

PACCAR MX-13

PACCAR MX-11



COMPETITIVE COMPARISON

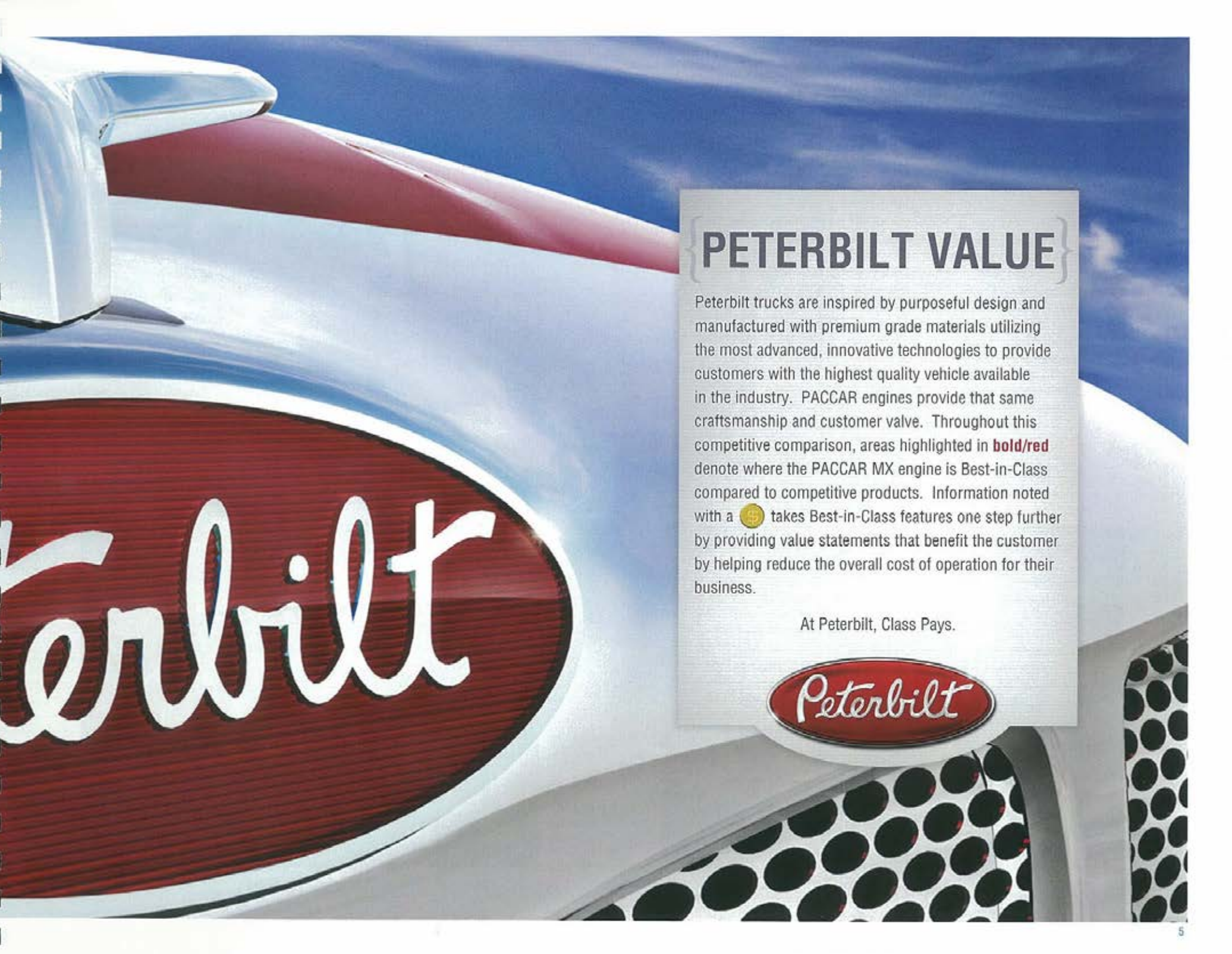


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** The information contained in this Competitive Comparison is based on publicly available data and is current and accurate as of the time of publication. For Internal use only.*





PETERBILT VALUE

Peterbilt trucks are inspired by purposeful design and manufactured with premium grade materials utilizing the most advanced, innovative technologies to provide customers with the highest quality vehicle available in the industry. PACCAR engines provide that same craftsmanship and customer value. Throughout this competitive comparison, areas highlighted in **bold/red** denote where the PACCAR MX engine is Best-in-Class compared to competitive products. Information noted with a 💰 takes Best-in-Class features one step further by providing value statements that benefit the customer by helping reduce the overall cost of operation for their business.

