

Fuel Recommendations and Specifications for Cummins ISB07 (018-002)

Table of Contents

Fuel Recommendations

Fuel Recommendations

TOC

WARNING

Do not mix gasoline, alcohol, or gasohol with diesel fuel. This mixture can cause an explosion.

CAUTION

Due to the precise tolerances of diesel injection systems, it is extremely important that the fuel be kept clean and free of dirt or water. Dirt or water in the system can cause severe damage to both the fuel pump and the fuel injectors.

CAUTION

Lighter fuels can reduce fuel economy or possibly damage fuel system components.

CAUTION

48-34 ⁽³⁾	40-24 ⁽³⁾	50-35 ⁽³⁾	51-37 ⁽³⁾	51-37 ⁽³⁾	48-36 ⁽³⁾	51-37 ⁽³⁾	57-45 ⁽³⁾	57-45 ⁽³⁾	57-45 ⁽³⁾
----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------	----------------------

1. Any adjustment to compensate for reduced performance with a fuel system using alternate fuel is **not** warrantable.
2. Winter blend fuels, such as found at commercial fuel dispensing outlets, are combinations of number 1D and number 2D diesel fuel and are acceptable.
3. BTU Content/Degree API Gravity - Low API gravity fuels have higher thermal energy content (BTU). As a general rule of thumb there is a 3 to 5 percent decrease in BTU content for every 10 degree increase in API gravity, there is also a 0.7 degree API gravity increase with an increase in fuel temperature. This decrease in energy content equates roughly to the same percentage of power loss. Use of fuels with higher API gravity will cause higher than normal fuel consumption.

NOTE: Cummins Inc. recommends that the cetane number of diesel fuel be a minimum of 45 for engines that are expected to operate at temperatures below 0°C [32°F] and a minimum of 42 for engines that are operated at temperatures above 0°C [32°F].

NOTE: Using diesel fuel with lower than recommended cetane number can cause hard starting, instability, and excessive white smoke. To maintain satisfactory operation at low ambient temperatures, it is important to specify diesel fuel of the correct cetane number.

NOTE: Cummins Inc. requires all permissible fuels to have adequate fuel lubricity. This means the BOCLE number is 3100 or greater as measured by ASTM specification D6078, Scuffing Load Ball On Cylinder Evaluator (SLBOCLE). Lubricity can also be measured by ASTM, specification D6079, ISO 12156, High Frequency Reciprocating Rig (HFRR) in which the fuel must have a wear scar diameter of 0.45 mm [0.02 in] or less.

For information on alternative fuels, such as biodiesel, and additional information for fuel recommendations and specifications, please refer to the Fuel for Cummins Engines, Bulletin [3379001](#).

Lubricating Oil Recommendations and Specifications (018-003)

Table of Contents

General Information

New Engine Break-in Oils

AfterMarket Oil Additive Usage

General Information

TOC



Extending the oil and filter change interval beyond the recommendations will decrease the engine life due to factors such as corrosion, deposits, and wear.

The use of quality engine lubricating oils, combined with appropriate oil drain and filter change intervals, is a critical factor in maintaining engine performance and durability. Extending the oil and filter change interval beyond the recommendations will decrease engine life due to factors such as corrosion, deposits, and wear. Refer to Procedure [102-002](#), Maintenance Schedule, to determine which oil drain interval to use for an application.

