Overview

The Bergstrom NITE (No Idle Thermal Environment) parked, or no-idle, air conditioning system is a compact, electrically powered, 3000-BTU system. It is designed to provide a means of air conditioning to the sleeper area without having the engine running. It is completely self-contained, and runs on 12-volt deep-cycle batteries. The system is designed to maintain cool air in the sleeper interior. For optimal operation, the curtain between the cab and the sleeper must be closed when using the A/C system. The parked A/C unit will not cool down a hot sleeper that has been sitting in the sun without the vehicle A/C running. If the interior temperature is higher than desired, start the engine and run the vehicle A/C system until the desired sleeper temperature is achieved. This will help cool the sleeper to a temperature the parked A/C system can maintain. Once the sleeper temperature is lowered, the system will maintain a comfortable setting.

The unit is located under the lower bunk in the sleeper compartment. The unit gets its intake air from the under-bunk area through a grate in the top panel. An air intake grille is located on the front panel of the lower bunk. The outlet ducting runs from the left side of the unit to an outlet near the bunk occupant's face on the back wall of the sleeper. It is important to keep the air intake grille, and the area under the bunk, free of objects that might block air flow or put objectionable odors into the cooling air. Air for the condenser is taken in from under the cab and exhausted through another opening in the cab floor.

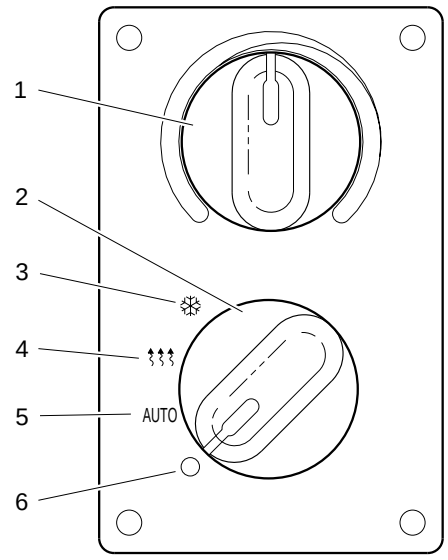
The system receives power from four deep-cycle batteries located between the frame rails. These batteries are completely isolated from the starting batteries to keep the starting batteries from being drawn down during operation.

IMPORTANT: The refrigerant system in the parked A/C unit is a sealed system, it is not serviceable. If problems occur; contact the NITE line at 1-866-204-8570, or visit www.nitesystem-.com.

Operation

The control panel for the parked A/C and heater is located on the back wall of the sleeper near the left side. It has a temperature control dial, and a four-position mode selector switch. Turn the temperature control dial to the left for cooling, and to the right for heat. See **Fig. 1**. See **Table 1** for a description of the function of the mode switch.

The system must be turned off whenever it is not in use, or the batteries may not charge properly. After using the system, turn the mode switch to the OFF position, even if the unit is not running.



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1. Temperature Control Dial
2. Mode Switch
3. A/C Only
4. Heat Only
5. AUTO
6. Off

Fig. 1, Parked A/C and Heater Control Panel

Parked A/C and Heater Mode Switch Operation	
Mode	**Function**
Off	Turns the unit off.
AUTO	Allows the unit to automatically heat or cool the sleeper, depending on the temperature setting and the sleeper temperature. Adjusts the compressor, heater, and fans to keep temperature constant.
Heat Only	Allows only the heat portion of the system to run. Adjusts the heater only to keep the temperature constant.

General Information

Parked A/C and Heater Mode Switch Operation	
Mode	**Function**
A/C Only	Allows only the A/C portion of the system to run. Adjusts compressor and fans only to keep the temperature constant.

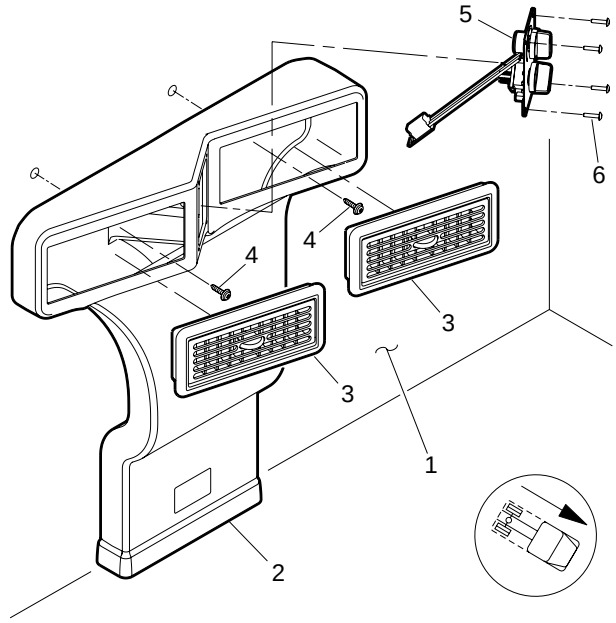
Table 1, Parked A/C and Heater Mode Switch Operation

Safety Precautions

IMPORTANT: The refrigerant system on this unit is **not** servicable. Do not attempt to open the refrigerant system. The only reason you should come in contact with the refrigerant is if there is a leak in the system.

Removal

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Remove the outlet grilles. See **Fig. 1**.



1. Sleeper Back Wall
2. Plenum
3. Grille
4. Plenum Screws
5. Control Panel
6. Control Panel Screws

Fig. 1, Plenum and Control Panel Installation

3. Remove the screws that hold the plenum to the back wall of the sleeper.
4. Tilt the plenum out from the wall, and disconnect the wires.
5. Remove the fasteners, and remove the control panel.

Installation

1. Position the control panel in the opening in the housing, and install the fasteners.
2. Connect the wires to the control panel.
3. Position the plenum, and install the fasteners.
4. Install the outlet grilles.
5. Connect the batteries.

Replacement

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.

NOTE: Mark all wires for reference before disconnecting them.

2. Disconnect the harness and the battery cables at the terminals under the sleeper floor. See **Fig. 1**.

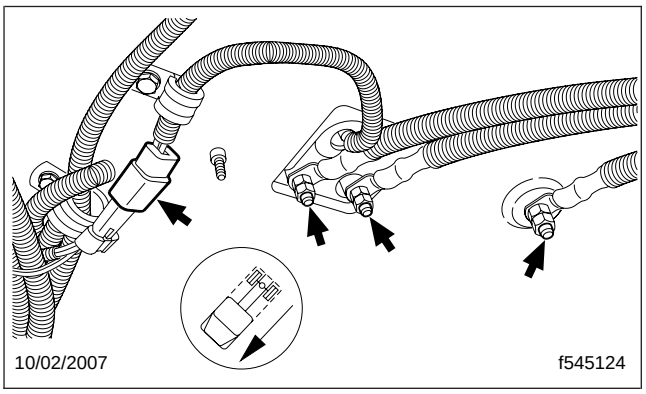


Fig. 1, Harness and Battery Cables

3. Raise and secure the lower bunk.
4. Disconnect the air duct from the outlet opening on the left side of the unit.
5. Disconnect the wires that go to the control panel.
6. Remove the nuts at the corners of the unit.

NOTE: The unit weighs approximately 70 lb (32 kg), and it is awkward to handle in the tight confines of the sleeper. Be careful when lifting it, to avoid personal injury or damaging the cab interior parts.

7. Lift the unit out of the under-bunk area.
8. Position the unit on the mounting studs in the under bunk area, and install the mounting nuts.
9. Connect the wires to the control panel.
10. Attach the air duct to the outlet opening in the left side of the unit.
11. Connect the harness and the battery cables to the terminals under the sleeper floor.
12. Connect the batteries.
13. Lower the bunk.

