



Countries:
Availability:
Major System: ENGINES
Current Language: English
Other Languages: NONE
Viewed: 96

Document ID: IK1200990
Revision: 0
Created: 10/17/2013
Last Modified: 12/27/2013
Author: Aaron Mimbs

[Less Info](#)
☒ Hide Details

Coding Information

Copy Link	Copy Relative Link	Bookmark	Add to Favorites	Print	Provide Feedback	Helpful	Not Helpful
		 View My Bookmarks				 1	 0

Title: MaxxForce 7 Fuel Dilution Diagnostics

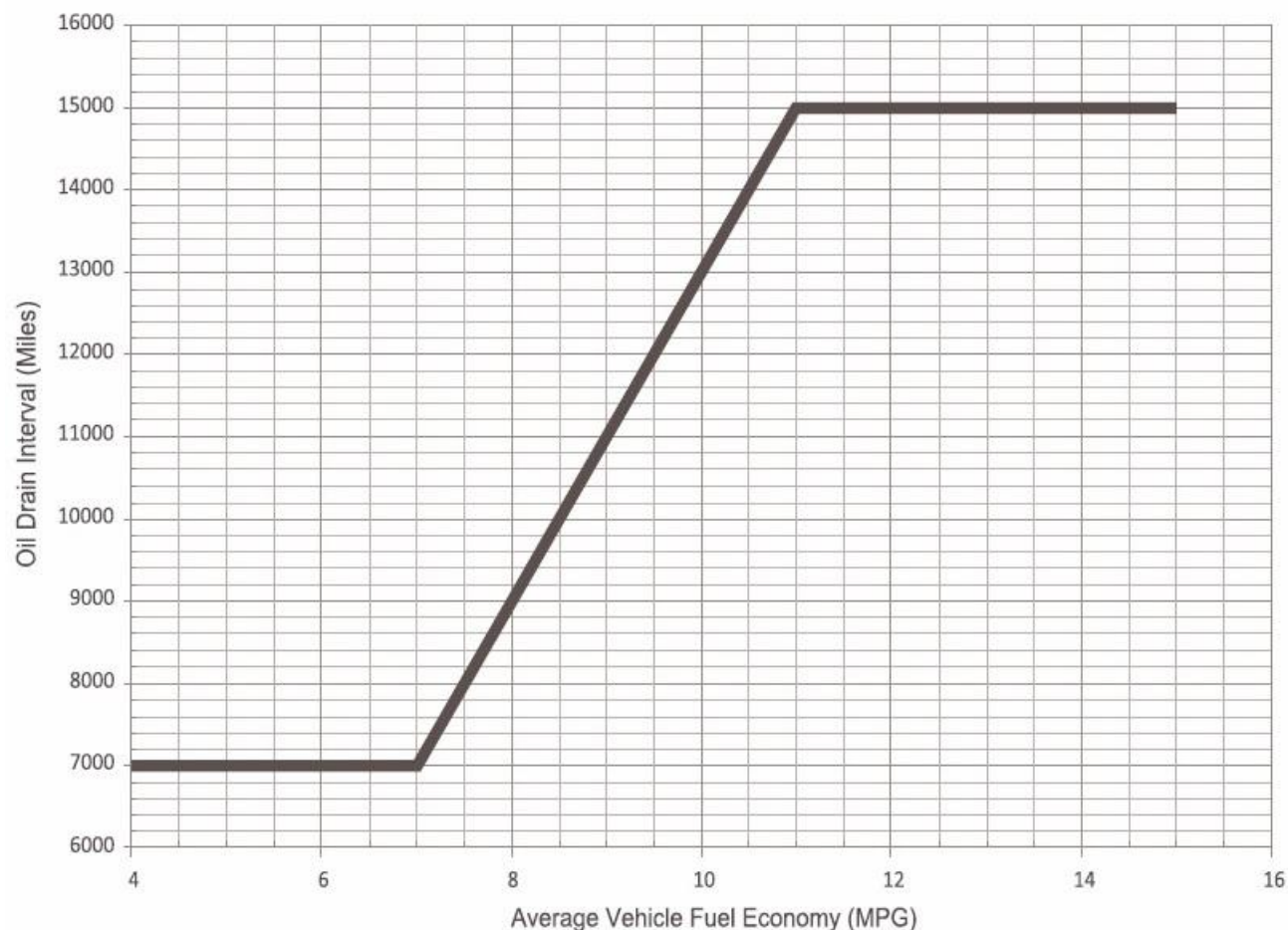
Applies To: All MaxxForce 7

DESCRIPTION

Over time the engine oil will naturally dilute with fuel over the recommended service interval due to post injection during active and passive regenerations. Mild dilution is acceptable, if this is the case then there is no concern and warranty will not cover any diagnostic procedures performed on the unit. Dilution issues are evident when the engine is making excessive amounts of oil that is noticeable in a short time frame of oil life. Before performing any diagnostics make sure the ECM calibration is current and any open AFCs have been performed. In severe dilution cases the enclosed high pressure fuel system could potentially have developed a leak over time putting fuel into the oil. Check with the customer and his oil service habits, if they are not in line with the recommended service as outlined below have the oil changed and release the unit for the customer to monitor the level.

2007-2009 MaxxForce 7: Make sure [AFC 12948](#) has been completed. The new calibration and AFC was released to address the fuel dilution problem and has been very effective in doing so. The required oil service interval for this engine is every 10,000 miles OR 350 hours whichever comes first. Please see the operator's manual for more information.

