Countries:	AUSTRALIA, BRAZIL, CANADA, CHILE, COLOMBIA, UNITED STATES, MEXICO, NICARAGUA, PERU, PUERTO RICO, NEW ZEALAND, PANAMA	**Document ID:**	IK1900226
Availability:	ISIS, FleetISIS	**Revision:**	2
Major System:	ACCESSORIES	**Created:**	8/18/2014
Current Language:	English	**Last Modified:**	10/28/2014
Other Languages:	NONE	**Author:**	Kevin Kochanek
Viewed:	245		

Less Info

Hide Details Coding Information

Copy Link	Copy Relative Link	Bookmark	Add to Favorites	Print	Provide Feedback	Helpful	Not Helpful
		View My Bookmarks				0	2

Title: Air Conditioning Control Head Diagnostics

Applies To: Post 2010 NGV

CHANGE LOG

10/28/2014 - Author updated for feedback purposes
10/1/2014 - Updated with new IKnow links.
9/8/2014 - Updated SRT, special tools, and coding.
8/05/2014 - Initial Article Release

DESCRIPTION

This document is supplemental to IK1900228 and addresses Control Head issues.

SYMPTOM:

Incorrect vent temperatures with compressor engaged and correct pressure gauge readings

Inoperable modes or blower speeds

SPECIAL TOOLS:

Tool Description	Tool Number	Comments	Instructions
Fluke DVOM Universal	ZTSE4357	Used for checking electrical connections	

Possible Causes:

Active DTC

Actuator/ Doors needs to be recalibrated

No voltage or ground to HVAC Control head

Failed actuator

Mechanical door damage

Blower stuck

Failed LPM

No A/C request from A/C control head to Body Controller

A/C CONTROL HEAD DIAGNOSIS

Note-Body controller will not engage the clutch when A/C related DTCs are active. The following procedures are ONLY VALID if the A/C system is fully charged and the A/C system checks in IK1900228 were performed.
Note- When a failed circuit or component is detected, repair as needed and retest for original problem.

1	HVAC Module Inspection	Decision
A. Visually inspect HVAC module for clogged filters, obstructed ducts, and wiring disconnected from actuators and Linear Power Module (LPM). B. Inspect the 5 Amp and 10 Amp, and 30 Amp HVAC fuses. Are issues detected?		Yes: Repair as needed. If A/C does not operate correctly, go to step 2. If A/C now operates correctly, Diagnostic are complete. No: Go to step 2.

……

2	Control Head Power	Decision
A. Disconnect the harness from the control head. B. Turn ignition Key-ON. C. Connect a 12V test light between Pin-A1 and B6 of the A/C control head harness connector (1200). D. Connect a 12V test light between Pin-A2 and Pin B6 of the A/C control head harness connector (1200). Does the test light illuminate brightly in both steps C and step D? (If using a DMM, both Pin-A1 and Pin-A2 should have 12 V ± 1.5)		Yes: Reconnect harness to control head but do not reassemble control head to dash, and then go to step 3. No: Leave control head unplugged and go to**Step 22.**

…..

3	A/C Request to Body Controller	Decision
A. Turn ignition Key-ON, HVAC control switch to NORM, and blower ON. B. Open DLB. C. "Watch" *A/C Request* in the DLB Signal column. Is the *A/C Request* box check-marked?		Yes: Go to step 4. No: Go to **Step 5 (A/C Request Diagnostics).**

….

4	A/C Operation	Decision
A. Start Engine. B. Turn HVAC control to NORM, Blower ON, and temperature to coldest setting. C. Turn blower switch to each speed (1-7) and check for proper fan operation. D. Turn mode control to each position and check interior vents for proper mode door operation. Note: Allow time for interior module doors to rotate to correct position. E. Vary mode control from NORM to MAX A/C and check recirculation mode (increase in vent air flow) F. Vary temperature control switch and check vents for change in air temperature.		Yes: A/C system operates correctly. No, Blower, Mode, Recirculation, and Temperature controls do not function: Replace HVAC Controller. No, blower speed does not function correctly: Go to **Step 6 (Blower Speed Diagnostics).**

Does the system operate correctly including fan, mode control, MAX A/C recirculation, and temperature control?	No: Temperature Control does not operate correctly: Go to **Step 9 (Blend Door Diagnostics).**
	No, mode control switch does not function correctly: Go to **Step 14 (Mode Control Diagnostics)**.
	No, recirculation does not function correctly: Go to **Step 18 (Recirculation Door Diagnostics).**

…..

