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Coding Information

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Title: Power Distribution Center (PDC) Replacement

Applies To: 7000 (Workstar) Model Series with Allison or Manual Transmissions

DESCRIPTION

Vehicles repeatedly exposed to severe weather environments such as snow plow applications may experience corrosion issues in the various components housed in the original Power Distribution Center PDC. This procedure provides the guidelines needed to remove and replace the existing PDC with a redesigned PDC and distribution harness.

Part Listing

Part Number	Description	Qty.
2593492C93	Harness, Dash w/ 48-way round dash connector	1
2591041C1	Contact Cleaner	1
2591044C1	Contact Protector/Enhancer	1
2592073C1	Nyogel Dielectric Grease	1
2593493C91	Harn, Dash w/ 76-way rectang. dash connector	1
3710368C1, 3710369C1, 3710370C1	Housing, Control, Power Distribution Center	1 of each

SERVICE PROCEDURE

While this procedure is written to provide the needed steps for the replacement of the PDC, attention must also be given to other connections within the engine compartments. Prior to mating any of the new harness connectors with those remaining from the original installation, all remaining connectors must be thoroughly cleaned and protected. In particular, all mating connectors and terminals must be thoroughly cleaned with 2591041C1 contact cleaner, blown dry with clean shop air, coated with 2591044C1 contact protector/enhancer and sealed with 2592072C1 Nyogel dielectric grease before mating with new connectors on the new harness. For the purposes of this instruction, the new harness connectors are grouped into the following harness sections for assembly clarification.

Group/Function	Connectors in Group/Breakout
System Controller/Pass Through	4004, 1921M, 4007, 4008, 4005, PDC Grd, 4006 4014, 4028, 4028A Fig. 2
PDC w/Populated Blocks 4000, 4001, 4002 and 4003	PDC Grd, 4023, 4024, B+ Fig. 3

Engine/Transmission	4705, 4103, 6334M, 4105 Fig. 4
Forward Chassis	4415, 4305M, 4301, 9718F Fig. 5
Rear Chassis	4410, 4460, 9714, 9716, 9717, 4450, 9715 Fig. 5
AC	4019, 4018, 4017, 4120, 4015, 8601, Rest. Air Hose Fig. 6

See Figure 1 for connector groups and Figures 2-7 for connector identification.

