

Thank you for purchasing the

SWAPHelper.COM **CLUSTER HELPER**

Please solder all wire connections and cover in the included shrink wrap for best performance. Wire nuts, butt connectors and other similar connection methods can lead to intermittent signal issues. These methods are only suitable in temporary testing situations.



Warnings:

- 1. Do NOT plug an '08-'10 cluster into the '11-'16 cluster port or vice versa! Doing so will cause permanent damage to both the Cluster Helper and cluster. If you are unfamiliar with the differences between the two year ranges, contact us and we will assist you.*
- 2. If you do not have experience soldering wires, please hire someone who does. The quality of your cluster swap experience will be dictated by the quality of the install.*
- 3. It is highly recommended you complete your wiring with the harness outside of the truck and with the harness in good lighting.*
- 4. Do NOT start your cluster swap under a tight timeline, e.g. starting Sunday afternoon and you need your truck for work Monday morning. You need to plan to take your time, including double checking your work and diagnosing any issues after install.*
- 5. Do NOT plug the USB into a computer that is also connected to a 120v inverter in the vehicle! Doing so could cause damage to the Cluster Helper!*

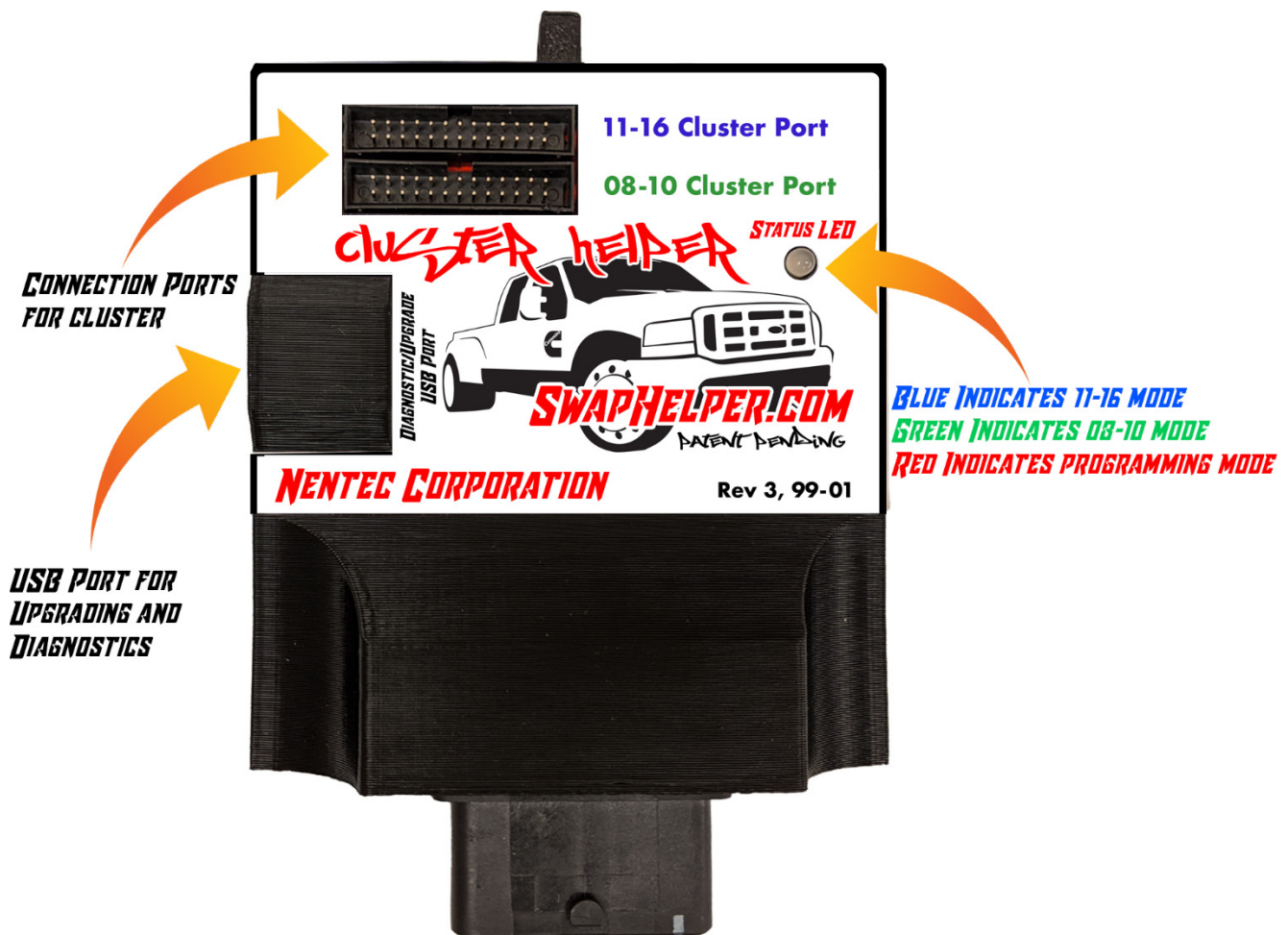
Opening the box:

The following items are included with your Cluster Helper:

1. Cluster Helper
2. Wiring Harness with 40 wires
3. Cluster Cable
4. 50 x Marine Grade Shrink-wrap
5. Transmission Temperature Sensor
6. USB Cable
7. Instructions
8. '11 to '16 Adapter Bar with two screws and lock nuts
9. 5 x T-taps for PCM wires and 1 x ring terminal for Trans Temp Sensor

Getting to know your Cluster Helper:

Your Cluster Helper is a sophisticated device that allows you to install a 2008 to 2016 cluster in a 1999 to 2001 Ford Super Duty or Excursion. Here is the general layout:



Installation:

We have assembled videos on our website to assist with your installation, which can be found at <http://www.SwapHelper.com/clusterhelper>

It is recommended you watch the videos on the website before installation to help visualize the installation and help answer installation questions you may have.

Disconnect battery prior to starting installation!

The Cluster Helper attaches to your instrument cluster using the original screws on your cluster. For '08-'10, the Cluster Helper mounts directly to the cluster, and with '11 to '16 clusters you will use the included adapter bar, which, using the two included screws, mounts to the Cluster Helper and then to the cluster.

