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Current Language: English **Last Modified:** 10/16/2018
Other Languages: NONE **Author:** Dan Myers
Viewed: 2066

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Title: DT466 EGR ENGINES WITH CRANK/NO START CONDITION.

Applies To: 2004 MY DT466 ENGINES

CHANGE LOG

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

01/12/2018 - Author Article
 04/03/2018 - Add Relay test procedure
 04/05/2018 - Add Injector test procedure
 10/08/2018 - Add F/C 147 to test procedure
 10/16/2018 - Edit Hz readings

DESCRIPTION

This document will guide the user through Crank/No Start Condition for the 2004 MY Emissions DT466 (EGR) Engine

SYMPTOM(s)

Engine cranks but will not start
 RPM's not displayed on EGC
 RPM's not displayed in EST
 Active Fault Code(s)

DTC/Light	Description
Fault Code 143 SPN 21 FMI 2	Incorrect CMP signal signature
Fault Code 145 SPN 21 FMI 12	CMP signal inactive
Fault Code 146 SPN 64 FMI 12	CKP signal inactive
Fault Code 147 SPN 64 FMI 2	Incorrect CKP signal signature
Fault Code 525 SPN 254 FMI 6	IDM fault

SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Laptop		ServiceMaxx J1708 diagnostic software	
Interface			
DVOM	Fluke 88 (or similar)	Meter must read HZ	
Terminal Test Adapter Kit	ZTSE4435A		
96 Pin Breakout Box	ZTSE4582		
CMP Breakout Harness	TXT126870160	Use Harness Repair Kit TXT1268701	Make test lead locally

CKP Breakout Harness	TXT126870148	Use Harness Repair Kit TXT1268701	Make test lead locally
100W Headlight	GE 24768 (or similar)		Make test leads locally
Midtronics test tool	EXP-1000-HD-NAV		
Relay Breakout Harness	ZTSE4596		

SERVICE PARTS INFORMATION

Kit Description	Part Number	Quantity Required	Notes
As needed			

DIAGNOSTIC STEP(s)

Step	Action	Decision
#1	DIAGNOSTIC: Are any of fault codes 143, 145, 146, 147 active?	Yes. Refer to Step based diagnostics in manual: DT 466 / DT 570 / HT 570 Diesel Engine Diagnostic Manual - 2004 Emissions with EGR
		No. Proceed to Step 2

Step	Action	Decision
#2	DIAGNOSTIC: Perform Injector Buzz test Do all injectors buzz & buzz strongly?	Yes. Proceed to Step 3
		No. Proceed to Step 2A

Step	Action	Decision
#2A	DIAGNOSTIC: Check IDM & UVC connections Are connections tight & free of defects?	Yes. Proceed to Step 2B

		No. Proceed to Step 3
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Step	Action	Decision
#2B	DIAGNOSTIC: Connect a known to be good injector to #1 UVC harness connector Does the injector buzz?	Yes. Replace set of injectors & confirm repair
		No. Proceed to Step 3

Step	Action	Decision
#3	DIAGNOSTIC: Is fault code 525 active?	Yes. Proceed to Step 4
		No. Proceed to Step 11

Step	Action	Decision
#4	DIAGNOSTIC: Use the Midtronics tool to test integrity of batteries. Do batteries pass?	Yes. Proceed to Step 5
		No. Replace batteries - confirm repair

Step	Action	Decision
#5	<p>DIAGNOSTIC:</p> <p>Reference IK1200261 Battery Box Located Clean Power Fuses for the IDM (Injector Drive Module), ECM (Engine Control Module), and TCM (Transmission Control Module) Failing</p> <p>Is the fuse/fuse holder in the battery box for the ECM/IDM free of damage?</p>	<p>Yes. Proceed to Step 6</p>
		<p>No. Refer to iKNow article IK1200261 - confirm repair</p>
Step	Action	Decision
#6	<p>DIAGNOSTIC:</p> <p>Using your hand, follow B+ & GND wiring from the batteries to the ECM relay & engine ground. Check for rubbing/chafing wires, test light pierce points & harness connectors for damage/corrosion.</p> <p>Is wiring damage free?</p>	<p>Yes. Proceed to Step 7</p>
		<p>No. Overlay B+ straight from fuse holder to ECM & IDM relays. Overlay GND straight from battery to ECM X-3 connector. Consult EGED285 for wire locations - confirm repair</p>
Step	Action	Decision
#7	<p>DIAGNOSTIC:</p> <p>Remove ECM & IDM relays.</p> <p>Are relay connections free from corrosion, pushed back or spread pins?</p>	<p>Yes. Proceed to Step 8</p>
		<p>No. Repair connection issues - confirm repair</p>
Step	Action	Decision

