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Title: Service Information New Shell Rotella Ultra Extended Life Coolant (ELC) used in MaxxForce 11, 13, and 15 engines

Applies To: 2010 MaxxForce 11 and 13 Engines 2009 MaxxForce 13 Engine with 2010 Components 2011 MaxxForce 15 Engine

DESCRIPTION

With the introduction of 2010 compliant MaxxForce engines, we will be using Shell Rotella® Ultra ELC Coolant in MaxxForce11, 13, and 15 liter products. Many customers are asking what is different and why we are switching. The primary difference is Ultra ELC coolant is nitrite free.

Key benefits:

- Enhanced corrosion protection for the aluminum components in our cooling system
- Increased service life of 600,000 miles or 12,000 hours without the need for extender additive
- Same cooling and antifreeze performance as today's coolant
- Backwards compatibility for all cooling systems with OAT coolants

SERVICE:

Why Ultra?

Shell Rotella® Ultra ELC is a nitrite free, ethylene glycol and water coolant, based on Organic Additive Technology (OAT) for cooling system protection, It was designed to provide the best coolant performance with improved aluminum protection, oxidation control and elastomer compatibility. It also provides reduced maintenance costs by eliminating the midlife requirement to service the cooling system with coolant additives/extenders.

Why has Navistar replaced Rotella® ELC with Rotella Ultra ELC?

Navistar has been monitoring the performance of Rotella® ELC across many different engine manufacturers and vehicle applications. Navistar and Shell believe Shell Rotella® Ultra ELC provides better coolant performance by eliminating the nitrite depletion mechanism (ammonia formation).

Why was the Rotella® Ultra ELC formulated to be nitrite-free?

Nitrites were included in the initial offering of extended life coolant for cavitation protection. The disadvantage is nitrite levels deplete over time and must be replaced. An undesirable aspect of the use of nitrite in coolants is more rapid depletion. An associated undesirable characteristic is the formation of ammonia vapors. These vapors cause an increase in pH which has shown to be detrimental to aluminum at pH levels above 10.

Is there any maintenance that has to be done and what is it?

Recommend testing freeze point at each PM interval or at least twice per year. No other maintenance is needed if system is maintained with Rotella® Ultra ELC or equivalent nitrite free organic additive technology coolant designed for use in heavy duty diesel engines.

How do we test Shell Rotella® Ultra ELC?

(Freeze protection, contamination or additive package depletion)

Freeze protection: Traditional refractometer is the preferred technology to test percent ethylene glycol by volume. The same as with Shell Rotella® ELC coolant.

Contamination: Is defined as the presence of nitrite which is typically found in most extended life and hybrid (conventional coolant supplemented with organic additive technology) coolants found in the marketplace. Straight conventional coolants, that utilize silicates to protect internal engine components, are also considered a contaminant.

Color: Contamination of coolants may not be obvious from color alone.

Contamination: Test strips designed for extended life coolants (OAT plus nitrites) can be used to quantify the nitrite contamination levels. The presence of nitrites should not be considered a cause for concern unless the nitrite level exceeds (200 ppm), then it is considered contaminated. At contamination levels greater than 20% with Rotella® ELC, the maximum cooling system performance would be obtained by draining the system and refilling with Rotella® Ultra ELC. The lack of nitrites during a test should be considered normal since Rotella® Ultra ELC is a nitrite-free coolant.

Shell Rotella® Ultra ELC has been formulated to include three organic additives which provide cylinder liner cavitation protection and permit the elimination of nitrites and the need for an extender.

It is important that Rotella® Ultra ELC coolant remains clean and not contaminated by residual coolant left in drain pans or contaminated with debris when drained from engine . Navistar plans to release an Essential Tool (coolant management tool) in October to specifically address this issue and enable an improved vacuum refilling process. Refer to the published cooling system refill instructions before refilling any 2010 emission engine.

Is extender necessary?