Replacement

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Raise and secure the lower bunk.
3. Remove the top panel. See **Fig. 1**.

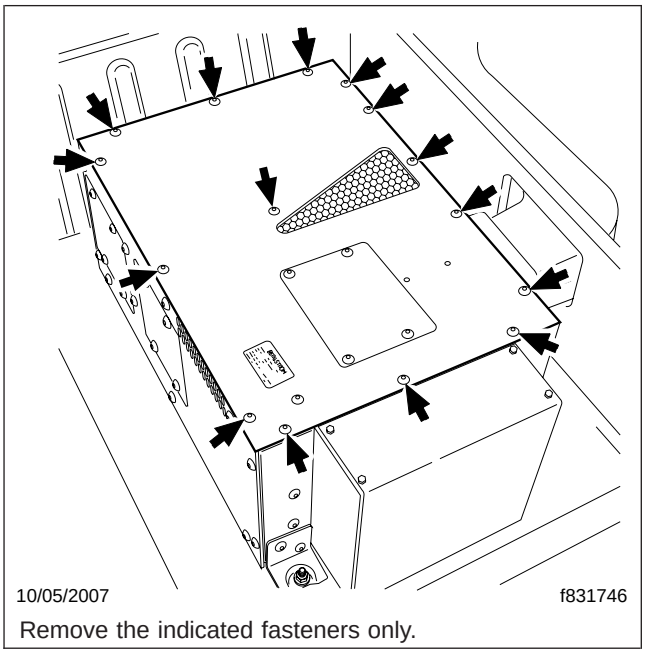


Fig. 1, Top Access Panel

4. Remove the two fasteners on the inside panel of the unit. See **Fig. 2**.
5. Remove the two fasteners on the outside of the unit, below the outlet duct.
6. Disconnect the wire connector at the blower.
7. Lift the blower assembly out of the unit housing.
8. Position the blower assembly in the unit housing.
9. Connect the wire connector at the blower.
10. Install the blower mounting fasteners; two inside, and two outside.
11. Connect the batteries.
12. Install the top panel.
13. Lower the bunk.

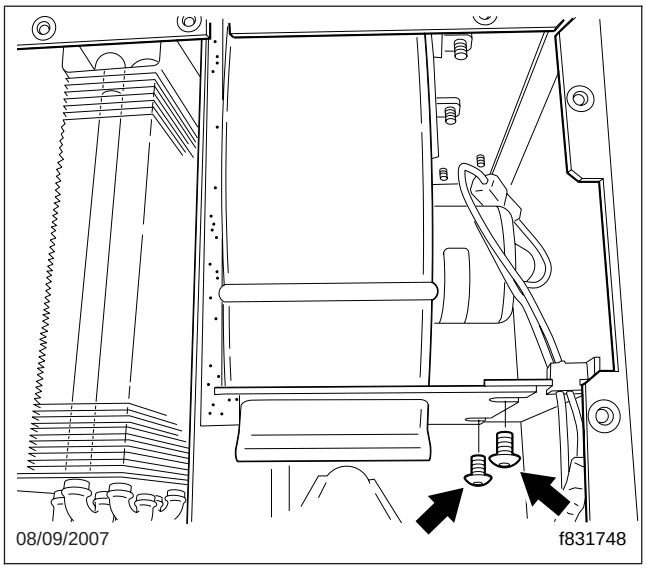
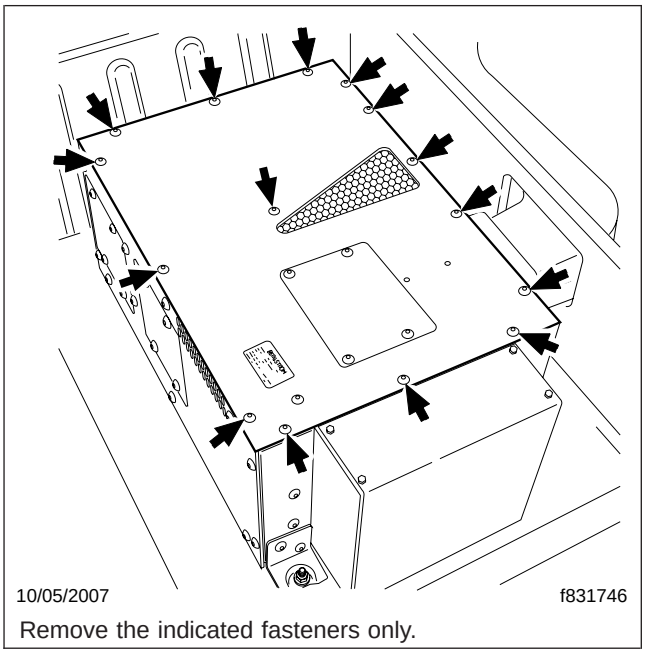


Fig. 2, Inside Blower Fasteners

Condenser Fan Replacement

Replacement

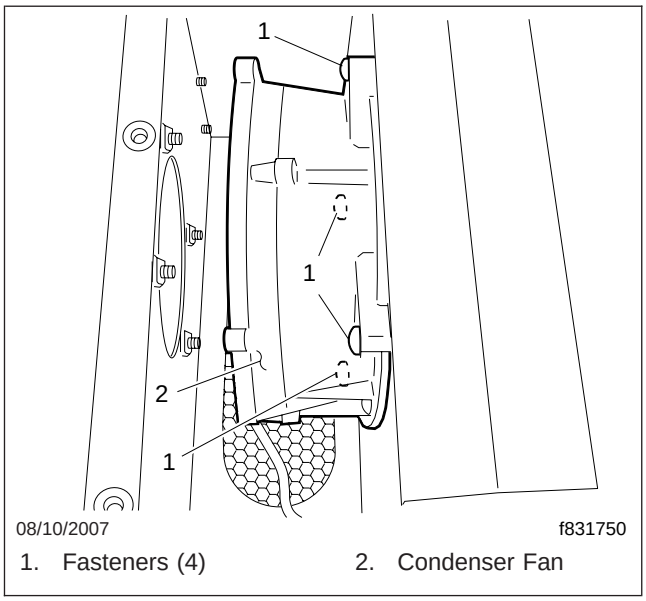
1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Raise and secure the lower bunk.
3. Remove the top panel. See **Fig. 1**.



Remove the indicated fasteners only.

Fig. 1, Top Access Panels

4. Remove the fasteners from the condenser fan assembly. See **Fig. 2**.
5. Cut any wire ties as needed, and disconnect the wire connector from the condenser fan.
6. Remove the condenser fan assembly from the unit housing.
7. Position the condenser fan assembly in the unit housing, and install the fasteners.
8. Connect the wire connector and install wire ties as needed.
9. Connect the batteries.
10. Install the top panel.
11. Lower the bunk.



