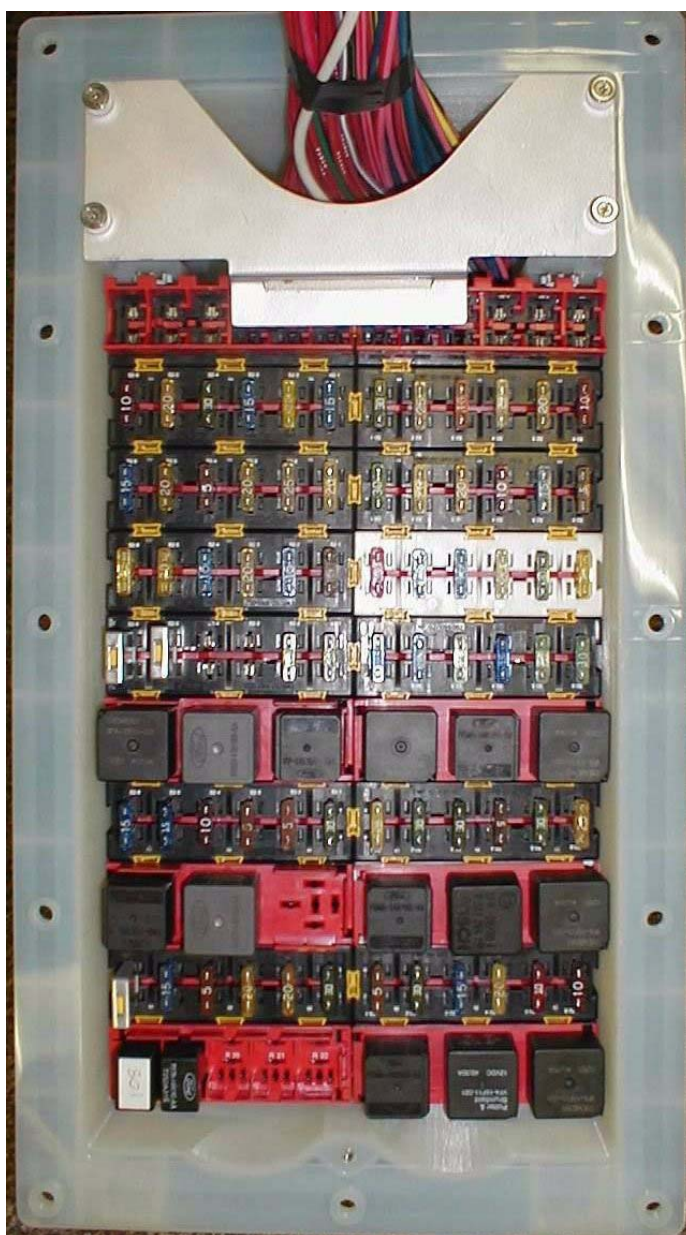


# Service Manual

Department	Customer Service
Category	Service Manual
Section	Electrical
Title	Power Distribution Box (for chassis built after 12/03/01)
Number	<b>KM815055</b>
Date	03/11/03
Model	W900, T800, T600, C500 (excluding T800 City Cab and T800 Work Cab)
Page	1 of 20

## Power Distribution Box

(for W900, T600, T800 C500 chassis built after 12/03/01)



### Component Location

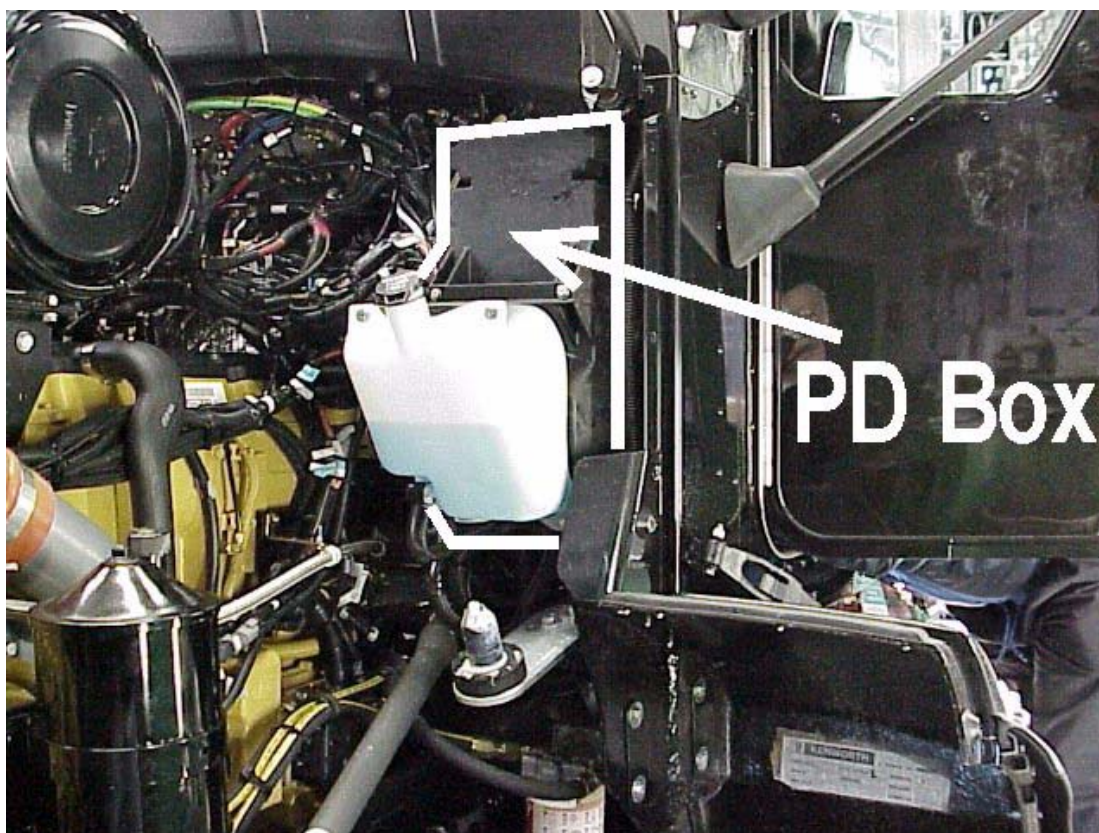


Figure 15-1

## Electrical: Power Distribution Box (after 12/01)

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[“Option # 1: PD Box Spare PWR/GND Sockets” on page 10](#)

[“Option # 2: Spare Circuit Bullet Connectors” on page 12](#)

[“Option # 3: Spare Circuit Relays \(For loads exceeding 20 amps\)” on page 12](#)

[\*\*“Servicing” on page 15\*\*](#)

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## Electrical: Power Distribution Box (after 12/01)

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### Manufacturing Start Dates

This information applies to W900, T600, T800 and C500 (excluding T800 City Cab & T800 Work Cab) chassis built from:

- 12/03/01 - Renton
- 12/10/01 - Chillicothe
- 1/14/02 - KenMex



## Electrical: Power Distribution Box (after 12/01)

### Diagrams



*NOTE: The following diagrams are provided as an introduction to this product. Future diagrams will be added to ServiceNet but will not be added to this list. The procedure to determine the proper diagram for a chassis is to start with the diagrams link in ECAT (Refer to [Web ECAT - Diagrams](#)).*

