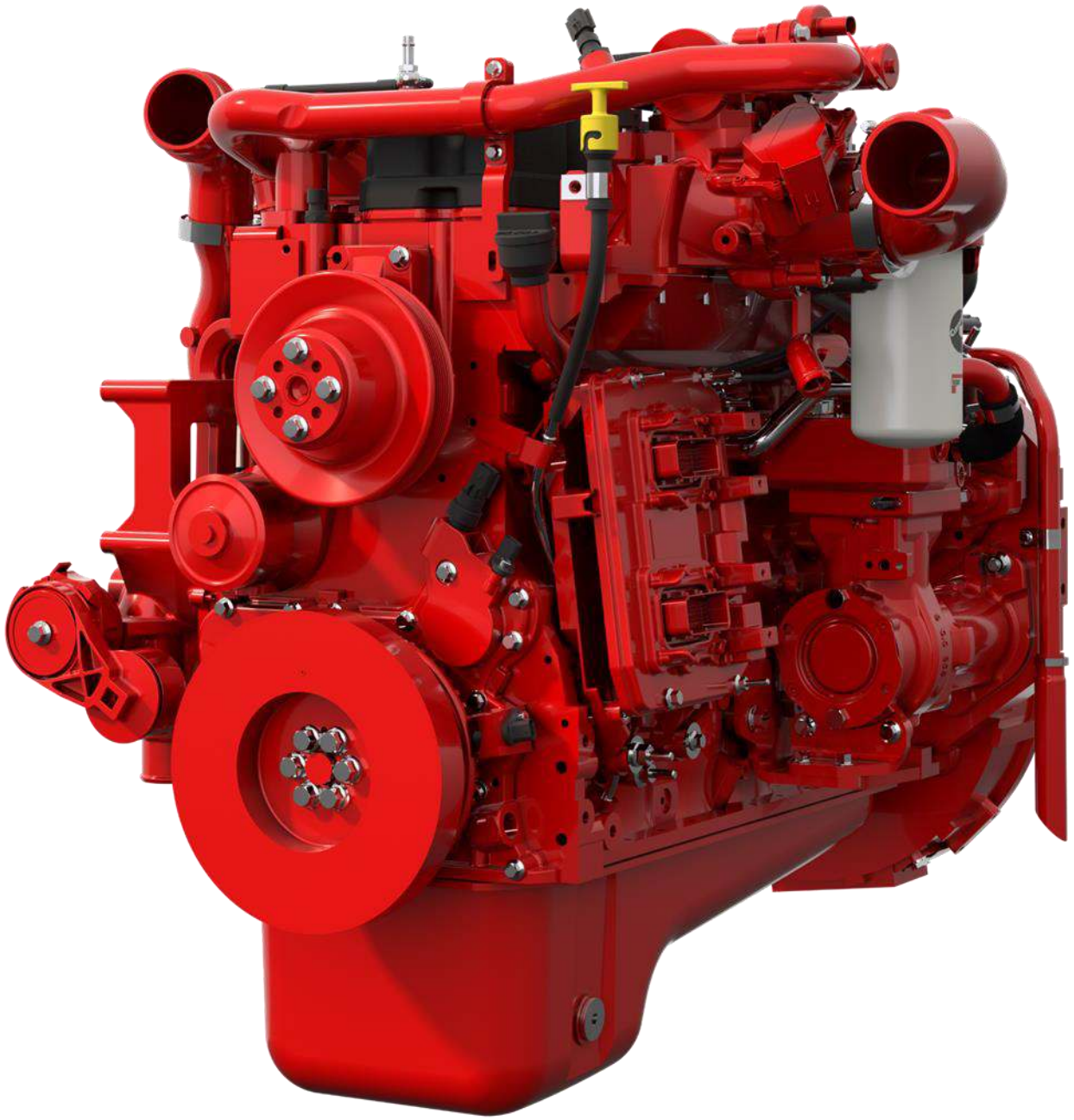


2021 Truck Medium-duty Engine Overview

B6.7™

L9™

1 **Portfolio**
A History of Improving

2 **Value**
Providing Tools for the Job

3 **Uptime**
Always On

1 Medium Duty Portfolio

Cummins B-series

A History

July 1983

B-series introduced

1998 ISB

24V Cylinder Head

2002 ISB

EGR Introduced

2007 ISB

5.9L to 6.7L DPF Introduced

2010 ISB6.7

SCR Introduced

2017 B6.7

Single Module Aftertreatment Introduced

2021 B6.7

Maintenance Free Breather Introduced

Cummins L-series

A History

1985

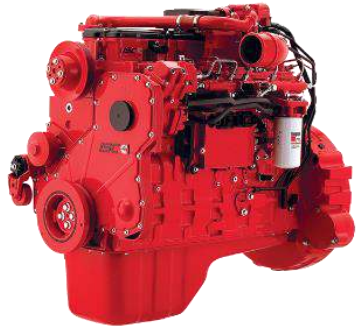
6C8.3 introduced

1998

ISC8.3 Introduced

2003

HPCR and VGT Introduced



2013 ISL9

Merged ISL & ISC Platforms

2017 L9

Single Module Aftertreatment Introduced

2021 L9

Maintenance Free Breather Introduced

Medium Duty Line-Up

B6.7 The Proven Champion

- 38 years of production with over 13 million B-Series produced globally and over 2.25 million miles of pre-production experience
- 200-325 HP, 520-750 lb-ft Torque
  - Efficiency and Performance Ratings
- Certified to 2021 GHG standards

L9 The Medium-duty Workhorse

- 35 years of production with over 5 million L-Series produced globally and over 2.2 million miles of pre-production experience
- 260-380 HP, 860-1250 lb-ft Torque
  - Productivity and Performance ratings
- Certified to 2021 GHG standards

