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<b>Viewed:</b>	13841		

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Coding Information

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**Title: MaxxPower No Idle Battery-Powered A/C System Diagnostic Guide**

**Applies To: Feature code 16UZL**

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## Change Log

Please refer to the change log text box below for recent changes to this article:

03/18/2015 - Removed Troubleshooting Table. Removed Appendix. Updated Basic Troubleshooting to reflect the change to a 150A relay and the removal of the 60A Maxi Fuse and 70A Relay for the Compressor Controller. Changed Diagnostic Information, this now links 6 new step based troubleshooting iKNOW articles for this system. Updated Service Parts Information.

02/12/2015 - Updated Circuit Diagrams to include different wiring configurations based on build date of the No-Idle unit.

09/29/2014 - Added link to IK1600210 - MaxxPower (0016UZL) Compressor Relay and Power Harness Upgrade.

05/21/2014 - Updated "Parts Information" section to include new harness part numbers. Added SPT Information and

## Description

Safety Recall 14516 has been issued for units built prior to June 23, 2014.

- To properly diagnose the system you must ensure the recall has been performed.

Diagnostic guide for the MaxxPower A/C system.

- [IK1600210 - MaxxPower \(0016UZL\) Compressor Relay and Power Harness Upgrade](#)
  - IK1600210 applies to units build prior to June 23, 2014
- For the A/C side, only a few electrical components can be replaced.
- DO NOT REPLACE THE COMPLETE UNIT IF THE A/C IS NOT FUNCTIONING.
- Refer to the BASIC TROUBLESHOOTING below prior to replacing any components. This will help you identify which component is at fault or any electrical issues.
- Refer to PARTS INFORMATION to properly identify the parts that may require replacement
- The A/C portion of the system is listed below in the parts section.
- The 16UZL No-Idle HVAC system is designed to disengage when the engine is started, and can be turned on with the key in any position.

This battery-powered no idle HVAC system provides heating and cooling of the sleeper area without use of the vehicle engine.

- The system is comprised of the no idle HVAC components located in the sleeper HVAC module, a separate fuel operated coolant heater mounted under the sleeper, and four additional batteries housed in a second battery box.
- The no idle HVAC system shares the air handling assembly and several major components with the truck's standard HVAC system.
- Most importantly, the shared evaporator core contains refrigerant circuits for both the no idle system and the truck's standard A/C system.
- With this configuration, some procedures required to service the no idle A/C system will require opening the refrigerant circuit of the truck's standard A/C system.

**Trucks equipped with 16UZL No-Idle HVAC system have two separate HVAC systems (Standard Truck A/C and the MaxxPower unit), it is important to identify each clearly, so you are troubleshooting the correct system.**

**NOTE:**

Per the Operators Manual page 10: Run the heater at least once a month during the year (for a minimum of 15 minutes).

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  - C: Blower Fuse 20 amp (Mini)
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  - E: Relays (Compressor, Condenser Fan, Blower)
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- **Circuit Diagrams**
- **Photos with Call Outs**
- **Parts Information - with Cold Loop Identification**
- **Additional Resources**
- **SRT Information**

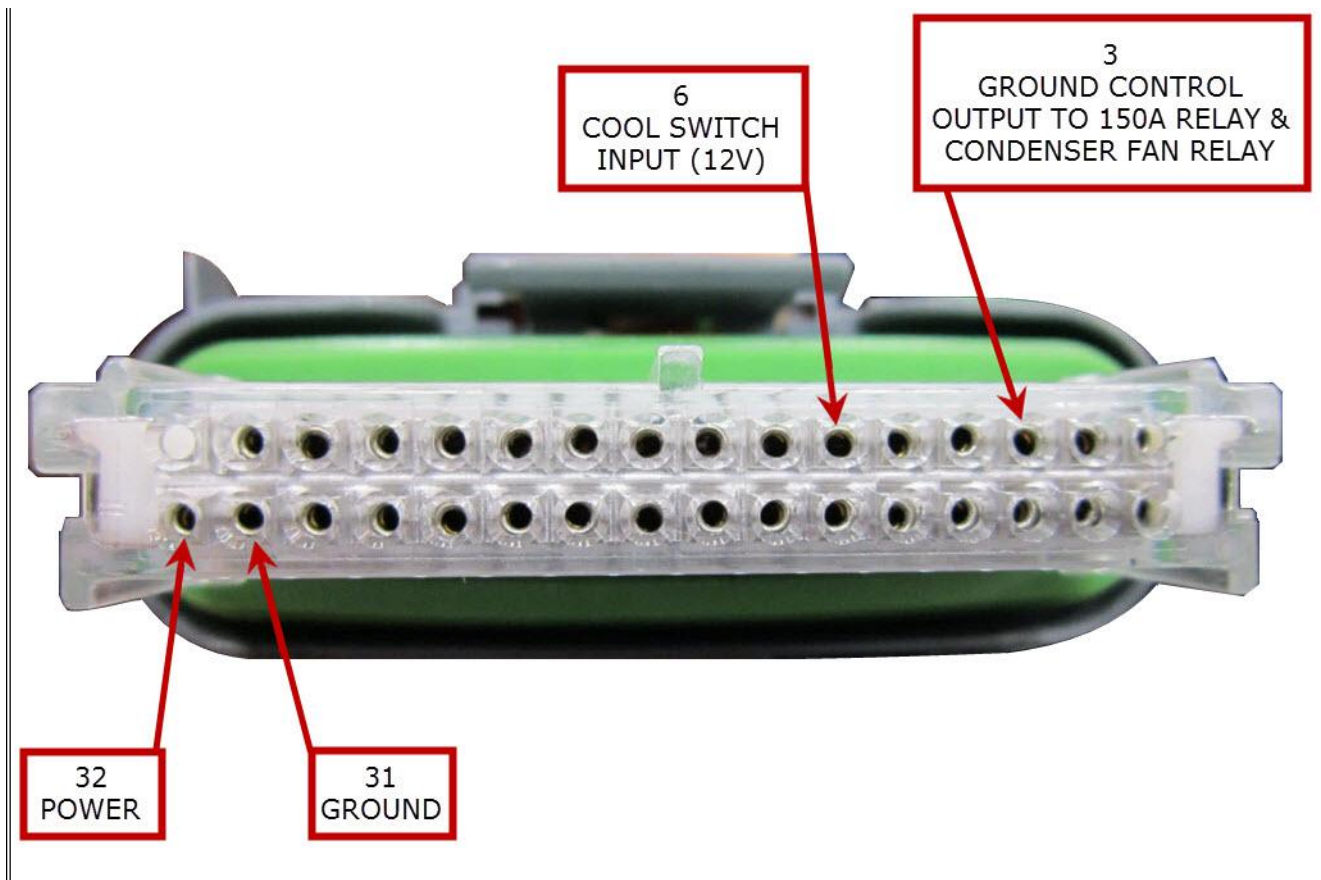
**Basic Troubleshooting**

Prior to replacing any components, these basic electrical checks should be performed.

