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Coding Information

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Title: Espar Heater Diagnostic Guide
Applies To: Airtronic D2 Heater, Hydronic D5 Heater, Feature code 16UZL, 16VTV

CHANGE LOG

9/8/2015 - Made minor grammatical corrections, added actual table for service parts instead of clickable PDF link, added the special warranty requirement section, added Espar fault codes to the Symptoms section.
 12/1/2014 - Article updated with tool information
 10/27/2014 - Article updated to step based diagnostic form
 11/18/2013- Article Updated with manufacture diagnostics

DESCRIPTION

The Espar diesel-fired heating system provides heat for the cab area without the use of the vehicle engine. When the Espar system is on, the front cab blower will also operate to prevent condensation buildup. The heater may have a short run time if the the vehicle has sat for an extended period of time with battery low state of charge. This document will guide the user through pre season maintenance, diagnosing, and repairing both Espar Airtronic & Hydronic systems on Navistar equipped vehicles. You may refer to the manufacturer's website for additional literature as indicated in diagnostic steps below.

Pre Season Maintenance

[Airtronic](#)
[Hydronic](#)

SYMPTOMS

Diagnostic Trouble Codes:

DTC/Light	Description
N/A	N/A

Customer Observations or Concerns:

Performance:

- No heat in cab
- Espar not working all the time
- Espar intermittent operation
- Espar stops working after a period of time

Noise:

- Abnormal Noise

SPECIAL TOOLS / SOFTWARE

The following tools have been approved as an essential tool to all Medium and Heavy Duty, Main and Secondary locations and are to be used to properly diagnose the listed heater units. **Navistar shipped and debited dealer accounts the week of December 10, 2012** for the price of \$252.33 for the ESP2215418900000Z and \$85.59 for the ESP2029007050280Z plus additional charges for shipping and taxes to each receiving location.





Figure 1: ISO Adaptor ESP2215418900000Z (Used for all Espar Heaters)



Figure 2: Adaptor ESP2029007050280Z (Used with ISO adaptor for Hydronic System)

Tool Description	Tool Number	Comments
EDiTH Diagnostic Software	PDF	Manufacturer Tool
ISO Adaptor	PDF	Manufacturer Tool
Airtronic Y Adaptor	PDF	Manufacturer Tool
Hydronic Y Adaptor	PDF	Manufacturer Tool

SERVICE PARTS INFORMATION

Bergstrom Cold Side Service Parts

Part Number	Order Method	Part Description	Reference Notes
ZGG3685825C92	D/S Only	Complete Maxx Power unit, without FOH	Purple Compressor until 7/16/2012 - u
3685825C95	PDC	Complete Maxx Power unit, without FOH	Black Compressor - uses Cluster Bloc
2614669C1	PDC	Sealed REF Loop Kit	
2602024C91	PDC	Main System Controller	Main Control for Purple Compressor w
2614670C1	PDC	Main System Controller	Main Control for Black Compressor wi
2612470C91	PDC	Unit Harness Relay	
3688228C2	PDC		
2602547C91	PDC	PC Board Control	PC Board with Purple Compressor wit
2610933C91	PDC	PC Board Control	PC Board with Black Compressor with
3695241C1	PDC	Temp Sensor	Used in all Systems
3685807C1	PDC	Condenser Fan	Used in all Systems
3695239C1	PDC	Maxi Fuse	Used in all Systems
N/A	Obtain Locally	10 Amp Red Fuse	Used in all Systems
MIN20	PDC	20 Amp Yellow Fuse	Used in all Systems
3688242C2	PDC	Expansion Valve	Used in all Systems
3693481C1	PDC	Modular Linear Power	Used in all Systems
3685800C1	PDC	120 degree CCW Actuator	Used in all Systems
3685801C1	PDC	Micro 280 Form 1C relay	Used in all Systems
3685805C1	PDC	316x187x12.7 Filter	Used in all Systems
2602548C91	PDC	Blend Door	Used in all Systems
2602545C91	PDC	Blower Motor W/Flange	Used in all Systems

2602545C91	PDC	Blower Wheel	Used in all Systems
3688227C1	PDC	Drain Tube	Used in all Systems
2602547C91	PDC	Unit Control Cover	Used in all Systems
3685799C1	PDC	Relay, 70 Amp 12Volt W/ Resistor	Used in all Systems

