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| **Countries:** | AUSTRALIA, CANADA, UNITED STATES, MEXICO, NEW ZEALAND | **Document ID:** | IK1200920 |
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| **Major System:** | ENGINES | **Created:** | 6/17/2013 |
| **Current Language:** | English | **Last Modified:** | 11/17/2015 |
| **Other Languages:** | NONE | **Author:** | Ben Krejcie |
| **Viewed:** | 3498 | | |

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**Title: Oil Leak- Road Draft Tube IBB**

**Applies To: 2010 and 2013 MaxxForce 11 & 13L, 2013 N13 13L**

## CHANGE LOG

2015/11/17 - Added diagnostic step, multiple other corrections based on feedback
2015/08/12 - Author updated for feedback purposes.
2015/07/23 - Added New Zealand to country coding
2015/06/15 - Revised formatting, coding updated to include N13

## DESCRIPTION

This iKNow will guide the user through troubleshooting the CCOS (Crankcase Oil Separator) in cases where excessive lubrication oil consumption is noted or a concern of oil leaking out of the road draft tube.

## SYMPTOMS

**Diagnostic Trouble Codes & Dashboard Indicator Lights:**

| DTC/Light | Description |
|---|---|
| SPN 4227 FMI 7/ Possible MIL lamp | CC Oil Separator Speed: Not Spinning |

**Customer Observations or Concerns:**

- Excessive lubrication oil consumption
- Oil leak at the road draft tube

## SPECIAL TOOLS / SOFTWARE

| Tool Description | Tool Number | Comments |
|---|---|---|
| Ultrasonic Leak Detector | ZTSE4800 | |
| Crankcase Pressure Test Tool | ZTSE4039 | 11/13/N13 Crankcase pressure test adapter |
| Kit, Water Manometer | ZTSE2217A | Slack Tube Monometer, (Digital manometer can be used but must be sourced locally) |
| MaxxForce 11/13L Cap & Plug | ZTSE4891 | Misc. cap sizes |
| Kit, Pressure Test | ZTSE4409 | |

## SERVICE PARTS INFORMATION

| Kit Description | Part Number | Qty | Notes |
|---|---|---|---|
| KIT, BREATHER HOUSING | 2512067C* | 1 | Use newest part number available |
| TUBE, ASSY TURBO OIL SUPPLY | 3018397C* | 1 | Use newest part number available |
| KIT, BREATHER JET PLATE | 2512660C* | 1 | Use newest part number available |
| FILTER, OIL, FILTER OIL, SPINNER II MODEL 960 | 3681678C* | 1 | Use newest part number available |

## DIAGNOSTIC STEP(s)

| Step | Action | Decision |
|---|---|---|
| 1 | **Crankcase Oil Breather Separator Speed Test**<br>• Ensure Engine Coolant Temperature is above 183º F (84º C)<br>• Connect EST to Vehicle<br>• Start Engine<br>• Monitor CC Oil Separator RPM (Crankcase Oil Separator Speed)<br>Is the CC Oil Separator RPM > 6000 RPM | **Yes**. Proceed to Step 3<br>**No**. Proceed to Step 2 |

| Step | Action | Decision |
|---|---|---|
| 2 | **Audio Check for CCOS Movement**<br>• Ensure Engine Coolant Temperature is above 183º F (84º C)<br>• Connect EST to Vehicle<br>• Start Engine<br>• Place Tool ZTSE4800 near the CCOSS Sensor<br>• Turn the engine off and quickly monitor CCOS for centrifugal noise (audible noise of spinning for around 15 sec.)<br>Was noise heard though tool ZTSE4800 when the engine was turned off? | **Yes.** Proceed to CCOSS Sensor Diagnostics in the Engine Diagnostic Manual<br>**No.** Replace CCOS.<br>Reference IK1201272 for instructions<br>Proceed to Step 1 |