- System will not turn on.
- System starts and cools, but then stops cooling or shuts off.
- Verify proper power and ground is present at the system controller. (Load test the circuits with a headlamp). If the complaint is the system stops cooling, verify you still have power and ground at 31 and 32 when the issue occurs (Figure 1)
- Verify 12 volt input to pin 6 from the Cool Switch (Figure 1)
- Verify ground control output from pin 3 to the 150A Relay and Condenser Fan Relay

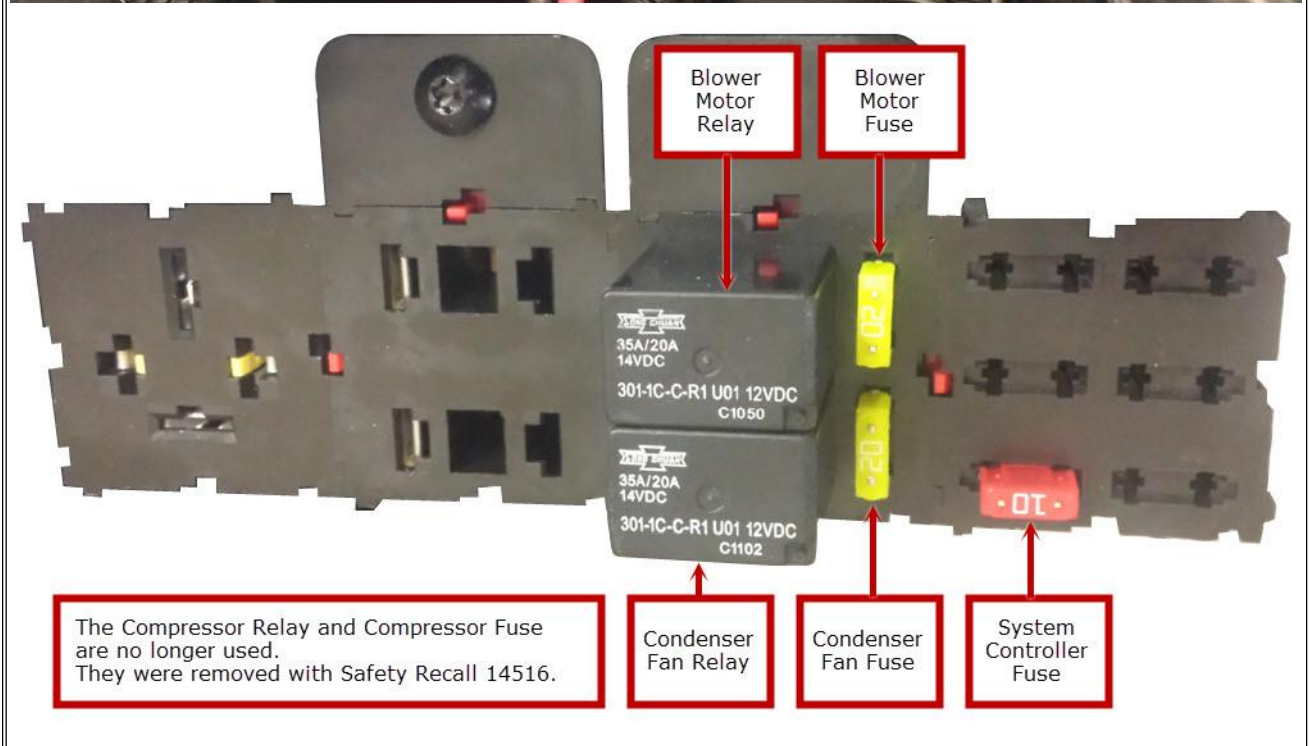
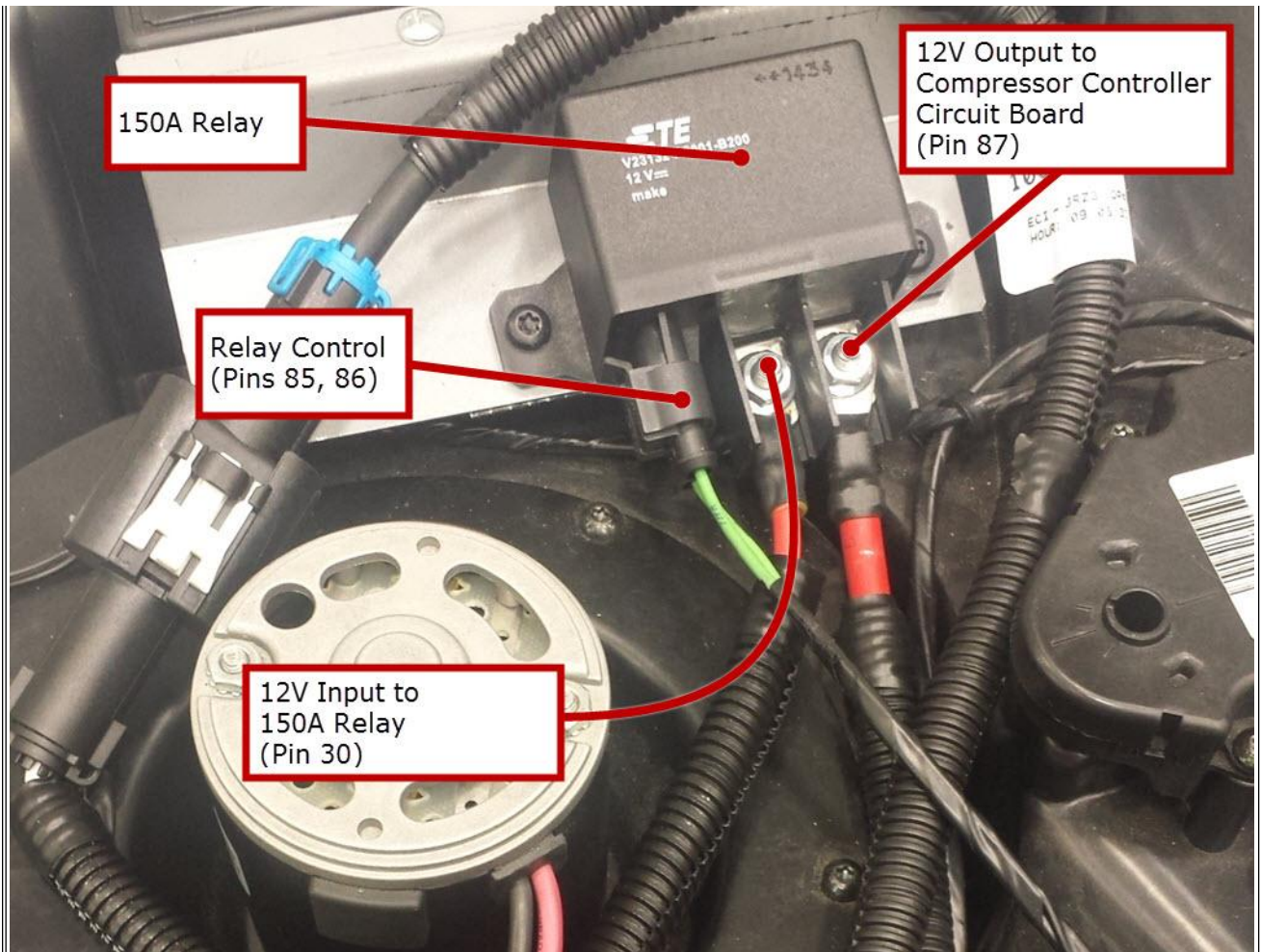
If you have ground control from pin 3 to the relays and the system is still not operating properly, the system controller is not at fault. Continue with further diagnostics.

