

# The Cummins EPA 2021 X12

Rev. October 2020

Public

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# Specs overview

## Item

## Specs for EPA 2021 X12

Configuration	Inline 6 Cylinders
Displacement	11.8 L
Bore	5.2 in (132 mm)
Stroke	5.67 in (144 mm)
Compression Ratio	18:3:1
Weight (Dry)	2050 lbs. (930 kg)
HP Range	350 – 500 HP
Torque Range	1250 – 1700 lb-ft.
Clutch Engagement Torque	800 lb-ft.

*If different or additional parameters are needed, let your Cummins representative know*

# Key component & system changes (2018-2021)

■ TCO
■ Uptime
■ Integrated systems
■ Customer-focused

## Turbocharger

- Compressor wheel changes for improved engine breathing

## Base engine

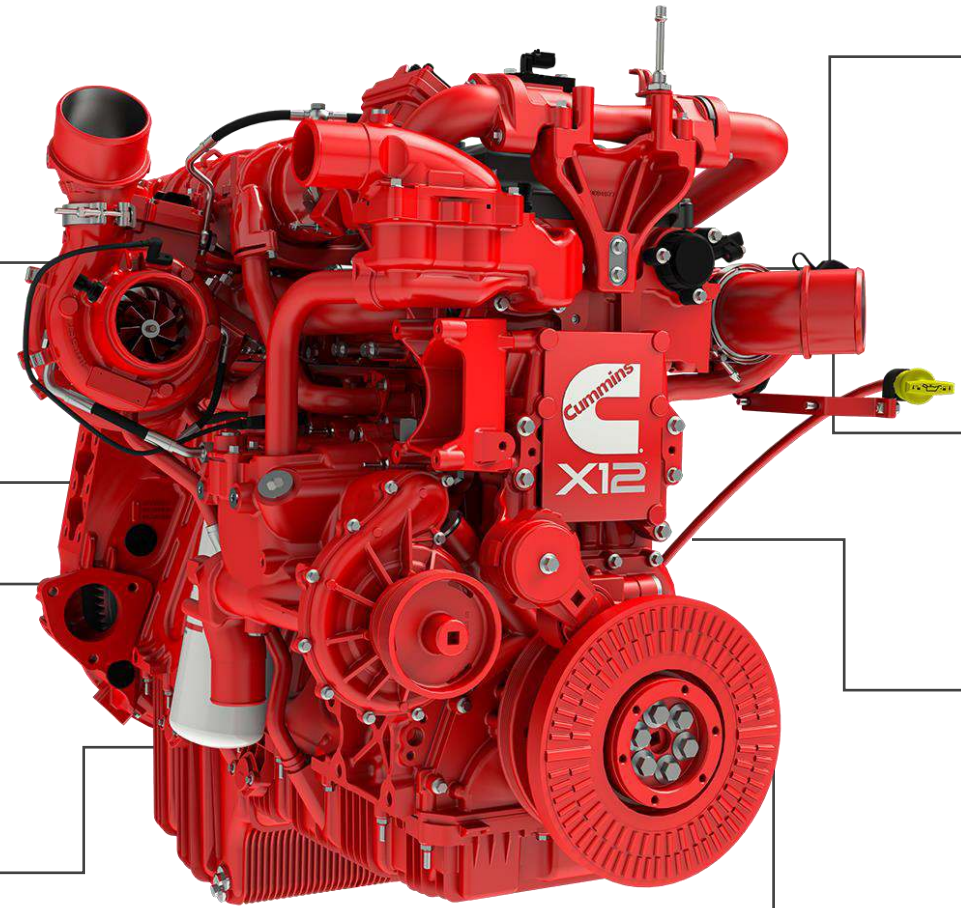
- Block casting and camshaft material changes for enhanced durability
- New camshaft lobe profile for improved engine breathing

## Fuel system

- Longer life fuel filter for extended maintenance interval (remote)

## Powertrain integration

- Paired with Endurant™ HD, enabling EX ratings and powertrain features



## Power cylinder

- Bowl geometry changes for increased compression ratio and combustion efficiency
- Reduced tension oil ring, for decreased engine friction

## Noise improvements

- Air compressor resonator for lower in cab and idling noise.
- Standard and REPTO gear train improvements with lower gear train loading

## Connected features

- New CM2450 with additional memory and new software
- Cummins communication module for onboard connectivity

## Front crank seal + lube pump

- Lube pump, gasket, and front crank seal robustness improvements

# Vocational truck ratings

Key | New since 2018

## The 2018 X12

Engine rating (HP)	Peak torque (lb-ft.)	Peak torque speed (RPM)	Governed speed (RPM)
Vocational			
350	1350	1000	2000
350	1450	1000	2000
365	1250	1000	2100
370	1350	1000	2000
380	1450	1000	2000
410	1450	1000	2000
430	1550	1000	2000
430	1650	1000	2000
455	1550	1000	2000
455	1700	1000	2000
475	1700	1000	2000
500	1695	1000	2000
Refuse			
350	1350	1000	2000
350	1450	1000	2000
365	1250	1000	2100
380	1450	1000	2000