### Wiring

[Instrument Panel Harness, Cat and Cummins Engines P92-2040 - 01](#)

[Instrument Panel Harness, DDEC Engines P92-2041 - 01](#)

[Trailer ABS P94-1311 01](#)

[Fog Lamps P94-1338 A 01](#)

[Trailer ABS P94-1349 01](#)

[Trailer ABS P94-1353 01](#)

[Trailer ABS P94-1355 01](#)

[Trailer ABS P94-1356 01](#)

[Trailer ABS P94-1357 01](#)

[Trailer ABS P94-1358 01](#)

[Trailer ABS P94-1359 01](#)

[Trailer ABS P94-1360 01](#)

[Trailer ABS P94-1361 01](#)

[Trailer ABS P94-1362 01](#)

[Headlamps P94-1379 01](#)

[Headlamps, w/ MUX Wheel P94-1380 01](#)

[Headlamps, w/DRL P94-1381 01](#)

[Headlamps, w/MUX & DRL P94-1382 01](#)

[Park and Tail Lamps P94-1384 A 01](#)

[Charge and Start P94-1385 A 01](#)

[Ether Start P94-1390 A 01](#)

[Cummins Engine Fan Interlock Instructions P95-1576 01](#)

[Cat/DDEC Engine Fan Interlock Instructions P95-1577 01](#)

[Windshield Wipe & Wash P94-1331 - 01](#)

[Cab HVAC P94-1391 - 01](#)

[Accessory Power, 38-in Sleeper P94-1392 - 01](#)

[Accessory Power, 62-in/72-in Sleeper P94-1393 - 01](#)

[Accessory Power, 86-in Sleeper P94-1394 - 01](#)

[Power Windows P94-1396 A 01](#)

[Stop and Turn Lamps P94-1399 - 01](#)

[Radio or CB Radio P94-1400 A 01](#)

[Clearance and ID Lamps P94-1413 A 01](#)

[Interior Lighting P94-1414 A 01](#)

### Routing

[Instrument Panel Harness R414-1260 A 01](#)

[Chassis Harness - Cab Section & PD Box Power R414-1261 A 01](#)

[Trailer Harness Options R414-1262 A 01](#)

[Headlight Harness, T800H R414-1274 01](#)

[Firewall - Wire & Cable Entry Locations R414-1275 01](#)

[Headlamp Harness, T6 w/SMC Hood R414-1265 A 01](#)

[Headlamp Harness Routing R414-1266 - 01](#)

[Air Dryer Harness, RH Front Mounted R414-1278 - 01](#)

## Electrical: Power Distribution Box (after 12/01)

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### System Description

The new Power Distribution Box includes the box housing, instrument panel harness and 20 separate fuse and relay modules locked together to form the Central Electrical Panel (CEP). The system was designed to improve overall system reliability, simplify power distribution wiring and connections, and make servicing easier. The CEP is the heart of the vehicle electrical system, providing 72 circuits (twice as many as the previous PD box design) to meet today's electrical system demands and those of the future.

### Central Electrical Panel (CEP) Fuse Layout

All circuits are protected with fuses and/or circuit breakers and relays are used to carry most high amperage current loads. A 135 amp circuit breaker in the battery box provides circuit protection for the CEP. Each electrical circuit is color coded and identified with a circuit number. Wiring and routing diagrams applicable to the new PD box design are available in ServiceNet. See ["Manufacturing Start Dates" on page 4](#) and ["Routing" on page 5](#).



**WARNING!** Several circuits in the Central Electrical Panel are designated as "Fuse Only" circuits. **Do not install a circuit breaker in place of a fuse for the following circuits:**

- RADIO M
- RADIO P
- CB PWR
- SLPR ACC
- FOG LPS
- and whenever a spare circuit is used to supply power for an additional cigar lighter and/or ACC power well.

