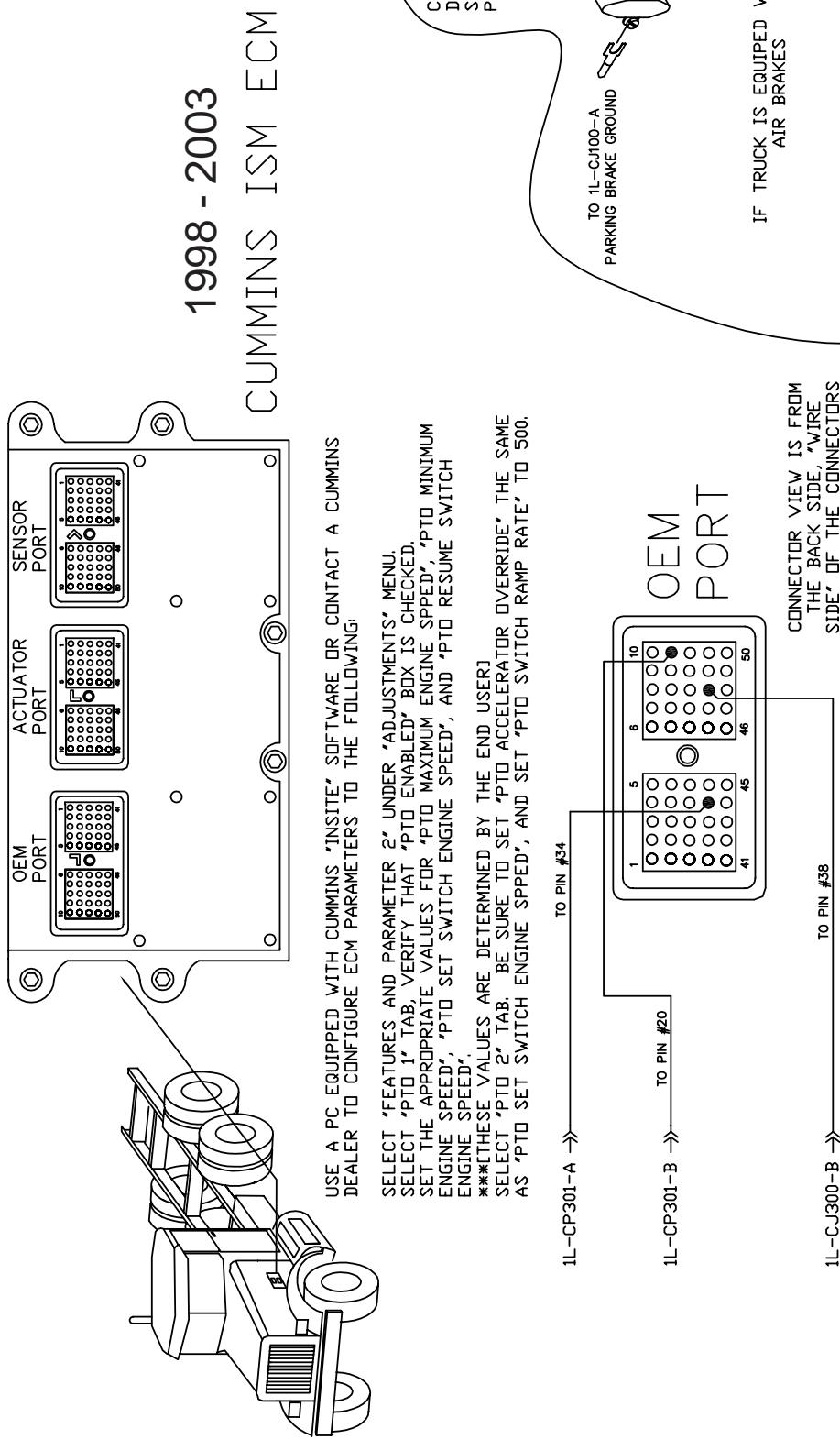
**CUMMINS ISB & ISC SERIES EFM (1998-  
2003) (99903393-2)**



**CUMMINS ISM SERIES EFM (99903394-1)****FOR: 1998 TO 2003 CUMMINS ISM ENGINE****NOTES:**

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

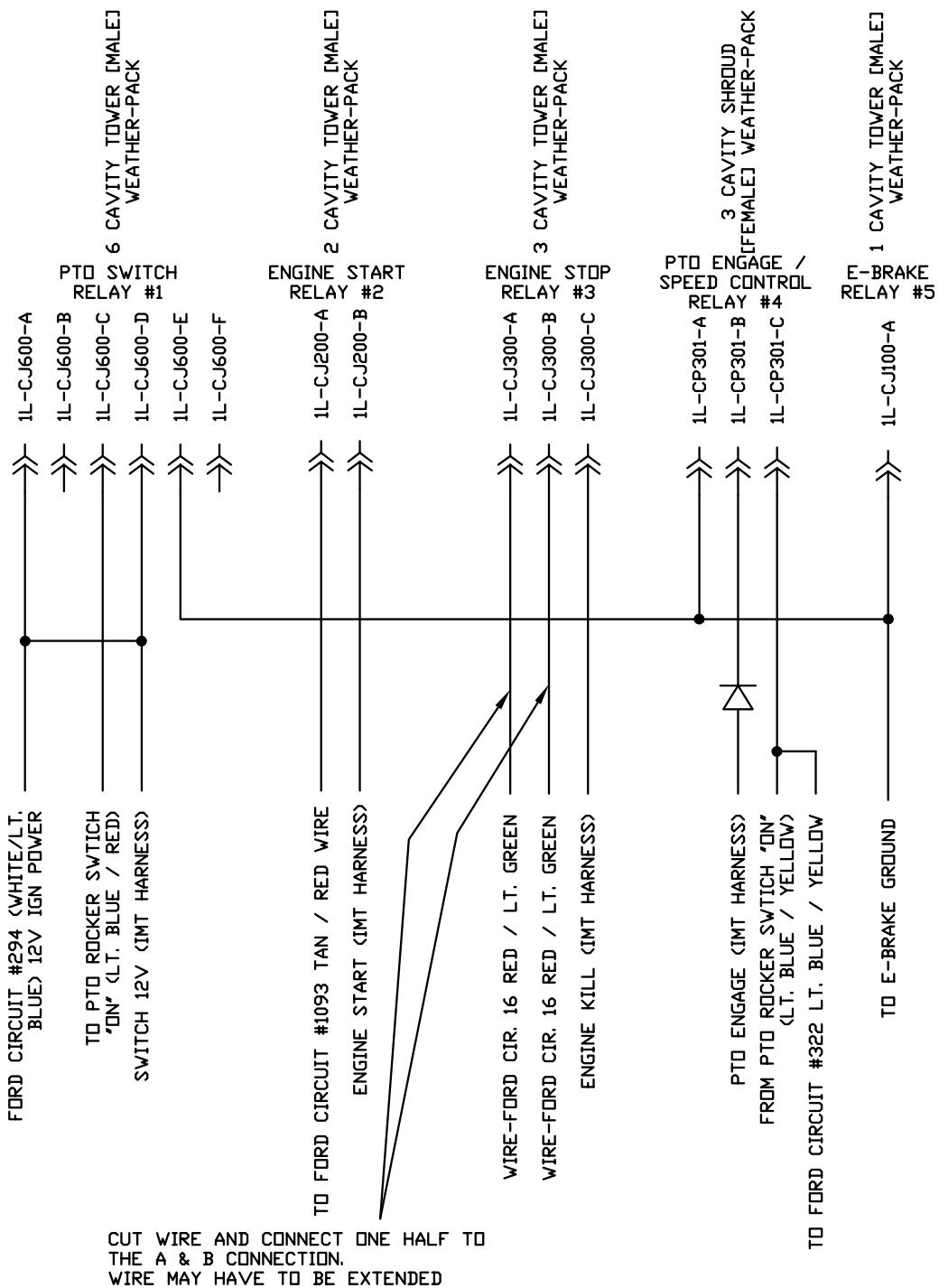




**2001 FORD SUPER-DUTY AUTO. TRANS-  
MISSION EFM (99903395-1)**
**FOR: 2001 FORD SUPER-DUTY WITH AUTO-  
MATIC TRANSMISSION**

## NOTES:

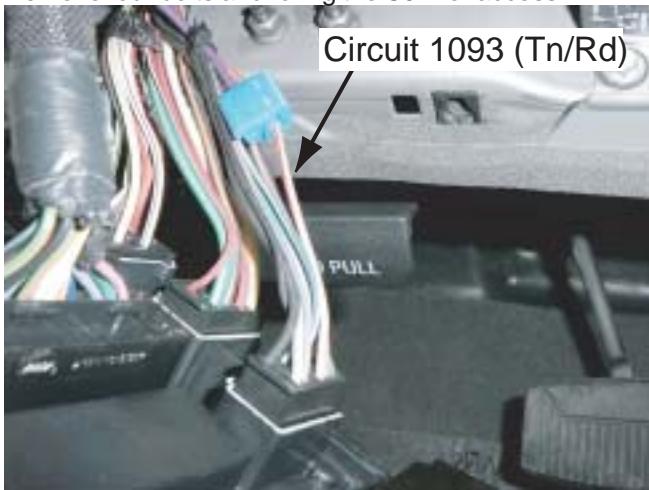
1. Engine start not used on Predator.
2. Plug all unused cavities with Packard plug #12010300 (IMT # 77044893). Cap all unused connectors on EFM.
3. Engine speed on Ford automatic transmission vehicles is controlled by the Ford APC module.
4. PTO switch is interlocked with the parking brake. If the parking brake is disengaged, the PTO will disengage.



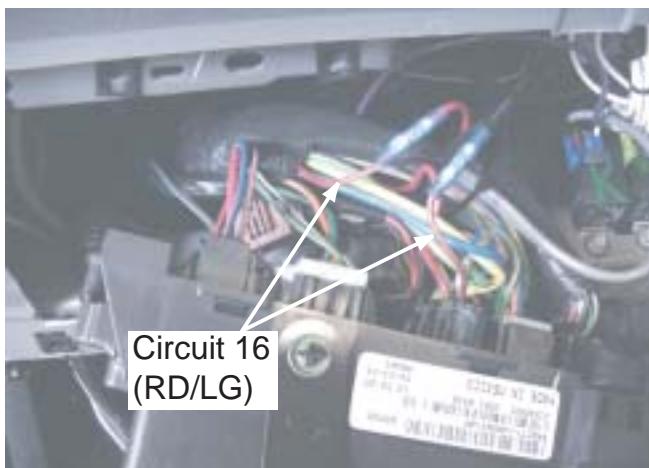
## 2001 FORD SUPER-DUTY AUTO. TRANS-MISSION EFM (99903395-2)



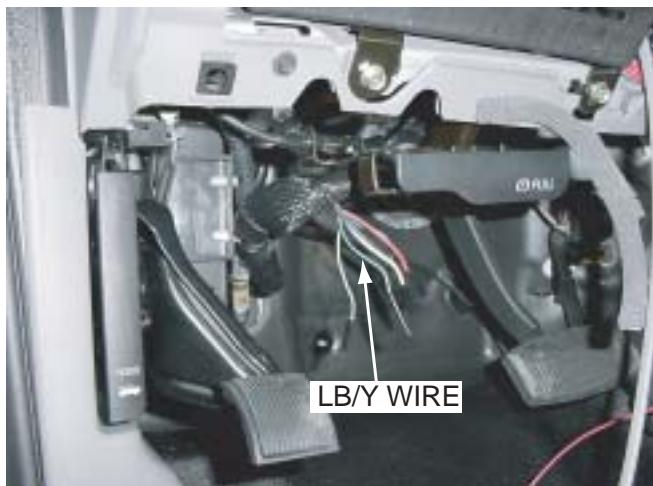
1. The Control Junction Box (CJB) is located behind the modesty panel below the steering wheel. Access to the engine kill and engine start wires are behind the CJB. Remove four bolts anchoring the CJB for access.



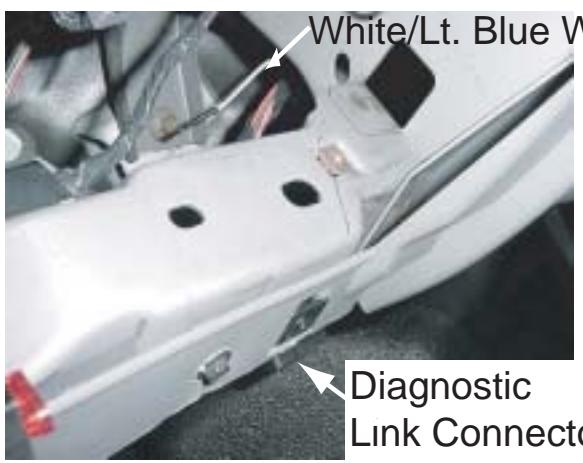
2. For engine start, splice into the tan/red wire (circuit 1093) in location shown.



3. For engine kill, cut the red/lt. green wire (circuit 16) in location shown and splice.



4. The PTO switch has a lt. blue/ yellow wire that hooks directly up to the Ford-supplied lt. blue/ yellow (cir. 322).



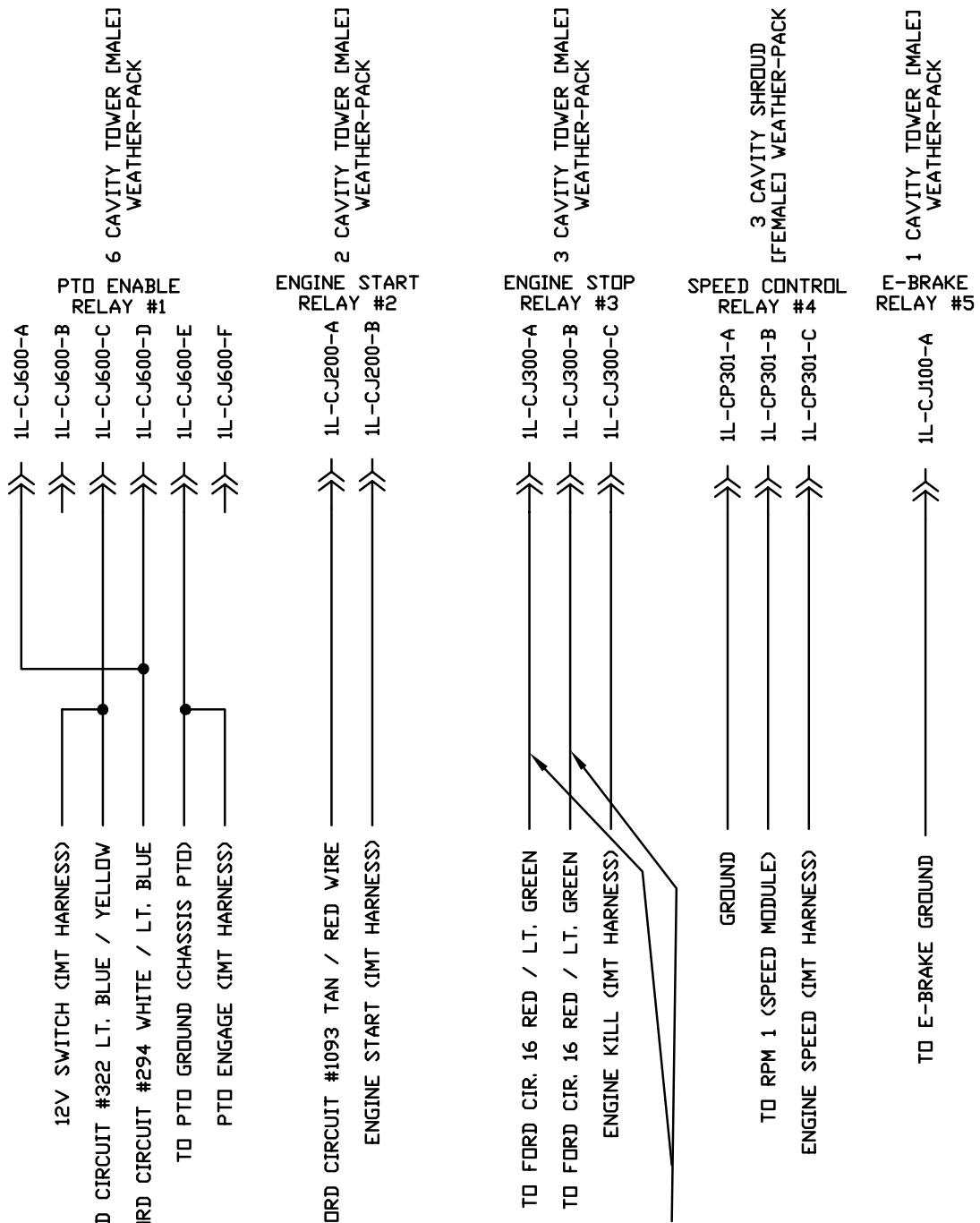
5. The Ford-supplied 12V PTO power source (cir. 294) is located here.

## 2001 FORD SUPER-DUTY MANUAL TRANSMISSION EFM (99903396-1)

### FOR: 2001 FORD SUPER-DUTY WITH MANUAL TRANSMISSION

#### NOTES:

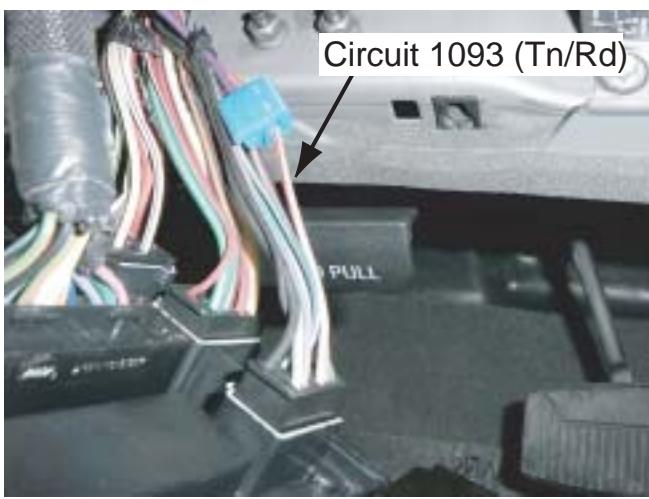
1. Engine start not used on Predator.
2. Plug all unused cavities with Packard plug #12010300 (IMT # 77044893). Cap all unused connectors on EFM.
3. Engine speed on Ford Super Duty is controlled by the inpower direct speed control module.



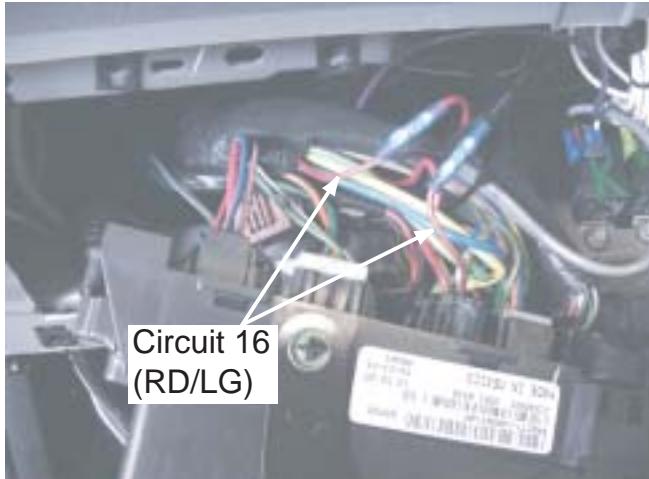
CUT WIRE AND CONNECT ONE HALF TO  
THE A & B CONNECTION.  
WIRE MAY HAVE TO BE EXTENDED

**2001 FORD SUPER-DUTY MANUAL  
TRANSMISSION EFM (99903396-2)**

1. The Control Junction Box (CJB) is located behind the modesty panel below the steering wheel. Access to the engine kill and engine start wires are behind the CJB. Remove four bolts anchoring the CJB for access.



2. For engine start, splice into the tan/red wire (circuit 1093) in location shown.



3. For engine kill, cut the red/lt. green wire (circuit 16) in location shown and splice.

**NOTE:**

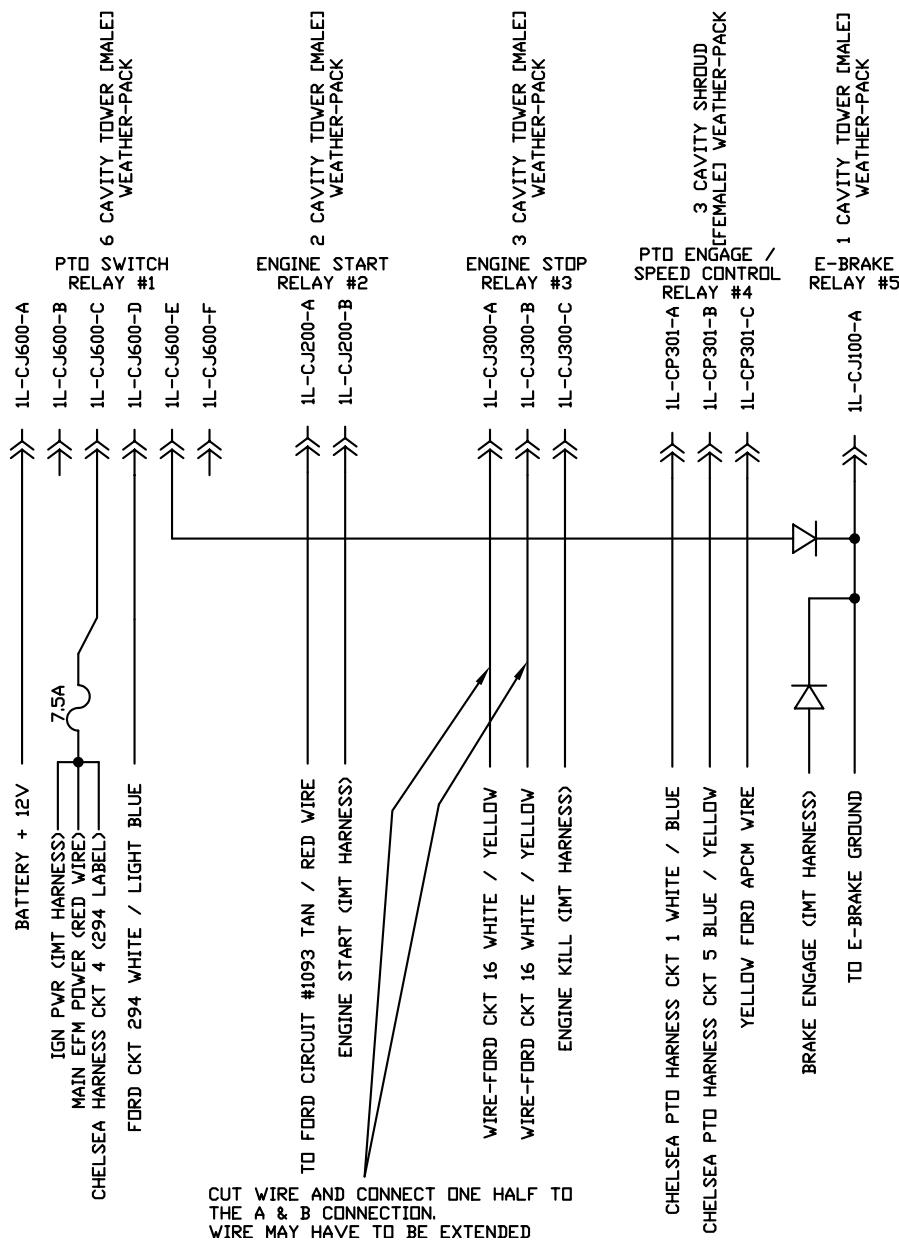
SEE 99903454 FOR INPOWER DIRECT SPEED CONTROL MODULE.

**FORD SUPER-DUTY- 2002 TO 2004  
AUTOMATIC TRANSMISSION EFM  
(99903553-1)**

**FOR: 2002 TO 2004 FORD SUPER-DUTY WITH  
AUTOMATIC TRANSMISSION**

**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. Engine speed and PTO activation on Ford Super Duty with automatic transmission are controlled by the Ford APC module.
4. PTO switch is interlocked with the parking brake. If the parking brake is disengaged, the PTO will disengage.
5. Ford circuit 322 is not shown on this drawing, but should be connected to the Chelsea PTO harness according to Chelsea's installation instructions, shown on 99903556.



**FORD SUPER-DUTY- 2002 TO 2004 -  
AUTOMATIC TRANSMISSION EFM  
(99903553-2)**



The CJB is located behind the modesty panel below the steering wheel. Access to the engine kill and engine start wires are behind the CJB. Remove the four bolts holding the CJB for access.



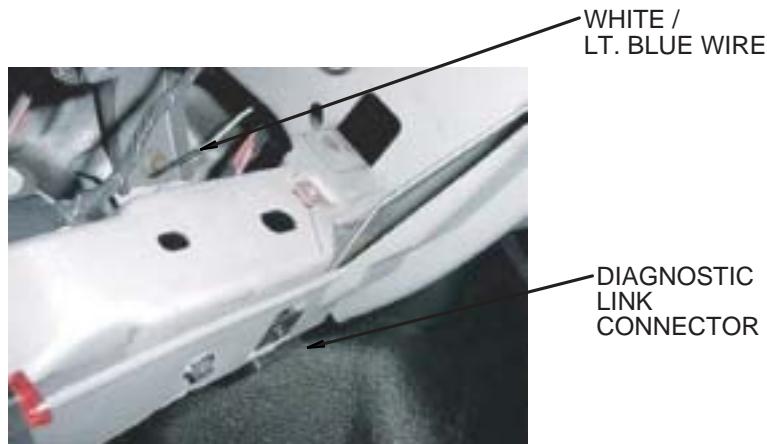
For engine start, splice into circuit 1093 (tan / red) in the location shown.



For engine kill, cut circuit 16 (white / yellow) in the location shown and splice.



The PTO switch has a lt. blue / yellow wire that hooks up directly to the Ford-supplied circuit 322 (lt. blue / yellow).



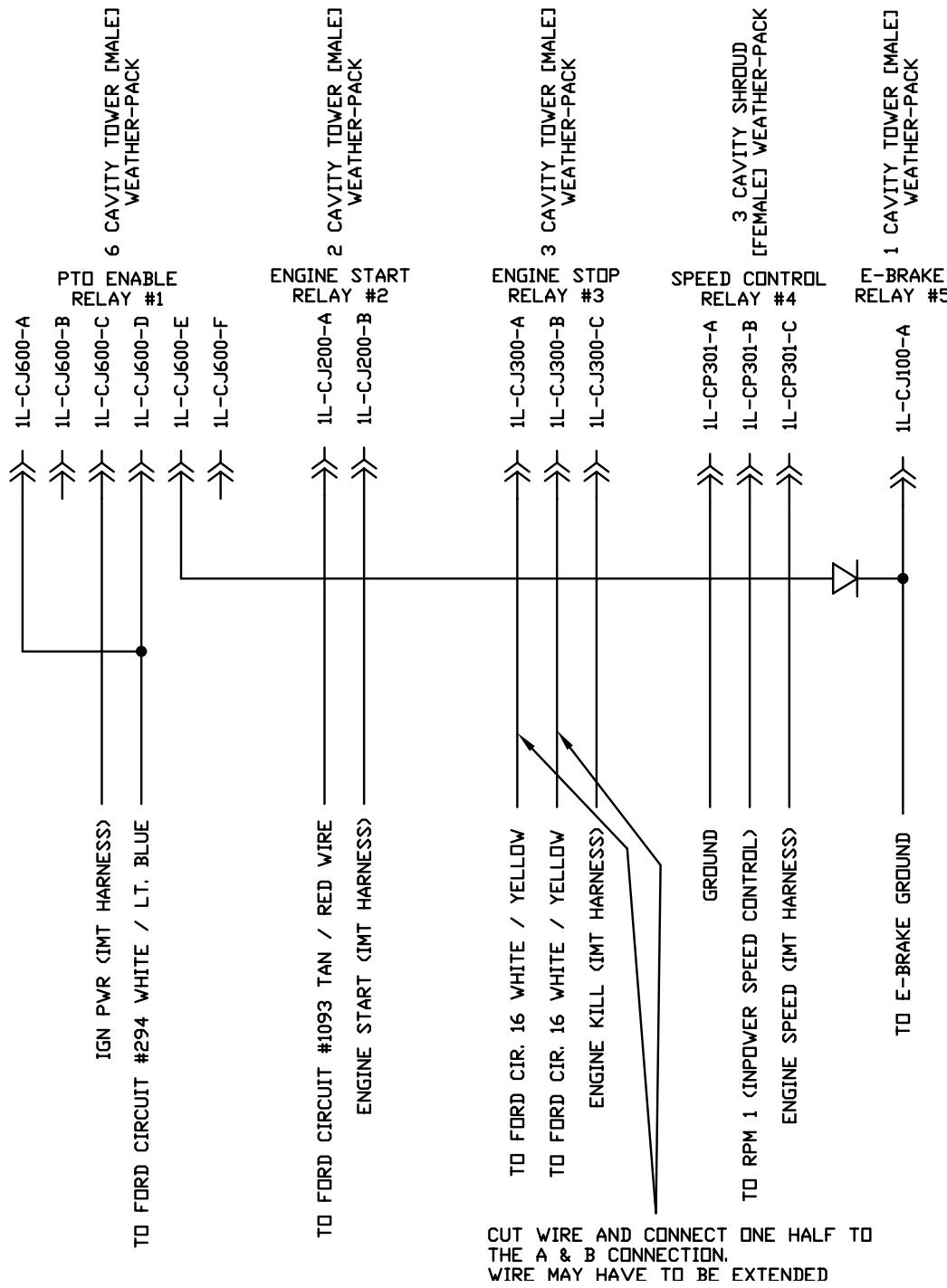
The Ford-supplied 12 volt PTO power source, circuit 294 (white / lt. blue) is located here.

**FORD SUPER-DUTY- 2002 TO 2004 -  
MANUAL TRANSMISSION EFM (99903554-  
1)**

**FOR: 2002 TO 2004 FORD SUPER-DUTY WITH  
MANUAL TRANSMISSION**

**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. Engine speed on Ford Super Duty is controlled by the Ford Inpower Direct speed control module.
4. Ford circuit 322 does not need to be energized during PTO operation on Ford Superduty with 6.0L diesel engine with 6-speed manual transmission.



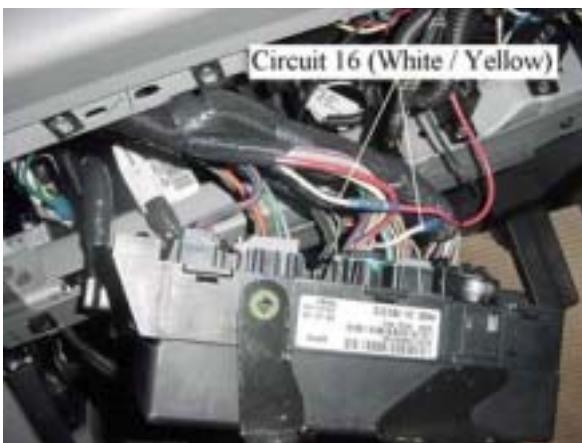
**FORD SUPER-DUTY- 2002 TO 2004 - MANUAL TRANSMISSION EFM (99903554-2)**

See 99903454 for Inpower Direct speed control installation.