The majority of the wiring connects to the three connectors that connected to the original cluster. The wiring listed as TR1 through TR4 will connect to the PCM wiring located on the driver's side fender well. There is a single wire that goes to the Transmission Temperature Sensor, and three wires that run to the optional Boost Sensor. If the Boost Sensor is not utilized, use the included shrink wraps to cap off the unused wires like this:

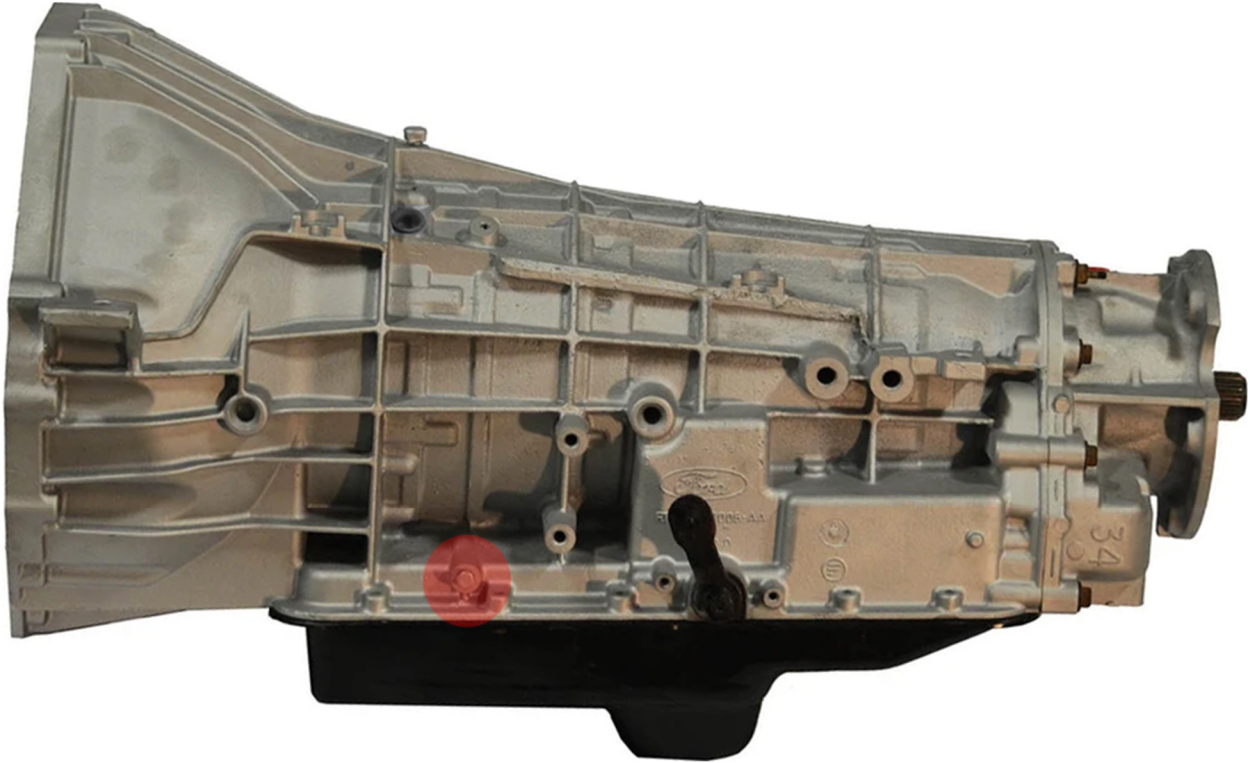


If you are not installing the SwapHelper.com Headlight Helper product at the same time as your Cluster Helper, then you will either need to run your dimmer switch at 100%, or, if your cluster flashes during operation, you will need to wire the Cluster Helper illumination input (**Yellow wire, D1**) to your headlight circuit. When this is done, the cluster illumination will be at 100% when the headlights are on, and 0% when they are off.

The included Transmission Temperature Sensor mounts in the service port on the 4R100 transmission. It is best to use a thread sealant when installing, such as a PTFE sealant. When installing, have the sensor in your hand ready to go in when

you remove the plug from the service port, as fluid will come out of the service port when the plug is removed.

In the following image, you can see the service port highlighted in red:



If your truck is a manual transmission and you want to run the Transmission Temperature Sensor, you will need to fabricate something for the sensor to mount in the transmission fluid, such as in the face of the PTO cover on a ZF6.

Soldering your connections:

Good solder joints are imperative. While this is a quick tutorial on soldering using the included shrink wraps, if you are not comfortable soldering or suffer from color blindness, we highly recommend you hire someone to solder your harness.

As stated above, it is recommended you work on the dash wiring harness outside of the truck in good lighting.

For solder, we recommend you use lead-based solder, which is typically 63/37 or 60/40 Lead/Tin solder. Lead free solder is more difficult to work with.

Strip the wire back and put the provided shrink wrap over one end:



Wrap the two stripped sections:



Solder the two sections together, making sure the solder is sucked into the wire strands. This step is **imperative** – a cold or poor solder joint will impact cluster operation.



Lastly, slide the shrink wrap over the solder joint and heat until you see the adhesive:



The solder joint is complete!