## Electrical: Power Distribution Box (after 12/01)

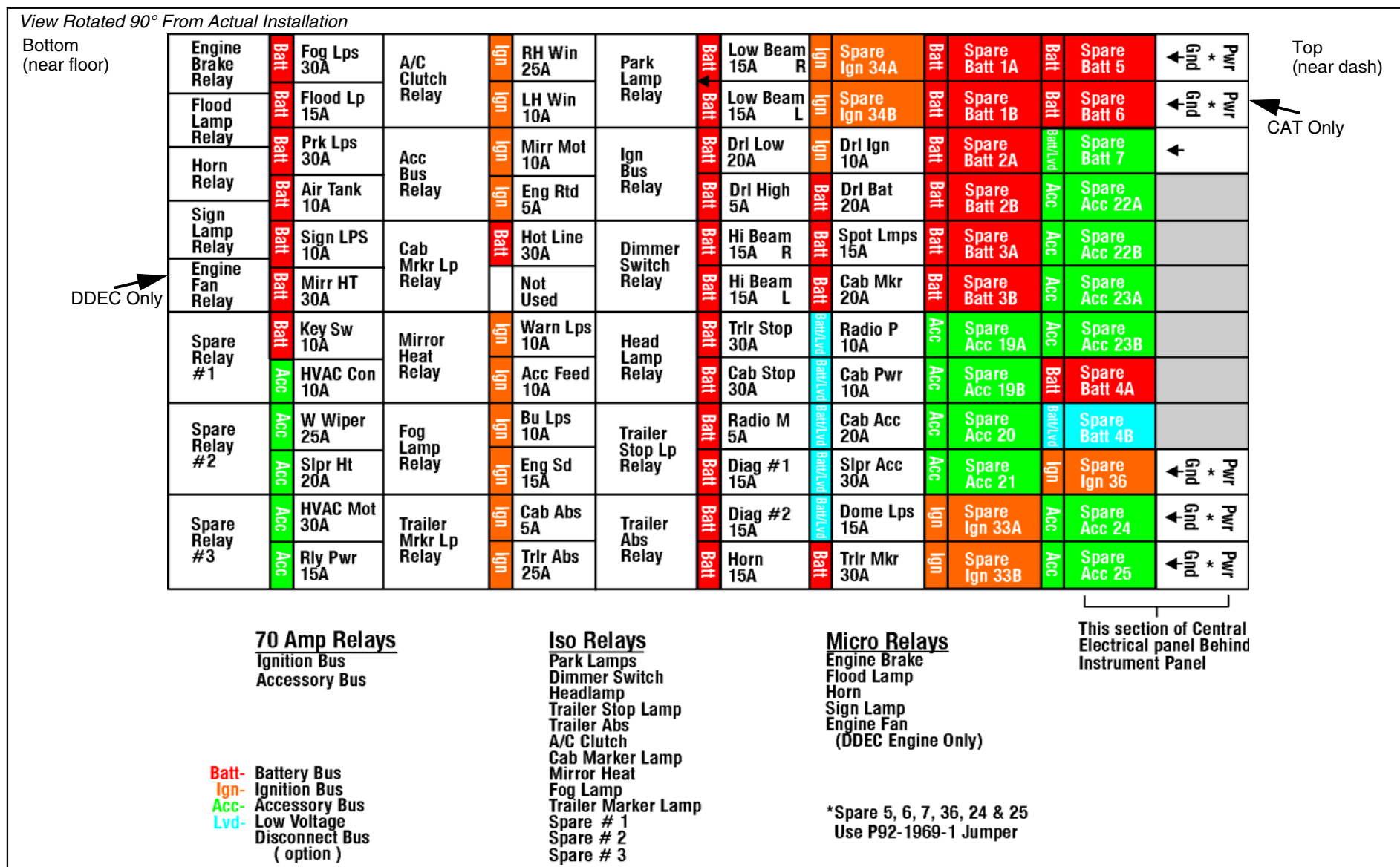


Figure 15-2 CEP Fuse Cover Decal

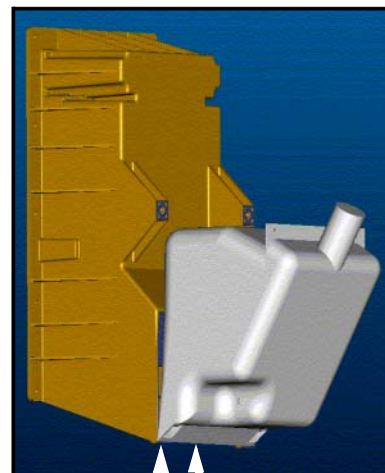




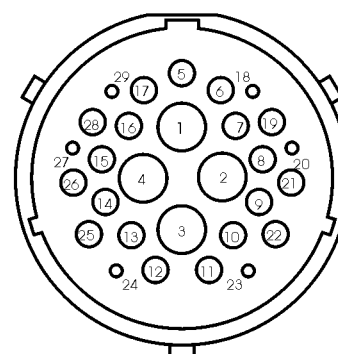
## Electrical: Power Distribution Box (after 12/01)

### PD Box Connectors - Pinout Locations

PD Box Deutsch Connectors (mates with chassis harness)			
Wire Number	Circuit	Term	Function
WREO425	L7HBR	1	High Beam Lamp Right
WREO517	P79BL	2	Backup Lamps
WREO204	C2AX	3	Stop Lamps
WREO580	L7HBL	4	High Beam Lamp Left
WREO316	L6LBL	5	Low Beam Lamp Left
WREO315	L6LBR	6	Low Beam Lamp Right
WREO496	L9FG	7	LH Fog Lamp
WREO537	L33LT	8	Left Front Directional Turn Signal & Trailer
WREO538	L34RT	9	Right Front Directional Turn Signal & Trailer
WREO161	L35LT	10	Left Turn
WREO162	L36RT	11	Right Turn
WREO510	L1PL	12	Tail & Park Lamps
WREO446	L3ML	13	Marker Lamps
WREO503	L14FL	14	Flood Lamp
WREO518	P118SK	15	Engine Shutdown
WREO641	C102FC	16	Air Conditioner Clutch Control
WREO521	H90AT	17	Air Tank
WREO427	G278U	18	Aux Trans Oil Temp
WREO117	C20WW	19	Windshield Washer Motor
WREO426	G28SU	20	FF or Single Rear Axle Temp
WREO489	C53HN	21	Horn Relay To Horn
WREO190	C71HI	22	Windshield Wiper High
WREO429	G29SU	23	RR Axle Temp
WREO430	G72SU	24	Fuel Gauge Sender
WREO191	C71LW	25	Windshield Wiper Low
WREO397	P20WW	26	Windshield Washer Motor
WREO192	C71WM	27	Windshield Wiper Motor
WREO		28	Plug
WREO		29	Plug

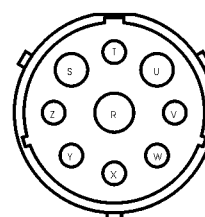


Chassis and Trailer Harness Connectors Located Behind Windshield Washer Reservoir



P20-1134-29-5-0 (chas)

PD Box Deutsch Connectors (mates with trailer harness)			
Wire Number	Circuit	Term	Function
WREO447	P181TR	R	Aux Battery see note 10
WREO452	L2TR	S	Stop Lamp Trailer
WREO539	P4TR	T	Hot Wire For Aux Devices On Trailer
WREO454	P154TR	U	Trailer ABS Power
WREO509	L1PL	V	Park Lamp
WREO536	L34RT	W	Right Front Directional Signal Lamp
WREO540	L155TR	X	ABS Trailer Warn Lamp
WREO535	L33LT	Y	Left Front Directional Signal Lamp
WREO559	L3TR	Z	Marker Lamps Trailer



P20-1134-29-5-0 (ABS01)

Figure 15-4

## Spare Circuits

The CEP has a total of 26 spare circuits (3 of which can be connected to spare relays on the CEP).

They include:

- 11 spare battery circuits
- 10 spare accessory circuits
- 5 spare ignition circuits

## Adding Spare Circuits

The CEP has 3 different options available for tapping into spare BATT, ACC or IGN power.

### Option # 1: PD Box Spare PWR/GND Sockets

1. Remove 3 fasteners securing the courtesy lamp mounting plate under the dash.
2. Allow plate to hang loose. See [Figure 15-5](#).

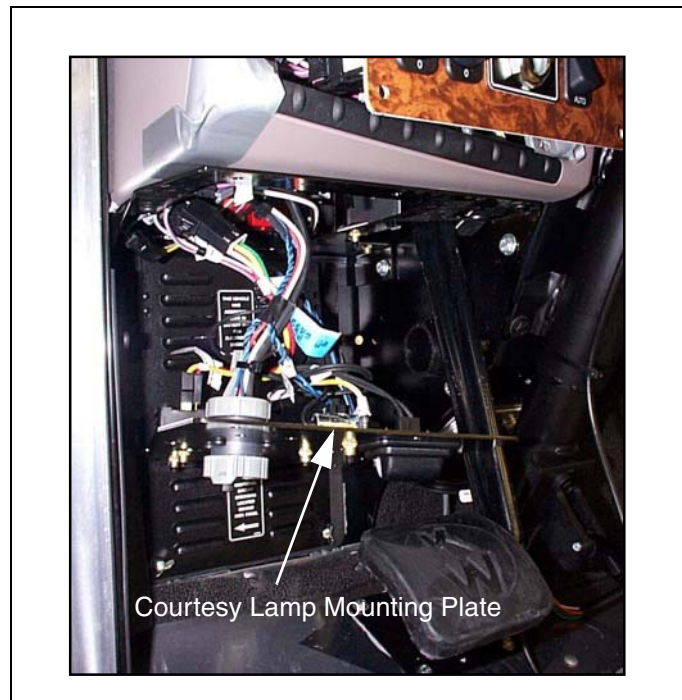


Figure 15-5

3. From under the dash, install a P92-1969-1 power jumper wire into one of the top row of 6 spare BATT, ACC, or IGN sockets not currently being used. See [Figure 15-6](#).