## The 2021 X12

Engine rating (HP)	Peak torque (lb-ft.)	Peak torque speed (RPM)	Governed speed (RPM)
Productivity series (Vocational)			
350	1350	1000	2000
350	1450	1000	2000
365	1250	900	2100
370	1350	1000	2000
380	1450	1000	2000
410	1450	1000	2000
430	1550	1000	2000
430	1650	1000	2000
455	1550	1000	2000
455	1700	1000	2000
475	1700	1000	2000
500	1700	1000	2000
Productivity series (Refuse)			
350	1350	1000	2000
350	1450	1000	2000
365	1250	900	2100
380	1450	1000	2000



# Specialty ratings

Key | New since 2018

## The 2021 X12

Engine rating (HP)	Peak torque (lb-ft.)	Peak torque speed (RPM)	Governed speed (RPM)
<b>Commuter Coach (Only)</b>			
410	1450	1000	2000
<b>Motorcoach (Only)</b>			
410	1450	1000	2000
455	1550	1000	2000
455	1700	1000	2000
<b>Emergency Vehicles</b>			
455	1700	1000	2000
500	1700	1000	2000
<b>Recreational Vehicles</b>			
455	1550	1000	2000
500	1700	1000	2000



# Line / regional haul ratings

Key | New since 2018

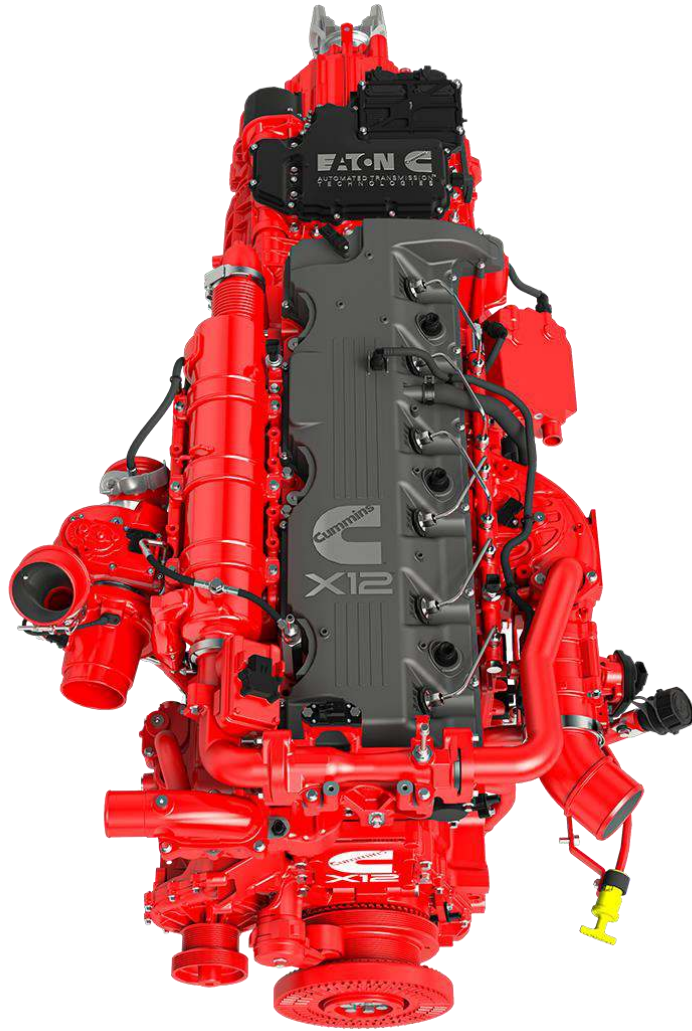
## The 2018 X12

Engine rating (HP)	Peak torque (lb-ft.)	Peak torque speed (RPM)	Governed speed (RPM)
350	1350	1000	1900
370	1350	1000	1900
380	1450	1000	1900
400ST	1550/1700	1000	1900
410	1450	1000	1900
410	1650	1000	1900
410ST	1450/1650	1000	1900
430	1550	1000	1900
430	1650	1000	1900
455	1700	1000	1900
455ST	1550/1700	1000	1900

## The 2021 X12

Engine rating (HP)	Peak torque (lb-ft.)	Peak torque speed (RPM)	Governed speed (RPM)
Efficiency series			
350	1350	1000	1800
370	1350	1000	1800
380	1450	1000	1800
380EX	1450	1000	1800
400ST	1550/1700	1000	1800
400EX	1650	1000	1800
410	1450	1000	1800
410	1450	1000	2000
410	1650	1000	1800
410ST	1450/1650	1000	1800
430	1550	1000	1800
430	1650	1000	1800
455	1700	1000	1800
455ST	1550/1700	1000	1800
455EX	1700	1000	1800

