



Countries: CANADA, UNITED STATES Document ID: IK1201299  
 Availability: ISIS, Fleet/ISIS, NotSIR Revision: 10  
 Major System: ENGINES Created: 7/10/2015  
 Current Language: English Last Modified: 9/9/2019  
 Other Languages: NONE Author: Dan Myers  
 Viewed: 12084

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Title: Engine Oil Capacities

Applies To: All Electronic International Engines 1994 - Present. Cummins ISB, ISM & ISX

## CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

09/03/2019 - Correct N13 capacity  
 08/29/2019 - Added PSI Gas verbiage  
 07/08/2019 - Revised ISB capacity  
 09/20/2018 - Add X15, B6.7, PSI Gas & International 6.6  
 01/18/2018 - Add A26

## DESCRIPTION

This document provides the User with a quick reference to engine oil capacities with oil filter change.

**Oil capacities may differ for various applications.**

- Add the **minimum** amount of oil recommended per engine Manufacturer.
- Start the engine to circulate the oil.
- Check the oil level per the Manufacturers procedure.
- Adjust the oil level as needed.



### 1994 - 2003

Engine	ESN Range	Capacity w/ Filter Change
DT/HT466E/530E (3 Box & CEC)	0933834 - 1194038	26L (28 U.S. QT)
T444E	0000500 - 5999999	13L (14 U.S. QT)

### 2004 - 2006

Engine	ESN Range	Capacity w/ Filter Change
DT/HT466E/530E (EGR)	2000000 - 2999999	28L (30 U.S. QT)

VT275	All	14L (15 U.S. QT)
VT365	0000500 - 5999999	18L (19 U.S. QT)

Check that engine crankcase is filled to the proper oil level (Figure 18) and with proper grade of oil for the prevailing temperature. Refer to "Engine Specifications" and "Engine Lubrication Requirements" in Section 6.

**SAE VISCOSITY GRADES**

**EXPECTED TEMPERATURE RANGE**

EG-3262

**Figure 22 SAE Viscosity Grades and Temperature Ranges**



**2007 - 2009**

Engine	ESN Range	Capacity w/ Filter Change
MaxxFORCE DT/9/10	3000000 - 3300000	28L (30 U.S. QT)
MaxxFORCE 5	All	14L (15 U.S. QT)
MaxxFORCE 7	0434544 - 5300001	18L (19 U.S. QT)

**2010 - 2013**

Engine	ESN Range	Capacity w/ Filter Change
MaxxFORCE 11/13	3000000 - 3300000	40L (42 U.S. QT)
MaxxFORCE DT/9/10	3000000 - 3300000	28L (30 U.S. QT)
MaxxFORCE 5	All	14L (15 U.S. QT)
MaxxFORCE 7	0434544 - 5300001	18.9L (20 U.S. QT)
MaxxFORCE 7 (TerraStar Only)	0434544 - 5300001	20.8L (22 U.S. QT)

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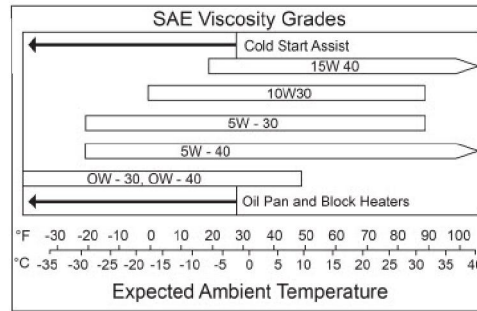
API CJ-4 FOR HIGH PERFORMANCE DIESEL ENGINES



Figure 9 API Identification symbol

API CJ-4 oils are recommended for high speed diesel engines with advanced exhaust aftertreatment systems that meet 2007 and beyond on-highway exhaust emission standards.

SAE OIL VISCOSITY GRADES AND TEMPERATURE RANGES



OIL LEVEL

Service Interval: Before Engine Operation

1. Park vehicle on level ground.

**NOTE:** Do not check oil level if engine is running or immediately after engine shutdown.

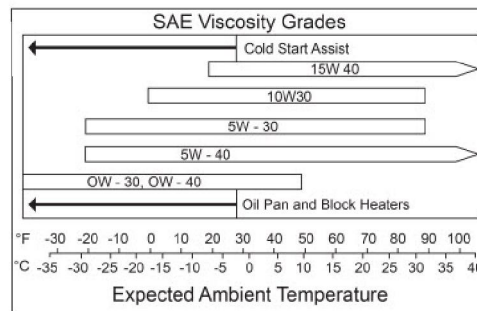
2. Shut down engine and wait 15 minutes.
3. Remove oil level gauge from fill tube.