Wiring legend:

OE Desc	OE Color	OE Circuit	CH Color	CH Position	Notes
AIRBAG IN	Black/Yellow	608	Light Green	A1	Cluster Wiring
SEATBELT IN	D Green/L Green	450	Dark Green	B1	Cluster Wiring
WATER IN FUEL	Red	643	Red	C1	Cluster Wiring
ILLUMINATION IN	L Blue/Red	19	Yellow	D1	Cluster Wiring
OIL PRESSURE IN	White/Red	31	Blue	E1	Cluster Wiring
COOLANT TEMP IN	Red/White	39	Pink	F1	Cluster Wiring
FUEL LEVEL IN	Yellow/White	29	White	G1	Cluster Wiring
CRUISE INDICATOR IN	Orange/L Blue	203	Grey	H1	Cluster Wiring
LEFT BLINKER IN	L Green/White	3	Orange	J1	Cluster Wiring
RIGHT BLINKER IN	White/L Blue	2	Violet	K1	Cluster Wiring
GEN SIGNAL	L Green/Red	904	Orange	L1	Cluster Wiring
GEN CHARGE	White/Yellow	1044	White	M1	Cluster Wiring
TACH IN	White/Pink	648	Brown	A2	Cluster Wiring
WAIT TO START IN	Black/Pink	464	Light Blue	B2	Cluster Wiring
MIL IN	Pink/L Green	658	Tan	C2	Cluster Wiring
BRAKE WARNING IN	Violet/White	Pink/White 977	Light Green	D2	Cluster Wiring
4X4 HI IN	L Blue	210	Dark Green	E2	Cluster Wiring
DOOR AJAR IN	D Green/Orange	433	Red	F2	Cluster Wiring
SECURITY IN	Orange/Red	1269	Yellow	G2	Unused
HIGH BEAM IN	L Green/Black	12	Blue	H2	Cluster Wiring
4X4 LO IN	Brown/Yellow	L Blue/Black 975/784	Pink	J2	Cluster Wiring
TRANS TEMP IN			White	K2	Connect to included sensor
Voltmeter/B+	L Blue/Black	Red/White 99 or Excursion 22/729	Red	M2	Cluster Wiring
ABS LIGHT IN	Dark Green	603	Grey	A3	Cluster Wiring
TOW/HAUL IN	White/L Green	911	Orange	B3	Cluster Wiring
TR1 IN	Yellow/Black	1144	Violet	C3	PCM Wiring
TR2 IN	L Blue/Black	1145	Brown	D3	PCM Wiring
TR3A IN	L Blue/Yellow	199	Light Blue	E3	PCM Wiring
TR4 IN	White/Black	1143	Tan	F3	PCM Wiring
11-16 SELECT IN			Brown	G3	Connect to ground for 11-16
BOOST GROUND	Black		Black	H3	Connect to boost sensor
BOOST IN	Green		Dark Green	J3	Connect to boost sensor
BOOST 5V	Red		Red	K3	Connect to boost sensor
IGNITION	Red/Yellow	640	Dark Green	L3	Cluster Wiring
IGNITION	Red/Yellow	640	Dark Green	M3	Cluster Wiring
VSS IN	Grey/Black	679	Blue	A4	Cluster Wiring
INFO CENTER GROUND	White/Brown	RMC27/RMC33	Black	G4	New Dash Side
INFO CENTER IN	Green/Violet	CMC39	Brown	K4	New Dash Side
FUEL LEVEL GROUND	Pink/Orange	676	Black	L4	Cluster Wiring
GROUND	Black	57	Black	M4	Cluster Wiring

Cluster Cable:

The included grey cable connects from the Cluster Helper to the cluster. When installing the cable into the cluster, the **Red** stripe on the cable goes towards the driver's side (left side if outside US). Take your time when inserting the cable – you only need to do it once, so there is no need to rush. On the Cluster Helper side, the connectors are keyed so they only go in one way. **DO NOT INSERT THE CABLE INTO THE INCORRECT PORT ON THE CLUSTER HELPER FOR YOUR CLUSTER YEAR! DOING SO MAY CAUSE IRREPARABLE DAMAGE YOUR CLUSTER AND CLUSTER HELPER!**

Functionality:

Once the Cluster Helper wiring is completed, before connecting the Cluster Helper in the truck, either cap off the 11-16 Select wire if you are running an '08-'10 cluster, or connect the 11-16 Select wire to ground (such as to the frame of the dash) to allow the use of an '11-'16 cluster. Once the Cluster Helper is connected to power, it will save the cluster mode until power is removed and reapplied.

If the Cluster Helper is in '08-'10 mode, the Status LED will be a soft **Green**. If the Cluster Helper is in '11-'16 mode, the Status LED will be a soft **Blue**.

Diagnostic Software:

We have written a Windows application that allows you to connect to your Cluster Helper and allow you to view diagnostic data and upgrade your Cluster Helper. This software is available for download from our website, www.SwapHelper.com.

USB Cable:

Since the USB cable is used to connect to the software in the above section, we recommend installing the cable in the truck permanently and routing it so you can gain access to it at a later time. It is important you cap off the end of the cable to avoid it contacting another circuit and damaging the Cluster Helper.

Wiring Diagrams:

The attached diagrams are provided for diagnostic purposes. We have added labels to sections where the wire color may vary based on year model.

Since Ford used some colors more than once in the cluster wiring, such as Light Blue/Black or Red/White depending on vehicle year and model, the diagrams can be useful to ascertain pin position to make sure you are looking at the correct wire. The pin numbers are the small numbers inside the boxes (labeled Instrument Cluster or PCM).

4x4 Low Range Wiring:

If your truck is equipped with 4x4 and has both **Brown/Yellow** and **L Blue/Black** wires going to the cluster, those two wires should be combined and connected to the Cluster Helper **Pink 4X4 LO IN** wire (J2).

Errata:

Due to the complexity of a product of this nature, your Cluster Helper *may* include an Errata log, which is an explanation of errors found postproduction (such as typos) and how to correct them or avoid an issue. If included, it will be a loose sheet in the box with your order.