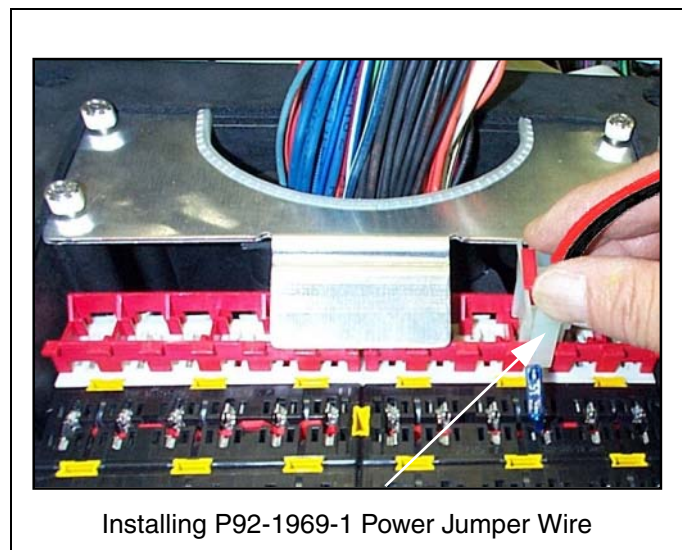


Figure 15-6

## Electrical: Power Distribution Box (after 12/01)

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### Option # 1: PD Box Spare PWR/GND

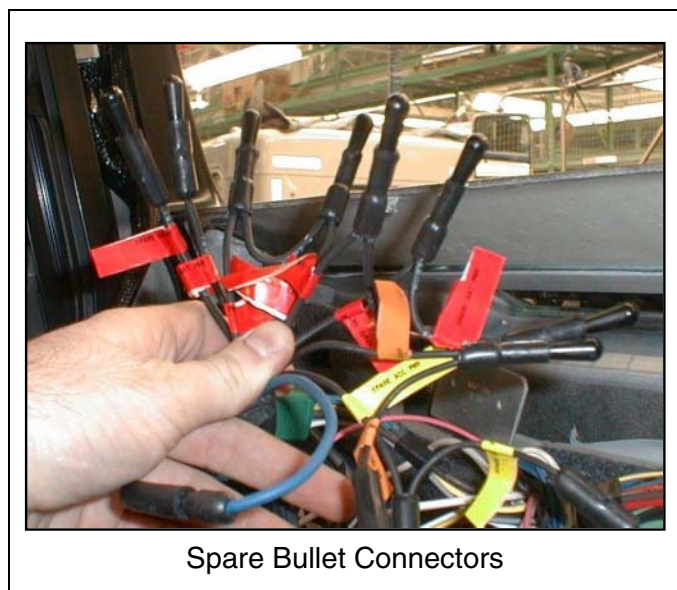
#### Sockets (continued)

1. Connect the other end of the jumper wire positive (+) and negative (-) leads to the accessory. If the accessory is to be controlled by a dash switch, connect the negative (-) lead to a spare dash switch, then to the accessory.
2. Install the correct rated fuse, or circuit breaker, into the fuse socket directly below the jumper harness installed in step 3.

## Electrical: Power Distribution Box (after 12/01)

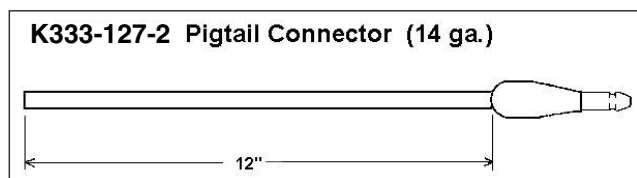
### Option # 2: Spare Circuit Bullet Connectors

1. Remove the LH gauge panel above ignition key switch.
2. From behind the gauge panel, locate one of the 20 spare BATT, ACC, or IGN bullet connectors not currently being used. See [Figure 15-7](#).



**Figure 15-7**

3. Plug one end of a K333-127-2 pigtail harness into the appropriate spare circuit bullet connector. See [Figure 15-8](#).

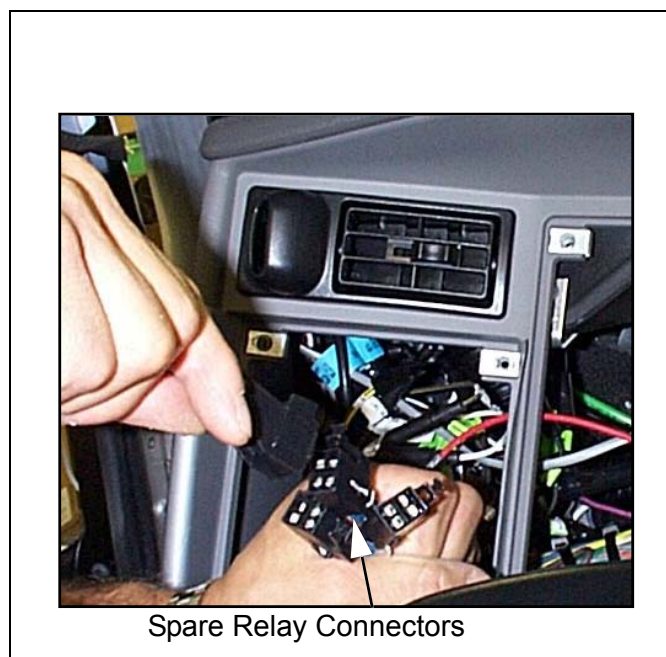


**Figure 15-8**

4. Connect the other end of the pigtail harness to the accessory. If the accessory is to be controlled by a dash switch, connect a ground wire to the switch, then to the accessory.
5. Install the correct rated fuse, or circuit breaker, into the fuse socket that corresponds to the spare circuit selected in step 2.

### Option # 3: Spare Circuit Relays (For loads exceeding 20 amps)

1. Remove the LH gauge panel above ignition key switch.
2. From behind the gauge panel, locate one of the 3 spare relay connectors not currently used. See [Figure 15-9](#).



**Figure 15-9**

3. Plug one end of a spare relay harness (PN P92-1947-X) into the appropriate spare relay circuit connector. See [Figure 15-10 on page 13](#).

**i** **NOTE:** Use a P92-1947-1 or -3 harness for a Normally Open (NO) spare relay circuit. Use a P92-1947-2 or -4 harness for a Normally Closed (NC) spare relay circuit.

Electrical: Power Distribution Box (after 12/01)

Option # 3: Spare Circuit Relays (For loads exceeding 20 amps) (continued)