THE CJB IS LOCATED BEHIND THE MODESTY PANEL BELOW THE STEERING WHEEL.  
ACCESS TO THE ENGINE KILL AND ENGINE START WIRES ARE BEHIND THE CJB.  
REMOVE THE FOUR BOLTS HOLDING THE CJB FOR ACCESS.

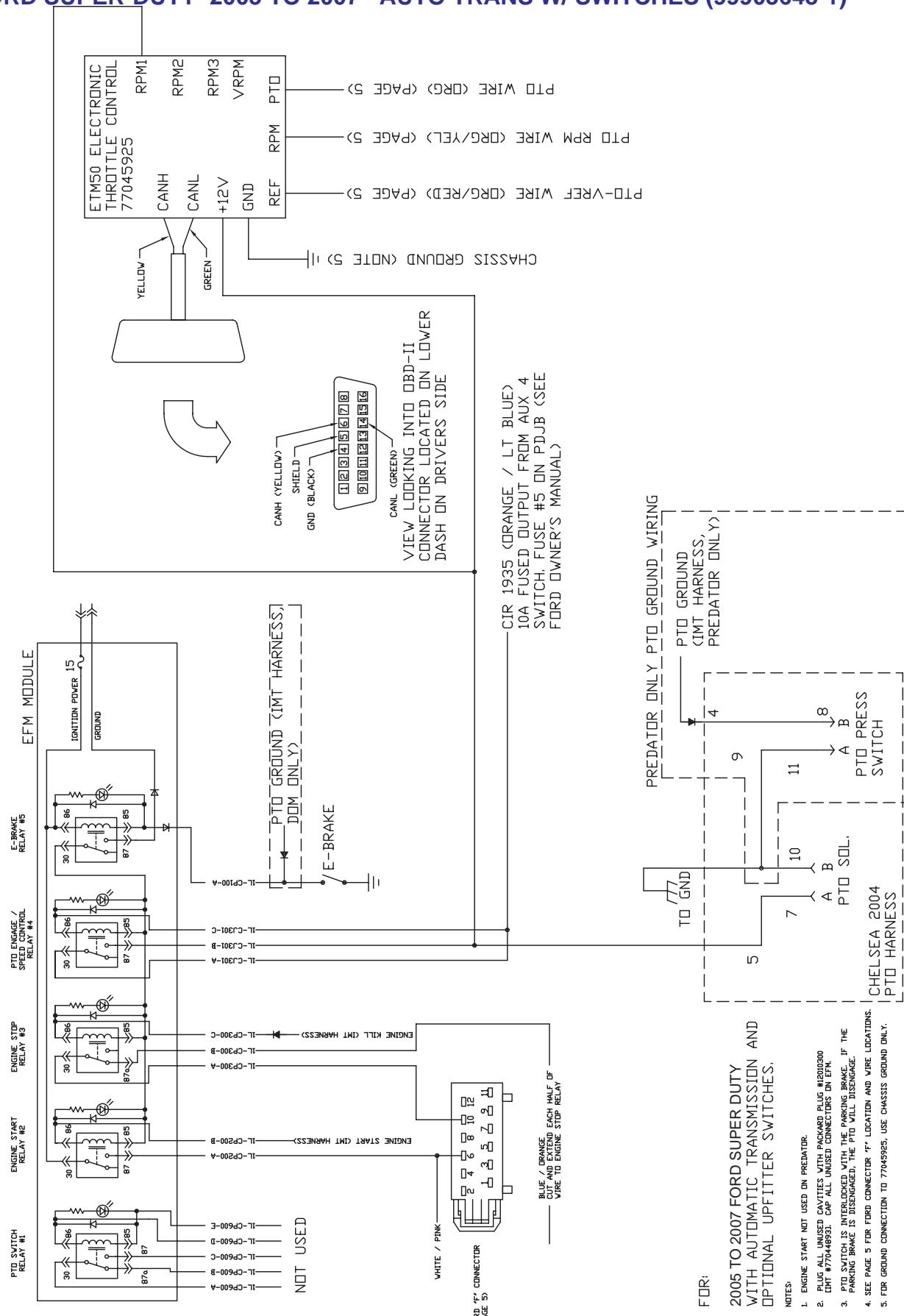


FOR ENGINE START, SPLICE INTO CIR. 1093 (THE TAN / RED WIRE) IN THE LOCATION SHOWN.



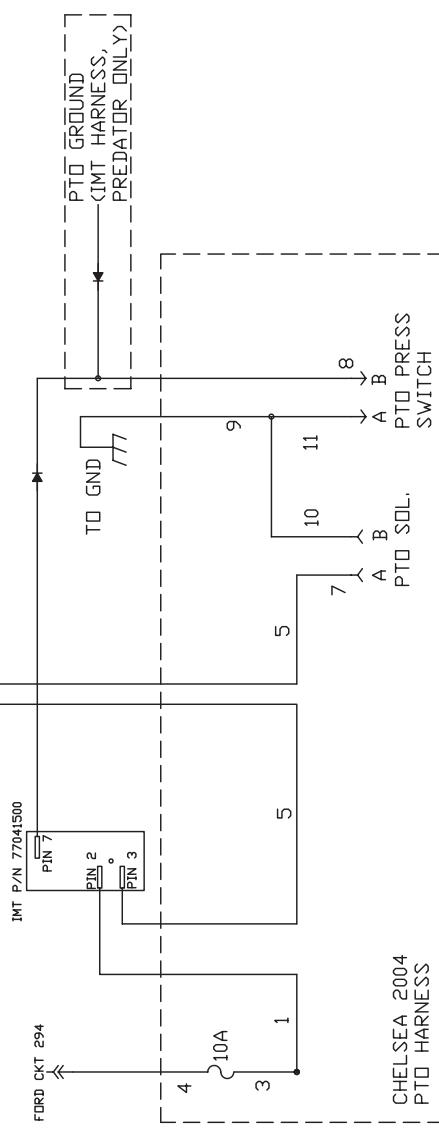
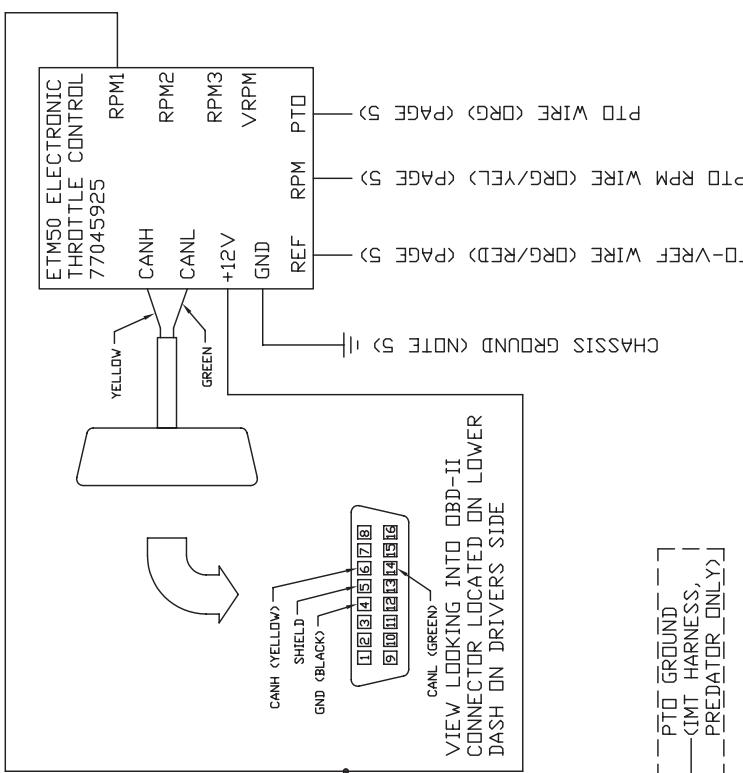
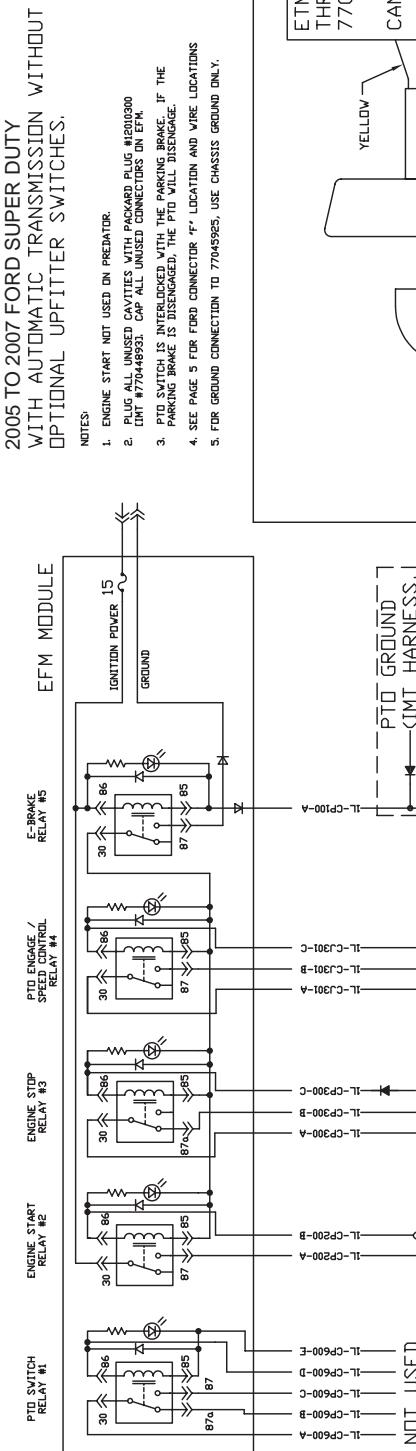
FOR ENGINE KILL, CUT CIR. 16 (WHITE / YELLOW) IN THE LOCATION SHOWN AND SPLICE.

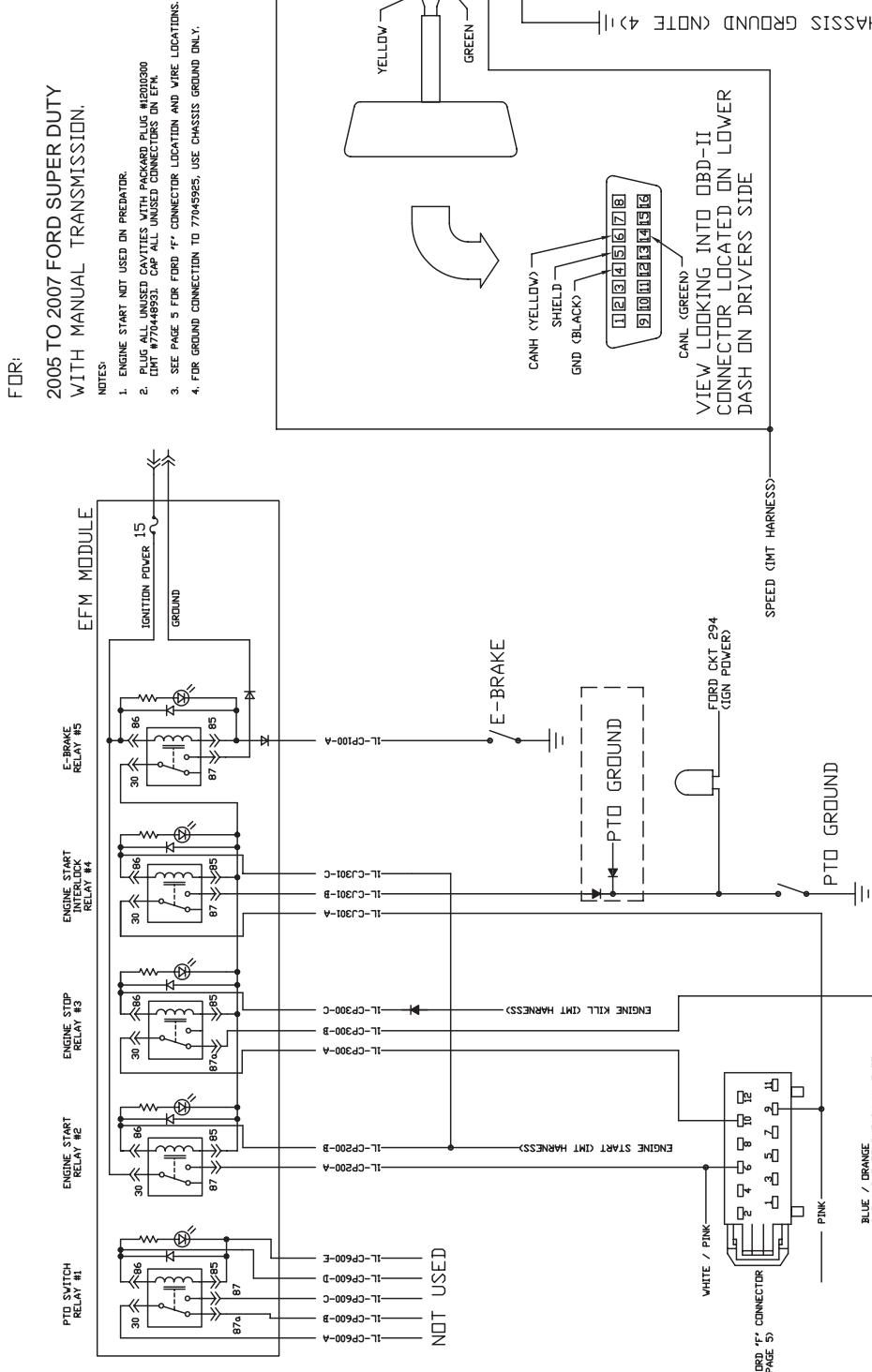
## FORD SUPER-DUTY- 2005 TO 2007 - AUTO TRANS W/ SWITCHES (99903648-1)



**FORD SUPER-DUTY- 2005 TO 2007 - AUTO TRANS W/O SWITCHES (99903648-2)**

FDR:

CHELSEA 2004  
PTO HARNESS

**FORD SUPER-DUTY- 2005 TO 2007 -MANUAL TRANSMISSION (99903648-3)**

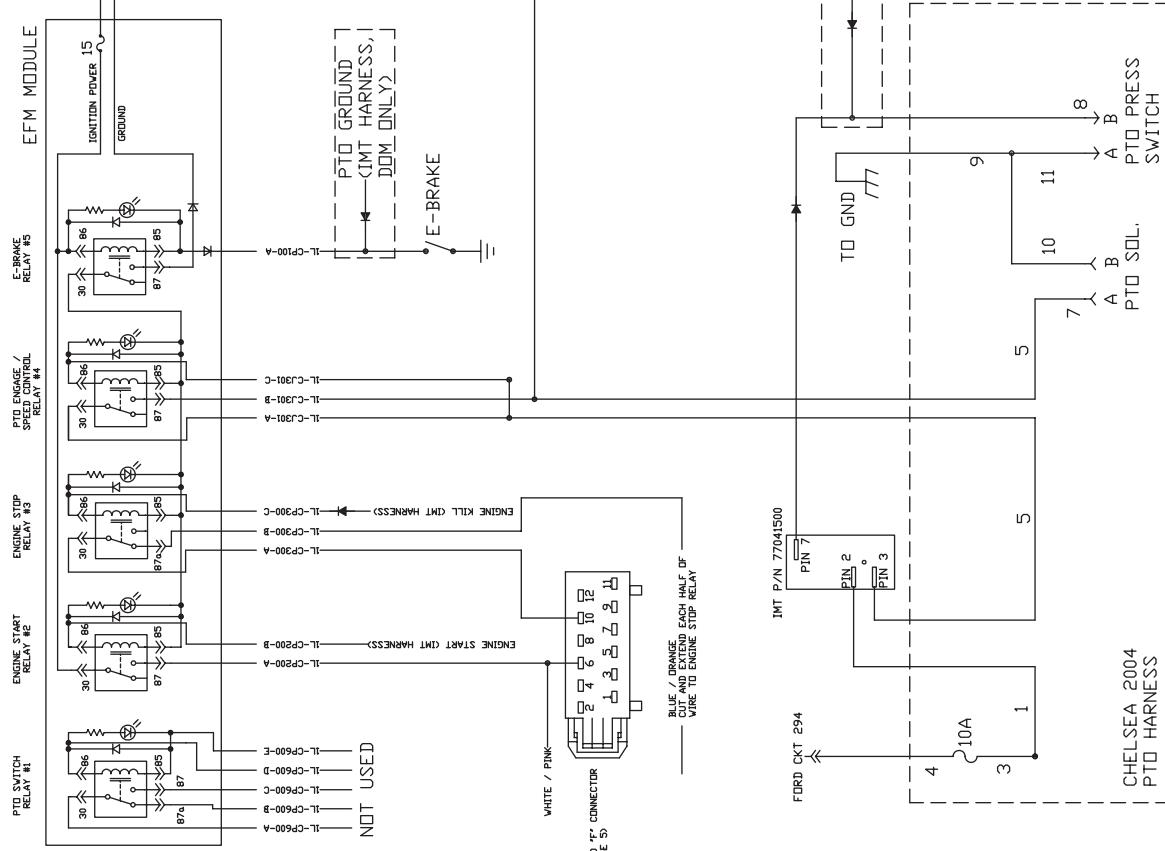
**FORD SUPER-DUTY- 2005 TO 2007 -V10 GAS AUTO TRANSMISSION (99903648-4)**

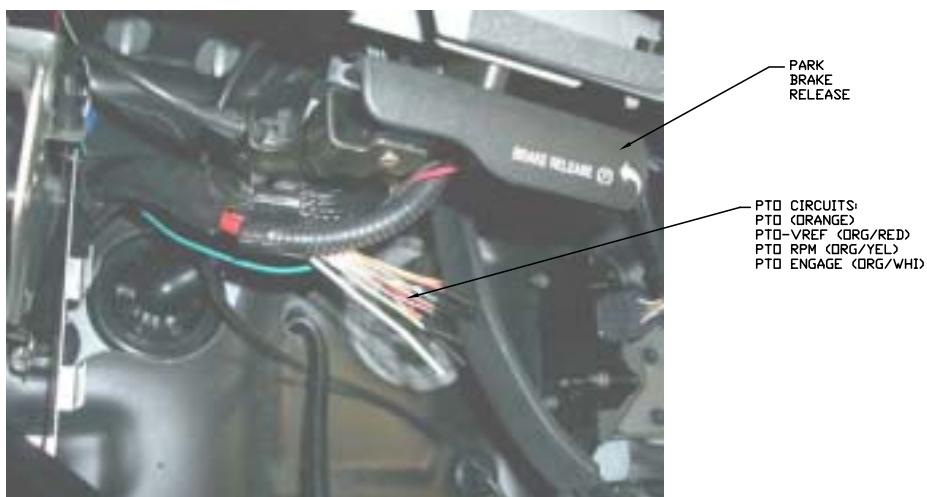
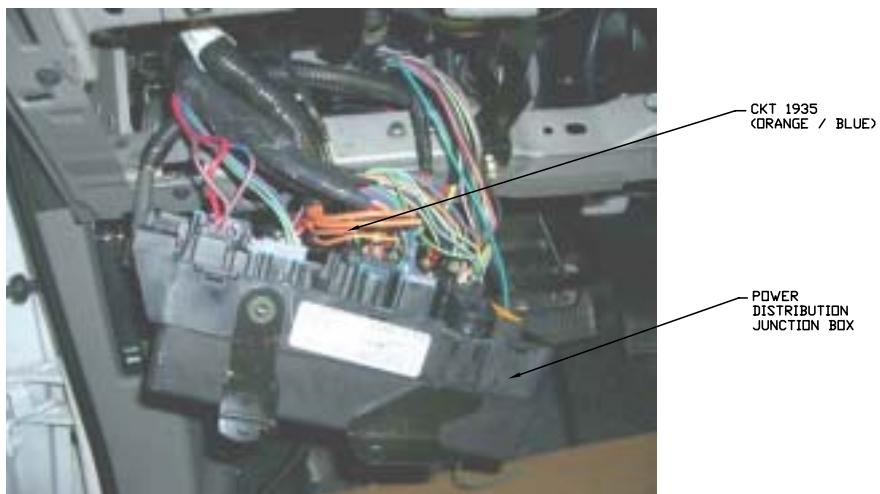
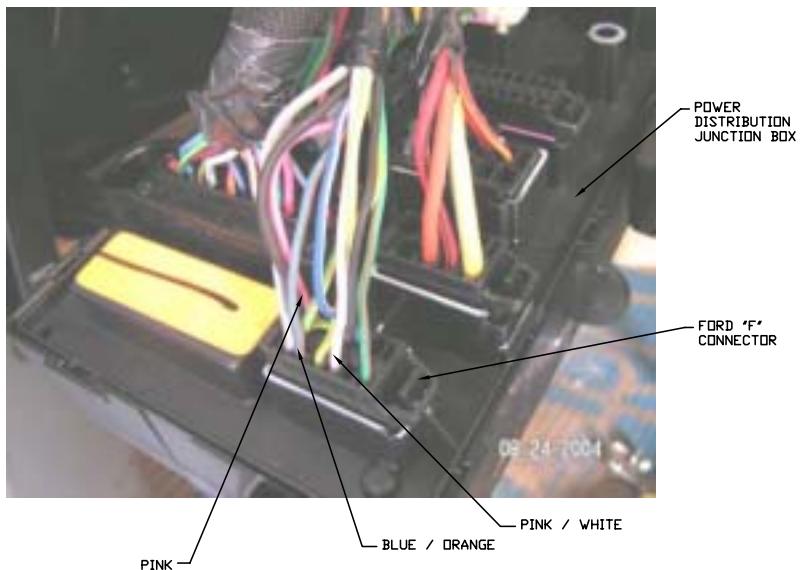
FOR: V10 GAS

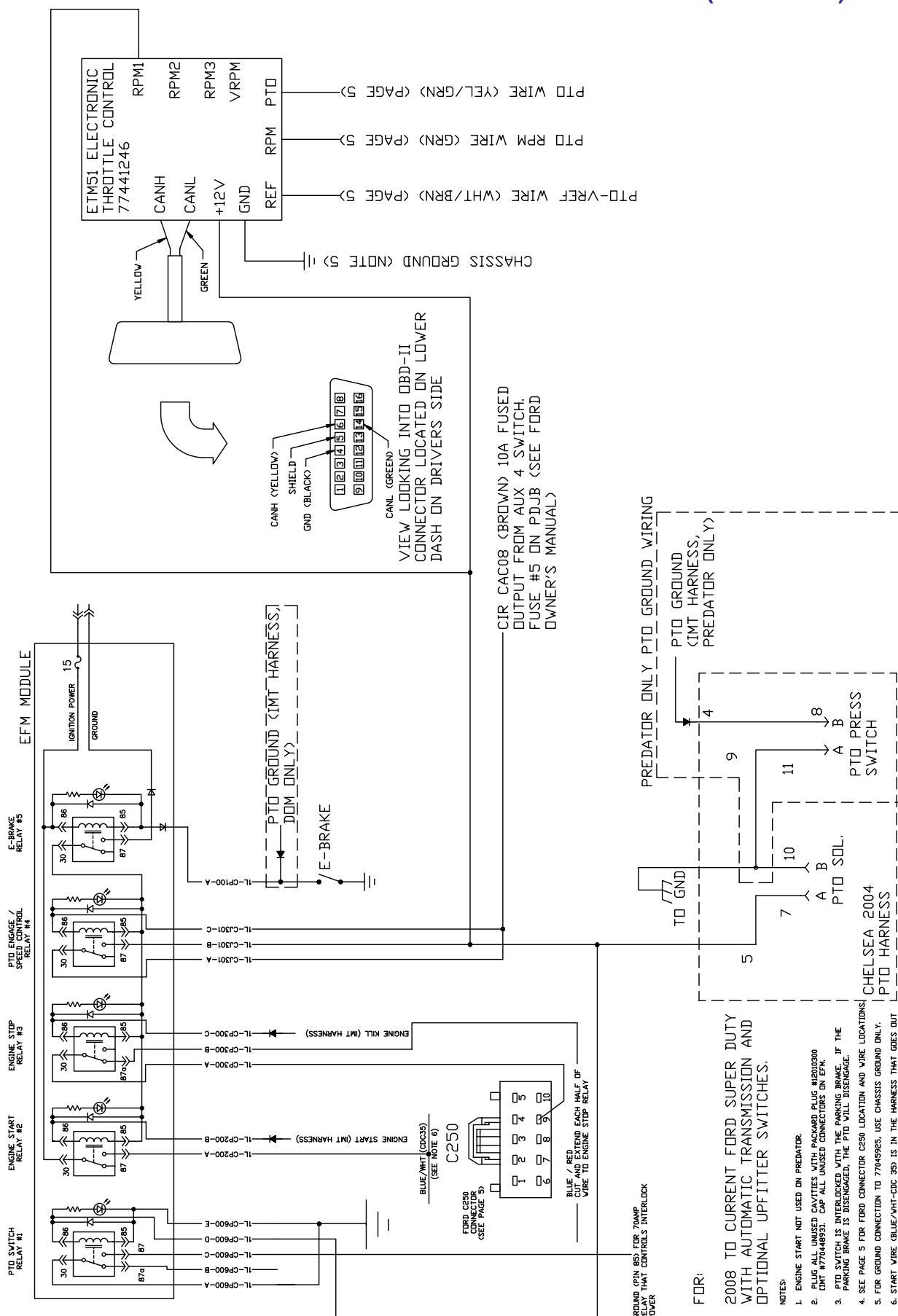
2005 TO 2007 FORD SUPER DUTY  
WITH V10 GAS, AUTOMATIC TRANSMISSION  
WITHOUT OPTIONAL UPTITTER SWITCHES.

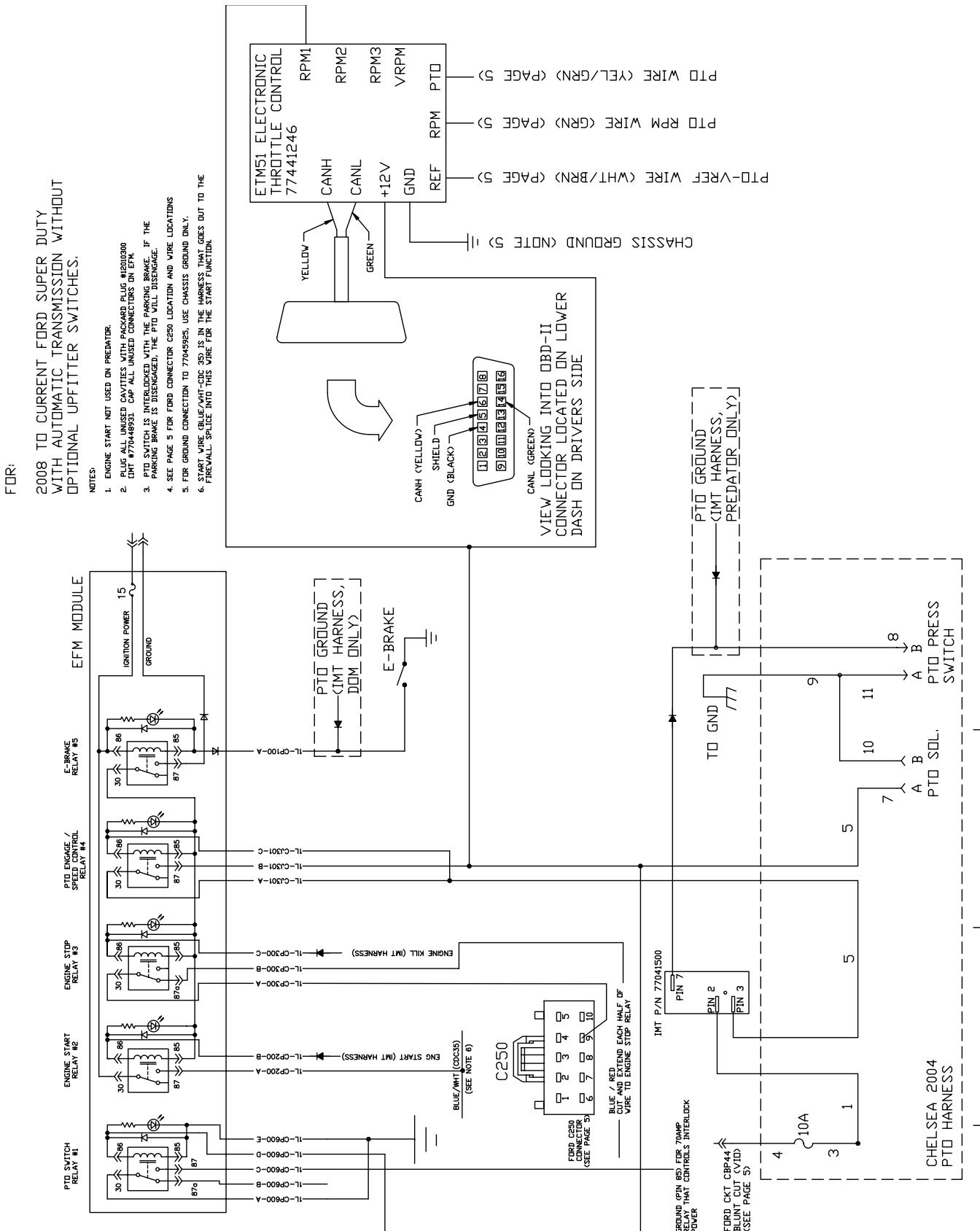
NOTES:

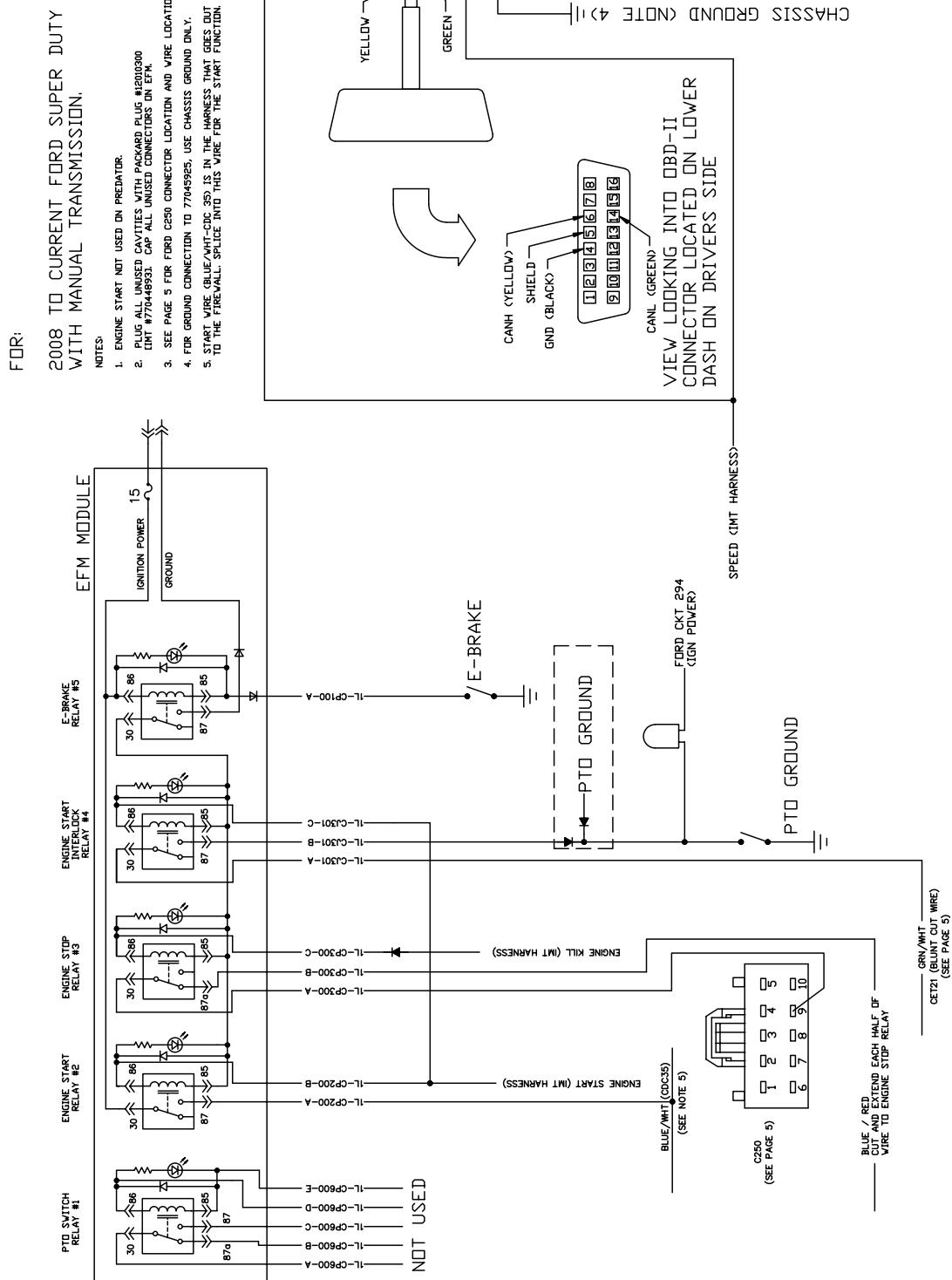
1. ENGINE START NOT USED IN PREDATOR.
2. PLUG ALL UNUSED CAVITIES WITH PLUGGED PLUG #1201300  
LHT #7744693.
3. PTO SWITCH IS INTERLOCKED WITH THE PARKING BRAKE. IF THE  
PARKING BRAKE IS DISENGAGED, THE PTO WILL DISengage.
4. SEE PAGE 5 FOR FORD CONNECTOR 'F' LOCATION AND WIRE LOCATIONS.
5. FOR GROUND CONNECTION TO 77045925, USE CHASSIS GROUND ONLY.



