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Coding Information

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Title: 1995-2001 MY DT-466E/530E Engines with Active 143 and/or 144 CMP Fault Codes

Applies To: 1995-2001 MY DT-466E/530E Engines

CHANGE LOG

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

11/05/2015 - Add air gap procedure
 11/03/2015 - Draft

DESCRIPTION

This document will guide the user through diagnosing and repairing Active Fault Code 143 and/or 144 on 1995-2003 MY emissions DT466E/530E engines.

SYMPTOM(s)

DTC/Light	Description
143 SPN 21 FMI 2	Incorrect Number of CMP Signal Transitions per Cam Revolution.
144 SPN 21 FMI 8	CMP Signal Noise detected

Customer Observations or Concerns:

- EWL Illuminated
- White Exhaust Smoke
- Engine Misfire
- Engine Surging
- Engine Stumble

SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
EST w/ServiceMaxx			
Interface - NavCom/Nexiq			
CMP Sensor Breakout Tee	ZTSE4486		
Terminal Test Adapter Kit	ZTSE4435		
Dial Indicator w/Magnetic Base	Obtain Locally		
CMP Sensor Air Gap Tool	ZTSE4414		
Depth Gage Micrometer	Obtain Locally		
DVOM	Obtain Locally		

SERVICE PARTS INFORMATION

Kit Description	Part Number	Quantity Required	Notes
Sensor Kit, CAMP	1885812C9*	1	
Harness Repair Connector	IK0800148		
Shim and Service Kit, CMP Sensor	TSI 01-12-13		

DIAGNOSTIC STEP(s)**WARNING:**

Make sure the vehicle is in neutral, the parking brake is set, and the wheels are blocked before doing any work or diagnostic procedures on the engine or vehicle.

CAUTION:

- Wear protective glasses and safety shoes
- Wear correct clothing
- Do not wear rings, watches or other jewelry
- Restrain long hair

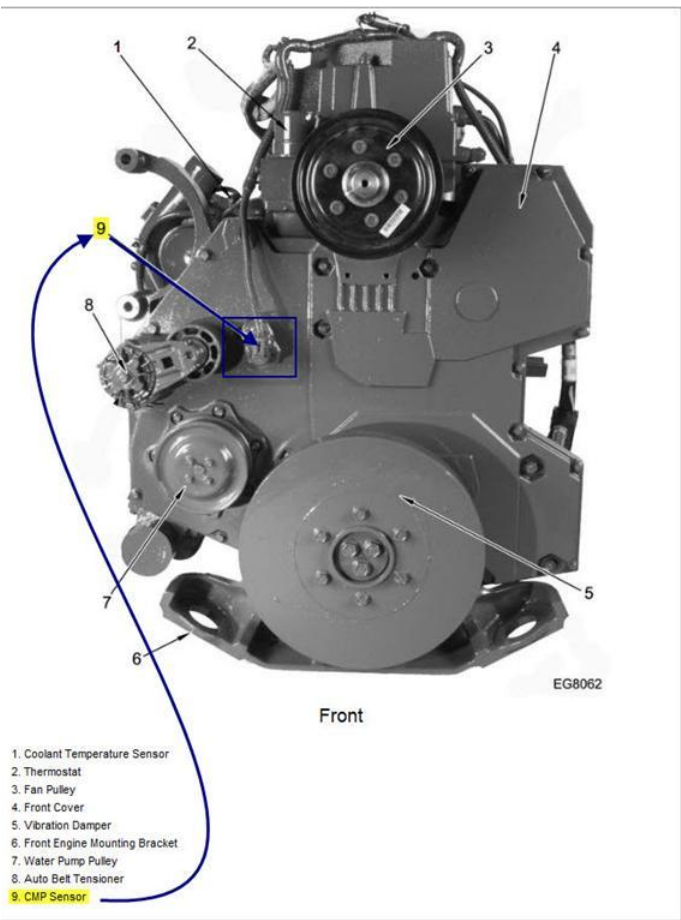
Step	Action	Decision
#1	DIAGNOSTIC: Check Sensor connection for corroded Pins and Terminals, damaged Wiring and bent or pushed back Pins Perform CMP Circuit Voltage and Resistance tests	Yes. Proceed to Step 2 No. Refer to EGES-1751, Chapter 6, Harness Repair Repair Circuit and retest