1. Fasteners (4)
2. Condenser Fan

Fig. 2, Condenser Fan Installation

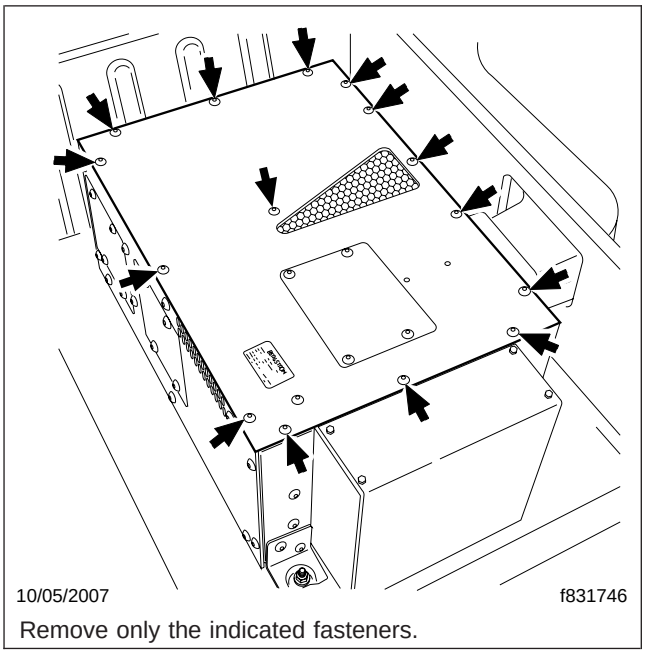
Compressor Control Module Replacement

Replacement

CAUTION

When removing or installing the control module housing, be very careful not to damage the exposed control board. Even a small chip or crack in the control board can ruin it.

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Raise and secure the lower bunk.
3. Remove the top panel. See **Fig. 1**.



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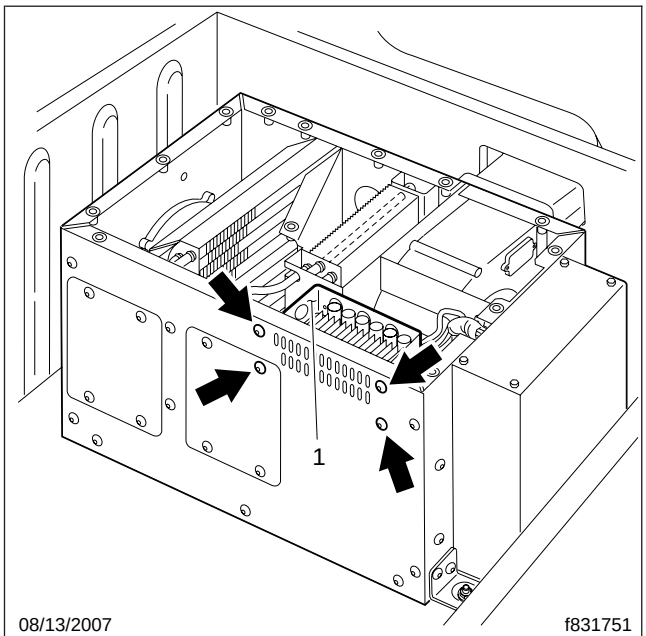
Remove only the indicated fasteners.

Fig. 1, Top Access Panels

4. Remove the four control module housing fasteners on the side panel. See **Fig. 2**.
5. Remove the nut from the compressor cap, and remove the compressor cap. See **Fig. 3**.
6. Mark the wires as needed, then disconnect the wires from the compressor. See **Fig. 4**.
7. Disconnect the power supply wires.
8. Disconnect the connector from the harness to the control board.
9. Carefully remove the compressor control module.



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1. Compressor Control Module

Fig. 2, Control-Module-Housing Fasteners

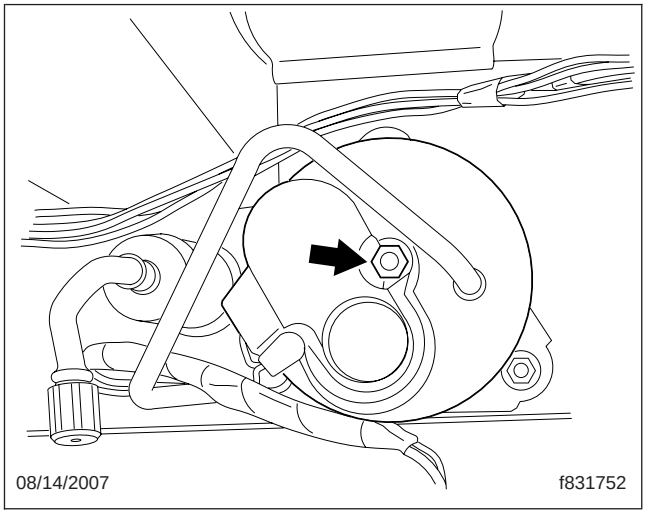

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Fig. 3, Compressor-Cap Nut

10. Connect the wire connectors to the compressor.
11. Install the compressor cap and nut.
12. Position the compressor control module in the unit housing.
13. Connect the wire connectors to the power supply and the control board.

Compressor Control Module Replacement

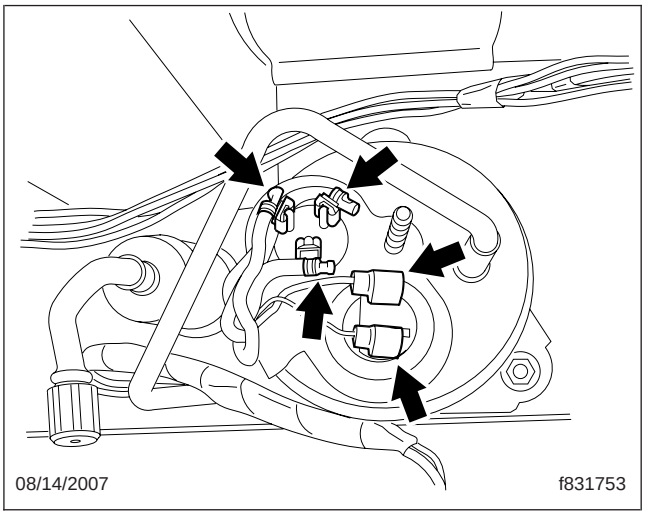


Fig. 4, Compressor Wires

14. Install the compressor control module fasteners.
15. Connect the batteries.
16. Install the top panel.
17. Lower the bunk.

Replacement

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Raise and secure the lower bunk.
3. Remove the top panel. See **Fig. 1**.

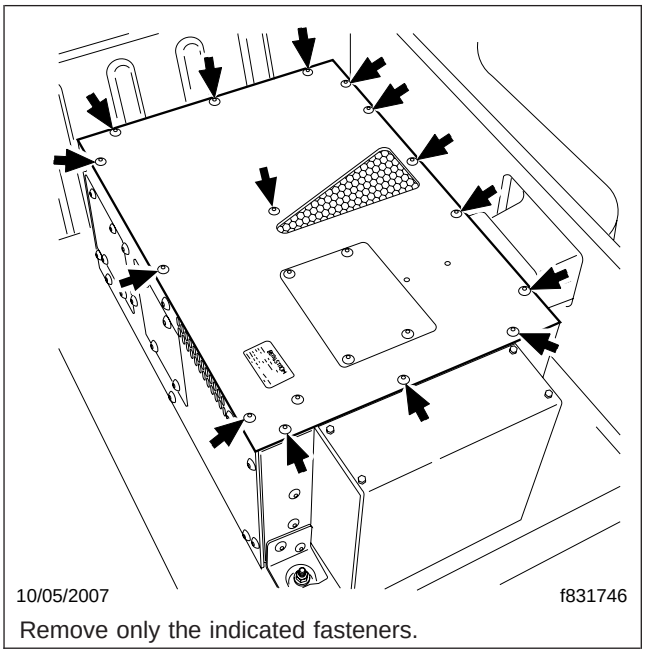


Fig. 1, Top Access Panels

4. Unplug the freeze switch.
5. Remove the fastener. See **Fig. 2**.
6. Remove the freeze switch probe from the evaporator coil, and pull the probe, wire, and rubber grommet out the hole on the panel. See **Fig. 3**.
7. Remove the freeze switch.
8. Insert the probe into the evaporator core in the same location as the original. Install the grommet in the hole in the panel.
9. Position the new freeze switch and install the fastener.
10. Connect the wire into the switch.
11. Connect the batteries.
12. Install the top panel.
13. Lower the bunk.

