



Technical Information and Diagnostic Guide FOR

Freightliner *Park Smart* No Idle System

This guide will assist you in becoming more familiar with the working components of the **Park Smart®** System and the proper steps and procedures to completely diagnose the no idle unit.

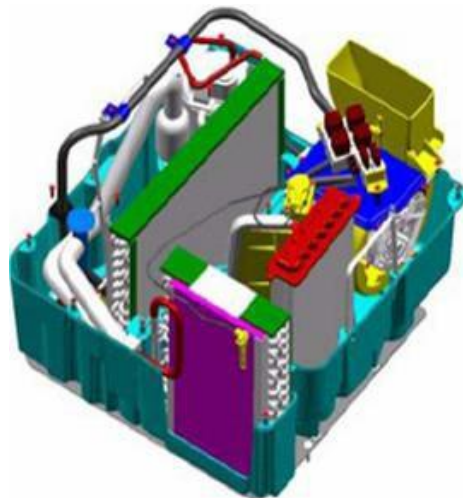


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A: Battery Separator

The battery separator is used for separating the trucks main starting batteries from the **AUX** batteries. It also allows the charging of the **AUX** batteries after the main truck batteries are charged above 13.2 Volts. Mounting is outside the truck on the frame rail.

This device should be protected from the elements
due to corrosion and exposure to short circuits.



B: F1 Fuse 60 Amp (Maxi)

This fuse provides short circuit protection for the compressor.
Location: On the control center.

C: F2 Fuse 15 Amp (Mini)

This fuse provides short circuit protection for the unit controls.
Location: On the control center

D: F3 Fuse 20 amp (Mini)-Heater

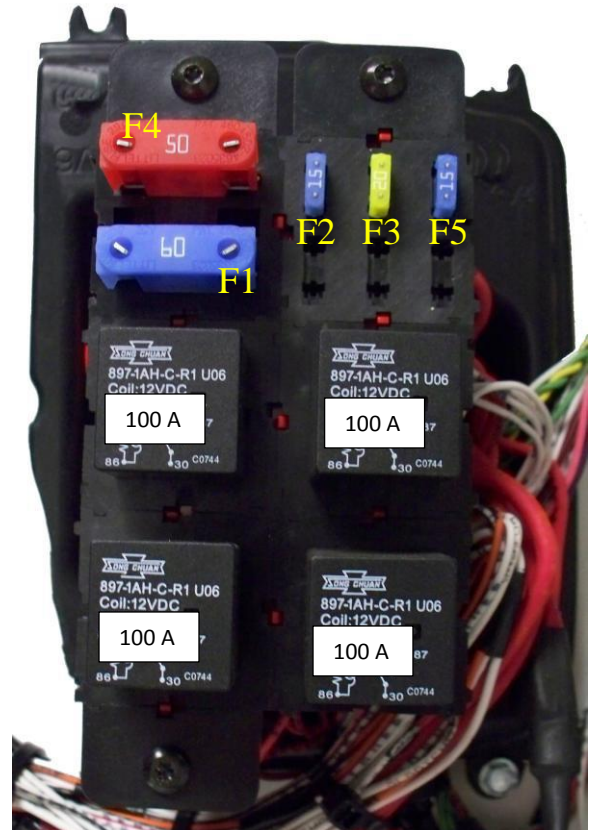
This fuse provides protection for the fuel fired heater.
Location: On the control center

E: F4 Fuse 50 Amp (Maxi)

This fuse provides protection for the evaporator blower.
Location: On the control center

F: F5 Fuse 15 Amp (Mini)

This fuse provides protection for the condenser fan.
Location: On the control center



NEVER INSTALL FUSE F6. THIS IS FOR PROGRAMMING ONLY AND IF INSTALLED IT WILL DISABLE THE PARKSMART UNIT!

G: Relays

Location: On the control center

LS1. This relay controls the voltage to the compressor controlling section of the Control PCB Assembly when in the **(ENGINE ON MODE)**

LS2. This relay controls the voltage to the condenser fan and the evaporator blower when in the **(ENGINE ON MODE)**

LS3. . This relay controls the voltage to the compressor controlling section of the Control PCB assembly when in the **(PARKED MODE OR ENGINE OFF-KEY ON MODE)**

LS4. This relay controls the voltage to the condenser fan and the evaporator blower when in the **(PARKED MODE OR ENGINE OFF-KEY ON MODE)**



H: Blend Door Actuator

This actuator operates the blend door, changing the air flow path through the Park Smart evaporator coil and heater core.



I: AUX Control

Panel Lights for 8 seconds when touched in Park mode.

Operates like standard Auxiliary HVAC when the engine is running.



Pushing “PARKED” button with engine off/brakes set starts parked mode.

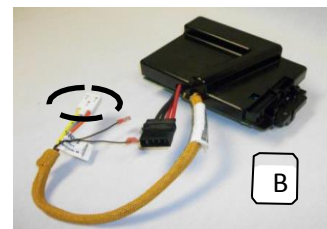
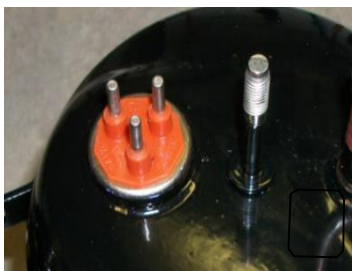
Unit exits parked when, engine is Started, unit is shut off or Parked batteries are depleted.

A: Control PCB Assembly

This device stores the operating program and controls the **Park Smart** Unit, as well as controls the output voltage to the variable speed compressor. It is located in the lower section under the evaporator blower and fuse center.



Photo (B) shows Control PCB Assembly for units built after 4 - 2012. This assembly has cluster block connections.



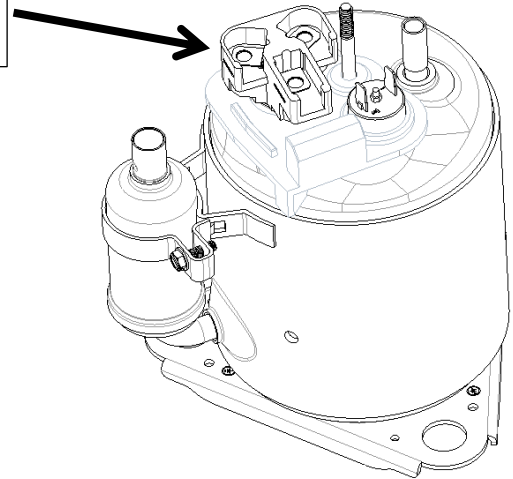
Units built with **cluster block** compressor Follow instructions on pages 34-37 for Harness and Controller Service.

B: Compressor

This unit is part of the hermetically sealed refrigeration system.

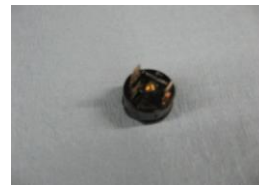


Units built with **RING TERMINAL** compressor.
Follow instructions on pages 38-41 for Harness
and Controller Service. New 10-2015



C: Thermal Limit Switch on Compressor

This is a normally closed switch to protect compressor from high temperature.



D: Evaporator Blower

This blower pulls air through the evaporator coil to cool the interior of the sleeper.



E: Condenser Fan

This fan draws air from outside underneath the truck and pushes it through the condenser coil to cool the refrigerant flowing through the system. The hot air is exhausted under the truck.



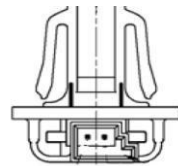
F: High Pressure Switch

This normally closed, brazed pressure switch will open and prevent the operation of the compressor if high internal pressure develops in the system. It is NOT serviceable.



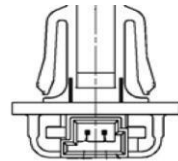
G: Evaporator Sensor/Freeze Switch

This sensor stops and prevents the operation of the compressor if ice was to form on the evaporator coil. See appendix G page 14 for test instructions.



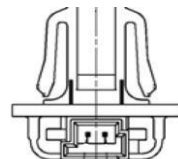
H: Sleeper Sensor

This sensor monitors the sleeper compartment temperature. See appendix N page 16 for test instructions.



I: Outside Air Sensor

This sensor monitors the air at the condenser coil. See appendix O Page 16 for test instructions.



Park Smart System Diagnostic Table

TRUCK MUST BE IN PARKED MODE TO PERFORM DIAGNOSTIC TESTS!