Technical specifications

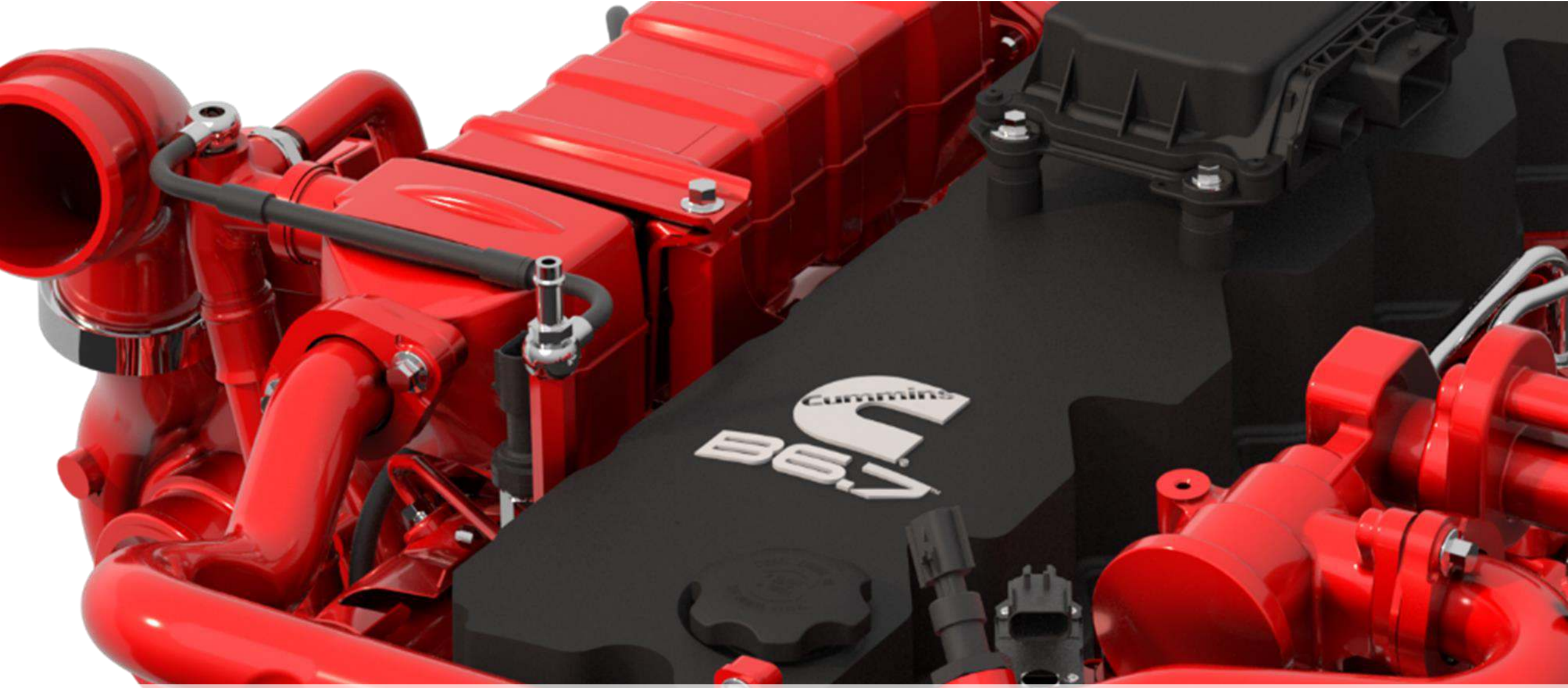
	B6.7™	L9™
Advertised Horsepower	200-325 hp	260-380 hp
Peak Torque	520-750 lb-ft	860-1250 lb-ft
Governed Speed	2600 rpm	2100/2200 rpm
Clutch Engagement Torque	400 lb-ft	575 lb-ft
Number of Cylinders	6	
Bore and Stroke	107 mm x 124 mm	114 mm x 145 mm
System Weight	1295 lb	1852 lb
Engine (Dry)	1150 lb	1695 lb
Aftertreatment System	145 lb	157 lb

2 EPA 2021 Product Value

EPA 2021 Key Value Drivers

We focused improvements to the EPA 2021 L9 and B6.7 products in the following areas.

	FUEL EFFICIENCY	RELIABILITY	MAINTENANCE INTERVALS	REGULATORY REQUIREMENTS
	We made the engine more efficient by minimizing frictional losses and optimizing combustion.	Using the voice of the customer, we made technical improvements to meet market demands.	To maximize uptime, we synchronized and extended scheduled maintenance intervals across the engine.	We made improvements to emissions and on-board diagnostics (OBD) to ensure we are meeting or exceeding EPA and CARB requirements for 2021.
 B6.7		✓	✓	✓
 L9	✓	✓	✓	✓