**FORD SUPER-DUTY- 2005 TO 2007 -INSTALLATION PHOTOS (99903648-5)**

**FORD SUPER-DUTY- 2008 TO 2010 -AUTO TRANS W/SWITCHES (99904249-1)**

**FORD SUPER-DUTY- 2008 TO 2010 -AUTO TRANS W/O SWITCHES (99904249-2)**

**FORD SUPER-DUTY- 2008 TO 2010 -MANUAL TRANSMISSION (99904249-3)**

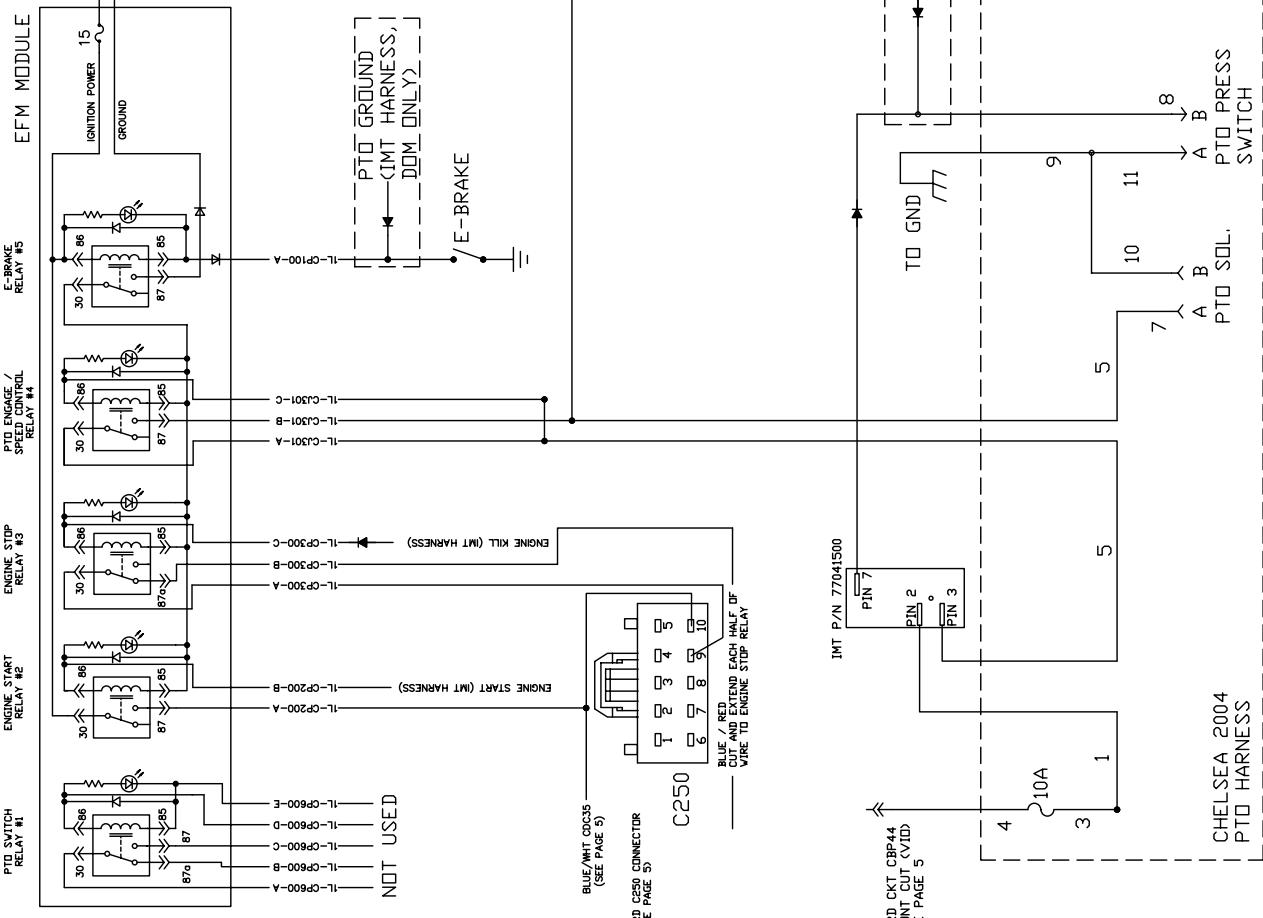
**FORD SUPER-DUTY- 2008 TO 2010 -V10 GAS AUTO (99904249-4)**

FOR:

2008 TO CURRENT FORD SUPER DUTY  
WITH V10 GAS AUTOMATIC TRANSMISSION  
WITHOUT OPTIONAL UPTITTER SWITCHES.

NOTES

1. ENGINE START NOT USED IN PREDATOR.
2. PLUG ALL UNUSED CAVITIES WITH PARKARD PLUG NUMBER 30 THAT #7704593. 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 PAGE 5 FOR FORD CONNECTOR C250 LOCATION AND WIRE LOCATIONS.
5. FOR GROUND CONNECTION TO 7704595, USE CHASSIS GROUND ONLY.

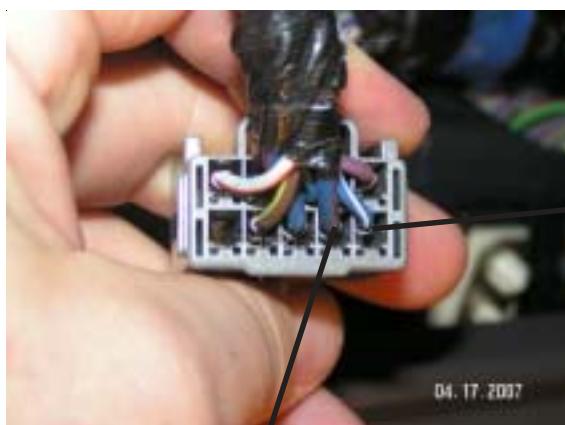


**FORD SUPER-DUTY- 2008 TO 2010 -INSTALLATION PHOTOS (99904249-5)**

1. Loosen screws under steering column.
2. Reach behind the steering column cover to find C250.

C250  
LOCATIONSTEERING  
COLUMN  
COVER

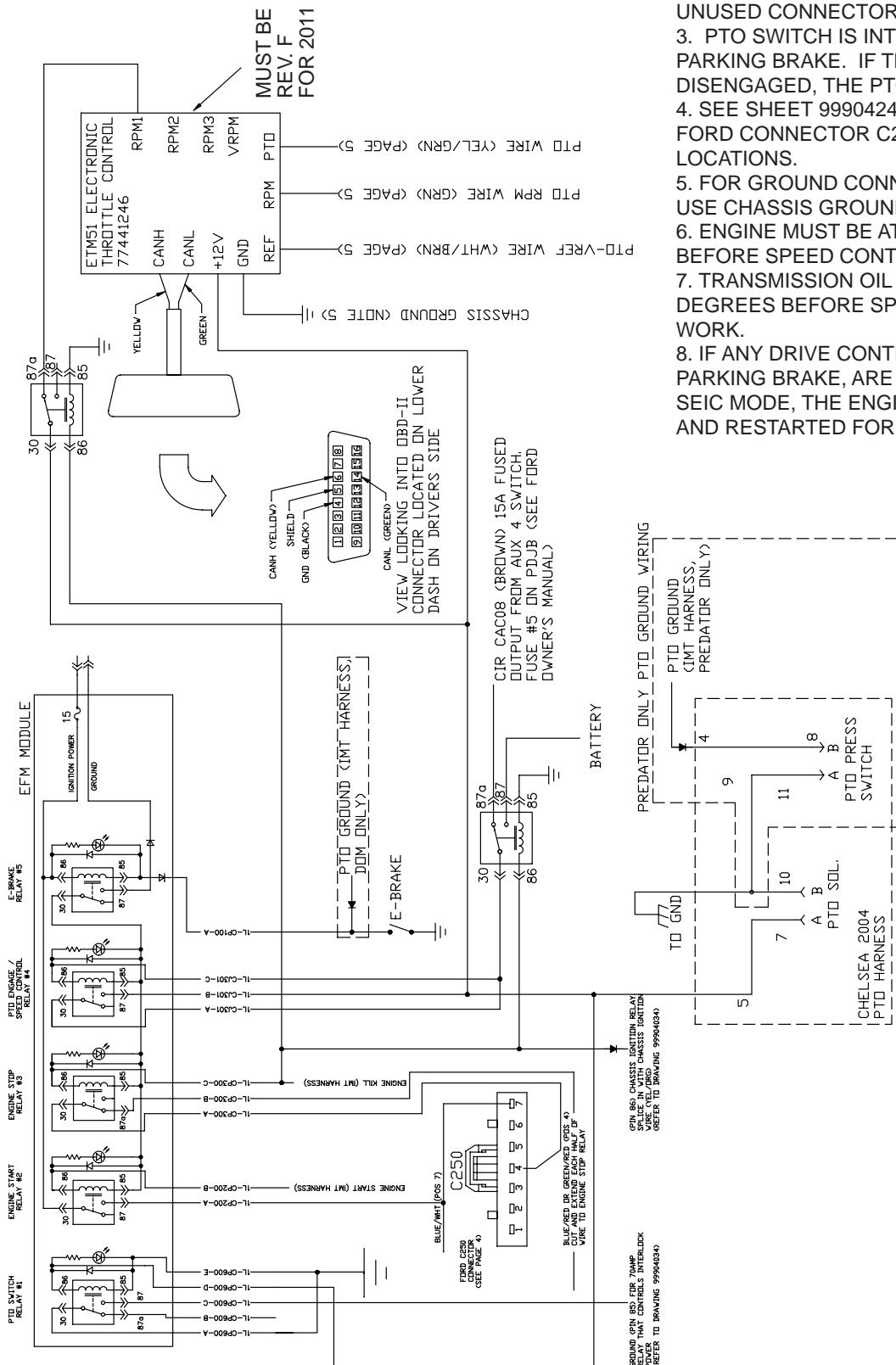
PTO CIRCUITS:  
PTO (YELLOW/GREEN)  
PTO-VREF (WHITE/BROWN)  
PTO RPM (GREEN)  
PTO ENGAGE (ORANGE/WHITE)  
NEUTRAL SIGNAL (GREEN/WHITE)  
IGNITION (VIOLET)

C250 PIN 10 (GAS) (BLUE/WHITE)  
ENGINE START

C250 PIN 9 (BLUE/RED)  
ENGINE KILL

**FORD SUPER-DUTY- 2011-PRESENT -DIESEL AUTOMATIC W/SWITCHES (99904889-1)**

FOR: FORD SUPER-DUTY MODEL YEAR 2011

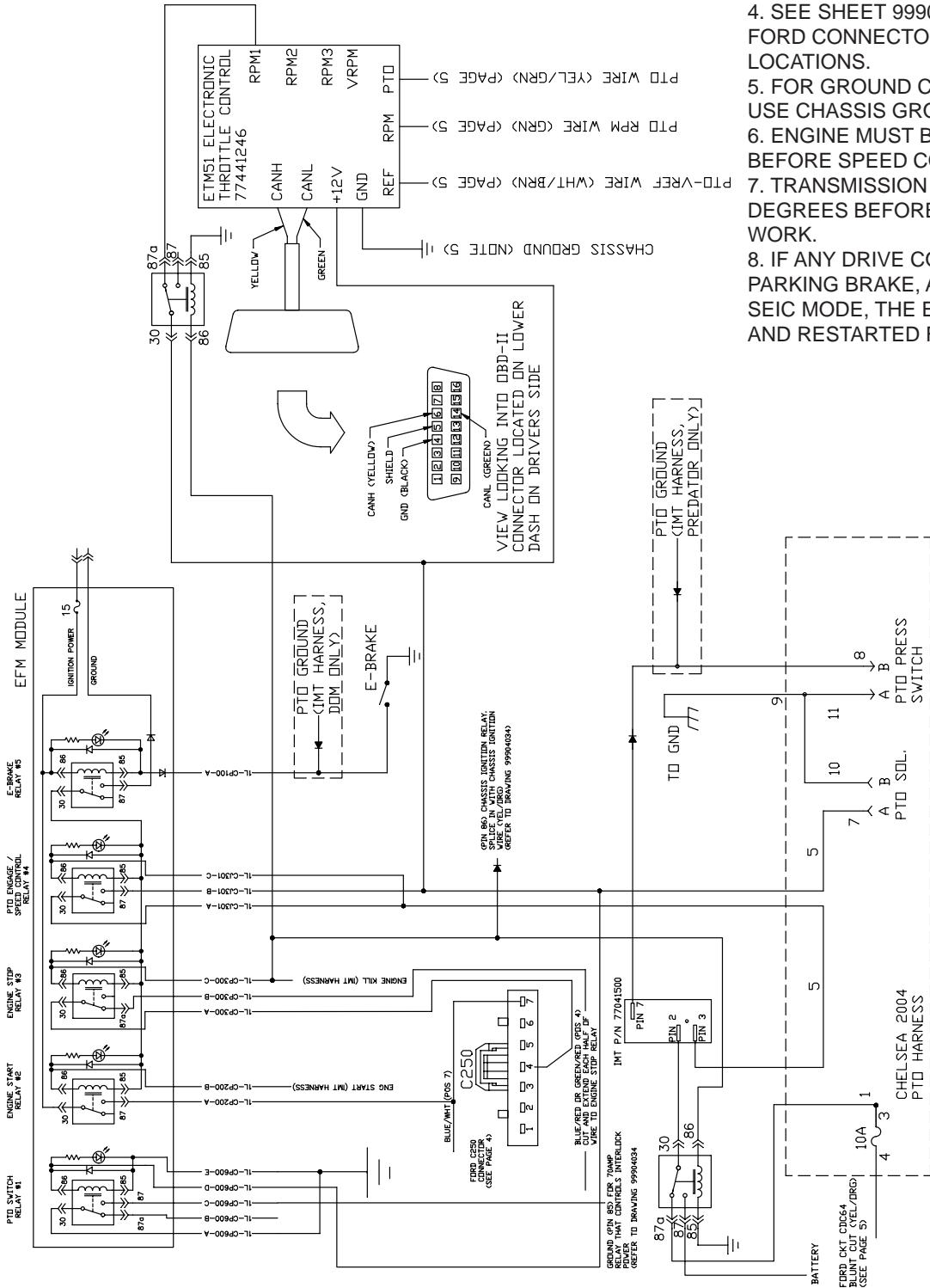


# FORD SUPER-DUTY- 2011-PRESENT-DIESEL AUTOMATIC WITHOUT SWITCHES (99904889-2)

FOR: FORD SUPER-DUTY MODEL YEAR 2011

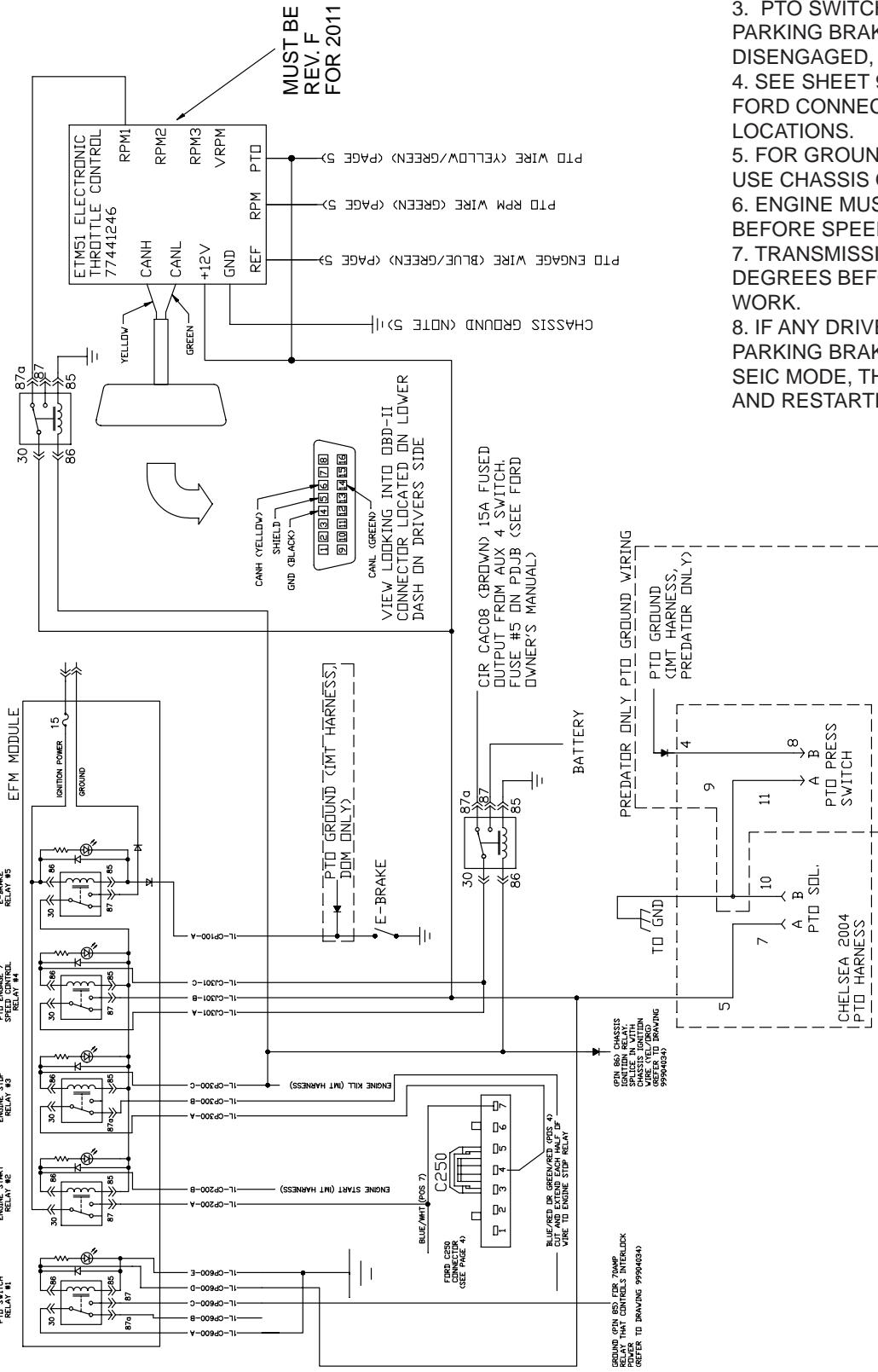
## NOTES:

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 SHEET 99904249-5 FOR PICTURES OF FORD CONNECTOR C250 LOCATION AND WIRE LOCATIONS.
5. FOR GROUND CONNECTION TO 77045925, USE CHASSIS GROUND ONLY.
6. ENGINE MUST BE AT LEAST 120 DEGREES BEFORE SPEED CONTROL WILL WORK.
7. TRANSMISSION OIL MUST BE AT LEAST 20 DEGREES BEFORE SPEED CONTROL WILL WORK.
8. IF ANY DRIVE CONTROLS, INCLUDING PARKING BRAKE, ARE ACTIVATED WHILE IN SEIC MODE, THE ENGINE MUST BE SHUT OFF AND RESTARTED FOR SEIC TO WORK AGAIN.



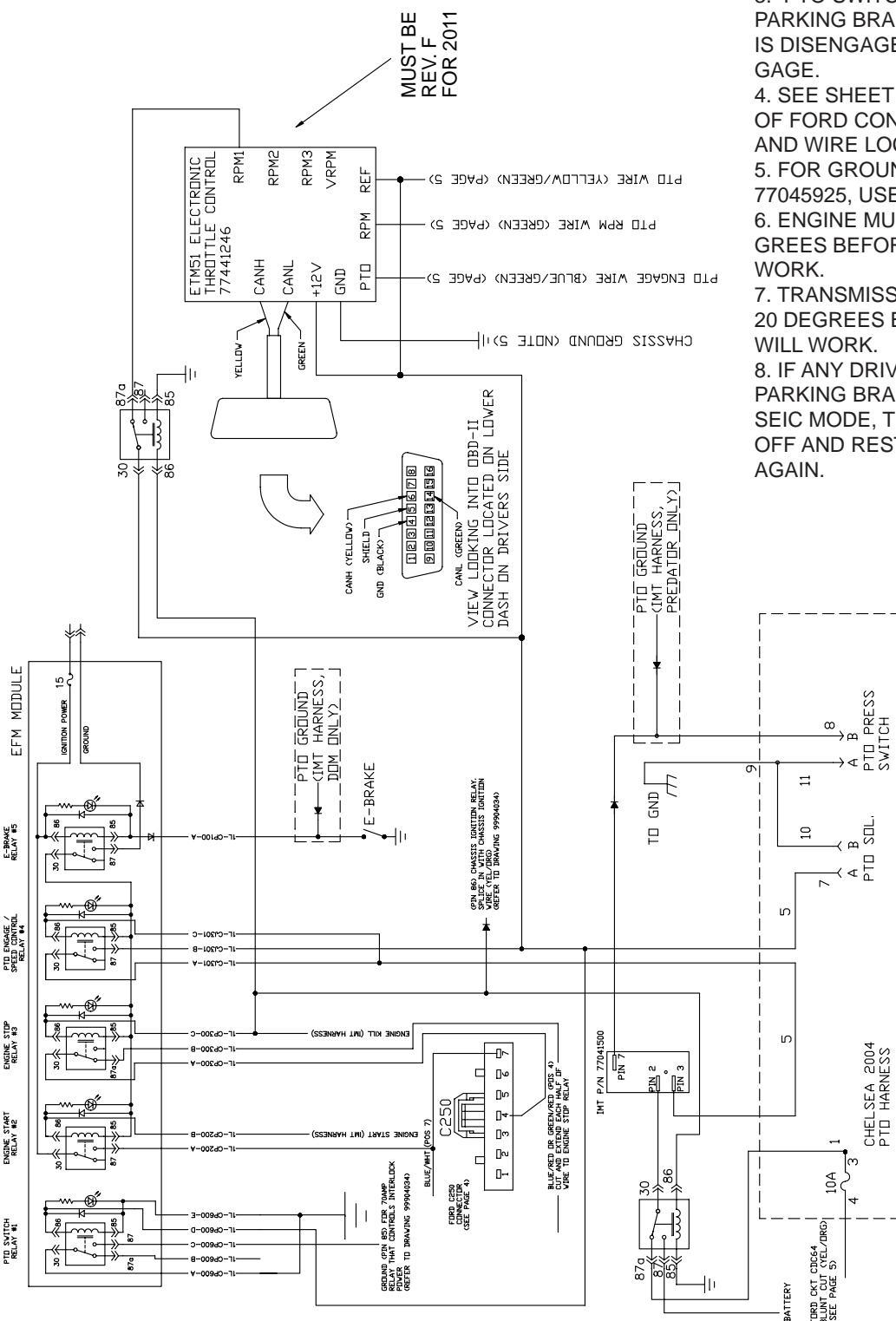
**FORD SUPER-DUTY- 2011-PRESENT -V10 GAS WITH SWITCHES (99904889-3)**

FOR: FORD SUPER-DUTY MODEL YEAR 2011



**FORD SUPER-DUTY- 2011-PRESENT -V10 GAS WITHOUT SWITCHES (99904889-4)**

FOR: FORD SUPER-DUTY MODEL YEAR 2011

**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 SHEET 99904249-5 FOR PICTURES OF FORD CONNECTOR C250 LOCATION AND WIRE LOCATIONS.
5. FOR GROUND CONNECTION TO 77045925, USE CHASSIS GROUND ONLY.
6. ENGINE MUST BE AT LEAST 120 DEGREES BEFORE SPEED CONTROL WILL WORK.
7. TRANSMISSION OIL MUST BE AT LEAST 20 DEGREES BEFORE SPEED CONTROL WILL WORK.
8. IF ANY DRIVE CONTROLS, INCLUDING PARKING BRAKE, ARE ACTIVATED WHILE IN SEIC MODE, THE ENGINE MUST BE SHUT OFF AND RESTARTED FOR SEIC TO WORK AGAIN.

**FORD SUPER-DUTY- 2011-PRESENT - INSTALLATION PHOTOS (99904889-5)**

C250 LOCATION



PTO CIRCUITS:  
PTORS1 (YELLOW / GREEN)  
PTORS2 (BLUE / ORANGE)  
PTO RELAY (BLUE / WHITE)  
PTO RPM (GREEN)  
PTOREF (WHITE / BROWN)  
PTORTN (GRAY / VIOLET)  
BCP SW (VIOLET / BROWN)  
BCP LAMP (BROWN)  
IGNITION (YELLOW PTO CIRCUITS:  
PTO (YELLOW/GREEN)  
PTO-VREF (WHITE/BROWN)  
PTO RPM (GREEN)  
PTO ENGAGE (ORANGE/WHITE)  
NEUTRAL SIGNAL (GREEN/WHITE)  
IGNITION (YELLOW / ORANGE)

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

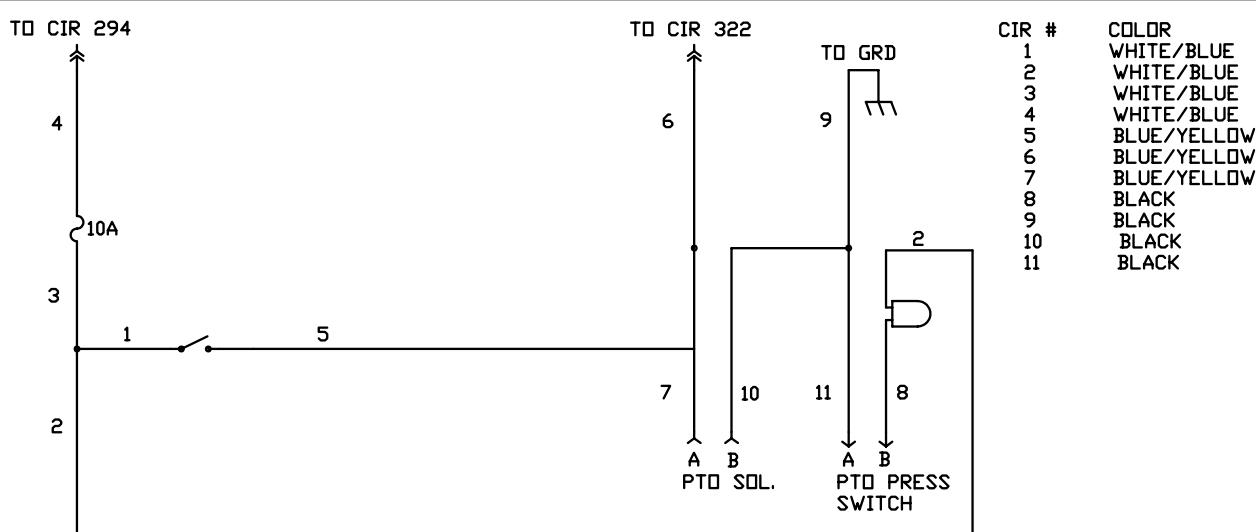
**ELECTRICAL WIRING & NOTES -****CHELSEA PTO (99903356)****NOTES:**

1. Speed control and PTO actuation for 2003 Ford Super Duty chassis with automatic transmission are controlled by the Ford APCM.
2. The APCM must be configured to have RPM control and PTO control in "linked" mode.
3. The Ford APCM's yellow wire provides 12V when the RPM control and PTO control are active. This 12V signal is used by the EFM to engage the PTO.