| Step | Action | Decision |
|---|---|---|
| 3 | **Crankcase Pressure Test**<br>1. Disconnect Breather Outlet Tube from the top of the CCOS<br>2. Connect ZTSE4039 to the 90° fitting on top of the CCOS<br>3. Connect Tool ZTSE4409 or equivalent to ZTSE4039<br>4. Start the engine<br>5. Raise RPM to >2000 RPM (Customer Parameters may limit the RPM when at a parked condition)<br>6. Allow time for a stable reading and record the results<br>Is Crankcase Pressure below 8 in/H2O? | **Yes.** Replace CCOS<br>Reference IK1201272 for instructions<br>**Note: The CCOS can fail in a manner where it will not separate oil despite maintaining adequate RPM and low crankcase pressure**<br>**No, and the truck is equipped with a Chassis mounted Centrifugal Oil Filter.** Proceed to Step 4<br>**No, and the truck is not equipped with a Chassis mounted Centrifugal Oil** |

| Step | Action | Decision |
|---|---|---|
| 4 | **Crankcase Pressure Test - Bypass Chassis Mounted Centrifugal Oil Filter**<br><br>1. Drain the vehicle air tanks until the pressure is removed from the air system<br>2. Remove the air line from the chassis mounted centrifugal oil filter and cap the air line<br>3. Install the air cap, fuel cap, and plug from tool ZTSE4891<br>4. Start the engine<br>5. Raise RPM to >2000 RPM (Customer Parameters may limit the RPM when at a parked condition)<br>6. Allow time for a stable reading and record the Crankcase Pressure results<br><br>Is Crankcase Pressure below 8 in/H2O? | **Yes.** Replace the Chassis Mounted Centrifugal Oil Filter.<br><br>Diagnostics Complete<br><br>**No.** Proceed to Step 5 |

| Step | Action | Decision |
|---|---|---|
| 5 | **Crankcase Pressure Test - Bypass The Turbo Oil Drain Line**<br><br>1. Remove turbo oil drain line from crankcase and route line into a bucket<br>2. Plug off oil drain line port in crankcase<br>3. Start Engine<br>4. Raise RPM to >2000 RPM (Customer Parameters may limit the RPM when at a parked condition)<br>5. Allow time for a stable reading and record the Crankcase Pressure results<br><br>Is Crankcase Pressure below 8 in/H2O? | **Yes.** Replace high pressure turbocharger per IK1201242<br><br>Diagnostics Complete<br><br>**No.** Proceed to Step 6 |

| Step | Action | Decision |
|---|---|---|
| 6 | **Crankcase Pressure Test - Bypass the Truck Mounted Air Compressor**<br><br>1. Remove discharge line from air compressor<br>2. Start Engine<br>3. Raise RPM to >2000 RPM (Customer Parameters may limit the RPM when at a parked condition)<br>4. Allow time for a stable reading and record the Crankcase Pressure results<br><br>Is Crankcase Pressure below 8 in/H2O? | **Yes.** Repair or replace air compressor<br><br>Diagnostics Complete<br><br>**No.** Engine has a compression leak into the crankcase. See Engine Service Service Manual |

## REPAIR STEPS

**See appropriate Service Manual for proper removal and installation steps. The latest can be found through the MSI, linked below.**

## WARRANTY INFORMATION

**Warranty Claim Coding: (dependent on repair made)**

| | |
|---|---|
| **Group:** | 12000 - Engine |
| **Noun:** | 215 - Filter, Oil Seperator, Crankcase Vent |

| | |
|---|---|
| **Group:** | 04000 - Air Brakes |
| **Noun:** | 202 - Air Compressor, Air Brakes |

**Standard Repair Time(s):**
**Standard Repair Time(s):**

| Step | Description | Chassis | Engine | SRT | Hours |
|---|---|---|---|---|---|
| 1 | Crankcase Oil Breather Separator Speed Test | All | EPA 10 11,13, N13 | Tech Time | 0.3 hr. |
| 2 | Audio Check for CCOS Movement | All | EPA 10 11,13, N13 | Tech Time | 0.1 hr. |
| 2/3 | CRANKCASE BREATHER, REPLACE | All | EPA 10 11,13 | R12-9215U | Breather Replace (SRTs) |
| | | All | N13 | R12-9215US | |
| | | All | N13 Update | R12-9215UT | |