#8	<p>DIAGNOSTIC:</p> <p>Test Relays:</p> <p>Step 1 Switch DVOM to the highest Ω setting if it has more than one setting.</p> <p>Step 2 Be sure the meter is Zeroed when both leads are touched together.</p> <p>Step 3 Place one probe on terminal 85 and place the other probe on terminal 86. If the meter reads OL the relay is good. If not replace the relay.</p> <p>Step 4 Place one probe on terminal 30 and place the other probe on terminal 87A. If the meter reads OL the relay is good. If not replace the relay.</p> <p>Step 5 Place one probe on terminal 30 and place the other probe on terminal 87. If the meter reads OL the relay is good. If not replace the relay.</p> <p>Step 6 Apply a fused B+ to terminal 85 and B- to terminal 86. An audible "click" should be heard. If not replace the relay.</p>	<p>Yes. Proceed to Step 9</p> <p>No. Replace relays - confirm repair</p>
Step	Action	Decision
#9	<p>DIAGNOSTIC:</p> <p>Disconnect ECM X-3/X-4 connector - connect a 100W headlight to a fused B+ source. Load test wiring by grounding the opposite end of the circuit to a good known ground & test as follows:</p> <p>*Consult EGED285 for wire locations</p> <p>Load test B+ wiring to ECM connector X4-1 & X4-2</p> <p>Load test GND wiring to ECM connector X3-6 & X3-7</p> <p>Does the 100W headlight stay bright when testing each circuit?</p>	<p>Yes. Proceed to Step 10</p> <p>No. Consult EGED285. Check integrity of each circuit. Pay particular attention to the 12 pin connector. Overlay chassis wiring as needed</p>
Step	Action	Decision
#10	<p>DIAGNOSTIC:</p> <p>Disconnect IDM X-3 connector - connect a 100W headlight to a fused B+ source. Load test wiring by grounding the opposite end of the circuit to a good known ground & test as follows:</p> <p>*Consult EGED285 for wire locations</p> <p>Load test B+ wiring to IDM connector X3-8, X3-3, X3-4, X3-23, X3-24 & X3-25.</p> <p>Load test GND wiring to IDM connector X3-1, X3-2, X3-3, X3-22 & X3-26.</p> <p>Load test IGN+ to IDM connector X3-7</p> <p>Does the 100W headlight stay bright when testing each circuit?</p>	<p>Yes. Proceed to Step 11</p> <p>No. Consult EGED285. Check integrity of each circuit. Pay particular attention to the 12 pin connector. Overlay chassis wiring as needed, replace engine sensor harness if fault is found between the 12 pin connector & IDM - Confirm repair</p>
Step	Action	Decision
#11	<p>DIAGNOSTIC:</p> <p>Disconnect ECM X-1/X-2 connector.</p> <p>Disconnect IDM X-3 connector.</p> <p>connect a 100W headlight to a fused B+ source. Load test wiring by grounding the opposite end of the circuit to a good known ground & test as follows:</p> <p>*Consult EGED285 for wire locations</p> <p>Load test ECM X1-19 to IDM X3-5</p> <p>Load test ECM X1-24 to IDM X3-10</p> <p>Does the 100W headlight stay bright when testing each circuit?</p>	<p>Yes. Proceed to Step 12</p> <p>No. Consult EGED285. Check integrity of each circuit. Replace engine sensor harness - Confirm repair</p>

Step	Action	Decision
#12	<p>DIAGNOSTIC:</p> <p>Remove CMP & CKP sensors Reference IK1201042 Air Gap Specs. for Crankshaft and Camshaft Position Sensors</p> <p>Are all items free of defects?</p>	Yes. Proceed to Step 13
		No. Refer to EGES-2652 Service Manual & EGES-2701 Diagnostic Manual to make necessary repairs - Confirm repair