At Peterbilt, Class Pays.



TARGET MARKET SEGMENTS



Line Haul



Heavy Haul



Vocational



PACCAR MX-13

PACCAR MX-13

The 12.9-liter PACCAR MX-13 engine is characterized by its combination of proven technologies and state-of-the-art innovations that lead to superior fuel economy. Broad power offerings including a 500 horsepower rating with 1,850 lb-ft of torque along with best-in-class weight provides a powerful combination. The PACCAR MX-13 engine is designed to meet the demands of both line haul and vocational heavy-duty truck applications. The PACCAR MX-13 is manufactured in a state-of-the-art facility in Columbus, Mississippi and is the newest engine platform available in the industry.



PACCAR
MX-13

Displacement (Liters)	12.9
Performance	
Horsepower	380 – 500
kW	284 – 373
Torque	
Ft-Lbs.	1,450 – 1,850
Nm	1,960 – 2,500
Bore x Stroke (mm)	130 x 162
Weight	
Lbs.	2,600
Kg	1,182
Introduction Date	2005 – EU 2010 – NA



PETERBILT VALUE

The PACCAR MX-13 Engine has the best power-to-weight ratio among its competitors providing customers with more payload with the power they want. A 400 lb. weight savings can mean up to a \$1,200 advantage in increased payload.



Detroit Diesel
DD15



Detroit Diesel
DD16



Volvo
D16



Cummins
ISX15

14.8

15.6

16.1

14.9

455 – 505

475 – 600

500 – 600

400 – 475

340 – 377

354 – 448

373 – 448

299 – 354

1,550 – 1,750

1,850 – 2,050

1,850 – 2,050

1,450 – 1,750

2,100 – 2,350

1,700 – 2,780

1,700 – 2,780

1,960 – 2,780

139 x 163

139 x 171

144 x 165

137 x 169

2,763

2,880

3,134

2,964

1,256

1,309

1,425

1,347

2009

2010

2009

1999


PACCAR MX-13

- ▶ The larger cam shaft of the MX-13 is **extremely durable**, improving reliability and contributing to its **B-10 design life** and offering a lower overall cost of ownership.
- ▶ The MX-13 uses Compacted Graphite Iron (CGI) to create the **head and block**. CGI is **75% stronger** than gray iron alone, allows for a lighter design **saving weight** and provides **200% better thermal dissipation** improving overall fuel efficiency. CGI is the same material used by NASCAR teams to optimize the performance of their race cars.
- ▶ The MX-13 utilizes **forced fracture technology** for both the **main bearing and connecting rods** to create a **stronger clamping force** and increase the shear strength versus bolted connections.
- ▶ The MX-13 crankshaft uses no counterweights **reducing vibration** and leading to **quicker acceleration**.
- ▶ The MX-13 features an **integrated retarder brake** providing 3 levels of braking power with a lighter design using less parts.



PACCAR
MX-13

Upper Mechanical Comparisons

Head Material  CGI

Lower Mechanical Comparisons

Block Material  CGI

Main Bearing Force Fracture

Crankshaft No Counterweight

Connecting Rod Force Fracture

Retarder

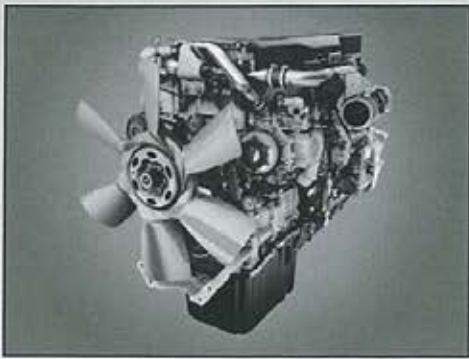
Integrated or Added On Integrated Retarder Brake

Max Engine Brake Rating (bhp) 505



PETERBILT VALUE

The PACCAR MX-13 Engine is the only engine in its class that uses Compacted Graphite Iron for both the head and the block contributing to its class-leading power-to-weight ratio.



