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Availability: ISIS, FleetSIS

Major System: ACCESSORIES

Current Language: English

Other Languages: [Français](#), [Español](#)

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Coding Information

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Title: 2010 and Newer Vehicle Air Conditioning Diagnostics (Start Here)

Applies To: Post 2010 NGV

CHANGE LOG

- 05/26/2015 - Fixed link on step 6 to properly route viewer to IK1900226
- 5/15/2105 - Fixed link to S16046 Manual and added link to PDF for the HVAC System Pressure Test Chart.
- 4/9/2015 - Added SPN 2609 to symptom table
- 2/24/2015 - Corrected diagnostic flow steps
- 11/21/2014 - Added Pre-2010 information to reference dealer to Pre-2010 Resource Center. Adjusted document to make it easier to find in iKnow.

DESCRIPTION

This document addresses Air Conditioning issues on the following 2010 to 2014 vehicles with a BCM.

The following procedures will guide the user through : Common Air Conditioning failure areas, diagnostic tools, SRTs, and warranty filing.

Note: For anything Pre-2010, reference the Pre-2010 A/C HVAC Resource Center located [IK1900156](#).

SYMPTOM

Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):

SPN	FMI	Description
2609	16	A/C High Pressure Protection
2609	15	Low Charge Protection
1079	1	5 volt sensor supply below normal
3985	9	A/C Control Head Circuit Failed To Communicate With Body Controller
1552	2	A/C Control Head Temperature Mix DM1
3981	2	A/C Control Head Mode Fault DM1
3984	2	A/C Control Head Air Inlet DM1
2058	9	Rear A/C Data Link Communication Failure
2058	14	Rear A/C Data Link Communication Failure
3982	2	A/C Rear Blower Speed Control Switch Error
3983	2	Rear A/C Temperature Control Switch Error
520465	2	A/C Control Head Multiple Motor Faults

Customer Observations or Concerns:

- Malfunction Indicator Light (MIL)
- No cab air conditioning
- "Warm" A/C
- No air flow through vents
- No rear A/C
- Inoperative MaxxPro no-idle A/C system

SPECIAL TOOLS / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Robinair Air Conditioning Machine or equivalent	34988	A/C recovery, vac, and performance test	

SERVICE PARTS INFORMATION

Due to variety of configurations, reference the parts catalog for vehicle being repaired.

[Parts Catalog](#)

PROCEDURE OVERVIEW:

NOTE:
Do not start engine until steps 2-4 have been completed. If the engine has been run recently, allow the vehicle to sit for one hour so system pressures can stabilize.

Consider the following before beginning:

- Are any Air Conditioning related AFC's open?
- Was the vehicle recently in for an Air Conditioning repair, in which the system was not properly filled or serviced?
- Were A/C repairs made recently, and fault codes not cleared properly?

If the A/C issue is known (blown off hose, visible dye, inoperative blower motor) go directly to the respective steps or iKNow articles listed below. Otherwise, go to step 1.

- [IK1900226 A/C Control Head Issues](#)
- [IK1900225 A/C Mechanical Pressures diagnostics](#)
- [IK1900223 A/C Sensor/ Electronic Issues](#)
- [IK1900198 12V-No Idle HVAC Unit](#)
- [IK1900227 Rear A/C Electrical and Mechanical Diagnostics](#)

DIAGNOSTIC STEPS

Step	Action	Decision
1	<p>Customer Interview:</p> <p>Review the Repair Order to determine the following:</p> <ul style="list-style-type: none"> • What is the Air Conditioning System doing specifically? (No cold air, not cold enough, no air flow at vent, or no defrost?) • When does the concern occur? Vehicle stationary, when idling overnight, or going down the road? • Is the problem intermittent, or happen consistently? • Have you had the vehicle serviced recently? When and where? Was there an A/C related service performed during that service? • Does issue concern the passenger compartment, the sleeper, or both? • If equipped with a No-Idle system does the issue only happen when utilizing the No-Idle System? <p>Is the problem confined to the rear A/C system while the Cab A/C works correctly?</p> <p>Is the problem confined to the operation or performance of the MaxxPro No Idle system?</p>	<p>Yes: cab A/C works correctly but rear . not: Go to step 7.</p> <p>YES: concern is with MaxxPro No-Idle unit: Go to IK1900198</p> <p>No: to step 2.</p>