2021 B6.7 Update

EPA 2021 B6.7

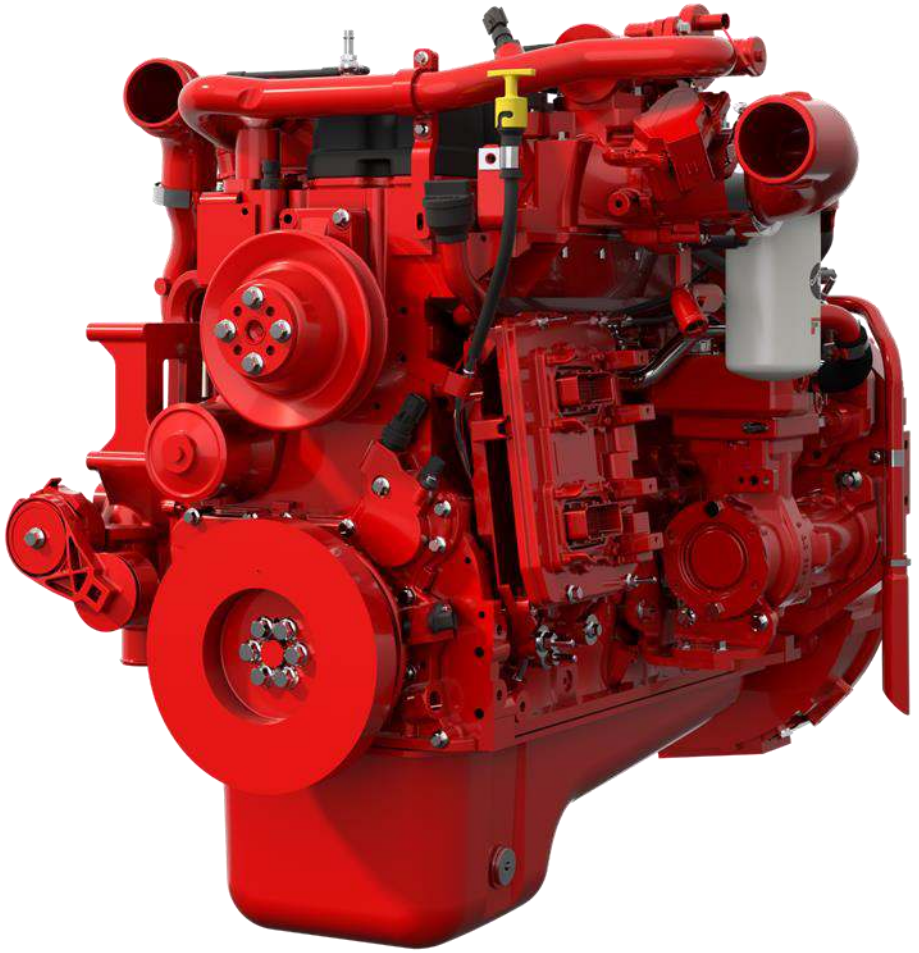
The Platform Basics

The EPA 2021 B6.7 builds on the strong legacy of the B series platform: nearly 40 years of production and more than 12 million engines manufactured globally.

While maintaining the elements that customers have come to expect, such as compact size and weight and class-leading power and torque ratings, the new engine has been updated with improvements to deliver the following:

The major updates to the engine delivered the following:

- Lower TCO via improved maintenance intervals
- Required regulatory improvements (GHG Phase II, OBD)
- Connectivity enhancements through Connected Solutions™



B6.7 | 2021 Truck Rating Offering

Ratings consistent with 2017 product

ENGINE RATING (HP)	PEAK TORQUE (lb.-ft.)	PEAK TORQUE SPEED (RPM)	GOVERNED SPEED (RPM)
Performance Series			
325	750	1800	2600
300	660	1600	2600
280	660	1600	2600
Efficiency Series			
260	660	1600	2600
250	660	1600	2600
240	560	1600	2600
220	600	1600	2600
220	520	1600	2600
200	520	1600	2600

*Ratings are the same as the EPA 2017 product. Additional ratings information is available on GCE.

Summary of Changes to 2021 B6.7

MAINTENANCE REGULATORY RELIABILITY

BASE ENGINE

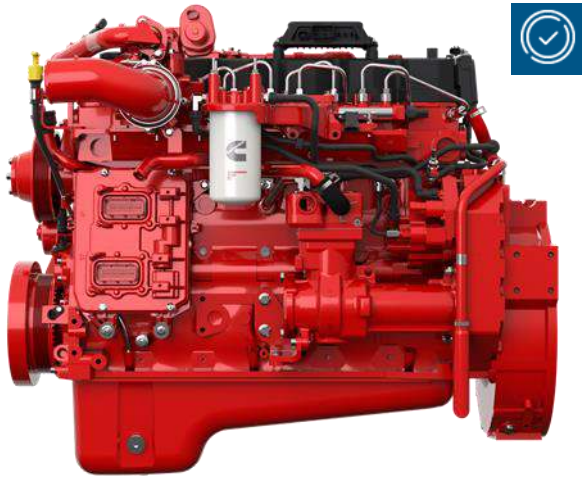
- Modified valve cover design to incorporate new breather and connectivity device
- Incorporated OEM truck requested engine-mounted air cleaner bracket

ELECTRONICS

- Next generation CM2450 control module and controls software
- Improved connectivity to find, resolve, and prevent issues
- Wiring harness changes to improve reliability and integrate with CM2450.

LUBE AND COOLING

- Implemented copper-free oil cooler.



AIR HANDLING

- Added exhaust manifold pressure sensor
- Improved turbocharger speed sensor robustness

POWER CYLINDER

- Modified piston design for improved maintenance intervals and to maintain dependability.
- Top and oil piston rings with improved coatings and designs

MAINTENANCE

- Maintenance-free breather system.
- Increased capabilities on oil filter and Stage 1 & 2 fuel filters

Changes to 2021 B6.7 Aftertreatment

REGULATORY RELIABILITY

DOSING SYSTEM

Updated UL2.0 dosing unit with the Next Gen Nozzle for improved uptime and performance.

PHASE 35 SOFTWARE

Compatible with next generation CM2450 control module and controls software for improved computing capabilities required to meet emissions and OBD requirements.

SENSING TECHNOLOGY

Improved RADP Sensor for improved uptime.