| Step | Description | Chassis | Engine | SRT | Hours |
|---|---|---|---|---|---|
| 1 | Crankcase Oil Breather Separator Speed Test | All | EPA 10 11,13, N13 | Tech Time | 0.3 hr. |
| 2 | Audio Check for CCOS Movement | All | EPA 10 11,13, N13 | Tech Time | 0.1 hr. |
| 2/3 | CRANCASE BREATHER, REPLACE | ProStar | EPA 10 11,13 | R12-9215U | 0.9 hr. |
| | | ProStar | N13 | R12-9215US | 0.9 hr. |
| | | TranStar | EPA 10 11,13 | Q12-9215U | 0.9 hr. |
| | | TranStar | N13 | Q12-9215US | 0.9 hr. |
| | | WorkStar | EPA 10 11,13 | N12-9215U | 0.9 hr. |
| | | WorkStar | N13 | N12-9215US | 0.9 hr. |
| | | PayStar | EPA 10 11,13 | T12-9215U | 0.9 hr. |
| | | LoneStar | EPA 10 11,13 | S12-9215U | 0.9 hr. |
| | | CAT CT660 | EPA 10 11,13 | TC12-9215U | 0.9 hr. |
| 3 | ELECTRONIC ENGINE PERFORMANCE, Diagnose (Crankcase Pressure Test) | All | EPA 10 11,13, N13 | R12-2194U | 0.6 hr. |
| 4 | Bypass Chassis Mounted Centrifugal Oil Filter | All | EPA 10 11,13, N13 | Tech Time | 0.3 hr |
| 4 | SOOT CENTRIFUGE FILTER (CHASSIS MOUNTED), REPLACE | ProStar | EPA 10 11,13 | R12-4656U-25 | 0.8 hr. |
| | | TranStar | EPA 10 11,13 | Q12-4656U-25 | 0.8 hr. |
| | | WorkStar | EPA 10 11,13 | N12-1656U-25 | 0.8 hr. |
| | | PayStar | EPA 10 11,13 | T12-4656U-25 | 0.8 hr. |
| 5 | Bypass the Truck Mounted Air Compressor. | All | EPA 10 11,13, N13 | Tech Time | 0.3 hr. |
| 5 | AIR COMPRESSOR, REPLACE | ProStar -Single Cylinder | EPA 10 11,13 | R04-1202U-21 | 3.5 hr. |
| | | ProStar - Two Cylinder | EPA 10 11,13 | R04-1202U | 3.4 hr. |
| | | ProStar 113 - Two Cylinder | EPA 10 | R04-1202U-20 | 3.4 hr. |
| | | ProStar - Two Cylinder | N13 | R04-1202US | 3.4 hr. |
| | | ProStar - Single Cylinder | N13 | R04-1202US-20 | 3.5 hr. |
| | | TranStar - Single Cylinder | EPA 10 11,13 | Q04-1202U-20 | 3.5 hr. |

| | | | | | |
|---|---|---|---|---|---|
| | | TranStar - Two Cylinder | EPA 10 11,13 | Q04-1202U | 3.4 hr. |
| | | TranStar - Single Cylinder | N13 | Q04-1202US-20 | 3.5 hr. |
| | | TranStar - Two Cylinder | N13 | Q04-1202US | 3.4 hr |
| | | WorkStar - Single Cylinder | EPA 10 11,13 | N04-1202U-20 | 3.4 hr. |
| | | WorkStar - Two Cylinder | EPA 10 11,13 | N04-1202U | 3.5 hr. |
| | | WorkStar - Single Cylinder | N13 | N04-1202US-20 | 3.4 hr. |
| | | WorkStar - Two Cylinder | N13 | N04-1202U | 3.5 hr. |
| | | PayStar - Single Cylinder | EPA 10 11,13 | T04-1202U-20 | 3.4 hr. |
| | | PayStar - Two Cylinder | EPA 10 11,13 | T04-1202U | 3.5 hr. |
| | | PayStar - Single Cylinder | N13 | T04-1202US-20 | 3.4 hr. |

## OTHER RESOURCES

Master Service Information Site

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