# The X12 and Endurant HD™ powertrain



- The X12 and Endurant HD 12-speed overdrive powertrain is currently available in regional haul applications with the Freightliner Cascadia® day cab (116" BBC) and sleeper cabs (48" and 60")
- In 2021, customers will be able to get EX ratings with this powertrain



*Cascadia sleeper cab and day cabs shown*



# The new **EX** expanded ratings

## X12 and Endurant HD powertrain

### What are EX ratings?

- New, optimized powertrain ratings that offer Cummins' fully expanded suite of electronic features for the best fuel efficiency, performance, drivability and safety.

### What is the benefit of EX ratings?

- With industry-exclusive features, the EX ratings provide superior drivability while delivering up to an additional 1.5% fuel economy improvement from current product. Up to an additional 3% in fuel economy benefits to come through new features released throughout the life of the engine.

### How do I get EX ratings?

- EX ratings require that the engine is paired with the Endurant HD transmission and GPS map data.

The 2021 X12			
Engine rating (HP)	Peak torque (lb-ft.)	Peak torque speed (RPM)	Governed speed (RPM)
Efficiency series			
380EX	1450	1000	1800
400EX	1650	1000	1800
455EX	1700	1000	1800

# A fully optimized powertrain package

## Electronic features with EX ratings

### On-Ramp Boost

- Momentarily unleashes full performance by disabling all fuel economy focused features and augments the shift calibration for greater acceleration

### Predictive Gear Shifting

- Improves trip time and maintains speed uphill by downshifting before the hill where beneficial

### Predictive Engine Braking

- Driver aid for safe load management regardless of terrain
- Reduces the likelihood of an overspeed by turning on engine brakes early, higher level brakes sooner, and commanding a downshift if needed

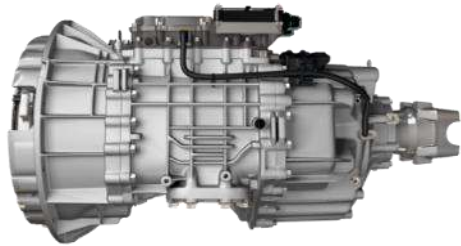
### Dynamic Power

- Consistent trip times and performance
- Leverages look-ahead data to manage power delivery for optimal fuel economy and trip time management

# Complete X12 transmission options

Efficiency series (line / regional haul)

Available with EX

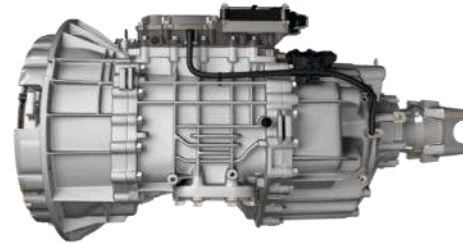


**Endurant™ HD**

ECJV

- Overdrive
- Direct Drive

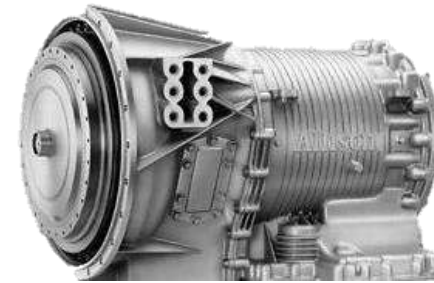
Available with Straight and ST ratings



**Endurant HD**

ECJV

- Overdrive
- Direct Drive



**Allison**

- 3414



**Fuller Manual\***

Eaton

- FAS M
- FR-10
- RT-13
- RT-18

Cascadia offering

\*Includes Fuller Advantage

# Complete X12 transmission options

Productivity series (vocational, refuse, specialty vehicle)

## Available with Refuse



### Allison

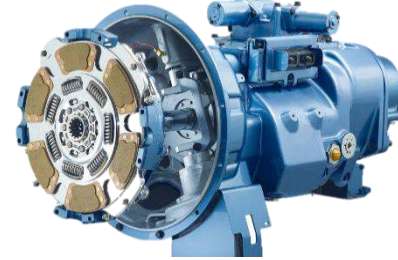
- 3000 Series
- 4000 Series
- 4500 Series

