Heavy Duty Engine Oils

TRAVELING TOOLBOX

CITGO LUBRICANTS



CONTENTS

The CITGO Heavy Duty Engine Oils **Traveling Toolbox** provides the following:

- Fingertip access to essential information needed during sales visits.
- A resource for product and sales education.

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1

FUEL EFFICIENCY FACTS

1



Know the Facts about Fuel Efficiency

Viscosity Grade	API	FE Ranking	Product
SAE 5W-30	CK-4	BEST	CITGARD® 1000 Full Synthetic
SAE 10W-30	FA-4		CITGARD 700 SB MFE
SAE 10W-30	CK-4		CITGARD 700 SB
SAE 5W-40	CK-4		CITGARD 1000 Full Synthetic

All of the above viscosity grades improve fuel efficiency when compared to a SAE 15W-40 engine oil.

CITGARD 700

DEMONSTRATED

100%

BETTER OXIDATION CONTROL

COMPARED TO A CJ-4 OIL

OXIDATION RESULTS IN OIL **THICKENING** = THICKENING **REDUCES FUEL EFFICIENCY** DURING ODI

KEY POINTS

1

CITGARD 700 CAN LAST TWICE AS LONG AS CJ-4 OILS

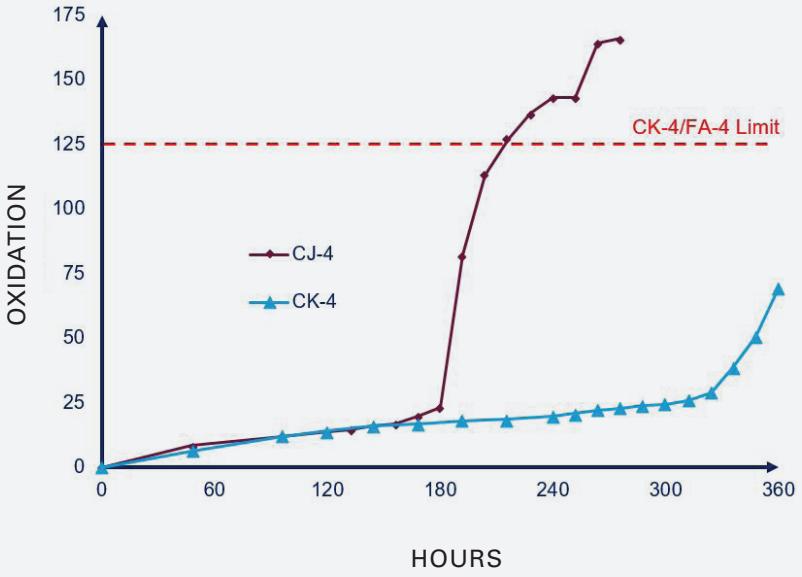
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CITGARD 700 HAS DOUBLE THE OXIDATION PROTECTION

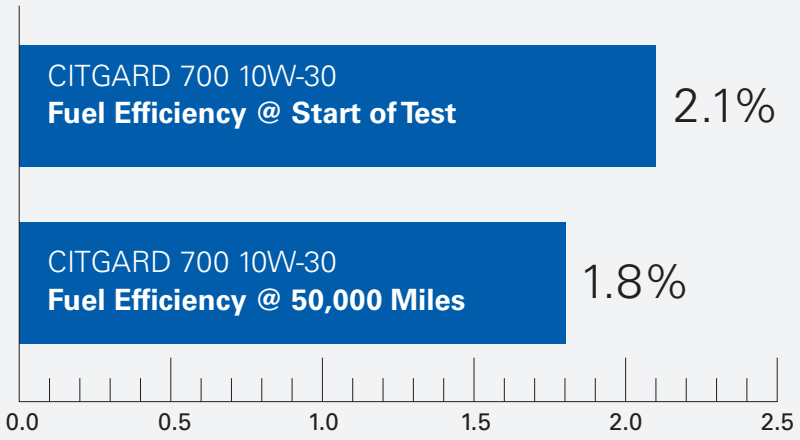
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CITGARD 700 CAN MAINTAIN 1.8% FUEL EFFICIENCY @ 50,000 MILE OIL DRAIN INTERVALS (ODI) WHEN COMPARED TO AN SAE 15W-40 OIL