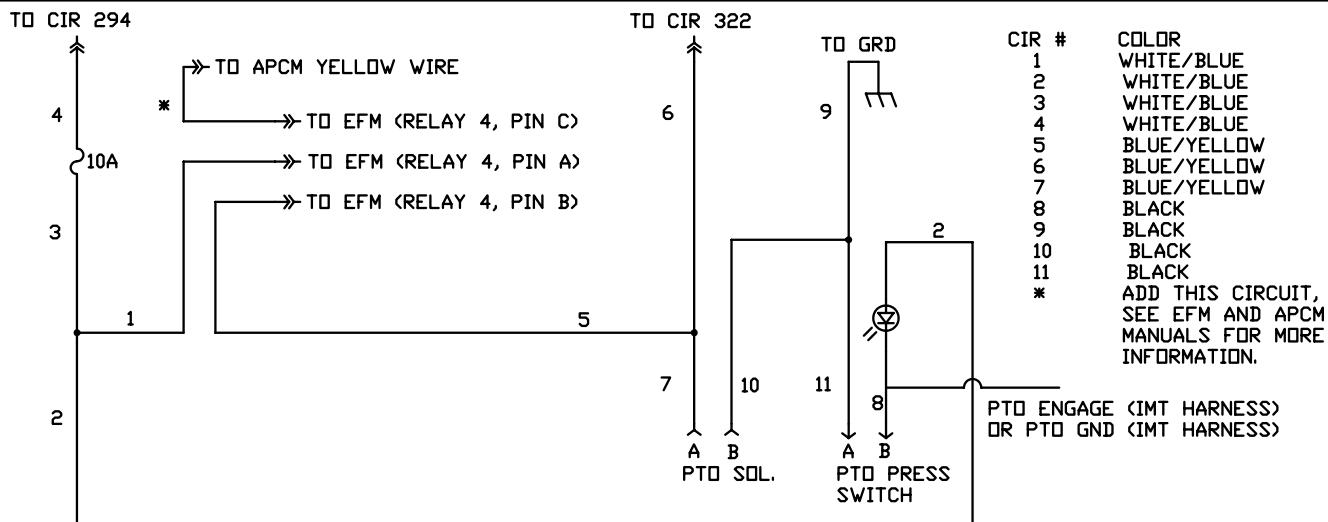
4. 2002 model year chassis can be wired per 1999 installation instructions with the following exceptions:

- a. Ford Super Duty wiring color and circuit number for 12V ignition power changed from circuit 295 (light blue w/pink) to circuit 294 (white w/light blue) for 2002 model year.
- b. Ford Super Duty wiring color for engine kill (circuit 16) changed from red/light green to white/yellow for 2002 model year.

**FIGURE 1 CHELSEA PTO WIRING DIAGRAM FOR FORD SUPER DUTY WITH AUTOMATIC TRANSMISSION W/DOUT EFM. (WIRING AS RECEIVED WITH CHELESEA PTO).**



**FIGURE 2 MODIFICATION OF CHELSEA PTO WIRING HARNESS FOR 2003 FORD SUPER DUTY WITH AUTOMATIC TRANSMISSION AND EFM (WIRING AFTER MODIFICATION OF CHELSEA PTO HARNESS).**

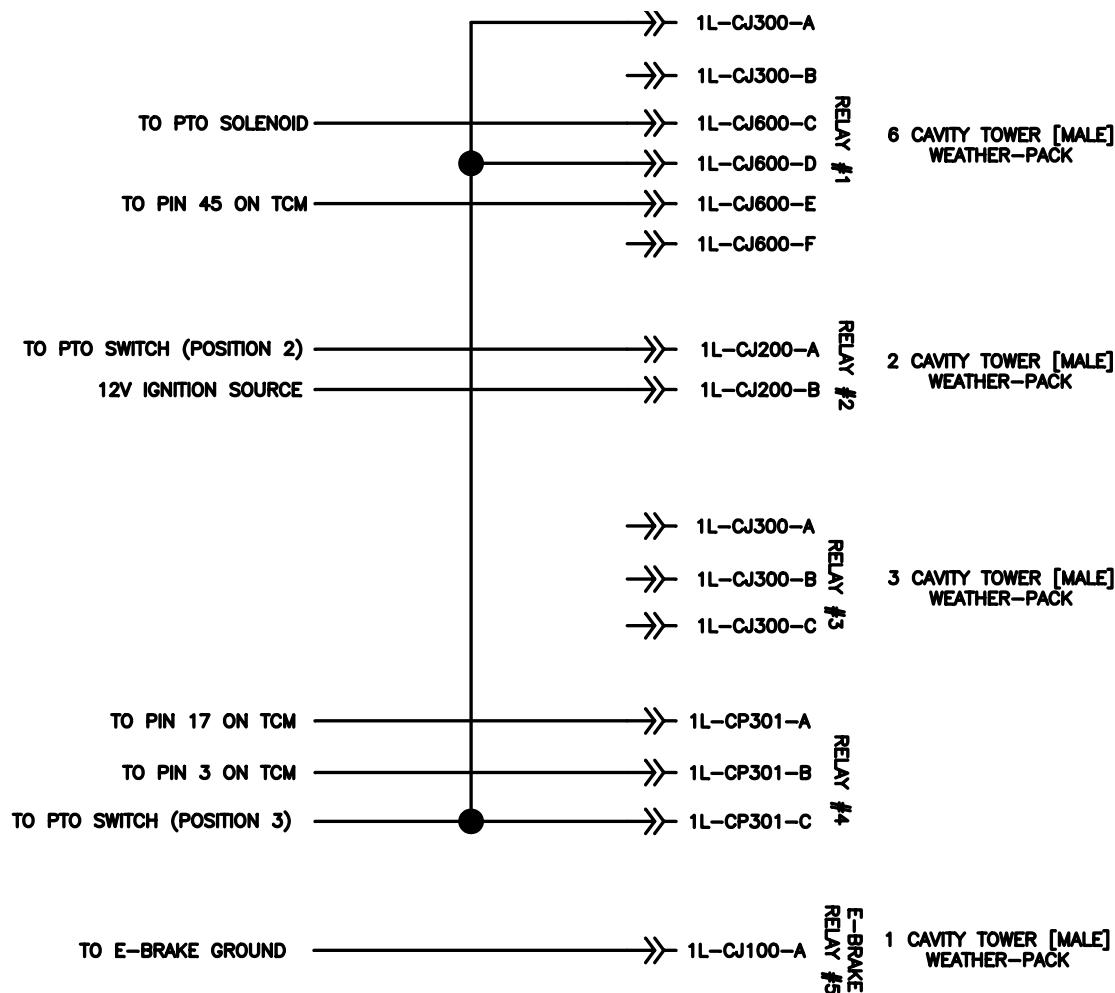
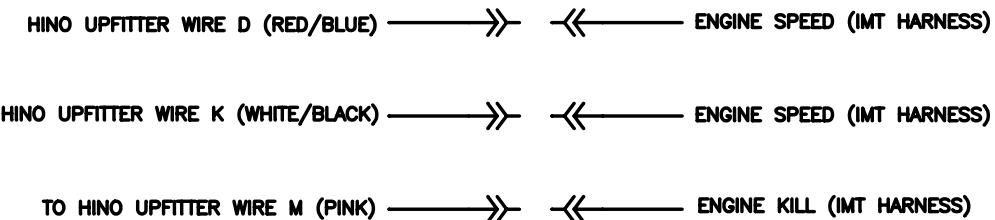


**HINO 338 EFM- 2008 - PRESENT (99904847-1)**

FOR: 2008 TO CURRENT HINO 338 (EFFECTIVE 2/22/10)

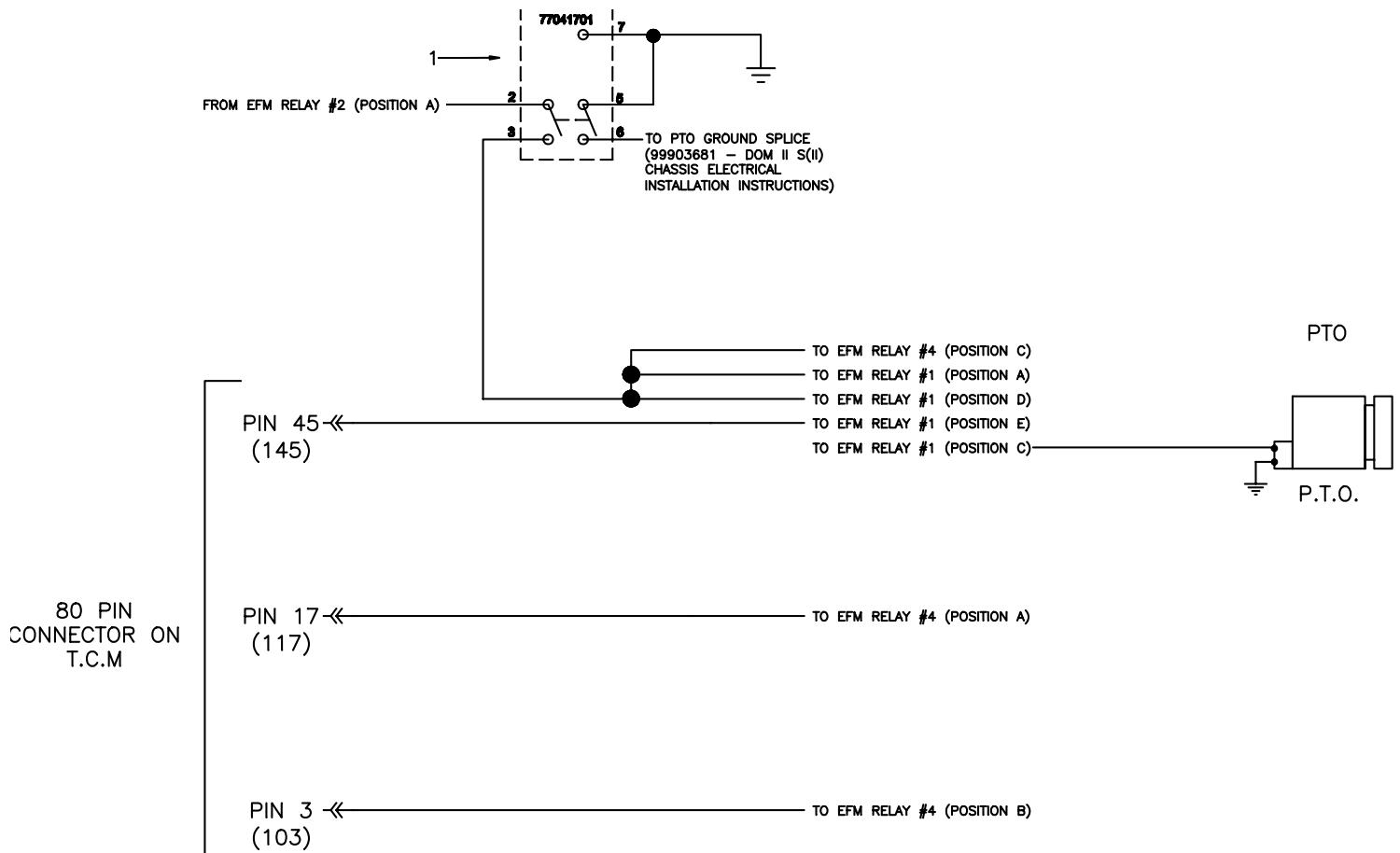
**NOTES:**

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. SEE SHEET 99904847-2 FOR PICTURES.
4. FOLLOW WIRING SCHEMATIC AS SHOWN TO INSURE PROPER FUNCTION. FAILURE TO DO SO WILL RESULT IN SYSTEM FAILURE AND POSSIBLE ENGINE ERROR CODE GENERATION.
5. BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) MUST BE DISCONNECTED BEFORE DOING ANY WIRING ON VEHICLE.
6. ECM PROGRAMMING, BY IMT OR A HINO DEALER, IS NECESSARY FOR PROPER SPEED AND PTO OPERATIONS.

**SEE NOTE 3**

**HINO 338 EFM- 2008 - PRESENT (99904847-2)**

See 99904847-1 for EFM wiring.



1. Remove panel beneath center instrument panel.
2. Locate upfitter wires.
3. Follow wiring instructions.



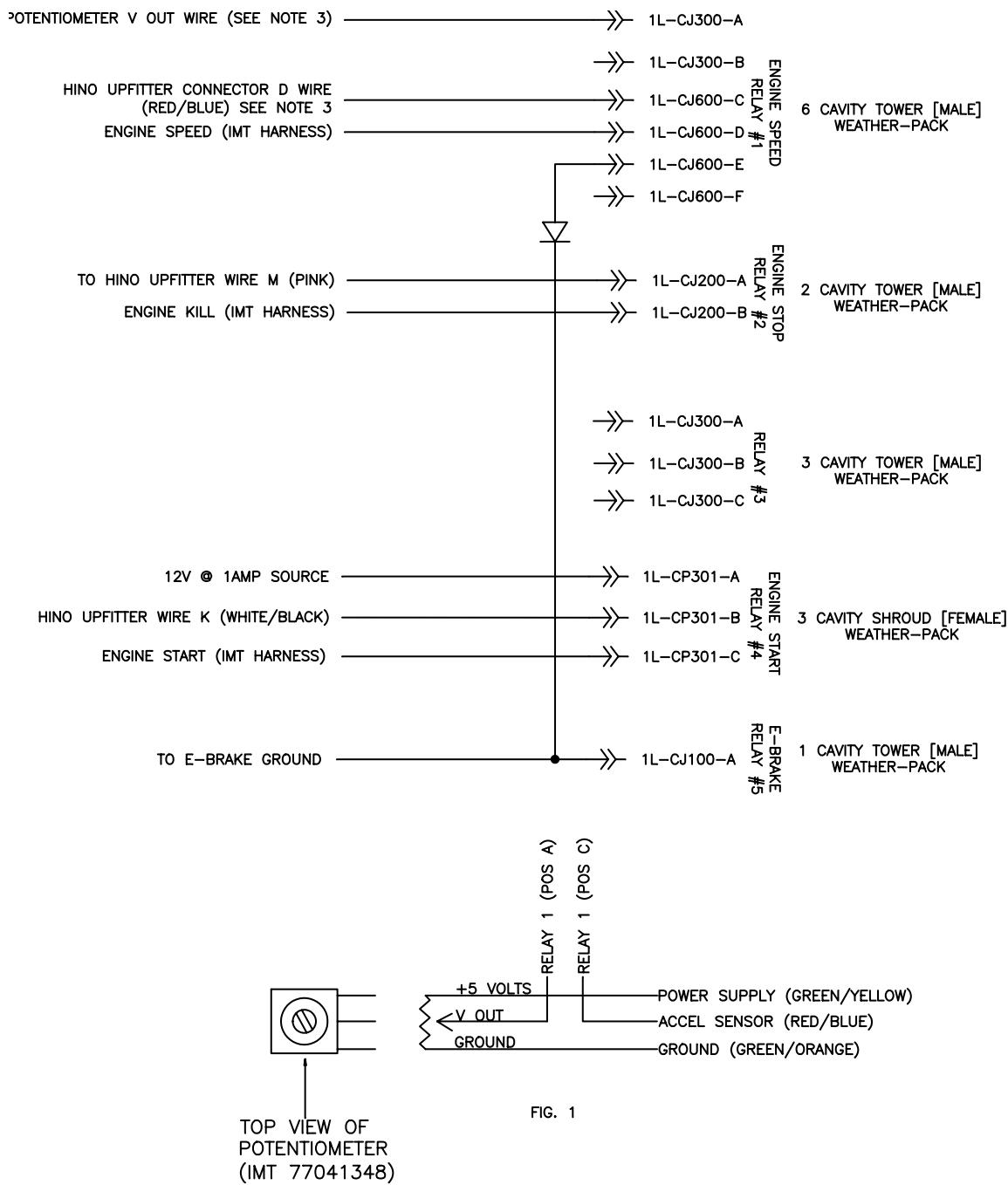
UPFITTER WIRES

**HINO 338 ENGINE EFM- 2008 - 2/22/10 (999044777-1)**

FOR: 2008 TO CURRENT HINO 338 (EFFECTIVE UNTIL 2/22/10)

**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. USE IMT #77041348 POTENTIOMETER TO SET SPEED. REFER TO FIGURE 1 FOR WIRING SCHEMATIC.
4. SEE 99904477-2 FOR PICTURES.
5. FOLLOW WIRING SCHEMATIC AS SHOWN TO INSURE PROPER FUNCTION. FAILURE TO DO SO WILL RESULT IN SYSTEM FAILURE AND POSSIBLE ENGINE ERROR CODE GENERATION.
6. BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) MUST BE DISCONNECTED BEFORE DOING ANY WIRING ON VEHICLE.



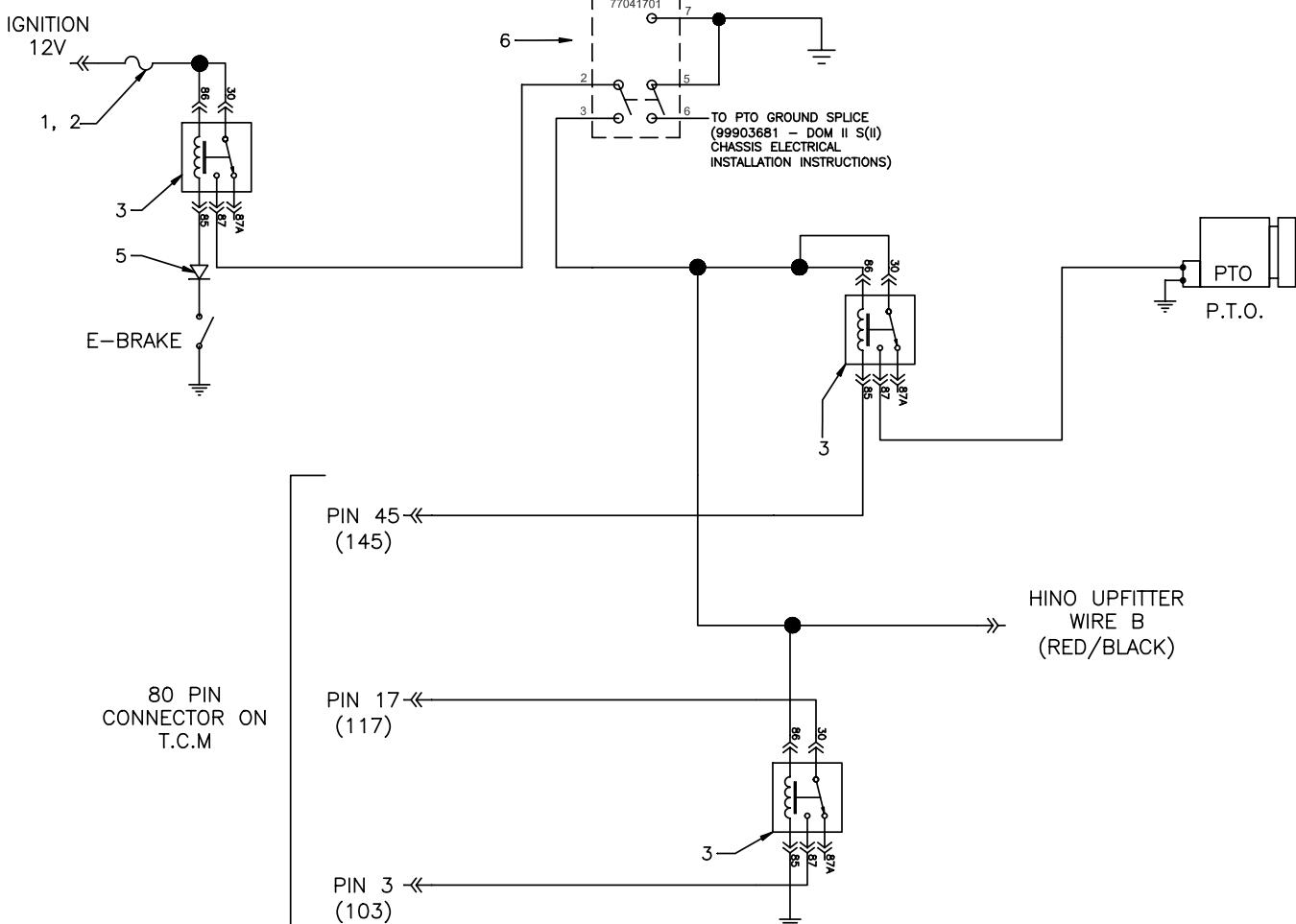
**HINO 338 ENGINE EFM- 2008 - 2/22/10 (999044777-2)****NOTES:**

1. DIFFERENT CHASSIS MAY HAVE DIFFERENT CODES FOR THE TCM WIRE NUMBERS.
2. TCM FOR FREIGHTLINER IS BEHIND THE DASH ON THE PASSENGER SIDE OF THE CAB. SPLICE INTO APPROPRIATE WIRES AT THAT LOCATION.
3. 2007 & NEWER GM TRANSMISSION CONNECTOR: (LOCATED NEAR THE GM UPFITTER CONNECTOR IN THE ENGINE COMPARTMENT ON THE RIGHT SIDE)

PIN 45 = PIN A

PIN 17 = PIN B

PIN 3 = PIN J



1. Remove panel beneath center instrument panel.
2. Locate upfitter wires.
3. Follow wiring instructions.



UPFITTER WIRES

## INPOWER DIRECT INSTALLATION GUIDE

### (99903454)

#### OPERATION

When the vehicle is parked and *Chassis Conditions for Proper Operation* are satisfied the engine idle speed may be controlled by selecting one of the two available modes (Preset1 and Preset2). The preset RPM modes may be adjusted by the user via two calibration potentiometers on the top of the ETM30 unit.

#### *Chassis Conditions for Proper Operation*

1. Parking brake is set.
2. For automatic transmission, gear shift lever is in "PARK."
3. For manual transmission, foot is off clutch pedal.
4. Foot is off service brake.
5. Foot is off accelerator pedal.
6. Vehicle is stationary.
7. Engine is started and idling.

#### *Modes of Operation*

##### A. Two Preset RM High Idle Modes:

Function: Increase idle to a preset RPM value.

Terminals: RPM1, RPM2

Activation: Apply ground to terminal

Range of Calibration: 1200 to 2600 rpm

Type of Adjustment: Internal potentiometers

RPM1 Adjustment: Potentiometer 1

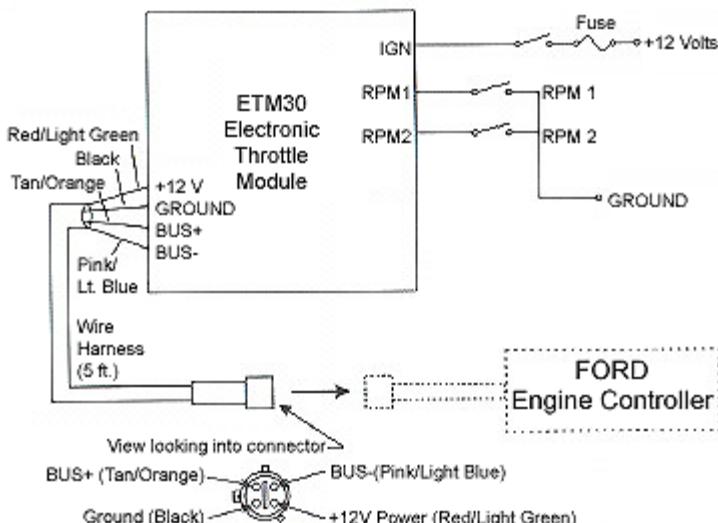
RPM2 Adjustment: Potentiometer 2

##### B. Mode Priorities

RPM 1      Highest - Will override RPM2 mode

RPM2      Lowest - Will only work if RPM1 is off

## WIRING DIAGRAM



#### Status Indicators

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

<b>LED</b>	<b>Status</b>	<b>Indication</b>
ON/OFF	On Solid	Module ON and functioning
ON/OFF	Flashing	Module ON, but a problem was detected
GEAR	On Solid	Vehicle Gear = Park, Park Brake set
GEAR	Flashing	Park Brake not set or Foot Brake on
RPM1	On Solid	RPM1 terminal grounded, engine at RPM1
RPM1	Flashing	RPM1 terminal grounded, engine at Low Idle
RPM2	On Solid	RPM2 terminal grounded, engine at RPM2
RPM2	Flashing	RPM2 terminal grounded, engine at Low Idle

#### Installation

The ETM30 is usually mounted inside the cab under the dashboard. A five foot cable is supplied that connects to the Ford wiring harness' four-pin connector. The mode activation connections are supplied by the user and are 1/4" Faston terminals. (See wiring diagram.)

#### Setup and Calibration

The only calibration required is to select each of the two preset modes (RPM1 and RPM2) and adjust the two respective potentiometers on the ETM30 to the desired RPM.

#### Specifications

##### Electrical

Input Voltage (+12V Terminal): 8 to 16 volts

Input Current (+12V Terminal): 37 mA

Standby Current: 28 mA

Input Current (on/off terminal): 1 mA

Control Current: 1 mA

##### Mechanical:

Weight: 0.164 lb

Connections: Faston 1/4" terminals

Case Material: Cylac thermoplastic (UL 94VO)

Encapsulation Mat'l: Epoxy potting compound, resistant to most fuels, oils, acids, and cleaning agents.

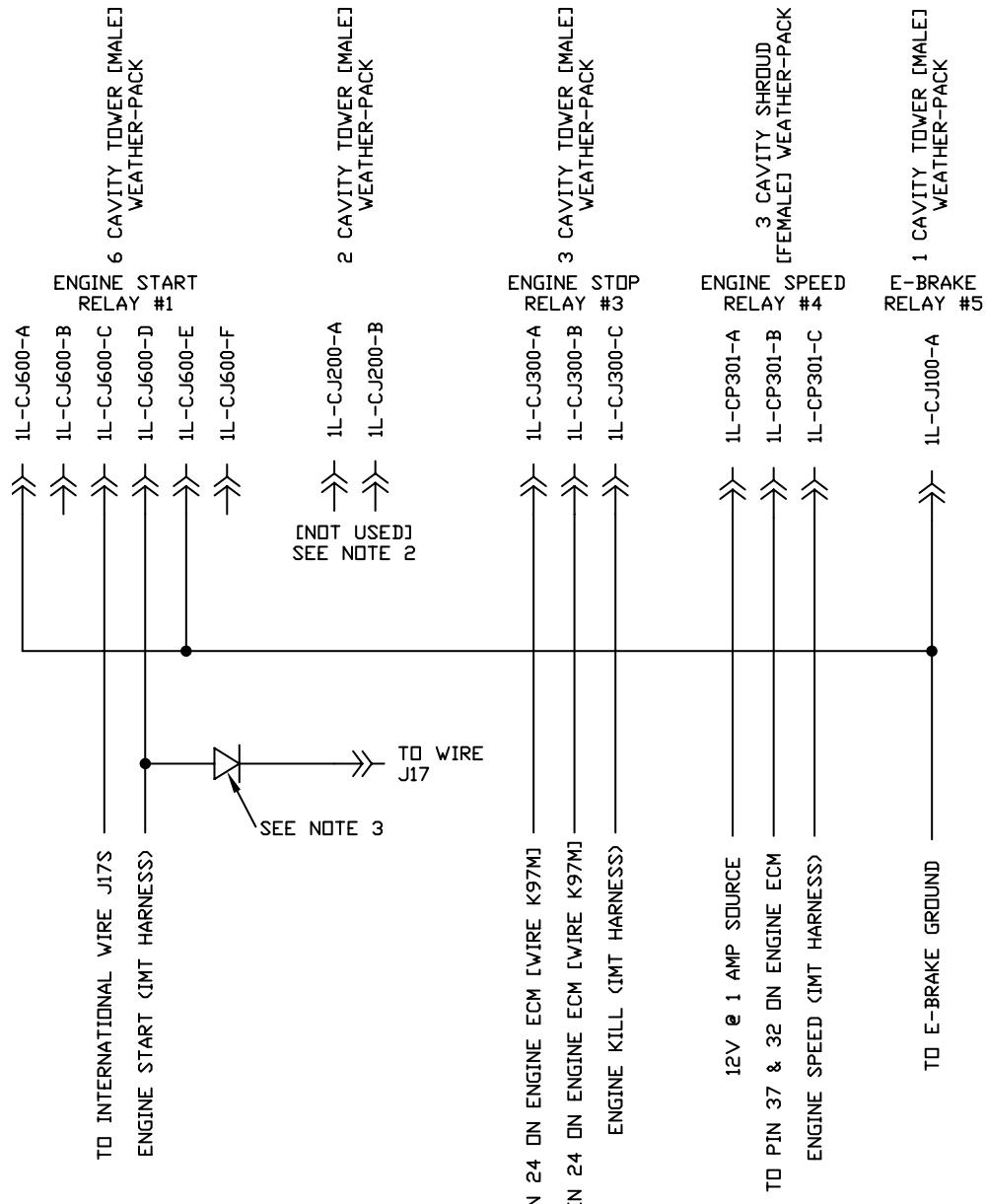
**INTERNATIONAL EFM- DT530 & DT466 2001-2004 (99903397-1)**

F □ R:

2001 TO 2004 INTERNATIONAL DT466,  
 2001 TO PRESENT INTERNATIONAL  
 DT530 WITH MANUAL TRANSMISSION.

## 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. DIODE TO BE AT LEAST 2.2 AMP, IMT #77044556.
4. IF BODY BUILDER OPTION 12VVW IS NOT ORDERED, NO WIRES WILL BE PRESENT IN ECM PIN 37 & 32. IT IS HIGHLY RECOMMENDED THAT THESE PINS BE INSTALLED AT A DEALER. IF NOT USE CONNECTORS SUPPLIED (#20) IN ECM.
5. J17 AND J17S ARE LOCATED UNDER THE FUSE/RELAY PANEL ABOVE THE DRIVERS SIDE WHEEL WELL. THE FUSE/RELAY PANEL CAN BE REMOVED FROM IT'S ENCLOSURE AND THE WIRES J17 AND J17S LOCATED. SPLICE INTO THE WIRES WHERE CONVENIENT.