## Available with Vocational



### Allison

- 3000 Series
- 4000 Series\*\*
- 4500 Series
- 4700 Series



### UltraShift PLUS\*

#### Eaton

- FAS C Ratio (phasing out)
- MHP
- MXP
- VXP
- VCS
- VMS



### Fuller Manual\*

#### Eaton

- FAS M
- FR-10
- RT-13
- RT-18
- RT-8LL
- RT-9ALL
- RT-15

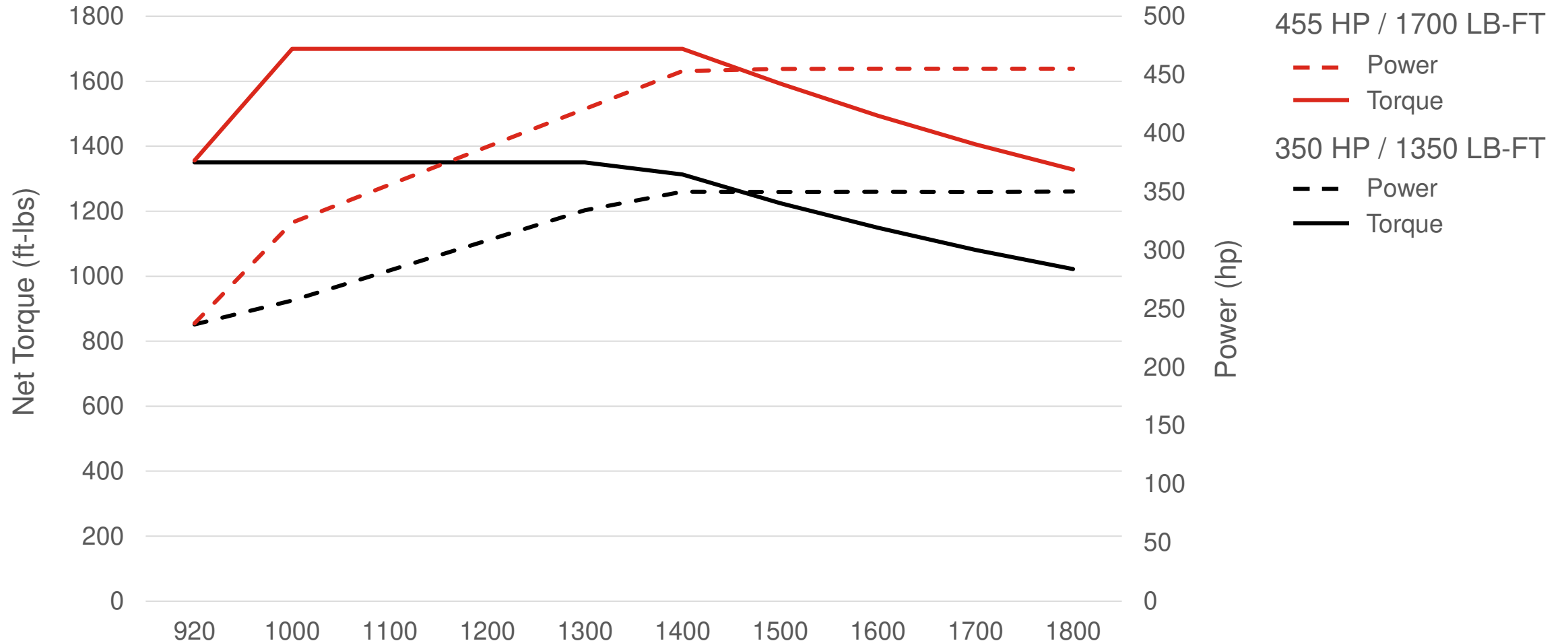
*\*Includes Fuller Advantage*

*\*\*Available for EV / RV as well*



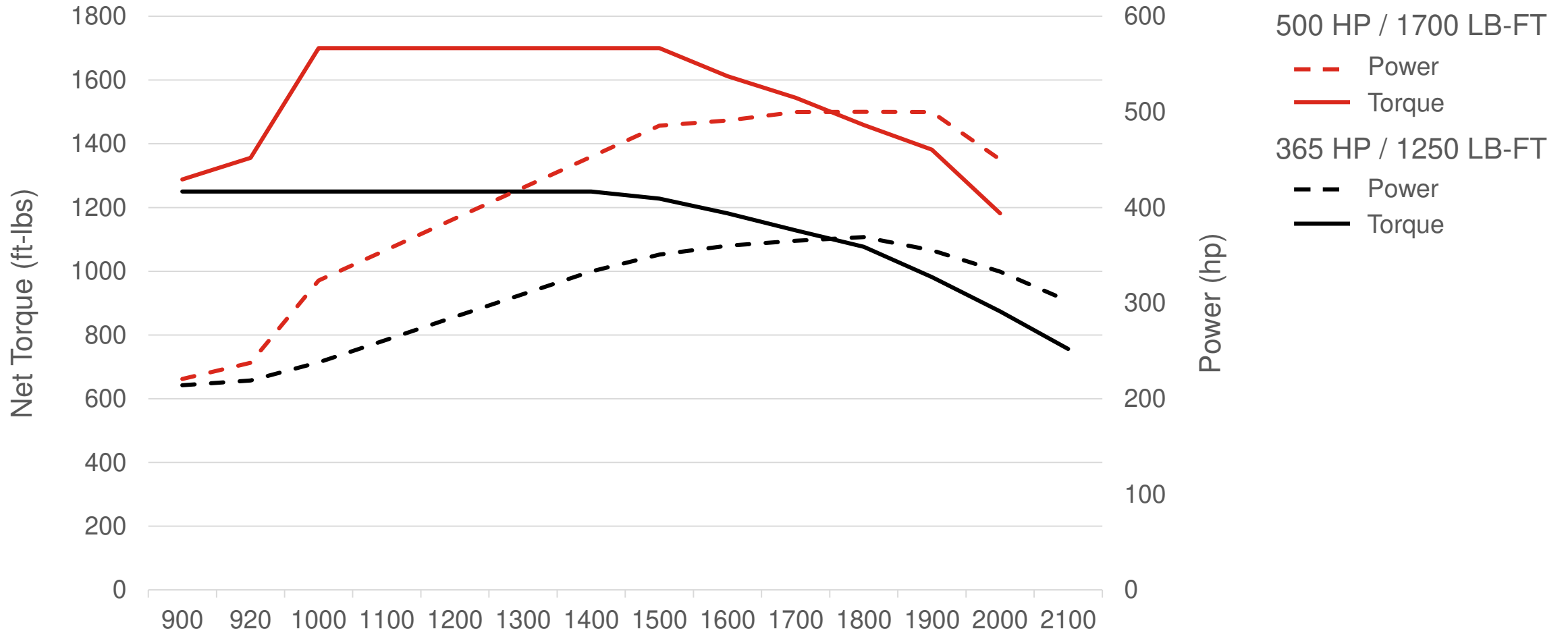
# Torque curves

Efficiency series (line / regional haul)