IMPROVED OXIDATION CONTROL WITH CITGARD 700



% FUEL ECONOMY IMPROVEMENT



Know the Facts about Fuel Efficiency

Fuel Efficiency FAQ	Answer
How does a low viscosity oil improve fuel economy vs. a 15W-40?	Low viscosity oils reduce engine energy losses by reducing the fluid friction during circulation and churning of the oil during engine operation.
Why is there a reported variance in fuel efficiency of low viscosity oils of less than 1% to 4% or more?	The lower the viscosity grade, the greater the fuel efficiency when combined with operating conditions such as stop-and-go vs. long haul operation.
Will CITGARD low viscosity oils provide equal wear protection and engine durability?	Yes. CITGARD engine oils are proven to provide excellent engine durability and wear protection in major fleet tests.
How do low viscosity oils improve fuel economy at engine start up?	Low viscosity oils improve fluidity during the start-up phase and reduce engine energy losses while the engine is reaching operating temperature.
Is there a difference in fuel consumption when using a low viscosity conventional oil vs. synthetic oil?	Engine oil fuel efficiency is primarily attributed to oil viscometrics and not influenced by synthetic content. However, oils like CITGARD 700 and CITGARD 1000 tend to resist oil oxidation and oil thickening, thereby providing sustained fuel efficiency over the entire oil change interval.
Why does an API FA-4 oil offer better fuel efficiency than an API CK-4 oil of the same viscosity grade?	CITGARD 700 MFE 10W-30, an API FA-4 oil, is formulated to a lower viscosity within the SAE 30 range compared to CITGARD 700 CK-4 10W-30 oil. This lower viscosity of API FA-4 10W-30 at operating temperature results in improved fuel economy and less energy loss.
Why does CITGO not currently offer an API FA-4 5W-30 oil?	API FA-4 oils currently have limited OEM compliance. It will take some time for fleet managers to become confident in an API 5W-30 FA-4 oil.
How can a fleet manager evaluate the fuel efficiency advantage of a low viscosity oil?	Testing the fuel economy of a low viscosity oil is challenging because there are so many variables impacting fuel economy. However, the CITGO Guaranteed Efficiency Program has a four-step process that is designed to monitor fuel efficiency and leading American fleets who are enrolled in the program have reported an increase in fuel efficiency.
How do I respond to a fleet manager who questions the fuel efficiency advantage of a low viscosity oil?	This can be difficult since opinions do vary in the industry; however, most on-highway OEMs now factory-fill with 10W-30. Many major fleets made the change several years ago and are reporting excellent results in engine durability and the fuel efficiency advantage. Finally the fuel efficiency advantage of low viscosity oils is inherent with the viscosity regardless of operating conditions.

OEM VISCOSITY RECOMMENDATIONS

2



5

Cold Start Lubrication Facts

Did you know?



- Most engine wear occurs at start up.
- Cold box testing indicates that it takes five times longer for the oil pump to deliver an SAE 15W-40 oil into the engine at 32°F compared to a 5W-40 or 5W-30 engine oil.
- The longer the cold cranking to start-up phase, the greater the stress on batteries and starters, resulting in reduced component life.
- Many fleets depend on engine block heaters in cold weather. CITGARD 1000 Full Synthetic 5W-40, 5W-30 and CITGARD 700 Synthetic Blend 10W-30 may reduce the dependency on engine block heaters, which can reduce winter time operational costs resulting from cost of kilowatt energy and the days and hours of usage.

Low Temperature Comparison

Oil flow can be restricted at very low temperatures when using higher viscosity oils. When this happens, critical engine components may be starved of oil and this in turn may lead to critical component wear.



Cold box testing at -22°F (-30°C) of used oil demonstrates the superior flow characteristics of CITGARD 1000 Full Synthetic 5W-40

Original Equipment Manufacturer (OEM) Viscosity Recommendations

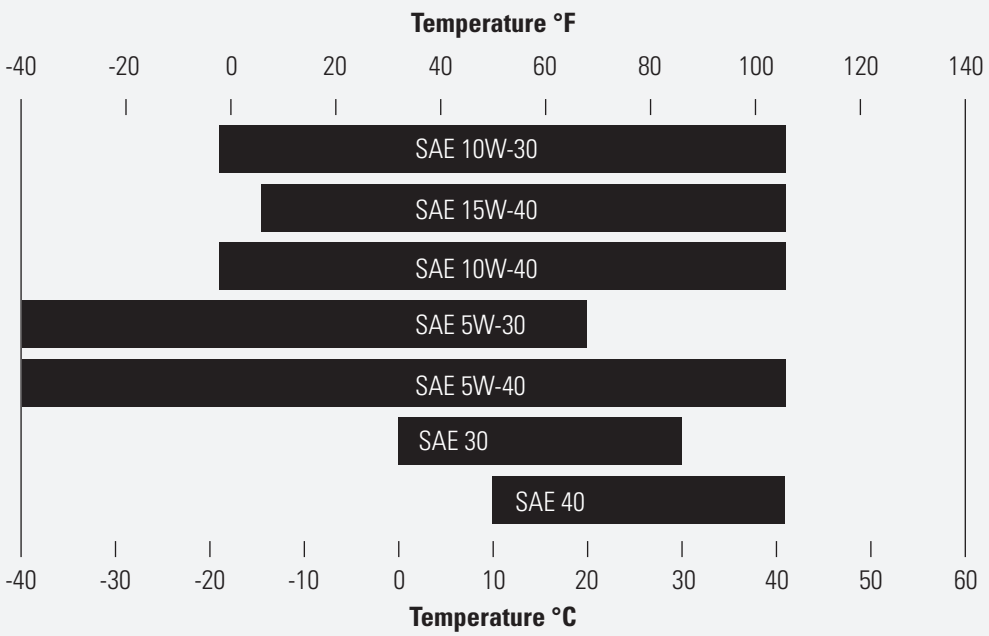
Viscosity recommendations are included in most OEM service bulletins. Examples taken from the leading OEMs are enclosed for your information.

