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Title: **Big Bore Over Temperature Diagnostics**

Applies To: **ProStar, LoneStar, WorkStar,TranStar and PayStar 2010 MaxxForce 11/13, N13 Engines**

CHANGE LOG

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

8/05/2014 - Initial Article Release

DESCRIPTION

Overheat Diagnostics. Please go through Steps listed in : IK1201066 prior to starting this document.

SYMPTOM(s)

Engine Overheating
Red Light on under temperature gauge

Customer Concern(s)
- Overheat

Possible Causes

Cooling Package Debris clogging
Damaged Fan Belt
Accessory Belt Tensioner Failure
Inoperative/slipping Fan Clutch
Inoperative/Damaged Cooling Fan
Damaged Water Pump Impeller
Stuck Closed Thermostats

SPECIAL TOOL(s) or SOFTWARE

Tool Description	Tool Number	Comments
Plastic Plug / Cap Kit	ZTSE4891	Used for sealing components during repairs
Radiator Pressure Testing Kit	ZTSE2384	
Coolant Cap Pressure Testing Kit	09-040-01	Perform with warm engine
Coolant Management Tool	KL5007NAV	Cooling system drain and vacuum fill
EGR Cooler Leak Detection Kit	KL20060NAV	HT and LT EGRC Pressure Tester "New" procedure tests with valve installed
EGR Cooler Alignment Tool	12-892-01	If replacing an HT or LT EGRC section
EGR Cooler Lifting Bracket	12-892-03	If removing EGR Cooler

Kit, Charge Air Cooler Test	ZTSE6042	LPCAC Pressure Test Tool

OVERVIEW

GOVERNMENT REGULATION: Engine fluids (oil, fuel, and coolant) may be a hazard to human health and the environment. Handle all fluids and other contaminated materials (e.g., filters rags) in accordance with applicable regulations. Recycle or dispose of engine fluids, filters, and other contaminated materials according to applicable regulations.

WARNING:

To prevent personal injury or death, make sure the engine has cooled before removing components.

WARNING:

To prevent personal injury or death, do not let engine fluids stay on your skin. Clean skin and nails using hand cleaner and wash with soap and water. Wash or discard clothing and rags contaminated with engine fluids.

DIAGNOSTIC PROCEDURE

Step	Action	Decision
1	Debris Check • Check for blockages/excessive debris to areas between radiators and other cooling package coolers. Was significant blockage/debris found?	Yes: Clean cooling package, and retest No: Go to Step 2

Step	Action	Decision
2	Cooling System Component Inspection • Inspect Cooling fan blade, shroud, accessory drive belt(s), accessory drive belt tensioner(s), and radiator for damage Was any damage found with these components?	Yes: Repair damage, and retest No: Go to Step 3

Step	Action	Decision
3	Cooling System Flow Test Run Engine, and observe radiator and aeration lines for coolant flow. • Check for Flow in the Surge tank.	Yes: Go to Step 4 No: Go to Step 7

	Is there coolant circulating in the Reservoir/Surge tank?	

Step	Action	Decision
4	Fan Clutch Operation Verification Follow : IK0900094 Horton V Master Ultra (Stratis) Viscous Fan Hub Diagnostics and Troubleshooting guide. • Note : See IK0900094 for warranty submission and SRT details. Does the Vehicle Still overheat after following IK0900094?	Yes: Go to Step 5 No: Reassemble vehicle to operating condition, and retest

Step	Action	Decision
5	Thermostat(s) inspection/HT Plugging and test Verify Cooling System Flow by checking hose temperatures. 1. Bring engine up to operating temperature 2. Using EST with ServiceMaxx™ monitor, and record ECT 1 Sensor Signal 3. Utilizing a Infrared Thermometer target Upper Radiator Hose, and record reading 4. Calculate difference At operating temperature does the upper radiator hose have a similar temperature to ECT 1 within 25 degrees F?	Yes: Go to Step 6 No: Replace Thermostats and retest