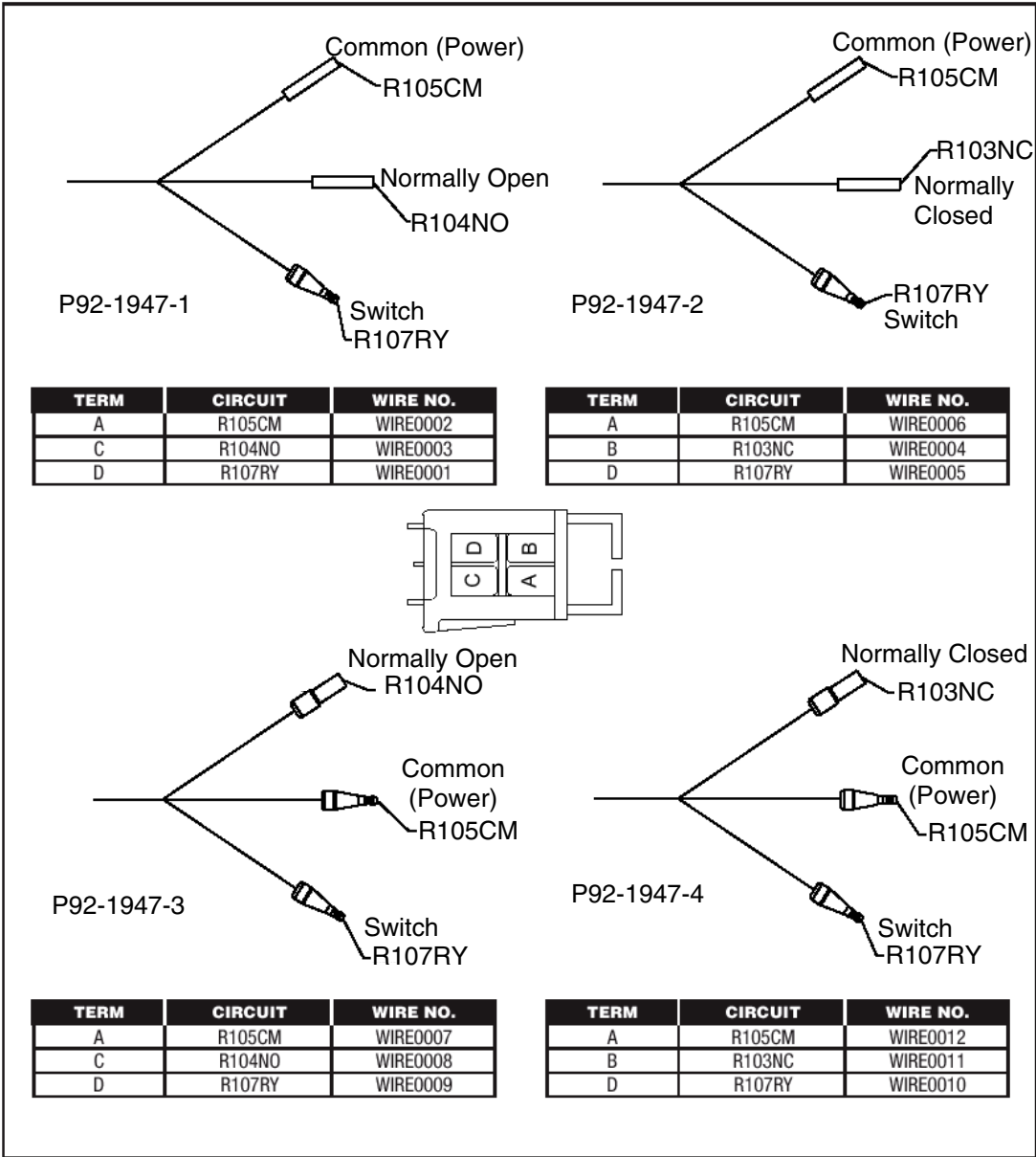


Figure 15-10



## Electrical: Power Distribution Box (after 12/01)

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### Option # 3: Spare Circuit Relays (For loads exceeding 20 amps) (continued)

4. Connect the spare relay harness end labeled NORMALLY OPEN or NORMALLY CLOSED to the accessory.
5. Connect the spare relay harness end labeled SWITCH (a ground wire) to a spare dash switch. Ensure the switch is properly grounded. Next, ground the accessory to a known good ground source (i.e. cab, engine, frame).
6. To provide power to the relay, connect a power source to the spare relay harness end labeled COMMON. To accomplish this, follow the procedure below:
  - a. Locate one of the spare IGN, ACC, or BATT “bullet” connectors located behind the LH gauge panel. See [Figure 15-7 on page 12](#).
  - b. Using a K333-127-2 jumper harness, plug one end of the jumper harness into one of the spare “bullet” connectors. Connect the other end of the jumper harness to the spare relay jumper harness end labeled COMMON.
  - c. Install the correct amperage fuse in the appropriate spare fuse socket. Install a K301-179 or VF4-15F11-S01 relay into the socket that corresponds to the spare relay circuit selected in step 2.

## Electrical: Power Distribution Box (after 12/01)

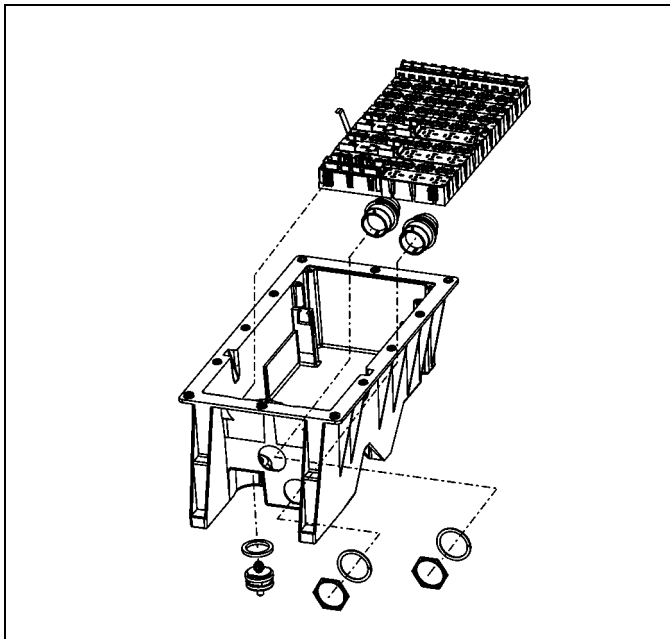
### Servicing

#### Power Distribution Box And Fuse/Relay Module Removal

The new P D Box includes:

- housing
- instrument panel harness
- 20 separate fuse and relay modules

The modules lock together to form the Central Electrical Panel. Each fuse and relay module can be replaced separately by releasing the “locking wedges” that fasten each module together.