2013+

Engine	ESN Range	Capacity w/ Filter Change
N9/N10	3540000+	28L (30 U.S. QT)

SAE OIL VISCOSITY GRADES AND TEMPERATURE RANGES



API CJ-4 FOR HIGH PERFORMANCE DIESEL ENGINES



D31565

Figure 9 API Identification symbol

API CJ-4 oils are recommended for high speed diesel engines with advanced exhaust aftertreatment systems that meet 2007 and beyond on-highway exhaust emission standards.

OIL LEVEL

Service Interval: Before Engine Operation

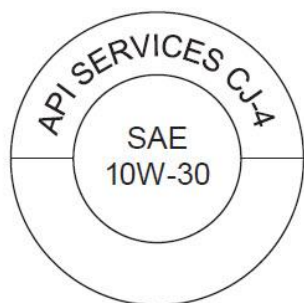
1. Park vehicle on level ground.

**NOTE:** Do not check oil level if engine is running or immediately after engine shutdown.

2. Shut down engine and wait 15 minutes.
3. Remove oil level gauge from fill tube.

Engine	ESN Range	Capacity w/ Filter Change
N13	4400000+	40L (42 U.S. QT)

API CJ-4 AND CK-4 FOR HIGH PERFORMANCE DIESEL ENGINES



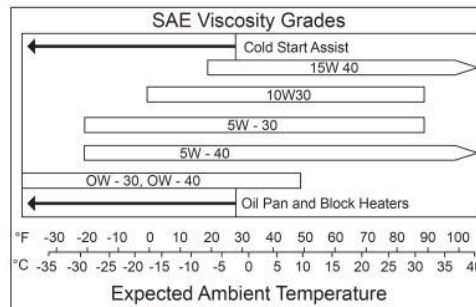
0000413809

Figure 8 API Identification Symbol

API CJ-4 or CK-4 oils are recommended for high-speed diesel engines with advanced exhaust aftertreatment systems that meet 2007 and beyond on-highway exhaust emission standards.

**NOTE:** Mineral and synthetic oils are acceptable for use provided they meet the API category recommendations and ambient temperature guidelines.

SAE OIL VISCOSITY GRADES AND TEMPERATURE RANGES



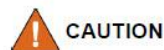
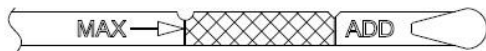
**OIL LEVEL**

Service Interval: Before Engine Operation

1. Park vehicle on level ground, set parking brake.

**NOTE: Do not check oil level if engine is running or immediately after engine shutdown.**

2. Shut down the engine and wait 15 minutes.
3. Remove oil level gauge from oil level gauge tube.



To prevent engine damage, perform the following:

- Make sure oil level readings are within the crosshatched operating range on the oil level gauge.
  - Do not overfill the engine with oil.
  - Do not operate engine if oil level is above or below the operating range.
4. If oil level is below operating range, fill with recommended oil for operating climate. The ADD mark indicates 6 quarts (5.8 liters) of oil should be added. See Engine Oil Quality and Service Categories (page 33).



2017

Engine	ESN Range	Capacity W/Filter Change
A26	4500000+	40L (42 U.S. QT)

**Engine Oil**

**ENGINE OIL QUALITY AND SERVICE CATEGORIES**

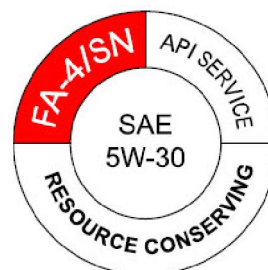
The API defines engine oil quality by service categories that define oil performance measured in standardized engine tests.



0000397082

Figure 8 API CK-4 Identification Symbol

**NOTE: Mineral and synthetic oils are acceptable for use provided they meet the API category recommendations and ambient temperature guidelines.**

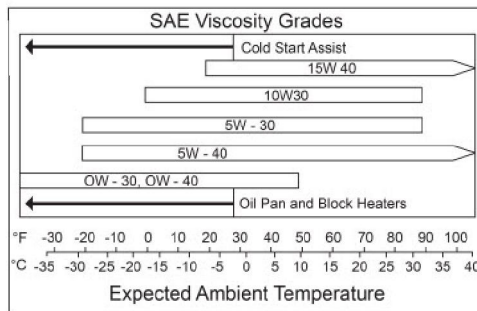


0000406204

Figure 11 API FA-4 Identification Symbol

API CK-4 (standard) and FA-4 (optional) oils are required for high-speed diesel engines with advanced exhaust aftertreatment systems that meet 2017 and beyond on-highway exhaust emissions standards. FA-4 is intended to increase fuel economy by reducing parasitic power loss within the engine. FA-4 is approved for line haul applications **only**. FA-4 is not approved for severe service applications. Vehicles accumulating less than 30,000 annual miles are classified as severe service.