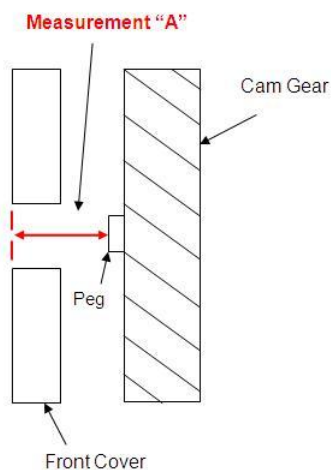
Connector Voltage Checks (Check with sensor connector disconnected, ignition key ON, all accessories off.)		
Test Points	Spec.	Comments
A to gnd	0V	No voltage expected
B to gnd	5V $\pm$ 0.5	V _{REF} - check key ON, V _{REF} not present check open/short to ground Pin 40 to B, see V _{REF} circuit
C to gnd	5V $\pm$ 0.5	If < than 4.5V check for poor connection, if 0V check for open/short to ground circuit
Connector Checks to Chassis Ground (Check with sensor connector (406) disconnected, positive battery cable disconnected and ignition key OFF.)		
Test Points	Spec.	Comments
A to gnd	<5 Ω	Resistance to chassis ground, check with key off, > than 5 Ω the harness is open
B to gnd	>1000 Ω	Resistance less than 1000 Ω indicates a short to ground
C to gnd	>1000 Ω	Resistance less than 1000 Ω indicates a short to ground
Harness Resistance Checks (Check with breakout box installed on engine harness only with ignition key Off.)		
Test Points	Spec.	Comments
53 to A	<5 Ω	Resistance from harness connector to 60 pin connector - Signal ground (CMP) has dedicated ground circuit
40 to B	<5 Ω	Resistance from harness connector to 60 pin connector - V _{REF}
51 to C	<5 Ω	Resistance from harness connector to 60 pin connector - CMP signal
Continued on next page		
Operational Voltage Checks (Check with breakout box installed in line with the ECM and ignition key ON.)		
Test Points		
(+) No 51 to (-) No 53		
Voltage	Position	Comments
5V $\pm$ 0.5	Vane	With the breakout box installed, the CMP sensor and ECM connected, bar engine by hand
0.2V to 2V	Window	The CMP signal voltage should change voltage state as the timing wheel and cam are rotated
Diagnostic Trouble Code Reference		
612 = ECM / target disk mismatch detected (wrong ECM Programming Installed).		
315 = Engine rpm exceeded 3000 rpm.		
143 = Incorrect number of sync to transition counts detected, possible intermittent CMP sensor/circuit.		
144 = Electrical noise detected, check wire routing and grounds.		
145 = Inactive CMP signal detected during engine cranking when ICP pressure was sufficient for starting.		

Are CMP connections clean/undamaged/circuits within Specifications?

Step	Action	Decision
#2	DIAGNOSTIC: Has a known to be good CMP sensor of the correct Part Number been used to verify circuit operation?	Yes. Proceed to Step 3
		No. Use a known to be good CMP Sensor of the correct Part Number and retest

Step	Action	Decision
#3	DIAGNOSTIC: Remove the CMP Sensor and inspect.	Yes. Proceed to Step 4
	Is the CMP Sensor free of damage? Is the Tone Ring free of damage? Is it free of sludge accumulation?	No. Repair cause of Sensor damage or source of oil contamination and retest

Step	Action	Decision
#4	DIAGNOSTIC: Measure Camshaft endplay via the CMP Sensor hole:  1. Coolant Temperature Sensor 2. Thermostat 3. Fan Pulley 4. Front Cover 5. Vibration Damper 6. Front Engine Mounting Bracket 7. Water Pump Pulley 8. Auto Belt Tensioner 9. CMP Sensor	Yes. Proceed to Step 5 No. Repair Camshaft per Service Manual EGES-2101, Chapter 6, Rocker Arm Assembly, Camshaft Assembly, Tappets, and Push Rods then retest



- Measure the CMP Sensor from the mounting flange to the tip of the Sensor (**measurement "B"**) and record the measurement



- Subtract measurement B from measurement A: - this is the air gap.
- Adjust air gap/retest.

Is DTC 143 and/or 144 now inactive?