CATERPILLAR®

Cat® Diesel Engine Oil (DEO™) Viscosities for Ambient Temperatures*

Compartment or System	Oil Type & Performance Requirements	Oil Viscosities	°C		°F	
			MIN	MAX	MIN	MAX
Engine Crankcase for all Direct Injection (DI) Engines	Cat DEO Cold Weather (API CJ-4)	SAE 0W-40	-40	40	-40	104
	Cat DEO-ULS SYN (API CJ-4)	SAE 5W-40	-30	50	-22	122
	Cat DEO-ULS (API CJ-4) Cat DEO (API CI-4/CI-4 PLUS)	SAE 10W-30	-18	40	0	104
		SAE 10W-40	-10	50	14	122

MACK®



*OEM references are subject to updates. Charts represent data at the time of publication. Always consult your OEM service literature for official oil drain intervals.

HDEO CATEGORY CLASSIFICATION

3



Understanding CK-4/FA-4 Categorization

- The classification of heavy-duty diesel engine oils goes beyond the API categories and OEM credentials.
- Before making a recommendation, it is important to understand and be able to present the right classification of product which can impact the overall cost savings and bottom line of a customer.
- Today's heavy-duty engine oils can actually be broken down into at least five categories:
  - Basic conventional fleet API CK-4 oils
  - Premium conventional API CK-4 oils
  - Synthetic blend API CK-4 oils
  - Synthetic blend API FA-4 oils
  - Full synthetic oils
- Even though engine manufacturers do not differentiate these categories in their basic recommendations, selecting the right products can yield improved overall performance depending on the operating conditions and needs of the fleet operation.
- The chart following will serve two objectives:
  - Properly align CITGO HDEO products with competition
  - Provide a basis for recommending a specific product category for a fleet

Understanding CK-4/FA-4 Categorization

Category	CITGO LUBRICANTS	Mystik LUBRICANTS	EXXON MOBIL®	SHELL®	CHEVRON®	CASTROL®	PHILLIPS 66®	VALVOLINE®	PETRO CANADA
Full Synthetic*	**CITGARD® 1000 Full Synthetic 5W-30 5W-40**	**JT-8® Synthetic 5W-40**	Delvac™ 1 ESP 5W-30 5W-40 Turbo Diesel Truck 5W-40 Delvac™ Extreme 10W-30 15W-40	Rotella Rotella® T-6 0W-40 5W-40 15W-40 Rotella® T-6 Multi-Vehicle 5W-30	Delo® 400 XSP 5W-30 5W-40	Vecton® Long Drain CK-4/SN 5W-30 Vecton® CK-4/SN 5W-40	Guardol XT™ Full Synthetic 5W-40 Guardol FE® Full Synthetic (FA-4) 5W-30	Premium Blue™ Extreme Full Synthetic 5W-40	Duron UHP Full Synthetic 5W-30 5W-40 Duron UHP E6 Full Synthetic 5W-30 10W-40 Duron Advanced Synthetic 5W-30 (FA-4)
Synthetic Blend* API CK-4*	**CITGARD® 800 Synthetic Blend 10W-30 15W-40 CITGARD® 700 Synthetic Blend 10W-30 15W-40**	**JT-8® Synthetic Blend SHD 10W-30 10W-40 15W-40**	Delvac™ Modern CNG/LNG 15W-40 (800 only) Delvac™ 1300 Super 10W-30 15W-40	Rotella® T-5 Synthetic Blend 10W-30 15W-40	Delo® 400 XLE 10W-30 15W-40 Delo® 400 SDE 10W-30 Delo® ADF 600 10W-30 15W-40	Vecton® Multi-Fuel CK-4/NG 10W-30 (800 only) 15W-40 (800 only) Vecton® Long Drain CK-4 10W-30 Vecton® CK-4 15W-40	Guardol ECT® Synthetic Blend 10W-30 15W-40 Guardol Fleet EC™ 10W-30	Premium Blue™ One Solution GEN2 Synthetic Blend 10W-30 (800 only) 15W-40 (800 only) All-Terrain Synthetic Blend 10W-30	Duron SHP Synthetic Blend 10W-30 15W-40
Synthetic Blend API FA-4*	**CITGARD® 700 MFE Synthetic Blend 10W-30**	**N/A**	Delvac™ Extreme FE 10W-30 Delvac™ Super FE 10W-30	Rotella® T-5 Ultra Synthetic Blend 10W-30	Delo® 400 ZFA 10W30	Vecton® 10W-30 FA-4	Guardol FE® Synthetic Blend 10W-30	Premium Blue 8700 FE Synthetic Blend 10W-30	Duron Advanced Synthetic Blend 10W-30
Conventional	**CITGARD® 600 10W-30 15W40**	**N/A**	Delvac™ HDEO 10W-30 15W-40	Rotella® T-4 10W-30 15W-40 Rotella® T-4 NG Plus 15W-40 (800 only) Rotella® T-3 Fleet 15W-40	Delo® 400 SDE 15W-40 Ursa Super Plus EC 15W-40	CRB Multi CK-4 10W-30 15W-40	Guardol Eco™ 15W-40 Guardol® NG-D 15W-40 (800 Only) Guardol Fleet EC™ 15W-40	All Terrain 15W-40	Duron HP 15W-40

*Synthetic heavy-duty engine oils are often marketed as Full Synthetic, Synthetic Blend, or just Synthetic type oils. It is recommended that consumers ask their supplier what differentiates these various descriptions.

