QUICK REFERENCE GUIDE

Truck maintenance and operation

2021 X15

Performance Hardware

For ease of identification, important characteristics of this engine are:

- Single camshaft
- XPI fuel system
- Single module DPF and SCR aftertreatment system
- ECM 2450 (this control module incorporates DEF dosing control)
- Variable geometry turbocharger (VGT)
- Exhaust gas recirculation system (EGR)

MAINTENANCE INTERVALS

Duty cycle (mpg)	Severe (3-4.9)	Short-haul (5-5.9)	Normal (6-6.9)	Light (7+)
Oil drain intervals (ODI)*	25,000 miles / 12 months	50,000 miles / 12 months	60,000 miles / 12 months	75,000 miles / 12 months**
	500 hours for vocational applications			
with OilGuard™ program	Extensions available			Up to 100,000 miles
Fuel filter(s)	25,000 miles	50,000 miles	60,000 miles	75,000 miles
with FF5971NN	Up to 100,000 miles			
Diesel particulate filter[1]	250,000–400,000 |	400,000–600,000 |	600,000–800,000	
Coolant system flush	Follow OEM coolant recommendations			
DEF filter	300,000 miles / 6,750 hours			
Engine brake assembly	500,000 miles / 10,000 hours / 60 months			
Overhead adjustment	500,000 miles / 10,000 hours / 60 months			

* The extreme severe duty cycle (<3 mpg) has an oil drain interval of 4,500 miles (7,000 kilometers), 500 hours or 12 months—whichever occurs first.
* For Premium Blue users, the Fuel Filter interval matches the ODI.
* Add 5,000 miles to severe, short-haul, normal and light duty ODI when using Valvoline Premium Blue.
** For oil drain intervals exceeding 60,000 miles, the use of LF14001NN lube oil filter is recommended.

Maintenance information

CAUTION

- Never crack a high pressure fuel line with the engine running. With the engine stopped, relieve pressure only at the fuel pump inlet line fitting on the side of the rail.
- When changing the engine-mounted fuel filter, never pre-fill by pouring fuel in the center hole (clean side).
- Recommended procedure is to install filter dry and cycle the key switch on 3–4 times and allow the priming pump to fill the filter.
- If you have to pre-fill the filter, use the smaller outside holes (dirty side) and let the fuel flow through the filter media to provide clean, filtered fuel to the clean side.
- Synthetic or semi-synthetic oils may be beneficial for extreme arctic or extreme heat conditions but DO NOT EXTEND oil drain intervals with synthetic or semi-synthetic oils.
- Typical oil change volume: 36.3–43.8 liters (9.6–11.6 gal). For full list of compatible oil weights, please refer to the Owners and Operations manual: https://quickserve.cummins.com/qs3/pubsys2/xml/en/procedures/377/377-018-003.html.
- Check the oil pressure indicators, temperature indicators, warning lights, and other gauges daily to make sure they are operational.
- Check the oil pressure, coolant temperatures, DEF level, and other engine parameters daily via the OEM instrument panel or gauge cluster to make sure they are operational. Check the instrument panel regularly for any alarm messages. Take appropriate action to rectify the alarm condition or contact your nearest Cummins distributor.

Electronic features

For best fuel economy and performance, take advantage of the following electronic engine features. Set the parameters to meet your needs:

- EX ratings for enhanced powertrain features like on-ramp boost and predictive braking
- Predictive cruise control
- Road speed governor and cruise control
- Idle control
- Load-based speed control
- Gear down protection

Guidance is available for parameter settings: https://www.cummins.com/support/digital-products-and-services-support/powerspec-support.

Diesel Particulate Filter[1] (DPF) cleaning

X15 engines incorporate an ash load monitor that the customers can rely on to determine when the DPF cleaning is due. The driver will be notified by the check engine lamp or amber warning lamp, which will flash for 30 seconds after the key switch is set to ON.

If the aftertreatment DPF has been removed for cleaning and is considered reusable (according to the Aftertreatment Diesel Oxidation Catalyst and Aftertreatment Diesel Particulate Filter Reuse Guidelines, bulletin 4021600), the aftertreatment DPF should be returned to Cummins to be exchanged.

Cummins does not endorse localized air cleaning machines for ash removal. All DPFs requiring ash cleaning should be returned to a Cummins authorized repair location in exchange for a New/ReCon DPF.