**SAE OIL VISCOSITY GRADES AND TEMPERATURE RANGES**



**OIL LEVEL**

Service Interval: Before Engine Operation

1. Park vehicle on level ground, set parking brake.

**NOTE: Do not check oil level if engine is running or immediately after engine shutdown.**

2. Shut down the engine and wait 15 minutes.
3. Remove oil level gauge from oil level gauge tube.



**CAUTION**

To prevent engine damage, perform the following:

- Make sure oil level readings are within the crosshatched operating range on the oil level gauge.
  - Do not overfill the engine with oil.
  - Do not operate engine if oil level is above or below the operating range.
4. If oil level is below operating range, fill with recommended oil for operating climate. The ADD mark indicates 6 quarts (5.8 liters) of oil should be added. See Engine Oil Quality and Service Categories (page 33).

**INTERNATIONAL 6.6 ENGINE**

2019

Engine	ESN Range	Capacity W/Filter Change
International 6.6	TBD	9.5L (10 U.S. QT)



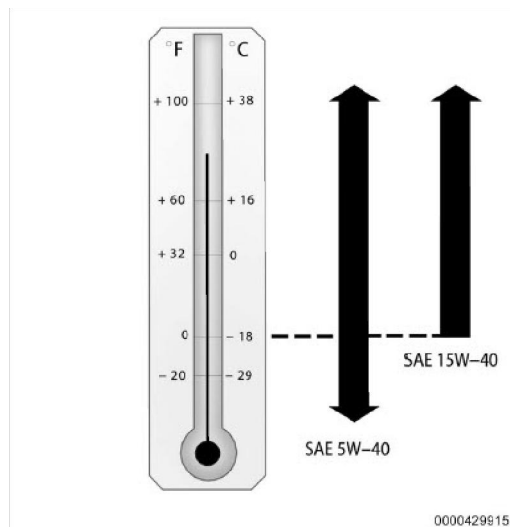


Figure 6 Oil Viscosity Grades and Temperature Ranges

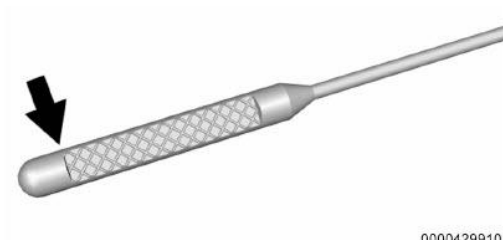


Figure 33 Engine Oil Dipstick

If the oil is below the cross-hatched area at the tip of the dipstick and the engine has been off for at least 15 minutes, add 1 qt (1 L) of the recommended oil and then recheck the level.

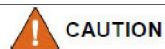
### Checking Engine Oil

Check the engine oil level regularly, every 400 mi (650 km), especially prior to a long trip. The engine oil dipstick handle is a loop. See *Left-Side Engine Compartment* in the vehicle Operation and Maintenance Manual for the location.

If a low oil Driver Information Center (DIC) message displays, check the oil level.

Follow these guidelines:

- To get an accurate reading, park the vehicle on level ground. Check the engine oil level after the engine has been off for at least two hours. Checking the engine oil level on steep grades or too soon after engine shutoff can result in incorrect readings. Accuracy improves when checking a cold engine prior to starting. Remove the dipstick and check the level.
- If unable to wait two hours, the engine must be off for at least 15 minutes if the engine is warm, or at least 30 minutes if the engine is not warm. Pull out the dipstick, wipe it with a clean paper towel or cloth, then push it back in all the way. Remove it again, keeping the tip down, and check the level.




### ENGINE OIL ADDITIVES / ENGINE OIL FLUSHES


Do not add anything to the oil. The recommended oils with the API service symbol are all that is needed for good performance and engine protection.

Engine oil system flushes are not recommended and could cause engine damage not covered by the vehicle warranty.