LUBEALERT FLUID CONDITION MONITORING SERVICE

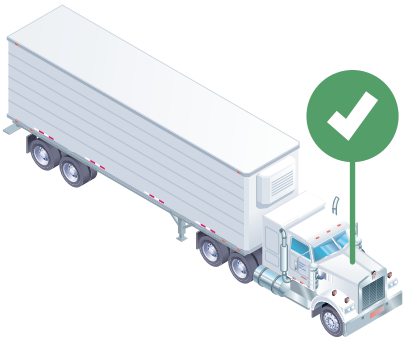
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LubeAlert™



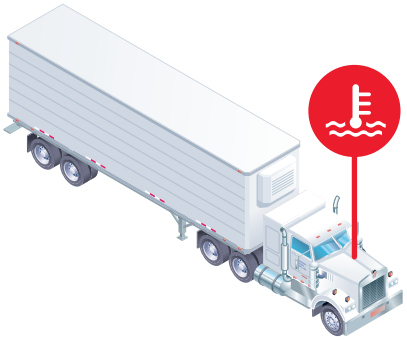
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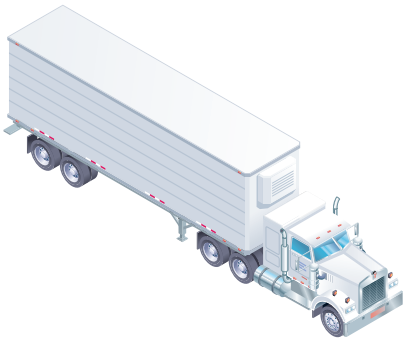
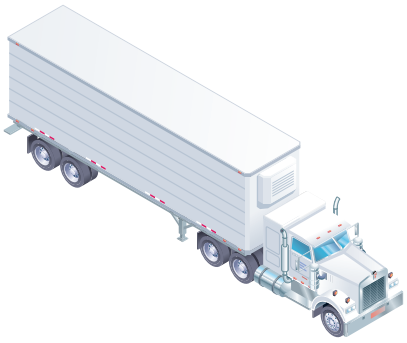




What is Oil Analysis?

Owners can get a health check on their equipment, providing early detection for trouble spots.







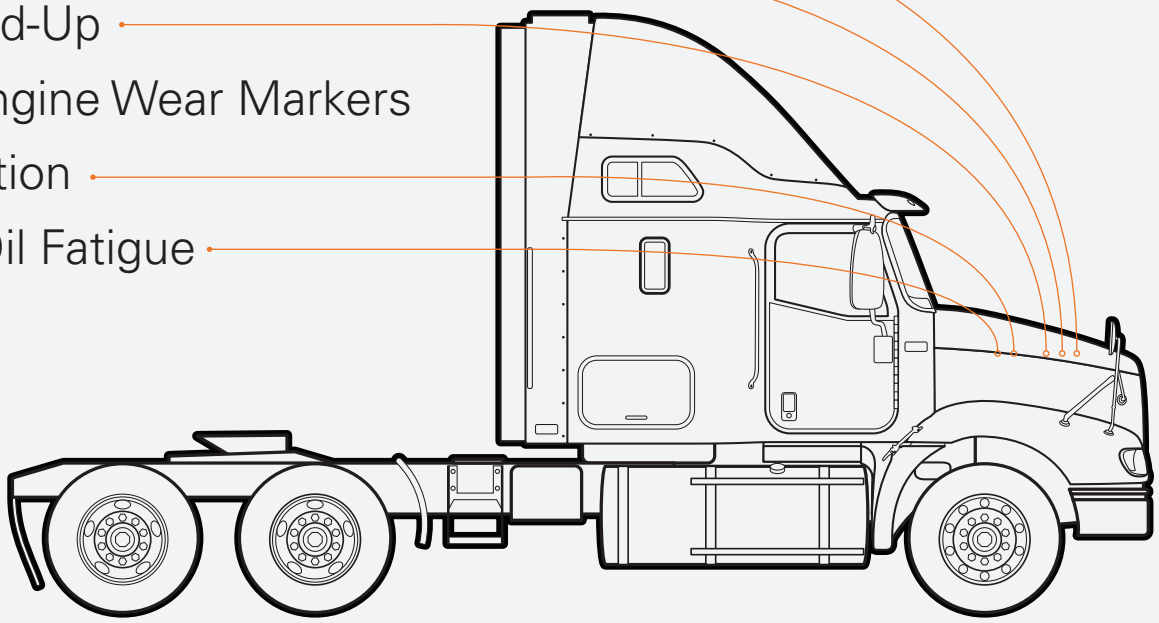

Your Greatest Sales Tool
1
Demonstrate a commitment to action
2
Create a legitimate reason to go back after a repeat visit
3
Build sustainable and long lasting business relationships
4
Show direct and tangible results within their fleet
LubeAlert

How can LubeAlert Help?

- ✔ Increase resale value
- ✔ Support warranty (documentation)
- ✔ Improve equipment availability
- ✔ Optimize oil change intervals (safely!)
- ✔ Decrease maintenance costs

Oil Analysis Detects Lubrication Related Trouble Spots

Coolant Issues
Dirt Ingestion
Soot Build-Up
Diesel Engine Wear Markers
Fuel Dilution
Engine Oil Fatigue



Find out how LubeAlert can benefit your operations.