**Figure 1**



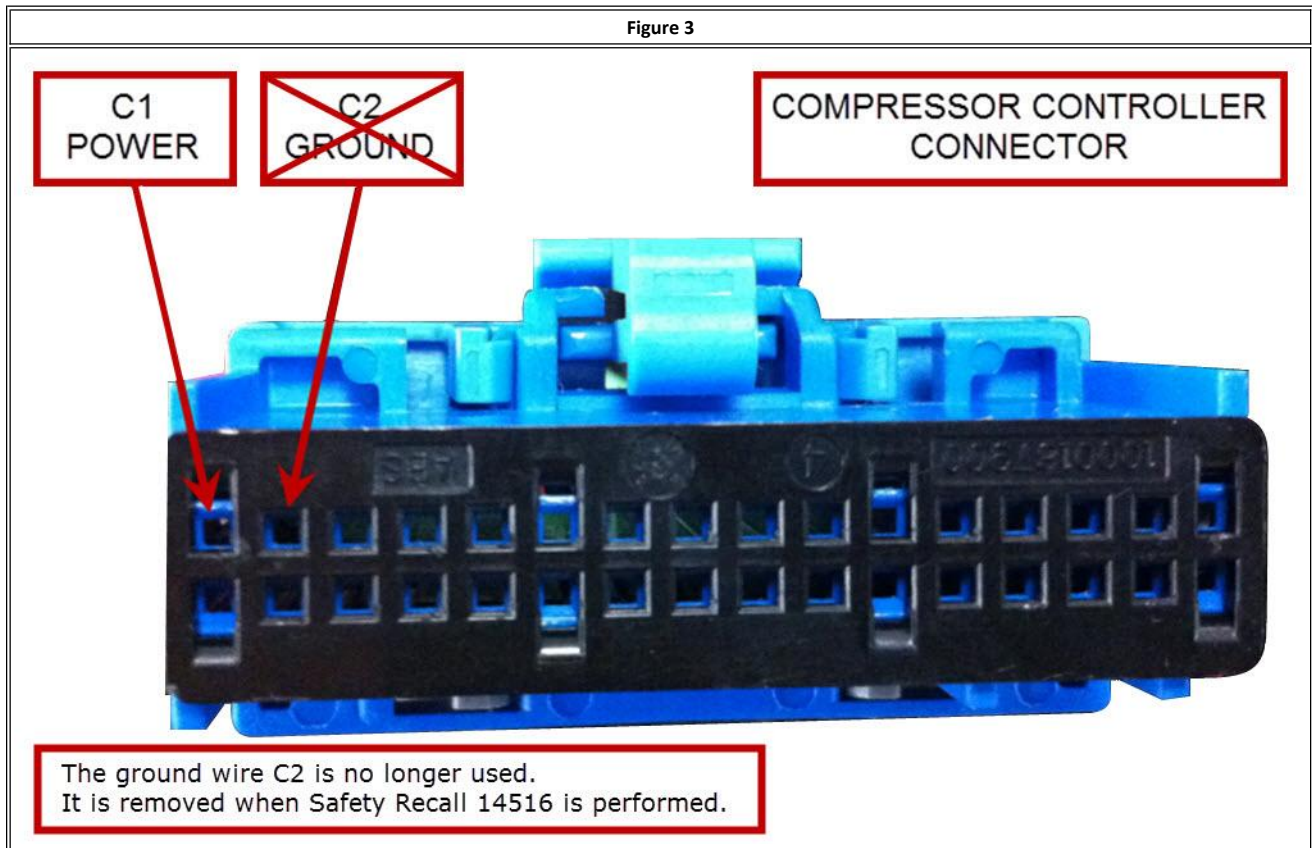
- Verify proper voltage at pin 30 (Figure 2) of the 150A Relay. (Load test the circuit with a headlamp).
  - If you do not have proper voltage at this point, you need to check the truck wiring from the fuses in the battery box to the relay terminal.
- Verify power on pin 1 and ground on pin 2 of the Relay Control. (Load test both circuits with a headlamp).
- Verify the relay engages and power is present on the output pin 87 of the 150A Relay to the Compressor Controller Circuit Board. (Figure 2)