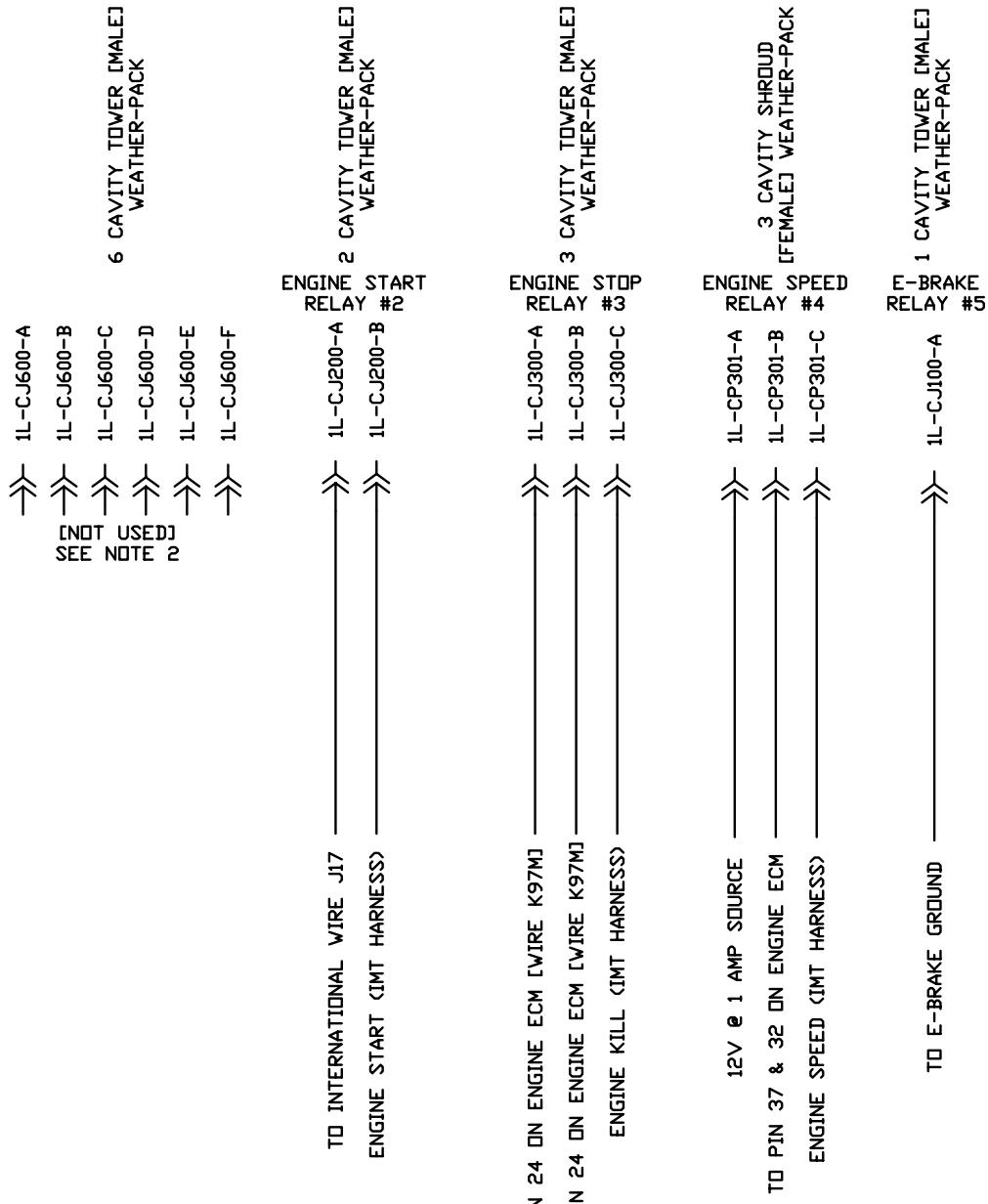


**INTERNATIONAL EFM- DT530 & DT466 2001-2004 (99903397-2)**

FOR: 2001 TO 2004 INTERNATIONAL DT466,  
2001 TO PRESENT DT530 WITH  
AUTOMATIC TRANSMISSION.

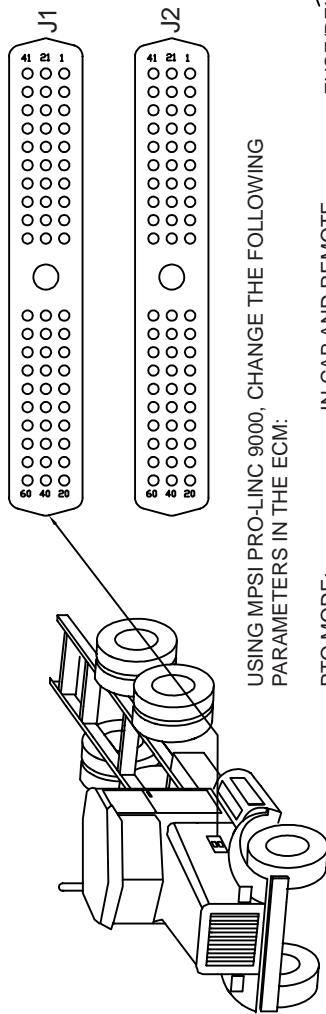
## NOTES:

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. IF BODY BUILDER OPTION 12VWW IS NOT ORDERED, NO WIRES WILL BE PRESENT IN ECM PIN 37 & 32. IT IS HIGHLY RECOMMENDED THAT THESE PINS BE INSTALLED AT A DEALER. IF NOT USE CONNECTORS SUPPLIED (#20) IN ECM.
4. J17 IS LOCATED UNDER THE FUSE/RELAY PANEL ABOVE THE DRIVERS SIDE WHEEL WELL. THE FUSE/RELAY PANEL CAN BE REMOVED FROM IT'S ENCLOSURE AND J17 LOCATED. SPLICE INTO THE WIRE WHERE CONVENIENT.



**INTERNATIONAL EFM- DT530 & DT466 2001-2004 (99903397-3)**

# INTERNATIONAL ECM

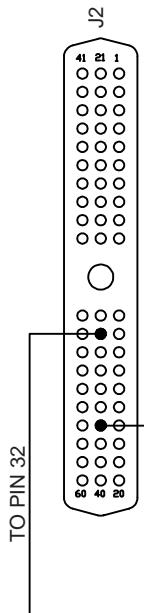


USING MPSI PRO-LINIC 9000, CHANGE THE FOLLOWING PARAMETERS IN THE ECM:

PTO MODE: IN CAB AND REMOTE  
IN-CAB PTO MODE: PRESET  
DISABLE CAB CONTROLS: YES  
SET SWITCH SPEED: \*\* USER TO DETERMINE RPM  
RESUME SWITCH SPEED: \*\* SAME AS SET SWITCH  
SPEED  
ENGINE RAMP RATE: 500 RPM/SEC

FUSE/RELAY PANEL ABOVE DRIVER'S SIDE WHEEL WELL.

WIRES J17 AND J17S ARE LOCATED UNDER FUSE/RELAY PANEL. REMOVE PANEL AFTER DISCONNECTING MAIN POWER FEED. FIND WIRES J17 AND J17S AND SPLICE ACCORDINGLY.

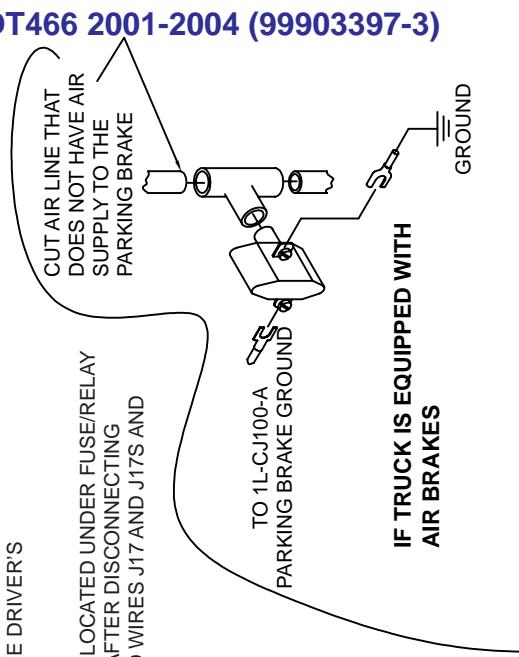


PIN LOCATIONS ARE FOR CONNECTOR 6007,  
LOCATED ON LOWER LH SIDE OF ENGINE.

- 1) USE 1/4" RATCHET (NO SOCKET) TO REMOVE CONNECTOR.
  - 2) USE SMALL PHILLIPS SCREWDRIVER TO REMOVE CAP FROM CONNECTOR.
  - 3) REMOVE CONNECTOR FROM CONNECTOR HOUSING.
  - 4) REMOVE RED PLUG THAT SURROUNDS PIN LOCATIONS. INSTALL P/N 77045001 INTO PIN LOCATIONS 32 AND 37.
- PIN 32 SHOULD HAVE GREEN WIRE SPLICED TO P/N 77045001.  
-PIN 37 SHOULD HAVE BLACK WIRE SPLICED TO P/N 77045001.

NOTE: VISUALLY VERIFY THAT PINS ARE COMPLETELY SEATED IN CONNECTOR BEFORE PROCEEDING.

- 5) REPLACE RED PLUG, CONNECTOR HOUSING, AND CONNECTOR CAP BEFORE REPLACING CONNECTOR. USE 1/4" RATCHET (NO SOCKET) TO FASTEN CONNECTOR.



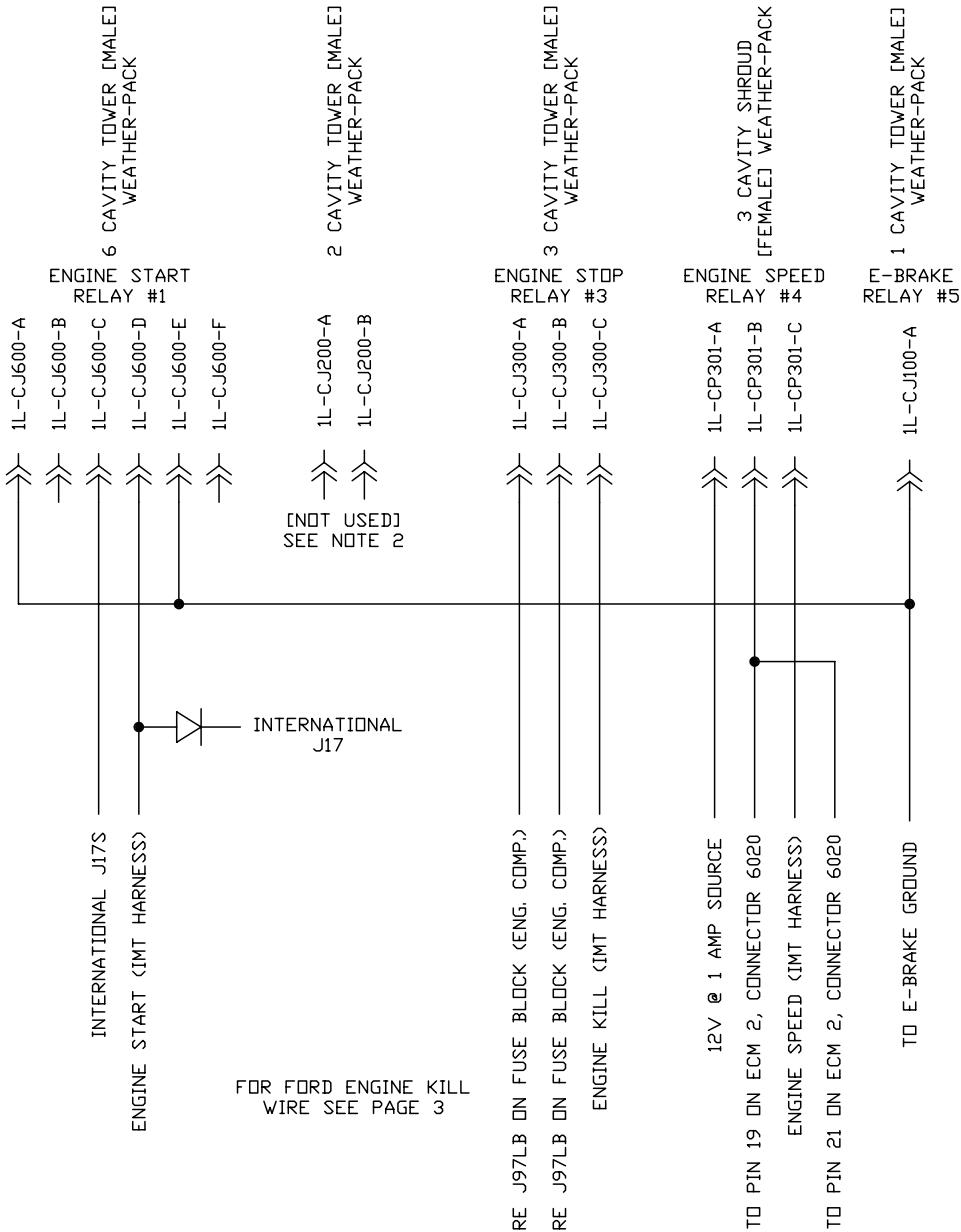
**INTERNATIONAL EFM- VT365 & DT466 2005-PRESENT (99903607-1)**

FOR:

2004 TO PRESENT INTERNATIONAL VT365  
AND 2005 TO PRESENT DT-466 WITH  
MANUAL TRANSMISSION.

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. WIRES A17 AND A13C ARE LOCATED IN THE PASS-THROUGH HARNESS LOCATED NEAR THE DRIVER'S LEFT LEG (UNDER THE STEERING WHEEL).
4. A13DD CAN BE FOUND ON THE BACK OF THE IGNITION SWITCH.
5. USE P/N 77045924 FOR INTERNATIONAL ECM CONNECTIONS.



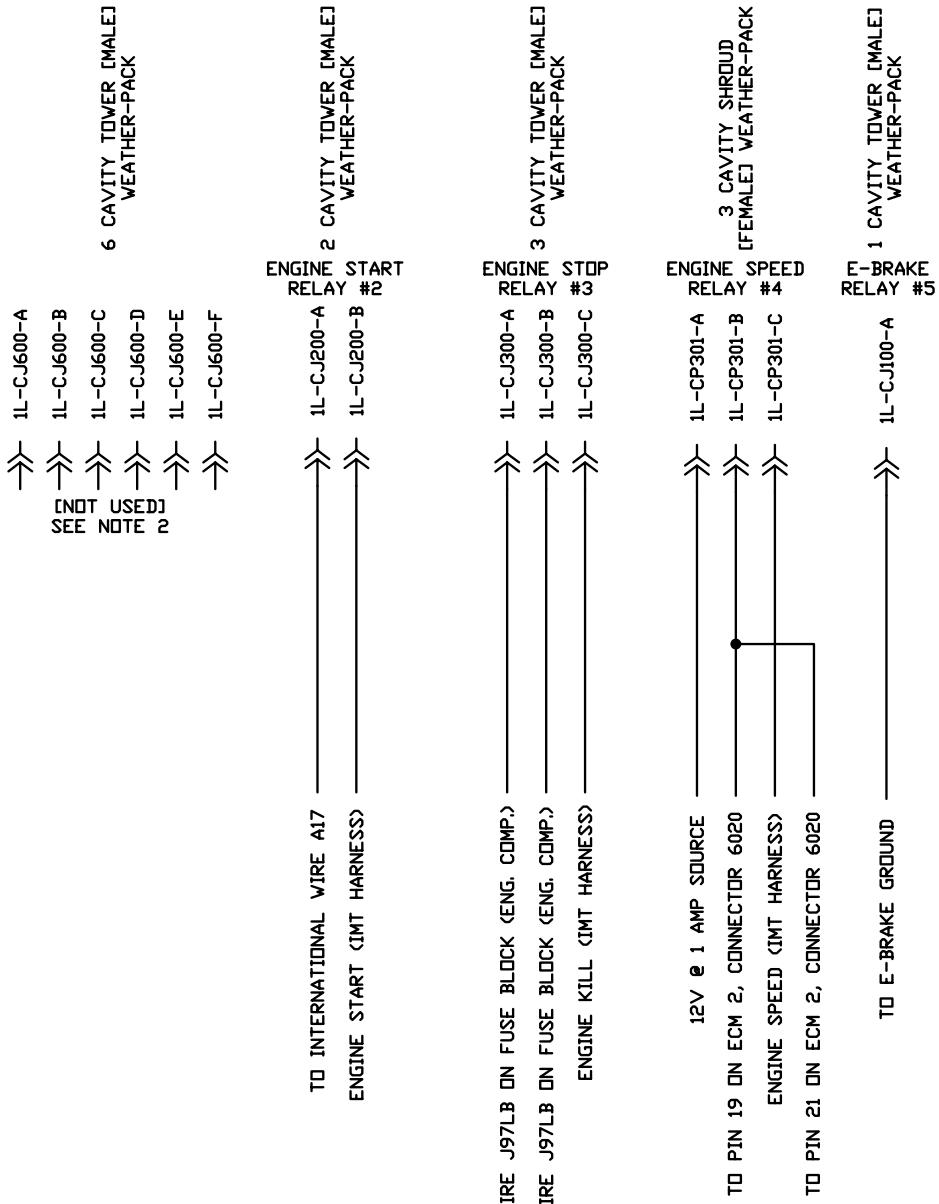
**INTERNATIONAL EFM- VT365 & DT466 2005-PRESENT (99903607-2)**

FOR:

2004 TO PRESENT INTERNATIONAL VT365  
AND 2005 TO PRESENT DT-466 WITH  
AUTOMATIC TRANSMISSION.

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. IF BODY BUILDER OPTION 12VYC IS NOT ORDERED, NO WIRES WILL BE PRESENT IN ECM PIN 19 AND 21. IT IS HIGHLY RECOMMENDED THAT THESE PINS BE INSTALLED AT A DEALER. IF NOT PREVIOUSLY INSTALLED CONNECTORS MAY BE ORDERED FROM IMT (P/N 77045001 2 REQUIRED).
4. A17 IS LOCATED UNDER THE FUSE/RELAY PANEL ABOVE THE DRIVERS SIDE WHEEL WELL. THE FUSE/RELAY PANEL CAN BE REMOVED FROM IT'S ENCLOSURE AND J17 LOCATED. SPLICING INTO THE WIRE WHERE CONVENIENT.
5. USE P/N 77045924 FOR INTERNATIONAL ECM CONNECTIONS.



**INTERNATIONAL EFM- VT365 & DT466 2005-PRESENT (99903607-3)****NOTES:**

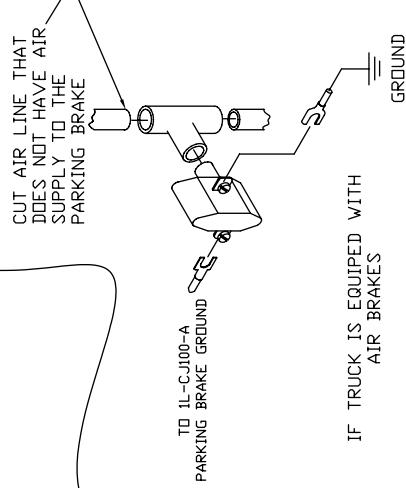
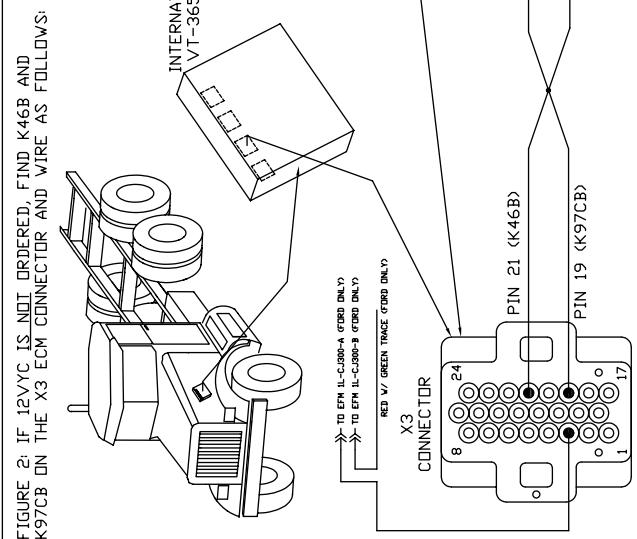
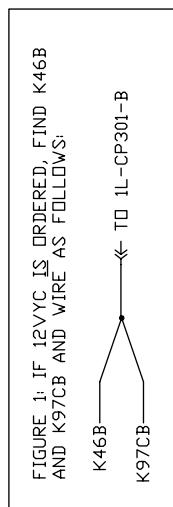
1. WIRES K46B AND K97CB MAY BE ACCESSIBLE FROM THE BODY BUILDER'S BLUNT CUT WIRES IF THE CHASSIS IS ORDERED WITH OPTION 12VYC (SEE FIGURE 1).
2. IF THE CHASSIS IS NOT ORDERED WITH OPTION 12VYC, MAKE THE CONNECTIONS AS SHOWN TO THE ECM X3 CONNECTOR USING P/N 77045924. THE CONNECTOR DOES NOT NEED TO BE TAKEN APART. THERE IS A LOCK IN THE MIDDLE OF THE CONNECTOR THAT MUST BE RELEASED BY DEPRESSING WITH A SMALL SCREWDRIVER. THE LOCK TAB WILL SNAP WHEN UNLOCKED AND PROTRUDE APPROXIMATELY  $\frac{1}{8}$ " ALLOWING TERMINALS TO BE INSTALLED OR REMOVED. BE CAREFUL AFTER UNLOCKING THE CONNECTOR AS ALL TERMINALS WILL BE RELEASED. WHEN DONE SNAP THE LOCK BACK INTO THE CONNECTOR SO IT IS FLUSH WITH THE CONNECTOR BODY.

**3. USING MPSI PRO-LINK 9000, CHANGE THE FOLLOWING PARAMETERS IN THE ECM.**

PTO MODE: IN CAB AND REMOTE  
 IN-CAB PTO MODE: PRESET  
 DISABLE CAB CONTROLS: YES  
 SET SWITCH SPEED: \*\*\* USER TO DETERMINE RPM  
 RESUME SWITCH SPEED: \*\* SAME AS SET SWITCH SPEED  
 ENGINE RAMP RATE: 500 RPM/SEC

**4. USE P/N 77045924 FOR INTERNATIONAL ECM CONNECTIONS.**

5. THE SAME ECM IS USED ON VT-365 AND DT-466 ENGINES, BUT IS MOUNTED IN DIFFERENT LOCATIONS. THE X3 CONNECTOR IS THE WHITE ECM CONNECTOR SECOND FROM THE FRONT AS VIEWED FROM THE DRIVER'S SIDE OF THE ENGINE COMPARTMENT. FOR VT-365 ENGINES, THE CONNECTORS ARE TOWARDS THE ENGINE. FOR THE DT-466 ENGINE, THE CONNECTORS ARE AWAY FROM THE ENGINE.



**MERCEDES SERIES EFM (99903482-1)**

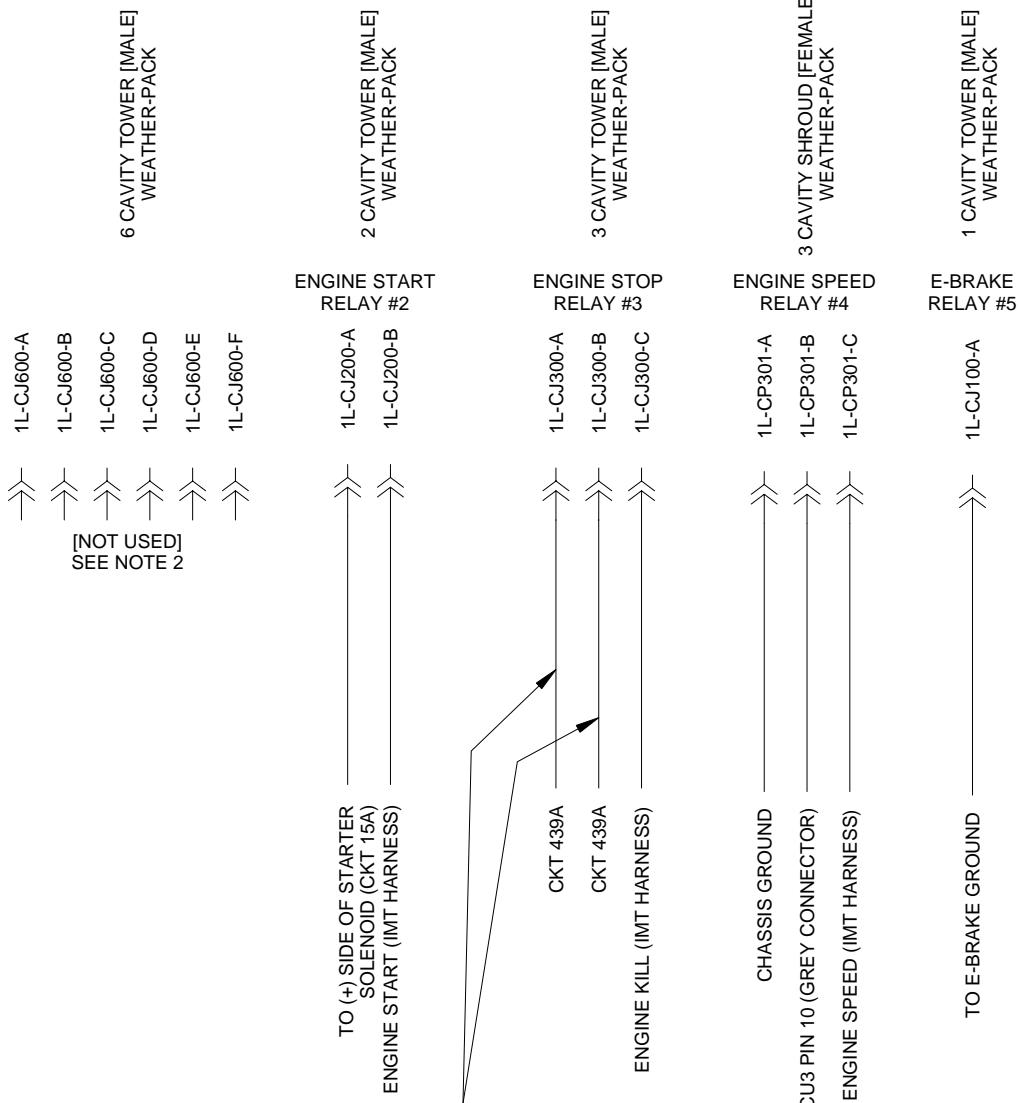
FOR:

2003 TO PRESENT MERCEDES BENZ MBE900E

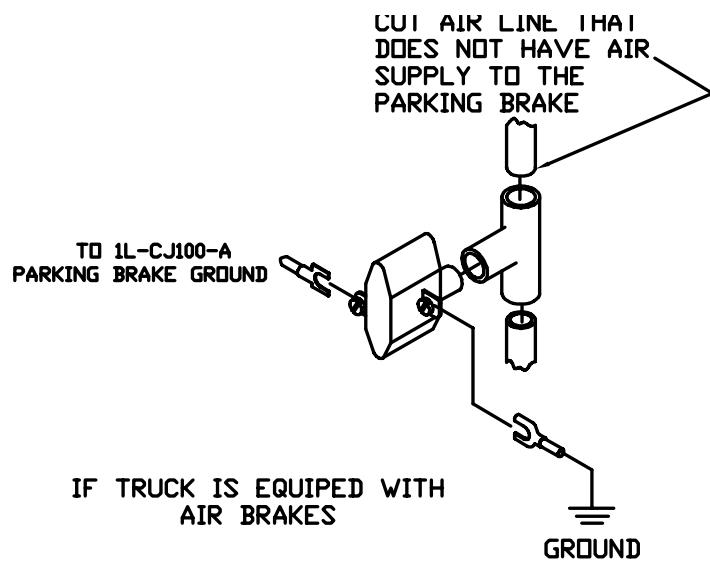
NOTES:

1. ENGINE START NOT USED ON PREDATOR.
2. PLUG ALL UNUSED CAVITIES WITH PACKARD PLUG #12010300 [IMT #77044893]. CAP ALL UNUSED CONNECTORS ON EFM.
- 3a. WIRE TO PIN 10 ON 2007 AND OLDER VCU3 ON MBE900 VCU MAY HAVE TO BE INSTALLED.
- 3b. WIRE TO PIN 9 ON 2008 AND NEWER VCU3 ON MBE900 VCU MAY HAVE TO BE INSTALLED.  
IF SO USE IMT P/N 77441059 AND APPROPRIATE GAUGE WIRE.
4. THE VCU MAY BE FOUND UNDER THE DASH ON THE PASSENGER'S SIDE OF THE VEHICLE. THE CONNECTORS ARE COLOR CODED.

VCU1 = BROWN CONNECTOR  
 VCU3 = GRAY CONNECTOR  
 VCU4 = VIOLET CONNECTOR.



CUT EXISTING WIRE FROM PIN 2 ON VCU1 (CKT. 439A ON BROWN CONNECTOR). CONNECT ONE HALF TO EACH WIRE. WIRE MAY NEED TO BE EXTENDED

**MERCEDES SERIES EFM (99903482-2)**

REMOTE PTO PARAMETERS	NEW VALUES	AVAILABLE RANGE / OPTIONS	DEFAULT
PTO FUNCTION ENABLE / DISABLE	1	0 - DISABLED 1 - ENABLED	0
NUMBER OF REMOTE PTO SPEEDS	1	1, 2, OR 3	1
MAXIMUM SPEED - PTO #1	1250 RPM*	500 - 3000 RPM	950 RPM
MAXIMUM SPEED - PTO #2	N/A	N/A	N/A
MAXIMUM SPEED - PTO #3	N/A	N/A	N/A
REMOTE ACCELERATOR ENABLE	0	0 - DISABLED 1 - ENABLED	0

ALL PTO PARAMETER SETTINGS CAN BE  
REPROGRAMMED WITH SERVICELINK 2.2 OR HIGHER.

\* FINAL VALUE TO BE DETERMINED BY END USER.

## PTO INSTALLATION - CHEVY 4500/5500 SERIES (99903579-1)

## NOTES:

1. FOR SINGLE PTO APPLICATIONS WITH ALLISON 1000P TRANSMISSIONS (DIAGRAM 1), THE PTO SWITCH ON THE 4500 / 5500 DASH WILL ENABLE SPEED CONTROL AND ACTIVATE THE PTO. THE PTO MANUFACTURER'S SWITCH IS NOT USED.
2. FOR DUAL PTO APPLICATIONS WITH ALLISON 1000P TRANSMISSIONS (DIAGRAM 2), THE PTO SWITCH ON THE 4500 / 5500 DASH WILL ENABLE SPEED CONTROL AND ALLOW THE MANUFACTURER'S PTO SWITCHES TO BE ACTIVE. NORMAL OPERATION OF THE PTO WILL BE:
  - A. ACTIVATION OF CHEVROLET DASH SWITCH TO ENABLE PTO SWITCHES / SPEED CONTROL.
  - B. ACTIVATION OF ONE OR BOTH PTO SWITCHES TO ACTIVATE PTO(S).
3. FOR SINGLE PTO APPLICATIONS WITH ZED-F S6-650 TRANSMISSIONS (DIAGRAM 3), THE PTO SWITCH ON THE 4500/5500 DASH WILL NOT BE USED. ELEVATED IDLE WILL BE CONTROLLED BY COMPRESSOR AND/OR SWITCH ON IMT CRANE HANDSET.
4. FOR BOTH SINGLE AND DOUBLE PTO APPLICATIONS, REGARDLESS OF TRANSMISSION, PROPER PROGRAMMING OF THE DURAMAX ECM MAY BE REQUIRED FOR CORRECT IDLE SETTINGS (SEE FIG. 1).