Lubricating oil and cooling systems

SPECIFICATIONS

Preferred oil filter	
Fleetguard oil filter	LF14001NN
Oil pressure	
At idle (min at operating temperature)	68 kPa (10 Psi)
At no-load governed speed	241 to 324 kPa (35 to 47 Psi)
Oil pan drain fitting size	
M27x2 STOR	35 lb-ft Torque
Typical oil change capacity (pan and filter)	
Low	36.3 liters (9.6 gal)
Max	43.8 liters (11.6 gal)

Reference oil drain intervals specific to an oil and pan type: https://quickserve.cummins.com/qs3/pubsys2/xml/en/procedures/564/564-018-017.html

Cooling system

SPECIFICATIONS

Coolant capacity (engine only)	26.5 liters (28 qt)
Normal coolant temperature	
Greater than	180°F (82.2°C)
Fan on at	210°F (99.0°C)
High temp alert	225°F (107.2°C)
Pressure cap pressure	
Minimum recommended	103 kPa (15 Psi)

Fuel system

SPECIFICATIONS

Preferred spin-on pressure fuel filter	
Fleetguard part number	FF5825NN
- OR -	
Extended life fuel filter (up to 75,000 miles)	FF5971NN
Spin-on suction fuel filter	
Consult owner's manual for OEM filter housing	
Maximum pressure drop across fuel filter	600 kPa (87 Psi)
Maximum fuel drain line pressure	
High idle	102 mm-Hg (4 in-Hg)
Loaded condition	203 mm-Hg (8 in-Hg)

Cooling system information

Cummins recommends using either a 50/50 mixture of distilled water and fully formulated antifreeze, or fully formulated coolant when filling the cooling system. The fully formulated antifreeze or coolant must meet Cummins Engineering Standard (CES)14603 specifications.

Most coolants which meet American Society of Testing and Materials (ASTM) D6210 also meet CES14603.

However, some OAT coolants such as Shell™ Rotell ELC, Chevron™, Texaco™, and Delo ELC and their private label counterparts meet ASTM D6210, but do not meet the elastomer compatibility test of CES14603. These coolants are acceptable for use, assuming the OEM added silicate at initial fill. Refer to bulletin 3666132, Cummins® Coolant Requirements and Maintenance, Section 3, Extended Service Interval, for more details.

Good-quality water is important for cooling system performance. Excessive levels of calcium and magnesium contribute to scaling problems, and excessive levels of chlorides and sulfates cause cooling system corrosion.

Diesel Exhaust Fluid

It is unlawful to tamper with or remove any component of the aftertreatment system. It is also unlawful to use a Diesel Exhaust Fluid (DEF) that does not meet the specifications provided or to operate the vehicle/equipment with no DEF. Cummins is not responsible for failures or damage resulting from what Cummins determines to be abuse or neglect.

In compliance with the regulatory agencies (EPA and CARB), the Cummins engine system incorporates on board diagnostics and electronic controls to monitor and ensure that tail pipe emissions requirements are met. A DEF lamp will notify the driver when the DEF tank level is running low and/or the quality of the DEF in the tank is not meeting specifications. Failure to promptly refill or replace DEF in the tank will trigger an inducement sequence, limiting engine torque and, eventually, vehicle speed to 5 mph.

For further details and discussion of DEF for Cummins engines, refer to Diesel Exhaust Fluid Specifications for Cummins Selective Catalytic Reduction Systems, bulletin 4021566.

For engines using SCR operating in the United States and Canada, it is also strongly recommended that the DEF used be certified by the American Petroleum Institute (API). This would be indicated by a symbol on the container/dispensing system.

To ensure the correct DEF is used, Cummins recommends the use of Fleetguard® Diesel Exhaust Fluid. Fleetguard® carries different quantity options from small to bulk containers.

For complete maintenance recommendations and guidelines, refer to the X15 CM2450 X124B Owner's Manual, bulletin 5504581 or X15 CM2450 X124B Operation and Maintenance manual, bulletin 5504582.

Cummins Inc.
Box 3005
Columbus, IN 47202-3005
U.S.A.

cummins.com

Bulletin 6504123 Produced in U.S.A. Rev. 6/25