Figure 2

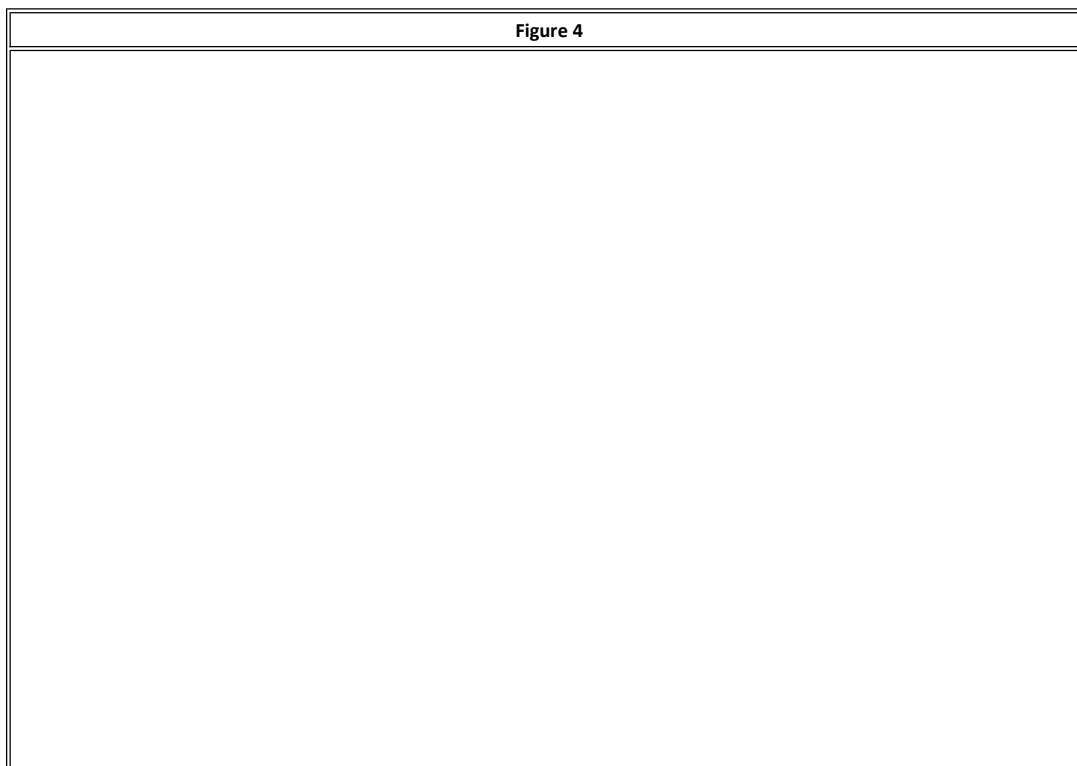


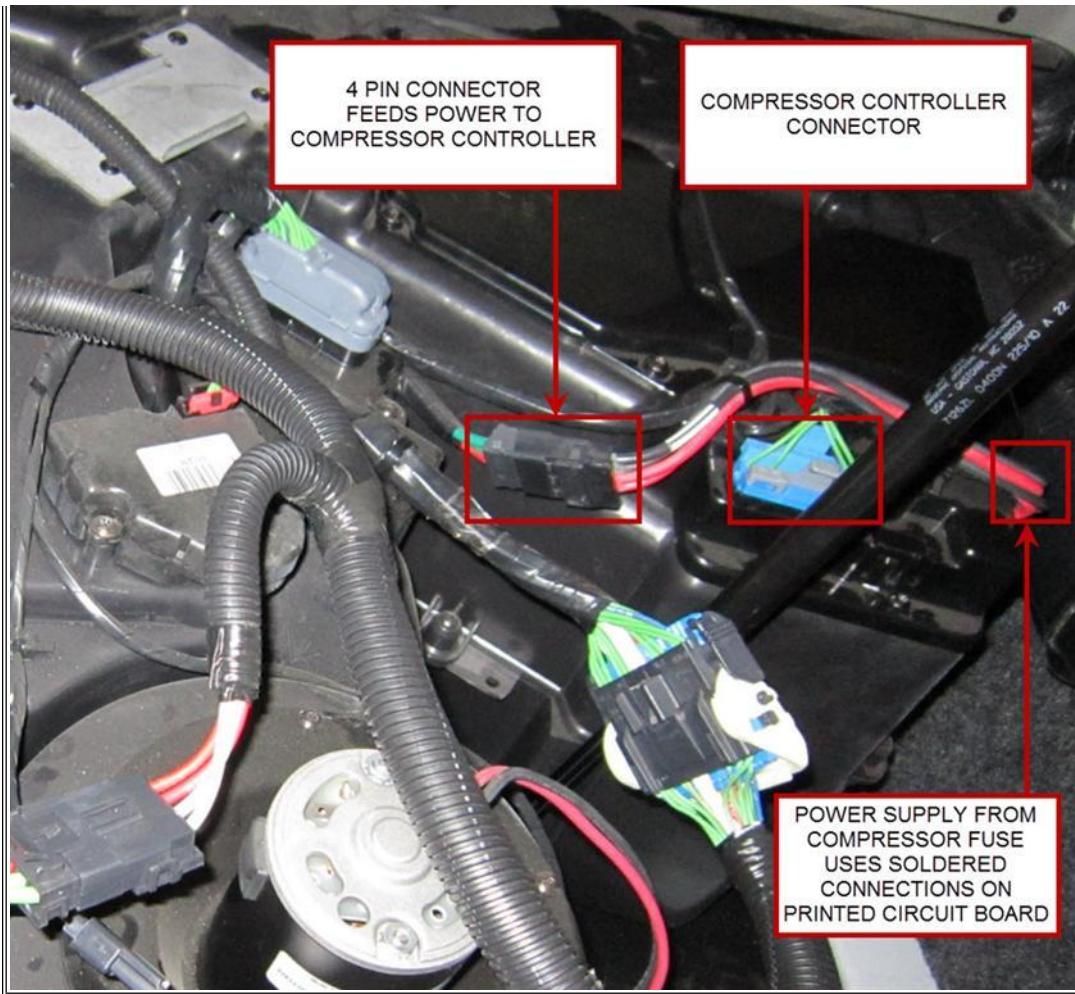
- The 150A fuse feeds power to the compressor controller circuit board (Figure 2)

- Check the 4 pin connector between the fuse and the compressor controller circuit board, ensuring the terminals are fully seated and locked. (Figure 4)
- Verify proper power terminal C1 of the compressor controller connector. (Load test the circuit with a headlamp). (Figure 3)




- Depending on the type of compressor controller, you will have one of the 2 style connectors on the compressor (Flag or Cluster Block).
- Check for 6 volts cycling on each of the three wires.





**Component Identification and Location**

<p><b>Navistar main system fuses</b></p> <ul style="list-style-type: none"> <li>• Location: Inside battery box</li> <li>• These fuses are identified on the wiring diagram as F6 and F7</li> </ul>	<p>Navistar main system fuses in battery box:</p> 
<p>150A Relay for Units built June 23, 2014 or later</p> <ul style="list-style-type: none"> <li>• This relay also applies to units that have had the power harness upgrade - Safety Recall 14516</li> </ul>	



**A: Compressor Fuse - (No longer used)**

- Removed with Safety Recall 14516.

**B: System Controller Fuse 10 Amp (Mini)**

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

**C: Blower Fuse 20 Amp (Mini)**

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

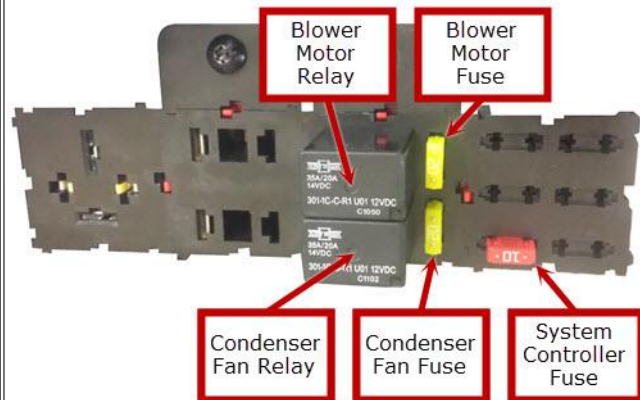
**D: Condenser Fan Fuse 20 Amp (Mini)**

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

**E: Relays**

- **Location:** On the control center
- **Compressor Relay - (No longer used)**
  - Removed with Safety Recall 14516.
- **Condenser Fan Relay**
  - This relay controls the voltage to the condenser fan.
  - (ENGINE OFF MODE)
- **Blower Motor Relay**
  - This relay controls the voltage to the evaporator blower
  - (ENGINE OFF and ENGINE ON MODE)

**A-E: Fuses and Relays**



The Compressor Relay and Compressor Fuse are no longer used. They were removed with Safety Recall 14516

**F: Switches / Fan and Temperature Control Display**

- **COOL / No Idle switch:**
  - Lights up and starts the MaxxPower A/C unit at default settings in the parked mode.
- **HEAT / No Idle switch:**
  - Lights up and starts the MaxxPower unit and auxiliary coolant heater at default settings in the parked mode.
- **LED Display:**
  - Allows for temperature and Blower speed adjustment of the MaxxPower unit when operating in A/C or heat mode.

**F: Switches / Fan and Temperature Control Display:**

- Operates like standard Auxiliary HVAC when the engine is running.
- MaxxPower A/C Unit and Auxiliary Coolant Heater - stop when, engine is started, unit is shut off or batteries are depleted.



**G: System Controller**

- This device stores the operating program and controls the MaxxPower unit.
- Location: Under the bunk, next to blend door motor, under the grey 32 pin connector.

**G: System Controller:**



**H: Compressor Controller:**

- This device controls the output voltage to the variable speed compressor.
- Location: On the top / rear area under the plastic access cover.

**H: Compressor Controller:**



**I: Linear Power Module (LPM):**

- This module controls the amount of voltage delivered to the evaporator blower creating variable blower speeds.
- Location: On the blower wheel housing.

**I: Linear Power Module:**



**J: Blend Door Actuator:**

**J: Blend Door Actuator:**

- This actuator operates the blend door, changing air flow path through the MaxxPower evaporator coil and heater core.
- Location: Under the bunk, near the blower motor.



**K: Inlet Temperature Sensor:**

- This sensor monitors the return air temperature in front of the evaporator coil.

**L: Discharge Temperature Sensor - Freeze Switch:**

- This sensor monitors the evaporator outlet temperature as it enters the vehicle duct system.

**K-L: Inlet and Discharge Temperature Sensor:**



**M: Evaporator Blower:**

- This blower pulls air through the evaporator coil or heater core and blows conditioned air into the interior of the sleeper. This blower operates with parked (no-idle) and engine driven systems.

**M: Evaporator Blower:**



**N: Condenser Fan:**

- This blower draws air from outside the truck, through a section of the louvered door on the passenger side and pushes it through the condenser coil to cool the refrigerant flowing through the system. The hot air is exhausted out the same louver panel on the passenger side of the truck.