5. FUSES ARE TO BE SIZED ACCORDING PTO MANUFACTURER'S RECOMMENDATIONS. MUNCIE RECOMMENDS 10 AMP FUSES, CHELSEA RECOMMENDS 9 AMP FUSES.
6. THE 10 WAY UPFITTER PTO CONNECTOR IS LOCATED IN THE ENGINE COMPARTMENT ON THE PASSENGER'S SIDE NEAR THE FIREWALL (SEE FIG. 2). CONNECTIONS TO THE PTO CONNECTOR CAN BE MADE USING IMT P/N 77044565 AND 70394069 TERMINAL AND SEAL. THESE ARE INCLUDED IN EFM KIT 51717388.
7. REFERENCE: 2003 MEDIUM DUCY C SERIES ELECTRICAL, PAGE B-1 (ELECTRICAL COMPONENT LEGEND) AND C-18 (10-WAY UPFITTER PTO CONNECTOR).

FIG. 1  
DURAMAX ENGINE PARAMETERS FOR PTO OPERATION

PARAMETER	PROGRAMMED VALUE	FORMULA (SEE NOTE)
PTO FAST IDLE OPTION	PRESET	N/A
PTO MAX ENGINE SPEED	1450	PTO RPM + 200
PTO STANDBY SPEED	1250	PTO RPM
PTO SET SPEED	1250	PTO RPM
PTO RESUME SPEED	1250	PTO RPM
PTO MAX ENGAGE SPEED	1050	PTO RPM - 200
ENGINE SHUTDOWN	NO	N/A
PTO ENGAGE RELAY	YES	N/A
PTO FEEDBACK	YES	N/A

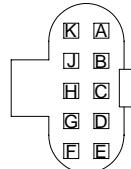
PROGRAMMED VALUES ARE LISTED FOR A DESIRED ENGINE SPEED OF 1250 RPM DURING PTO OPERATION. FOR SETTINGS OTHER THAN 1250, USE THE FORMULA COLUMN.

PTO RPM = DESIRED ENGINE SPEED DURING PTO OPERATION.

PTO FEEDBACK SET TO "YES" WILL FORCE ELEVATED IDLE ONLY WHEN PIN "G" IN PTO UPFITTER CONNECTOR IS PROVIDED WITH CONSTANT 12V. THE GM DASH PTO SWITCH MUST BE ACTIVATED IN ORDER FOR ELEVATED IDLE TO OCCUR.

PTO FEEDBACK SET TO "NO" WILL FORCE ELEVATED IDLE WITH SWITCH ACTIVATION. INPUT TO PIN "G" IN PTO UPFITTER CONNECTOR IS NOT REQUIRED.

FIG. 2  
10 WAY UPFITTER PTO CONNECTOR

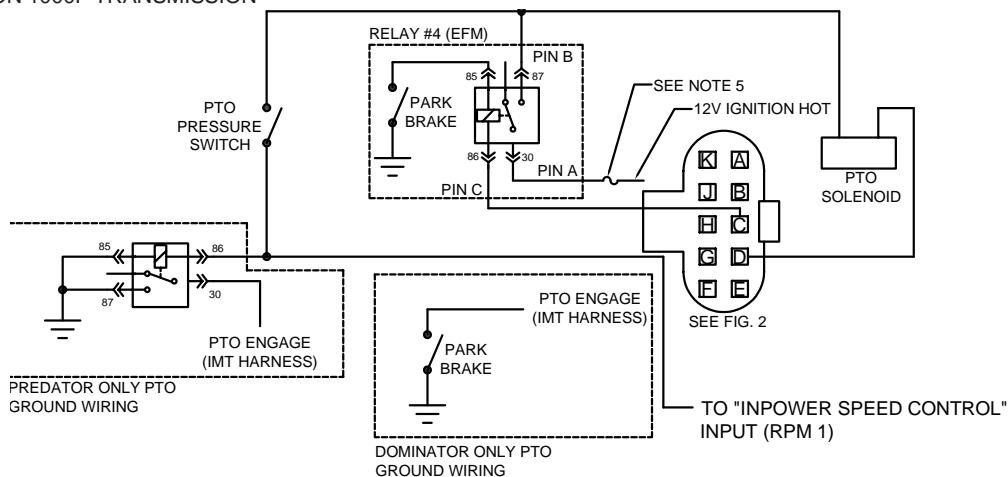


PIN	WIRE	FUNCTION	
	CKT #	COLOR	
A	N/C	-	
B	494	LIGHT BLUE	PTO KILL
C	488	LIGHT GREEN	PTO ENABLE
D	250	BLACK	GROUND
E	2663	PURPLE	TAP UP
F	488	LIGHT GREEN	PTO ENABLE
G	2522	YELLOW	PTO FEEDBACK
H	2561	WHITE	ENGAGE
J	2664	TAN	TAP DOWN
K	N/C	-	-

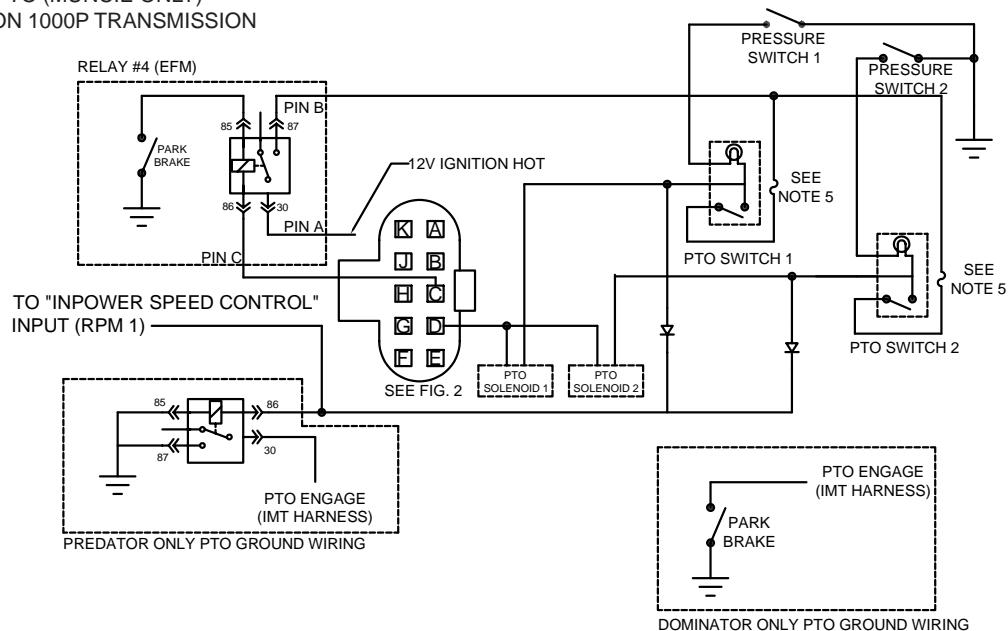
## PTO INSTALLATION - CHEVY 4500/5500 SERIES (99903579-2)

NOTE: REFER TO 99903587 FOR ADDITIONAL EFM WIRING INFORMATION, INCLUDING WIRING DIAGRAMS FOR PTO GROUND, ENGINE START, AND ENGINE STOP.

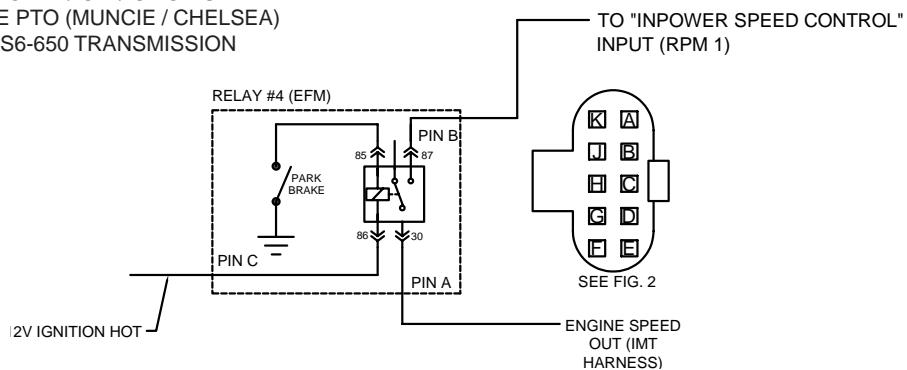
**DIAGRAM 1:**  
CHEVROLET / GM / GMC DURAMAX  
SINGLE PTO (MUNCIE / CHELSEA)  
ALLISON 1000P TRANSMISSION



**DIAGRAM 2:**  
CHEVROLET / GM / GMC DURAMAX  
DUAL PTO (MUNCIE ONLY)  
ALLISON 1000P TRANSMISSION



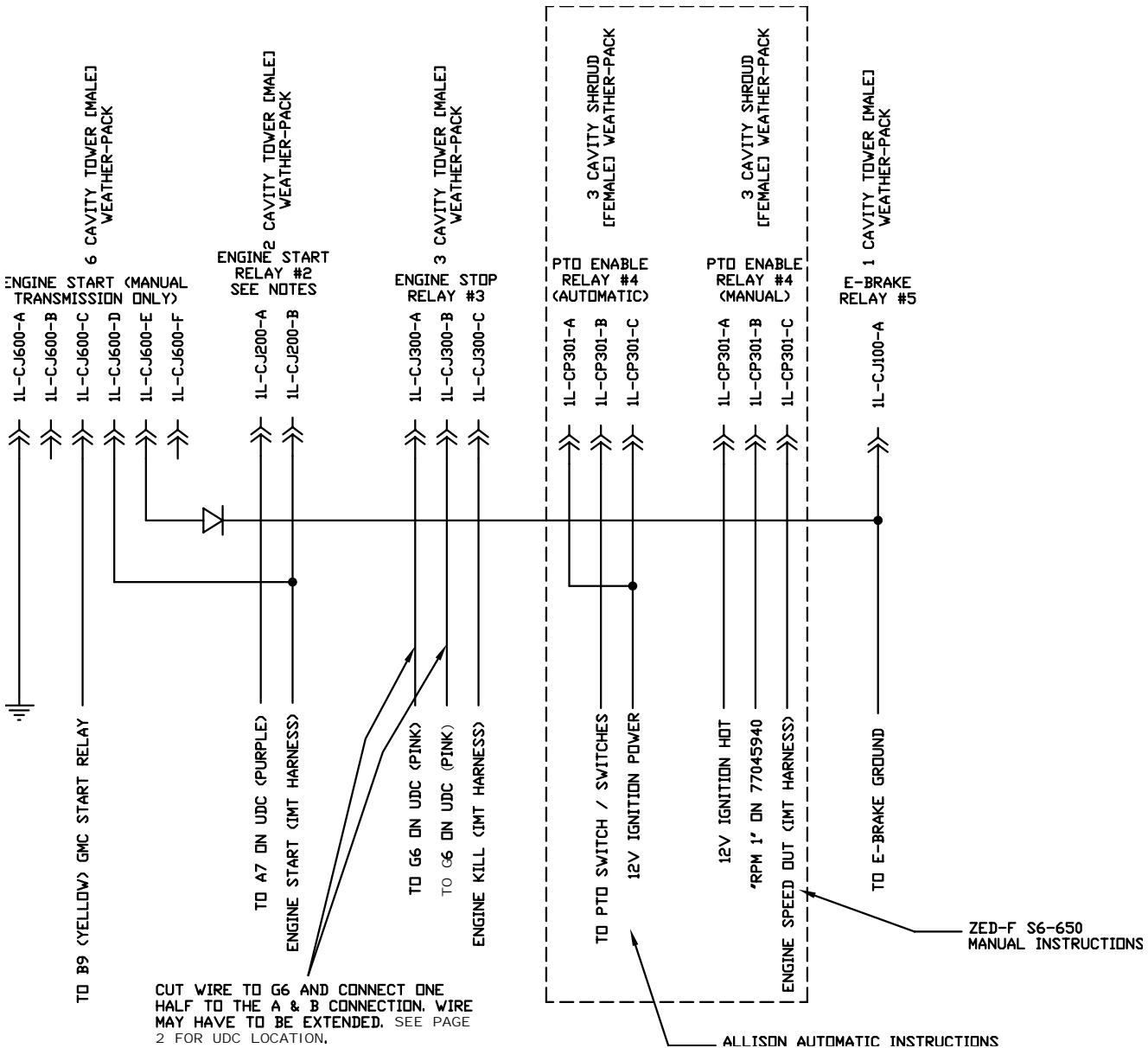
**DIAGRAM 3:**  
CHEVROLET / GM / GMC DURAMAX  
SINGLE PTO (MUNCIE / CHELSEA)  
ZED-F S6-650 TRANSMISSION



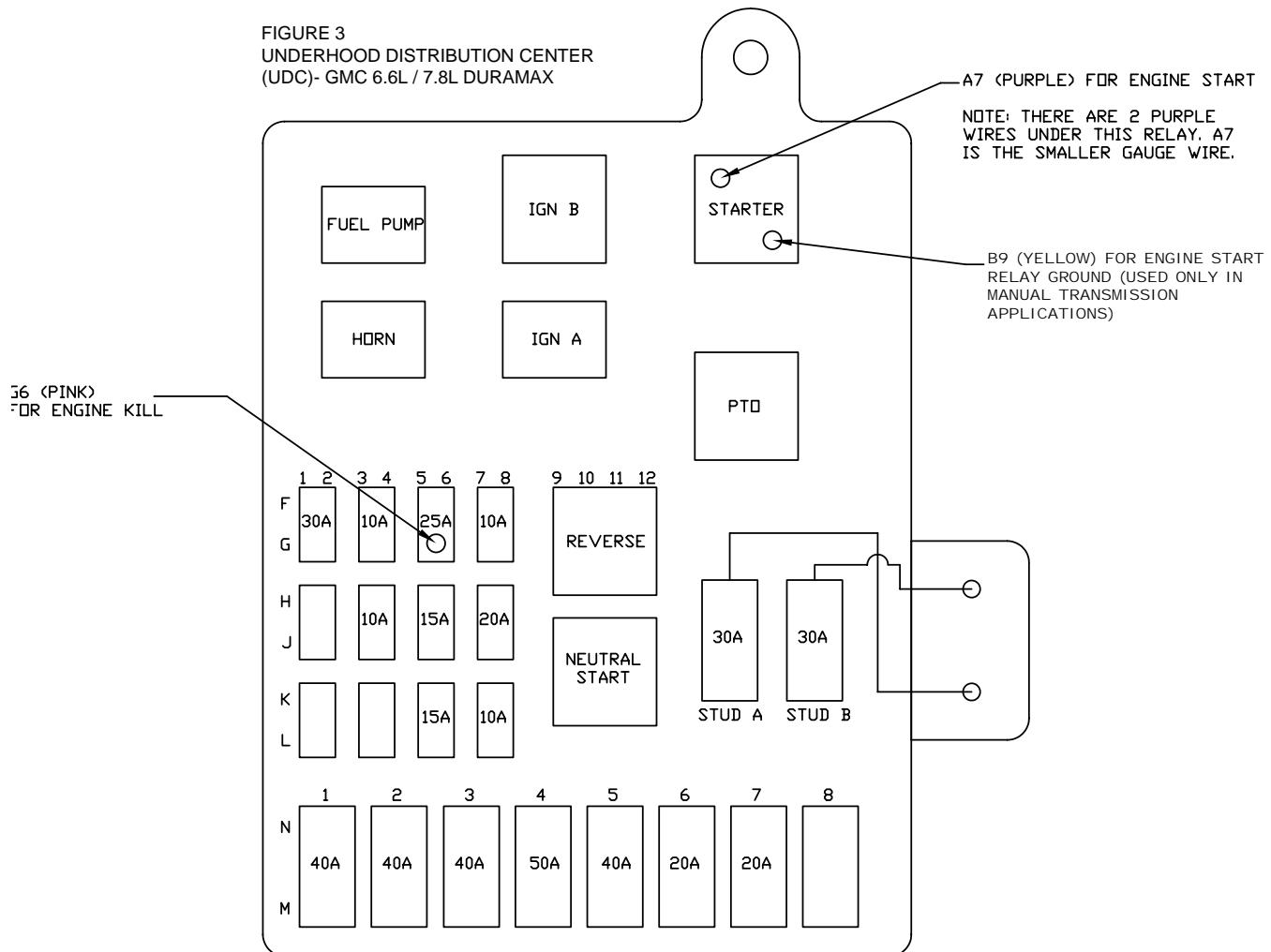
**EFM INSTALLATION - CHEVY 4500/5500 SERIES (99903587-1)****2002 TO CURRENT GMC 4500 / 5500 WITH 6.6L /7.8L DURAMAX ENGINE**

## 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. SEE PAGE 2 FOR DESCRIPTION OF WIRES IN GMC'S UNDERHOOD DISTRIBUTION CENTER (UDC)
4. GMC CKT 2522 (YELLOW), 2561 (WHITE), AND 250 (BLACK) CAN BE FOUND IN GMC PTO UPFITTER CONNECTOR. THIS CONNECTOR IS LOCATED IN THE ENGINE COMPARTMENT JUST ABOVE THE CURB SIDE WHEEL WELL. SEE 99903579 FOR DETAILS.
5. ENGINE KILL AND ENGINE START CIRCUITS CAN BE FOUND IN THE UNDERHOOD DISTRIBUTION CENTER ON THE PASSENGER'S SIDE FIREWALL. ENGINE KILL WIRE IS PINK AND FOUND AT LOCATION G6. ENGINE START WIRE IS PURPLE AND FOUND AT LOCATION A7 (PIN 85 ON START RELAY). SEE PAGE 2 FOR DETAILS. NOTE: THERE ARE TWO PURPLE WIRES ON THE START RELAY. LOCATION A7 IS THE SMALLER GAUGE OF THE TWO WIRES.
6. FOR BOTH SINGLE AND DUAL PTO APPLICATIONS, THE DURAMAX ENGINE MAY NEED TO BE PROGRAMMED. SEE 99903579 FOR PARAMETERS AND SETTINGS.
7. FOR TRANSMISSION-SPECIFIC PTO WIRING SCHEMATICS, SEE 99903579.



## EFM INSTALLATION - CHEVY 4500/5500 SERIES (99903587-2)



## PTO INSTALLATION - 65 75 DURAMAX 7.8 L ENGINE (99903649-1)

**NOTES:**

1. For single PTO applications with Allison MD transmissions (Diagram 1), the PTO switch on the 6500/7500 dash will enable the PTO. The PTO manufacturer's switch is not used. Elevated idle will be controlled by compressor and/or speed switch on the IMT crane handset. See Table 1.
  2. For single PTO applications with manual transmissions (Diagram 2), the PTO switch on the 6500/7500 dash will not be used. Elevated idle will be controlled by compressor and/or speed switch on the IMT crane handset. See Table 1.
  3. For dual PTO applications with Allison MD transmissions (Diagram 3), the PTO switch on the 6500/7500 dash will enable the manufacturer's PTO switches to be active. Normal operation of the PTO will be:
    - a. Activation of GM dash switch to enable PTO manufacturer's switches.
    - b. Activation of one or both PTO switches to activate PTO(s).
 Elevated idle will be controlled by compressor and/or speed switch on the IMT crane handset.
4. For both single and double PTO applications, regardless of transmission, proper programming of the Duramax 7.8L EFM may be required for correct idle settings. See Table 1.
  5. Fuses are to be sized according to PTO manufacturer's recommendations. Muncie recommends 10 amp fuses; Chelsea recommends 9 amp fuses.
  6. The 10-way upfitter PTO connection is located in the engine compartment on the passenger side near the firewall. Connections to the PTO connector can be made using IMT part numbers 77044565 and 70394069 terminal and seal.
  7. The transmission connector is located in the engine compartment on the passenger side near the transmission control module (TCM), or typically, just ahead of the 10-way upfitter PTO connector. Connections to the PTO connector can be made using IMT part numbers 77044565 and 70394069 terminal and seal.

**TABLE 1: DURAMAX 7.8L ENGINE PARAMETERS FOR PTO OPERATION**

PARAMETER	PROGRAMMED VALUE	FORMULA (SEE NOTE)
PTO FAST IDLE OPTION	PRESET	N/A
PTO MAX ENGINE SPEED	1450	PTO RPM + 200
PTO STANDBY SPEED	1250	PTO RPM
PTO SET SPEED	1250	PTO RPM
PTO RESUME SPEED	1250	PTO RPM
PTO MAX ENGAGE SPEED	1050	PTO RPM - 200
ENGINE SHUTDOWN	NO	N/A
PTO ENGAGE RELAY	YES	N/A
PTO FEEDBACK	YES	N/A

**NOTES:**

Programmed values listed are for a desired engine speed of 1250 RPM during PTO operation. For settings other than 1250 RPM, use the formula column.

PTO RPM = Desired engine speed during PTO operation

PTO feedback set to "YES" will force elevated idle when pin "G" in PTO upfitter connector is provided with constant 12V. Once elevated idle occurs, it is latched on by the GM ECM. Base idle will occur if speed control inputs are disabled and:

1. The PTO switch is toggled off, then on.
2. The remote stop switch resets the PTO switch. By "bumping" the engine kill switch, the speed drops to idle without killing the engine.

The GM dash switch must be activated in order for elevated idle to occur.

## PTO INSTALLATION - 65 75 DURAMAX 7.8 L ENGINE (99903649-2)

DIAGRAM 1:  
**CHEVROLET / GM / GMC DURAMAX 7.8L**  
 SINGLE PTO (MUNCIE / CHELSEA)  
 ALLISON MD (3000 / 4000) SERIES TRANSMISSION

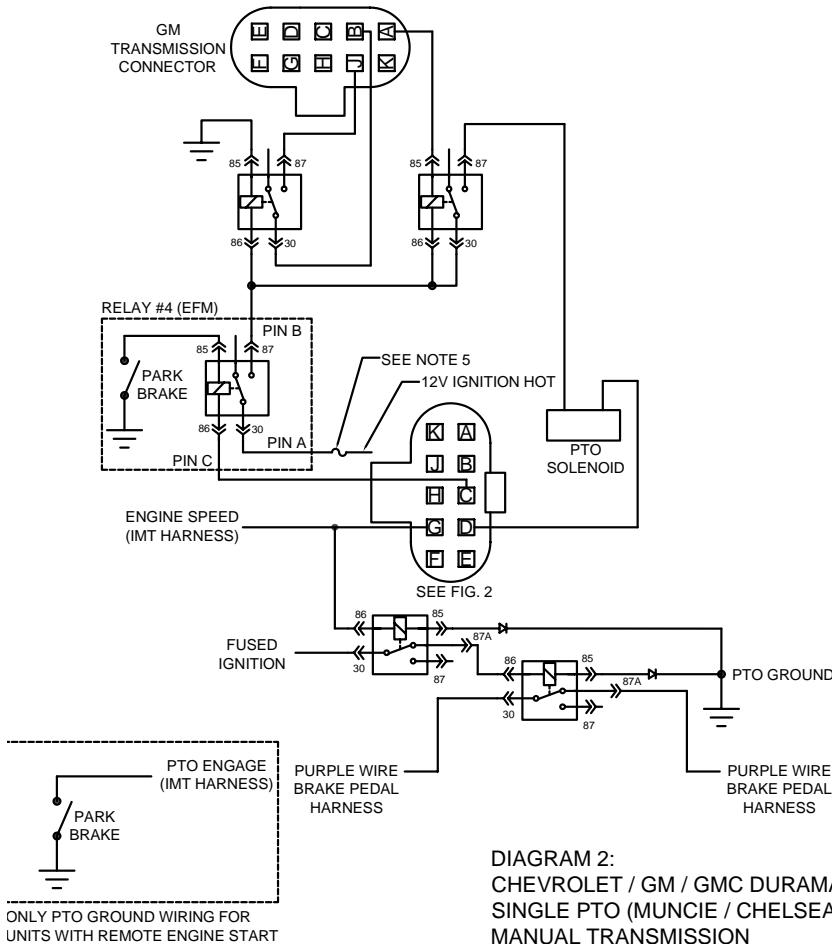
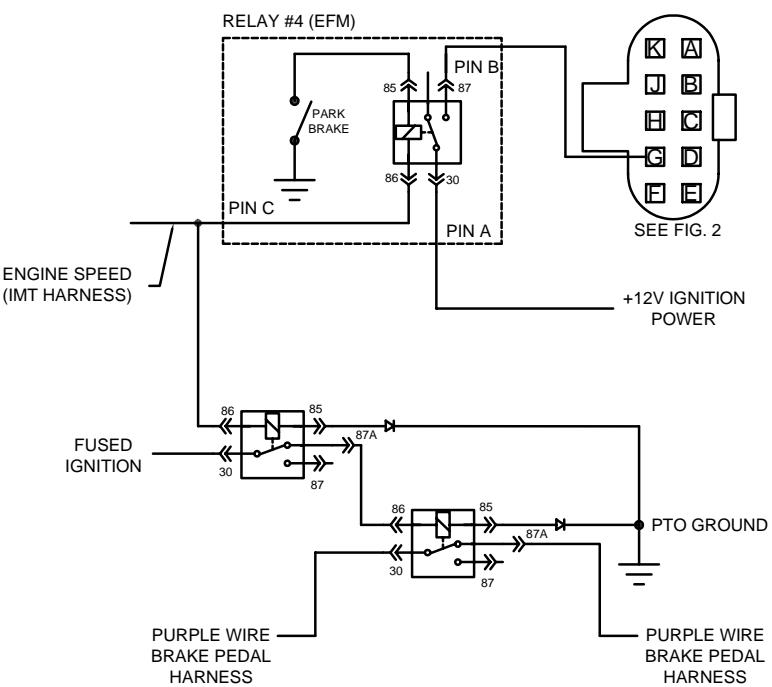
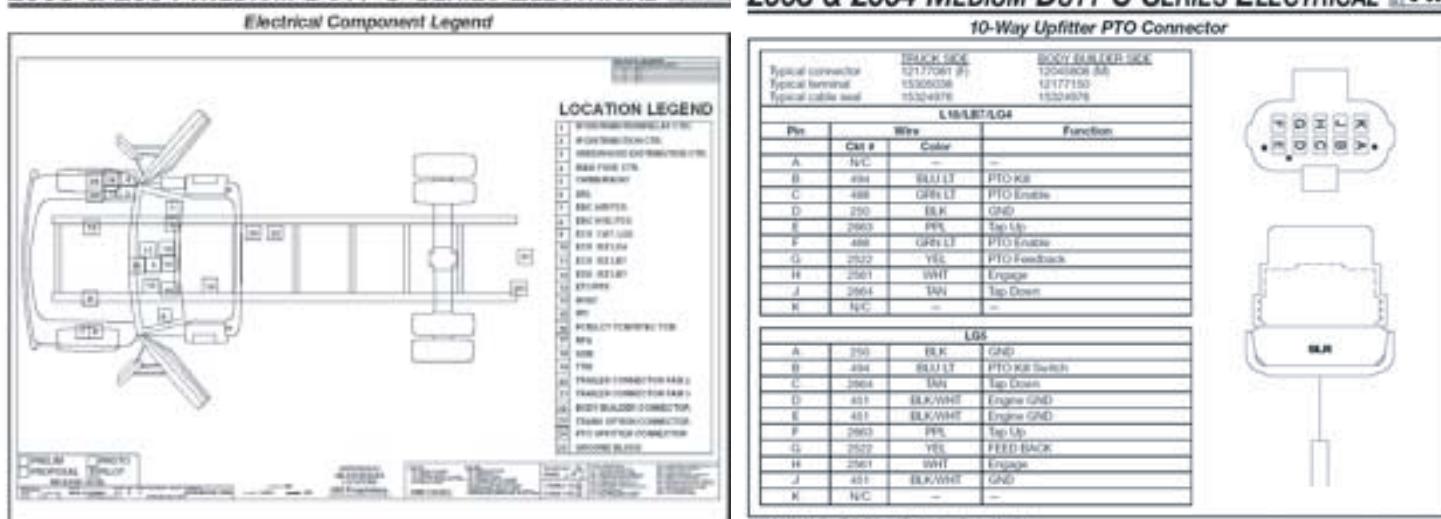


DIAGRAM 2:  
**CHEVROLET / GM / GMC DURAMAX 7.8L**  
 SINGLE PTO (MUNCIE / CHELSEA)  
 MANUAL TRANSMISSION

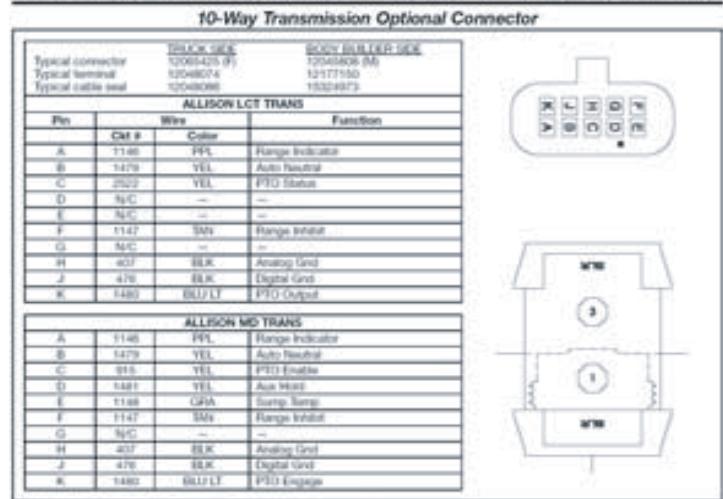


**PTO INSTALLATION - MEDIUM DUTY ELECTRICAL DIAGRAMS (99903649)**

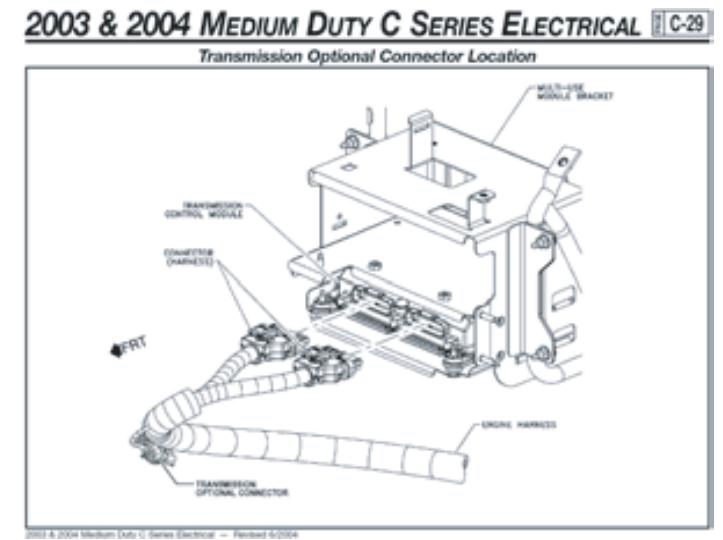
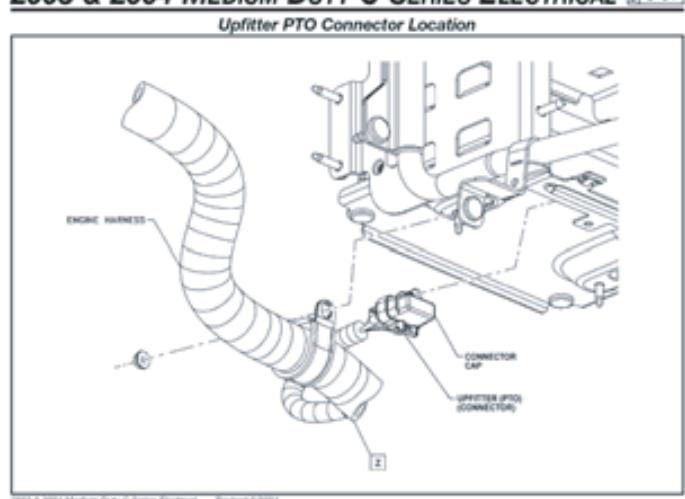
For reference: 2003 and 2004 Medium Duty series C electrical page B-1 (Electrical Component Legend) and page C-28 through C-31 (10-way upfitter PTO connector and 10-way transmission connector).