Troubleshooting:

As mentioned above, it is recommended you visit our website and watch videos regarding the Cluster Helper installation and use. The information can be found at:

<http://www.SwapHelper.com/clusterhelper>

Still can't figure out your issue? Shoot us an e-mail for additional support:

Contact@SwapHelper.com

*7.3L DIESEL

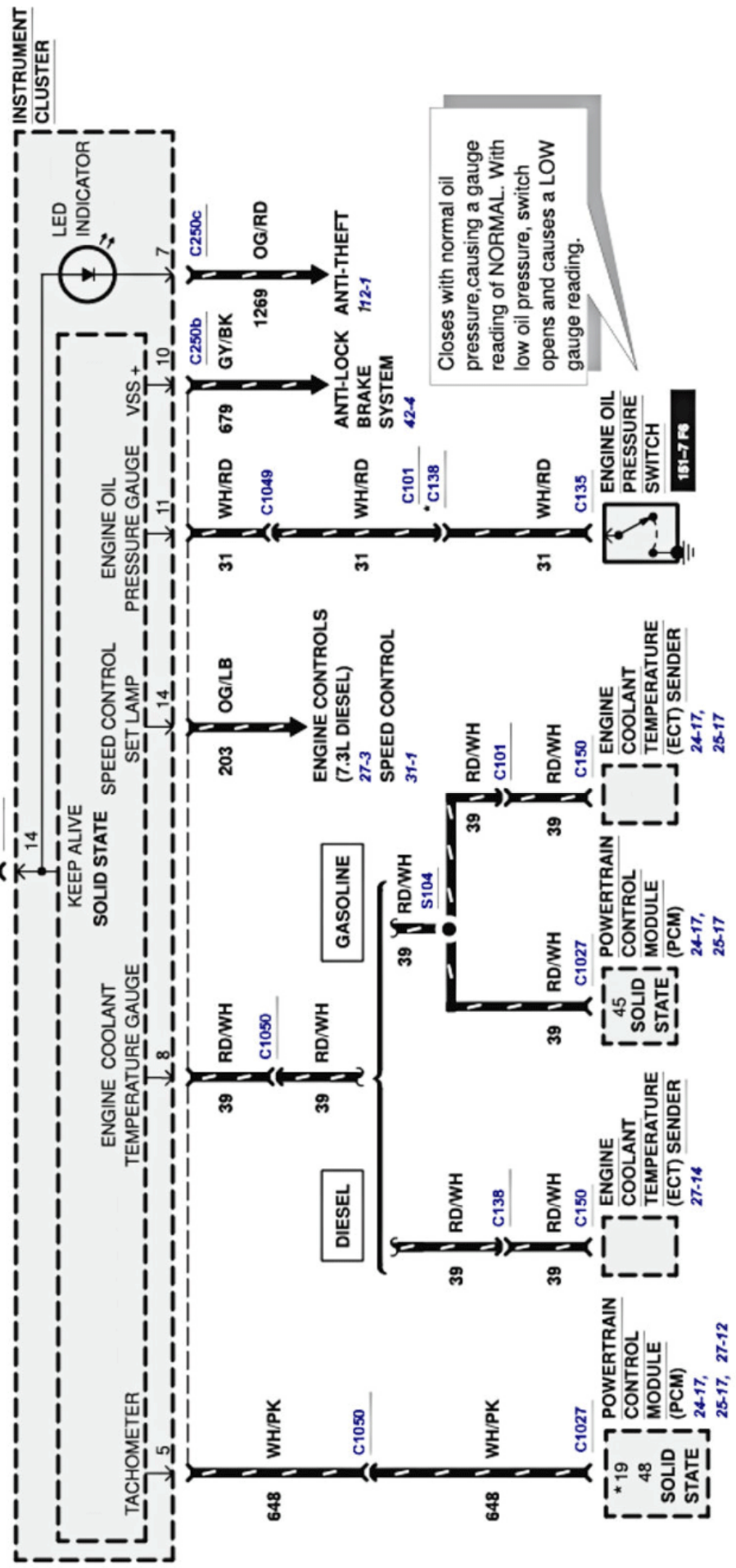
HOT AT ALL TIMES

EXCURSION

SEE POWER DISTRIBUTION 13-9

RD/WH L Blue/Black in trucks, Circuit 22

REVISED



Closes with normal oil pressure, causing a gauge reading of NORMAL. With low oil pressure, switch opens and causes a LOW gauge reading.

ENGINE OIL PRESSURE SWITCH 151-7 P

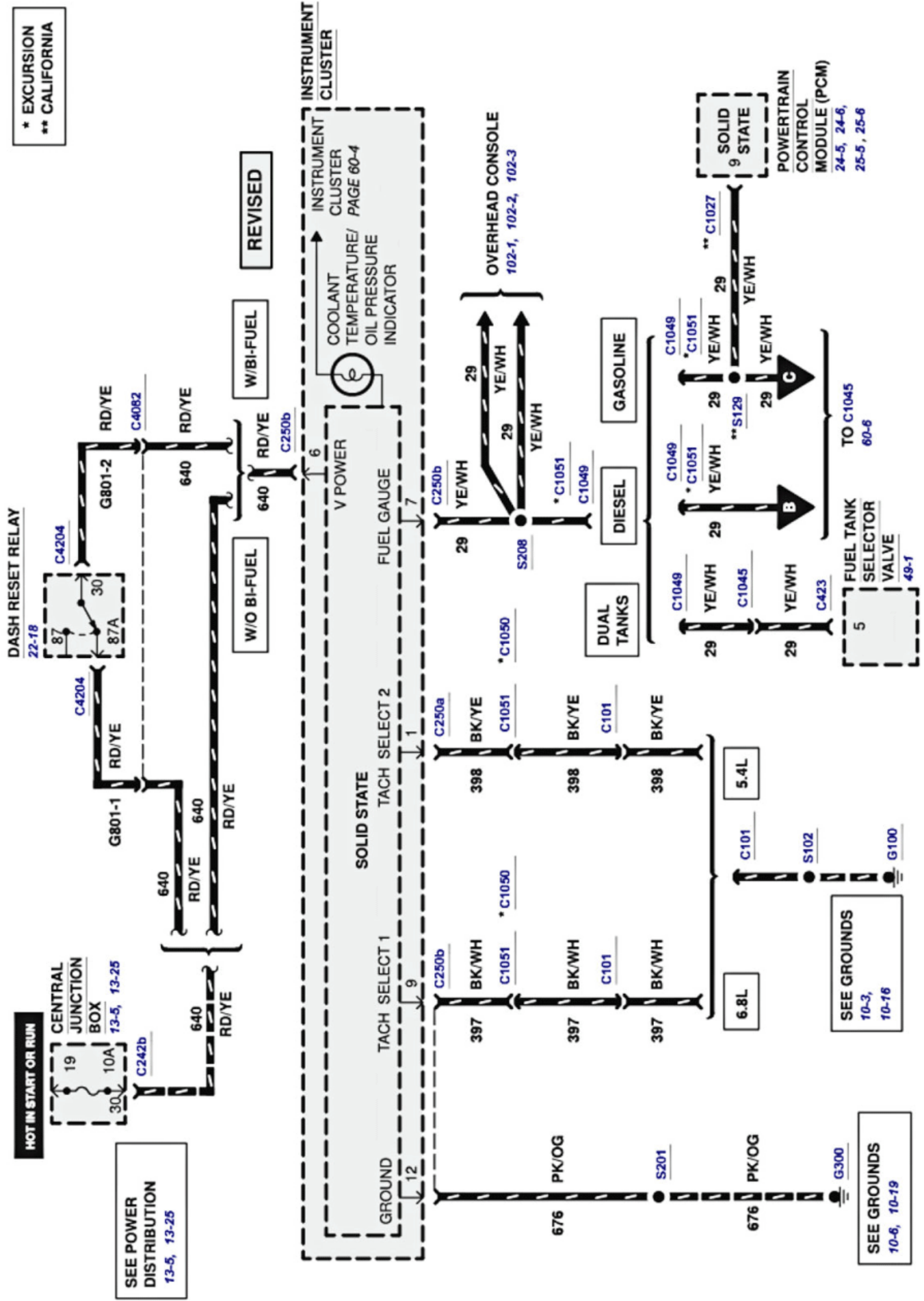
ENGINE COOLANT TEMPERATURE (ECT) SENDER 24-17, 25-17