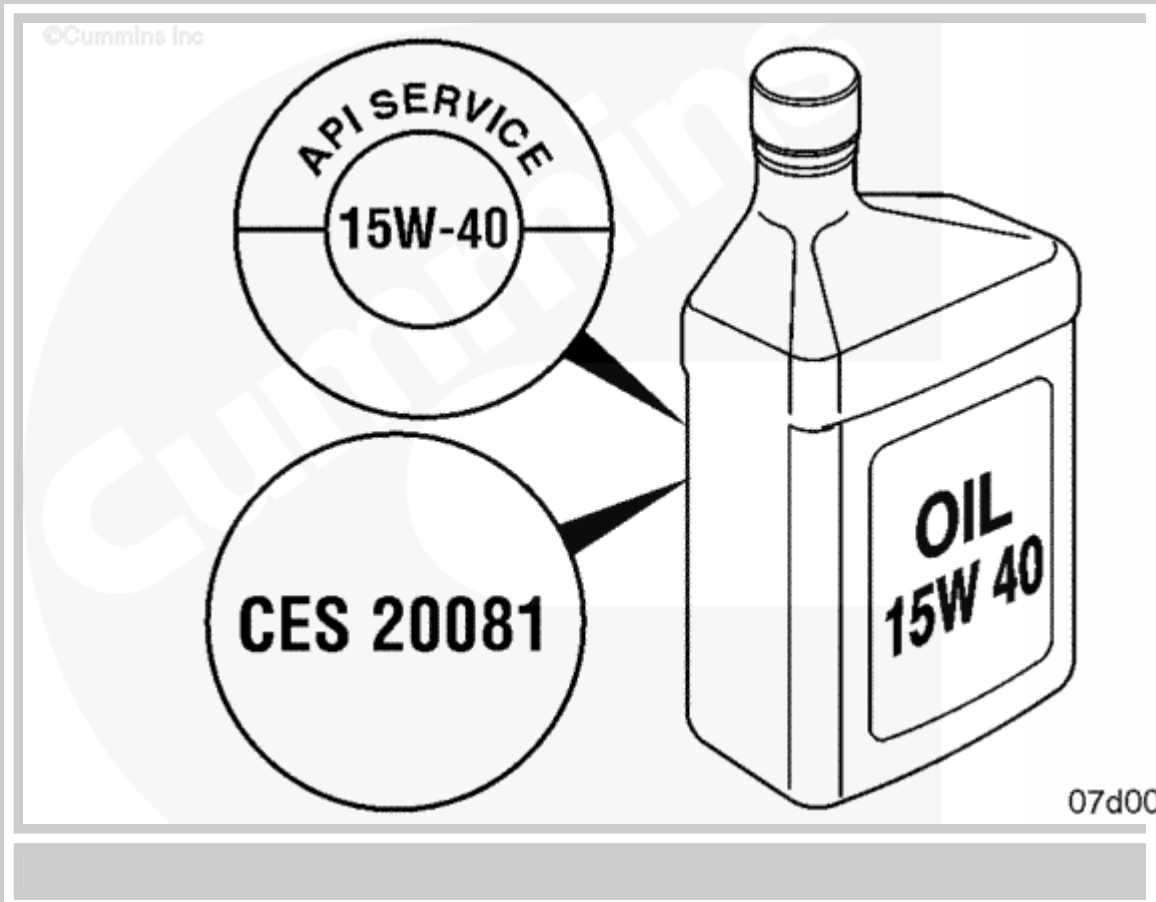
NOTE: The responsibility is with the owner. If recommendations are ignored, warranty could be affected.

API: American Petroleum Institute

CES: Cummins Engineering Standard

Cummins Inc. allows, for midrange applications, the use of lubricating oils that meet or exceed CES 20078 or CES 20081 with no change in oil drain interval. But, if a non-low

ash lubricating oil meeting the Cummins Engineering Standard (CES) classification CEA 20078 is used, the service interval(s) for the after treatment system will be reduced, refer to Procedure [102-002](#), Maintenance Schedule.



To determine if the lubricating oil meets CES 20078 or CES 20081, review the label on the back of the lubricating oil bottle for the CES 20078 or CES 20081 reference. If acquiring the lubricating oil in bulk, contact the supplier for the lubricating oil specifications and confirm that the oil meets CES 20078 or CES 20081.

Also located on the lubricating oil bottle is the API service symbol which is shown in the accompanying illustration. The upper half of the symbol displays the appropriate oil categories. The center section identifies the SAE oil viscosity grade. The table below shows how the Cummins Engineering Standard (CES) compares to the American Petroleum Institute (API) classification.

Cummins Engine Standard Classifications (CES)	American Petroleum Institute Classification (API)	Comments
CES-20071, CES-20072, CES-20076, CES-20077	API CH-4/SJ	Not recommended. Lubricating oil drain interval must be reduced by 50%. After treatment maintenance interval will be reduced.
CES-20078	CI-4/SL	After treatment maintenance interval will be reduced.
CES-20081	CJ-4/SL	Maximum after treatment maintenance interval. No change in lubricating oil drain interval.

NOTE: A lubricating oil that meets the American Petroleum Institute (API) performance classification CJ-4/SL may not meet the CES 20081 requirement. Always make sure that the lubricating oil used meets the CES 20081 requirement in addition to the API performance classification CJ-4/SL.