**2003 & 2004 MEDIUM DUTY C SERIES ELECTRICAL** [B-1]**2003 & 2004 MEDIUM DUTY C SERIES ELECTRICAL** [C-30]

2003 &amp; 2004 Medium Duty C Series Electrical — Revised 6/2004

**2003 & 2004 MEDIUM DUTY C SERIES ELECTRICAL** [C-28]**2003 & 2004 MEDIUM DUTY C SERIES ELECTRICAL** [C-31]

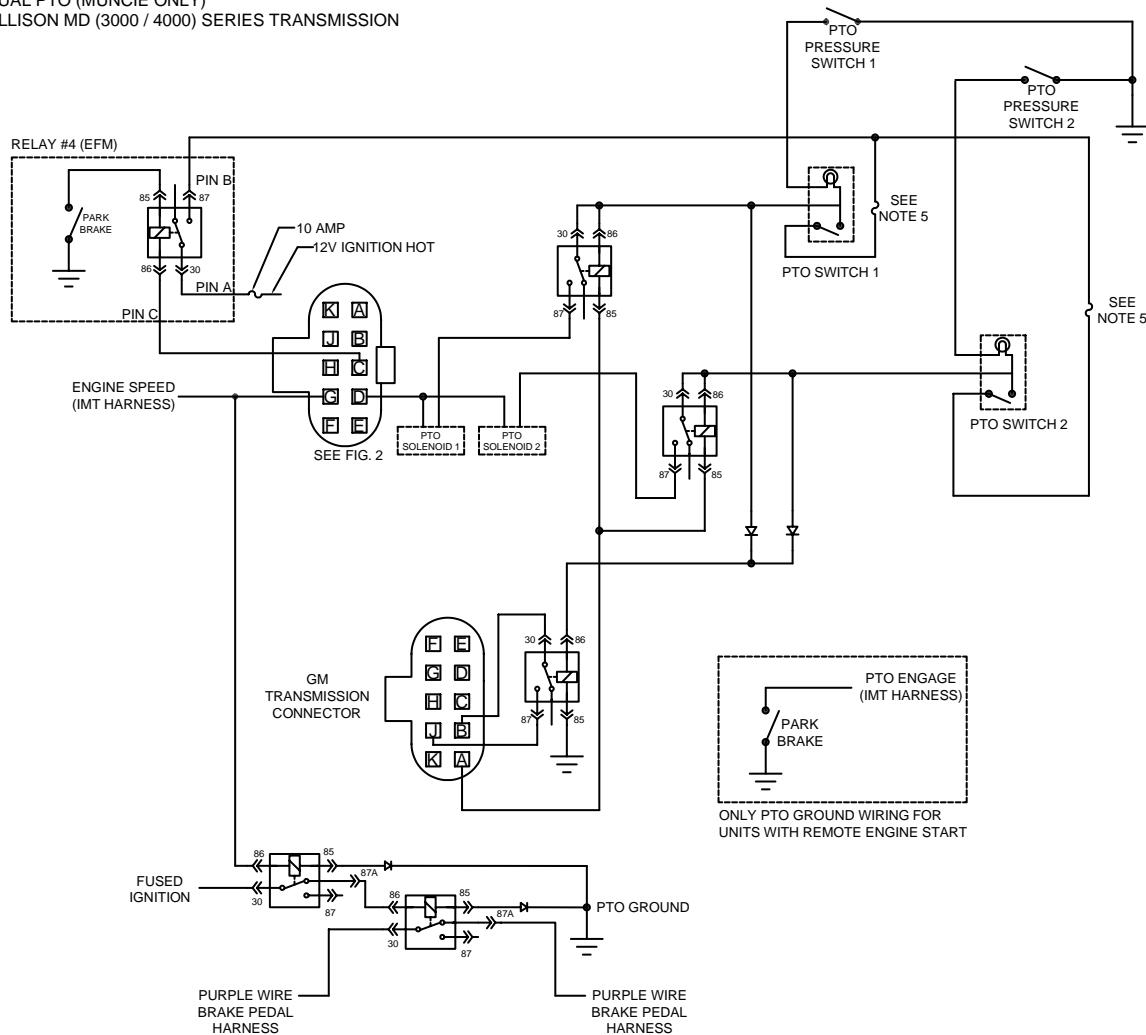
2003 &amp; 2004 Medium Duty C Series Electrical — Revised 6/2004



2003 &amp; 2004 Medium Duty C Series Electrical — Revised 6/2004

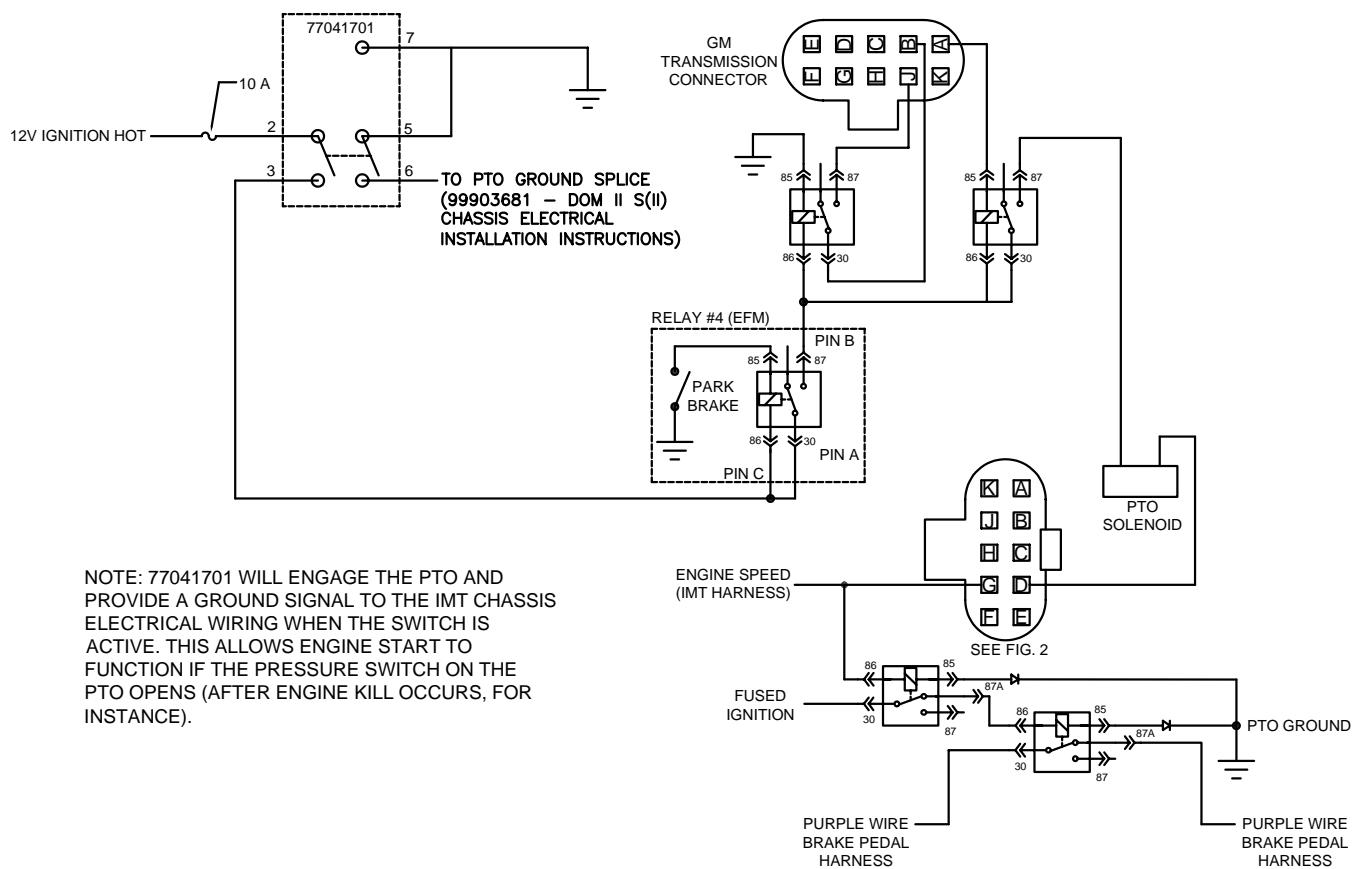
**PTO INSTALLATION - 65 75 DURAMAX 7.8 L ENGINE (99903649-3)**

**DIAGRAM 3:**  
**CHEVROLET / GM / GMC DURAMAX 7.8L**  
**DUAL PTO (MUNCIE ONLY)**  
**ALLISON MD (3000 / 4000) SERIES TRANSMISSION**

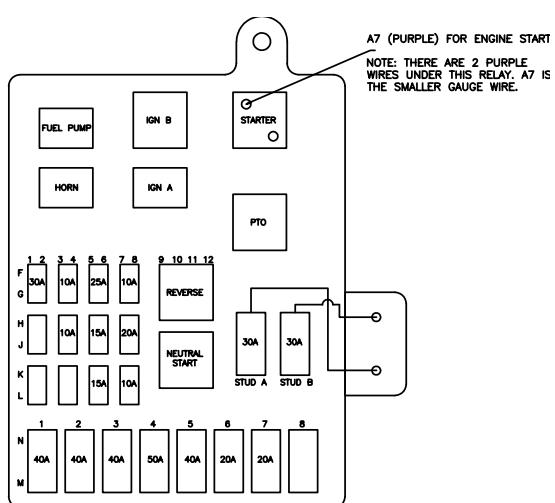
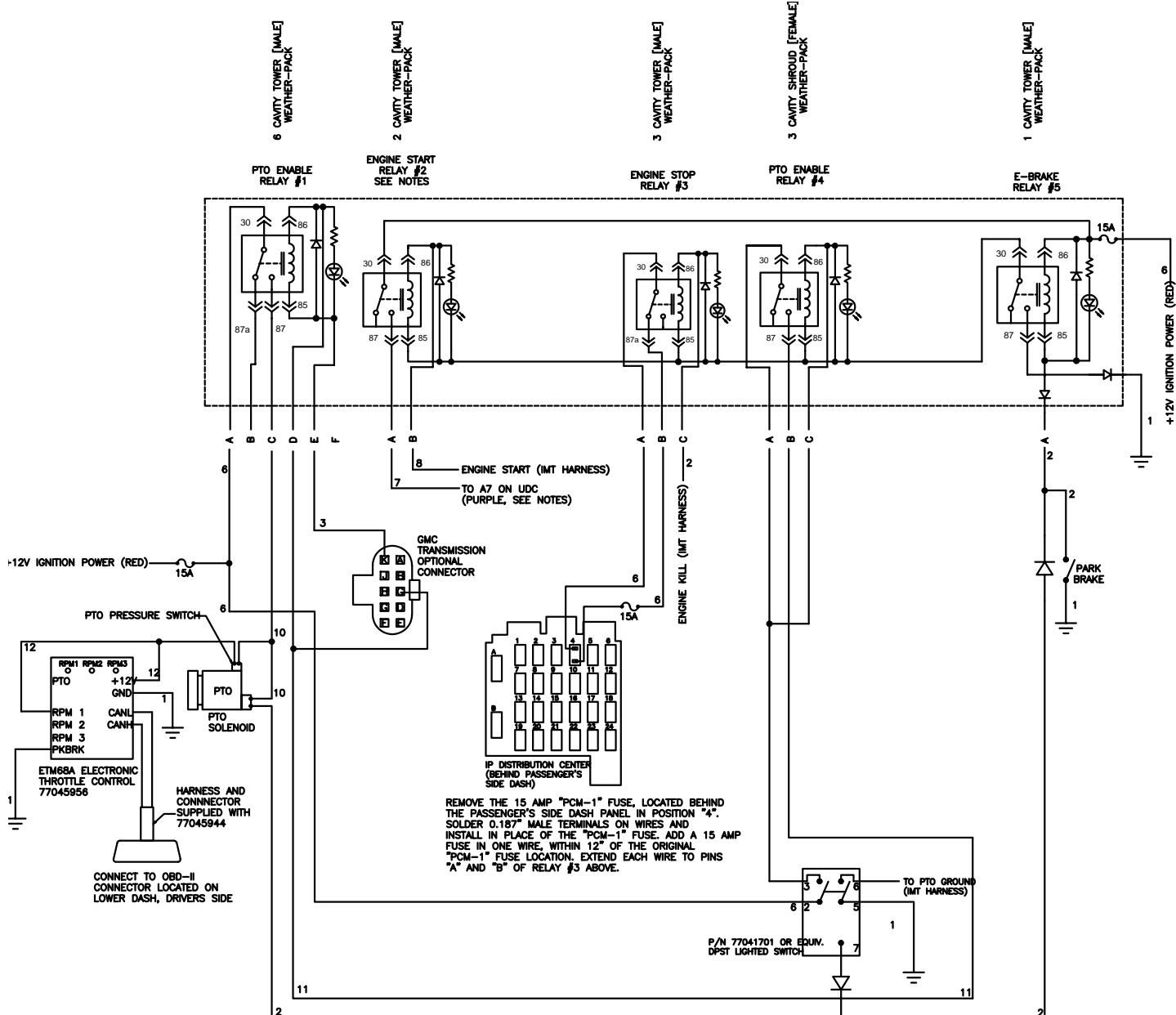


## PTO INSTALLATION - 65 75 DURAMAX 7.8 L ENGINE (99903649-4)

For use with Chevrolet / GM / GMC Duramax 7.8L single PTO (Muncie / Chelsea) or Allison MD (3000 / 4000) series transmissions on Dominator II bodies built after 4-15-2005.



## PTO INSTALLATION - 2007 TO PRESENT 4500 5500 DURAMAX 6.6 L ENGINE (99904414)



**FOR: 2007 TO PRESENT GMC 4500 5500 WITH 6.6 L DURAMAX ENGINE, ALLISON 1000 TRANSMISSION, AND INPOWER SPEED CONTROL**

**NOTES:**

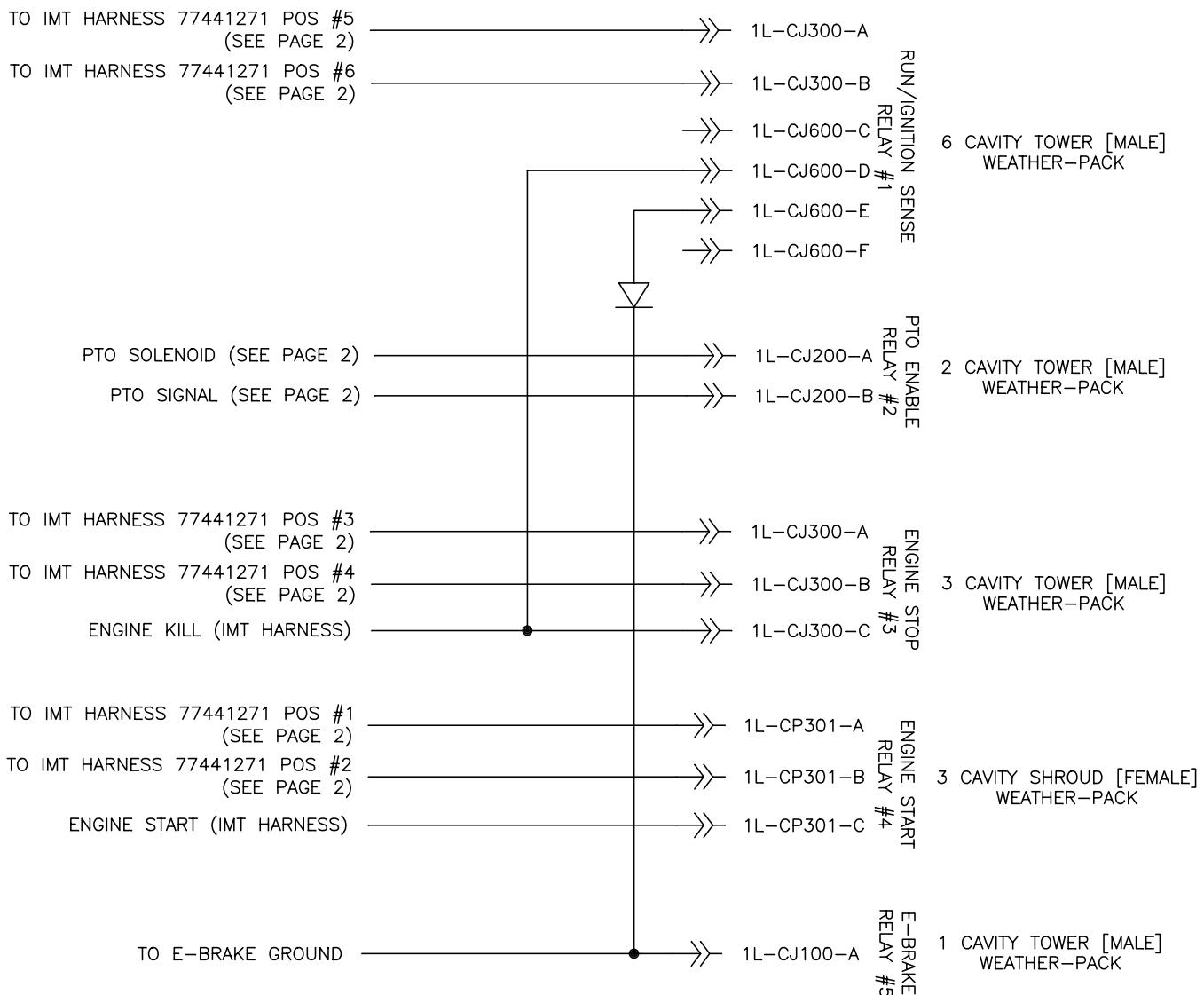
1. Engine start not used on Predator.
2. Plug all unused cavities with plug #77044893. Cap unused connectors.
3. The GMC wire used for engine start is located in the underhood distribution center (UDC) on the passenger side firewall. The engine start wire is purple and found at location a7 (pin 85) on the start relay. See figure 1 for details. Note: There are two purple wires on the start relay. Location A7 is the smaller gauge of the two wires.

FIGURE 1  
UNDERHOOD DISTRIBUTION CENTER (UDC)- GMC 6.6L / 7.8L DURAMAX

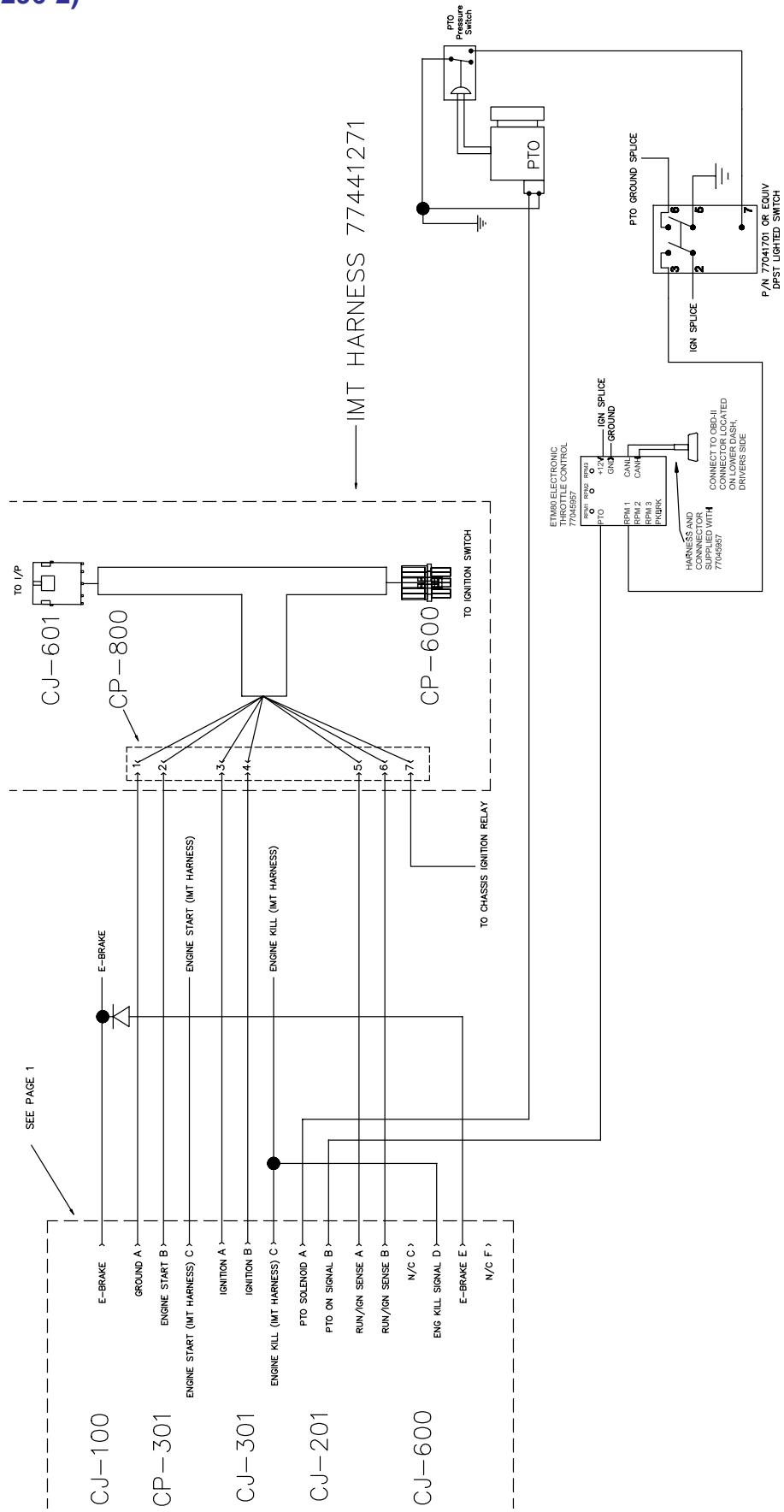
## 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (EFM-AUT TRANS) (99904296-1)

**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. SEE SHEET 99904296-2 FOR DODGE STEERING COLUMN WIRING.
4. SEE SHEET 99904296-3 FOR PICTURES.
5. FOLLOW WIRING SCHEMATIC AS SHOWN TO INSURE PROPER FUNCTION. FAILURE TO DO SO WILL RESULT IN SYSTEM FAILURE AND POSSIBLE ENGINE ERROR CODE GENERATION.
6. BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) MUST BE DISCONNECTED BEFORE DOING ANY WIRING ON VEHICLE.



**2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (SCHEMATIC-AUTO TRANS) (99904296-2)**



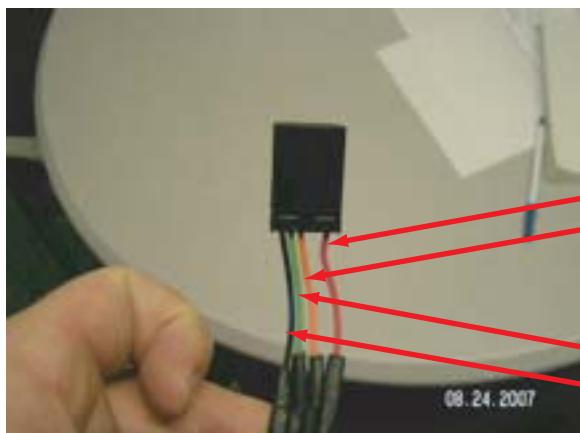
**2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (PHOTOS-AUTO TRANS)  
(99904296-3)**

## NOTES:

1. REMOVE PANEL BENEATH STEERING COLUMN.
2. LOCATE HARD MOUNTED CONNECTOR ON THE LEFT SIDE OF THE STEERING COLUMN. IT WILL BE JUST INSIDE THE COLUMN COVER.
3. REMOVE CONNECTOR AND IMT HARNESS 77441271 AS SHOWN ON 99904296-2.
4. WIRING CONNECTOR TO THE KEY SWITCH IS HARD MOUNTED.
5. WIRING TO THE INSTRUMENT PANEL IS ON THE FREE HARNESS SIDE.



I/P AND KEY SWITCH  
CONNECTOR LOCATION



AS MARKED ON CONNECTOR

CAVITY ONE (BATTERY)

CAVITY FOUR (IGNITION)

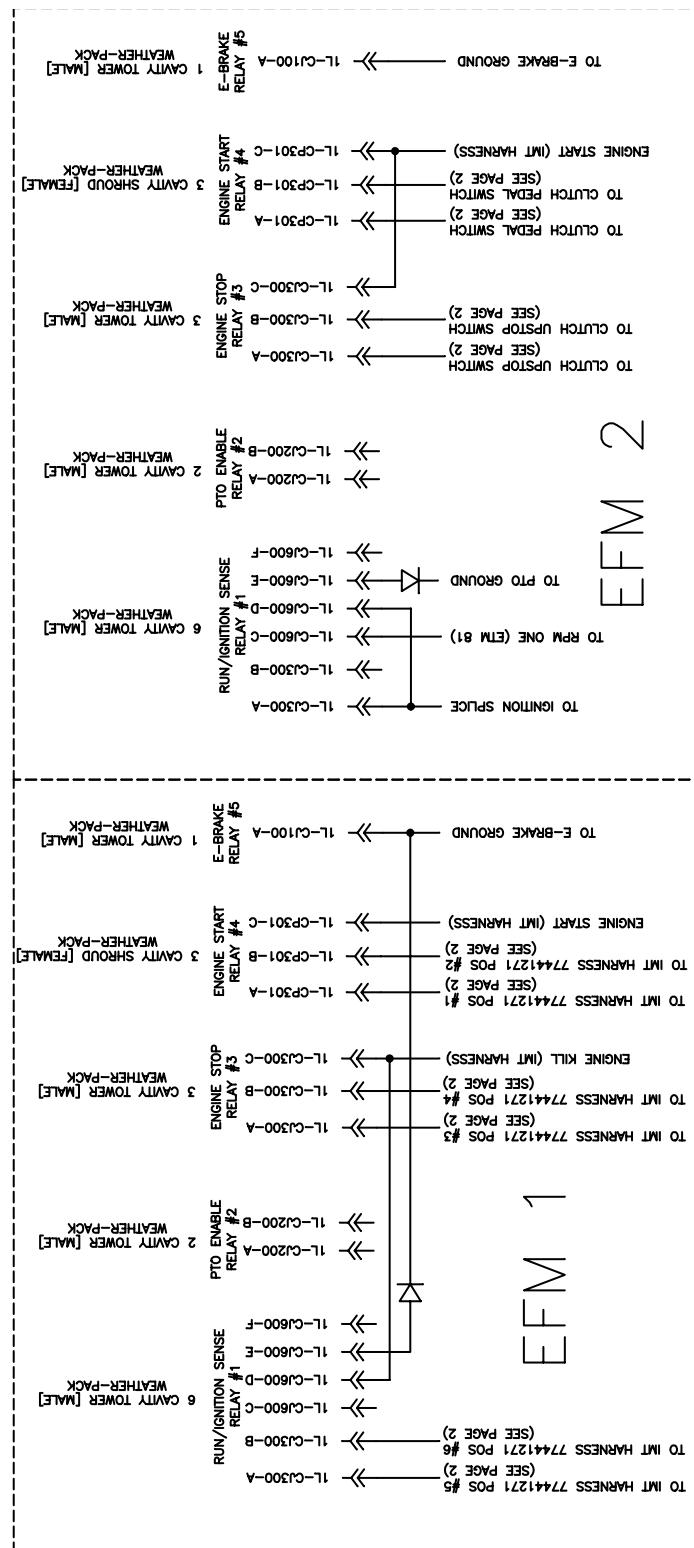
CAVITY FIVE (RUN / IGN SENSE)

CAVITY SIX (GROUND)

## 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (EFM-2WD MANUAL) (99904296-4)

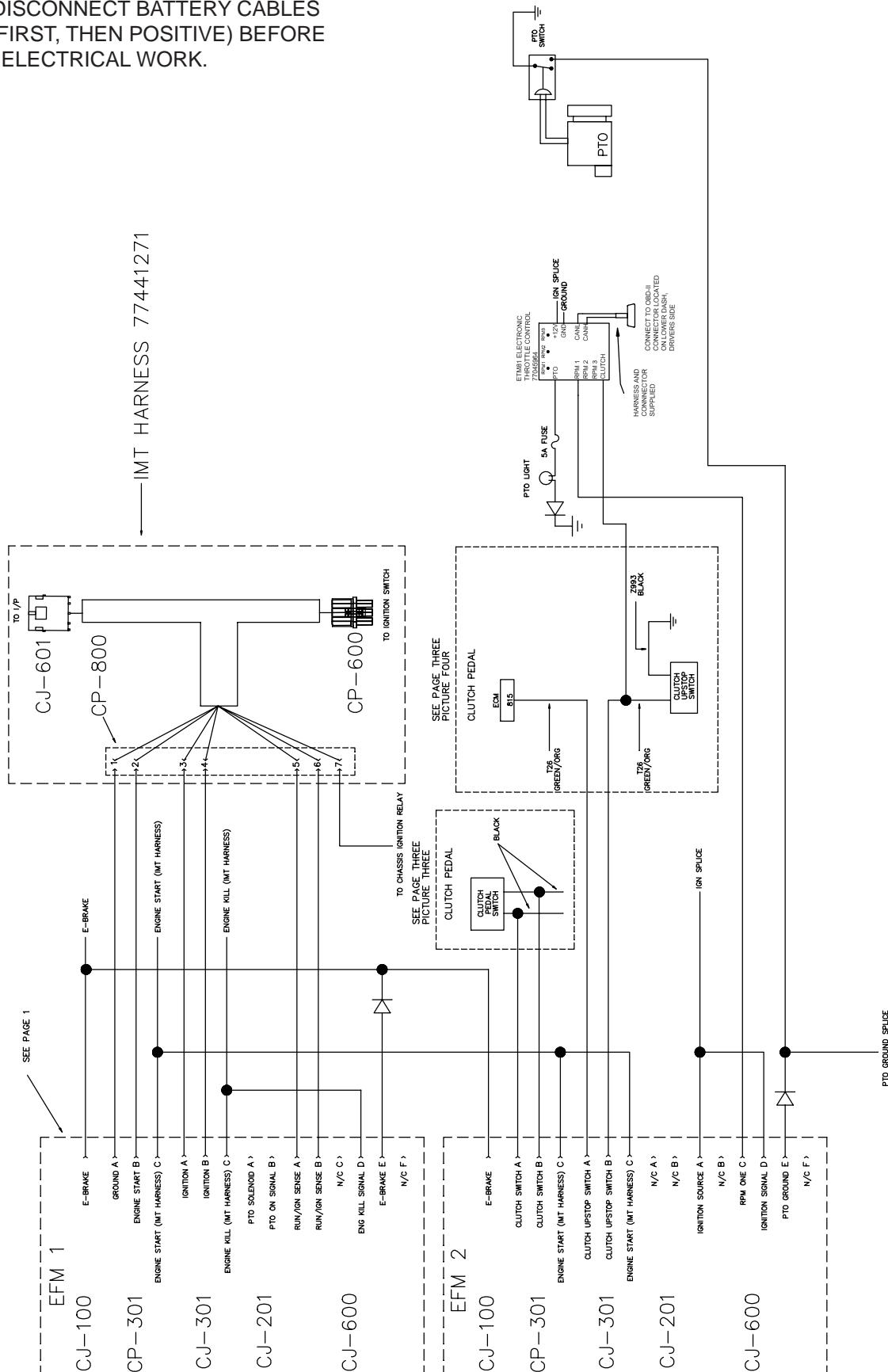
**NOTES:**

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. SEE SHEET 99904296-2 FOR DODGE STEERING COLUMN WIRING.
4. SEE SHEET 99904296-3 FOR PICTURES.
5. FOLLOW WIRING SCHEMATIC AS SHOWN TO INSURE PROPER FUNCTION. FAILURE TO DO SO WILL RESULT IN SYSTEM FAILURE AND POSSIBLE ENGINE ERROR CODE GENERATION.
6. BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) MUST BE DISCONNECTED BEFORE DOING ANY WIRING ON VEHICLE.