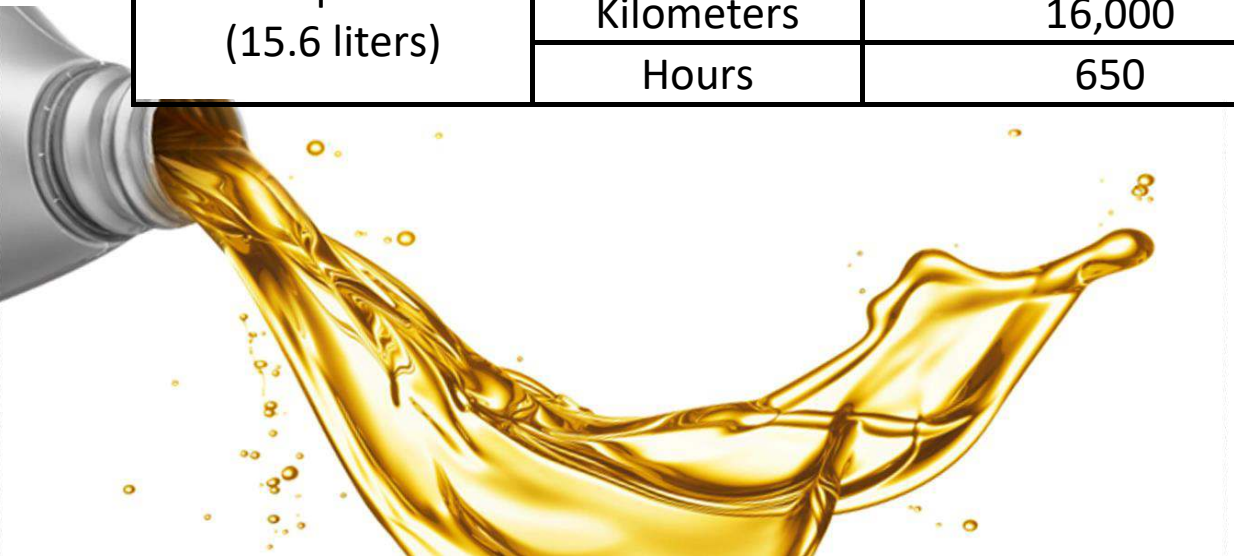
B6.7 | 2021 Maintenance Changes

Maintenance Event	EPA 2017 B6.7	EPA 2021 B6.7
Oil and Filter Change	Up to 20K miles / 550 hours / 12 months (duty cycle dependent)	Up to 30K miles / 1000 hours / 18 months (duty cycle dependent)
Fuel Filter Change	15K miles / 500 hours / 12 months	60K miles / 2000 hours / 18 months
Crankcase Ventilation Filter ("Breather") Change	75K miles / 2500 hours	MAINTENANCE FREE
Valve Lash Adjust	150K miles / 5000 hours	150K miles / 5000 hours
DPF Clean	200K miles / 6500 hours	200K miles / 6500 hours
DEF Filter Change	200K miles / 6500 hours	200K miles / 6500 hours

See Owner's Manual for full recommended maintenance schedules

B6.7 | 2021 Oil Drain Interval Schedule

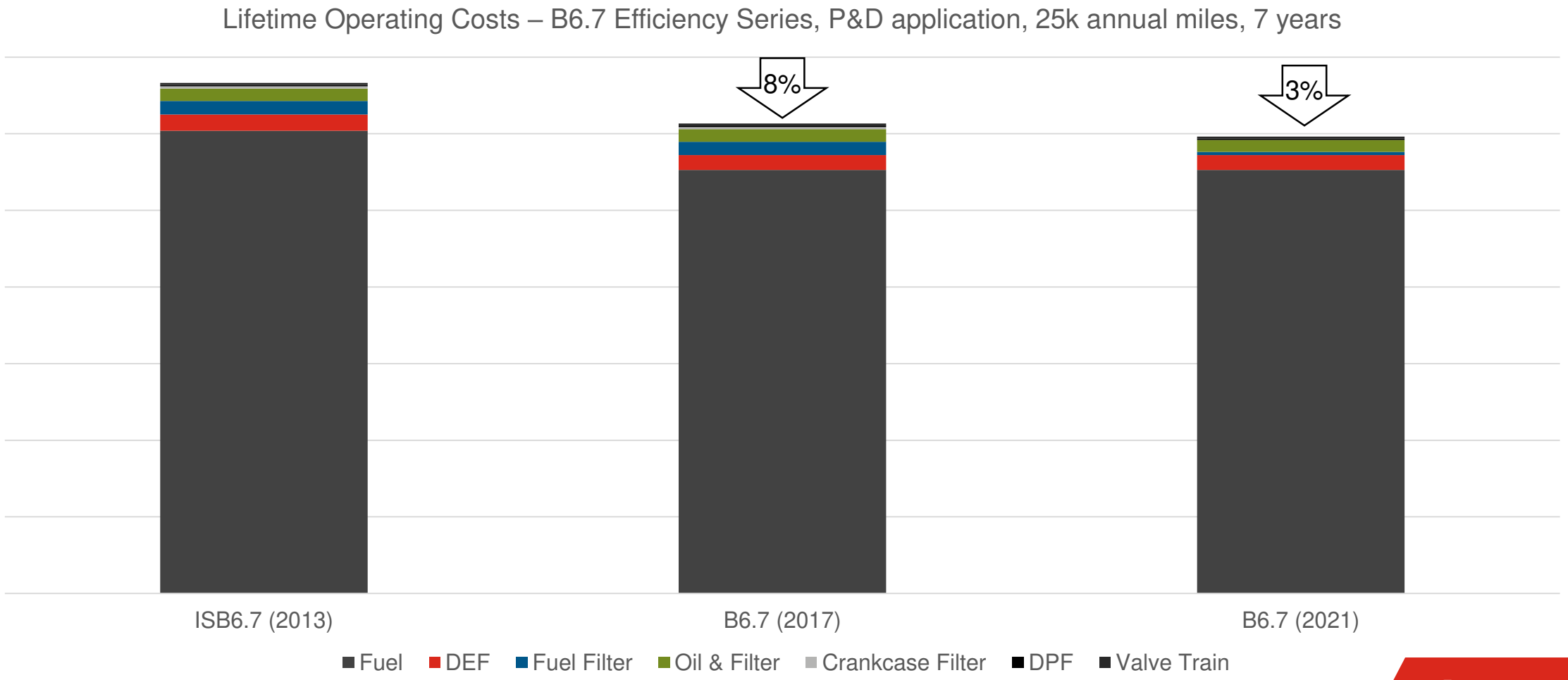
Total Oil Capacity (Oil Pan + Lube Filter)	Engine Distance or Run Time	Fuel Economy		
		Severe < 6 mpg (<2.6 km/liter)	Normal 6 -10 mpg (2.5-4.3 km/liter)	Light > 10 mpg (>4.3 km/liter)
19.5 quarts (18.5 liters)	Miles	12,000	25,000	30,000
	Kilometers	19,000	40,000	48,000
	Hours	900	1000	1,000
16 quarts (15.6 liters)	Miles	10,000	20,000	25,000
	Kilometers	16,000	32,000	40,000
	Hours	650	750	850