**N: Condenser Fan:**



**O: High Pressure Switch:**

- This brazed pressure switch will open and prevent the operation of the compressor due to high internal pressure. It is NOT serviceable.

**O: High Pressure Switch:**

	
<p><b>P: Compressor</b></p> <ul style="list-style-type: none"> <li>This unit is part of the hermetically sealed refrigeration system.</li> </ul>	<p><b>P: Compressor:</b></p> 
<p><b>Q: Thermal Limit Switch on Compressor:</b></p> <ul style="list-style-type: none"> <li>This is a normally closed (auto reset) switch to protect the compressor from high temperature.</li> </ul>	<p><b>Q: Thermal Limit Switch on Compressor:</b></p> 
<p><b>R: Evaporator Inlet Filter:</b></p> <ul style="list-style-type: none"> <li>This filter protects the evaporator coil from dust and debris.</li> <li>It should be inspected and serviced periodically during routine maintenance.</li> </ul>	

### **Diagnostic Information**

Please refer to the following iKNow article for step based diagnostics:

- [IK1900235](#) - No-Idle HVAC Operational Check - STARTING POINT
- [IK1900234](#) - Symptom 1: No-Idle HVAC Cools but Operates Incorrectly
- [IK1900236](#) - Symptom 2: No-Idle HVAC Fault Codes
- [IK1900237](#) - Symptom 3: No-Idle HVAC Inoperative
- [IK1900238](#) - Symptom 4: No-Idle HVAC Digital Display Inoperative
- [IK1900239](#) - Symptom 5: No-Idle HVAC Blows Warm Air

**Circuit Diagrams**

**NOTE:**

The Bergstrom No-Idle HVAC System uses a Bergstrom harness that connects to the OEM harness.

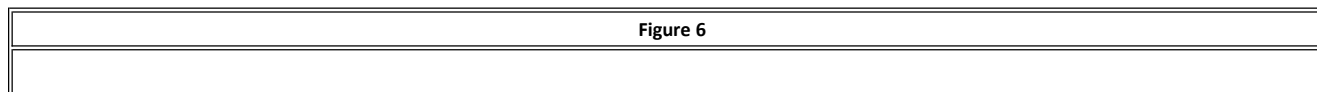
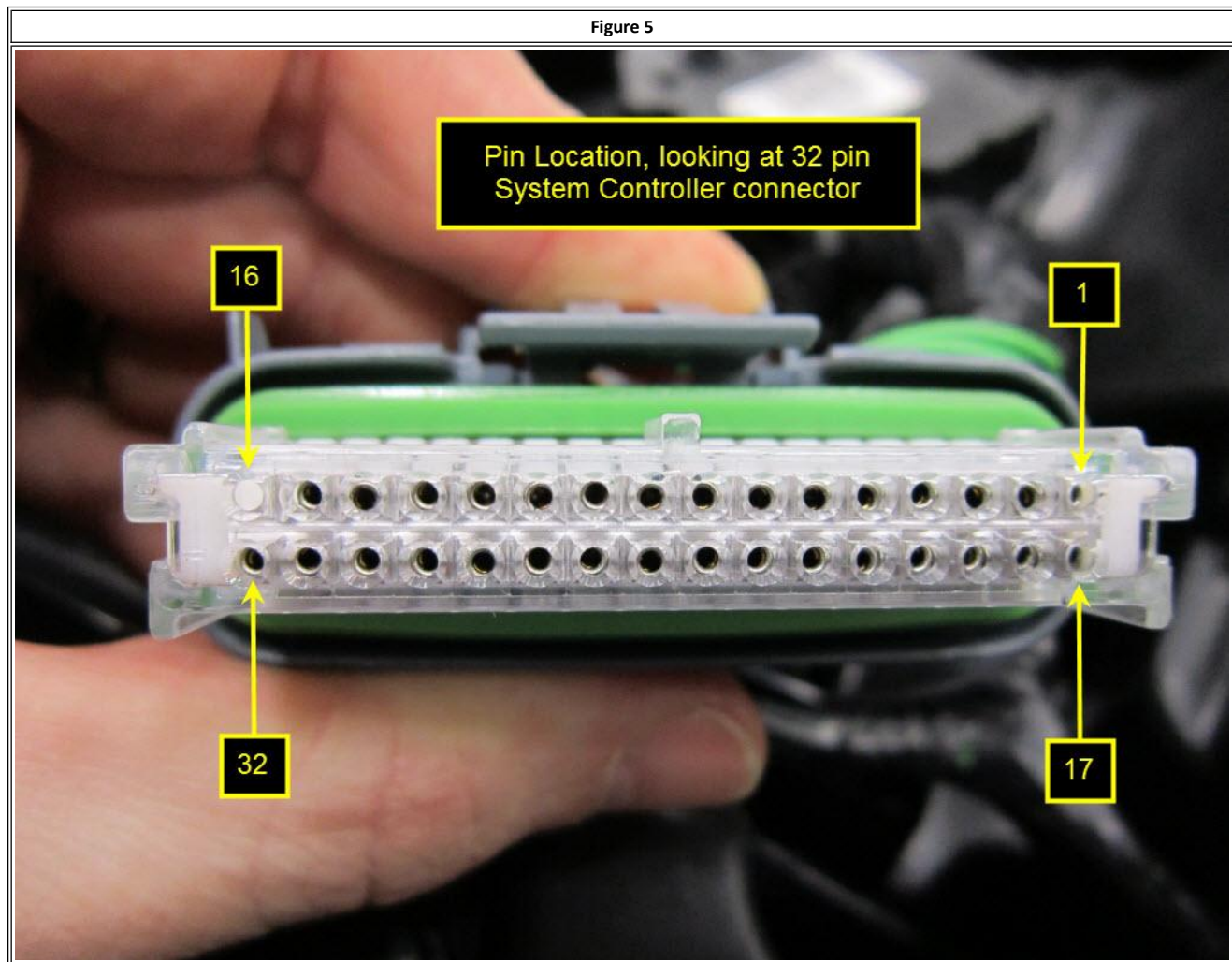
- The wiring schematic books will only show the OEM wiring.
- The PDFs below will outline the OEM wiring and show all the Bergstrom wiring.
- The wiring shown as "A/C UNIT" is where the OEM and Bergstrom harnesses meet.