POWERTRAIN CONTROL MODULE (PCM) 24-17, 25-17

ENGINE COOLANT TEMPERATURE (ECT) SENDER 27-14

POWERTRAIN CONTROL MODULE (PCM) 24-17, 25-17, 27-12

* EXCURSION
** CALIFORNIA



SEE POWER DISTRIBUTION 13-5, 13-25

SEE GROUNDS 10-3, 10-16

SEE GROUNDS 10-6, 10-19

REVISED

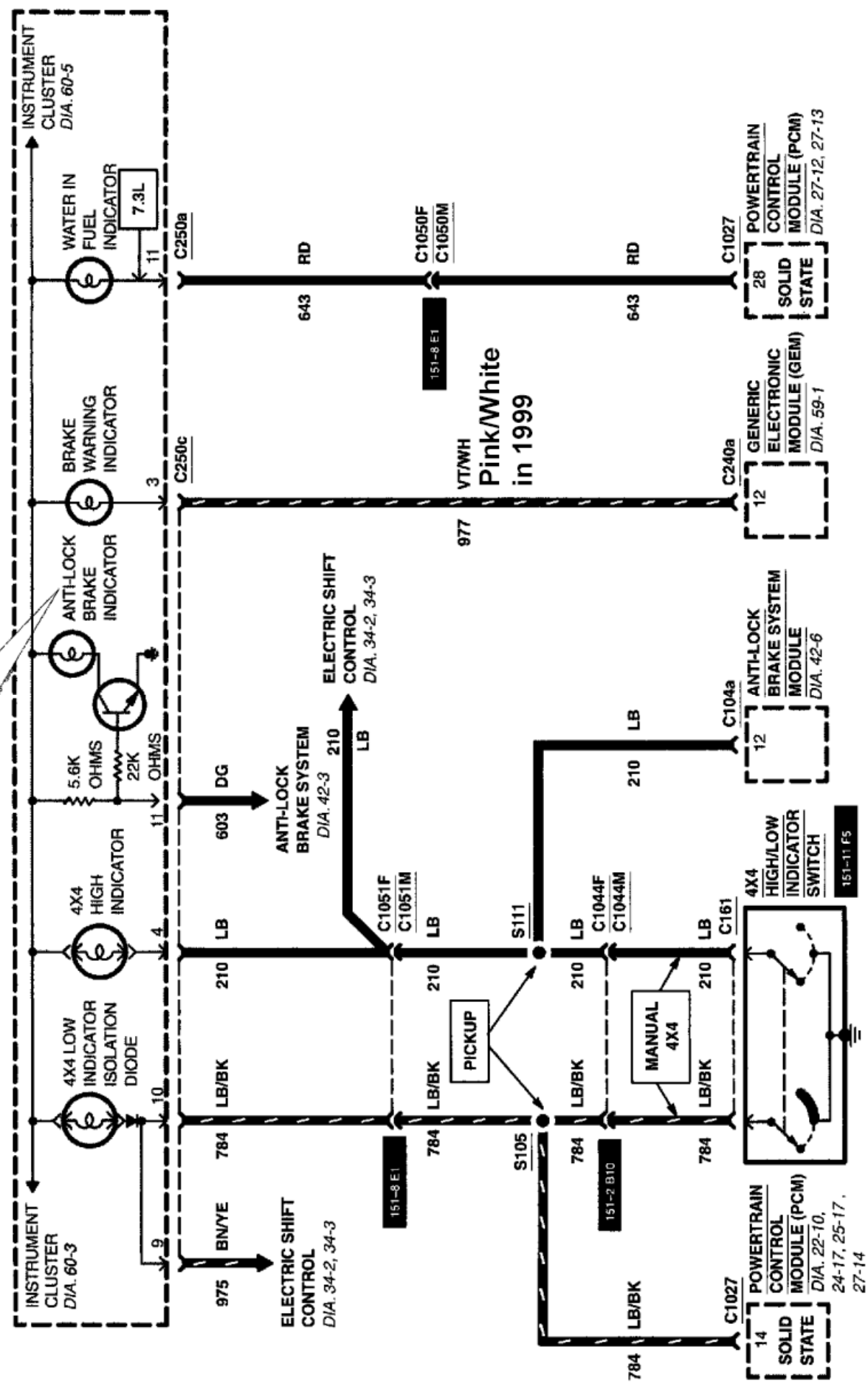
OVERHEAD CONSOLE 102-1, 102-2, 102-3

SOLID STATE 9 STATE

POWERTRAIN CONTROL MODULE (PCM) 24-5, 24-6, 25-5, 25-6

Indicator receives a ground from the module when there is a fault in the system. The lamp will stay on until the fault is corrected.