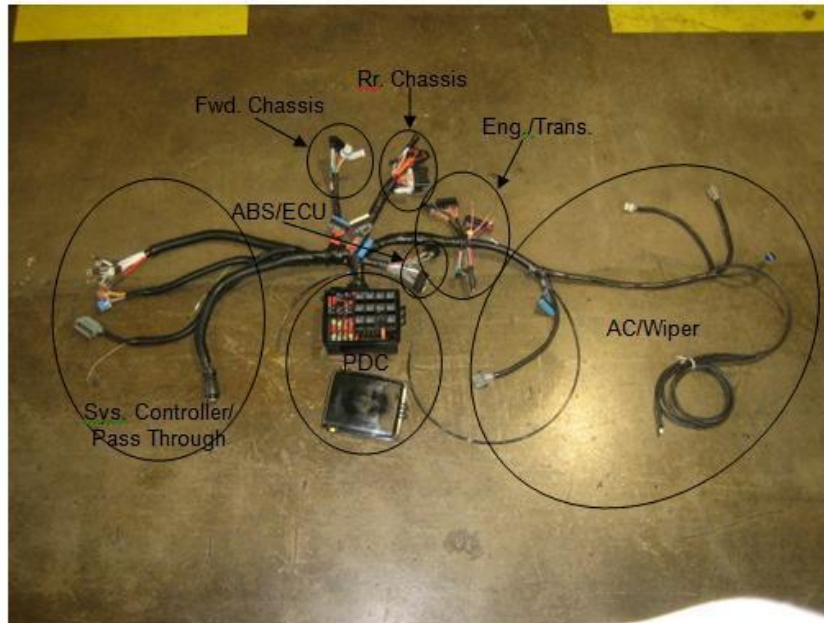


Figure 1

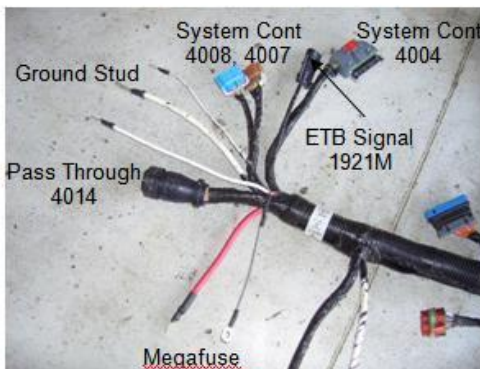


Figure 2 - System Controller

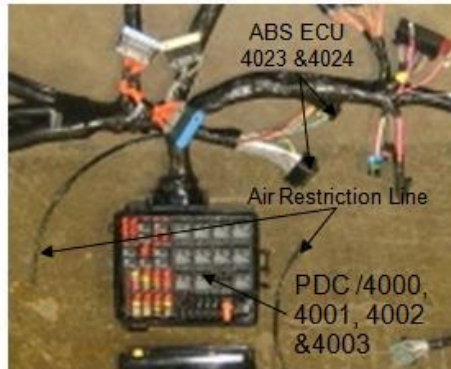


Figure 3 - PDC

WARNING:

To avoid personal injury or death, disconnect main negative battery cable before disconnecting or connecting electrical components. If both battery cables are disconnected, always connect main negative battery cable last.

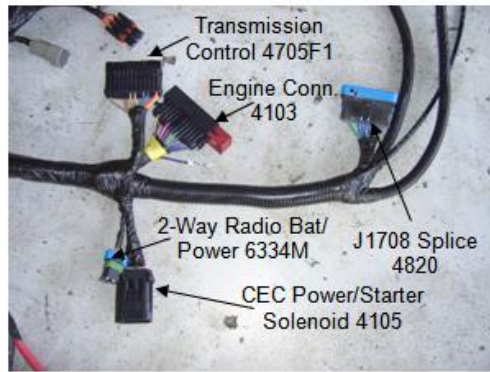


Figure 4 – Engine/Trans



Figure 5 – Fwd/Rr Chassis



Figure 6 – AC/Wiper

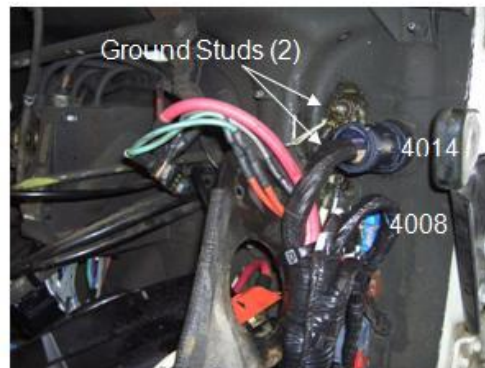


Figure 7 – ECU

Disassembly

Note: Not all trucks will have all the listed connectors. Note which connectors are not on the original harness and plug those on the new harness to prevent shorts.

1. Disconnect the negative battery connections at the battery box.
2. Remove the driver and passenger side inner fender panels.
3. Inspect the original PDC and any splice points on the old harness which may have had modifications and/or circuits added by a body builder or customer after the vehicle was originally assembled. Remove those additions and carefully make note of how they were being fed so that they may be moved to dash fuse panel and/or appropriate ground after this modification is complete.
4. Remove tie straps that are supporting the main PDC feed harness. If not sure of a strap function, wait until the removal begins to verify that it must be cut.
5. Separate the System Controller connectors (4004-System Controller, 4007-System Controller Brown and 4008-System Controller Blue) The ETB Brake Signal 1921M and feed through connector 4014 on the driver's side of the engine bulkhead. See Figure 7.
6. Remove the ground stud (2) nuts from just behind the PDC and remove the ground cables as shown in Figure 7.
7. Remove the ring terminals from the Megafuse studs. Note that one side will have to feed to the dash fuse panel and the other should have the 12 volt feed from the starter, the feed to the PDC, the feed to the System Controller and the fusible link to the start circuit. See Figure 8.

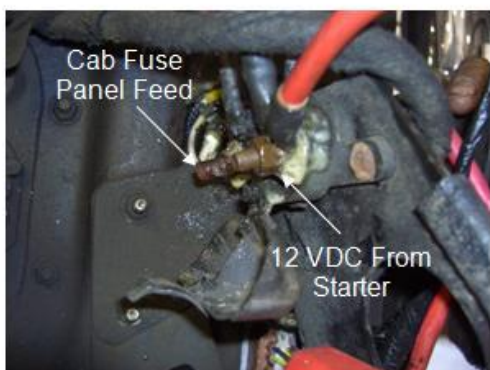


Figure 8



Figure 9 – ABS ECU

8. Unsnap the PDC box from its mounting bracket by prying loose the four plastic snaps on the bottom of the box.
9. Using a 1/4" socket remove the two ABS connectors (4023 18-way, 4024 30-way) from the bottom of the ABS ECU located inboard of the PDC on the bulkhead as shown in Figure 9.
10. Disconnect the forward chassis harness connectors 4301-Fwd Chassis, 4305M-Aux Fwd Chassis, 4415-Fwd Remote Power Module and 9718F-Dual Work Light. See Figures 10 and 5, harness routes up from left frame rail between steering column and engine.