Espar Hot Side Service Parts

Part Number	Order Method	Part Description	Reference Notes
2592945C1 / ESP2522161000002Z	PDC / DS	Burner Tube	Hydronic D5 , Figure # 4 Espar Illu:
2592948C1 / ESP2018199916000Z	PDC / DS	Combustion Air Blower	Hydronic D5 , Figure # 2 Espar Illu: 12
2592951C2 / ESP2252010400110Z	PDC / DS	Control Unit / ECU	Hydronic D5 , Figure # 6 Espar Illu:
2592955C1 / ESP2522190120002Z	PDC / DS	Overheat and Temperature sensor with cable section	Hydronic D5 , Figure # 20 Espar Ill: 14
2592957C1 / ESP2521060110002Z	PDC / DS	Glow Pin with Cable Section	Hydronic D5 , Figure # 14 Espar Ill: 15
2592958C1 / ESP2521219901130Z	PDC / DS	Atomizing Screen with 2 O-Rings for the plug connection	Hydronic D5 , Figure # 16 Espar Ill: 16
2592959C2 / ESP2519203600002Z	PDC / DS	Flame Sensor	Hydronic D5 , Figure # 19 Espar Ill: 17
2593232C1 / ESP2519170100022Z	PDC / DS	Cover, For blower fan and holder for metering pump	Hydronic D5 , Figure # 3 Espar Illu:
2606521C1 / ESP2522192500002Z	PDC / DS	Coolant Pump Assembly	Hydronic D5 , Figure # 8 Espar Illu:
ESP2245040300000Z	DS	Fuel Metering Pump (Internal)	Hydronic D5 , Figure # 9 Espar Illu:
ESP2013120000060Z	DS	Integrated fuel pump filter	Hydronic D5 , Figure # 10 Espar Ill:
2592946C1 / ESP2018209900010Z	PDC / DS	Seal (Graphite seal and blower motor gasket)	Hydronic D5 , Figure # 12 Espar Ill:
2593234C1 / ESP2521470114002Z	PDC / DS	Plug Connection- Fuel inlet + glow pin screen and glow holder	Hydronic D5 , Figure # 15 Espar Ill:
2592956C1 / ESP2210003010100Z	PDC / DS	Plug kit 14 pin	Hydronic D5 , Figure # 21 Espar Ill:
2593244C1 / ESP2017530118002Z	PDC / DS	Cable section water pump	Hydronic D5 , Figure # 22 Espar Ill:
2592954C1 / ESP2210007000060Z	PDC / DS	O-Ring 14x2.6 (for coolant ports)	Hydronic D5 , Figure # 25 Espar Ill:
2592960C1 / ESP2210007000090Z	PDC / DS	O-Ring 7x2 (for overheat and coolant temperature sensors)	Hydronic D5 , Figure # 26 Espar Ill:
2592943C1 / ESP2521490101012Z	PDC / DS	Outer Casing / Water Jacket	Hydronic D5 , Figure # 1 Espar Illu:
2592944C1 / ESP2521490600012Z	PDC / DS	Heat exchanger	Hydronic D5 , Figure # 5 Espar Illu:
ESP5560006	DS	Coolant pump O-ring 45mm x 1.5mm	Hydronic D5 , No Espar Illustration
2593233C1 / ESP2017529901030Z	PDC / DS	Cover with combustion air port for blower motor	Hydronic D5 , Figure # 7 Espar Illu:
ESP2519170100070Z	DS	Holder / Vibration dampner for Fuel Metering pump	Hydronic D5 , Figure # 11 Espar Ill:
ESP2210007000182Z	DS	O-Ring 74 x 3mm - between water jacket and heat exchanger	Hydronic D5 , Figure # 13 Espar Ill:
2593235C1 / ESP2017520100042Z	PDC / DS	Holder - clamp down for plug connection	Hydronic D5 , Figure # 15 Espar Ill:
2593245C1 / ESP2519220100052Z	PDC / DS	Spring leaf to hold down overheat and coolant temp sensors	Hydronic D5 , Figure # 23 Espar Ill:
2592953C1 / ESP2519170100032Z	PDC / DS	Cover fuel metering pump	Hydronic D5 , Figure # 24 Espar Ill:
2593246C1 / ESP2519170100110Z	PDC / DS	Fuel hose (connecting fuel pump to plug connection)	Hydronic D5 , Figure # 27 Espar Ill:
2593247C1 / ESP20931071	PDC / DS	Cable Band	Hydronic D5 , Figure # 28 Espar Ill:
2593248C1 / ESP251917250012	PDC / DS	Screw	Hydronic D5 , Figure # 29 Espar Ill:
ESP10910153	DS	Screw M5x 12	Hydronic D5 , Figure # 31 Espar Ill:
2592947C1 / ESP2519170100052Z	PDC / DS	Sleeve	Hydronic D5 , Figure # 32 Espar Ill:
ESP10910154	DS	Tapite Screw M5 x 35 Torx	Hydronic D5 , Figure # 34 Espar Ill:
ESP10910152	DS	Tapite Screw M5 x 25 Torx	Hydronic D5 , Figure # 35 Espar Ill:
ESP10010350	DS	Cheese-head Screw M5 x 65 Torx	Hydronic D5 , Figure # 36 Espar Ill:
ESP10910151	DS	Tapite Screw M5 x 16 Torx	Hydronic D5 , Figure # 37 Espar Ill:
ESP10910150	DS	Tapite Screw M4 x 10 Torx	Hydronic D5 , Figure # 38 Espar Ill:
ESP10210302	DS	Counter sunk Screws M5 x 12 Torx	Hydronic D5 , Figure # 39 Espar Ill:
N/A	DS	O-Ring 5 x 1.5mm (Locally Available Hardware)	Hydronic D5 , Figure # 30 Espar Ill:

Circuit Diagrams

Diagram	Link
Airtronic with key off operation	PDF
Airtronic with key on or in accessory position	PDF
Hydronic Maxxpower no-idle	PDF
Condensation Module	PDF

DIAGNOSTIC STEP(s)

Step	Action	Decision
1	Operational Checks: Review operational cards to determine if Espar control equipment is operating as intended Operation Cards Multi Max Digi Max (under voltage shutdown must be set to 11.4v) Does the heater controller and unit operate as the manufacture intended?	Yes. Educate operator with manufacturer operating intentions
		No Step 2

Step	Action	Decision
2	Diagnostics: Review manufacturer provided troubleshooting manuals posted below to diagnose and repair controller or heater as required (additional resources may be found at Espar.com) Hydronic Heater Multi Max Controller Airtronic Heater Digi Max Controller Airtronic Flame Tube Carbon Removal Diagnostic Overview Does the controller and heater operate as manufacture intended?	Yes. Educate operator with manufacturer's operating intentions
		No 1. Visit Espar.com 2. Click Download Center 3. Click Technical Manuals 4. Create free username and password 5. Follow additional technical manuals

REPAIR STEPS

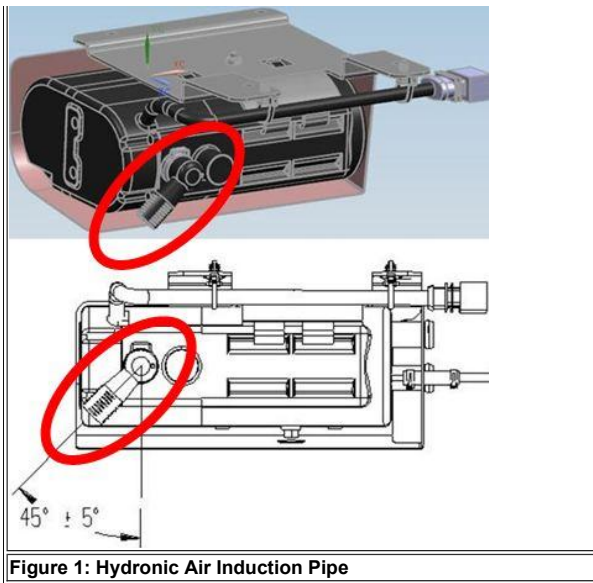
The direction in which the hydronic heater air intake is pointed may accelerate wear on the hydronic combustion air blower. The entire Espar heater assembly **DOES NOT** need to be replaced if the combustion air blower is failed. When Espar hydronic system is serviced, refer to figures 1 & 2 below. If the air intake is already in the 45 degree position, the procedure does not need to be followed. If the air intake is not in the 45 degree position, follow the 2 step procedure as indicated below.

PROCEDURE:



Figure 1: Hydronic Air Induction Pipe

1. Locate Air Induction Pipe (Figure 1)



2. Rotate Air Induction Pipe clockwise 45 degrees (Figure 2)

WARRANTY INFORMATION

Warranty Claim Coding:

Group:	19030 - Auxiliary No-Idle HVAC
Noun:	633 - Auxiliary Fuel-Fired Heater

Standard Repair Times:

Description	Chassis	Engine	SRT	Hours
Hydronic Air Intake Rotation	Prostar	All	T-Time	0.1
Airtronic/Hydronic Diagnostics	Prostar	All	R19-8013A	0.5
Combustion Air Blower	Prostar	All	R19-7633A-20	0.5
ESPAR Coolant Heater (Replace)	Prostar	All	R19-7633A	1.0
Coolant Pump	Prostar	All	R19-7633A-21	0.3
Overheat Sensor	Prostar	All	R19-7633A-22	0.5
Flame Sensor	Prostar	All	R19-7633A-23	0.3
Glow Pin	Prostar	All	R19-7633A-24	0.3
Fuel Metering Pump	Prostar	All	R19-7633A-25	0.4
Burner Flame Tube	Prostar	All	R19-7633A-26	0.5
O-Ring Coolant Pump	Prostar	All	R19-7633A-27	0.3
O-Ring Sensor	Prostar	All	R19-7633A-28	0.3
O-Ring Heat Exchanger	Prostar	All	R19-7633A-29	0.5
Seal Kit	Prostar	All	R19-7633A-30	0.5
ECU ESPAR Heater	Prostar	All	R19-7633A-31	0.4

Special Requirements:

The following information is necessary for the warranty claim to be processed:

- a. Serial Number needs to be listed (I will get you a picture of where the serial number is listed)
- b. Hours on Espar System
- c. Fault Code Found

Complete Espar system replacement not warrantable, individual system parts need to be replaced.

OTHER RESOURCES

[Master Service Information Site](#)

Hide Details	Feedback Information
No Feedback Found	Viewed: 15856
	Helpful: 440
	Not Helpful: 332

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