***For additional wiring diagrams and J1939 fault codes see Freightliner doc
C02.03***

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION / SEE APPENDIX
Unit Will Not Run or Turn On	<ol style="list-style-type: none"> Loose connection No power is available at the unit. F6 programming fuse has been installed Blown fuse or fuses Defective AUX Control panel. Lost signal to Aux Control Panel -WAKE UP Control PCB Assembly defective. Park Switch defective or wrong logics. No 12 volts to pin C3 battery sense. Broken wire or defective wire harness Parked button illuminates for a couple of seconds but unit does not run. 	<ol style="list-style-type: none"> Confirm all connections are tight, including ground lugs, and terminals crimped on wires and battery cables. Check AUX batteries for voltage. Low voltage cut out 11.3 Remove F6 programming fuse and cycle power off to reset. Check F2 fuse for continuity and/or voltage and 12 volt input at pin C1 on Control PCB Assembly. See appendix F. Check for 12 volts and ground at AUX control panel. See appendix C Check Wake up signal pin D6 on Control PCB Assembly. See appendix C and /or I. Test Control PCB Assembly. See appendix I Truck parked 0 volts to pin C4. Brakes released 12 volt to pin C4. Check for input. See Appendix I Check unfused 12 volt power signal from Aux batteries to C3. See appendix I Inspect all wiring and harness connections. Check for loss of communication on Can Bus J1939. Check for loss of wake up signal (switched to ground) from control to pin D6 on Control PCB Assembly. See appendix C
Unit runs in parked mode but not engine running mode.	<ol style="list-style-type: none"> Broken wire to relay to LS1 and/or LS2 relays LS1 and / or LS2 relay defective Fuse F2 blown Lost output (ground) from Control PCB Assembly pin D10 and/ or D11 going to LS1 and LS2 relays. 	<ol style="list-style-type: none"> Inspect all wiring and harness connections. Check connections and test both relays. See appendix D Check fuse. See appendix F Determine if ground from Control PCB Assembly has failed. See appendix I
Unit runs in <i>Engine On</i> mode, but not <i>Engine Off</i>	<ol style="list-style-type: none"> Low Aux Batteries Park Brake Signal Wake Up Signal Relays LS3/LS4 Wiring Harness Heater Enable Signal 	<ol style="list-style-type: none"> Check Aux batteries and battery separator. See Appendix A & B Park brake switch defective, wiring harness issue or wrong switch logics Loss of wake up signal. Check Aux control panel and control PCB Assy. See Appendix C & I. Check relays and wiring. See Appendix D Check wiring harness connectors and physical condition. Check for Aux battery voltage (12V) at the control PCB Assy pin C3.

Park Smart System Diagnostic Table

TRUCK MUST BE IN PARKED MODE TO PERFORM DIAGNOSTIC TESTS!

PROBLEM	POSSIBLE CAUSE	CORRECTIVE ACTION / SEE APPENDIX
Unit Runs - But Does Not Blow Cold Air	<ol style="list-style-type: none"> 1. Airflow blockage. 2. Compressor Fuse or Relay. 3. Compressor controller connections. 4. Compressor controller board. 5. High pressure switch 6. Evaporator Sensor/Freeze switch defective 7. Compressor thermal switch 8. Defective compressor 9. Blend door position. 10. Evaporator blower 11. Loss of charge (refrigerant system not serviceable). 	<ol style="list-style-type: none"> 1. Clear any blockage from recirculation grill or louvers. Also check condenser inlet and outlet for restriction (under truck). 2. Check F1 fuse and PARKED MODE LS3 relay. See appendix F and D 3. Confirm all wire harness plugs are connected. 4. Check Control PCB Assembly. See appendix I 5. Check pressure switch. See appendix E 6. Check freeze switch. See appendix G 7. Check thermal switch. See appendix H 8. Check power to compressor. See appendix I 9. Check blend door operation. See appendix M 10. Check Evaporator blower. See appendix K 11. If all tests check OK a loss of charge may have occurred.
Unit Cycles On And Off	<ol style="list-style-type: none"> 1. Poor electrical connection. 2. Condenser fan inoperative. 3. Air flow blockage causing high pressure or freeze condition. 	<ol style="list-style-type: none"> 1. Check all electrical connections. 2. Check condenser fan. See appendix J 3. Check for restricted airflow under truck at condenser inlet and outlet and at louvers and recirculation grill. Check pressure switch and/or freeze switch. See appendix E and G
Unit Blows Cold Air, But Low Airflow	<ol style="list-style-type: none"> 1. Check all duct work connections. 2. Air flow restricted 3. Evaporator Blower motor inoperative. 	<ol style="list-style-type: none"> 1. Make sure all ducts are connected, sealed and secure. 2. Check for airflow at louvers and recirculation grill. 3. Check evaporator blower motor. See appendix K
Unit Runs Correctly, But Less Than Expected Run Time	<ol style="list-style-type: none"> 1. Ground terminal(s). 2. AUX batteries weak or not charged correctly. 3. Separator not functioning correctly. 4. Trucks main batteries poor condition 5. High amperage draw 6. Defective Outside air temperature sensor. 	<ol style="list-style-type: none"> 1. Inspect and tighten ALL connections. 2. Check AUX batteries for condition and state of charge. See appendix A 3. Check separator connections and operation. See appendix B 4. Check Main truck batteries for condition and state of charge. See appendix A 5. Use DC ammeter to check amps when running. Excessive amperage could signal compressor or internal component issue. Amperage ranges 40A to 75A depending on conditions 6. Energy management will stop and amp usage will increase. 7. See appendix O.
Unit is Noisy or Vibrates	<ol style="list-style-type: none"> 1. Evaporator Blower motor. 2. Condenser fan motor. 3. Compressor mounting. 	<ol style="list-style-type: none"> 1. Check evaporator blower. See appendix K 2. Check condenser fan. See appendix J 3. Check rubber compressor mounts. See appendix L
Unit runs but does not blow hot air	<ol style="list-style-type: none"> 1. Heater power and ground 2. Heater fuse 3. Wiring harness 4. Heater enable signal 	<ol style="list-style-type: none"> 1. Check for power at the heater pins 1 & 2 2. Check heater fuse F3. See page 5. 3. Check wiring harness connectors and physical condition 4. Check for heater enable 12V at heater pin 7 from control PCB assy, pin C15

NOTE: Heater diagnostics can be performed using Espar's EDITH diagnostics lap top based program. You must have the ISO cable adapter for the ParkSmart Hydronic heater. It is proprietary to Freightliner and other cable adapters will not interchange!

Appendix

A. Battery Condition and Performance:

Battery Voltage is critical for system operation. Special attention should be given to both sets of batteries.

Attention: Poor quality truck batteries or a weak alternator will have a Negative impact on **Park Smart** unit run time. Always maintain the best possible batteries and charging system.

Standard alternator 270 Amp.

Load test and maintain batteries as required by the manufacturer.

B. Separator

Check the voltage of the trucks main batteries on the separator (main) battery terminal.

With the truck not running the truck battery Voltage should be under 13 Volts. Anytime the truck main battery voltage is **below 13.2** the separator contacts will be open.

Start the truck. When a Voltage of 13.2 on the truck batteries is reached, the separator contacts will close, and allow power to begin charging the **AUX** batteries. You should see a voltage increase going into the **AUX** batteries. Using a clamp on DC ammeter you will see the rate of charge going to the batteries.

When this occurs, the separator is working correctly.

If the separator does not close or closes and does not allow charging to the AUX batteries, replace the separator.

Please note: It is normal for the separator to change back and forth between charging the truck bank of batteries and the **AUX** system bank of batteries, especially in the first two hours. As the truck batteries regain charge the separator will stay engaged for longer periods of time.

C. AUX Control Panel Testing: Attention! Conduct this test with ENGINE OFF/ KEY OFF AND BRAKES SET!!!

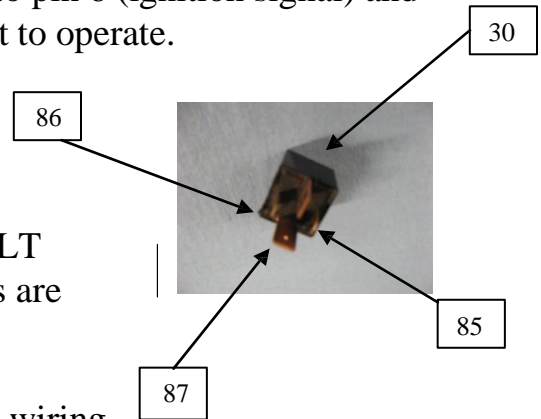
First, check for proper voltage and signal at the ACU 26 pin connector. You should have 12 volts across pins 4 (pos) and 5 (neg). You should also have 12 volts at pin 24 (wake up signal). Pushing the parked button switches the 12 volts at pin 24 to ground, signaling the Park Smart unit to operate.

During this test, you should not have 12 volts to pin 6 (ignition signal) and you must have Can Bus connection for the unit to operate.

D. Relay Testing

With relay unplugged, confirm there is 12 VOLT on the sockets where 85 and 30 relay terminals are connected.

If you do not have 12 VOLT here check fuses, wiring and battery connections.



Now, with relay unplugged, check across terminals 85 and 86 of the relay, using an OHM meter. You should have an ohms value between 80 – 100 ohms through the relay coil. If you do not, replace relay.

In Parked mode, as soon as you turn the **AUX Control Panel** blower switch on and set the temperature control to cold and push the parked button, terminals 86 on LS3 and LS4 relays become connected to ground internally on the Control PCB Assembly pins D12 and D13. When this happens the relays will pull in the contacts and allow voltage through the relays. You should now have 12 VOLT passing through the relay on spade terminal 87 of the relay. This provides power through fuses F1, F4 and F5, to the evaporator blower, condenser fan and the compressor controlling section of the Control PCB Assembly.