Figure 10 – Fwd Chassis



Figure 11 – Rr Chassis

11. Remove the push to connect air filter restriction gauge fitting where it enters the bulkhead manifold shown in Figure 13.
12. Disconnect the rear chassis legs of the existing harness; connectors 9714-Rear Chassis, 4460-Body Builder Trailer Turn/Stop, 9716-Trailer Socket #2, 9717-Trailer Socket Ground, 4450-Body Builder Conn, 9715 Trailer Socket #1 and 4410-Remote Power Module. Figure 11 shows the harness and connectors after all tie straps are removed. Normal location of harness/connectors is under wiper motor at the rear of the engine. If any connectors are not used, make note from the original harnesses and either cap or seal the unused connectors when the new harness is installed. If Remote Power Module connections are not used, the connectors on the new harness must be properly terminated with 120 ohm resistors.
13. Disconnect the wiper motor connector 4015 shown in Figure 15.
14. Disconnect the two AC Accumulator Thermistor connectors 4018 and 4019 (Figure 18) and the pressure switch 8602 (Figure 19).
15. Disconnect the HVAC recirculation motor connector 4017 (Figure 16) and the snow valve connector 4120 (Figure 17).
16. Disconnect the air filter restriction gauge hose from the air cleaner housing.

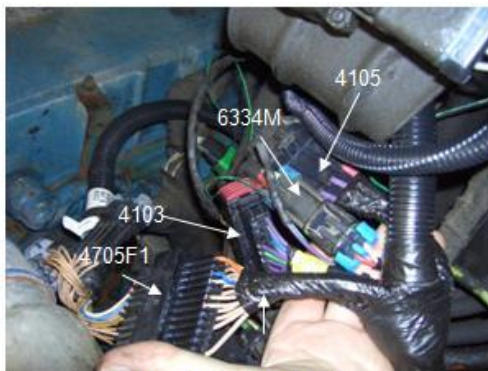


Figure 12 – Engine/Trans

17. At this time the only thing holding the harness should be the engine and transmission connectors and remaining tie straps. Remove remaining tie straps.
18. Disconnect the CEC Power/Starter Solenoid 4105, the Two-Way Radio Battery/Power Connector 6334M, the Transmssion Control 4705F1 and lastly the Engine Connector 4103. See Figures 4 and 12.
19. Remove the old PDC and harness from the chassis.

Mounting New PDC

1. Place the new PDC in position above the mounting bracket.
2. Route the new harness breakouts to the same locations as the previous connections required.
3. Align the new box mounting tabs above the four holes in the mounting bracket and snap the new PDC in place.

Connector Cleaning

1. Prior to reassembly with the new harness connectors, clean all remaining harness connectors and terminals with 2591041C1 Contact Cleaner.
2. Blow clean shop air to dry the cleaner and remove any contaminates from the connectors and terminals.

3. Inspect all connector terminals and make sure that there is no corrosion or contamination inside the connectors or terminals. If proper cleaning cannot be done, replace terminals as required.
4. Coat all terminals 2591044C1 Contact Protector/Enhancer spray.

Harness Installation

1. Place the new harness and PDC in the engine compartment and run the AC Thermistor and Pressure leads through the wiper motor support bracket over to the passenger side of the engine compartment.
2. **(PDC)** Begin the installation by placing the main trunk of the harness on the passenger side with the new PDC.