Drain the oil and change the lube filter according to engine distance OR run time from the table OR 18 months, **whichever comes first.**

B6.7 Lifetime Operating Cost Reduction

Compared to the 2017 product, the 2021 B6.7 provides an additional ~3% reduction in lifetime TCO for truck through maintenance improvements.



2021 B6.7 Engine Profile Summary

Differences between the EPA 2017 B6.7 and EPA 2021 B6.7 engine profiles.

	EPA 2017	EPA 2021
RATINGS (BY FAMILY)	Efficiency: 200-260 hp/520-660 lb.-ft. Performance: 280-325 hp/660-750 lb.-ft.	Efficiency: 200-260 hp/520-660 lb.-ft. Performance: 280-325 hp/660-750 lb.-ft.
ENGINE WEIGHT (DRY)	1150 lbs.	Same as 2017
FUEL EFFICIENCY	Base	Similar to 2017
DEF (% OF FUEL USAGE)	3.7%	Similar to 2017
WIRING	Base	Same vehicle Input/Output
DIMENSIONS	Base	Similar to 2017
SOFTWARE	Base	New to meet 2021 requirements
WATER PUMP	Fixed ratio	Same as 2017
CONTROL MODULE	CM2350	CM2450 (Same Input/Output)
MAINTENANCE (DUTY CYCLE DEPENDENT)	Up to 20,000 miles/550 hours/12 months oil drain interval and fuel filter	Up to 30,000 miles/1000 hours/18 months oil drain interval and fuel filter; Maintenance-free crankcase filter
AFTERTREATMENT	Single Module with UL2.0	Performance improvements with same packaging/interfaces

2021 L9 Update

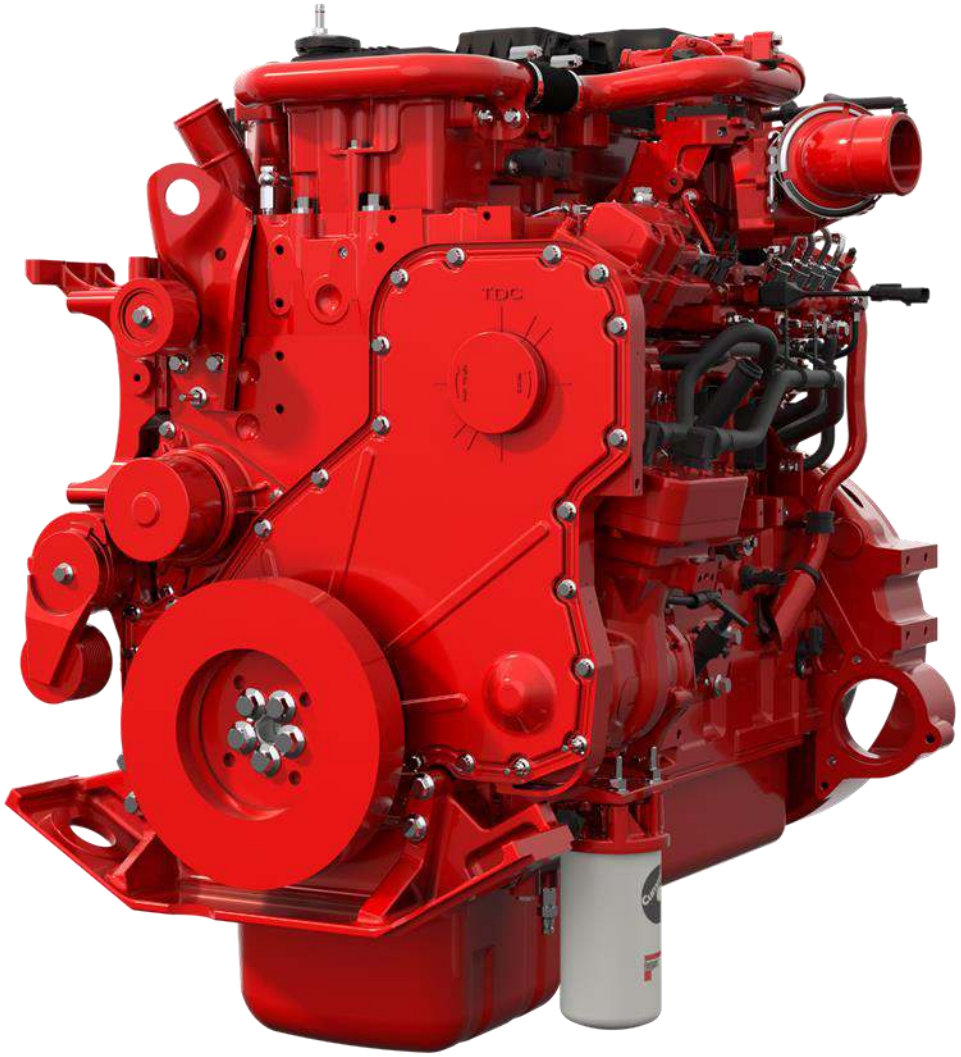
EPA 2021 L9

The Platform Basics

This platform boasts 35+ years of production with over 5 million engines manufactured globally. Building on this legacy The EPA 2021 L9 has the reliability and durability customers expect, with class-leading power and torque ratings and power-to-weight ratio to get the job done.