Call us: (844) 669-5608
Email: lubealert@alsglobal.net

OEM OIL CHANGE INTERVAL RECOMMENDATIONS

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OEM Diesel Engine Oil Drain Recommendation Summary*

	Service	API CK-4
Cummins X15	Light (>7.0 MPG)	75,000 (up to 100,000 with Cummins Oil Guard Program
	Normal (6.0 – 6.9 MPG)	60,000
	Short Haul (<5.0 – 5.5 MPG)	50,000
	Severe	25,000
Detroit Diesel	Efficient Long Haul (>7.0 MPG)	75,000 (DD15) / 65,000 (DD13)
	Long Haul (>6.0 MPG)	60,000 (DD15) / 55,000 (DD13)
	Short Haul (5.1-5.9 MPG)	45,000 (DD15) / 40,000 (DD13)
	Severe (<5 MPG)	35,000
Mack/ Volvo	Long Haul / Normal Duty (>6 MPG)	60,000**
	Light (7.5 MPG)	75,000
	Regional Haul / Heavy Duty (>5 MPG)	45,000**
	Heavy Haul / Severe Duty (<5 MPG)	35,000**
Caterpillar		Application Specific
Navistar	Light (> 6.5 MPG)	50,000 (up to 70,000 with oil analysis)
	Moderate (5.5 – 6.5 MPG)	30,000
	Severe (<5.5 MPG)	20,000
PACCAR	On Highway Light, <20% Idle	60,000
	On Highway Standard, > 20% Idle	50,000
	Vocational/Severe	25,000
GM (Duramax 6.6L)		7,500***
Ford (Powerstroke Diesel)		2,500 – 10,000***

* For API category comparison purposes only; refer to OEM service literature for official oil drain details. Chart used with permission from Infineum.
** Idle >30%, use next shorter ODI
*** Follow Oil-Life Monitor

Oil Drain Intervals and Choosing the Right Engine Oil for Equipment

What do OEMs use as a basis for making their engine oil change interval recommendations?

- Engine manufacturers, as shown in the OEM Diesel Engine Oil Drain Recommendation Summary chart on page 24, publish engine oil change intervals based on type of service and fuel consumption.
- The oil drain interval (ODI) recommendations are typically combined with the engine oil API Service Category recommendations such as API CK-4, in some cases, the engine manufacturer's engine oil specifications and maintenance guidelines to support engine warranties.

How far can I go on your oil?

- There are many factors.
- There have been claims that by using a specific type or brand of oil, an equipment owner can extend their engine ODI in some cases beyond the OEM recommended ODI. Attempting to go outside the engine manufacturer's ODI can result in loss of engine warranty and possibly engine problems down the road.
- Any attempt to exceed the engine manufacturer's recommended ODI should be done with extreme caution. Also, consider all factors while carefully and fully communicating with all stakeholders.
- There are situations where a fleet may not be aware or have all of the information to safely optimize the engine ODI and as a result may be changing oils more frequently than the engine oil manufacturer recommends. In such a case, you as a sales representative have an opportunity to work with the equipment owner as an expert consultant by utilizing not only the performance capability of CITGARD® and Mystik® JT-8 engine oils but also combining the benefits of LubeAlert Fluid Condition Monitoring Service to safely optimize the ODI. This will result in reduced maintenance costs, while protecting both engine durability and the engine warranty where warranty applies.
- Engine manufacturers do not generally base their engine ODI on the use of specific oil brands or the various categories of oil within a given brand. However, there have been situations where an OEM may offer an extended oil change interval by recommending a specific brand of oil when they combine it with an extended warranty or some other type of maintenance incentive.
- The challenge of attempting to evaluate all of the various categories of engine oil within all of the oil brands will simply overburden the engine manufacturer's capability of conducting individual product testing in order to differentiate all of the products in the marketplace.

What other factors should be considered in regards to oil quality along with knowing the OEM ODI recommendations?

- Oil quality can and does impact some additional engine performance factors and should be explained to fleet customers.
- CITGARD 700 Synthetic Blend SAE 10W-30, for instance, has demonstrated sustainable fuel efficiency, when compared to SAE 15W-40 engine oils at 50,000-mile ODI.
- Some fleets need to retain their equipment for as long as possible without an engine rebuild and engine repairs. Oil quality should be considered when selecting an engine oil. CITGARD 700 and Mystik JT-8 SHD engine oils are engineered to optimize engine life and protect the engine in the most severe operating conditions, compared to conventional API CK-4 engine oils.
- Products such as CITGARD 700 Synthetic Blend SAE 10W-30, CITGARD 1000 Full Synthetic SAE 5W-30 or 5W-40, Mystik JT-8 SHD SAE 10W-30 and Mystik JT-8 SHD Synthetic 5W-40 engine oils provide superior cold engine start-up lubrication with reduced stress on batteries and starters, while improving fuel efficiency compared to conventional CK-4 15W-40 engine oils.
- CITGARD 700 and Mystik JT-8 SHD engine oil technology can also improve diesel particulate filter performance.