No, Shell Rotella® Ultra ELC **DOES NOT** require the addition of extender opposed to the current Rotella® ELC requiring the addition of extender at 300,000 miles or 6,000 hours. This is unnecessary with Rotella® Ultra ELC because it is nitrite-free and provides protection using organic additive technology with insignificant depletion over time. Organic additives do not deplete like traditional coolant inhibitors. Rotella® Ultra ELC **DOES NOT** require any additives throughout the life of 600,000 miles or 12,000 hours.

What happens if coolant types are mixed?

Shell Rotella® Ultra ELC is compatible with other OAT coolants; however it is not recommended that it be mixed with Hybrids or fully formulated conventional coolants by more than 10%. Corrosion protection can be severely reduced with the mixing of coolants of different technologies (conventional, hybrid, etc.). If the use of a limited quantity of another coolant is necessary, another ELC (OAT) -derived coolant is preferred over a conventional or hybrid coolant. Note that contamination is defined as using any other coolant, including other ELCs (OAT) with nitrites, to top off the system filled with Rotella Ultra ELC.

Coolant Replenishment: Order of preference (1-3 gallons top off)

1. Shell Rotella® Ultra ELC 50/50 premix – no limit to quantity.
2. Shell Rotella® Ultra ELC 100% concentrate (at next PM, the freeze protection capability must be determined and then brought back into specification of 40-60% EG)
3. Any 50/50 premix of a nitrite-free organic additive technology (OAT) coolant designed for heavy duty diesel engines. Examples include Mobil Delvac Extended Life Coolant, Final Charge, and Fleetguard ES Compleat OAT (Nitrite-free), etc. – no limit to quantity.
4. Any 50/50 premix of an OAT coolant designed for heavy duty diesel engines. Shell Rotella® ELC is one example. Top off with Rotella® ELC is acceptable but recommended at less than 20%.
5. Straight water (at earliest convenience, the freeze protection capability must be determined and then brought back into specification of 40-60% EG)

The use of conventional silicate and hybrid coolants would be only permitted if their presence is below the 10% allowance.

If topping off, how much Rotella® Ultra ELC concentrate can be used before I need to add water?

In new vehicles with factory fill Rotella® Ultra ELC, 2 gallons of concentrate can be added to the cooling system and still be within the 40-60% concentration. It is always best to add premix when topping off.

Can I top off and/ or mix with other nitrite free coolants?

Yes, other nitrite free OAT coolants designed for heavy duty diesel engines can be used. Some examples include Mobil Delvac Extended Life Coolant, Final Charge, and Fleetguard ES Compleat OAT (Nitrite-free).

How much Rotella® ELC can be mixed with Rotella® Ultra ELC? Can I top off with Rotella® ELC (RED)?

The maximum performance benefit from Rotella® Ultra ELC is when mixing does not occur. Top off with Rotella® ELC is acceptable but recommended at less than 20%. At contamination levels greater than 20% with Rotella® ELC, the maximum

cooling system performance would be obtained by draining the system and refilling with Rotella® Ultra ELC.

Can I use Rotella® ELC in the 2010 MaxxForce 11, 13, and MaxxForce 15 Engines?

Maximum performance comes from using Rotella® **Ultra** ELC. The use of nitrited OAT coolants is not recommended.

Can I top off with water? How much water can I top off with?

Premix Rotella® Ultra ELC 50/50 top off is always preferred but 1-3 gallons of **Clean Filtered Distilled** water can be added to the system. Maintaining the 40-60% concentration is recommended and would require verification that adequate freeze protection remains within the optimum range. -30 to -40 °F is ideal freeze protection. At earliest convenience, the freeze protection capability must be determined and then brought back into specification of 40-60% EG.

Can I mix conventional green/purple coolant with Rotella® Ultra ELC?

Mixing Rotella® Ultra ELC with conventional coolant will dilute OAT content and depending on the concentration level, shorten coolant life. Therefore, adding conventional coolant is not recommended. It is strongly recommended to top off with an OAT coolant and especially nitrite free OAT coolant designed for heavy duty diesel engines.

Can I use conventional green/purple coolant in the MaxxForce 11, 13, and MaxxForce 15 Engines?