The major updates to the engine delivered the following:

- Lower TCO via improved fuel efficiency and maintenance intervals
- Required regulatory improvements (GHG Phase II, OBD)
- Connectivity enhancements through Connected Solutions™



L9 | 2021 Truck Rating Offering

Focused on down speeding peak torque and adding more power to the Productivity Series

L9 EPA17			
Engine Rating	Peak Torque	Peak Torque Speed (RPM)	Governed Speed (RPM)
Performance Series			
380	1250	1400	2100
370	1250	1400	2100
Productivity Series			
350	1150	1400	2200
350	1000	1400	2200
330	1000	1400	2200
300	860	1300	2200
270	800	1300	2200
260	720	1300	2200

L9 EPA21			
Engine Rating	Peak Torque	Peak Torque Speed (RPM)	Governed Speed (RPM)
Performance Series			
380	1250	1200	2100
370	1250	1200	2100
Productivity Series			
360	1150	1200	2200
350	1050	1200	2200
330	1000	1200	2200
300	860	1200	2200
270	860	1200	2200
260	860	1200	2200

*Ratings are for trucks only. Additional ratings information is available on GCE.

Summary of Changes to 2021

FUEL EFFICIENCY | MAINTENANCE | REGULATORY | RELIABILITY

POWERTRAIN

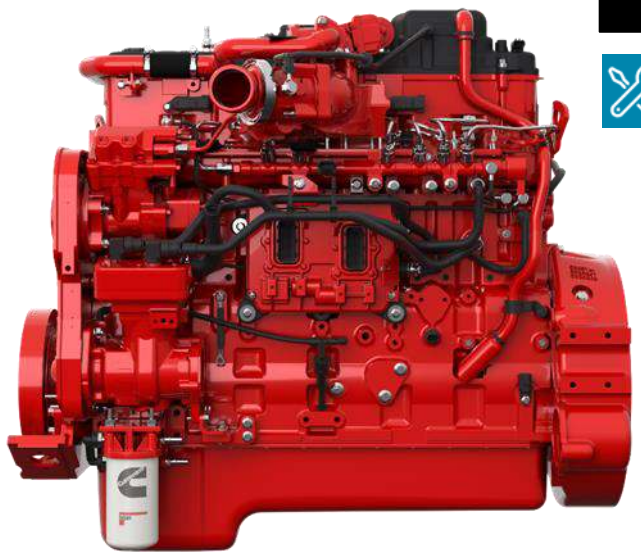
- Lowered peak torque speeds

AIR HANDLING

- EGR valve design with robustness improvements
- Coolant vent added to Turbocharger

ELECTRONICS

- Next generation CM2450 control module and controls software
- Improved connectivity to find, resolve, and prevent issues.
- Wiring harness changes to improve reliability and integrate with CM2450.



POWER CYLINDER

- Top and oil piston rings with low friction, improved coating design
- Increased compression ratio (20:1)

BASE ENGINE

- Modified camshaft valve timing
- Reduced water pump speeds
- Modified oil pan rail and the oil pan gasket

MAINTENANCE

- Maintenance-free breather system
- Increased capabilities on oil filter and Stage 1 & 2 fuel filters
- Increased oil pan capacity and oil level gauges

Changes to 2021 L9 Aftertreatment

REGULATORY

RELIABILITY

10 LM SIZE (L9 PRODUCTIVITY)

Larger DOC catalyst while maintaining overall package size.

DOSING SYSTEM

Updated UL2.0 dosing unit with the Next Gen Nozzle

SENSING TECHNOLOGY

Improved RADP Sensor for improved uptime.

10 LX SIZE (L9 PERFORMANCE)

Larger SCR catalyst while maintaining overall package size.

PHASE 35 SOFTWARE

Compatible with next generation CM2450 control module and controls software

L9 | 2021 Maintenance Changes

Maintenance Event	EPA 2017 L9	EPA 2021 L9
Oil and Filter Change	Up to 35K miles / 1000 hours / 18 months (duty cycle dependent)	Up to 50K miles / 1500 hours / 18 months (duty cycle dependent)
Fuel Filter Change	15K miles / 500 hours / 6 months	50K miles / 1500 hours / 18 months
Crankcase Ventilation Filter ("Breather") Change	60K miles / 2000 hours	MAINTENANCE FREE
Valve Lash Adjust	150K miles / 5000 hours	150K miles / 4500 hours
DPF Clean	200K miles / 6500 hours	200K miles / 6500 hours
DEF Filter Change	200K miles / 6500 hours	200K miles / 6500 hours