API CK-4/FA-4 AND OEM SPECIFICATIONS

6



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New Generation HDEO/OEM Summary

Heavy-Duty Engine Manufacturer Recommendations

- OEMs prefer the use of API CK-4 and some FA-4 oils in GHG '17-compliant engines designed for improved fuel efficiency and reduced CO_2 emissions.
- All on-highway diesel truck engine manufacturers factory fill with either API CK-4 or API FA-4 SAE 10W-30 diesel engine oils.

OEM Diesel Engine Oil Specifications Summary*

OEM	API CJ-4	API CK-4	API FA-4
Cummins	**CES 20081** 10W-30	**CES 20086** 10W-30	**CES 20087**
Detroit Diesel	**DFS 93K218** 10W-30	**DFS 93K222**	**DFS 93K223** 10W-30 **
Mack	**Mack EO-O PP** 10W-30	**Mack EOS-4.5** 10W-30	Mack EOS-5
Volvo	**Volvo VDS-4** 10W-30	**Volvo VDS-4.5** 10W-30	**Volvo VDS-5**
Caterpillar	**ECF 3** 10W-30 and 15W-40	**API CK-4** 10W-30 and 15W-40	
Navistar	**API CJ-4** 10W-30	**API CK-4** 10W-30	**API FA-4**
PACCAR	**API CJ-4** 10W-30	**API CK-4** 10W-30	**API FA-4**
GM (Duramax 6.6L)	**API CJ-4** 10W-30	**API CK-4** 10W-30	dexos D oil will be suggested for smaller diesel engines
Ford (Power Stroke 6.7L)	**WSS M2C171-E** *** 10W-30	**WSS M2C171-F1***** 10W-30	API FA-4 recommended for smaller 3.0 L Power Stroke Engine
Ford (Power Stroke 3.0L)			**WSS M2C214-B1**

* OEM Factory Fill viscosity grades are shown in the table under specification. Chart used with permission from Infineum
** Detroit Diesel Factory Fill for DD13, DD15 and DD16 engines is 10W-30 FA-4. FF for medium duty DD5 and DD8 has not been communicated.
*** Ford's requirements for WSS M2C171-E were identical to API CJ-4. WSS M2C171-F1 has some additional requirements to API CK-4.

Always follow OEM recommendations and utilize the CITGO LubeAlert Fluid Condition Monitoring Service to fully evaluate oil and engine system conditions.

GENERAL HDEO FAQS – MYTHS AND MISCONCEPTIONS

7



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HDEO Myths and Misconceptions

There is a true universal diesel and gasoline engine oil?

Fact: Some heavy-duty diesel engines oils carry the gasoline engine API SN category label and claim to have a formulation that is compatible with the automotive catalytic converter; however, a significant percentage of automotive gasoline engines on the highway require viscosities SAE 5W-30 or below and the largest percentage of diesel engines equipment owners are still using SAE 15W-40 engine oils. Manufacturer recommendations are also contained in their OEM. These recommendations vary widely, therefore it cannot be said that there is a universal diesel and gasoline engine oil.

You should stay with the same brand of oil the engine knows.

Fact: Despite infrequent reports of increased oil consumption and decrease in oil pressure, engine manufacturers support and know that changing brands is an inevitable and normal process. However, if the above problems have been encountered, the majority of reports indicate these conditions are temporary and harmless.

Grease color and texture can determine its performance.

Fact: Both grease color and texture or tackiness are cosmetic in nature, although they often do provide great "eye ball lubrication benefits." Rather than focus on those features, it is recommended to ask questions on features that impacts grease performance, such as water washout, load carrying capability, pump-ability and temperature range.

Oil analysis can only help when you may have a problem.

Fact: Fleet managers have reported several benefits resulting from oil analysis, including, protection against premature component failures, warranty protection, ODI optimization, improvement of equipment availability and improvement of equipment resale value.

Low viscosity heavy-duty engine oils such as a 10W-30 may improve fuel economy but they will not provide adequate wear protection and engine durability.

Fact: Major on highway-diesel OEMs factory fill their engines and support SAE 10W-30 oils with their warranties. This and the fact that major fleets across America have successfully used 10W-30 for several years with no lubrication-related problems make the case for fuel saving low viscosity oils.

HDEO Myths and Misconceptions

Engine oil change intervals are largely based on oil quality.

Fact: Oil quality is just one consideration when it comes to oil change intervals. Maintenance practices, operating conditions, oil analysis and OEM recommendations should always be considered before assuming that the oil change interval is only supported by the brand and quality of the oil.

Better oil filters can extend oil change intervals.

Facts:

1. Oil filter claims often promote the concept of better particle trapping efficiency or trapping more particles over time. The result is that you can run the oil longer.
2. Most, if not all, oil filters do not really trap wear particles due to their size and the particle trapping capability of the filter medium.
3. Most soot particles are not trapped due to their size until the engine oil soot dispersant becomes exhausted at which time soot clumps together, making it possible to trap the larger soot clumps.
4. Most filters do not allow the additives in an engine oil to go through the engine. As a result, critical components may lose their functionality as the lubricating properties of the oil are diminished.
5. Using a higher quality oil may help in extending the life of the filter as opposed to the life of the oil

Engine oil Total Base Number (TBN) is the best indicator of oil quality.