Step 5: A/C Request Diagnostics

5	**A/C Request Diagnostics:**	**Decision**
A. Disconnect body controller J3 connector (1600). B. Turn ignition Key-ON, HVAC control switch to NORM, and blower-ON. C. Measure voltage at Pin-A2 of connector 1600. Does Pin-A2 have 12V +/- 1.5?		Yes: Inspect J3 cavity for bent pins and verify body controller has power and ground. **Note: DLBshould show A/C Requestchecked if body controller receives 12V on connector J3 (1600) Pin A2.** After repairs are complete, reassemble unit and retest for operator concern.
		No: Check the following circuits for open or high resistance: **Circuit A77A**(connector 1600 Pin-A2 to control head connector 1200 Pin-A4. If circuit is good, control head has failed. After repairs are complete, reassemble unit and retest for operator concern.

….

Step 6-8: Blower Speed Diagnostics

6	**LPM Voltage**	**Decision**
A. Turn ignition Key-ON. B. Disconnect the three wire LPM connector (1220) C. Use a head lamp to Load test Pin-6 (B+) to a good ground. D. Use a head lamp to Load test Pin-6 (B+) to Pin-5. Does the lamp burn brightly on step C and step D?		Yes: leave three wire LPM connector (1220) unplugged and the Key-On: Go to step 7.
		Step C is Dim: Check B+ circuit from Pin-6 back to battery for high resistance. After repairs are complete, reassemble unit and retest for operator concern.

	Step C is bright and step D is Dim: Check the following circuit for open or high resistance: Circuit A75-G (connector 1220 Pin-E to *left side dash mounted dual post ground*). After repairs are complete, reassemble unit and retest for operator concern.

.....

7	Control Head Speed Signal	Decision
A. Turn blower-ON to highest speed. B. Measure voltage at Pin-4 to Pin-5. C. Repeat step 4 for each fan speed. D. Turn blower off and reconnect the three wire LPM connector (1220). Do the measured voltages for each speed match the chart?		Yes: Leave the Key-On and go to step 8. No: Key-Off. Replace control head.

Dash Switch speed	Control Head Voltage to LPM
Off	0-0.4V
1 (Lowest)	1.4V +/- 0.2
2	1.8V +/- 0.2
3	2.4V +/- 0.3
4	2.75V +/- 0.3
5	3.35V +/- 0.3
6	3.9V +/- 0.3
7 (Highest)	5.0V +/- 0.3

.....

8	Blower Voltage	Decision
A. Disconnect the two wire blower connector at the LPM. B. Turn blower-ON to highest speed. C. Measure voltage between red lead and black lead. D. Repeat step C for each fan speed. Does the motor voltage match the dash-switch speed?		Yes: Replace the blower. Reassemble unit and retest for operator concern. No: Replace the LPM. Reassemble unit and retest for operator concern.

Dash Switch Position	Motor Voltage
Off	0V
1 (Lowest)	3.85V
2	4.96 V +/-0.5
3	6.60 V +/-0.5
4	7.7 V +/-0.5
5	9.35 V +/-0.5
6	10.73 V +/-0.5
7 (Highest)	12.10V +/-0.5

Step 9-13: Blend Door Diagnostics

9	Blend Door Recalibration	Decision
A. Turn the ignition Key-ON. B. Turn the A/C blower-ON. C. Set HVAC selector to Defrost Mode. D. Remove the fuse box cover and remove the 5 Amp HVAC fuse (Battery to HVAC Control Head) (ProStar position is F1-B). E. Wait approximately 30 seconds then reinstall the fuse. F. You should hear the doors recalibrate by moving from one extreme position to the other. **Note -** Do not operate the control head during the recalibration. G. Start vehicle and check for correct operation of all modes and temperature. Do all modes work correctly?		Yes: Blend door operates correctly. Reassemble unit to run and retest for operator concern. No: Go to step 10.

10	Blend Door Actuator Signal	Decision
A. Disconnect harness connector from blend door actuator. B. Turn the ignition Key-On. C. Turn the A/C blower-ON. D. Set HVAC selector to A/C MAX Mode. E. Connect a test light between harness Pin-A and Pin-B. F. Move temperature switch through ALL settings while observing the test light. Does the test light illuminate in all switch positions? (If using a DMM, Pin-A to Pin-B spec is 12V +/- 1.5)		Yes: Go to step 12. No: Go to step 11.

