



TOTAL

COMMITTED TO BETTER ENERGY



SELECTIVE CATALYTIC REDUCTION AND DIESEL PARTICULATE FILTERS

TOTAL Lubricants range of Low-SAPS oils for Trucks, Tractors and Earth Moving equipment

Energizing performance. Every day



SELECTIVE CATALYTIC REDUCTION AND DIESEL PARTICULATE FILTERS

Most modern diesel powered Trucks, Tractors and some Earth Moving equipment are being fitted with filtration systems in the exhaust to meet the ever tightening exhaust emission standards. As a minimum these vehicles will now likely have a Diesel Particulate Filter (DPF) but many vehicles are also fitted with a Selective Catalytic Reduction (SCR) System. To maximize the reliable operation of these systems it is important that the correct oil is used in the engine.



Diesel Particulate Filters (DPF) filter soot particles from the exhaust to minimize soot emissions into the air we breathe. However the DPF needs to be regenerated in order to stop it eventually blocking with the soot it has collected.

- The DPF cleans or regenerates itself by burning off the captured soot particles as part of the normal driving process when the DPF temperature becomes hot enough.
- Alternatively the engine management system will trigger a regeneration sequence if the normal driving has not been able to provide sufficient regeneration

Selective Catalytic Reduction is a type of catalytic converter that reduces smog producing Nitrous oxide emissions (NOx) to Nitrogen and Water with the use of a Urea Solution known as a Diesel Exhaust Fluid (DEF) or AdBlue to assist the catalytic reaction.

- The DEF needs to be replenished periodically.
- If the DEF runs out the engine may go into limp home mode or may not be able to be restarted until the DEF is replenished.

Why is using the correct engine oil important?

- Engine oils contain Sulphated Ash and Phosphorous in order to do the work required of them. Sulphur is also contained in some base oils and additive systems. These compounds are commonly referred to as SAPS (Sulphated Ash, Phosphorous and Sulphur).
- To ensure long DPF and SCR life, most systems require Low SAPS oil in the engine.
 - Sulphated Ash can interfere with the regeneration of DPF's and result in blockages.
 - Phosphorous can poison catalysts
 - Sulphur can interfere with the regeneration process and poison catalysts.
- Synthetic base oils need to be used to achieve the restriction on SAPS content and required performance.

What can cause DPF and SCR issues? Whilst using the correct oil is important to ensure long DPF and SCR life it isn't usually the prime cause of DPF and SCR issues.

- Combustion or Fuel injection issues, stop start driving and short trips can all have an impact on the success and frequency of regeneration of these systems.
- Poor quality Diesel Exhaust Fluid (DEF) can impact the SCR system. Ensure the DEF is of the quality required by the vehicle manufacturer. TOTAL ADBLUE meets the requirements for DEF of the majority of vehicle manufacturers.

LOW SAPS OILS

If it is a late model heavy duty diesel vehicle it is likely to have a DPF, SCR or both and require Low SAPS engine oil that meets a Heavy Duty API or ACEA Catalyst Compatible specification. Many also require the vehicle manufacturer's particular specification that will typically be based on the API or ACEA Low SAPS specification plus the manufacturer's specific additional performance requirements.

There are 3 API and 2 ACEA Low SAPS specifications and the differences are illustrated in the table below together with a High SAPS specifications of API CI-4 and ACEA E4 to illustrate the differences;

API or ACEA	TBN mgKOH/g	Sulphur	Phosphorous	Sulphated Ash	HTHS mPa.s
API FA-4	-	≤ 0.4 %	≤ 0.12 %	≤ 1.0 %	≥ 2.9 ≤ 3.5
API CK-4	-	≤ 0.4 %	≤ 0.12 %	≤ 1.0 %	≥ 3.5
API CJ-4	-	≤ 0.4 %	≤ 0.12 %	≤ 1.0 %	≥ 3.5
API CI-4 (High SAPS)	-	No Limit	No Limit	No Limit	≥ 3.5
ACEA E9-16	≥ 7.0	≤ 0.4 %	≤ 0.12 %	≤ 1.0 %	≥ 3.5
ACEA E6-16	≥ 7.0	≤ 0.3 %	≤ 0.08 %	≤ 1.0 %	≥ 3.5
ACEA E4-16 (High SAPS)	≥ 12.0	No Limit	No Limit	≤ 2.0 %	≥ 3.5

Notes:

- EX-16 is the latest 2016 ACEA specifications which supersede EX-12, EX-10 etc.
- API CK-4 and API FA-4 are new API specifications released in December 2016.
- HTHS - High Temperature High Shear is the Dynamic viscosity which is important for wear protection.
- API FA-4 is a Low HTHS oil and should only be used in engines designed for API FA-4 oils.





TOTAL LUBRICANTS THE SOLUTION

TOTAL Lubricants has the RUBIA range of low SAPS oils to cover ACEA "E" and API specifications for heavy duty diesel engines.



RUBIA OPTIMA 1100 15W-40
RUBIA OPTIMA 1100 FE 10W-30

API CK-4, ACEA E9

Cummins, Detroit, Mack, Volvo, Renault, Ford



RUBIA OPTIMA 2100 XFE
10W-30

API FA-4

Cummins, Detroit (Engines calling for API FA-4 only)



RUBIA TIR 7900
15W-40

API CJ-4, ACEA E9

Caterpillar, Cummins, Detroit, Mack, MAN, Renault, Volvo, Isuzu



RUBIA TIR 7900 FE
10W-30

API CJ-4, ACEA E9

Cummins, DAF, Detroit, Mack, MAN, Renault, Volvo



RUBIA TIR 8900 10W-40
RUBIA TIR 8900 FE 10W-30

ACEA E6

Mercedes, Scania



RUBIA TIR 9900
10W-40

API CJ-4, ACEA E6/E9

Cummins, Detroit, Mack, MAN, Mercedes, Renault, Scania, Volvo



RUBIA TIR 9900 FE
5W-30

API CJ-4, ACEA E6/E9

Mack, MAN, Mercedes, Renault, Scania, Volvo



RUBIA WORKS 2000
10W-40

API CJ-4, ACEA E9

Caterpillar, Cummins, Detroit, Deutz, Mack, MAN, MTU, Renault, Volvo, Isuzu

The above is a guide and the current oil for the engine should be determined by the TOTAL LUB ADVISOR APP or Internet site.

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