**Figure 15-11**

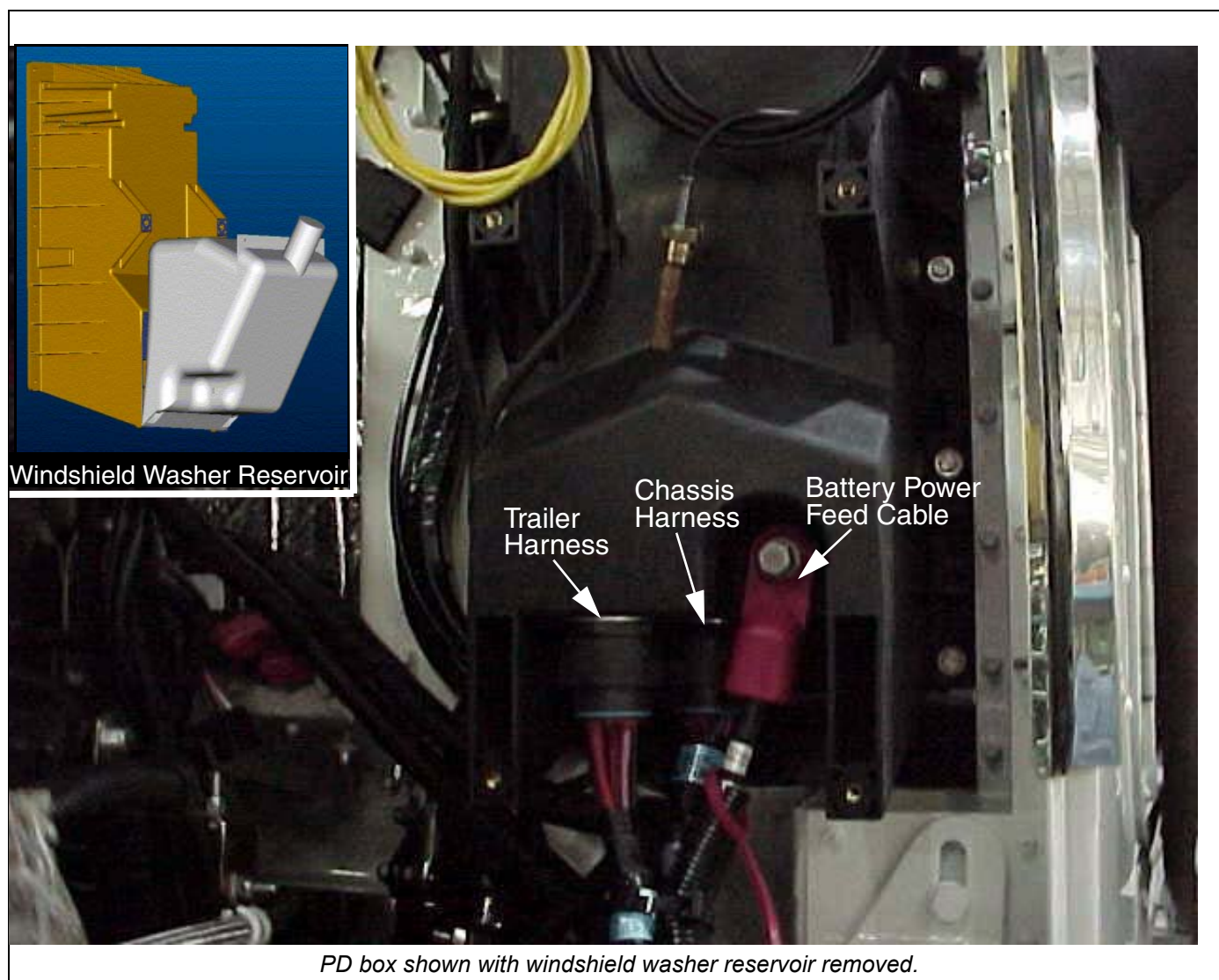
### Tips for Easier PD Box Servicing

- Replace damaged P20-1000-040 yellow module locking wedges before reassembly.
- Double-check each terminal wire removed during disassembly to assure it is re-installed and locked in the correct pin-out location on the new module.
- Inspect for possible loose terminals on the backside of other modules.
- Check the power feed cable and stud inside the PD box housing to assure it is properly tight (10 to 12 ft/lb.) and free of corrosion.
- During CEP reinstallation, make sure none of the harness wires are pinched behind or around the sides of the PD box housing. Secure the harness wires with plastic ties to minimize potential pinching.
- Assure that the threaded thumbscrew inserts remain attached to the housing during disassembly.
- Before reinstalling the upper PD box cover, position the pinchweld strip to prevent the harness from chafing on the cover edges.
- Replace the reusable housing gasket only if it is damaged.
- Torque values:
  - PD box housing firewall fasteners = 5 to 7 ft/lbs.
  - Battery power feed cable outside the PD box housing = 8 to 13 ft/lbs.
  - Battery power feed cable inside the PD box housing = 10 to 12 ft/lbs.
- The CEP can be disassembled from inside the cab, but workspace is limited. For this reason, Kenworth recommends removing the PD box housing from the engine side of the firewall to service the CEP as described in the next section.

## Electrical: Power Distribution Box (after 12/01)

### Power Distribution Box Removal

1. Disconnect the batteries.
2. If applicable, remove any air intake piping blocking access to the PD box on the engine side of the fire-wall.
3. Remove the windshield washer reservoir attached to the PD box. See [Figure 15-12](#).



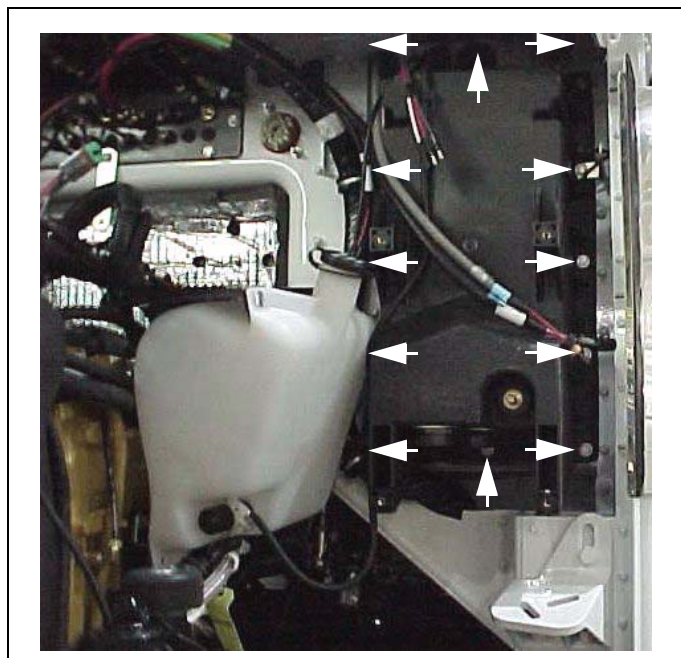
**Figure 15-12**

4. Remove the battery power feed cable at the PD box. See [Figure 15-12](#).
5. Remove the chassis and trailer harness Deutsch connectors at the bottom of the PD box. See [Figure 15-12](#).

## Electrical: Power Distribution Box (after 12/01)

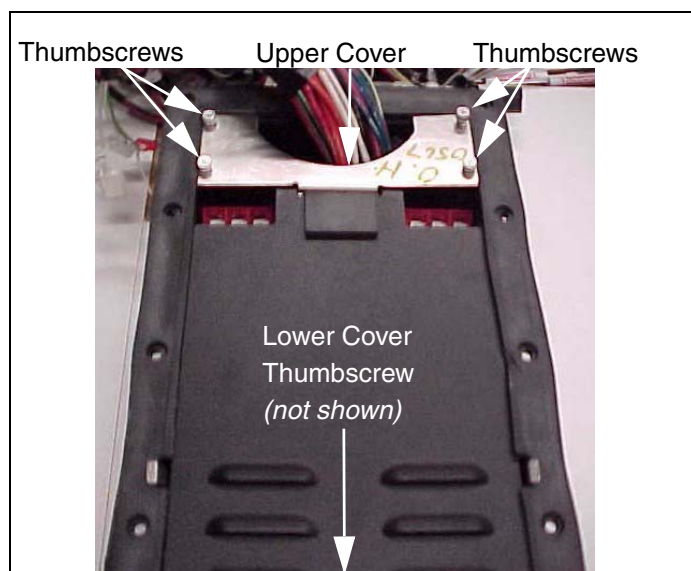
### Power Distribution Box Removal (continued)

- Remove 12 fasteners securing the PD box housing to the firewall. See [Figure 15-13](#).



**Figure 15-13**

- Unseat the PD box housing from the firewall and allow the box to hang free.
- Rotate the PD box housing enough to remove the lower PD box cover. The cover is held with a thumb-screw at the bottom and a flange at the top. See [Figure 15-14](#).