# 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (SCHEMATIC - 2WD MANUAL) (99904296-5)

**WARNING: DISCONNECT BATTERY CABLES  
(NEGATIVE FIRST, THEN POSITIVE) BEFORE  
DOING ANY ELECTRICAL WORK.**

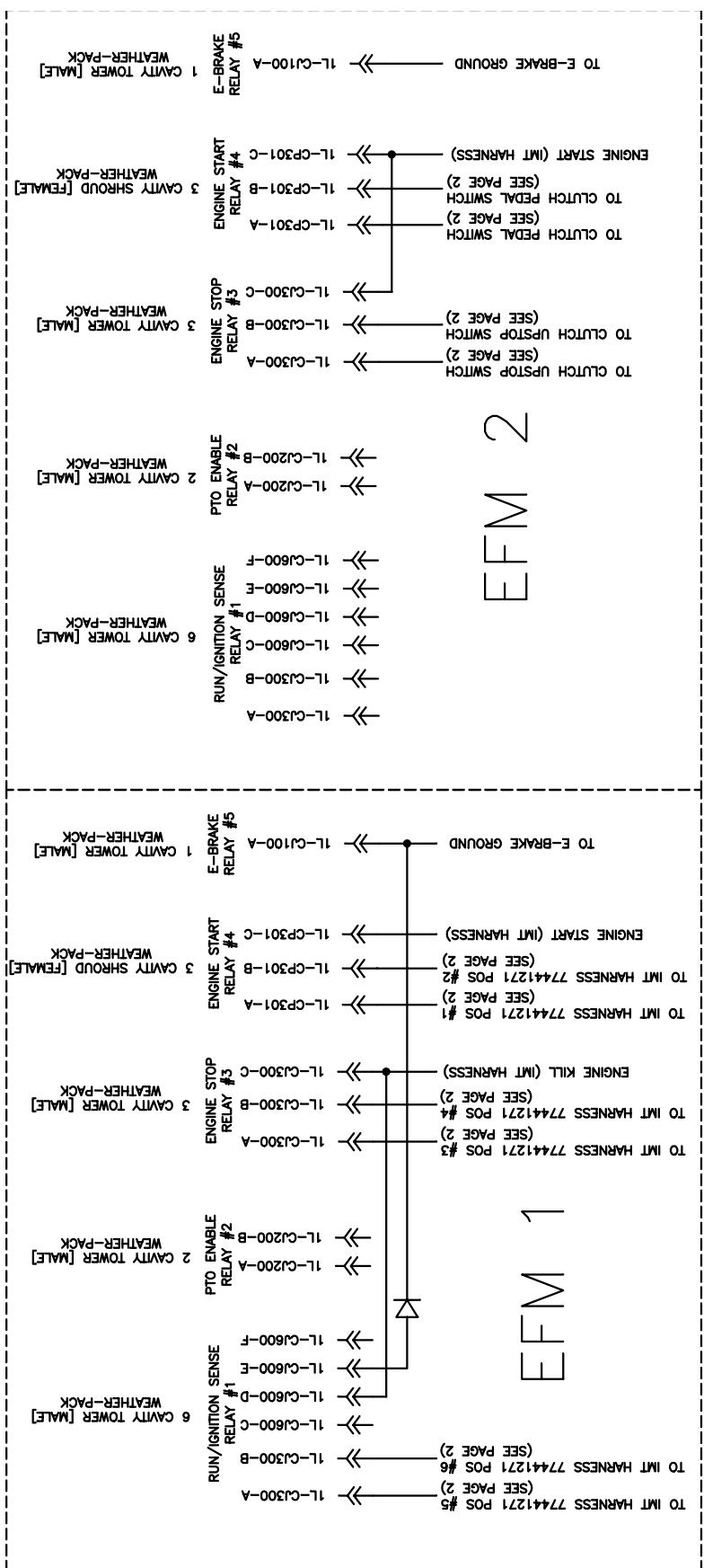


## 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (EFM - 4WD MANUAL) (99904296-6)

**NOTES:**

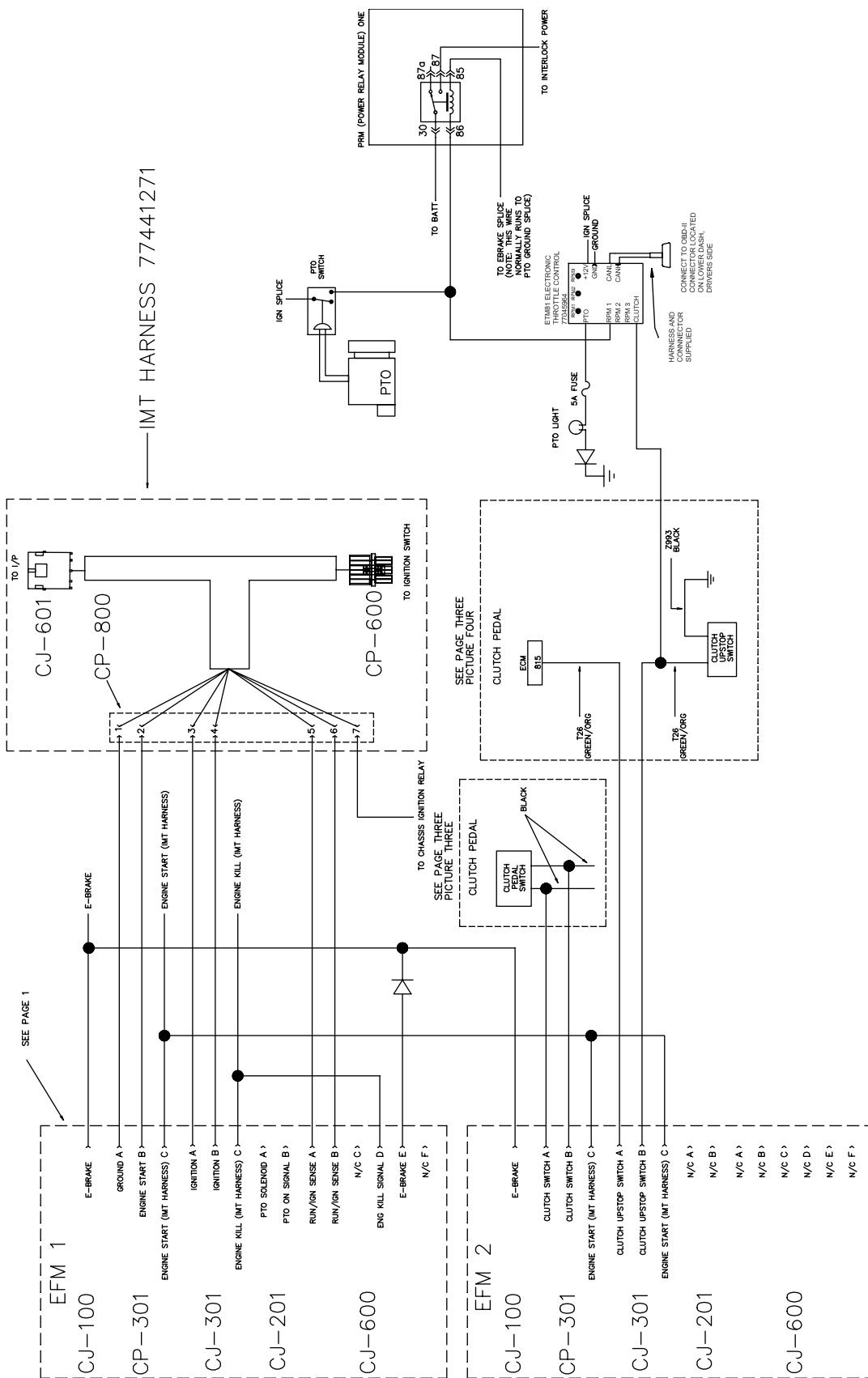
1. ENGINE START NOT USED ON PREDATOR
2. PLUG ALL UNUSED CAVITIES WITH PACKARD PLUG #12010300 (IMT # 77044893). CAP ALL UNUSED CONNECTORS ON EFM.
3. SEE SHEET 99904296-2 FOR DODGE STEERING COLUMN WIRING.
4. SEE SHEET 99904296-3 FOR PICTURES.
5. FOLLOW WIRING SCHEMATIC AS SHOWN TO INSURE PROPER FUNCTION. FAILURE TO DO SO WILL RESULT IN SYSTEM FAILURE AND POSSIBLE ENGINE ERROR CODE GENERATION.
6. BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) MUST BE DISCONNECTED BEFORE DOING ANY WIRING ON VEHICLE.

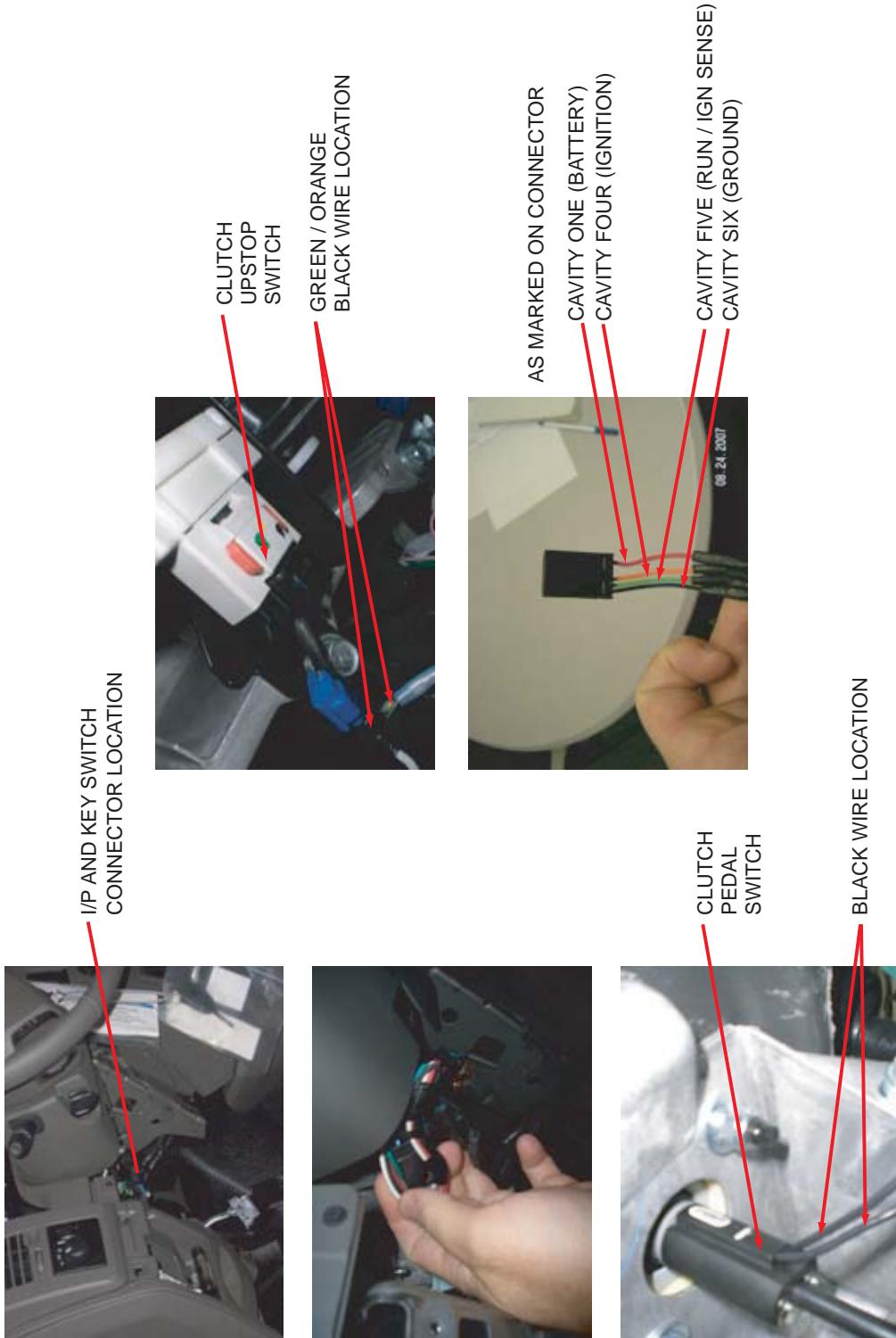
**WARNING: DISCONNECT BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) BEFORE DOING ANY ELECTRICAL WORK.**



# 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (SCHEMATIC - 4WD MANUAL) (99904296-7)

**WARNING: DISCONNECT BATTERY CABLES  
(NEGATIVE FIRST, THEN POSITIVE) BEFORE  
DOING ANY ELECTRICAL WORK.**



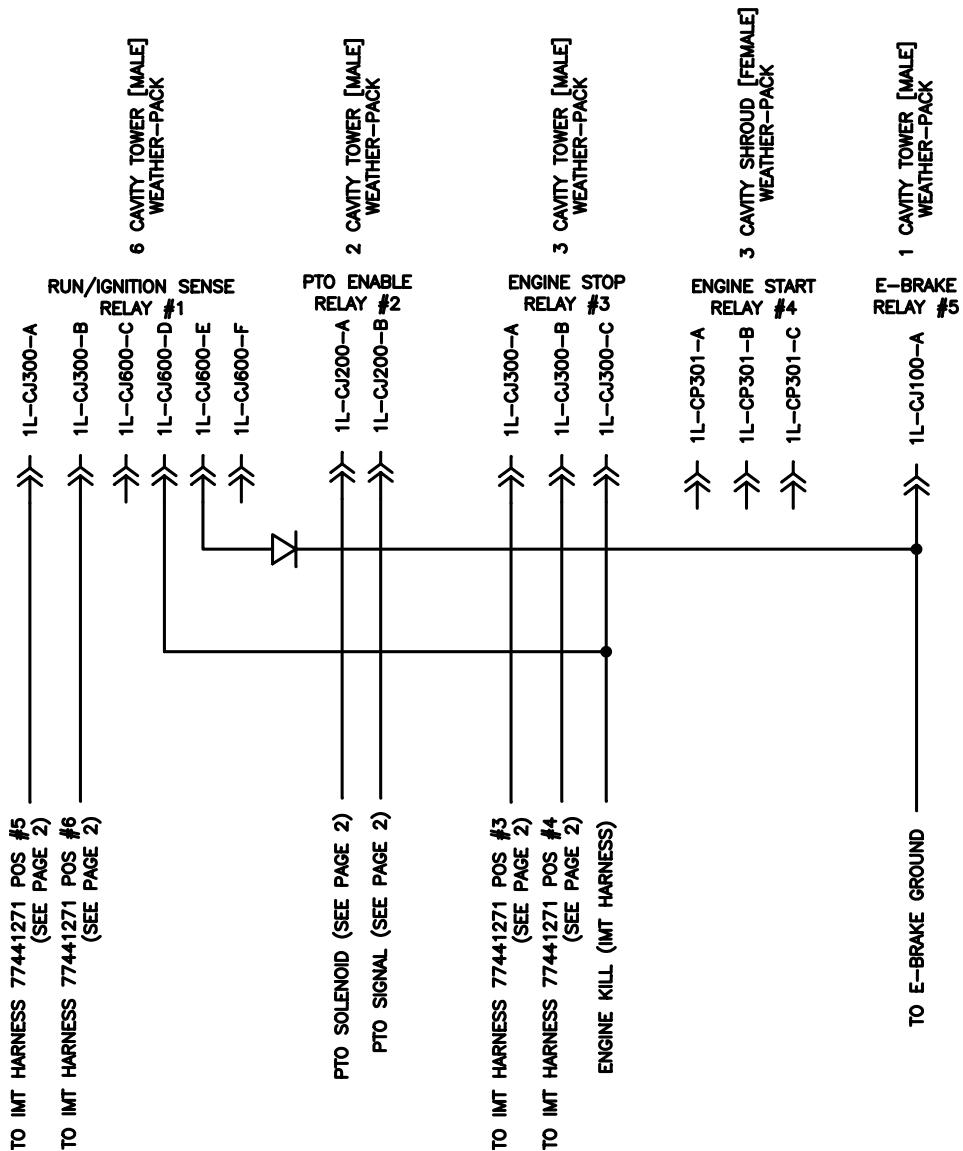
**2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (PICTURES - MANUAL)  
(99904296-8)**

## 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (EFM - PREDATORS) (99904296-9)

**NOTES:**

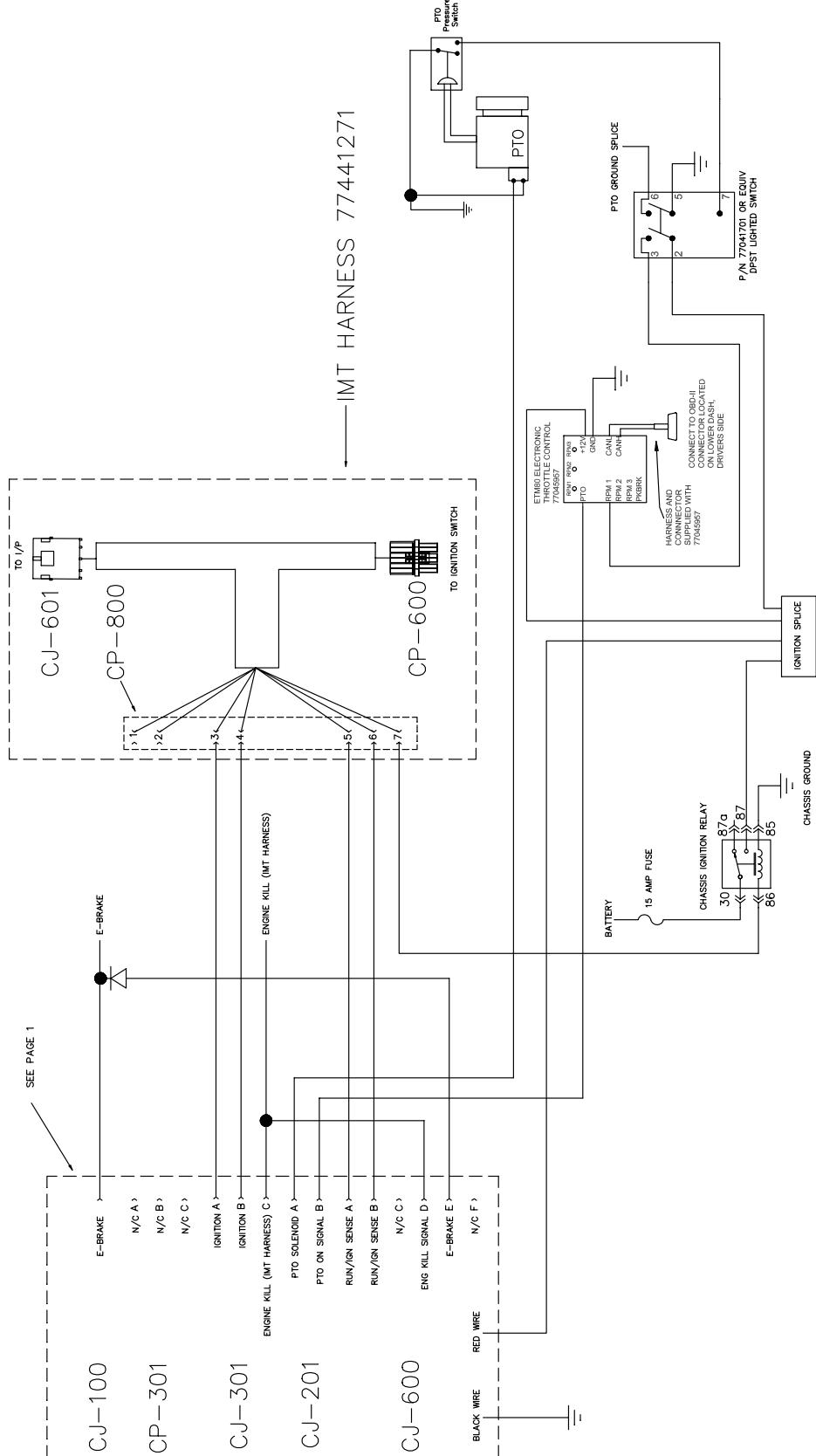
1. ENGINE START NOT USED ON PREDATOR
2. PLUG ALL UNUSED CAVITIES WITH PACKARD PLUG #12010300 (IMT # 77044893). CAP ALL UNUSED CONNECTORS ON EFM.
3. SEE SHEET 99904296-2 FOR DODGE STEERING COLUMN WIRING.
4. SEE SHEET 99904296-3 FOR PICTURES.
5. FOLLOW WIRING SCHEMATIC AS SHOWN TO INSURE PROPER FUNCTION. FAILURE TO DO SO WILL RESULT IN SYSTEM FAILURE AND POSSIBLE ENGINE ERROR CODE GENERATION.
6. BATTERY CABLES (NEGATIVE FIRST, THEN POSITIVE) MUST BE DISCONNECTED BEFORE DOING ANY WIRING ON VEHICLE.

**WARNING: DISCONNECT BATTERY CABLES  
(NEGATIVE FIRST, THEN POSITIVE) BEFORE  
DOING ANY ELECTRICAL WORK.**



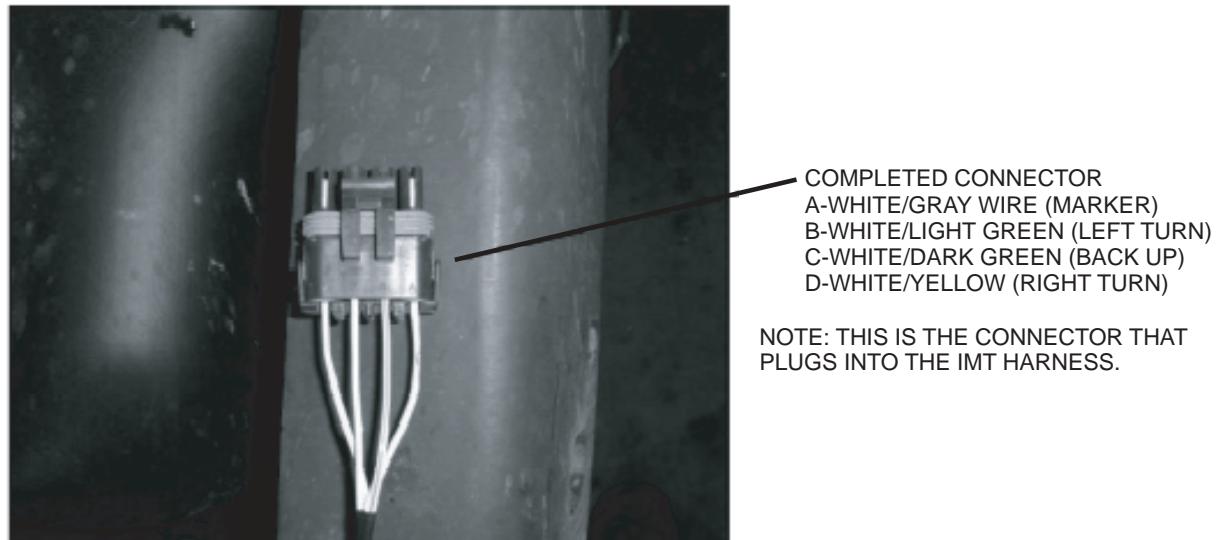
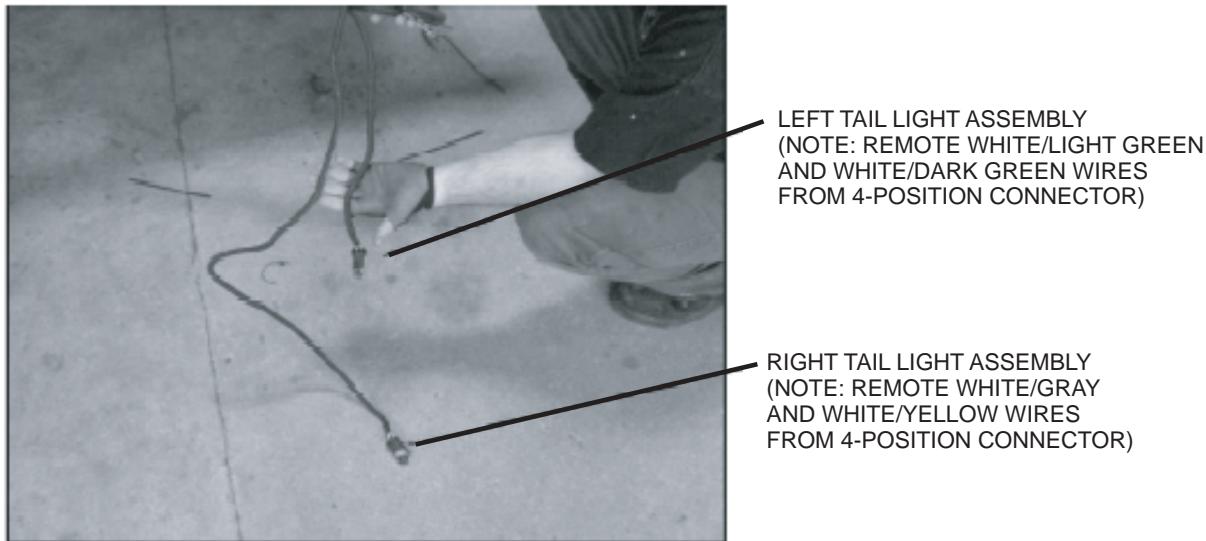
## 2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (SCHEMATIC - PREDEATORS) (99904296-10)

**WARNING: DISCONNECT BATTERY CABLES  
(NEGATIVE FIRST, THEN POSITIVE) BEFORE  
DOING ANY ELECTRICAL WORK.**



**2008 TO PRESENT DODGE 4500 5500 AND STERLING BULLET (TAIL LIGHT WIRING)  
(99904296-11)**

WARNING: DISCONNECT BATTERY CABLES  
(NEGATIVE FIRST, THEN POSITIVE) BEFORE  
DOING ANY ELECTRICAL WORK.

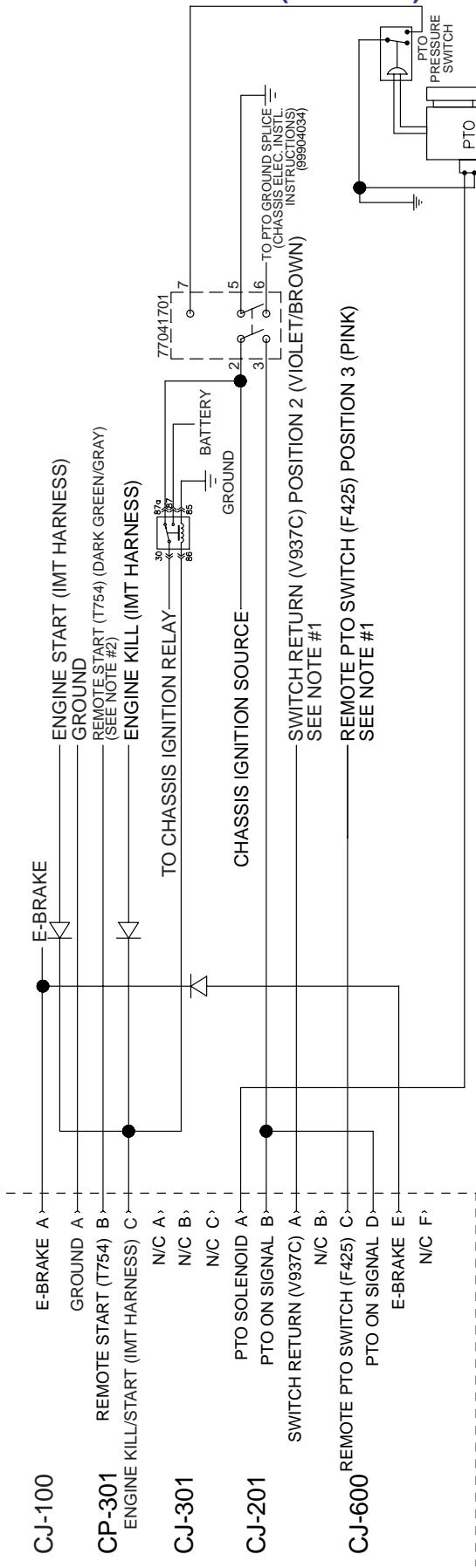


## 2011 TO PRESENT DODGE 4500 5500 AUTOMATIC TRANSMISSION (99904929)

**FOR 2011 TO PRESENT DODGE 4500/5500 4 X 2  
WITH 6.7 L CUMMINS ENGINE AND AUTOMATIC  
TRANSMISSION.**

**NOTES:**

1. PTO CONNECTOR (UNDER-DASH WHITE CONNECTOR) - THE MATING CONNECTOR COMES IN THE DODGE UPFITTER KIT.
2. BLUNT CUT WIRE WITH HEAT SHRINK IS LOCATED NEAR THE AUX. BOX IN THE ENGINE COMPARTMENT.
3. PLEASE WAIT 10 SECONDS BETWEEN ENGINE START AND ENGINE STOP.
4. REFER TO THE DODGE BODYBUILDER WEBSITE FOR PROGRAMMING ENGINE START/STOP AND ENGINE SPEED FUNCTIONS.  
[WWW.DODGE.COM/BODYBUILDER/YEAR.PDF](http://WWW.DODGE.COM/BODYBUILDER/YEAR.PDF)





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