INSTRUMENT CLUSTER
151-8 A4



151-8 ET

151-3 ET

151-2 B10

151-11 F5

VT/WH
Pink/White
in 1999

27-14

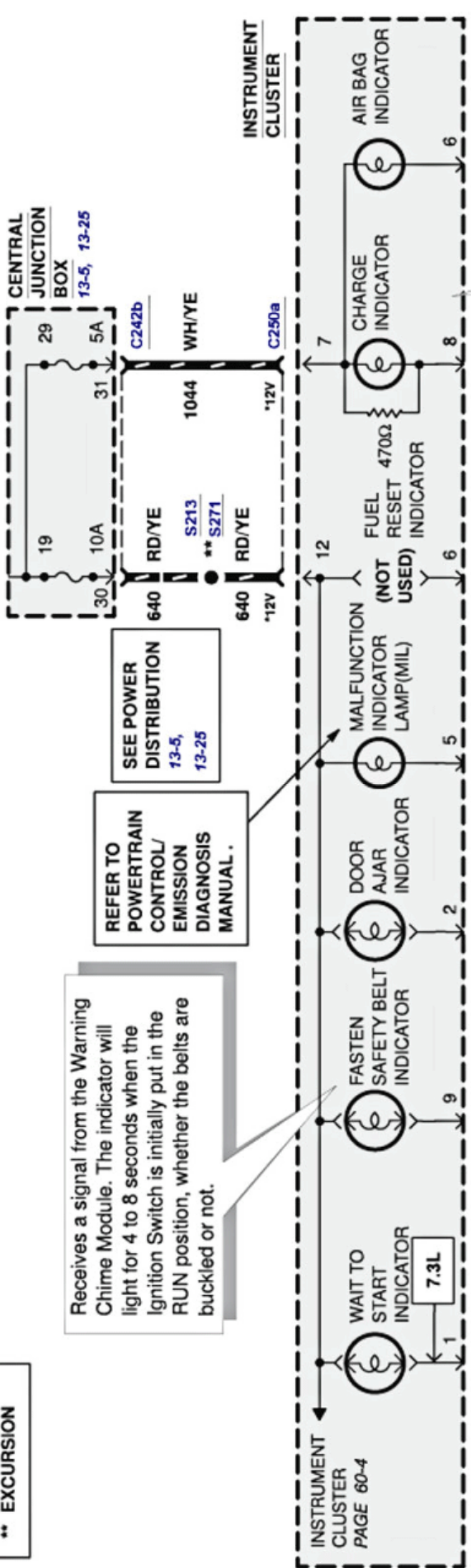
• START OR RUN EXCURSION

Receives a signal from the Warning Chime Module. The indicator will light for 4 