**Figure 15-14**

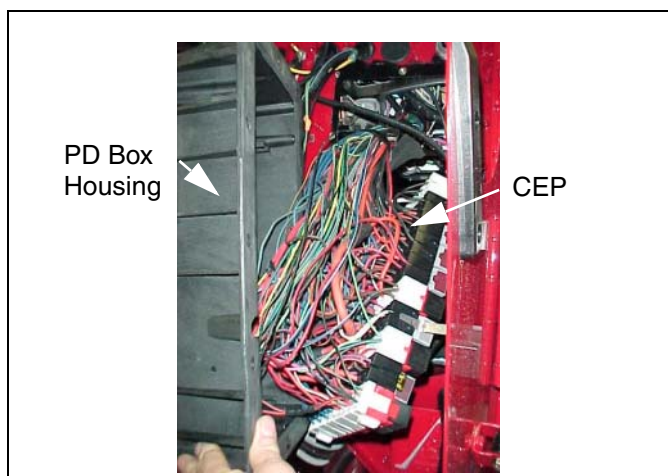
- Remove 4 thumbscrews securing the upper PD box cover, then remove the cover. See [Figure 15-14](#).

- Using a pair of needle-nosed pliers, compress the two lower lock fingers that secure the CEP inside the box housing. See [Figure 15-15](#). At the same time, pull the bottom of the CEP out slightly to ensure the lock fingers stay released.



**Figure 15-15**

- Apply slight downward pressure to the CEP while continuing to angle the bottom of the CEP out and down. This will disengage the upper lock fingers from the housing and allow the CEP to be removed.
- Move the housing to the side so that access to the CEP is unobstructed. See [Figure 15-16](#).



**Figure 15-16**

- Carefully pull the CEP out of the PD box housing.



**NOTE:** It is not necessary to remove the power feed cable or the two Deutsch connectors inside the PD box housing in order to separate the CEP from the housing.

Steps 1 through 13 above make the CEP accessible enough to allow replacement of individual fuse or relay modules.



## Fuse/Relay Module Replacement

Single module replacement is easier when a section of the CEP is separated first, freeing one side of the damaged module from the CEP and then releasing the locking wedges on the opposite side and end of the module being replaced.

The following example describes the replacement of a high current relay module, but the same procedure applies to all 20 modules. The only difference is the size or type of terminal connectors used with some modules.

1. With a small screwdriver, pry the red cover (if applicable) off the defective module. See [Figure 15-17](#).

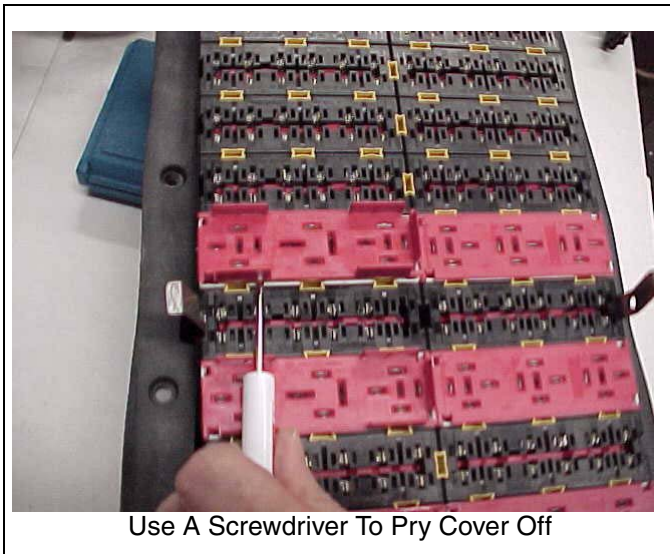


Figure 15-17

**i** **NOTE:** In steps 2a and 2b next, apply downward pressure to the modules at the same time as the tabs are released. This will assure the tabs stay released and allow the modules to be separated.

2. To separate a section of the CEP:
  - a. With a 3mm screwdriver, release the 6 yellow locking wedge tabs on one side of the defective module and the module next to it. See [Figure 15-18](#).
  - b. Release the 4 remaining lock wedge tabs on the module being replaced. See [Figure 15-19](#) and [Figure 15-20 on page 19](#).

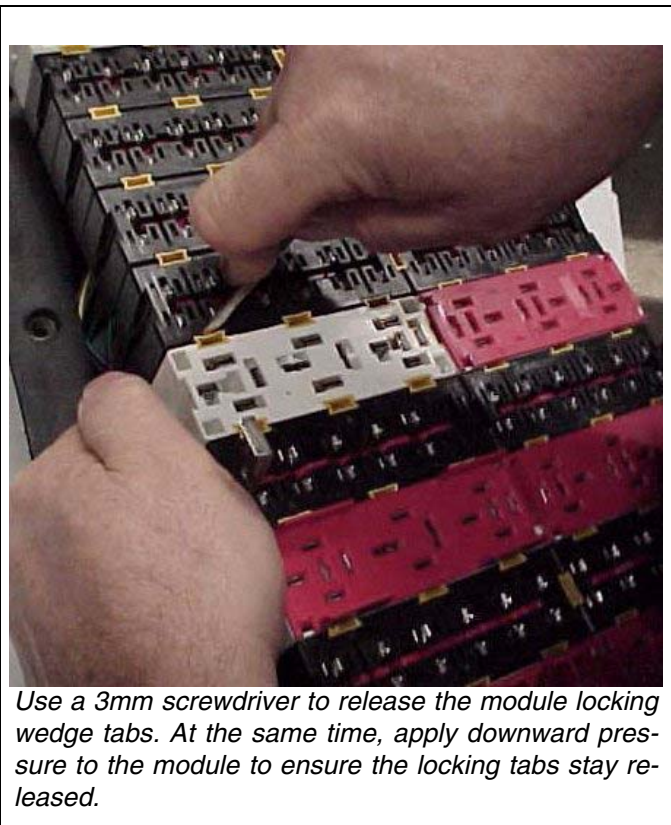


Figure 15-18

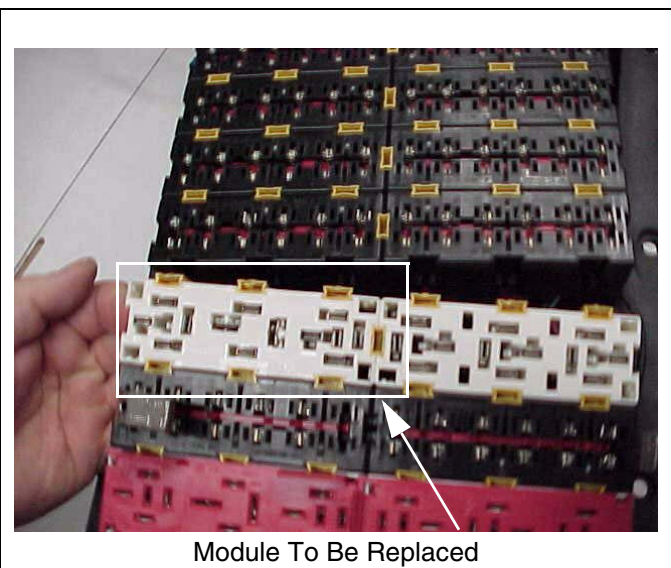


Figure 15-19



Fuse/Relay Module Replacement (continued)