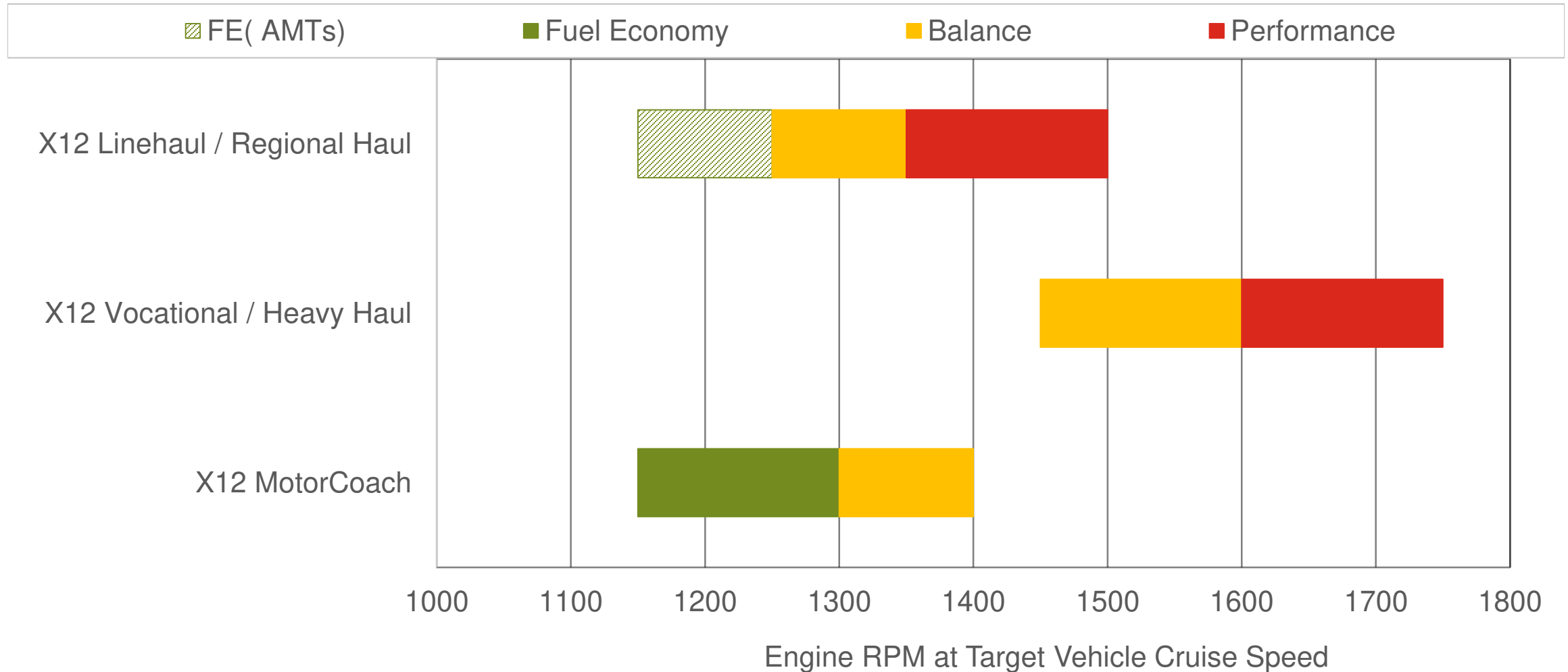


# Torque curves

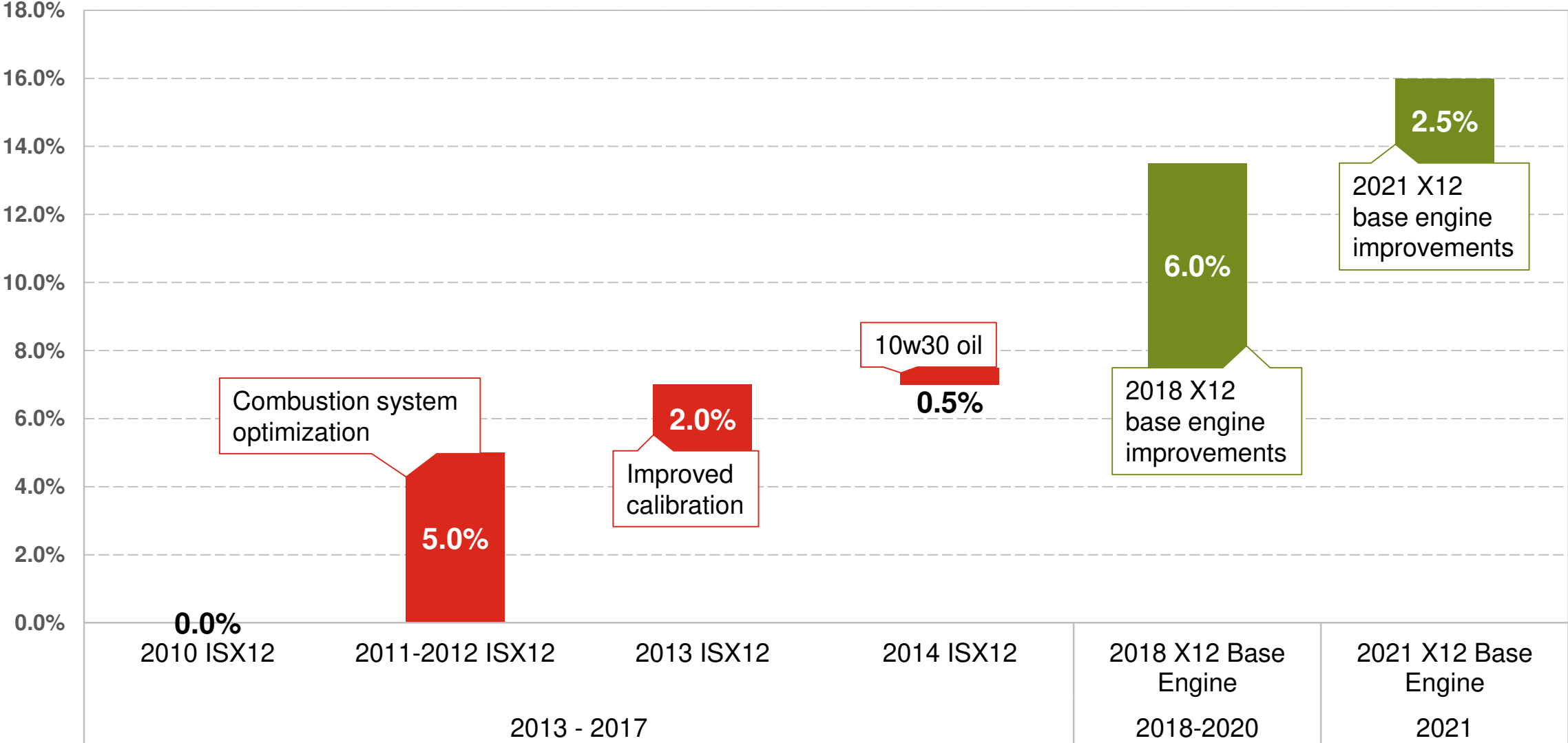
Productivity series (vocational, refuse, specialty vehicle)