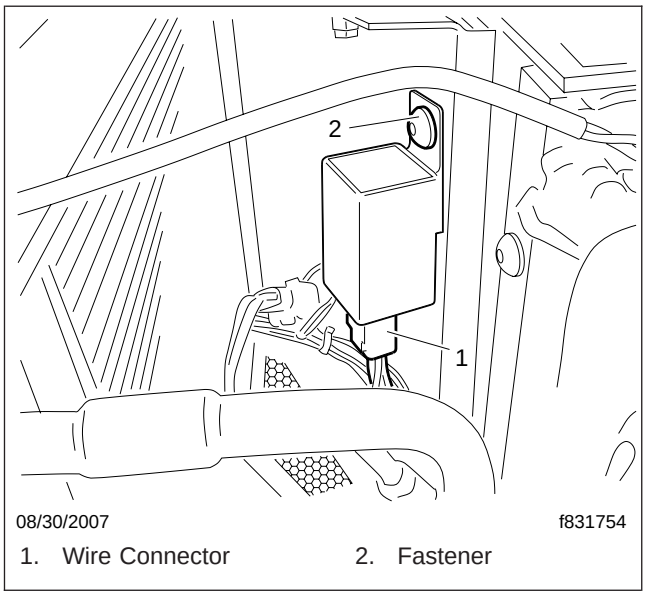


Fig. 2, Freeze Switch

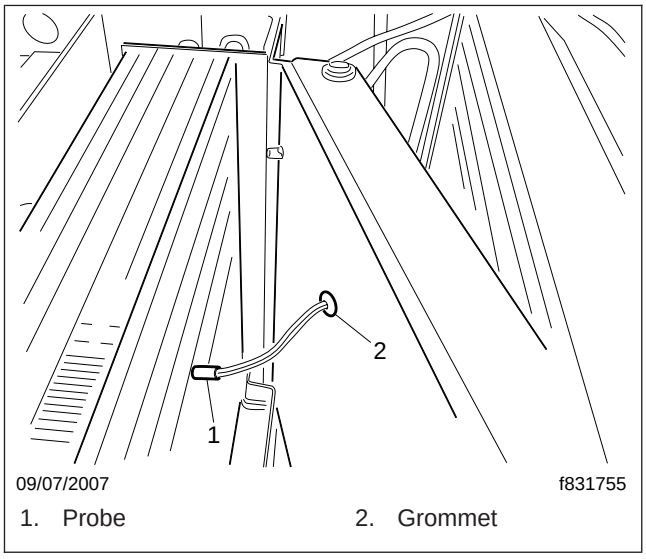


Fig. 3, Freeze Switch Probe

Replacement

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Raise and secure the lower bunk.
3. Remove the top panel. See **Fig. 1**.

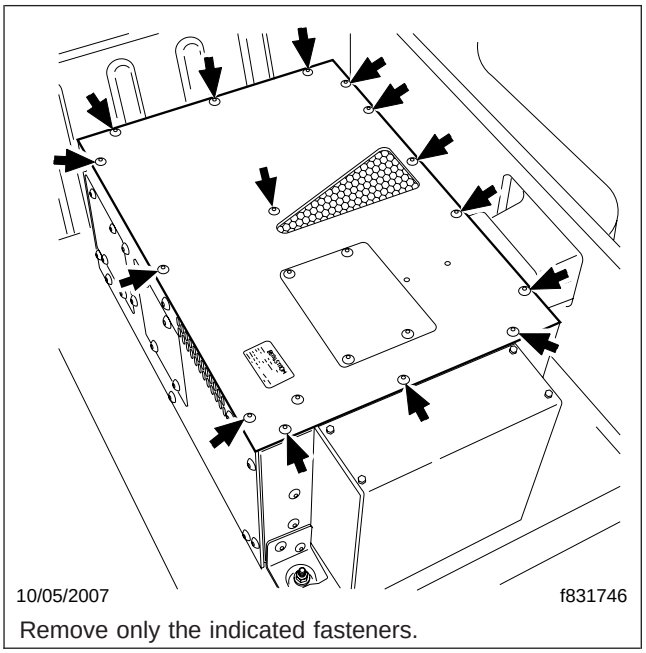


Fig. 1, Top Access Panel

4. Disconnect the three wire connectors from the unit control module. See **Fig. 2**.
5. Remove the electrical box cover. See **Fig. 3**.
6. Disconnect the wires from the bottom of the separator, under the sleeper. See **Fig. 4**.

NOTE: There may be a vapor barrier affixed to the bottom of the unit, including electrical box. If so, carefully cut it loose in order to be able to tilt the electrical box out from the unit without damaging the vapor barrier.

7. Remove the four sheetmetal screws that hold the electrical box to the front of the unit, and tilt the electrical box away from the unit. See **Fig. 5**.
8. Remove the fasteners for the control module mounting plate from the outside of the unit. See **Fig. 6**. Slide the mounting plate out of the unit with the control module attached.
9. Remove the control module fasteners, and remove the control module from the mounting plate. See **Fig. 7**.