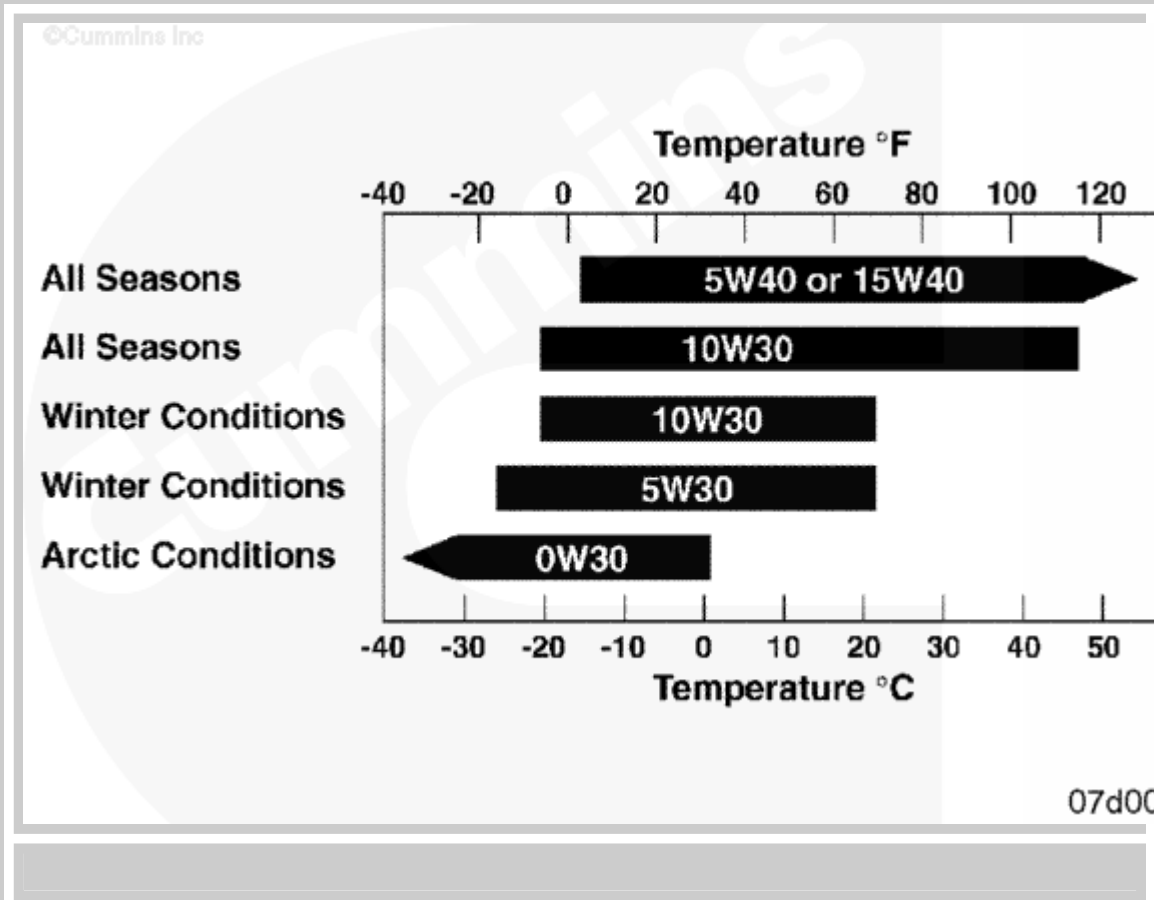
Cummins Inc. recommends the use of high-quality SAE 15W-40 heavy-duty engine oil, such as Valvoline Premium Blue.

NOTE: If a non-low ash lubricating oil meeting the American Petroleum Institute (API) performance classification CI-4/SK and/or CES 20078 is used, the service intervals for the after treatment systems will be reduced.

The primary Cummins recommendation is for the use of 15W-40 multigrade lubricating oil 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 to be certain the engine will meet applicable emissions requirements.

Use of "synthetic engine oils" (those made with API group 3 or group 4 base stocks) is permitted subject to the same performance and viscosity limitations of petroleum (mineral) based engine oils. The same oil change intervals **must** be applied to synthetic oils that are applied to petroleum (mineral) based engine oils.

For further details and discussion of engine lubricating oils for Cummins engines, refer to the latest revision of Cummins Engine Oil Recommendations, Bulletin [3810340](#).



While the preferred viscosity grade is 15W-40, lower viscosity multigrade oils can be used in colder climates. See the accompanying chart. Any viscosity grade lower than 15W-40 **must** still meet CES 20081.