11	Blend Door Actuator Circuits	Decision
A. Inspect circuit A74B (connector 1200 Pin-B11, to connector 2010 Pin-C, to blend door actuator Pin-B). B. Inspect circuit A74C (connector 1200 Pin-B12, to connector 2010 Pin-D, to blend door actuator Pin-A). Are circuits open or shorted?		Yes: Repair as needed. After repairs are complete, reassemble unit and retest for operator concern. No: Replace control head. Reassemble unit and retest for operator concern.

.....

12	Blend Door Movement	Decision
A. Remove blend door actuator from interior module. Connect the harness connector to the actuator. B. Turn the ignition Key-ON. C. Turn the blower-ON. D. Set HVAC selector to A/C MAX Mode. E. Move temperature switch through **ALL** settings while observing the actuator movement. F. Move the blend door by hand through its full range of movement. Does both the actuator respond to the control head signals and thedoor move freely?		Yes: Reinstall blend door actuator, plug in harness connector, and then go to step 13. No: door binds or sticks: disassemble interior module and repair as needed. After repairs are complete, reassemble unit and retest for operator concern.

	No, actuator does not function: replace actuator. Reassemble unit and retest for operator concern.

.....

13	Heater Core Sealing	Decision
A. Reassemble A/C system to operate. B. Use hose pinch off pliers the close off both heater hoses in engine compartment. C. Start the engine and raise the idle speed to 1500 rpm. D. Turn HVAC control switch to NORM. E. Turn Blower to highest speed and Temperature Control to coldest temp F. Insert thermometer into left side passenger dash vent. Do not allow thermometer to touch duct. G. Open windows and close both cab doors. H. After cab temperature stabilizes, record temperature. I. Remove both pair of pinch-off pliers. Is duct temperature correct until pliers are removed?		Yes: (Note-If vehicle has a manual coolant shut-off valve in the heater core circuit, verify it is in the off position.) Check Sealing around heater core for placement. Remove blower scroll housing, and heater core if required, to reposition seal around heater core. After repairs are complete, reassemble unit and retest for operator concern.
		No: System is working correctly. Reassemble unit and retest for operator concern.

.....

Step 14-17: Mode Control Diagnostics

14	Door Recalibration	Decision
A. Turn the ignition Key-On. B. Turn the blower ON. C. Set HVAC selector to Defrost Mode. D. Remove the fuse box cover. Remove the 5 Amp fuse from Battery to HVAC Control Head (ProStar position is F1-B). E. Wait approximately 30 seconds then reinstall the fuse. F. You should hear the doors recalibrate by moving from one extreme position to the other. **Note-**Do not operate the control head during the recalibration. G. Start vehicle and check for correct operation of all modes and temperature. Do all modes work correctly?		Yes: Mode control operates correctly. No: Go to step 15.

.....

15	Mode Door Actuator Signal	Decision
A. Disconnect harness connector from mode door actuator. B. Turn ignition Key-On. C. Turn blower ON D. Set HVAC selector to A/C MAX Mode. E. Connect a test light between harness Pin-A and Pin-B. F. Move mode switch through ALL settings while observing the test light. Does the test light illuminate in all switch positions? (If using a DMM, pin-A to Pin-B spec is 12V +/- 1.5)		Yes: Go to step 17. No: Go to step 16.

.....

16	Mode Door Actuator Circuits	Decision
A. Inspect circuit A74 (connector 1200 Pin-B9 to connector 2010 Pin-A to mode actuator Pin-B).		Yes: Repair as needed. After repairs are complete,

B. Inspect circuit A74A (connector 1200 Pin-B10 to connector 2010 Pin-B to mode actuator Pin-A). Are circuits open or shorted?	reassemble unit and retest for operator concern. No: Replace control head. Reassemble unit and retest for operator concern.

.....

17	Mode Door Movement	Decision
A. Remove mode door actuator from interior module. Connect the harness connector to the actuator. B. Turn ignition Key-On. C. Turn blower ON. D. Move mode switch through ALL settings while observing the actuator movement. E. Move the mode door by hand through its full range of movement. Does both the actuator respond to the control head signals and thedoor move freely?		Yes: system is functioning correctly. No: door binds or sticks: repair interior module as needed. After repairs are complete, reassemble unit and retest for operator concern. No: actuator does not function: Replace actuator. Reassemble unit and retest for operator concern.

.....