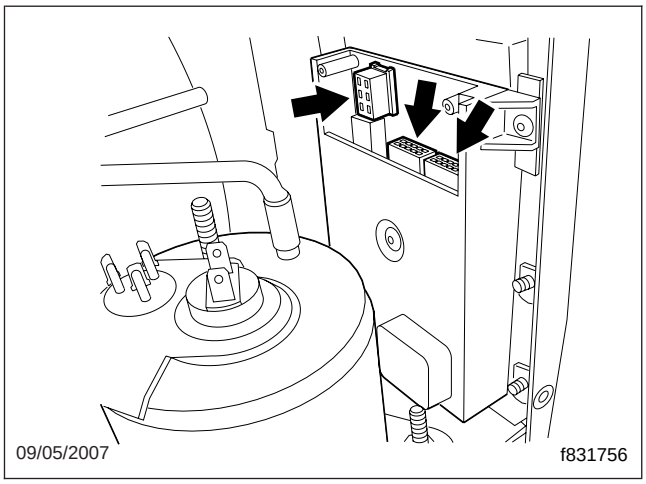


Fig. 2, Control Module Wiring

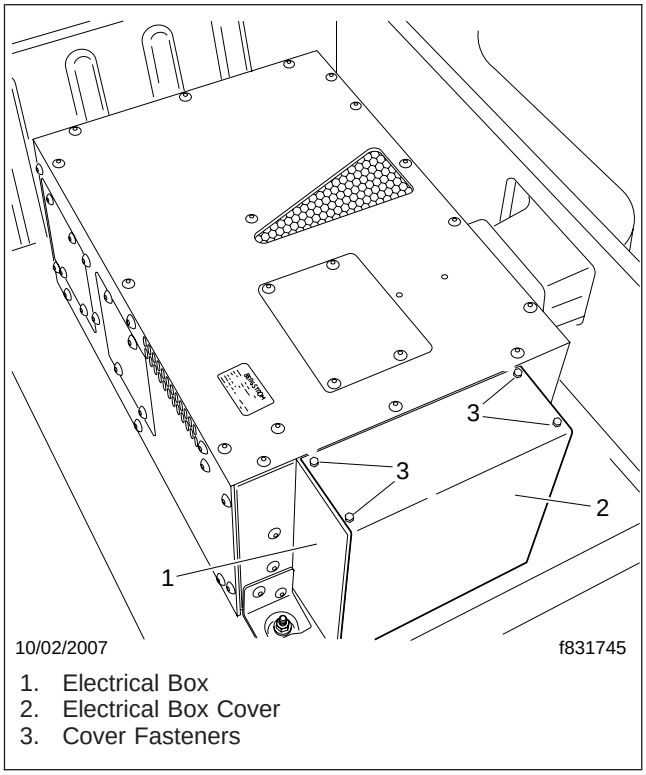


Fig. 3, Electrical Box Installation

Unit Control Module Replacement

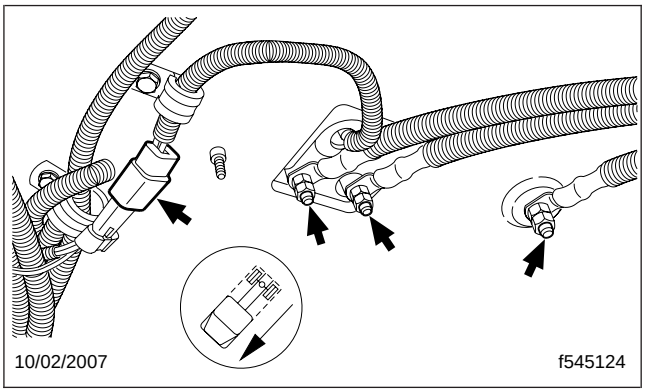
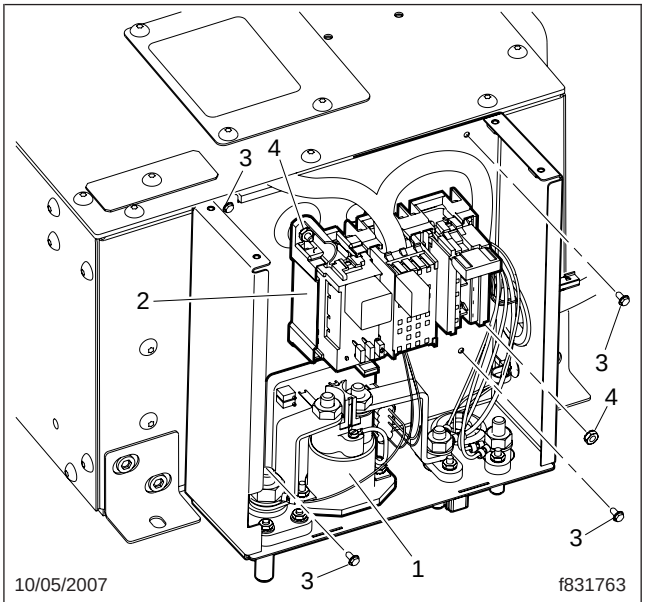


Fig. 4, Under Cab Wires



1. Separator
2. Fuse Panel
3. Sheetmetal Screws, Electrical Box (4)
4. Fuse Panel Nuts

Fig. 5, Fuse Panel and Separator

10. Position the control module on the mounting panel, and install the fasteners.
11. Position the mounting panel in the unit housing, and install the fasteners from the outside.
12. Position the electrical box, and install the screws.
13. Connect the wires to the bottom of the separator, under the sleeper.

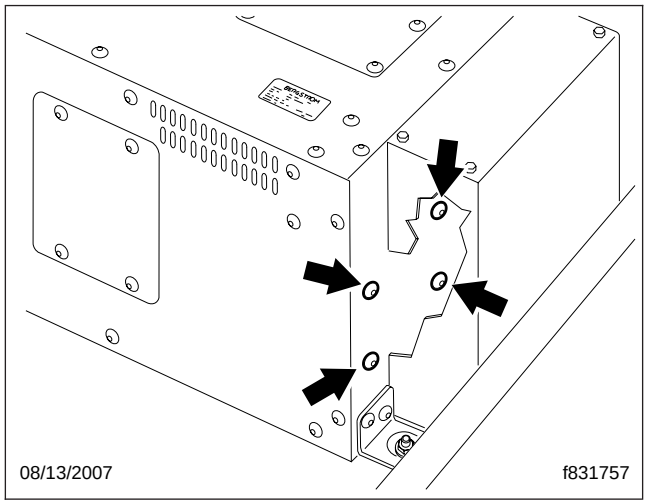


Fig. 6, Control Module Mounting-Plate Fasteners

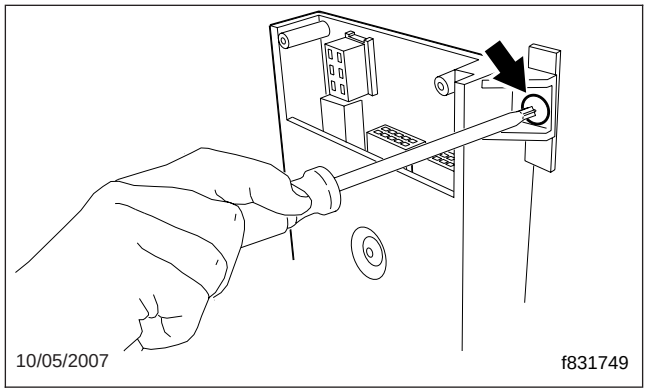
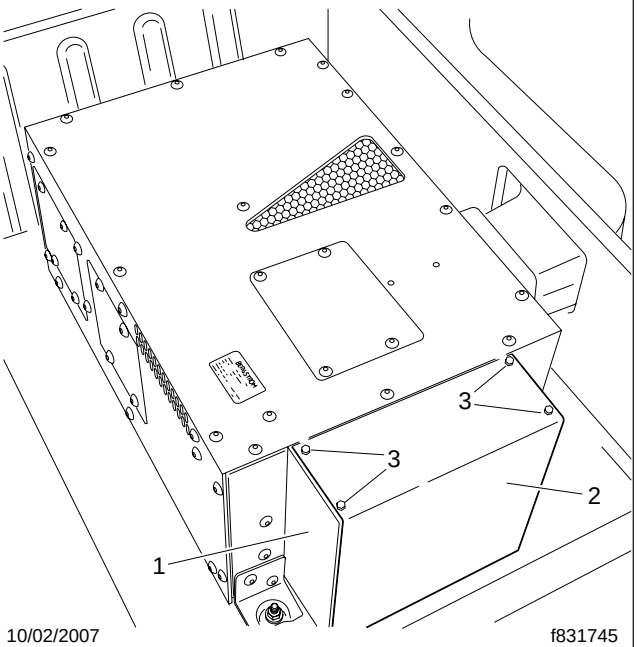


Fig. 7, Control Module Fastener

14. Connect the three wiring connectors to the control module.
15. Connect the batteries.
16. Install the top panel and electrical box cover.
17. Lower the bunk.

Removal

1. Park the vehicle on a level surface, shut down the engine, set the parking brakes, and chock the tires. Disconnect the vehicle batteries.
2. Raise and secure the lower bunk.
3. Remove the electrical box cover. See **Fig. 1**.



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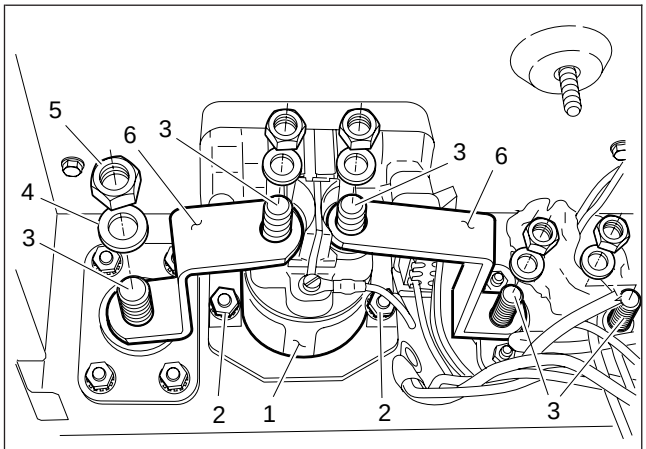
1. Electrical Box
2. Electrical Box Cover
3. Cover Fasteners

Fig. 1, Electrical Box Cover

4. Remove the nuts and washers from the terminals, and remove the two copper buss bars. See **Fig. 2**.
5. Remove the separator mounting nuts, and remove the separator.
6. Position the new separator, and install the mounting nuts.
7. Position the buss bars and install the mounting nuts and washers.
8. Connect the batteries.
9. Install the electrical box cover.
10. Lower the bunk.