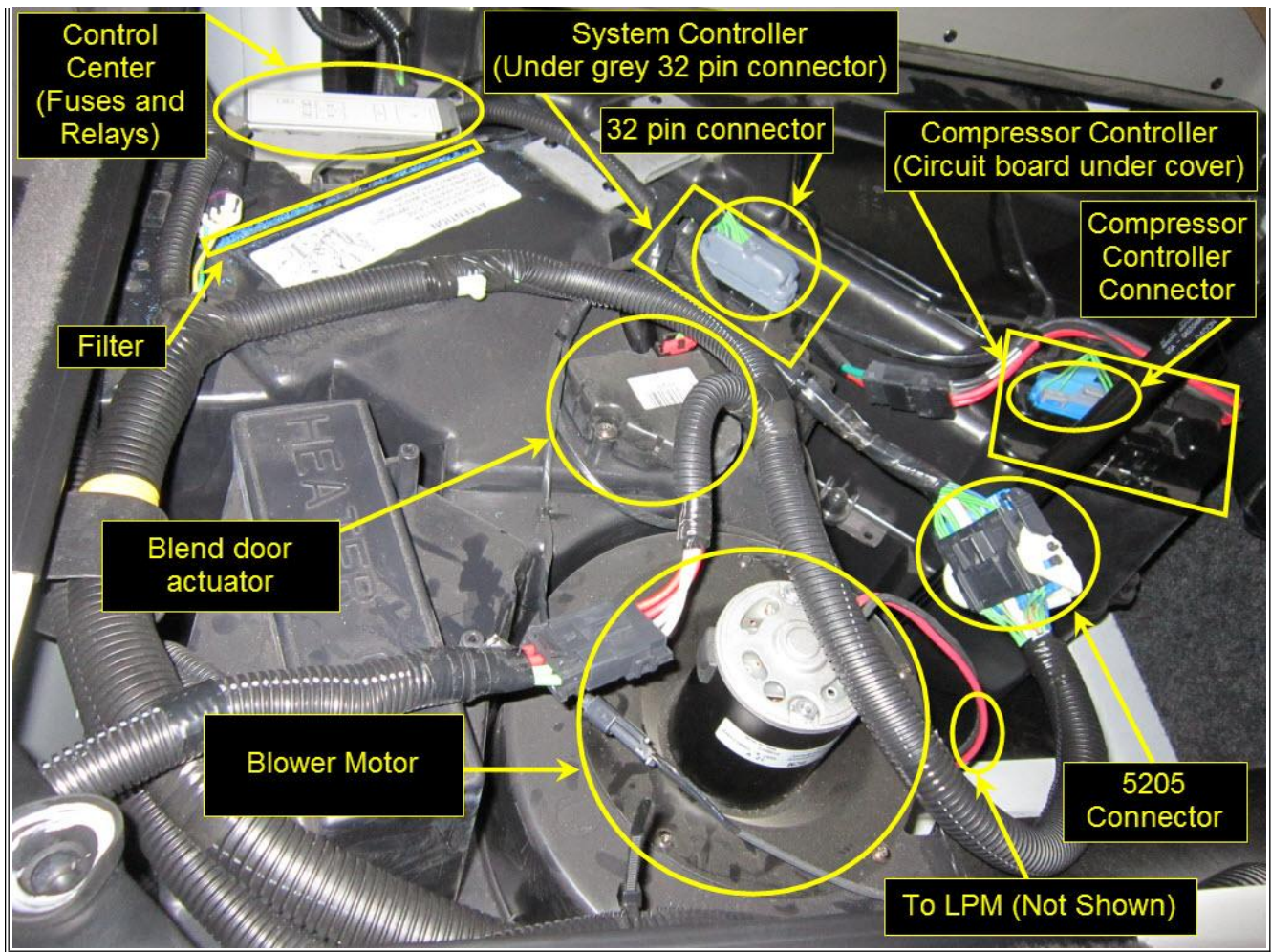
Also note the OEM wiring has standard sleeper HVAC wiring and all other sleeper wiring configurations. Take time to ensure you're looking at the correct schematic for this system. In the most current schematic book "0000002122" the No-Idle system wiring starts on Ch 12 Pg 15.

- Discharge Sensor / Air inlet sensor temp chart [CLICK HERE](#)
- Service Portal Master Service Information [CLICK HERE](#)

Circuit Diagrams vary based on the build date of the unit		
◦ For units that have had Safety Recall 14516 performed, refer to the schematic "06/23/2014 and newer"		
MaxxPower No-Idle System Circuit Diagram (PDF)	Prior to 11/11/2013	<a href="#">CLICK HERE</a>
MaxxPower No-Idle System Circuit Diagram (PDF)	11/11/2013 to 06/23/2014	<a href="#">CLICK HERE</a>
MaxxPower No-Idle System Circuit Diagram (PDF)	06/23/2014 and newer	<a href="#">CLICK HERE</a>

**Photos with Call Outs**





**Service Part(s) Information**

- Please refer to [IK1600210 - MaxxPower \(0016UZL\) Compressor Relay and Power Harness Upgrade](#)

Part #	Description	Qty.
2614669C1	Sealed Ref System 12V, Cold Loop *See Note Below*	1
3685807C1	Condenser Fan	1
3695241C1	Temp Sensor	2
3688226C3	System Controller (Under the Grey 32 Pin Connector)	1
4047671C91	Compressor Controller (Circuit Board) with Cluster Block Connector (Blue 32 Pin Connector) *See Figure 7 Below*	1
2602024C92	Compressor Controller (Circuit Board) with Flag Connectors (Blue 32 Pin Connector) *See Figure 7 Below*	1
3685818C1	Blend Door (The physical door)	1
3685800C1	Blend Door Actuator	1
3693481C1	LPM	1
2602545C91	Kit, Bunk Blower Motor with Scroll Assembly	1
3685805C1	Evaporator Inlet Filter (Blue)	1

**NOTE:**

REPLACEMENT OF NEW REFRIGERANT LOOP 2614669C1 MAY ALSO REQUIRE THE REPLACEMENT OF THE NEW COMPRESSOR CONTROLLER WITH CLUSTER BLOCK CONNECTOR 4047671C91 AS WELL.

**Replacing the Cold Loop**

The Bergstrom Maxx-Power air conditioning system has a cold loop replacement housing used to replace the non-serviceable air conditioning components. If the system has lost its refrigerant, if there is a compressor failure, or damage to the evaporator, condenser, or refrigerant lines, the cold loop will need to be replaced.

**Selecting the Correct Components**

Maxx-Power units built prior to 7/16/2012 were built with flag terminals on the compressors.

- Due to product improvements, the terminals were changed to a cluster block after 7/16/2012.
- All cold loop service parts are built with the cluster block style compressor.
- The cluster block style can be identified by its black color compressor.
- The flag style compressor is a purple / blue color.
  - The compressor controller is not compatible between the two units.
- If the vehicle was built with the flag type compressor (purple / blue), when replacing the cold loop, the compressor controller will also need to be replaced.