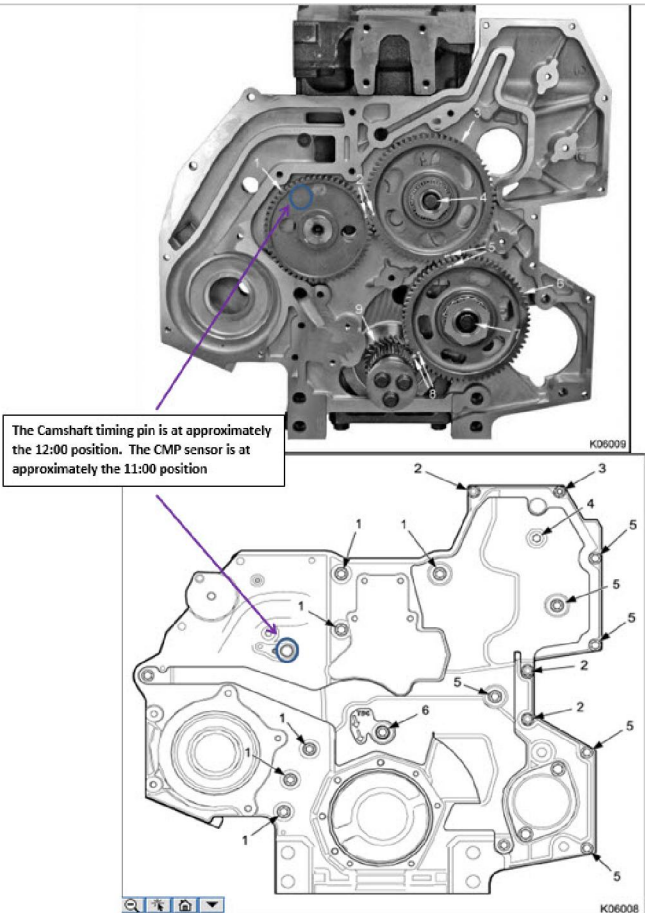
Step	Action	Decision
#13	<p>DIAGNOSTIC:</p> <p>Disconnect CMP & CKP sensors Install test harness (locally made see part numbers under heading "Special Tool(s) / Software" above.</p> <p>Crank engine & monitor RPM or Hz readings Camshaft speed is ~ 1/2 of Crankshaft speed.</p> <p>There are many free online Hz to RPM converters if your DVOM only reads Hz.</p> <p>Is Crankshaft to Camshaft speed within specs?</p>	Yes. Proceed to Step 14
		No. Replace sensors as necessary - Confirm repair

Step	Action	Decision
#14	<p>DIAGNOSTIC:</p> <p>Using a flashlight, watch the CKP tone ring while cranking the engine & check for wobble & debris accumulation.</p> <p>Does tone ring run straight & is free of debris accumulation?</p>	Yes. Proceed to Step 15
		No. Refer to EGES-2652 Service Manual to replace crankshaft tone ring - Confirm repair

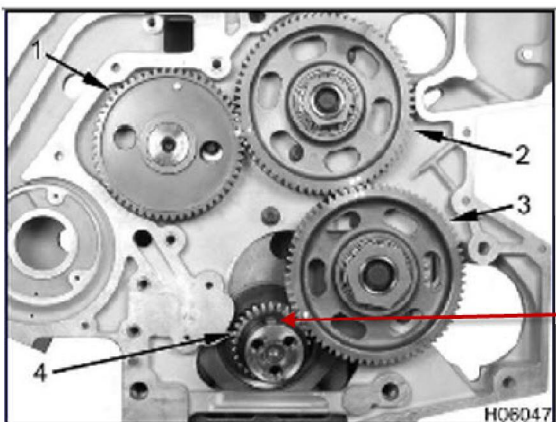
Step	Action	Decision
#15	<p>DIAGNOSTIC:</p> <p>Does this engine use a viscous drive fan?</p>	Yes. Proceed to Step 17
		No. Proceed to Step 16

Step	Action	Decision
#16	<p>DIAGNOSTIC:</p> <p>Disconnect the fan drive electrical connector</p> <p>Does the engine show RPM's & start?</p>	<p>Yes. Replace fan drive - Confirm repair</p>
		<p>No. Proceed to Step 17</p>
#17	<p>DIAGNOSTIC:</p> <p>Install a known to be good ECM/IDM. Program to VIN</p> <p>Does the engine show RPM's & start?</p>	<p>Yes. Replace ECM/IDM - Confirm repair</p>
		<p>No. Proceed to Step 18</p>
#18	<p>DIAGNOSTIC:</p> <p>Remove Injector #1 Bring #1 piston to TDC - use a depth gauge or vernier caliper to verify piston is at TDC Check rocker arms - rockers 1, 2, 3, 6, 7 & 10 will be loose. If not rotate crankshaft one complete revolution You will need to rotate the crankshaft back & forth to ensure that piston is at TDC Remove 3 vibration dampner bolts & plate. Keyway needs to be exactly at 12:00 position</p> <p>Is keyway at 12:00 position?</p>	<p>Yes. Review diagnostic steps with Lead Tech</p>
		<p>No. Proceed to Step 19</p>