Step	Action	Decision
2	<p>Preliminary checks:</p> <p>Note: Do not start engine until steps 2-4 have been completed. If the engine has been run recently, allow the vehicle to sit for one hour to allow system pressures to stabilize.</p> <p>Perform a visual check of the A/C system to verify that no obvious problems are present. With the engine off, inspect the following items:</p> <ul style="list-style-type: none"> • Compressor and clutch mounting • Compressor clutch coil wiring and connection • Compressor drive belt and belt tensioner • A/C hoses and connections • Condenser mounting • Condenser fins (blockage by debris) • Receiver-drier mounting • Expansion valve mounting • Filter element • Fresh air module drains • Fresh air module mounting and overall condition • Electrical connections to pressure transducer and low pressure switch • Electrical connections to actuators for airflow doors (recirculate, temperature, and mode doors) • Fan speeds and mode door operation <p>Were any issues found?</p>	<p>Yes: Repair as necessary. Restore sys operational condition and operate the A determine if the complaint was correcte</p> <p>No: Go to step 3.</p>

Step	Action	Decision
3	<p>Diagnostic Trouble Codes:</p> <p>Check for A/C related DTC's:</p> <p>Are any A/C related DTC's found?</p>	<p>Yes: Go to FAULT CODES in IK190020</p> <p>No: Go to step 4.</p>

Step	Action	Decision																																							
4	<p>Static Pressure:</p> <p>NOTE: Have the engine OFF and A/C system at ambient temperature when measuring static pressure. If the engine has been run recently, allow the vehicle to sit for a minimum of one hour to allow system pressures and temperatures to stabilize.</p> <ol style="list-style-type: none"> 1. Inspect high and low side Schrader valves for presence of dye and pooling of oil in valve. 2. Connect gauges to the A/C system and record static pressure readings. 3. Use a temperature probe to determine the ambient temperature within 1 or 2 degrees. Record the measured temperature. 4. Locate the ambient temperature on the chart below and compare the vehicle's static pressure to the chart pressure. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Temp °F</th> <th>Temp °C</th> <th>R134A PSIG</th> </tr> </thead> <tbody> <tr><td>40 °F</td><td>4.4 °C</td><td>35</td></tr> <tr><td>45 °F</td><td>7.2 °C</td><td>40</td></tr> <tr><td>50 °F</td><td>10.0 °C</td><td>45</td></tr> <tr><td>55 °F</td><td>12.8 °C</td><td>51</td></tr> <tr><td>60 °F</td><td>15.6 °C</td><td>57</td></tr> <tr><td>65 °F</td><td>18.3 °C</td><td>64</td></tr> <tr><td>70 °F</td><td>21.1 °C</td><td>71</td></tr> <tr><td>75 °F</td><td>23.9 °C</td><td>78</td></tr> <tr><td>80 °F</td><td>26.6 °C</td><td>86</td></tr> <tr><td>85 °F</td><td>29.4 °C</td><td>95</td></tr> <tr><td>90 °F</td><td>32.2 °C</td><td>104</td></tr> <tr><td>95 °F</td><td>35.0 °C</td><td>113</td></tr> </tbody> </table>	Temp °F	Temp °C	R134A PSIG	40 °F	4.4 °C	35	45 °F	7.2 °C	40	50 °F	10.0 °C	45	55 °F	12.8 °C	51	60 °F	15.6 °C	57	65 °F	18.3 °C	64	70 °F	21.1 °C	71	75 °F	23.9 °C	78	80 °F	26.6 °C	86	85 °F	29.4 °C	95	90 °F	32.2 °C	104	95 °F	35.0 °C	113	<p>Yes: Go to step 5.</p> <p>No: Go to Air Conditioning Mechanical Pressures Diagnostics IK1900225</p>
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100 °F	37.7 °C	124
105 °F	40.5 °C	134
110 °F	43.3 °C	146

Are the A/C pressures in spec?

Step	Action	Decision
5	<p>Compressor Engagement:</p> <p>Start engine. Turn the A/C on. Verify compressor engagement.</p> <p>Does the compressor engage?</p>	<p>Yes: Go to step 6.</p> <p>No: Go to Air Conditioning Electrical Diagnostics IK1900223</p>