# Gearing for your needs

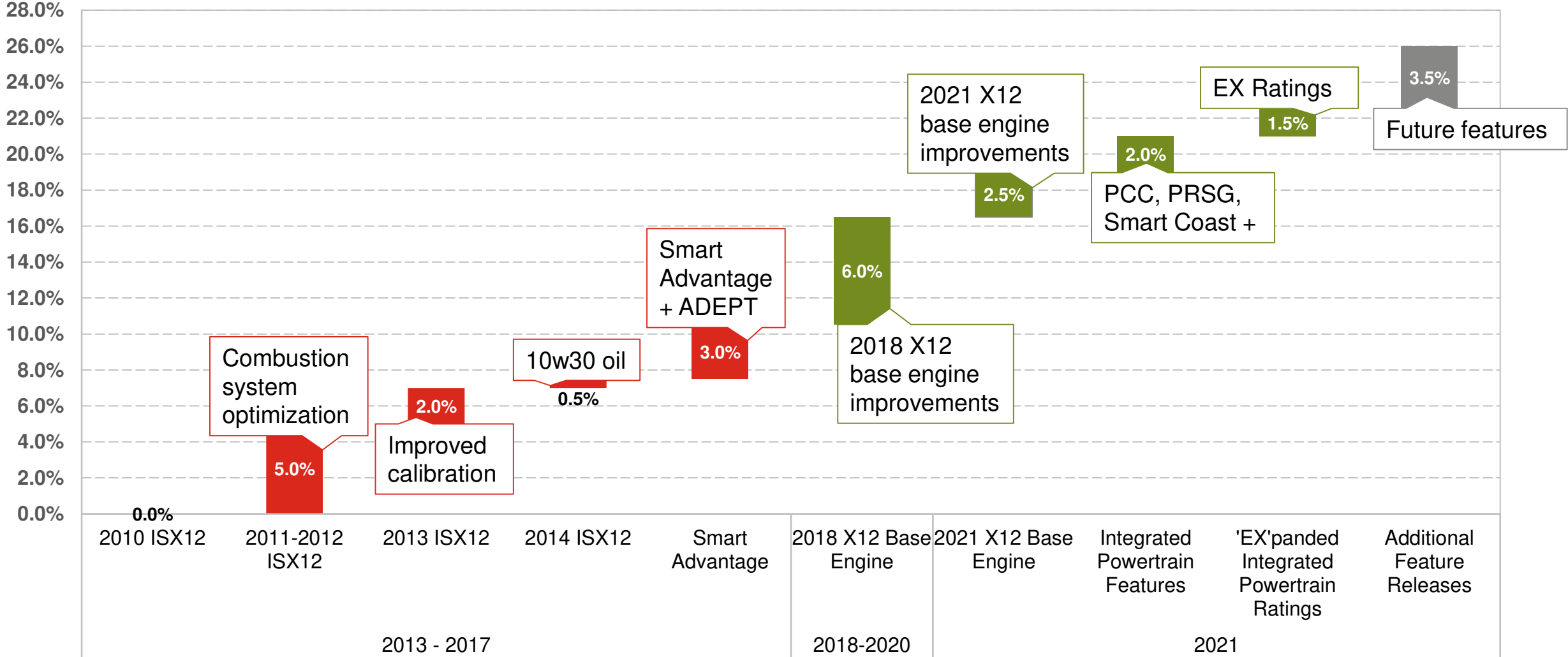


# Vocational fuel economy improvement





# Regional / Line haul fuel economy improvement



# EPA 2021 X12 maintenance intervals

## Fixed X12 Intervals

<u>Item</u>	<u>Miles</u>
DEF	300,000 Mi
Valvetrain	300,000 Mi
Crankcase Breather	N/A
HC Doser	N/A