With relay plugged in: **TURN THE UNIT ON IN PARKED MODE.** If you do not have 12 VOLT on terminal 87, check across terminals 85 (+) and 86 (-). You should have 12 VOLT. If you have 12 VOLT here and do not have 12 VOLT on terminal 87 your relay is defective. The internal coil of the relay is energized but the contacts are not closing.

(Continued on next page)

Replace the relay.

If you have 12 VOLT on terminal 87 and the compressor does not run you could have a defective Control PCB Assembly or compressor. See testing Control PCB Assembly. Appendix I.

E. Pressure Switch Testing: You must remove the top section of the ParkSmart unit to access the switch.

The brazed switch (see photo page 7) is not removable. This switch is **normally closed**. When the unit is off for a few minutes, unplug the 32 pin connector on the PCB assembly and check across terminals D2 and D5, you should always have continuity. If you do not, you may have a broken wire, bad connection, hi pressure situation or defective switch. If the pressure, harness and connections are ok, the unit will have to be replaced. Call Freightliner Dealer

F. Check continuity across fuse body (fuse does not look blown)

NEVER INSTALL FUSE F6. THIS IS FOR PROGRAMMING ONLY AND IF INSTALLED IT WILL DISABLE THE PARKSMART UNIT!

Remove fuse from fuse holder. Using a meter, check for continuity across the fuse. You can check for voltage across the fuse using a dc volt meter.

G. Evaporator Sensor/Freeze Switch Testing: Location: Top of unit, behind the evap coil, just inside the Cabinet base.

IF THE SENSOR OR CIRCUIT HAS A SHORT OR OPEN, the fault code will be seen on J1939. IF THE SENSOR IS DEFECTIVE THE COMPRESSOR WILL NOT OPERATE!

The freeze switch is a temperature sensor. To verify the condition you will need a Volt/OHM meter.

If a freeze condition occurs, the unit will stop the compressor. If the freeze condition leaves, the compressor will restart and the **ParkSmart** unit will continue to run.

See chart page 19 for sensor test data.

H. Compressor Thermal Limit Switch: You must remove the top section of the ParkSmart unit to access the switch.

This device is a normally closed switch. If the compressor gets too hot, the thermal limit switch will open and the compressor will stop. Checking with a meter you should always have continuity between the two terminals when it is cool.

I. Control PCB Assembly:

Do not attempt to test the controller or compressor until you have completely eliminated all other possibilities.

In parked mode, when you turn the **Park Smart** unit on, the compressor relay LS 3 and blower/fan relay LS 4 will close. LS 3 will send 12 VOLT main power from terminal 87, through the F 1 fuse, to the compressor controller section of the control PCB assembly. LS 4 will send main power through it's terminal 87, through F 4 and F 5 fuses to the blower and fan. If all other conditions are ok, such as the high pressure switch, freeze switch and the compressor thermal limit switch, the compressor controller will then send voltage out to the compressor.

Check for 12 VOLT from the F 1 fuse going to the PCB controller pin C 1. Also check for unfused 12 volts at pin C3 (Aux Battery Sense). If Aux battery voltage is below 11.3 the ParkSmart unit will not operate in parked mode. Before condemning an internal component or unit, try operating the unit with engine running.

!!! Cluster Block units – see instructions page 34-37!!!

Ring Terminal Units – Follow steps below also see pages 38 - 41

If you have the correct voltage in you should have voltage out on the three wires connected to the compressor. Disconnect the three wires ,RING TERMINAL UNITS ONLY! from the compressor. You will have to remove plastic cap from the top of compressor.

Using a volt meter check each wire, positive on (blue, orange or yellow) negative to battery ground. If you do not have a 6 volt pulse voltage out on each wire, replace the controller. Pulse voltage means the controller will cycle to each colored wire. You should see the voltage appear and disappear continuously.

Reconnecting the three wires you must connect blue to A, orange to B, and yellow to C.

If you do have a 6 volt pulse voltage out and the compressor does not run you have a defective compressor.

For additional wiring diagrams see pages 21/22

For controller pin out table see page 23

J. Condenser Fan Motor Testing: First do a visual inspection of all blower parts.

For condenser fan location see Freightliner ParkSmart documents.

Reconnect any wires or plugs you might have disconnected when removing the cover. Turn the **Parked Unit on**, if you do not have 12 volt at the fan, check fuse F5 And relay LS4. If you have 12 VOLT main power, check for the signal voltage from pin C 7 (white wire). You should have zero voltage with unit off and 1.6 to 2.6 volts unit on. If all voltages are correct, reconnect the plug. If the fan does not run, it is defective, and needs to be replaced

Using a DC ammeter you can check the amperage draw of the blower. Normal amps approx. **9.5** max.

Caution: If attempting to connect blower to an outside power source, internal electronic components are sensitive to arcing or reverse polarity! Damage will occur!!

K. Evaporator Blower Motor Testing: First do a visual inspection of all blower parts.

For evaporator fan location see Freightliner ParkSmart documents.

Reconnect any wires or plugs you might have disconnected when removing the cover. Turn the **Parked Unit on** and check for 12 VOLT at the unit side of the wiring harness. If you do not have 12 volt, check fuse F4 and relay LS4. If you have 12 VOLT main power, check for the signal voltage from pin C 13 (tan wire). You should have 10 volts on low speed and approx. 6 volts at high speed. If all voltages are correct, reconnect the plug. If fan does not run, it is defective, and needs to be replaced.

Using a DC ammeter you can check the amperage draw of the blower. Normal amps approx. **10** on high

Caution: If attempting to connect blower to an outside power source, internal electronic components are sensitive to arcing or reverse polarity! Damage will occur!!

L. Compressor Rubber Mounts:

Visual inspection of the compressor rubber mounts may be necessary if excessive vibration is present. Check for loose mounting nuts. If mounting nuts and captive studs are ok, vibration could be from the internal part of the compressor. If so call your Freightliner dealer.

M. Blend Door Actuator: For blend door location see Freightliner ParkSmart documents

Physical inspection can be seen through the top of the unit by removing the fuse panel and evaporator blower.

This actuator motor drives the blend door. Each time the unit is powered up the door sets to full cold. Removing the F 2 fuse will reset the unit and the blend door.

When in the heat mode the blend door will direct recycled air through the heater core as directed by the Aux. Control Panel in order to maintain a preset temperature. The Espar Hydronic coolant heater will provide a constant flow
(Continued on next page)

of heated coolant through the heated core for internal bunk heat as well as engine heat.

You cannot bench test this actuator.

Check for 12 volts at pin 2 on the actuator, this is power from pin C8 on the Control PCB Assembly. Use a common ground to check this voltage. With unit operating, phases A, B, C and D are switched to ground in a sequence. With the door in a stationary position check for 12 volts, you should have 12 volts on each phase. When the door is being positioned, these phases will be switched to ground. The voltage will be near zero on a switching phase.

N. Sleeper Temperature Sensor: Location see Freightliner ParkSmart documents

This sensor monitors the sleeper internal temperature. See chart page 18 for testing data.

If this sensor fails, the unit will default to 72 degrees.

O. Outside Air Temperature Sensor: Location see Freightliner ParkSmart documents

This sensor monitors the ambient air temperature. See chart page 18 for testing data.

If this sensor fails, the power management system stops and although the unit will still operate, the total run time of the battery pack will be reduced.