Maximum performance comes from using Rotella® Ultra ELC. The use of conventional coolant is not recommended.

Available information states when adding conventional green/purple coolant you also have to add some type of a supplemental coolant additive package as well?

Conventional coolant does require the addition of coolant additives (silicates).

Shell Rotella® Ultra ELC does not require any type of supplemental coolant additive package. The use of conventional coolant is **not** recommended.

Can I use Rotella® Ultra ELC in other MaxxForce and International Engines?

Model of Engine	**Emissions Model Year** (Ultra ELC not factory fill)	**Compatable w/ Shell Rotella® Ultra ELC**
MaxxForce DT, 9 & 10	2010	Yes
MaxxForce 15	2011	Yes
MaxxForce 7	2010	Yes
MaxxForce 11 & 13	2007	Yes
MaxxForce DT, 9 & 10	2007	Yes
MaxxForce 7	2007	Yes
MaxxForce 5	2007	Yes
Legacy engines	Prior to 2007	Ultra is approved for all products that are approved with OAT coolants.

Can I use Rotella® Ultra ELC in other OEM engines?

Rotella® Ultra ELC is approved for all products that are approved with OAT coolants. Verify OEM manufactuers recommendations.

Can current OAT (nitrite level only) be used to test Rotella® Ultra ELC?

Currently available test strips can be used to identify nitrite contamination levels in a vehicle running Rotella® Ultra ELC Shell does not have test strips to measure Rotella® Ultra ELC OAT levels. pH and glycol concentration levels can be checked using existing inspection methods and techniques. Since Rotella® Ultra ELC is nitrite-free, other manufacturers test strips should indicate the absence of nitrites and the presence of nitrites if at or above 200 ppm (contamination).

Will other test kits accurately test Rotella® Ultra ELC?

Test kits and strips used to test pH and nitrite level will also work with Shell Rotella® Ultra Extended Life Coolant.

The Shell Extended Life Coolant test kit confirms the total level of organic additives in the sample (OAT with and without nitrites).

The Chevron ELC test kit will also work in testing the total organic additive content.

Will this coolant have an impact on current service bay tools? (Vac and Fill, cooler testers)

Yes, care should be taken to avoid contaminating Rotella® Ultra ELC through the use of a common coolant retention receptacle containing the remnants of a different coolant technology. To maintain the benefits provided by Rotella® Ultra ELC, a designated coolant receptacle is desired. The cross-contamination limit of 10% would apply.

Because it is important that Rotella® Ultra ELC coolant remains clean and not contaminated by residual coolant left in drain pans or contaminated with debris when drained from engine . Navistar plans to release an Essential Tool (coolant management tool) in October to specifically address this issue and enable an improved vacuum refilling process. Refer to the published cooling system refill instructions before refilling any 2010 emission engine.

No, with respect seals, gaskets and mating surfaces of service tools.

What happens if oil is mixed with Rotella® Ultra ELC, how do we flush the system?

Coolant flush process is identical between Rotella® ELC and Rotella Ultra ELC and is outlined in the service manual.

Does this coolant need to be handled and stored differently than current Rotella® ELC?

No

PARTS:

It is recommended that all International Dealers stock Shell Rotella® Ultra ELC.

What are the part numbers and what is the availabilityof Shell Rotella® Ultra ELC?

Part Number	Description	Shell Direct Ship Program	PDC Launch Support (Temporary)
ZSH550022381D	55 Gallon Drum of concentrate	Yes	Yes
ZSH550022382D	55 Gallon Drum of 50/50 Mix	Yes	Yes
ZSH550024730G	1 Gallon container of concentrate	Yes	Yes
TBD - Part number in process	1 Gallon container of 50/50 mix	October 2010	September 2010

What is the part number of the Shell Rotella® ELC test kit (OAT with and without nitrites)?

Part Number	Description	Shell Direct Ship Program
TBD - Part number in process	Shell Rotella ELC Test Kit	September 2010

Other Communication:

Sales Information Letter: G-6217
Parts Information Letter: G-19-8664-B

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