Engine	ESN Range	Capacity W/Filter Change
8.8L LPG	All	7L (6.62 U.S. QT)
8.8L Gasoline	All	7L (6.62 U.S. QT)

<p>The PSI 8.8L LP engine requires the use of synthetic blend oil that meets Dexos1® standards. This requirement will provide a reduction in volatility and oil consumption, significant wear protection, and improved piston cleanliness. Meeting the Dexos1® standard can also enhanced aeration control for improved fuel efficiency while providing better oxidation properties.</p> <p>All oil used in the PSI 8.8L LP engine must meet the Dexos1® specification and display the green Dexos1® logo. (Shown Below)</p> 	<p><b>SAE Oil Viscosity Grades</b></p> <p>It is required that the Dexos1® oil meet SAE 5W-30 viscosity standards. This oil weight will be used regardless of ambient temperature.</p> <p><b>NOTE: A plug in oil heater is an option if the engine is being operated in conditions that may need a cold start assist.</b></p>
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<p>The PSI 8.8L Gasoline engine requires the use of synthetic blend oil that meets Dexos1® standards. This requirement will provide a reduction in volatility and oil consumption, significant wear protection, and improved piston cleanliness. Meeting the Dexos1® standard can also enhance aeration control for improved fuel efficiency while providing better oxidation properties.</p> <p>All oil used in the PSI 8.8L Gasoline engine must meet the Dexos1® specification and display the green Dexos1® logo. (Shown Below)</p> 	<p><b>SAE Oil Viscosity Grades</b></p> <p>It is required that the Dexos1® oil meet SAE 5W-30 viscosity standards. This oil weight will be used regardless of ambient temperature.</p> <p><b>NOTE: A plug in oil heater is an option if the engine is being operated in conditions that may need a cold start assist.</b></p>
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Engine	Capacity: Standard Oil Pan W/Filter	Capacity: High Capacity Oil Pan W/Filter	Capacity: Standard Oil Pan W/Stiffener Block	Capacity: Stamped Steel Oil Pan	Capacity: Aluminum Oil Pan
ISB	15L (15.9 U.S. QT)	N/A	20.6L (21.8 U.S. QT)		
B6.7	16.7L (17.6 U.S. QT)	19.7L (20.8 U.S. QT)	N/A		
ISL	26.5L (28 U.S. QT)	N/A	27.4L (29 U.S. QT)		
L9	22.7L (24 U.S. QT)	26.5L (28 U.S. QT)	25.6L (27 U.S. QT)		
ISM	26-34L (28-36 U.S. QT)	N/A	N/A		



ISX	49.21L (52 U.S. QT)	N/A	N/A		
X15				43.4L (11.5 gal)	41.6L (11 gal)