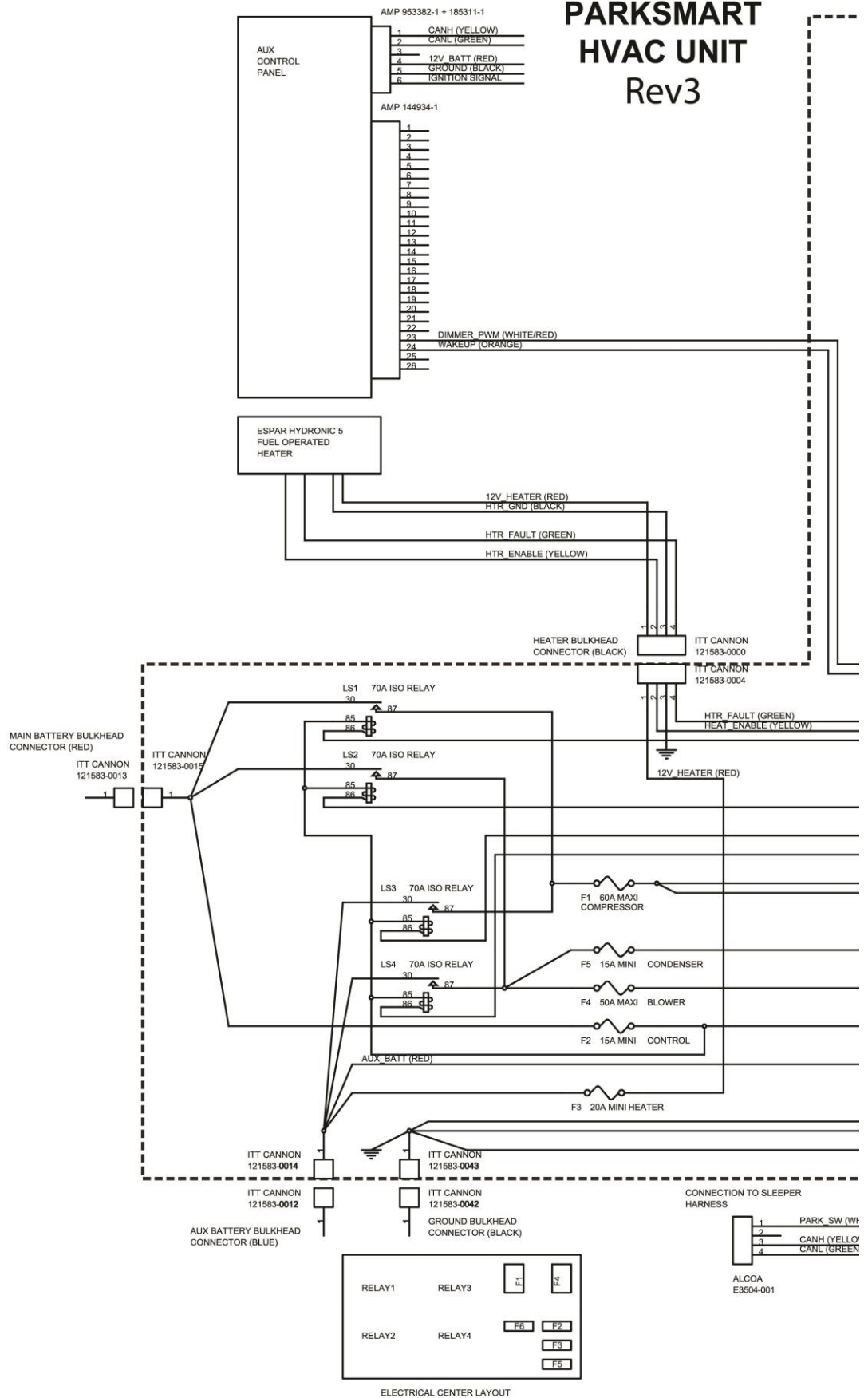
Evaporator Sensor Resistance Chart

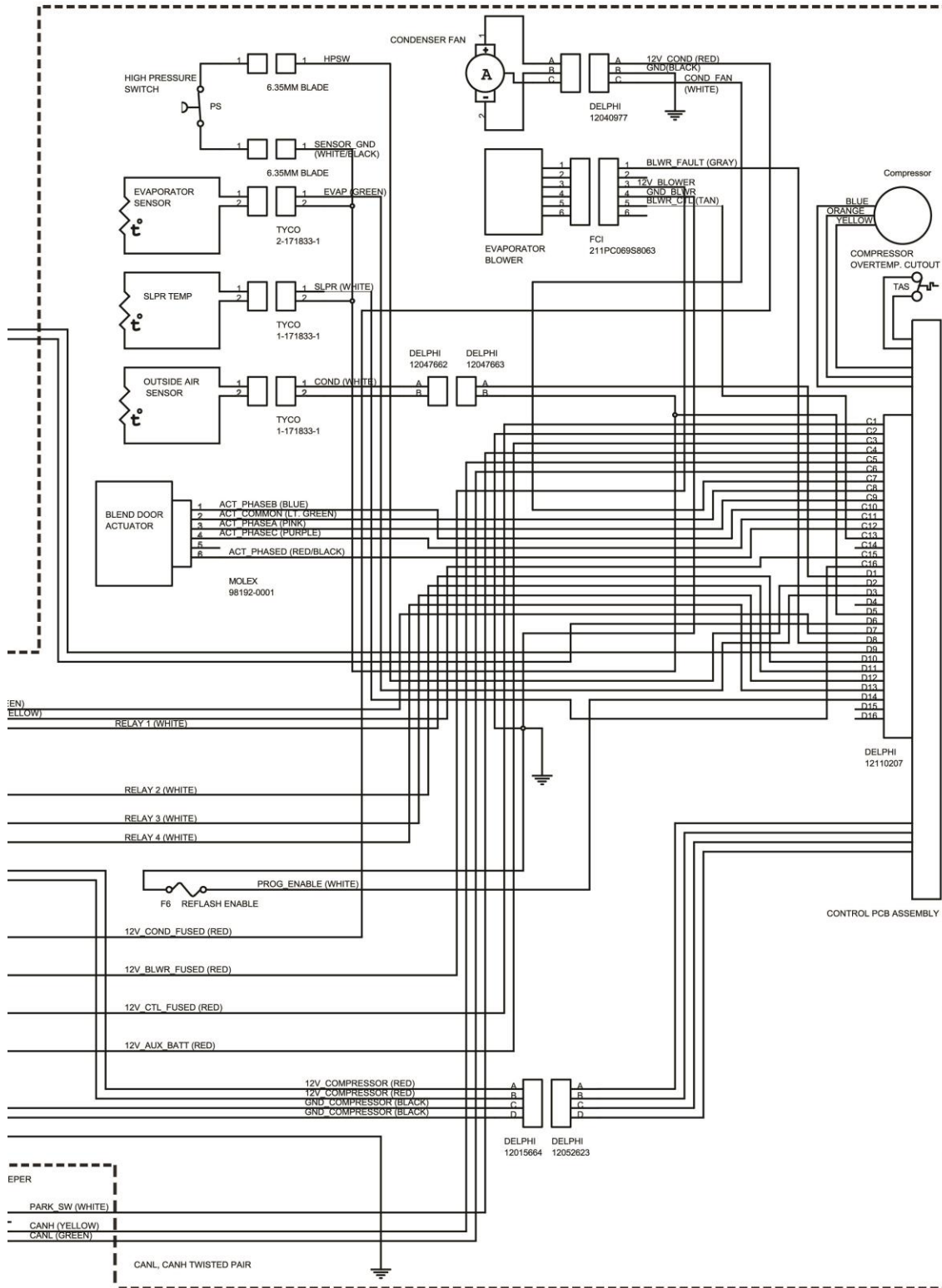
	A	B	C	D
1	Evaporator Sensor			
2				
3	Temp(°F)	Temp (°C)	Resistance (nominal)	Voltage (nominal)
4	-40.0	-40.0	92757.0	4.554
5	-31.0	-35.0	66870.0	4.402
6	-22.0	-30.0	48790.0	4.215
7	-13.0	-25.0	35937.0	3.991
8	-4.0	-20.0	26757.0	3.732
9	5.0	-15.0	20103.0	3.443
10	14.0	-10.0	15252.0	3.133
11	23.0	-5.0	11664.0	2.81
12	32.0	0.0	9000.0	2.488
13	41.0	5.0	6998.0	2.175
14	50.0	10.0	5485.0	1.882
15	59.0	15.0	4330.0	1.613
16	68.0	20.0	3443.0	1.374
17	77.0	25.0	2757.0	1.164
18	86.0	30.0	2221.0	0.982
19	95.0	35.0	1800.0	0.826
20	104.0	40.0	1468.0	0.695
21	113.0	45.0	1204.0	0.585
22	122.0	50.0	993.2	0.493
23	131.0	55.0	823.2	0.415
24	140.0	60.0	685.8	0.351
25	149.0	65.0	574.2	0.297
26	158.0	70.0	482.9	0.252
27	167.0	75.0	408.3	0.215
28	176.0	80.0	346.8	0.184
29	185.0	85.0	295.6	0.157

Sleeper & Ambient Air Sensor Resistance Chart

	A	B	C	D
1	Sleeper, Condenser Air Inlet Temperature Sensor			
2				
3	Temp(°F)	Temp (°C)	Resistance (nominal)	Voltage (nominal)
4	-40.0	-40.0	336500.0	4.86
5	-31.0	-35.0	242589.0	4.80
6	-22.0	-30.0	177000.0	4.73
7	-13.0	-25.0	130370.0	4.64
8	-4.0	-20.0	97070.0	4.53
9	5.0	-15.0	72929.0	4.40
10	14.0	-10.0	55330.0	4.24
11	23.0	-5.0	42315.0	4.04
12	32.0	0.0	32650.0	3.83
13	41.0	5.0	25388.0	3.59
14	50.0	10.0	19900.0	3.33
15	59.0	15.0	15708.0	3.06
16	68.0	20.0	12490.0	2.78
17	77.0	25.0	10000.0	2.50
18	86.0	30.0	8057.0	2.23
19	95.0	35.0	6531.0	1.98
20	104.0	40.0	5327.0	1.74
21	113.0	45.0	4369.0	1.52
22	122.0	50.0	3603.0	1.32
23	131.0	55.0	2986.0	1.15
24	140.0	60.0	2488.0	1.00
25	149.0	65.0	2083.0	0.86
26	158.0	70.0	1752.0	0.75
27	167.0	75.0	1481.0	0.65
28	176.0	80.0	1258.0	0.56