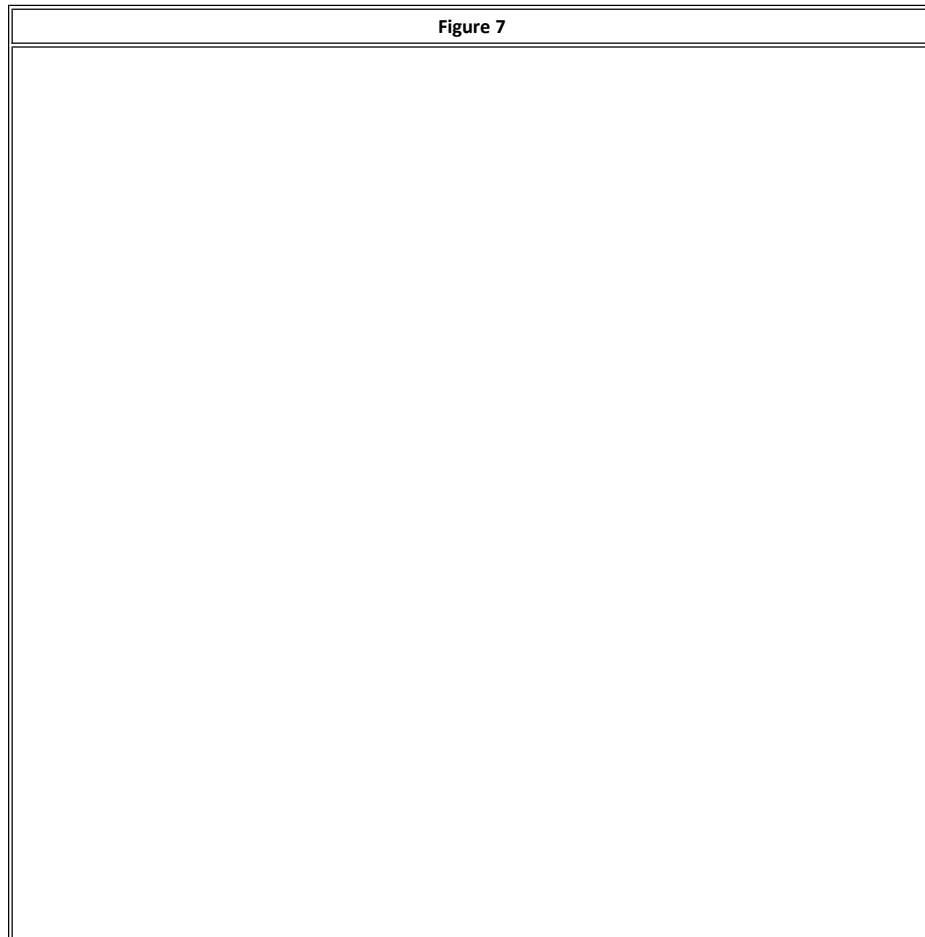
**NOTE:**

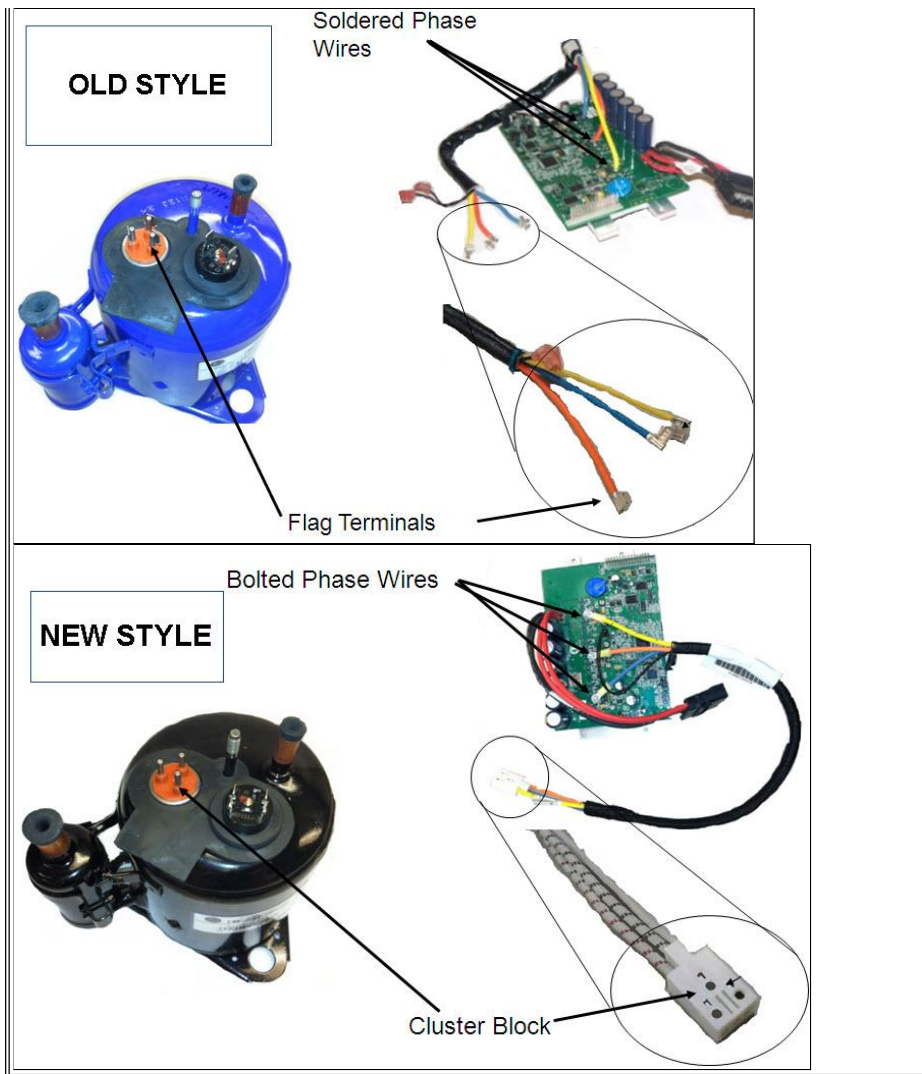
**If when removing the old cold loop it is found that the compressor in the unit is the cluster block style (black), the compressor controller should not be replaced.**

**If you have a failed compressor controller with the Purple (Blue) Compressor, you can replace the compressor controller.**

- Refer to the Parts Information section for the part number information for the different compressor controller circuit boards

Figure 7

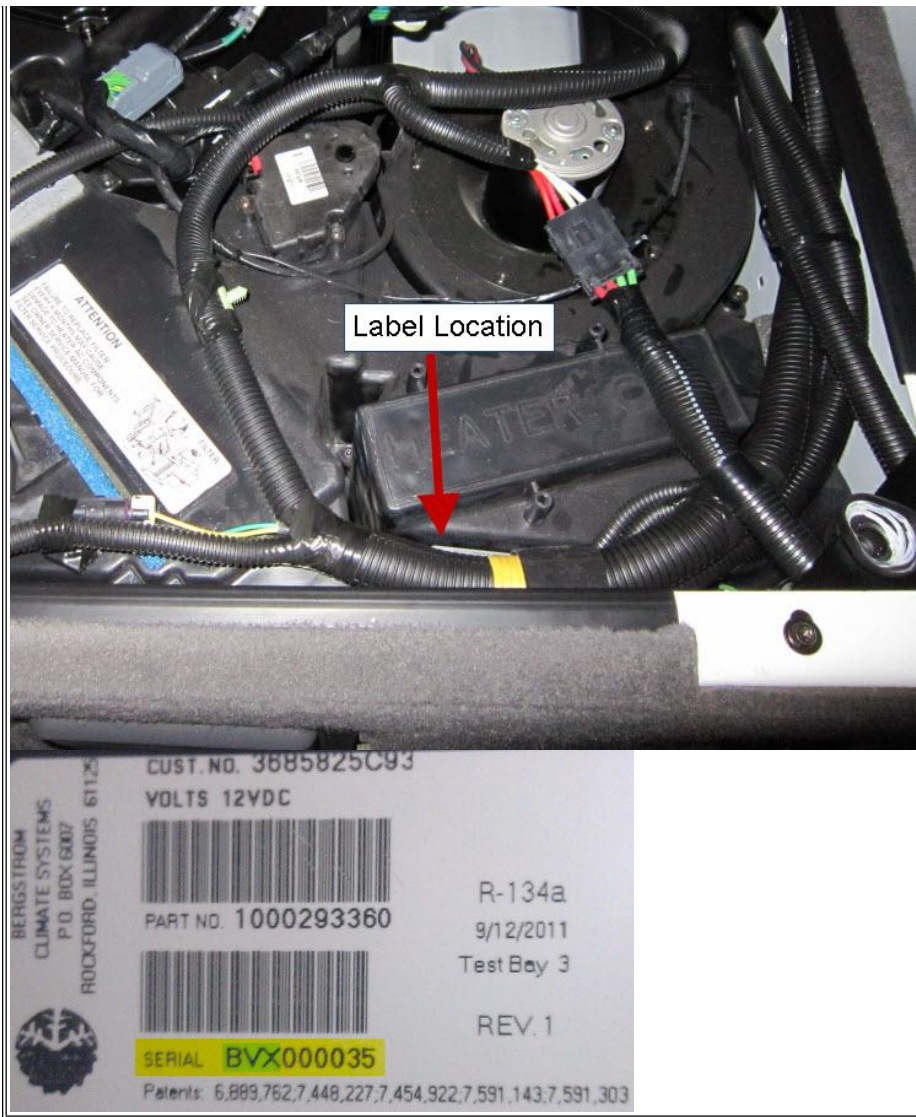




**Service Parts Based on Serial Number Prefix**

The serial number can be found on a tag of the MaxxPower HVAC box. To ensure that the proper components are ordered, the serial number prefix will determine what compressor this vehicle was built with. The tag faces the lower bunk frame front wall, and the serial number will be in the format of BVX000035. Please see the photos below for the tag example and an example position.