## X12 Maintenance Intervals by Fuel Consumption

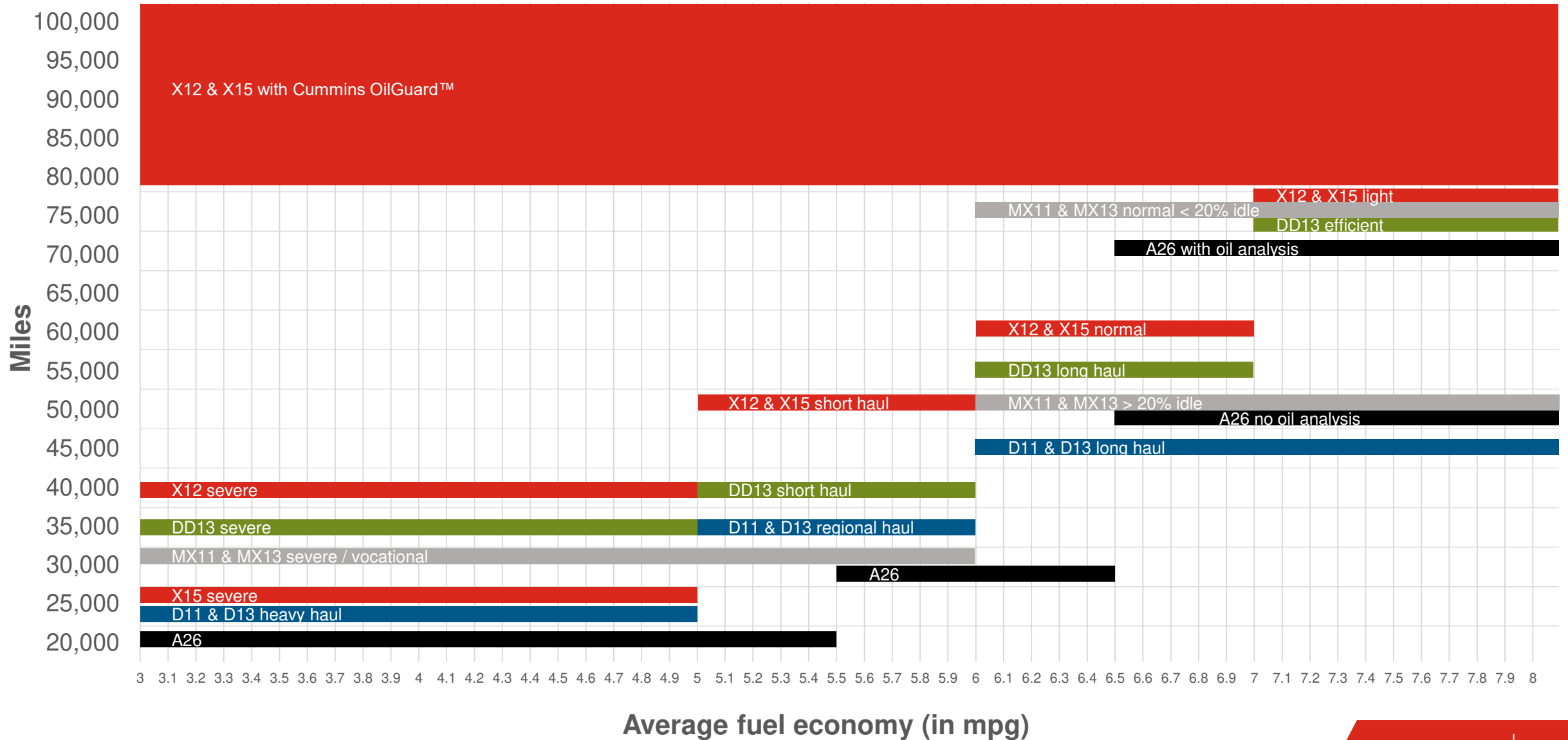
<u>Item</u>	<u>Vocational</u>	<u>Severe</u> 3-4.9 mpg	<u>Shorthaul</u> 5.0 – 5.9 mpg	<u>Normal</u> 6.0 – 6.9 mpg	<u>Light</u> > 7.0 mpg
Oil Drain*	1500 hrs. / 18 months	40,000 Mi 64,000 Km	50,000 Mi 80,000 Km	60,000 Mi 97,000 Km	75,000 Mi 120,000 Km
Oil Drain with Valvoline PB	1500 hrs. / 18 months	45,000 Mi 72,000 Km	55,000 Mi 89,000 Km	65,000 Mi 105,000 Km	80,000 Mi 130,000 Km
Oil Drain with OilGuard™	Extensions avail	Extensions avail	Extensions avail	Extensions avail	Up to 100,000 Mi Up to 160,000 Km
Fuel Filter*	1500 hrs.	30,000 Mi 48,000 Km	40,000 Mi 64,000 Km	50,000 Mi 80,000 Km	60,000 Mi 97,000 Km
Fuel Filter Extensions <sup>1</sup>	---	40,000 Mi 64,000 Km	50,000 Mi 80,000 Km	60,000 Mi 97,000 Km	75,000 Mi 120,000 Km
DPF Ash Maintenance***	12,000 – 16,000 hrs.	300,000 – 400,000 Mi 480,000 – 640,000 Km	300,000 – 400,000 Mi 480,000 – 640,000 Km	400,000 – 600,000 Mi 640,000 – 960,000 Km	600,000 – 800,000 mi 960,000 – 1,300,000 Km

\*If combined percent idle time plus power takeoff (PTO) time is greater than 40% for Shorthaul, Normal, or Light intervals, use the next lower drain interval. Less than 3 MPG ODI and Fuel Filter at 4,500 miles

<sup>1</sup>A remote mounted fuel filter is recommended to achieve these intervals

\*\*\*Cummins recommends using Cummins Remanufactured DPF at the DPF ash maintenance interval. Users can experience extended DPF ash maintenance using the DPF maintenance fault lamp (FC5383)

# Best total cost of ownership



# Changes to 2021 X12 aftertreatment



REGULATORY



RELIABILITY

## DOSING SYSTEM



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

## SENSING TECHNOLOGY



Improved RADP\* Sensor for improved uptime.



## PHASE 35 SOFTWARE



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

## DUAL VANE MIXER



New Dual Vane Mixer for improved performance

*\*RADP = Robust Analog Dual Pressure*



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