For Trucks built prior to July 2011 and Units built before April 13, 2015





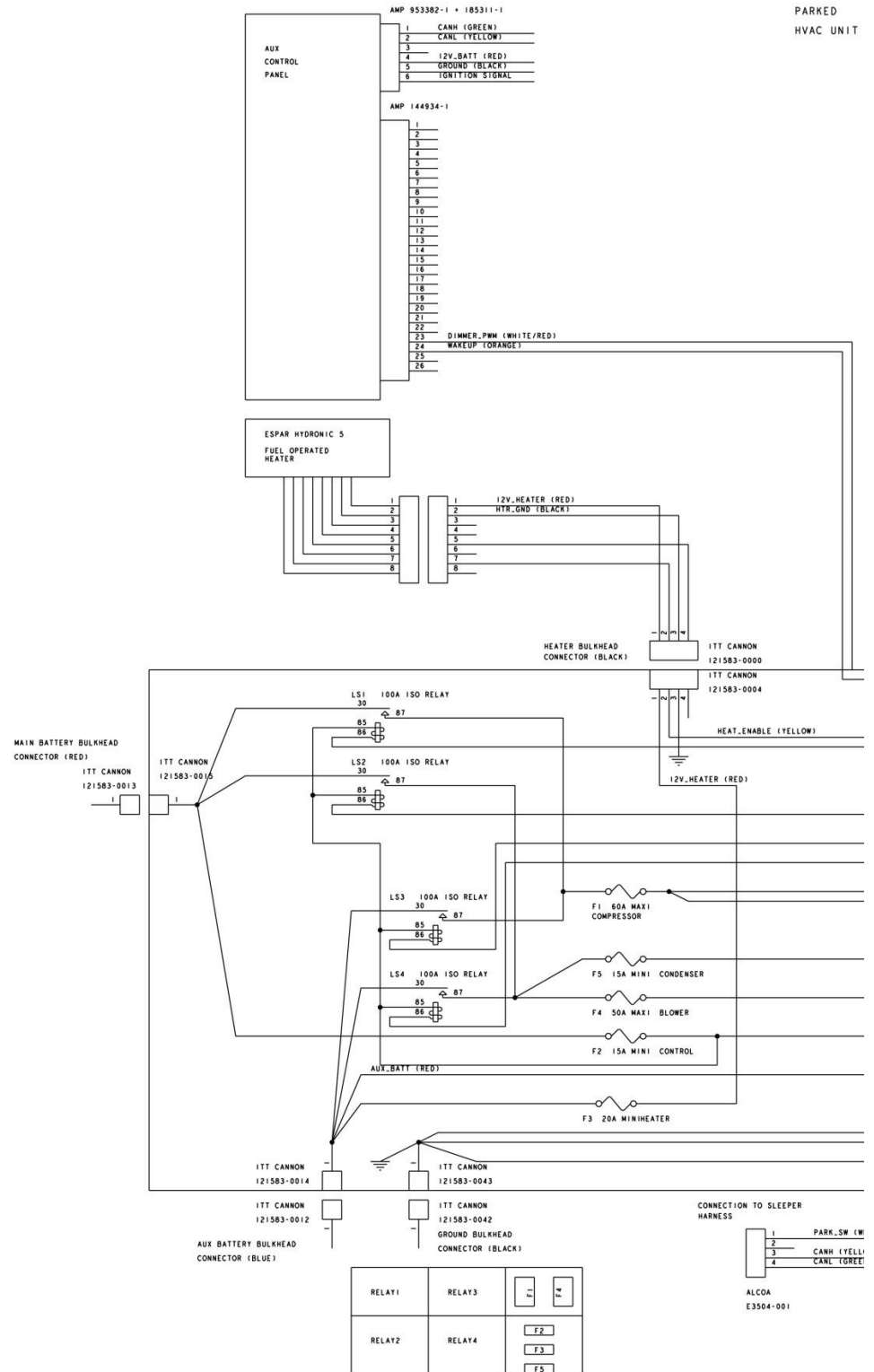
BERGSTROM Date: Wednesday, September 5, 2012

Rev.