to 8 seconds when the Ignition Switch is initially put in the RUN position, whether the belts are buckled or not.

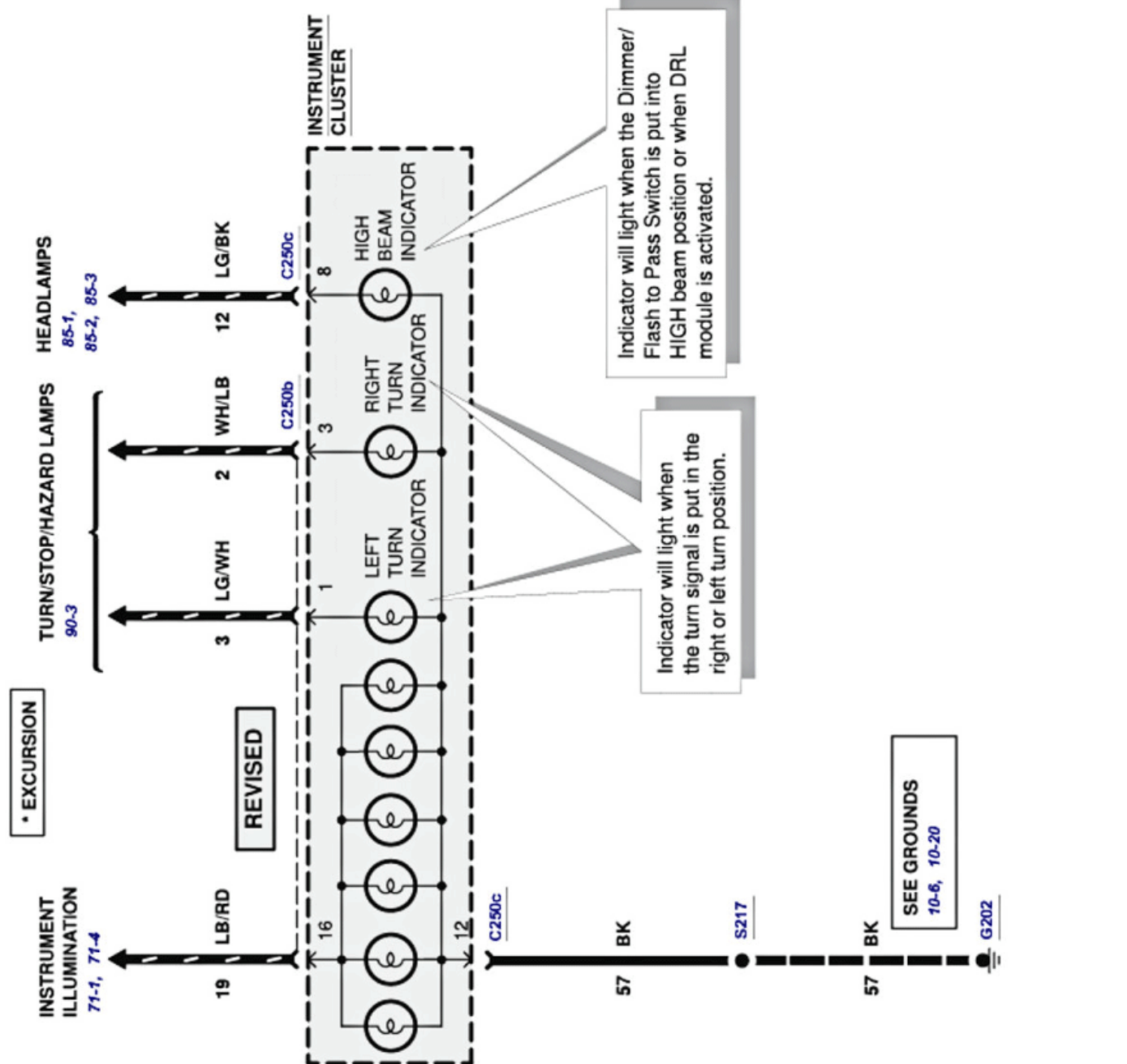
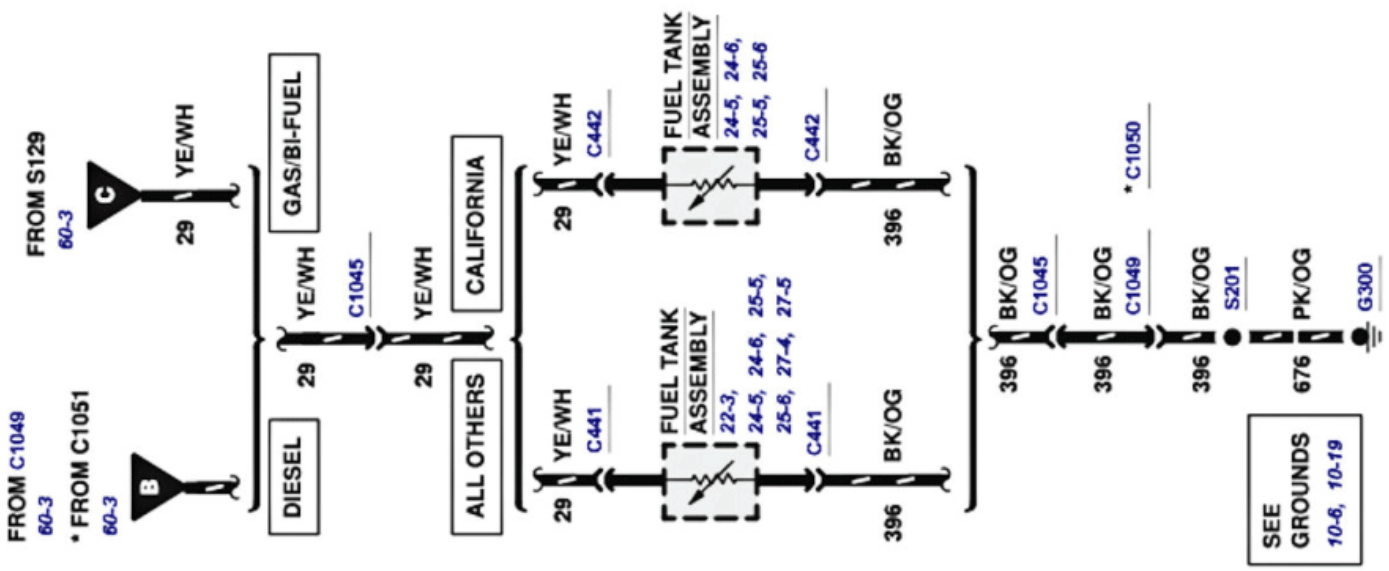
REFER TO POWERTRAIN CONTROL/EMISSION DIAGNOSIS MANUAL.