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1. Separator
2. Separator Mounting Nut
3. Terminal
4. Washer
5. Terminal Nut
6. Copper Buss Bars

Fig. 2, Separator Installation

Operational Checks

Table 1 explains how to check the main components of the system for proper operation.

Operational Checks		
Component	**Function**	**Operational Check**
Evaporator Blower	Draws cab air through the evaporator coils and blows it through the ducting back to the cab. The system is 100% recirculation. There are two air intakes; one on the unit, and one on the front lower panel of the bunk.	Switch the NITE control to position 1; you must feel air coming out of the duct louvers. Then switch the NITE control to position 2; you must feel an increase of the airflow coming out of the duct louvers. NOTE: Make sure nothing blocks the air intake opening (recirculation) on the NITE unit or the bunk.
Condenser Fan	Takes ambient outside air from under the sleeper floor and blows it through the condenser coil to cool it, then exhausts it through the floor outside the vehicle.	With the unit running, go under the sleeper and check that air is flowing into the unit at the intake, and out of the condenser air outlet.
Compressor	Compresses the refrigerant and moves it through the system.	With the compressor running at LOW speed, listen or feel the compressor speed by its sound and vibration. Wait 1 minute. Then set the control to HIGH speed: you must notice a change in the sound and/or vibration of the unit when the compressor speed changes.

Table 1, Operational Checks

Unit Electrical Power Checking

1. Check the NITE unit voltage.
   - 1.1 Locate the power supply cables (red and black cables) close to the unit.
   - 1.2 Check the voltage.

     When the NITE batteries are fully charged, and when the control position is on HIGH, you must read between 12 and 12.5 volts.
2. Check the NITE unit current.
   - 2.1 Switch the NITE unit control to the HIGH position.
   - 2.2 Using a clamp-on inductive ammeter, measure the current on the NITE unit power supply (red) cable. You must read between 27 and 35 Amps.

Air Temperature at the Louvers

Check the louvers temperature: when the NITE unit control is on HIGH position, when the sleeper temperature is between 75 and 80°F (24 and 27°C), and when the outside temperature is between 90 and 95°F (195 and 205°C), measure the temperature directly at one of the duct louvers. You must read between 55 and 62°F (13 and 17°C).

Condenser Outlet Temperature

As described earlier in this document the NITE unit pulls air from outside, under the sleeper floor, to cool down the condenser coil, then the air is rejected to the outside from the sleeper floor too. When the NITE unit is running in HIGH position, go under the sleeper and locate the condenser air outlet (rectangle opening with a screen). The temperature at the condenser outlet must be 10 to 20°F (6 to 12°C) higher than the outside temperature.

Temperature/Amperage Testing

1. Set mode to A/C only.
2. Set the temperature setting to max cold.
3. Place your hand on the sensor so it detects high temperature.

4. Open the vehicle doors and allow the ambient temperature to stabilize on the condenser and unit.
5. Let the unit run about 10 minutes before measuring the temperature and current.

   Table 2 shows temperature and amperage parameters for testing the system.

Separator Electrical Checking, Engine OFF

1. Check for loose electrical connections.
2. Check that the installation is wired according to the electrical diagram. See **Specifications, 400** for wiring diagrams.
3. Check that the 16 gauge ground wire is connected to the bottom blade terminal of the separator on one end, and to a good ground on the other end.
4. Check that the batteries are properly connected.
5. Make sure the battery ground cable is connected to a good ground.
6. Make sure the NITE unit power cables are connected to the correct terminals of the NITE batteries. The red cable goes to the positive terminal; the black cable goes to the ground.
7. Check that the voltage on the vehicle batteries is the same as the voltage at the separator (main batteries side). When checking the voltage on the separator, use the ground terminal on the separator. Both voltage readings should be the same.
8. Check that the voltage on the NITE batteries is the same as the voltage on the separator ("AUX" batteries side). When you check the voltage at the separator, use the ground terminal on the separator. Both voltage readings should be the same (approximately 12 volts).

Separator Electrical Checking, Engine Running

The separator controls the charging of the batteries as follows.

- When the engine is running, the alternator charges the vehicle batteries only, until the vehicle battery voltage reaches 13.2 volts. During this period, the separator is open and the NITE batteries are not being charged.
- When the vehicle batteries reach 13.2 volts, the separator closes, allowing the NITE batteries to charge.

1. With the engine running, check the voltage of the vehicle batteries. It should be higher than the voltage when the engine is OFF, more than 13 volts.
2. Check that the separator is operating properly. When the vehicle battery voltage reaches 13.2 volts, the separator closes, and the system starts charging the NITE batteries. There is an audible “click” when the separator closes.
3. With the engine running, check the voltage of the NITE batteries. It should be higher than the voltage when the engine is OFF, and approximately the same as the vehicle batteries.
4. Verify that the separator is allowing the NITE batteries to charge. Using a clamp-on-type inductive ammeter, on the cable that connects the separator to the NITE batteries positive terminal, measure the amps going to the NITE batteries. It should read more than 0 amps.

Temperature and Amperage Parameters		
Ambient Temperature: °F (°C)	**Louver Temperature: °F (°C)**	**Amps**
65 (18)	47–53 (8–12)	21–27
66 (19)	48–54 (9–12)	21–27
67 (19)	49–55 (9–13)	22–28
68 (20)	50–56 (10–13)	22–28
69 (21)	51–57 (11–14)	23–29
70 (21)	52–58 (11–14)	23–29

Temperature and Amperage Parameters		
Ambient Temperature: °F (°C)	**Louver Temperature: °F (°C)**	**Amps**
71 (22)	54–60 (12–16)	24–30
72 (22)	55–61 (13–16)	24–30
73 (23)	56–62 (13–17)	25–31
74 (23)	57–63 (14–17)	25–31
75 (24)	58–64 (14–18)	26–32
76 (24)	59–65 (15–18)	26–32
77 (25)	60–66 (16–19)	27–33
78 (26)	60–66 (16–19)	27–33
79 (26)	61–67 (16–19)	27–33
80 (27)	62–68 (17–20)	28–34
81 (27)	63–69 (17–21)	28–34
82 (28)	64–70 (18–21)	29–35
83 (28)	65–71 (18–22)	29–35
84 (29)	66–72 (19–22)	30–36
85 (29)	67–73 (19–23)	30–36
86 (30)	68–74 (20–23)	30–36
87 (31)	69–75 (21–24)	31–37
88 (31)	69–75 (21–24)	31–37
89 (32)	70–76 (21–24)	32–38
90 (32)	71–77 (22–25)	32–38
91 (33)	72–78 (22–26)	32–38
92 (33)	73–79 (23–26)	33–39
93 (34)	73–79 (23–26)	33–39
94 (34)	74–80 (23–27)	33–39
95 (35)	75–81 (24–27)	34–40
96 (36)	76–82 (24–28)	34–40
97 (36)	77–83 (25–28)	35–41
98 (37)	77–83 (25–28)	35–41
99 (37)	78–84 (26–29)	35–41
100 (38)	79–85 (26–29)	36–42
101 (38)	80–86 (27–30)	36–42
102 (39)	80–86 (27–30)	36–42
103 (39)	81–87 (27–31)	37–43
104 (40)	82–88 (28–31)	37–43
105 (41)	82–88 (28–31)	37–43

Table 2, Temperature and Amperage Parameters

Specifications

Table 1 details technical specifications of the NITE system as installed on Century Class Trucks. **Table 2** shows temperature and amperage parameters for testing the system.