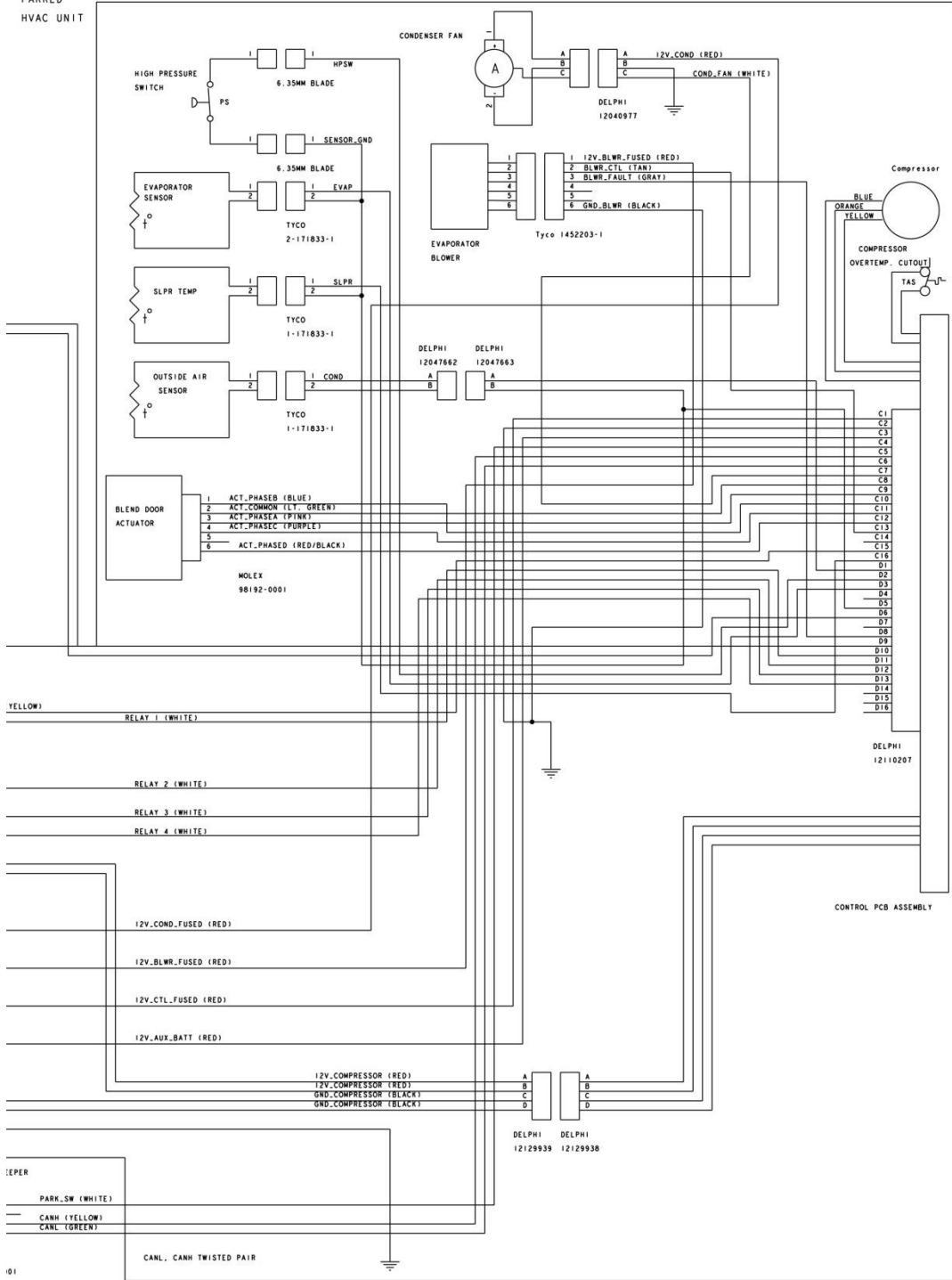
BERGSTROM

For Trucks built prior to July 2011 and Units built before April 13, 2015

For Trucks built after July 2011 and Units built after April 13, 2015



PARKED
HVAC UNIT



Date: Monday, April 13, 2015

Rev. 2

BERGSTROM

For Trucks built after July 2011 and Units built after April 13, 2015

Control module pinout with functional information

Pin	Circuit ID	Wire Color	Function	Typical Voltage	Other End of Circuit
C1	12V_CTL_FUSED	Red	12V power from main batteries for controls	12-14V	Control fuse F2
C2	GND	Black	Ground for controls	0V	Black bulkhead connector
C3	12V_AUX_BATT	Red	Sense wire for aux. battery voltage	12-14V	Blue bulkhead connector
C4	PARK_SW	White	Input from parking brake switch	11.5-14V - parking brake released, <0.5V - parking brake engaged	4 way connector near electrical center
C5	CANH	Yellow	J1939 Can bus Hi	2.5V bus idle, 3.5V active	4 way connector near electrical center
C6	CANL	Green	J1939 Can bus LO	2.5V bus idle, 3.5V active	4 way connector near electrical center
C7	COND_FAN	White	PWM ground switched output to control condenser fan speed	0V fan off, 1.6-3.9V cooling mode	Condenser fan (3 way connector)
C8	ACT_COMMON	Lt. Green	12V power for blend door actuator	11-14V	Blend door actuator (top of unit)
C9	ACT_PHASEA	Pink	Ground switched output to blend door motor phase	11-14VG, pulses to <0.5V when motor running	Blend door actuator (top of unit)
C10	ACT_PHASEB	Blue	Ground switched output to blend door motor phase	11-14VG, pulses to <0.5V when motor running	Blend door actuator (top of unit)
C11	ACT_PHASEC	Purple	Ground switched output to blend door motor phase	11-14VG, pulses to <0.5V when motor running	Blend door actuator (top of unit)
C12	ACT_PHASED	Red/Black	Ground switched output to blend door motor phase	11-14VG, pulses to <0.5V when motor running	Blend door actuator (top of unit)
C13	BLWR_CTL	Tan	PWM ground switched output to control blower speed	10V low speed, 6V high speed	Blower motor
C14	N/C		Not connected		
C15	HTR_ENABLE	Yellow	12V output enable FOH operation	11-14V in heat mode and parking brake engaged	4 way bulkhead connector
C16	SLPR_TEMP	White	0.5V input from sleeper temperature sensor	5V with senso open or unplugged, 2V-3.3V with sensor plugged in	Sleeper temp sensor - near ACU on cabinet
D1	COND_IN_TEMP	White	0.5V input from outside air temperature sensor	5V with senso open or unplugged, 2V-3.3V with sensor plugged in	Outside air temperature sensor - under control module cover
D2	PRESS_SW	Lt. Blue	Pressure switch input	11-14V if open and unit on, <1V if switch closed or unit off	High pressure switch
D3	EVAP_TEMP	Lt. Green	0.5V input from evaporator temperature sensor	5V with sensor open or unplugged 1V-2.5V with sensor plugged in	Evaporator temperature sensor - top of unit just inside cabinet base
D4	N/C		Not connected		
D5	SENSOR_GND	White/Black	Ground from control module for sensor pressure switch	Ground	Temperature sensors, high pressure switch
D6	WAKEUP	Orange	Switch to Ground input from ACU - turns on Parked unit	11-14V with control off, <1V when unit on (PARK button pressed or key on)	Yellow 26 way connector on back of ACU
D7	HTR_FAULT		Fault input from FOH - not currently implemented		4 way bulkhead connector
D8	BLWR_FAULT	Gray	Fault input from blower - switched to ground	N/A	Blower motor
D9	DIMMER	White/Red	PWM power output to dimmer when control changed	2-3V for 8-10 seconds after changing setting	Yellow 26 way connector on back of ACU
D10	RELAY1	White	Switch to Ground output to relay 1 - Compressor power from Main Batteries	<0.5V in Engine On mode, otherwise 11-14V	Relay in electrical center
D11	RELAY2	White	Switch to Ground output to relay 2 - Blower/Fan power from Main Batteries	<0.5V in Engine On mode, otherwise 11-14V	Relay in electrical center
D12	RELAY3	White	Switch to Ground output to relay 3 - Compressor power from AUX Batteries	<0.5V in Parked, Engine Off mode, otherwise 11-14V	Relay in electrical center
D13	RELAY4	White	Switch to Ground output to relay 4 - Blower/Fan power from Aux Batteries	<0.5V in Parked, Engine Off mode, otherwise 11-14V	Relay in electrical center
D14	PROG_ENABLE	White	Ground input to go into reprogramming mode	Not normally used	Loose blade connector or unused fuse in electrical center
D15	N/C		Not connected		
D16	N/C		Not connected		

ParkSmart Fault Code List

4/21/2010

Name	Description	SPN	FMI	Source Address
Outside Air Temperature Sensor	Shorted to ground	171	4	68
Outside Air Temperature Sensor	Shorted to battery or open circuit	171	5	68
High Pressure Switch	Shorted to battery or open circuit	605	5	68
Evaporator Sensor	Shorted to ground	1547	4	68
Evaporator Sensor	Shorted to battery or open circuit	1547	5	68
Sleeper Temperature Sensor	Shorted to ground	1548	4	68
Sleeper Temperature Sensor	Shorted to battery or open circuit	1548	5	68

All system controllers!

Attention: Removing the phase harness for testing

Operating the system for troubleshooting purposes with the phase harness disconnected can result in a locked out system.

With no active fault codes, the controller should always attempt to start the compressor up to 10 times in a period of approx. 2 minutes; even when the phase harness is disconnected. If the controller does not see the compressor start after 10 attempts, it will time out and stop sending voltage to the compressor. The controller will remain in locked out mode until power is cycled. Please make sure the time does not expire during the test procedure. If necessary, cycling the power switch off and back on will reset the controller. NOTE: "The compressor could take up to 2 minutes to start up after the power switch has been cycled.

Service Instructions for Phase Harness / **Cluster Block** Compressor Only

Service bulletin

Parksmart Rev 5 NON OPT IDLE - Compressor / controller diagnostics

System Issue: No Cooling / Compressor not running: Moving forward, please use these diagnostics steps when troubleshooting the above conditions.

DO NOT REMOVE THE CLUSTER BLOCK CONNECTOR FROM THE COMPRESSOR TERMINALS!

Follow the below instructions for proper diagnostic steps.

Check for 12 VOLT from the F2 fuse going to the PCB controller pin C1. Also, check voltage to pin C3 (Aux Battery Sense). If Aux battery voltage is below 11.3 the ParkSmart unit will not operate in parked mode. Before condemning an internal component or unit, also try operating the unit with engine running.

OVERVIEW

Compressor will not operate unless these items are in their operational state –refrigerant, high pressure switch, freeze switch and the compressor thermal limit.

Outside temperature must be above 40°F and the sleeper temperature must be above 60°F

View Service Link for active fault codes. See Technical guide for testing these items.

In parked mode, when you turn the ParkSmart unit on (parked led light on) - 2 relays should close.

(1) The compressor relay LS 3 will close and send 12 VOLT main power from terminal 87, through the F 1 compressor fuse, to the compressor controller section of the control PCB assembly. Once you have confirmed 12 volts through F1 fuse continuing through the 4 pin harness connector attached to the control PCB, your compressor should be operating. Before condemning a refrigerant loop for a compressor not operating, please attempt to operate the unit using a replacement controller. If the compressor does not operate using a replacement controller, replace the refrigerant loop. Do not remove the cluster block connector or harness from the compressor terminals!

(2) blower/fan relay LS 4 will send main power through its terminal 87, through F 4 and F 5 fuses to the blower and fan.

Please call the Nite Line at 1-866-204-8570 for any further assistance

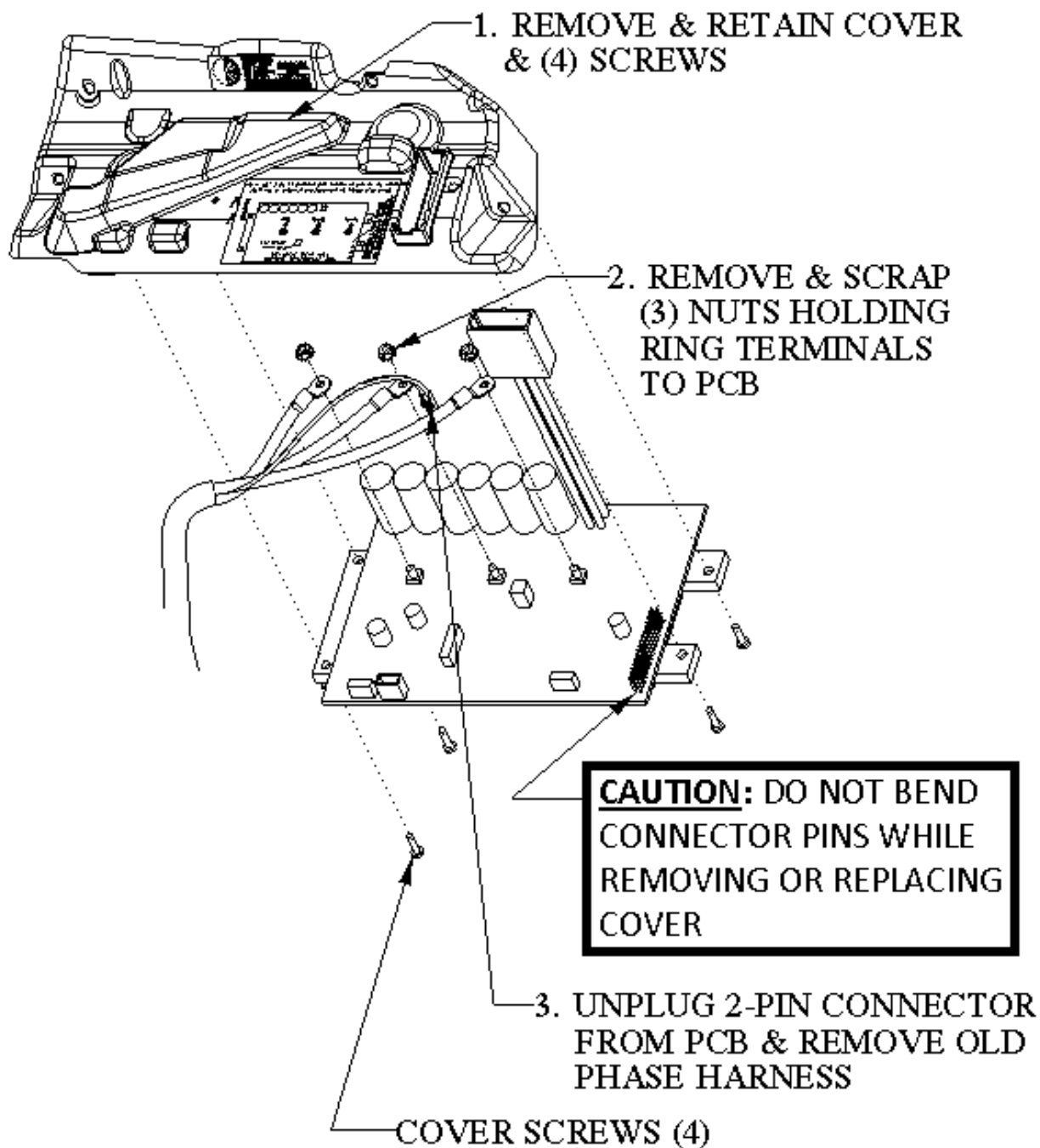
Service Instructions for Phase Harness Parksmart sealed



WARNING: To avoid potential property damage, personal injury read Important Safety Warnings and ALL instructions before attempting to install or service product.