SEE POWER DISTRIBUTION 13-5, 13-25

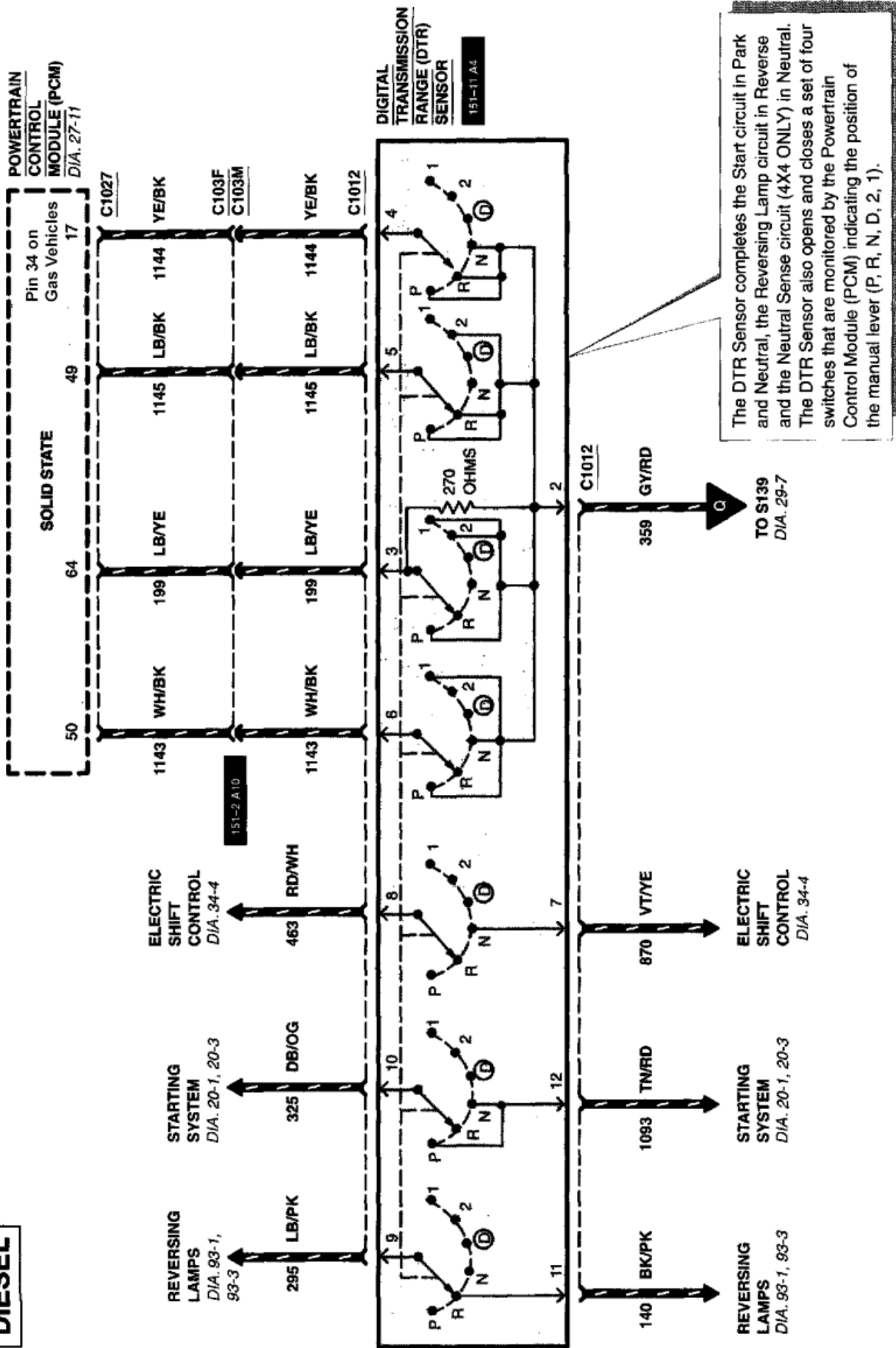
HOT IN START OR RUN



Receives a charge signal from the Generator. The warning indicator will light when the charge at the Generator falls below the normal operating range.



DIESEL



The DTR Sensor completes the Start circuit in Park and Neutral, the Reversing Lamp circuit in Reverse and the Neutral Sense circuit (4X4 ONLY) in Neutral. The DTR Sensor also opens and closes a set of four switches that are monitored by the Powertrain Control Module (PCM) indicating the position of the manual lever (P, R, N, D, 2, 1).

C250a INSTRUMENT CLUSTER		C250b INSTRUMENT CLUSTER		C250c INSTRUMENT CLUSTER	
PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION
1	*398 (BK/YE)	Tach Select 2	1	19 (LB/RD)	Dimmer to Illumination Lamps (POS)
2	—	NOT USED	2	22 (LB/BK)	NOT USED
3	—	NOT USED	3	*729 (RD/WH)	Voltmeter
4	—	NOT USED	4	676 (PK/OG)	Voltmeter
5	—	NOT USED	5	31 (WH/RD)	NOT USED
6	608 (BK/YE)	Air Bag Sensor to Indicator Lamp (GRD)	6	679 (GY/BK)	Oil Pressure Signal
7	1044 (WH/YE)	Generator Charge (Hot in Start or Run) (POS)	7	397 (BK/WH)	Vehicle Speed Signal
8	904 (LG/RD)	Generator Charge Signal (GRD)	8	39 (RD/WH)	Tachometer Select 1
9	450 (DG/LG)	Fasten Belt Indicator Input	9	29 (YE/WH)	Temperature Signal
10	—	NOT USED	10	640 (RD/YE)	Fuel Level Signal
11	**643 (RD)	Water in Fuel Signal (POS)	11	648 (WH/PK)	Ignition (Hot in Start or Run)
12	640 (RD/YE)	Ignition (Hot in Start and Run)	12	203 (OG/LB)	Tachometer Input Signal
			13	2 (WH/LB)	Speed Control Indicator Ground Input
			14		Right Turn Signal Switch (POS)
			15		NOT USED
			16	3 (LG/WH)	Left Turn Signal Switch (POS)

C250a INSTRUMENT CLUSTER		C250b INSTRUMENT CLUSTER		C250c INSTRUMENT CLUSTER	
PIN	CIRCUIT	CIRCUIT FUNCTION	PIN	CIRCUIT	CIRCUIT FUNCTION
1	—	—	1	464 (BK/PK)	Wait to Start Indicator Lamp (GRD)
2	—	—	2	433 (DG/OG)	Door Ajar
3	—	—	3	977 (VT/WH)	Brake Warning Switch to Indicator Lamp ^{PK/WH in 1989}
4	—	—	4	210 (LB)	4x4 Indicator Input
5	—	—	5	658 (PK/LG)	Check Engine Indicator Input
6	—	—	6	921 (GY/OG)	Fuel Indicator Lamp
7	—	—	7	1269 (OG/RD)	Anti-Theft Indicator Lamp
8	—	—	8	12 (LG/BK)	High Beam
9	—	—	9	975 (BN/YE)	4x4 Low Indicator Input
10	—	—	10	784 (LB/BK)	Low Range Indicator Input
11	—	—	11	603 (DG)	ABS Indicator Lamp (GRD)
12	—	—	12	57 (BK)	Ground

Technical specs:

Operating temperature range	: -40°C to 85°C (-40°F to 185°F)
Quiescent Current Consumption	: 300 μA (.0003 amps) Maximum
Operating voltage range	: 6v to 18v, DC only
Reverse Polarity Protection	: Yes
Load dump protection	: Yes
Water Resistance	: IP21

Return Policy:

Unopened, unused product(s) may be returned within 30 days of purchase date by original purchaser for a refund, minus original shipping charges and a 25% restocking fee. Customer is responsible for return shipping. Used products(s) are not eligible for return but may be repaired or replaced under Warranty policy. Return requests must be made by submitting a request to Contact@SwapHelper.com.

Warranty:

Nentec Corporation (SwapHelper.com) warranties this product to be free of defects in material and workmanship for one (1) year from date of purchase. This warranty is limited to the correction of any such defect, or the replacement of any such defective item, provided that: (a) item(s) was/were purchased from SwapHelper.com or an authorized Nentec Corporation distributor; (b) we are properly notified and consent to the return of the item(s) in question; (c) the item(s) is/are returned with proof of purchase date; and (d) it is found upon inspection by us that the item(s) is/are defective as noted above; (e) the return request is made by original purchaser. This warranty does not cover labor costs, consequential damages, nor does it apply to any item(s) that have been improperly installed, overloaded, altered, or otherwise abused by the customer, its agent(s) or employee(s). Other than the described obligation, we assume no further liability with respect to the sale or use of our products. We make no warranty, expressed or implied, and disclaim any warranty of merchantability or fitness for a particular purpose. Warranty requests must be made by requesting a Return Merchandise Authorization from Contact@SwapHelper.com.