Fact: TBN is an important oil quality in today's higher operating temperature engines as well as TAN (Total Acid Number). Together, both of these tests need to be evaluated as part of an engine maintenance program and NOT as the only factor to consider.

Engine oil brands should never be mixed.

Fact: No engine damage or harm can come from periodic or unavoidable mixing of engine oils. However, mixing oils should be limited as much as possible since oil quality can vary. If utilizing an oil analysis program, the analysis results can indicate increase in elements that are not wear related but result in what engine manufacturers explain as increase in "passive" wear levels that are temporary but tend to generate abnormal alerts.

Engine oil after-market additives can improve the performance of an engine oil.

Facts:

1. The use of "add-on" additives can alter and remove the licensing and engine manufacturer approvals for an engine oil that has an API license and has been approved by the engine OEMs.
2. The assumption is that the additional chemicals being added will actually improve the overall performance of the product. In most cases, these additives tend to decrease performance.
3. Most OEMs DO NOT RECOMMEND the use of after-market additives.
4. A proven and more cost effective solution is to choose a higher performance product.

PRODUCT APPLICATIONS

8



CITGO and Mystik HDEO Application Chart

Product	API	Viscosity Grade	ODI Optimization (Oil Drain Intervals)	GEP* FE	GEP* ODI	Oil Type	Fuel Efficiency Rating**	Temp Range***
 **CITGARD 1000** (formerly CITGARD Syndurance)	CK-4	5W-40	Yes	Yes	Yes	Full Synthetic	4	-20˚F – 120˚F
	CK-4	5W-30	Yes	Yes	Yes	Full Synthetic	1	-20˚F – 104˚F
 **CITGARD 800** (formerly CITGARD CNG/LNG Synthetic Blend Engine Oil)	CK-4	15W-40	Yes	Yes	Yes	Synthetic Blend	5	15˚F – 120˚F
	CK-4	10W-30	Yes	Yes	Yes	Synthetic Blend	3	-5˚F – 104˚F
 **CITGARD 700**	CK-4	15W-40	Yes	N/A	Yes	Synthetic Blend	5	15˚F – 120˚F
	CK-4	10W-30	Yes	Yes	Yes	Synthetic Blend	3	-5˚F – 104˚F
 **CITGARD 700 MFE**	FA-4	10W-30	Yes	Yes	Yes	Synthetic Blend	2	-5˚F – 104˚F
 **CITGARD 600**	CK-4	15W-40	Yes	N/A	Yes	Premium Conventional	5	15˚F – 120˚F
	CK-4	10W-30	Yes	N/A	Yes	Premium Conventional	4	-5˚F – 104˚F
 **Mystik JT-8 SHD**	CK-4	5W-40	Yes	Yes	Yes	Full Synthetic	4	-20˚F – 120˚F
 **Mystik JT-8 SHD**	CK-4	15W-40	Yes	Yes	Yes	Synthetic Blend	5	15˚F – 120˚F
	CK-4	10W-30	Yes	Yes	Yes	Synthetic Blend	3	-5˚F – 104˚F
 **Mystik JT-8 SHD**	CI-4 Plus	15W-50	Yes	N/A	N/A	Synthetic Blend	N/A	15˚F – 120˚F

* GEP (Guaranteed Efficiency Program) – Refer to program brochure for details.

(a) FE = GEP can be used to test for **fuel efficiency** with this product using LubeAlert Fluid Condition Monitoring System

(b) ODI = GEP can be used to evaluate optimum **oil drain interval** for this product within OEM recommendations using LubeAlert Fluid Condition Monitoring System

** Fuel Efficiency Rating – 1 = Best fuel efficiency rating. 15W-40 is given a rating of 5 based on sustained viscosity during ODI vs. competitive oils that may not maintain viscosity retention due to lack of oxidation and oil thickening control.

*** Temp. Range – Check OEM viscosity recommendations for specific temperature range.

Always follow OEM recommendations and utilize the CITGO LubeAlert Fluid Condition Monitoring System to fully evaluate oil and engine system conditions.

CITGO On-Highway Applications

ENGINE

CITGARD 1000 Full Synthetic

CITGARD 800

CITGARD 700

STEER AXLE WHEEL BEARINGS

CITGO SynDurance Synthetic Gear Lubricants 75W-90

CITGEAR® Synthetic HD-75W-90

FIFTH WHEEL

Mystik JT-6 Heavy Duty SynBlend 460 #2

Mystik JT-6 High Temp #2

Mystik LithoPlex Red Tacky #2

CLUTCH/THROW OUT BEARINGS

Mystik JT-6 Heavy Duty SynBlend 460 #2

Mystik JT-6 High Temp #2

Mystik LithoPlex Red Tacky #2

AXLES & DIFFERENTIALS

CITGEAR HD Synthetic HD-75W-90



STEERING GEAR

CITGO SynDurance Synthetic Gear Lubricants 75W-90

CITGEAR Synthetic HD-75W-90

GREASE POINTS

Mystik JT-6 Heavy Duty SynBlend 460 #2

Mystik JT-6 High Temp #2

Mystik LithoPlex Red Tacky #2

TRANSMISSION

SynDurance Synthetic MTF (Eaton® PS-386)

SynDurance 668 (Allison Transmission TES 668)

UNIVERSAL JOINTS

Mystik JT-6 Heavy Duty SynBlend 460 #2

Mystik JT-6 High Temp #2

Mystik LithoPlex Red Tacky #2

Updated information for heavy-duty truck transmissions

***Volvo I-Shift** – SynDurance Synthetic MTF-Suitable for service; not approved Allison TES 295.

****CITGEAR HD SAE 50** – Eaton is phasing out SAE 50 and changing to PS 386 Fluids.

*****QuatraSyn** is NOT an approved Allison TES 295 product, but is recommended for fleets that can benefit from a high performance full synthetic HD automatic transmission fluid.