Step	Action	Decision																						
6	<p>Performance Test: Check the System Performance by performing the following steps:</p> <p>A. Park the vehicle so there is no solar loading and no wind.</p> <p>B. Position a thermometer approximately 30 to 60 cm (12-24 inches) in front of the vehicle grille.</p> <p>C. Engage the engine cooling fan (unless viscous fan drive).</p> <p>D. Close the hood, being careful not to damage the equipment.</p> <p>E. Insert a thermometer into the passenger side, left instrument panel vent. Do not allow the thermometer to touch the sides of the duct. Insert a second thermometer into the lower passenger bunk vent</p> <p>F. Start the engine and raise the idle speed to 1500 rpm.</p> <p>G. Open windows and close both cab doors.</p> <p>H. Set the mode control to: NORM A/C; Highest blower speed; Coldest cooling temperature.</p> <p>I. Operate the system for five minutes, or until gauge readings settle.</p> <p>J. Record the following data:</p> <table border="1"> <thead> <tr> <th>Test Point</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Ambient Air Temperature</td> <td></td> </tr> <tr> <td>Relative Humidity</td> <td></td> </tr> <tr> <td>Cab Air duct Temp</td> <td></td> </tr> <tr> <td>Low-Side psi @ 1500 RPM</td> <td></td> </tr> <tr> <td>Compressor on (cut-in PSI)</td> <td></td> </tr> <tr> <td>Compressor off (cut-out PSI)</td> <td></td> </tr> <tr> <td>High-Side psi @ 1500 RPM</td> <td></td> </tr> <tr> <td>Compressor on (cut-in PSI)</td> <td></td> </tr> <tr> <td>Compressor off (cut-out PSI)</td> <td></td> </tr> <tr> <td>Lower Passenger bunk vent temp</td> <td></td> </tr> </tbody> </table> <p>K. Compare gauge readings, vent temperature, ambient temperature, and humidity to the appropriate HVAC System Pressure Test Chart.</p> <p>Does the Cab and rear HVAC operate correctly?</p>	Test Point	Value	Ambient Air Temperature		Relative Humidity		Cab Air duct Temp		Low-Side psi @ 1500 RPM		Compressor on (cut-in PSI)		Compressor off (cut-out PSI)		High-Side psi @ 1500 RPM		Compressor on (cut-in PSI)		Compressor off (cut-out PSI)		Lower Passenger bunk vent temp		<p>Yes: System is operating correctly. Discuss concern with customer.</p> <p>No: gauge readings are out of specification. Air Conditioning Mechanical Pressures Diagnostics IK1900225</p> <p>No: gauge readings are correct but cab temperature is out of specification: Go to Air Conditioning Control Head Diagnostics IK1900226</p>
Test Point	Value																							
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Step	Action	Decision
7	<p>Rear A/C Test:</p> <p>A. Start engine and raise engine speed to 1500 RPM.</p> <p>B. Turn cab A/C switch to NORM</p> <p>C. Turn cab blower switch to highest speed.</p> <p>D. Turn cab temperature switch to coldest position.</p>	<p>Yes: rear HVAC system operates correctly</p> <p>No: Rear A/C does not function: Go to Front Air Conditioning Electrical and Mechanical Diagnostics IK1900227</p> <p>No:</p>

- G. Use the dash SLPR-TEMP switch to vary sleeper temperature from warmest setting to the coldest setting.
- H. Use the Rear HVAC Control panel blower switch to raise and lower rear blower speed.
- I. Use the Rear HVAC Control panel TEMP switch to raise and lower the duct air Temperature.
- J. Review rear duct temperature recorded in step-6

rear control panel TEMP and FAN switch inoperative while SLPR-TEMP and SLP switches function: [Go to Rear A/C Control Inoperative IK1900231](#)

No: one or both SLPR TEMP and SLPR switches are inoperative but rear control TEMP and FAN switches functions correct to Sleeper Fan and Sleeper TEMP Switch Inoperative [IK1900232](#)

No: Front and rear controls function correct rear A/C blows warm air: Go to Rear A/C Warm Air [IK1900231](#)

Do the dash SLPR-FAN and SLPR-TEMP switches control the rear A/C?

Do the rear control panel blower speed and temperature switches control the rear A/C?

Does the stabilized rear duct temperature from step-6 meet specifications (See appropriate 2010 HVAC SYSTEM PRESSURE TEST CHART)?

WARRANTY INFORMATION:

Standard Repair Times: Due to the variety of vehicle configurations and number of components affected, reference the SRT Manual (quick links below) for repair times.

Description
A/C SYSTEM PRELIMINARY DIAGNOSIS (EXCEPT 5000, 9000 SERIES), PERFORM
A/C MECHANICAL PRESSURES DIAGNOSIS (EXCEPT 5000, 9000 SERIES), PERFORM
A/C ELECTRICAL DIAGNOSIS (EXCEPT 5000, 9000 SERIES) , PERFORM
A/C CONTROL HEAD DIAGNOSIS
A/C REAR UNIT ELECTRICAL AND MECHANICAL DIAGNOSIS (EXCEPT 5000,9000 SERIES), PERFORM

[SRT Manual](#)

Other Resources:

Document Number	Description
S16046	HEAT VENTILATION AIR CONDITIONING (HVAC) FOR 2010 - 3200 Bus, DuraStar®, TerraStar™, TranStar®, WorkStar® Models
000002221	HEAT VENTILATION AIR CONDITIONING (HVAC) FOR 2010 ProStar and LoneStar Models (Formerly S16047)
IK1900207	2010 and Later ProStar and LoneStar HVAC Information
IK1900022	A/C Refrigerant and Oil Capacities

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