CAUTION: Care must always be taken to install the control cover without bending the connector pins identified in **FIGURE 1**.

FIGURE 1.



Service Instructions for Phase Harness Parksmart sealed



WARNING: To avoid potential property damage, personal injury read Important Safety Warnings ALL instructions before attempting to install or service product.

CAUTION: Care must always be taken to install the control cover without bending the connector pins identified in **FIGURE 1**.

4. SLIDE (3) RING TERMINALS OF NEW HARNESS OVER THREADED POSTS OF PCB.

CAUTION: ALIGN EACH COLORED WIRE TO SPECIFIC THREADED POST IDENTIFIED ONLY.

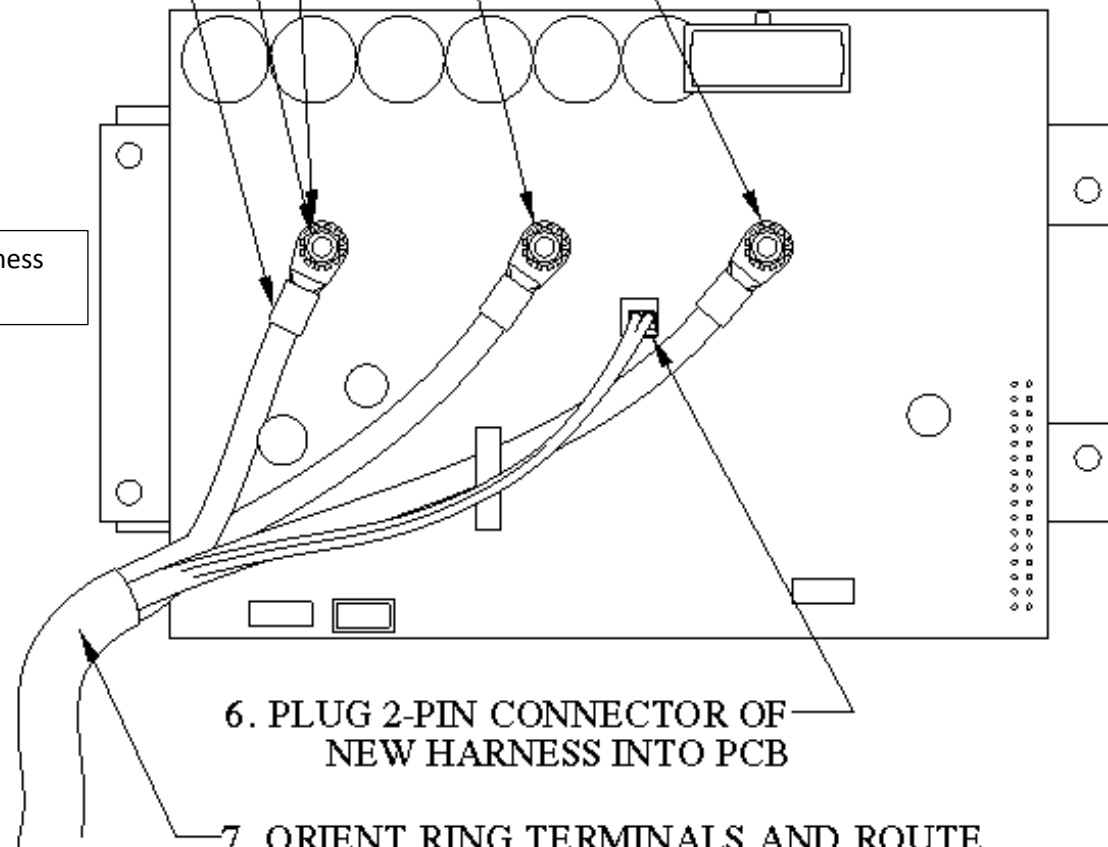
5. SECURE WITH (3) NEW NUTS PROVIDED ONLY.
TORQUE TO 12-14 INCH-LBS

CAUTION: USE ONLY NEW HARDWARE AND THE TORQUE VALUE SPECIFIED.

BLUE WIRE ("A")

ORANGE WIRE ("B")

YELLOW WIRE ("C")