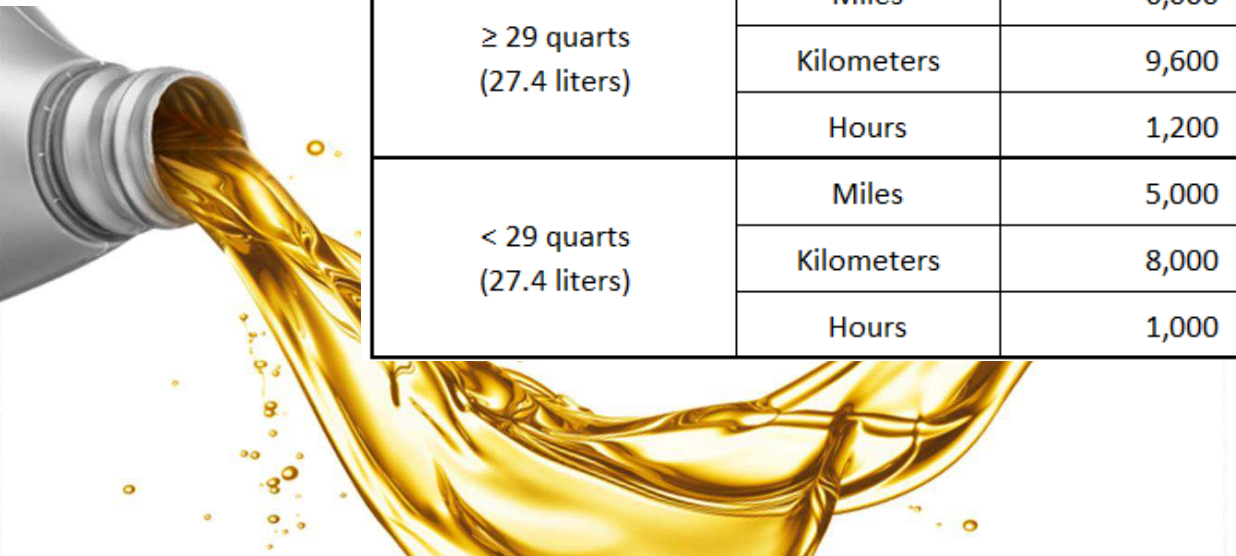
See Owner's Manual for full recommended maintenance schedules

L9 | 2021 Oil Drain Interval Schedule

Engine Change Improvements

- 3 new 27qt pans
- Higher oil level for existing pans
- Oil piston rings with improved coating
- Increased capabilities and size on oil filter

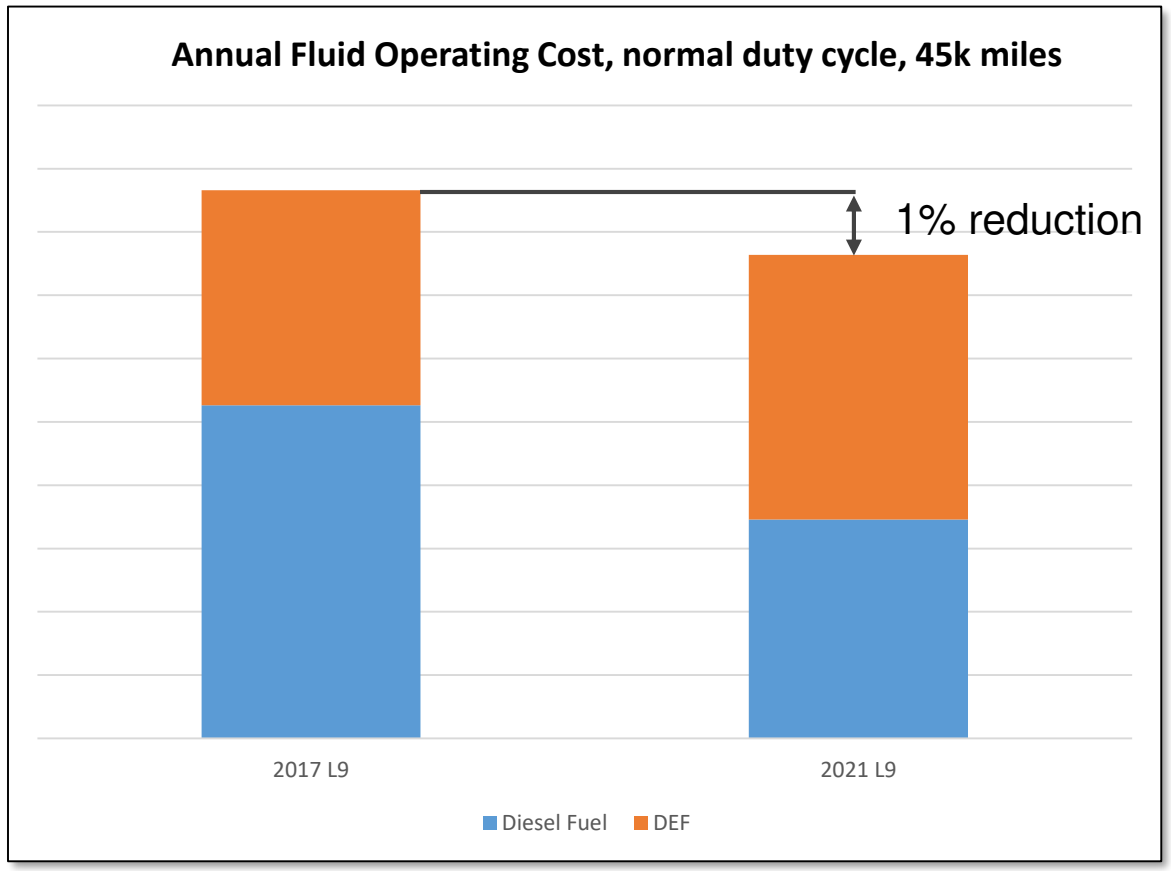
Total Oil Capacity* (Oil Pan + Lube Filter)	Engine Distance or Run Time	Fuel Consumption			
		Extreme Severe < 3 mpg (<1.3km/liter)	Severe 3 - 5 mpg (1.3 - 2.1km/liter)	Normal 5 -8 mpg (2.1 - 3.4 km/liter)	Light > 8 mpg (>3.4 km/liter)
≥ 29 quarts (27.4 liters)	Miles	6,000	15,000	30,000	50,000
	Kilometers	9,600	24,000	48,000	80,000
	Hours	1,200	1,500	1,500	1,500
< 29 quarts (27.4 liters)	Miles	5,000	12,500	25,000	40,000
	Kilometers	8,000	20,000	40,000	64,000
	Hours	1,000	1,200	1,200	1,200