Figure 1, **Fig. 2**, and **Fig. 3** show the wiring diagram for the Parked HVAC system.

System Specifications		
A/C	Cooling Capacity	3600 BTU/Hour
	Voltage	12 Volts DC
	System Power	400–405 Watts
	Dimensions	22 x 16 x 11 Inch (560 x 406 x 280 mm)
Power	Capacity	440 amp hours
	Battery Life	2+ years
	Operation time	10–12 hours
	Recharge time	4–6 hours
	Battery count	4

Table 1, System Specifications

Temperature and Amperage Parameters		
Ambient Temperature: °F (°C)	**Louver Temperature: °F (°C)**	**Amps**
65 (18)	47–53 (8–12)	21–27
66 (19)	48–54 (9–12)	21–27
67 (19)	49–55 (9–13)	22–28
68 (20)	50–56 (10–13)	22–28
69 (21)	51–57 (11–14)	23–29
70 (21)	52–58 (11–14)	23–29
71 (22)	54–60 (12–16)	24–30
72 (22)	55–61 (13–16)	24–30
73 (23)	56–62 (13–17)	25–31
74 (23)	57–63 (14–17)	25–31
75 (24)	58–64 (14–18)	26–32
76 (24)	59–65 (15–18)	26–32
77 (25)	60–66 (16–19)	27–33
78 (26)	60–66 (16–19)	27–33
79 (26)	61–67 (16–19)	27–33
80 (27)	62–68 (17–20)	28–34
81 (27)	63–69 (17–21)	28–34
82 (28)	64–70 (18–21)	29–35
83 (28)	65–71 (18–22)	29–35
84 (29)	66–72 (19–22)	30–36

Specifications

Temperature and Amperage Parameters		
Ambient Temperature: °F (°C)	**Louver Temperature: °F (°C)**	**Amps**
85 (29)	67–73 (19–23)	30–36
86 (30)	68–74 (20–23)	30–36
87 (31)	69–75 (21–24)	31–37
88 (31)	69–75 (21–24)	31–37
89 (32)	70–76 (21–24)	32–38
90 (32)	71–77 (22–25)	32–38
91 (33)	72–78 (22–26)	32–38
92 (33)	73–79 (23–26)	33–39
93 (34)	73–79 (23–26)	33–39
94 (34)	74–80 (23–27)	33–39
95 (35)	75–81 (24–27)	34–40
96 (36)	76–82 (24–28)	34–40
97 (36)	77–83 (25–28)	35–41
98 (37)	77–83 (25–28)	35–41
99 (37)	78–84 (26–29)	35–41
100 (38)	79–85 (26–29)	36–42
101 (38)	80–86 (27–30)	36–42
102 (39)	80–86 (27–30)	36–42
103 (39)	81–87 (27–31)	37–43
104 (40)	82–88 (28–31)	37–43
105 (41)	82–88 (28–31)	37–43