6. PLUG 2-PIN CONNECTOR OF
NEW HARNESS INTO PCB

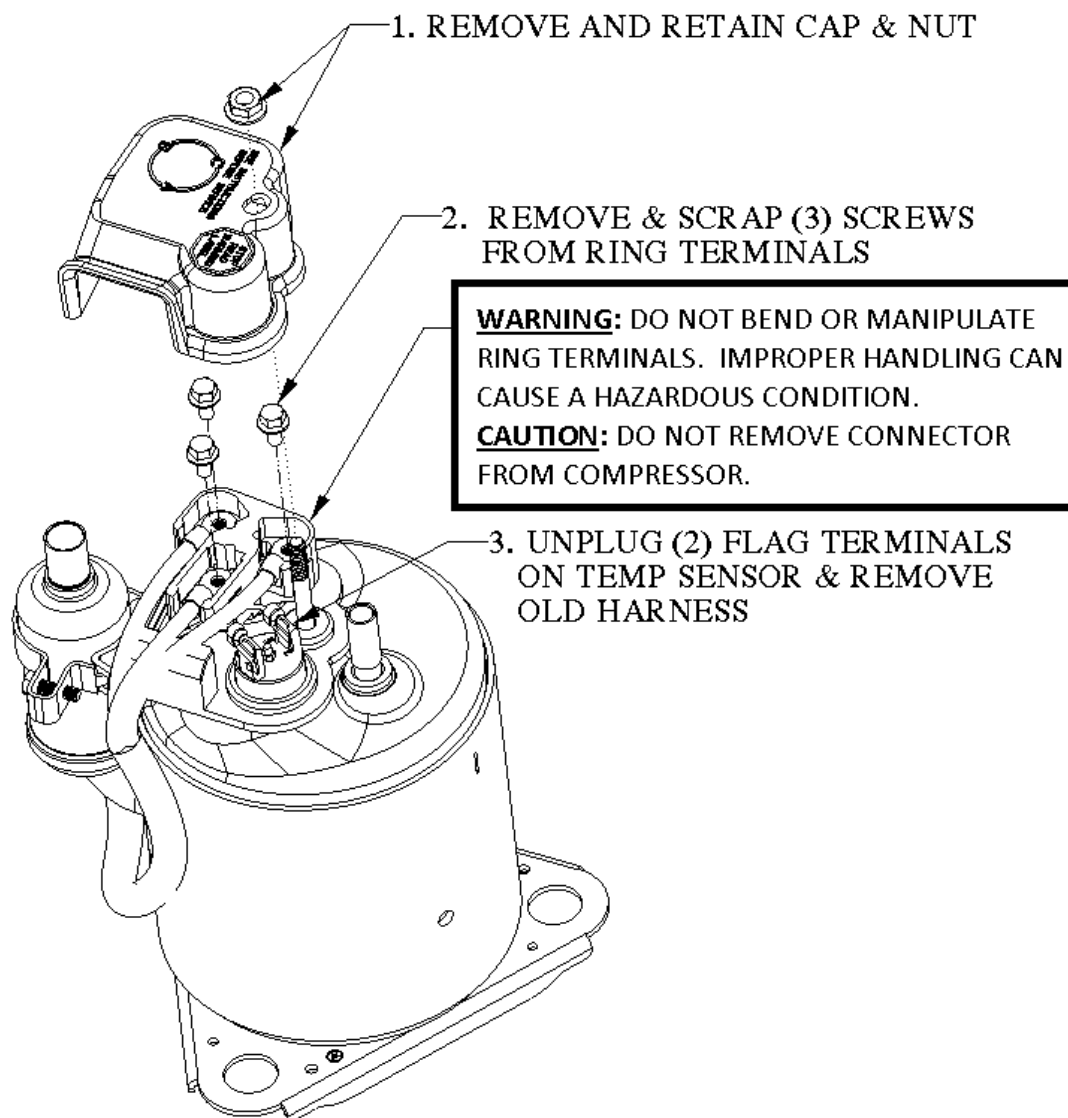
7. ORIENT RING TERMINALS AND ROUTE
WIRING HARNESS OUT OF COVER AS SHOWN

8. REPLACE COVER & (4) SCREWS

Service Instructions for Phase Harness / **Ring Terminal** Compressor Only



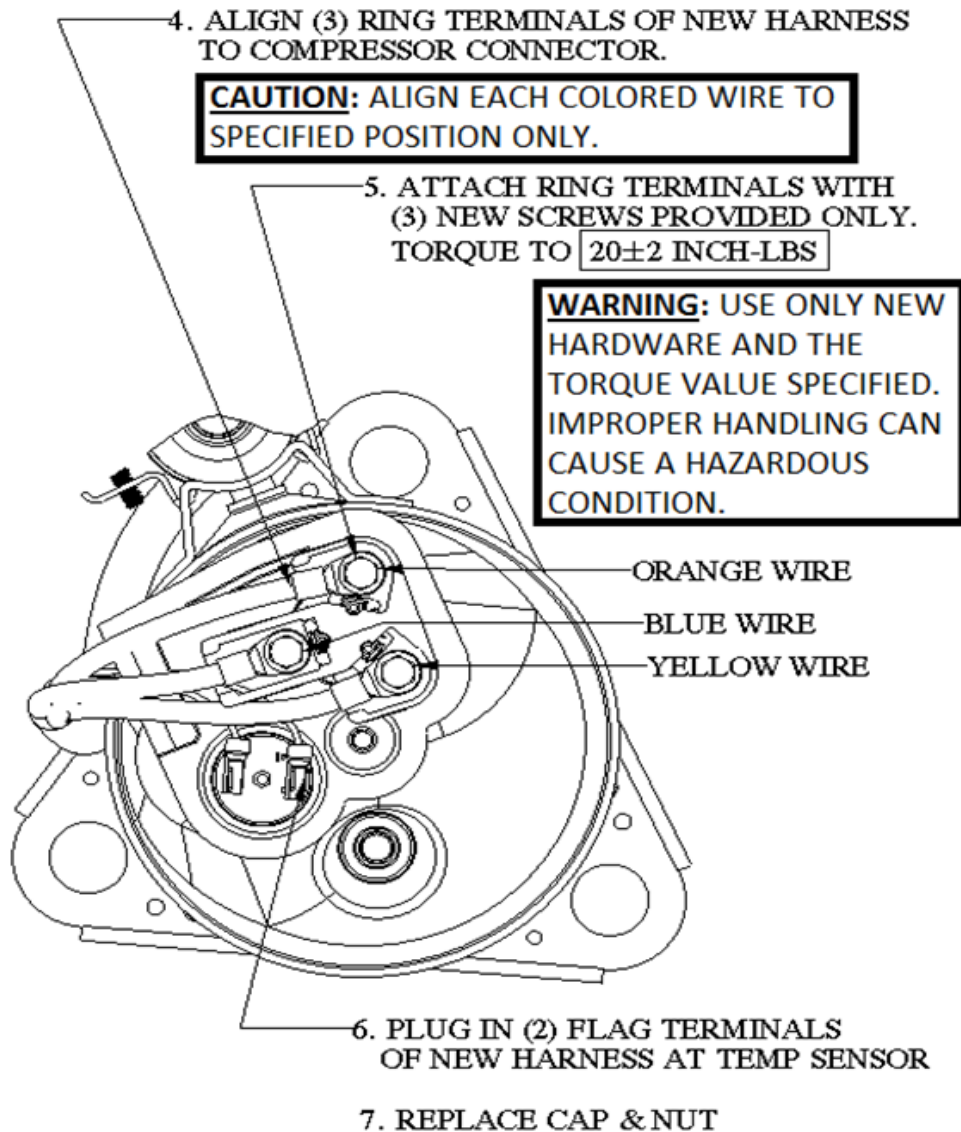
WARNING: To avoid potential property damage or personal injury, Read Important Safety Warnings and ALL instructions before attempting to install or service product.



Service Instructions for Phase Harness / Ring Terminal Compressor Only



WARNING: To avoid potential property damage or personal injury, Read Important Safety Warnings and ALL instructions before attempting to install or service product.





WARNING: To avoid potential property damage or personal injury, Read Important Safety Warnings and ALL instructions before attempting to install or service product.

CAUTION: Care must always be taken to install the control cover without bending the connector pins identified in **FIGURE 1**.

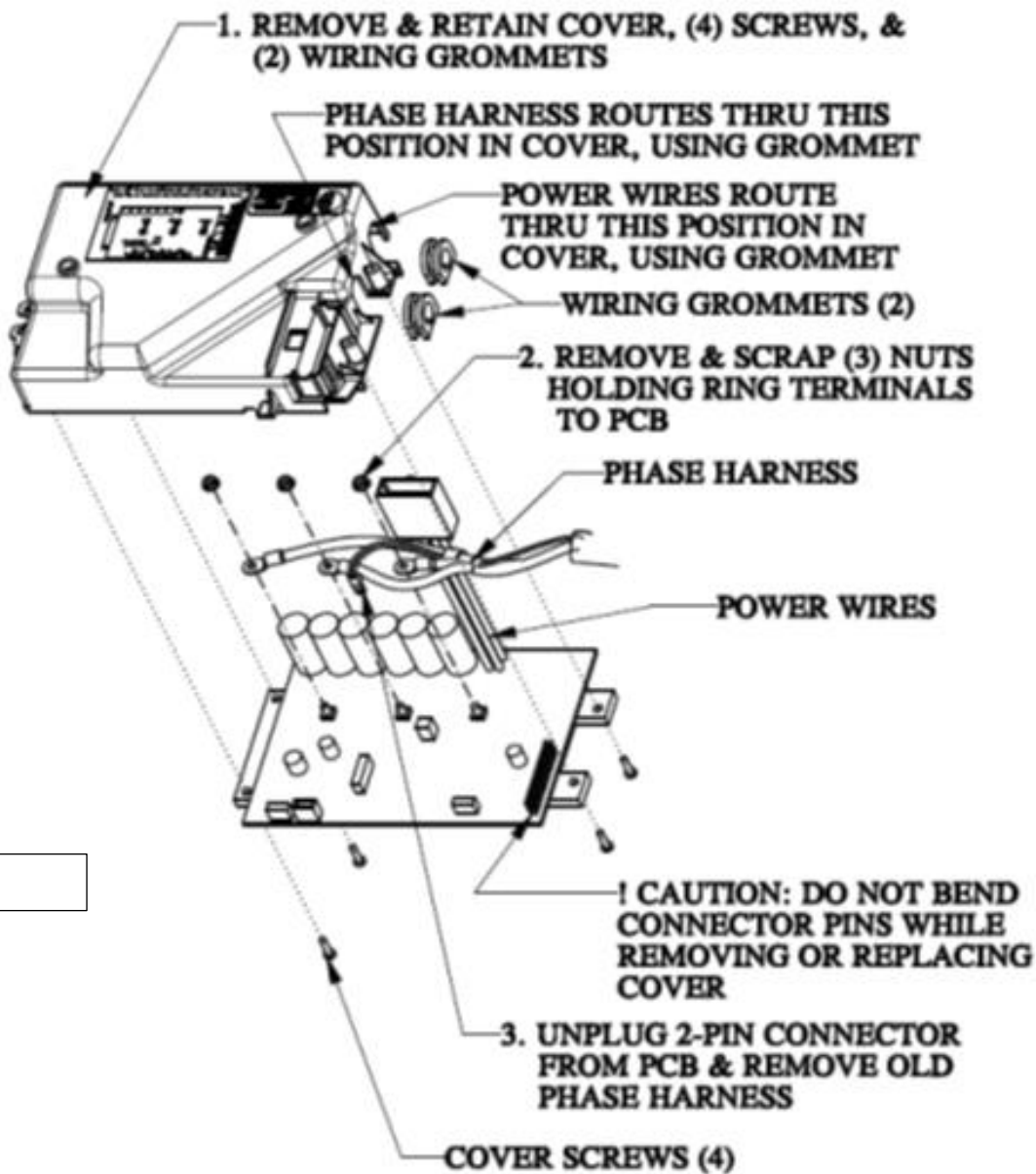


FIGURE 1



WARNING: To avoid potential property damage or personal injury, Read Important Safety Warnings and ALL instructions before attempting to install or service product.

CAUTION: Care must always be taken to install the control cover without bending the connector pins identified in **FIGURE 1**.

4. SLIDE (3) RING TERMINALS OF NEW HARNESS OVER THREADED POSTS OF PCB.

! CAUTION: ALIGN EACH COLORED WIRE TO SPECIFIC THREADED POST IDENTIFIED ONLY.

5. SECURE WITH (3) NEW NUTS PROVIDED ONLY. TORQUE TO 12 TO 14 INCH-LBS.

! CAUTION: USE ONLY NEW HARDWARE AND THE TORQUE VALUE SPECIFIED.

FIGURE 2