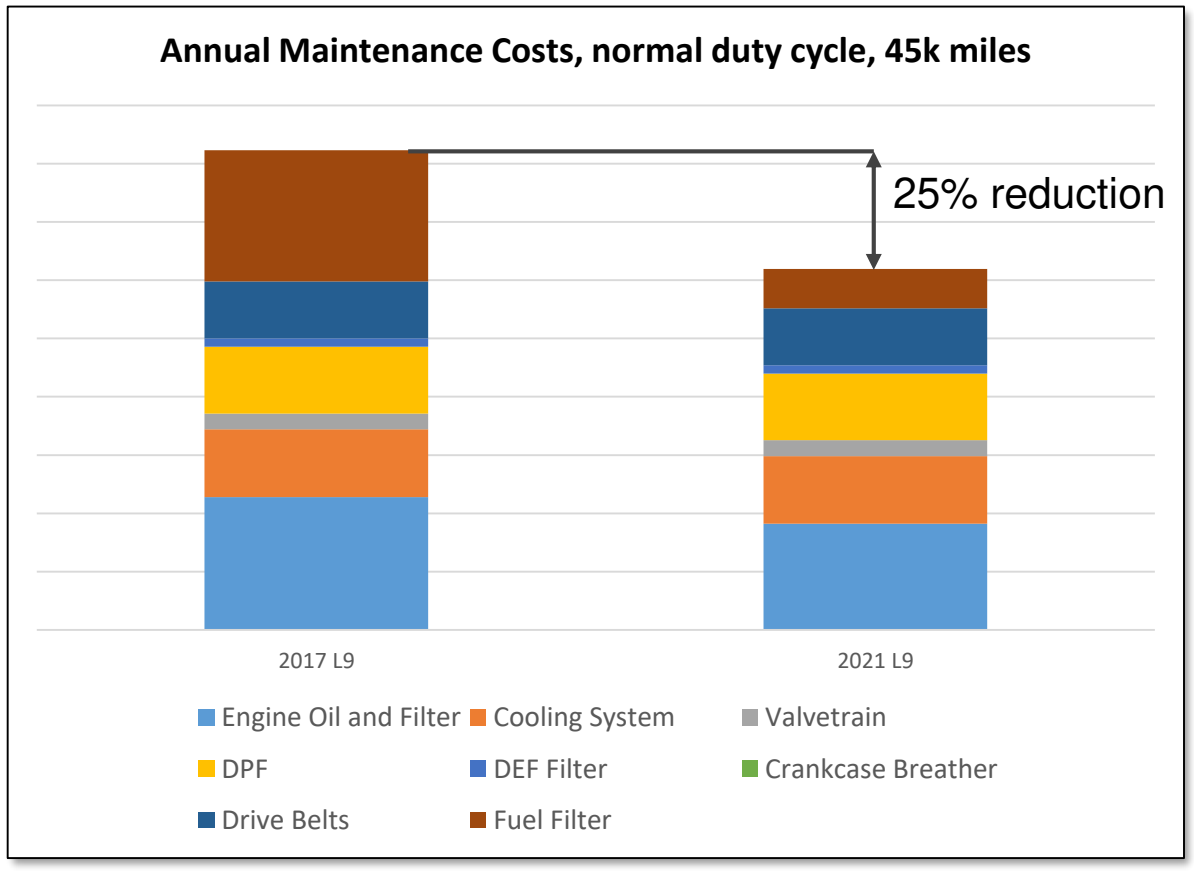


Drain the oil and change the lube filter according to engine distance OR run time from the table OR 18 months, **whichever comes first.**

L9 – Annual Operating Cost Reduction

Compared to the 2017 product, the 2021 L9 provides an additional ~1% annual reduction in fluid costs and reduces maintenance item costs by 25%.





*based on 45,000 annual miles, 1.5% FE improvement, and normal duty cycle (30k mile ODI)

2021 L9 Engine Profile Summary

Differences between the EPA 2017 L9 and EPA 2021 L9 engine profiles.

	EPA 2017	EPA 2021
RATINGS (BY FAMILY)	Productivity: 260-350 hp/720-1150 lb.-ft. Performance: 370-380 hp/1250 lb.-ft.	Productivity: 260-360 hp/860-1150 lb.-ft. Performance: 370-380 hp/1250 lb.-ft.
ENGINE WEIGHT (DRY)	1695 lbs.	Same as 2017
FUEL EFFICIENCY	Base	Productivity: up to 1.5% Performance: up to 3.5%
DEF (% OF FUEL USAGE)	4%	5%
WIRING	Base	Same vehicle Input/Output
DIMENSIONS	Base	Similar to 2017
SOFTWARE	Base	New to meet 2021 requirements
WATER PUMP	Fixed ratio	Improved efficiency; same flow rate as 2017
CONTROL MODULE	CM2350	CM2450 (Same Input/Output)
WARRANTY	2 years/250,000 miles	Same as 2017
MAINTENANCE (DUTY CYCLE DEPENDENT)	Up to 35,000 miles/1000 hours/18 month oil drain interval 15,000 mile/500 hour/6 month fuel filter	Up to 50,000 miles/1500 hours/18 months oil drain interval and fuel filter; Maintenance-free crankcase filter
AFTERTREATMENT	Single Module with UL2.0	Performance improvements with same packaging/interfaces