Always contact your equipment manufacturer for updated and proper lubricants recommendations.

Basic Lubricant

HYDRAULICS

HyDurance AW

HyDurance AW All-Temp

HyDurance AW NZ

CITGARD 600 SAE 10W

ENGINE

CITGARD 1000 Full Synthetic 5W-40/5W-30

CITGARD 700 15W-40/10W-30

CITGARD 600 15W-40/10W-30

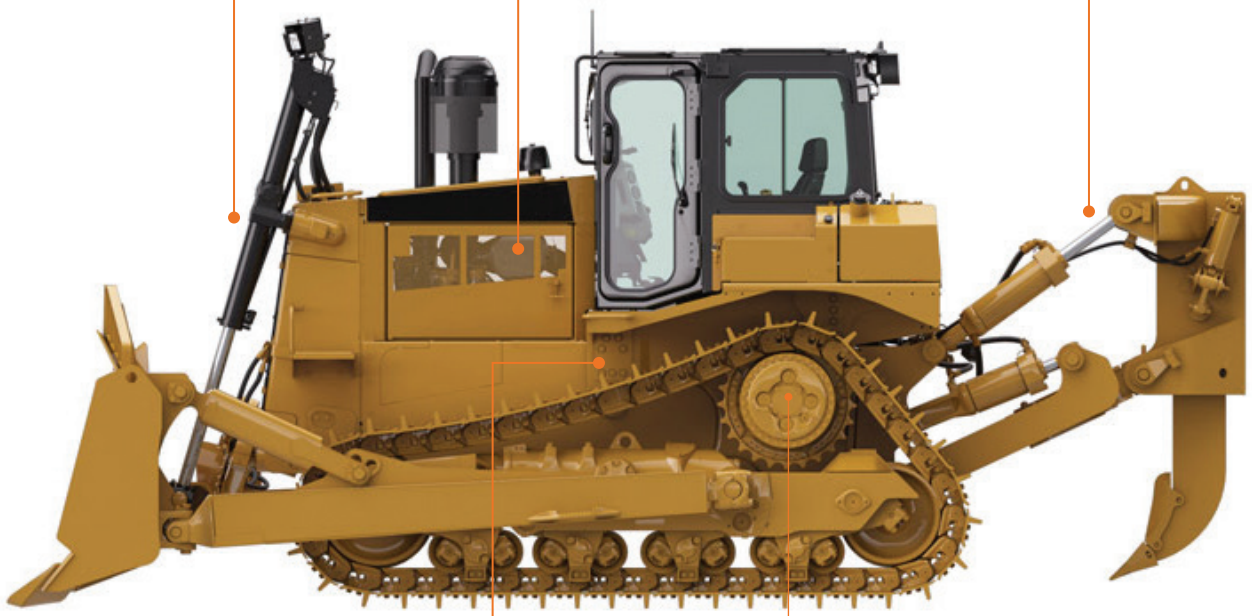
GREASE

Mystik JT-6 Heavy Duty SynBlend 460 #2

Mystik JT-6 High Temp #2

Mystik JT-6 High Temp 3% Moly #2

Mystik LithoPlex 3% Moly and 5% Moly



POWERSHIFT TRANSMISSION

SynDurance Synthetic All Seasons (TO-4M)

TRANSGARD HD SAE 10W, 30, 50 (TO-4)

FINAL DRIVE

CITGO FDO (FD-1)-SAE 60 (where recommended)

TRANSGARD HD (TO-4)-SAE 30, 50 (where recommended)

Always contact your equipment manufacturer for updated and proper lubricants recommendations.

CITGO OFFERS MANY OTHER SPECIALIZED PRODUCTS TO MEET DIFFERENT EQUIPMENT REQUIREMENTS FOR THE CONSTRUCTION SECTOR.

CONTACT US ABOUT YOUR EQUIPMENT'S UNIQUE NEEDS.

Helpful Resources

OEM specifications are subject to change. For the most up-to-date information on engine manufacturers, visit the following sites:

- **Paccar** https://maestropaccar.wpengine.com/engines
- **Navistar** https://www.internationaltrucks.com/engines
- **Detroit Diesel** https://demanddetroit.com/parts-service/support-by-model
- **Mack** https://www.macktrucks.com/powertrain-and-suspensions/engines
- **Volvo** https://www.volvotrucks.us/parts-and-services/services/service-and-maintenance-intervals
- **Cummins** https://www.cummins.com/engines/heavy-duty-truck
- **Ford** https://parts.ford.com/content/dam/ford-parts/resources/motorcraftpdf/Diesel_Motor_Oils_Meeting_Ford_WSSM2c171F1.pdf

Notes

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