Table 2, Temperature and Amperage Parameters

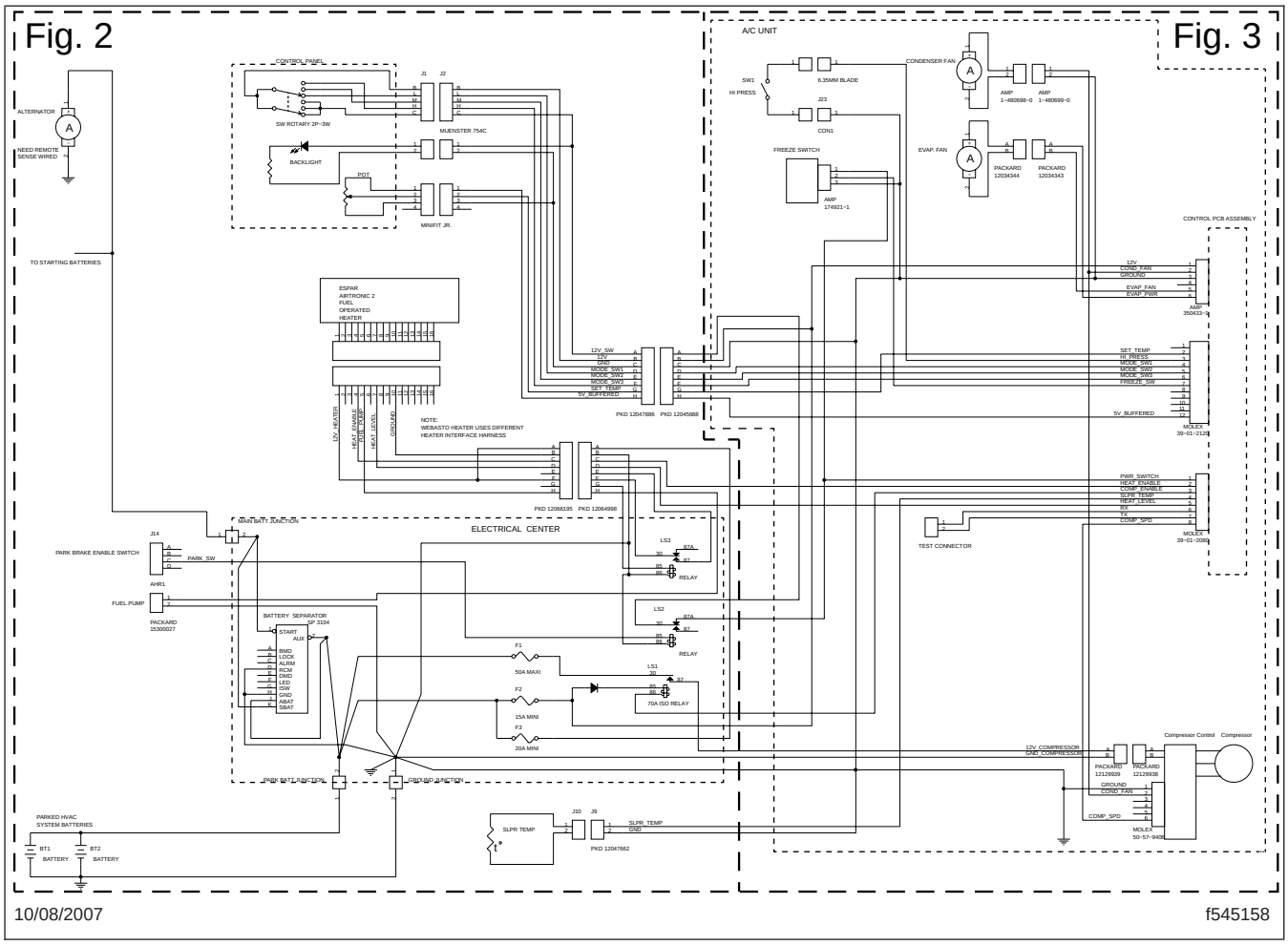

Fig. 1, Parked HVAC Wiring

Specifications

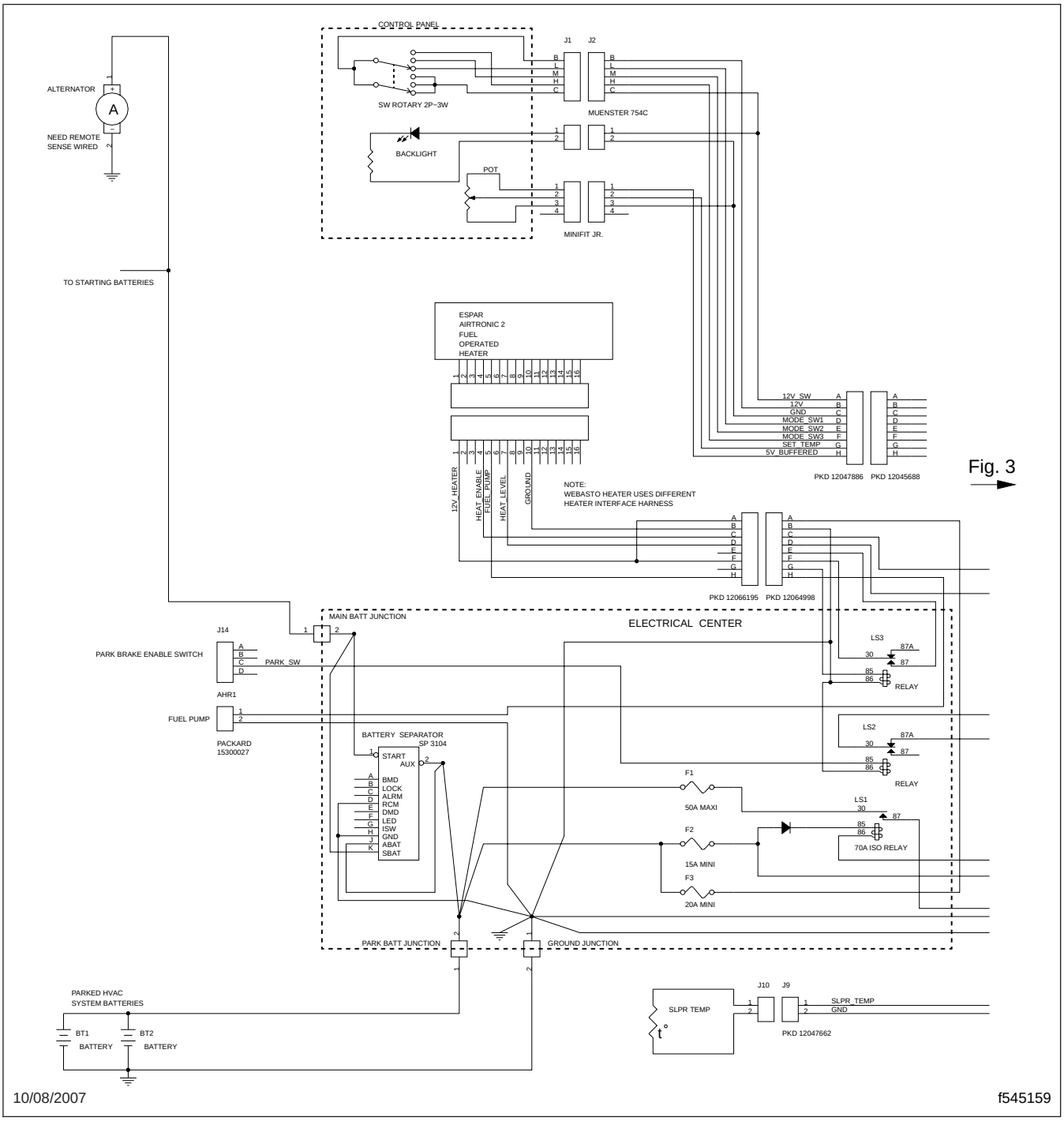

Fig. 3

Fig. 2, Parked HVAC Wiring (expanded, part 1)

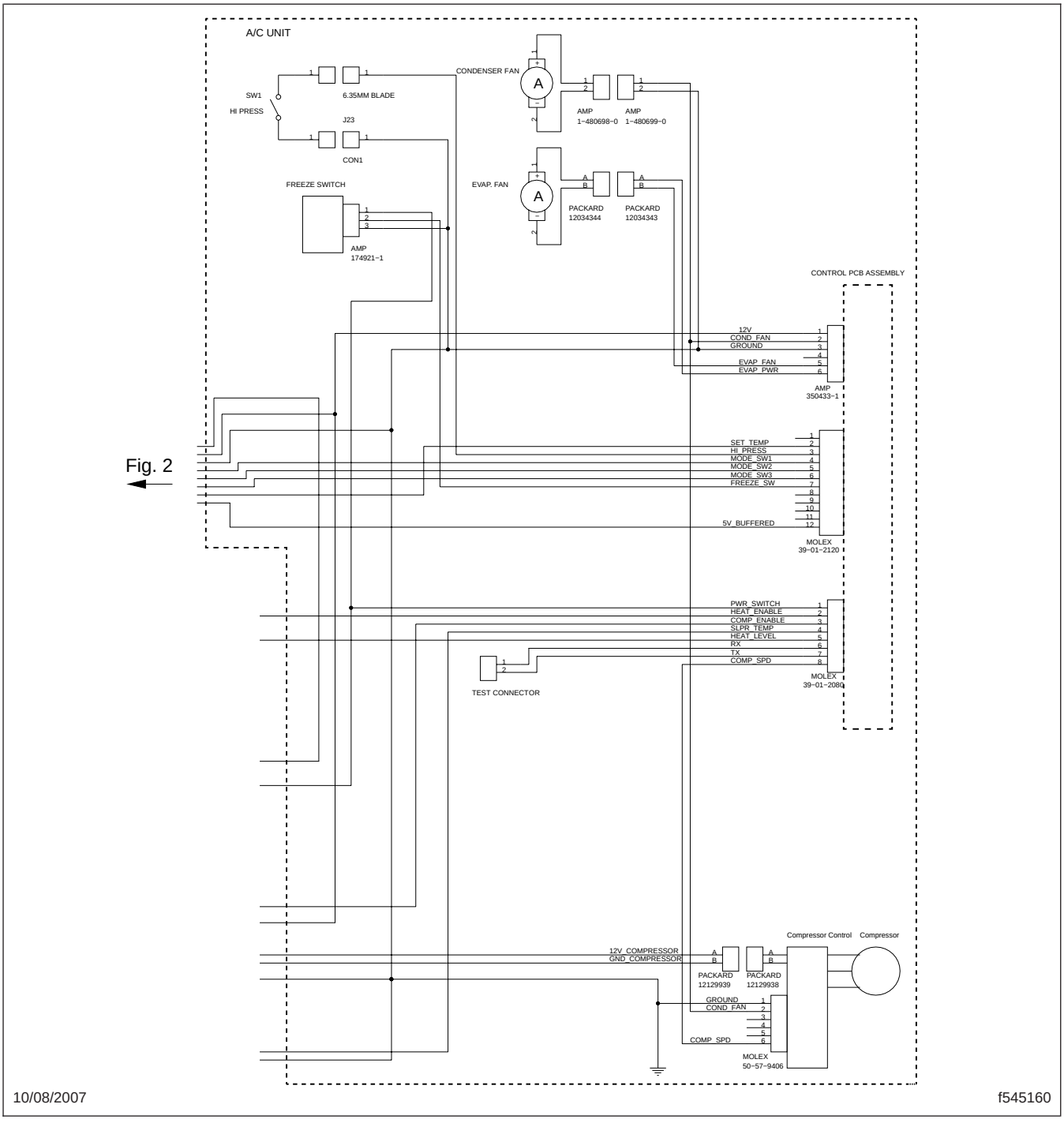

Fig. 2

Fig. 3, Parked HVAC Wiring (expanded, part 2)