Figure 13– New PDC/Harness

3. **(System Controller/Pass Through)** Bring the end of the main harness trunk under the PDC mounting bracket as shown in Figure 13 and connect 4014 pass thru connector to the mating connector in the bulkhead.
4. Connect System Controller 4004, 4007-Brown and 4008-Blue connectors to the corresponding color connectors on the system controller. See Figure 7.
5. Route the three harness ground wires over the PDC to the ground studs as shown in Figure 7. Make certain the studs have been properly cleaned before reinstalling the new and existing ground terminals to the studs.
6. Route the air restriction hose to the Push to connect fitting on the bulkhead just above and to the rear of the PDC as shown in Figure 13.
7. Route and connect Air ABS 30-way connector 4024 and Air ABS 18-way connector 4023 to the underside of the ABS ECU as shown in Figure 9.
8. Route the Red PDC feed (4028) and the Gray fusible link (4028A) and the +12VDC feed from the starter to the forward terminal of the Megafuse as shown in Figure 8.
9. At this point the main harness and breakouts should be tie strapped to assure that it will not move or rub against any sharp edges. In particular, the main harness trunk should be secured underneath and at the middle of the side of the PDC bracket to keep it way from the hood when it is lowered into position, windlass should be added/used to keep the positive wires going to the Megafuse from shorting to the sharp edge of the PDC bracket and ground wires going to the studs should be properly located away from abrading edges.
10. **(Rear Chassis)** Route the Rear Chassis group toward the corresponding connectors on the chassis as shown in Figures 5 and 11 and complete the following connections: Rear Chassis connector 9714, Body Builder Turn/Stop 4460, Body Builder connector 4450, Trailer Socket #1 9715, Trailer Socket #2 9716, Trailer Socket 9717 and Remote Power Module 4410. If the Remote Power Module was not used on the original harness, the terminating resistor from the original connector should be placed into the new Remote Power Module connector 4410. If the original harness did not have a terminating resistor or a Remote Power Module at this connection, add a 3559775C1 terminating resistor.
11. **(Forward Chassis)** Before making the forward chassis connections locate chassis side of the round Auxiliary Forward Chassis connector 4305M. If cavity "A" of the 4305M does not have a yellow 16 gauge wire, the low beam snow plow lights will not work. If cavity "A" is empty, remove the yellow 16 gauge wire from the cavity 20 of the Forward Chassis connector 4301, remove its terminal and replace it with terminal 3535486C1 and insert into cavity "A" of 4305M. Install a plug into the now empty cavity 20 of 4301.
12. Referring to Figures 5 and 10, connect the new harness Auxiliary Forward Chassis connector 4305M, Forward Chassis 4301, Dual Work Light connector 9718F and the Forward Remote Power Module connector 4415 to their mating connectors on the vehicle harness. If the Remote Power Module was not used on the original harness, remove the terminating resistor from the original connector and place into the new Power Module connector 4415. If the original harness did not have a terminating resistor or a power module at this connection, add a 3559775C91 terminating resistor.
13. Combine the forward and rear chassis breakouts along with the AC grouping and tie strap them to the harness saddle that is mounted to the bracket beside the ABS ECU. See Figure 13.
14. **(Engine/Transmission)** Route the following vehicle connectors and connect to the new harness connectors: Transmission Control 4705F1, Engine connector 4103 (see notes below), CEC Power/Starter Solenoid 4105 and 2-Way Radio Battery/Power connector 6334M. See Figures 4 and 12.

Note 1: If engine is an I6 EGR engine connector 4103 (Figure 14) in the new harness must be modified. Locate circuit LB97T (18 Ga. VT) in cavity 18 and move it from cavity 18 to cavity 1. Untape the separate circuit JV97J (18 Ga. VT) (See Figure 14) that is taped back to the new harness at connector 4103 and place it into cavity 18.

Note 2: If engine is a CAT engine, connector 4103 (Figure 14) in the new harness must be modified. Locate circuits LD17S (18 Ga. PK) in cavity 17 and JV97LA (18 Ga. VT) in cavity 18, remove them from cavities and tape back. Untape the two pink 14 Ga. wires (circuits MF17F and MF 17G see Figure 14) that are taped back to the new harness at connector 4103. In connector 4103 place circuit MF17F into cavity 17 and circuit MF17G into cavity 18.

Note 3: If engine is an I6 EGR or I6 HEUI engine **and has an exhaust brake**, connector 4103 (Figure 14) in the new harness must be modified. Locate circuit NA19A (14 Ga. GY) in cavity 16 and remove it from the cavity and tape back. Untape the separate circuit KC24A (16 Ga. GY see Figure 14) wire that is taped back to the new harness at connector 4103 and place it into cavity 16.