2010- Current MaxxForce 7: Make sure the engine calibration is up-to-date and the required oil service interval for this engine is described in the chart below. The interval is contingent on average MPH and MPG. Please see the operator's manual for more information. For low oil pressure concerns please see [IK1200744](#)



In extreme cases the oil level can visibly rise after a test drive or upon arrival to the dealer the oil maybe several inches over full and will have low viscosity. If this is the case then the following diagnostics should be performed.

SYMPTOMS

- Low Oil Pressure
- Increasing Oil Level
- Black Smoke
- Excessive Oil Carry Over into Intake
- High Crankcase Pressure
- Engine Vibration

TROUBLESHOOTING STEPS

1. Update ECM calibration if needed and note which calibration is in the ECM before and after the update
2. Check the oil level and note the level
3. Confirm oil is diluted with fuel
 - a. Perform Paper Drop Test: Sample the oil and drip some onto a piece of paper. If a clear ring forms around the oil this is the diesel fuel separating from the oil
 - i. Diesel is Present: Sample the oil and send it out for testing (Keep results and if a case file is needed scan them and attach to the case file) and proceed
 - ii. Diesel is NOT Present: Proceed to steps 4 and 5, review service records drain the oil to a proper level and release the unit back to the customer to monitor the level
4. Check for active and inactive DTCs

5. Request the latest service record from the customer and note how many hours and miles are on the current oil change (Ensure Proper Maintenance Habits)
6. **2007-2009 MaxxForce 7** Inspect the breather type and take note of which type it is (Open or Closed)
 - a. Non-Bus Application: Install Open Breather Kit 1889886C91 if needed ([Instructions](#))
7. Inspect the inlet of the Charge Air Cooler (CAC) with a flash light and mirror for plugging and oil contamination
 - a. CAC Plugged/Dirty: Attempt to Flush CAC (Replace if needed) then proceed
 - b. CAC Not Plugged: Proceed to next step
8. Inspect the Turbo for Oil/Fin Damage/Shaft Play
 - a. Turbo Damaged or Pushing Oil: Perform all necessary steps in diagnosing/replacing the turbocharger(s), cleaning the engine, and inspecting the aftertreatment. Diagnose Turbo Following [IK1200535](#) for Oil Leaks Inspect exhaust side for oil. If all seems okay then clean the turbocharger (Cleaning Kit 1891576C91)
 - b. **2007 – 2009 MaxxForce 7** Perform Diesel Oxidation Catalyst Cleaning Procedure:Reference [IK1200478](#), it will automatically create a snapshot of the procedure **(Attach to case file later if needed)** If DTC 1213 Remote Throttle Signal Out of Range Low is Active after running the cleaning see [IK0800323](#) to clear the code

Make sure the oil is at a proper level and mark the dip stick. Road test for 30 miles and if needed perform a stationary regeneration. Let the engine cool down and then recheck oil level to see if it has risen (**NOTE:Oil expands when it is hot**)

If the oil level did **NOT** rise then in extreme dilution cases request customer approval for an oil service however if the oil is already new and is heavily diluted contact CSE and request a good will warranty coverage on oil service. Give it back to the customer to monitor levels.

If the oil level is still rising get Crankcase Pressure and Blow-by (2010 - 2013) readings at Idle and Wide Open Throttle (WOT). If the readings performed are out of specification proceed with a manual compression test. If Crankcase Pressure on the 2010 - 2013 MaxxForce 7 is out of specification and Blow-By is in specification then the crankcase breather is most likely plugged.

(NOTE: Use the specification defined in these articles, the Blow-By test is only for the 2010-2013 MaxxForce 7 and is similar to the Crankcase Pressure test on the 2007-2009 MaxxForce 7. The crankcase pressure test on the 2010-2013 MaxxForce 7 is different and is meant to test the crankcase breather for plugging. There is always CCP and Blow-By and they are always greater at WOT, Gauges do break)

2007 – 2009 MaxxForce 7:Please see [IK1200881](#)

2010 - Current MaxxForce 7:Please reference the diagnostic manual [EGES485](#) under Performance Diagnostics >> Special Test Procedures >> Blow-by Test & Crankcase Pressure Test

If within specification remove the valve covers and then reassemble needed components to run the engine. Connect separate clean fuel source and add CUMMINS dye to the fuel. Allow the engine to idle to operating temperature and watch for leaking injectors with a black light. (We find that Cummins dye and a black light work the best for leak detection)

If leaks are found replace the component and recheck for leaks if all is well reassemble and recheck for dilution. If a leak is not found run the Standard Test in ServiceMaxx this will increase FRP which increases the chance of a leak. Inspect ALL high pressure fuel system connections and fittings including the FRP sensor, injector bodies, both jumper tube ends, and the high pressure rails. If no leaks are present brake stall the engine and watch for leaks, shut down the truck and feel around all the high pressure fittings and check your finger for dye. If no leaks are found pull the High Pressure Fuel Pump cover and reassemble clean off any fuel present from removing the lines and perform the same tests while looking for leaks at the pump.

If no leaks are found and this unit is still gaining oil please open a case file with all the above information.

Hide Details	Feedback Information
	Viewed: 95 Helpful: 1 Not Helpful: 0
No Feedback Found	

Copyright © 2014 Navistar, Inc.