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]. Synthetic 0W-30 oils that meet the requirements of API Group III or Group IV basestocks, can be used in operations where the ambient temperature **never** exceeds 0°C [32°F]. Multiviscosity oils rated 0W-30 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.

As these oils 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 can neither approve nor disapprove any product **not** manufactured by Cummins Inc. These claims are between the customer and oil supplier.

Obtain a commitment from the oil supplier that the oil will give satisfactory performance in Cummins engines or do **not** use the oil.

New Engine Break-in Oils

[TOC](#)

Special break-in engine lubricating oils are **not** recommended for new or rebuilt Cummins engines. Use the same type of oil during the break-in as is used in normal operation.

Aftermarket Oil Additive Usage

[TOC](#)

Cummins Inc. does **not** recommend the use of aftermarket oil additives. Current high-quality fully additive engine lubricating oils are very sophisticated, with precise amounts of additives blended into the lubricating oil to meet stringent requirements. 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 oil's capability to protect the engine.

Last Modified: 24-Aug-2006

Maintenance Schedule (102-002)

Table of Contents

General Information

Oil Drain Intervals

General Information

[TOC](#)

Perform maintenance at whichever interval that occurs first. At each scheduled maintenance interval, perform all previous maintenance checks that are due for scheduled maintenance.

Daily or Refueling

- Air Intake Piping - check
- Fan, Cooling - check
- Air Tank and Reservoirs - drain
- Coolant Level - check
- Fuel-Water Separator - drain
- Lubricating Oil Level - check
- After treatment Exhaust Piping - check

Every 12,000 km [7500 mi], 250 Hours, or 3 Months

- Air Cleaner Restriction - check
- Charge-Air Piping - check
- Charge-Air Cooler - check

Every 24,000 km [15,000 mi], 500 Hours, or 6 Months

- Fuel Filter (Spin-on Type) - change¹
- Lubricating Oil and Filters - change²

- Engine Coolant Antifreeze - check
- Batteries - check
- Battery Cables and Connections - check

Every 48,000 km [30,000 mi], 1000 Hours, or 1 Year

- Drive Belt, Cooling Fan- check
- Cooling Fan Belt Tensioner - inspect for reuse
- Air Compressor Discharge Lines - check

Every 96,000 km [60,000 mi], 2000 Hours, or 2 Years

- Cooling System - flush³
- Vibration Damper, Viscous - check
- Engine Steam Cleaning - clean
- Radiator Hoses - check
- Crankcase Ventilation Filter - inspect for reuse

Every 241,500 km [150,000 mi], 5000 Hours, or 4 Years

- Overhead Set - adjust

Every 321,500 km [200,000 mi], or 6500 Hours

- After treatment Diesel Particulate Filter - clean⁴

NOTE:

- 1. If the oil drain interval being used is greater than 24,000 km [15,000 mi], as determined by the Oil Drain Intervals section below, the fuel filter change can be extended until the oil drain interval.**
- 2. The oil drain intervals are based on an engine equipped with a 14.2 liter [15 qt] capacity lubricating oil pan and a normal duty cycle. For detailed information on oil drain intervals for a specific application/duty cycle, refer to the Oil Drain Intervals section of this procedure.**
- 3. Extended coolant drain/flush/fill intervals may be followed when certain requirements are met. For information on these requirements, refer to the Coolant Requirements and Maintenance Bulletin 3666132.**
- 4. The after treatment diesel particulate filter clean/replace interval is based on the use of lubricating oils that meet the Cummins Engineering Standard (C.E.S.) 20081 oil specification. If a non-low ash lubricating oil meeting the American Petroleum Institute (API) performance classification CI-4/SL and/or C.E.S. 20078 is used, the service intervals for the after treatment**

systems will be reduced to 241,000 km [150,000 mi] or 5000 Hours.

Follow the manufacturer's recommended maintenance procedures for the starter, alternator, generator, batteries, electrical components, exhaust brake, charge air cooler, radiator, air compressor, air cleaner, freon compressor, and fan clutch. Refer to Procedure [203-001](#) (Component Manufacturers) in Section M.

Oil Drain Intervals

[TOC](#)

The lubricating oil and lubricating oil filter interval can be adjusted based on application, fuel consumption, gross vehicle weight, and idle time.

Use the following questions to determine the maximum recommended oil change and filter change intervals in kilometers, miles, hours, or months, whichever comes first.