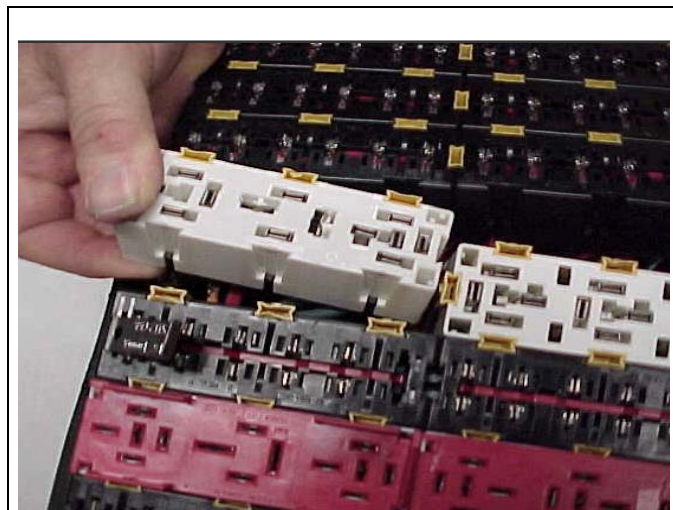
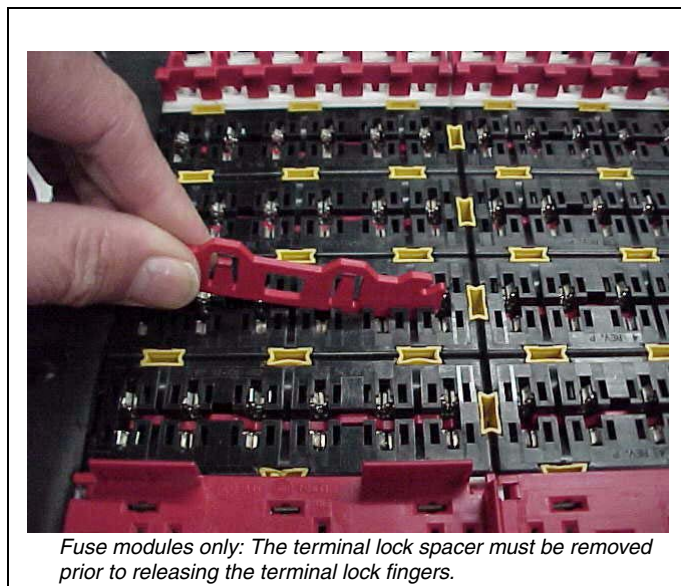


Figure 15-20



**NOTE:** Before performing steps 3 through 5 next, assure proper reassembly by writing down each wire's circuit number and location.

- When replacing a fuse module, remove the red spacer between the lock fingers before releasing the terminal lock fingers. See [Figure 15-21](#).



Fuse modules only: The terminal lock spacer must be removed prior to releasing the terminal lock fingers.

Figure 15-21

- Using a terminal extraction tool, release each terminal wire lock finger. See [Figure 15-22](#) and [Figure 15-23](#).

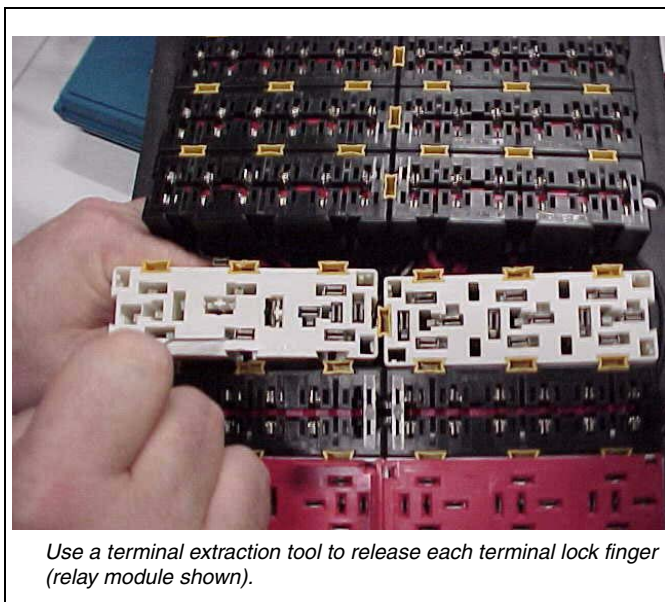


Figure 15-22

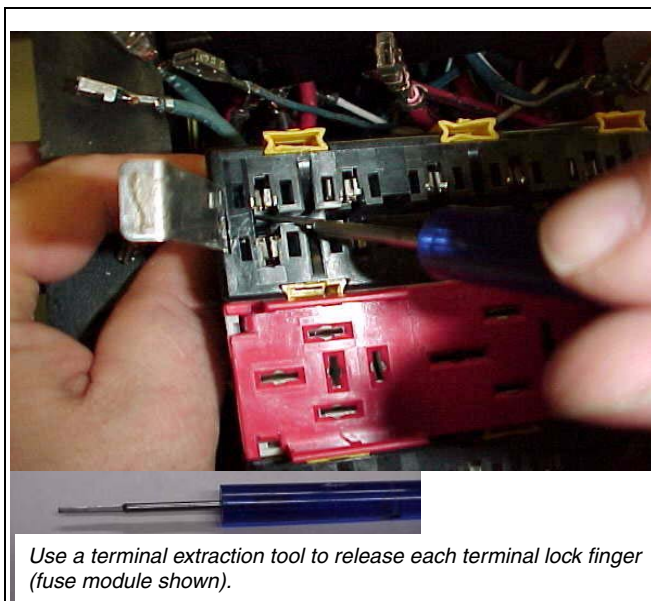
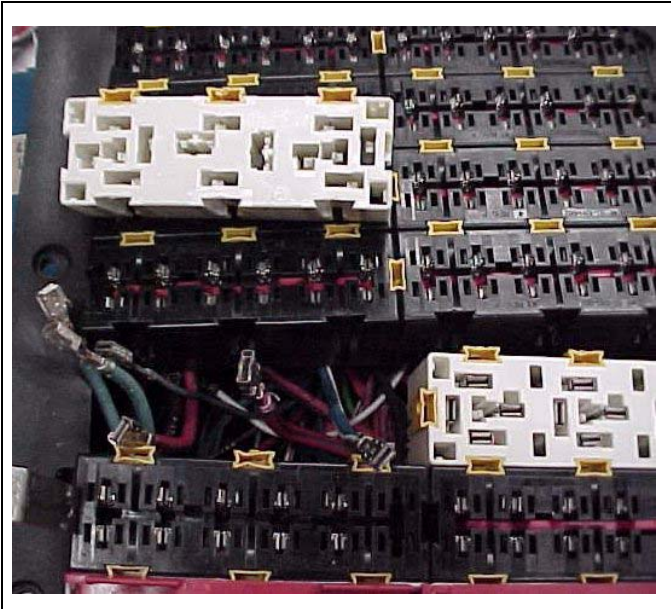


Figure 15-23

## Electrical: Power Distribution Box (after 12/01)

### Fuse/Relay Module Replacement (continued)

5. Pull each wire out from the backside of the module.  
See [Figure 15-24](#).



**Figure 15-24**

6. The defective module can now be replaced.
7. For reassembly, follow the R & R procedures in reverse order.