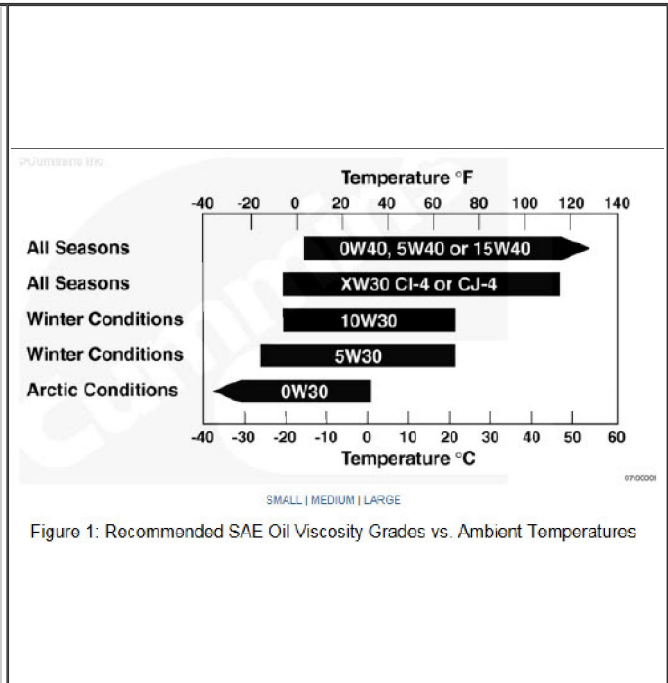
### General Information TOC

- The use of quality engine lubricating oils, combined with appropriate oil drain and lubricating oil filter change intervals, is a critical factor in maintaining engine performance and durability.
- Cummins Inc. recommends the use of a high quality 15W-40 multi-viscosity heavy-duty engine lubricating oil that meets the requirements of Cummins® Engineering Specification (CES) 20078, or 20081 (such as Valvoline™ Premium Blue™ or Valvoline™ Premium Blue Extreme™). For areas where products meeting CES 20078, or 20081 are **not** readily available, a product meeting American Petroleum Institute (API) CH-4 or CES 20078 can be used, but at a reduced drain interval. Reference the Oil Drain Intervals by severity of service km [mi] section. The oil grades CC, CD, CE, CF, CG-4, and CF-4 have been obsoleted by API and **must not** be used.
- Reference the Maintenance Schedule in the appropriate Owners or Operation and Maintenance Manuals.
- Shortened drain intervals can be required with monograde oils, as determined by close monitoring of the oil condition with scheduled oil sampling. Use of single-grade oils can affect engine oil control.
- Synthetic engine oils, API Group III and Group IV basestocks, are recommended for use in Cummins® engines operating in ambient temperature conditions consistently below -25°C [-13°F]. Above this temperature, petroleum-based multigrade lubricants are recommended. Synthetic 0W-30 oils that meet API Group III and Group IV basestocks can be used in operations where the ambient temperature **never** exceeds 0°C [32°F]. 0W-30 oils do **not** offer the same level of protection against fuel dilution as do higher multigrade oils. Higher cylinder wear can be experienced when using 0W-30 oils in high-load situations.

For further details and an explanation of engine lubricating oils for Cummins® engines, refer to Cummins® Engine Oil Recommendations, Bulletin 3810340.

Additional information regarding lubricating oil availability throughout the world is available in the Engine Manufacturing Association (EMA) Lubricating Oils Data Book for Heavy Duty Automotive and Industrial Engines. The data book can be ordered from: Engine Manufacturers Association, Two North LaSalle Street, Suite 2200, Chicago, IL 60602; Phone: (312) 827-8700, Facsimile: (312) 827-8737 (www.enginemanufacturers.org).

Oil viscosity **must** be chosen according to the typical climate conditions experienced by the user. Use of 15W-40 is recommended for the best engine durability at higher ambient temperatures. For cold conditions 5W-30 viscosity can be used for easier starting and improved oil flow.



### AfterMarket Oil Additive Usage TOC

Cummins Inc. does **not** recommend the use of aftermarket oil additives. Present high-quality fully additive engine lubricating oils are very sophisticated, with precise amounts of additives blended into the lubricating oil to meet stringent requirements defined in (1) Cummins® Engineering Specification CES 20076 that is similar to API CH-4, in (2) CES 20078 that is similar to API CI-4, and in (3) CES 20081 that is similar to API CJ-4. These furnished oils meet performance characteristics that conform to the lubricant industry standards. Aftermarket lubricating oil additives are **not** necessary to enhance engine oil performance and in some cases can reduce the finished oils capability to protect the engine.

The API service symbols are shown in the accompanying illustration.

- The upper half of the symbols display the appropriate oil categories.
- The lower half contains words to describe additional oil information.
- The center section identifies the SAE oil viscosity grade.

Cummins Inc. primary recommendation is for the use of 15W-40 multigrade for normal operation at ambient temperatures above -15°C (5°F). The use of multigrade oil reduces deposit formation, improves engine cranking in low temperature conditions and increases engine durability by maintaining lubrication during high temperature operating conditions. Since multigrade oils have been shown to provide approximately 30 percent lower oil consumption, compared with monograde oils, it is important to use multigrade oils. While the preferred viscosity grade is 15-40, lower viscosity multigrades can be used in colder climates. (See Figure 1: Recommended Society of Automotive Engineers (SAE) Oil Viscosity Grades at Ambient Temperatures.)

Oils meeting API CI-4, API CJ-4, and 10-30 viscosity grade, **must** meet a minimum High Temperature/high Shear viscosity of 3.5 cP, and ring wear/liner wear requirements of Cummins Inc. and Mack tests. Thus, they can be used over a wider temperature range than 10W-30 oils meeting older API performance classifications. As these oils will have directionally thinner oil films than 15W-40 oils, top quality Fleetguard® filters **must** be used above 20°C (70°F). Some oil suppliers might claim better fuel economy for these oils. Cummins Inc. can neither approve nor disapprove any product **not** manufactured by Cummins Inc. These claims are between the customer and oil supplier. Obtain the oil supplier's commitment that the oil will give satisfactory performance in Cummins® engines, or do **not** use the oil.

**NOTE:** For ISX dual overhead camshaft engines, 10W-30 is not recommended for use.

## OTHER RESOURCES

[Master Service Manual](#)

[PSI Engines](#)

[Cummins QuickServe](#) (User I.D. & Password required)

[SAE International](#) (Society of Automotive Engineers)

[API](#) (American Petroleum Institute)

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