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Major System: ACCESSORIES

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Coding Information

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

Applies To: TerraStar and TranStar Models Only

CHANGE LOG

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

05/04/2017 - Removed rear HVAC diagnostics and coded to TerraStar and TranStar only.
 12/19/2016 - Removed retired links
 06/01/2016 - Corrected diagnostic table layout
 09/01/2015 - Repaired iKNOW link in step 7
 06/30/2015 - Changed formatting of tables in Diagnostic section to fit on one page when printed.
 08/31/2015 - Fixed hyperlink.

DESCRIPTION

This document addresses Air Conditioning issues on the following 2010 to 2014 TerraStar and TranStar models.

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](#)

DIAGNOSTIC STEPS

Step	Action	Decision
1	Preliminary checks: 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. 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: • 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 Were any issues found?	Yes: Repair as necessary. Restore system to operational condition and operate the A/C system to determine if the complaint was corrected.
		No: Go to step 2.

Step	Action	Decision
2	Diagnostic Trouble Codes: Check for A/C related DTC's: Are any A/C related DTC's found?	Yes: Go to FAULT CODES in IK1900207
		No: Go to step 3.

Step	Action	Decision
3	Static Pressure:	Yes: Go to step 4.

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.

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.

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
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?

No: Go to Air Conditioning Mechanical Pressures Diagnostics [IK1900225](#)

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

Step	Action	Decision																	
5	C. Engage the engine cooling fan (unless viscous fan drive).																		
	D. Close the hood, being careful not to damage the equipment.	Yes: System is operating correctly. Discuss concern with customer.																	
	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.	No: Gauge readings are out of specification: Go to Air Conditioning Mechanical Pressures Diagnostics IK1900225																	
	F. Start the engine and raise the idle speed to 1500 rpm.	No: Gauge readings are correct but cab vent temperature is out of specification: Go to Air Conditioning Control Head Diagnostics IK1900226																	
	G. Open windows and close both cab doors.																		
	H. Set the mode control to: NORM A/C; Highest blower speed; Coldest cooling temperature.																		
	I. Operate the system for five minutes, or until gauge readings settle.																		
	J. Record the following data:																		
	<table><tr><th>Test Point</th><th>Value</th></tr><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></table>		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)
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WARRANTY INFORMATION

K. Compare gauge readings, vent temperature, ambient

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
0000002221	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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