Step	Action	Decision
6	Internal Radiator Blockage Inspection 1. Bring engine to operating temperature, with engine at high idle 2. Utilizing a Infrared Thermometer target Upper Radiator Hose, and record reading 3. Utilizing a Infrared Thermometer target the Lower Radiator Hose, and record reading 4. Calculate the difference Is the Lower Radiator Hose temperature within 40-60 degrees of the Upper Radiator Hose Temperature?	Yes: Go to Step 7 No: Clean/Replace Radiator due to internal restriction, and retest

Step	Action	Decision
7	Water Pump/Manifold Inspection 1. Remove four M8 x 16 bolts and water pump pulley. 2. Remove M8 x 130, M8 x 150 and seven M8 x 40 bolts. **CAUTION:** To prevent damage do not drop water pump impeller, or hit impeller with hard objects. 3. Remove water pump assembly.	Yes: Replace Water Pump, and retest No: Go To Step 8

	Is there any damage to the Water Pump?	

Step	Action	Decision
8	Water Distribution Housing Inspection • **If severe cavitation is present on the Water Distribution Housing see :** TSI 10-12-04R Is there any damage/cavitation to the Water Distribution Housing?	Yes: Replace Water Distribution Housing, and retest No: Reassemble vehicle to operating condition, and contact your supervisor.

SERVICE PART(s) INFORMATION

Kit Description	Part Number	Quantity Required	Ordering Instructions
Pump, ASM Water	3005814C3	1	
Gasket Water Pump Mtg	3005414C1	1	
Water Distribution Housing	3008116C92	1	
Gasket, Housing Coolant Distribute	3012268C1	1	
Gasket Pipe Flange	3902724C1	1	
Gasket, Housing Thermostat	7092260C91	1	
Tube, Extension for Coolant	3014371C1	2	
Low Temperature Radiator	N/A	1	Application Specific
Radiator	N/A	1	Application Specific
Accessory Drive Belt	N/A	1	Application Specific

WARRANTY INFORMATION

Warranty Claim Coding:

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

Group:	**Multiple Groups**
Noun:	**Multiple Nouns**

STANDARD REPAIR TIME(s)

ProStar			
Step	**Description**	**SRT Link**	**Hours**
1 - 3	Debris Check	T-Time	0.2

5	Thermostat Inspection	T-Time	0.2
5	Thermostat Replacement	R12-3785U	1.3
6	Radiator Blockage Inspection	T-Time	0.2
6	Radiator Replacement	R09-1022U	4.5
7	Water Pump Replacement	R12-3774A	1.4
8	Water Distribution Housing Replacement	R12-3771U	5.5

TranStar			
Step	**Description**	**SRT Link**	**Hours**
1 - 3	Debris Check	T-Time	0.2
5	Thermostat Inspection	T-Time	0.2
5	Thermostat Replacement	Q12-3785U	1.3
6	Radiator Blockage Inspection	T-Time	0.2
6	Radiator Replacement	Q09-1022U	5.0
7	Water Pump Replacement	Q12-3774A	1.4
8	Water Distribution Housing Replacement	Q12-3771U	5.6

WorkStar			
Step	**Description**	**SRT Link**	**Hours**
1 - 3	Debris Check	T-Time	0.2
5	Thermostat Inspection	T-Time	0.2
5	Thermostat Replacement	N12-3785U	1.3
6	Radiator Blockage Inspection	T-Time	0.2
6	Radiator Replacement	A09-5100	2.9
7	Water Pump Replacement	N12-3774A	1.4

8	Water Distribution Housing Replacement	N12-3771U	6.3

PayStar			
Step	**Description**	**SRT Link**	**Hours**
1 - 3	Debris Check	T-Time	0.2
5	Thermostat Inspection	T-Time	0.2
5	Thermostat Replacement	T12-3758U	1.2
6	Radiator Blockage Inspection	T-Time	0.2
6	Radiator Replacement	T09-1022U	5.0
7	Water Pump Replacement	T12-3774A	1.4
8	Water Distribution Housing Replacement	T12-3771U	5.6

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