Is the vehicle one of those listed below?

Delivery Truck
School Bus
Fire Truck or Emergency Vehicle

If Yes, select the correct oil drain interval from Table 1. If No, is the vehicle one of those listed below?

Refuse Truck
Mixer Truck or Dumper Truck

If Yes, select the correct oil drain interval from Table 2. If No, is the vehicle one of those listed below?

Shuttle Bus
Transit Bus

If Yes, select the correct oil drain interval from Table 3.

If the vehicle is a recreational vehicle or a vehicle that is **not** listed, select the correct oil drain interval from Table 4.

Table 1

Table 1, Maximum Oil Drain Interval	
(A) Severe-Duty (If Vehicle Meets Any of These Conditions)	(B) Normal-Duty (If Vehicle Meets Both Conditions)
Average fuel economy is less than 2.98 km/liter [7 mpg], or idle time is 40 percent or greater, or vehicle operates in dusty conditions, or gross vehicle weight is greater than 20,865 kg [46,000 lb].	Average fuel economy is greater than 2.98 km/liter [7 mpg] and gross vehicle weight is less than 20,865 kg [46,000 lb].
Vehicle uses the severe-duty oil drain interval (A)	Vehicle uses the normal-duty oil drain interval (B)
If equipped with a 14.2 liter [15 qt] oil pan ¹ : 14,500 km [9000 mi], 500 hours, 6 months, or 7571 liters [2000 gallons] of fuel, which ever comes first.	If equipped with a 14.2 liter [15 qt] oil pan ¹ : 24,000 km [15,000 mi], 500 hours, 6 months, or 7571 liters [2000 gallons] of fuel, which ever comes first.
If equipped with a 17 liter [18 qt] oil pan ¹ : 19,000 km [12,000 mi], 550 hours, 6 months, or 7571 liters [2000 gallons] of fuel, which ever comes first.	If equipped with a 18 liter [19 qt] oil pan ¹ : 32,000 km [20,000 mi], 550 hours, 6 months, or 7571 liters [2000 gallons] of fuel, which ever comes first.

Table 2

Table 2, Oil Drain Interval								
	With a 14.2 liter [15 qt] oil pan ¹	With a 18 liter [19 qt] oil pan ¹						
Refuse Truck, Mixer or Dump Truck	Kilometers	Miles	Hours	Months	Kilometers	Miles	Hours	Months
Below 10 mph	4850	3000	500	6	6450	4000	550	6

10 to 15 mph average	9650	6000	500	6	12,500	8000	550	6
15 to 20 mph average	13,750	8500	500	6	17,750	11,000	550	6
20 to 25 mph average	14,500	9000	500	6	19,000	12,000	550	6
Above 25 mph average	19,000	12,000	500	6	25,750	16,000	550	6

Table 3

Table 3, Oil Drain Interval								
	With a 14.2 liter [15 qt] oil pan ¹	With a 18 liter [19 qt] oil pan ¹						
Shuttle or Transit Bus	Kilometers	Miles	Hours	Months	Kilometers	Miles	Hours	Months
2 to 4 mph average	2400	1500	500	6	3250	2000	550	6
4 to 6 mph average	4850	3000	500	6	6450	4000	550	6
6 to 8 mph average	6450	4000	500	6	9000	5500	550	6
8 to 10 mph average	8050	5000	500	6	11,250	7000	550	6
10 to 15 mph average	9650	6000	500	6	12,500	8000	550	6

Table 4

Table 4, Oil Drain Interval

Vehicle/Equipment	With a 14.2 liter [15 qt] oil pan ¹	With a 18 liter [19 qt] oil pan ¹	Hours	Months	Kilometers	Miles	Hours	Months
	Kilometers	Miles						
Recreational Vehicle	24,000	15,000	500	12	32,000	20,000	550	12
Truck Crane	14,500	9000	500	6	19,000	12,000	550	6
Yard Spotter	14,500	9000	500	6	19,000	12,000	550	6
All Others	14,500	9000	500	6	19,000	12,000	550	6

1 - if the type/oil capacity of the oil pan is not known:

1. Contact a Cummins® Distributor/Dealer
2. Determine the capacity of the oil pan option for the engine being serviced using Quickservice Online and the engine serial number.
3. For the first oil drain interval, use the 14.2 liter [15 qt] oil drain interval. When filling the engine with oil, determine the oil capacity of the oil pan.

Last Modified: 06-Feb-2007