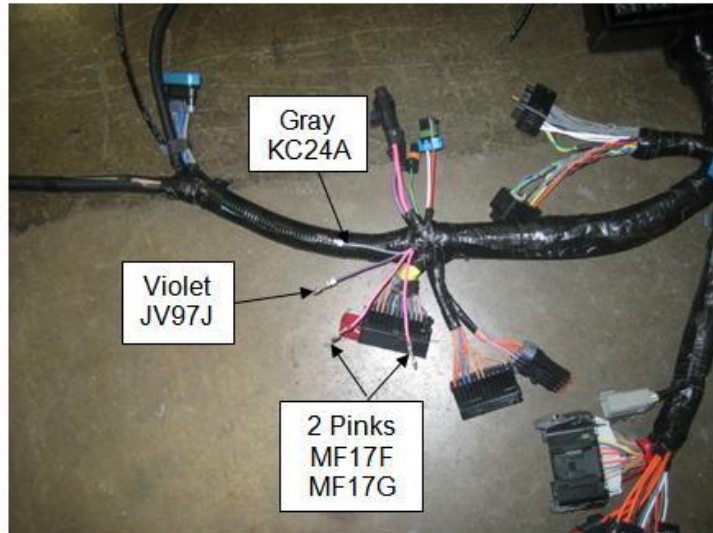


Figure 14



Figure 15



Figure 16

15. **(AC)** Connect the wiper motor connector 4015 to the wiper motor as shown in Figure 15.
16. Route the AC harness legs toward the passenger side of the chassis and connect the HVAC Recirculation connector 4017 to the Recirculation Motor (Figure 16).
17. Connect the Air Filter Restriction hose to the air cleaner push to connect fitting.
18. Connect the Snow Valve connector 4120 as shown in Figure 17.



Figure 17



Figure 18

19. Route the two Thermistor and Pressure leads behind the air handling box.
20. Connect AC Accumulator Thermistor #1 to the lower Thermistor on the Accumulator #2 and to the upper Thermistor as shown in Figure 18.
21. Route the AC pressure sensor lead and connector 8602 from behind the air handling box down along the bulkhead and forward with the chassis wiring harness above the frame rail until it will lead up to the pressure sensor as shown in Figure 19. Make sure the pressure sensor lead does not come in contact with or close to the turbocharger or exhaust system. Connect 8602 to the pressure sensor and cut the terminal off the old wiring.

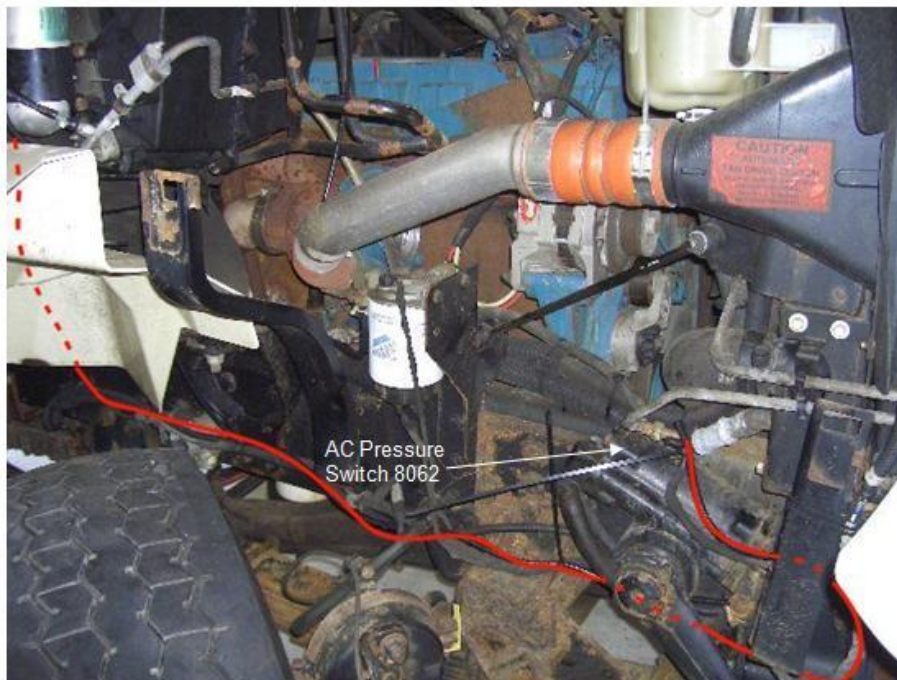


Figure 19

22. Tie strap the leads in the AC group to prevent rubbing and chaffin on sharp or hot surfaces.
23. Reinstall the driver and passenger side inner fender panels.
24. Review all routing and clipping to assure a trouble free installation in the areas of the clutch linkage, steering column and wiper linkage.
25. Close the hood and inspect inside the driver's side wheel well to make sure the upper fender is not interfering with the main harness trunk just outboard of the original PDC mounting bracket.
26. Adjust harness as required and add tie straps where needed.
27. Reconnect any post manufacture wiring to appropriate voltage feeds in the dash fuse panel.
28. Reconnect the negative terminals at the battery.
29. Test the vehicles operation. Pay particular attention to all lighting (high and low beam, directionals, hazard or body builder lighting), any body builder added equipment that uses Remote Power Modules, engine and transmission functions, radio equipment and any additional wiring devices that may have required relocation to the dash fuse panel.

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