**Figure 8**



S/N Prefix	Complete PN (Original Build)	Cold Loop PN(Updated)	Compressor Controller PN (Required with Cold Loop)	Date Range	Compressor Color (Original Build)
BOA	3685825C92	2614669C1	2614670C1	2/1/2009-8/1/2011	PURPLE (BLUE)
BOB	3685825C92	2614669C1	2614670C1	2/1/2009-8/1/2011	PURPLE (BLUE)
BWA	3685825C93	2614669C1	2614670C1	3/11/2011-6/1/2012	PURPLE (BLUE)
BVX	3685825C93	2614669C1	2614670C1	3/11/2011-6/1/2012	PURPLE (BLUE)
CBU	3685825C94	2614669C1	2614670C1	6/1/2012-7/16/2012	PURPLE (BLUE)
CBV	3685825C94	2614669C1	2614670C1	6/1/2012-7/16/2012	PURPLE (BLUE)
CCF	3685825C94	2614669C1	ORIGINAL IS COMPATIBLE	7/16/2012-1/7/2013	BLACK
CCG	3685825C94	2614669C1	ORIGINAL IS COMPATIBLE	7/16/2012-1/7/2013	BLACK
CCH	3685825C95	2614669C1	ORIGINAL IS COMPATIBLE	1/8/2013-	BLACK
CCI	3685825C95	2614669C1	ORIGINAL IS COMPATIBLE	1/8/2013-	BLACK
	3685825C96	2614669C1	ORIGINAL IS COMPATIBLE		BLACK
	3685825C97	2614669C1	ORIGINAL IS COMPATIBLE		BLACK
	3685825C98	2614669C1	ORIGINAL IS COMPATIBLE		BLACK
	4047605C91	2614669C1	ORIGINAL IS COMPATIBLE		BLACK
	2513868C91*	2614669C1	ORIGINAL IS COMPATIBLE	6/23/2014 - Current	BLACK

\*Units starting on 6/23/2014 were built with the 150A Relay.

**Additional Resources**

<a href="#">IK1600210</a>	MaxxPower (0016UZL) Compressor Relay and Power Harness Upgrade
<a href="#">S16043</a>	12V DC No Idle HVAC System (16UZL)
<a href="#">Operator's Manual</a>	12V DC No Idle HVAC System (16UZL)
<a href="#">IK1900156</a>	A/C HVAC Service Resource Center

**Warranty Information**

**Warranty Claim Coding:**

Group	Noun
19030 - Auxiliary No-Idle HVAC	777 Vehicle, Sub (Rental)***
	778 Towing, Out of Warranty****
	633 Auxiliary Fuel-Fired Heater
	635 Auxiliary Power Unit (APU)
	638 Electric HVAC Module

**Standard Repair Time(s):**

**NOTE:**

The Diagnostic SRTs for the A/C portion of the No-Idle system can be found in the Diagnostic Information iKnow Articles.

<u>19-No Idle HVAC Components, Diagnostics</u>		
SRT Description	SRT Code Link (Model)	SRT(hr)
ESPAR Coolant Heater	<a href="#">R19-8012A</a> (ProStar)	0.6
	<a href="#">S19-8015A</a> (LoneStar)	
Hydronic Heater Diagnosis	<a href="#">R19-8013A</a> (ProStar)	0.5
	<a href="#">S19-8016A</a> (LoneStar)	
Heater Function Test	<a href="#">R19-8014A</a> (ProStar)	0.5
	<a href="#">S19-8017A</a> (LoneStar)	

<u>19-No Idle HVAC Components, Replace</u>		
SRT Description	SRT Code Link (Model)	SRT(hr)
ESPAR Coolant Heater	<a href="#">R19-7633A</a> (ProStar)	1.0
	<a href="#">S19-7633A</a> (LoneStar)	
Blower Unit	<a href="#">R19-7633A-20</a> (ProStar)	0.5
	<a href="#">S19-7633A-20</a> (LoneStar)	
Coolant Pump	<a href="#">R19-7633A-21</a> (ProStar)	0.3
	<a href="#">S19-7633A-21</a> (LoneStar)	
Overheat Sensor w/Cable Section	<a href="#">R19-7633A-22</a> (ProStar)	0.5
	<a href="#">S19-7633A-22</a> (LoneStar)	
Flame Sensor	<a href="#">R19-7633A-23</a> (ProStar)	0.3
	<a href="#">S19-7633A-23</a> (LoneStar)	

Glow Pin	<a href="#">R19-7633A-24</a>	(ProStar)	0.3
	<a href="#">S19-7633A-24</a>	(LoneStar)	
Fuel Metering Pump	<a href="#">R19-7633A-25</a>	(ProStar)	0.4
	<a href="#">S19-7633A-25</a>	(LoneStar)	
Burner/ Flame Tube	<a href="#">R19-7633A-26</a>	(ProStar)	0.5
	<a href="#">S19-7633A-26</a>	(LoneStar)	
O-Rings, Coolant Pump	<a href="#">R19-7633A-27</a>	(ProStar)	0.3
	<a href="#">S19-7633A-27</a>	(LoneStar)	
O-Rings, Sensors	<a href="#">R19-7633A-28</a>	(ProStar)	0.3
	<a href="#">S19-7633A-28</a>	(LoneStar)	
O-Ring Heat Exchanger	<a href="#">R19-7633A-29</a>	(ProStar)	0.5
	<a href="#">S19-7633A-29</a>	(LoneStar)	
Seal Kit	<a href="#">R19-7633A-30</a>	(ProStar)	0.5
	<a href="#">S19-7633A-30</a>	(LoneStar)	
Electronic Control Unit (ECU) ESPAR Heater	<a href="#">R19-7633A-31</a>	(ProStar)	0.4
	<a href="#">S19-7633A-31</a>	(LoneStar)	
Complete Unit	<a href="#">R19-7638A</a>	(ProStar)	2.5
	<a href="#">S19-7638A</a>	(LoneStar)	
Blower Motor	<a href="#">R19-8638A-20</a>	(ProStar)	0.6
	<a href="#">S19-8638A-20</a>	(LoneStar)	
Condenser Fan	<a href="#">R19-8638A-21</a>	(ProStar)	0.6
	<a href="#">S19-8638A-21</a>	(LoneStar)	
Control Module (A/C Unit)	<a href="#">R19-8638A-22</a>	(ProStar)	0.3
	<a href="#">S19-8638A-22</a>	(LoneStar)	

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