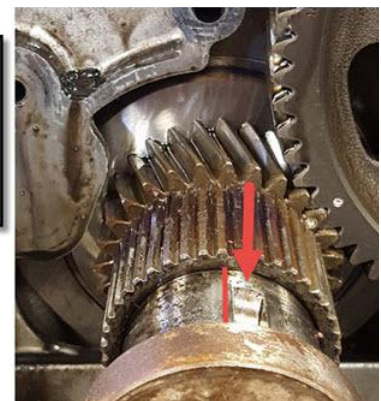
NOTE:



At #1 TDC, Camshaft timing pin will not be seen through the CMP sensor hole.

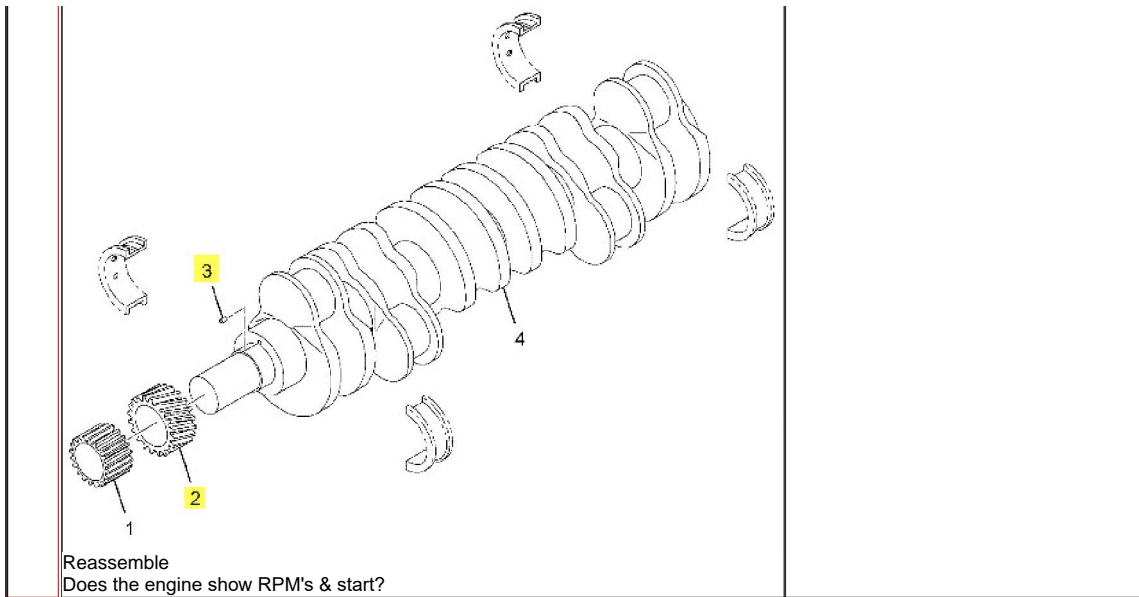


All timing marks lined up. Keyway not @ 12:00 position. Crankshaft drive gear has spun.



REPAIR STEP(s)

Step	Action	Decision
#19	REPAIR: Reference service manual EGED2652 for front cover removal. Replace crankshaft drive gear and timing pin	Yes. Repair complete
		No. Review all steps with Lead Tech



OTHER RESOURCES

[DT 466 / DT 570 / HT 570 Diesel Engine Diagnostic Manual - 2004 Emissions with EGR](#)

[DT 466, DT 570 and HT 570 Engine Service Manual - 2004 Emissions with EGR](#)

[EGED-285](#)

[IK1200261- Battery Box Located Clean Power Fuses for the IDM \(Injector Drive Module\), ECM \(Engine Control Module\), and TCM \(Transmission Control Module\) Failing](#)

[IK1201042 - Air Gap Specs. for Crankshaft and Camshaft Position Sensors](#)

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