Step 18-21: Recirculation Door Diagnostics

18	Door Recalibration	Decision
A. Turn ignition Key-On. B. Turn blower ON. C. Set HVAC selector to Defrost Mode. D. Remove the fuse box cover. Remove the 5 Amp fuse from Battery to HVAC Control Head (ProStar position is F1-B). E. Wait approximately 30 seconds then reinstall the fuse. F. You should hear the doors recalibrate by moving from one extreme position to the other. **Note -** Do not operate the control head during the recalibration. G. Start vehicle and check for correct operation of all modes and temperature. Do all modes work correctly?		Yes: Recirculation Door operates correctly. Reassemble unit and retest for operator concern. No: Go to step 19.

.....

19	Recirculation Door Actuator Signal	Decision
A. Disconnect harness connector from recirculation door actuator. B. Turn ignition Key-On. C. Turn blower ON. D. Set HVAC selector to A/C MAX Mode. E. Insert a test light between Pin-A and Pin-B of the recirculation door harness. F. Move mode switch from MAX to NORM. Does test light illuminate brightly in MAX? (If using a DMM, pin-A to Pin-B spec is 12V +/- 1.5)		Yes: Leave recirculation door actuator harness unplugged and go to step 21. No: Leave recirculation door actuator harness unplugged and go to step 20.

.....

20	Recirculation Door Actuator Circuits	Decision
A. Inspect circuit A74D (connector 1200 Pin-B1 to connector 2010 Pin-E to mode actuator Pin-A).		Yes: Repair as needed. Reassemble unit and retest for operator concern.

B. Inspect circuit A74E (connector 1200 Pin-B2 to connector 2010 Pin-F to mode actuator Pin-F). Are circuits open or shorted?	No: Replace control head. Reassemble unit and retest for operator concern.

……..

21	Recirculation Door Actuator Movement	Decision
A. Remove recirculation door actuator from interior module. Connect the harness connector to the actuator. B. Turn ignition Key-ON. C. Turn blower ON. D. Move mode switch from NORM to MAX A/C while observing the actuator movement. E. Move the recirculation door by hand through its full range of movement. Does both the actuator respond to the control head signals and thedoor move freely?		Yes: Recirculation door is functioning correctly. No, Door binds or sticks: repair interior module as needed. Reassemble unit and retest for operator concern. No, Actuator does not function: replace actuator. Reassemble unit and retest for operator concern.

…….

Step 22: Control Head Power

22	Control Head Power	Decision
A. Turn ignition Key-ON. B. Connect a 12V test light between a good ground and Pin-A1 of the A/C control head harness connector (1200). C. Wiggle 10A fuse F4-L while watching test light to check for loose/ intermittent fuse connection. D. Connect a 12V test light between Pin-A1 and B6 of the 1200 connector and monitor test light. E. Connect a 12V test light between a good ground and Pin-A2 of the A/C control head harness connector (1200). F. Wiggle 5A fuse F1-B while watching test light to check for loose/ intermittent fuse connection. G. Connect a 12V test light between Pin-A2 and B6 of the 1200 connector and monitor test light Which of the following steps does not illuminate the test light brightly: Step C, D, F, or G?		**Step C does not illuminate the test light brightly: If 10A HVAC fuse is good, check circuit A73A for open or high resistance. After repairs are complete, reassemble unit and retest for operator concern. Step D does not illuminate the test light brightly: Check circuit A74G and A11-GCA for open or high resistance (Connector 1200 Pin-B6 to Left Side Dash Mounted Dual Post GND Plate). After repairs are complete, reassemble unit and retest for operator concern. Step F does not illuminate the test light brightly: If 5A HVAC fuse is good, check circuit A75D for open or high resistance. After repairs are complete, reassemble unit and retest for operator concern. Step G does not illuminate the test light brightly: Check circuit A74G and A11-GCA for open or high resistance (Connector 1200 Pin-B6 to Left Side Dash Mounted Dual Post GND Plate).**

	After repairs are complete, reassemble unit and retest for operator concern.

.....

WARRANTY INFORMATION

NOTE: There are multiple noun groups that the diagnostic time could be charged to.

Warranty Claim Coding:

Group:	**1900 - Truck Air Conditioner**
Noun:	**Multiple Nouns - Code to repair made**

Warranty Coding Manual

Standard Repair Times:

DIAGNOSTICS			
Step	**Description**	**SRT Link**	**Hours**
1-23	INSPECTION/PERFORMANCE DIAGNOSTICS	A19-7006A	1.0

Link to the Standard Repair Time Manual: Click Here

Hide Details Feedback Information

Viewed: 244
Helpful: 0
Not Helpful: 2

No Feedback Found