REPAIR STEP(s)

Not Applicable

WARRANTY INFORMATION

Warranty Claim Coding:

Group:	12926 - DT 466E 12928 - International 530E
Noun:	169 - Sender, Camshaft Position (CMP)

Repair	Model	Engine	SRT	Hour
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Electronic Engine Performance, Diagnose	All	DT466E/530E	A12-2001G	.9
Perform all steps requiring test under full load (Road Test or Dyno)	All	DT466E/530E	A12-2001G-1	.8
Electronic Engine Control Sensors/Regulators, Replace - Camshaft Position (CMP)	All	DT466E/530E	A12-1030	.6
Cylinder Head Or Replace Gasket, R&R And/Or Replace	4000	DT466E/530E	A12-1101	8.5
Cylinder Head Or Replace Gasket, R&R And/Or Replace	3000FE	DT466E/530E	A12-1109	7.1
Cylinder Head Or Replace Gasket, R&R And/Or Replace	2000, 3600, 3800, 5000, 8100	DT466E/530E	A12-1115	8.9
Cylinder Head Or Replace Gasket, R&R And/Or Replace	3000RE	DT466E/530E	I12-1335G	10.4
With Air Conditioning	All	DT466E/530E	A12-1100-1	.5
Roller Tappets or Valve Lifters, Replace - One or All	All	DT466E/530E	A12-1100-3	.2
Valves (Includes Lap), Springs, Seals, R&R and/or Replace - 2 Valve Cylinder - All, One Cylinder	All	DT466E/530E	A12-1100-5	.2
Valve Guide(s), Replace - 2 Valve Cylinder - All, One Cylinder	All	DT466E/530E	A12-1100-6	.2
Valve Guide(s), Replace - 2 Valve Cylinder - All, Each Additional Cylinder	All	DT466E/530E	A12-1100-7	.1
Injector Sleeves, Replace - Each	All	DT466E/530E	A12-1100-8	.2
Injector Sleeves, Replace - All	All	DT466E/530E	A12-1101-1	.8
With Diamond Logic ECM	All	DT466E/530E	A12-1100-9	.4
Engine Front Cover And/Or Gasket, R&R And/Or Replace - Front Section Only	2000, 3600, 3800, 5000, 8100	DT466E/530E	A12-1192	5.9
Engine Front Cover And/Or Gasket, R&R And/Or Replace - Rear Section (Includes Front Section)	2000, 3600, 3800, 5000, 8100	DT466E/530E	A12-1193	9.0
Engine Front Cover And/Or Gasket, R&R And/Or Replace - Front Section Only	3000FE	DT466E/530E	A12-1196	9.3
Engine Front Cover And/Or Gasket, R&R And/Or Replace - Rear Section (Includes Front Section)	3000FE	DT466E/530E	A12-1197	11.3
Engine Front Cover And/Or Gasket, R&R And/Or Replace - Front Section Only	3000RE	DT466E/530E	I12-1573G-20	7.2
Engine Front Cover And/Or Gasket, R&R And/Or Replace - Rear Section (Includes Front Section)	3000RE	DT466E/530E	I12-1573G	10.1
Engine Camshaft, I-6 (In Chassis), Replace	CE	DT466E/530E	G12-1357G	.6
Engine Camshaft, I-6 (In Chassis), Replace	4300	DT466E/530E	K12-1357G	.6
Engine Camshaft, I-6 (In Chassis), Replace	4400	DT466E/530E	L12-1357G	.6
Engine Camshaft, I-6 (In Chassis), Replace	7300, 7400, 7500	DT466E/530E	M12-1357G	.6
Engine Camshaft, I-6 (In Chassis), Replace	8500	DT466E/530E	P12-1357G	.6
Engine Camshaft, I-6 (In Chassis), Replace	3200	DT466E/530E	Z12-1357G	.6
Camshaft Bushing(s), Replace	CE	DT466E/530E	G12-1357G-1	1.4
Camshaft Bushing(s), Replace	4300	DT466E/530E	K12-1357G-1	1.4
Camshaft Bushing(s), Replace	4400	DT466E/530E	L12-1357G-1	1.4
Camshaft Bushing(s), Replace	7300, 7400, 7500	DT466E/530E	M12-1357G-1	1.4
Camshaft Bushing(s), Replace	8500	DT466E/530E	P12-1357G-1	1.4
Camshaft Bushing(s), Replace	3200	DT466E/530E	Z12-1357G-1	1.4

OTHER RESOURCES

[EGES-1751 Engine Diagnostic Manual](#)

[EGES-2101 Engine Service Manual](#)

[SRT Manual](#)

[IK0800148 Engine Electrical Harness and connector Repair Kit Parts G Letter G-19-7772-B](#)

[TSI 01-12-13 Improved Shim and Service Kit for Camshaft Position \(CMP\) Sensor](#)

[TL2900008 Service Tool Resource Center](#)

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