Detroit Diesel
DD15



Detroit Diesel
DD16



Volvo
D16



Cummins
ISX15

CGI

CGI

Gray Iron

Gray Iron

Gray Iron

Gray Iron

Gray Iron

Gray Iron

Machined

Machined

Machined

Machined

Counterweight

Counterweight

Counterweight

Counterweight

Force Fracture

Force Fracture

Force Fracture

Force Fracture

Integrated Jake

Integrated Jake

Optional Integrated

ISX Intebrake

546

546

600

600

PACCAR MX-13

- ▶ The PACCAR MX-13 features a high pressure, common fuel rail system delivering **precisely controlled**, 36,000 psi injection pressure to deliver the **highest fuel economy**.
- ▶ The MX-13's composite oil pan virtually **eliminates all drumming noise** typically seen with metal, rigidly-mounted oil pans. This is one of the many reasons why customers say the PACCAR MX-13 is one of the **quietest engines in the industry**.
- ▶ **Integrated air passages** in the head and block ensure cool lubrication is delivered to needed areas throughout the engine. It's just one of the many features that contribute to the MX-13's **superior fuel economy**.



PACCAR
MX-13

Fuel System Comparisons

Fuel System	Common Rail
Injection Pressure	36,000 psi
Pumps	2 Independent

Lube/Cooling Systems

Oil Pan	Composite
Oil Sump Capacity (U.S. Gallons)	11.5
Turbo	Sliding Nozzle VGT



PETERBILT VALUE

Two independent fuel pumps ensure our customers will always have the ability to return home even if one pump stops functioning. Other OEM's customers could be left stranded. Tow truck and down time costs can reach the \$1,000's.



Detroit Diesel
DD15



Detroit Diesel
DD16



Volvo
D16



Cummins
ISX15

Adv Common Rail
30,450 psi
Single

Adv Common Rail
30,450 psi
Single

Common Rail
35,000 psi
Single

Cummins XPI™
32,300 psi
Single

Composite
11.75
Electronic Waste Gate Asymmetric

Rigid
11.75
Electronic Waste Gate Asymmetric

Rigid
11.1
Sliding Nozzle VGT

Rigid
14
Sliding Nozzle VGT

PACCAR MX-13

- ▶ The PACCAR MX-13 is the **only engine with a B-10 life** rating meaning at least **90% of all MX-13's will reach 1,000,000 miles without a major overhaul**. For its competitors, 50% of engines will need a major overhaul.
- ▶ The MX-13 is offered with a **competitive standard warranty** with the ability to upgrade to the **longest coverage in the industry**. Aftermarket warranties are also available for the 2nd owner.



PACCAR
MX-13

Engine	Oil Change Interval	Valve Adjustment (Initial/Regular)	DEF Filter	Total Cost
PACCAR MX-13	60	180/300	300	\$ 6,623
Cummins ISX15	35	250/500	300	\$ 10,447
Detroit Diesel DD15	50	100/500	250	\$ 9,176
Volvo D16	45	150/300	150	\$ 8,528

Intervals in 1,000 miles


Engine Life

Rating	B10
Mileage	1,000,000

Basic Limited Warranty

Engine	2 Years, 250,000 Miles
Injectors	2 Years, 250,000 Miles
Major Components	Up to 84 Months, 700,000 Miles

Maintenance Cost at 600,000 Miles and \$110 Labor

Total Cost (\$) for Linehaul, <20% Idle	\$6,623
Increase Versus MX-13 (\$) 	N/A

Oil Service Interval

Miles – Linehaul, <20% Idle	60,000
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PETERBILT VALUE

The MX-13 offers the lowest cost of ownership due to longer oil change intervals, superior reliability and lower overall maintenance costs. The MX-13 is lower by up to \$5,300 versus other competitors for a 600,000 mile service life.



Detroit Diesel
DD15



Detroit Diesel
DD16



Volvo
D16



Cummins
ISX15

B50

1,200,000

2 Years, Unlimited Miles

2 Years, 200,000 Miles

Up to 60 Months, 500,000 Miles

9,176

2,553

50,000

B50

1,200,000

2 Years, Unlimited Miles

2 Years, 200,000 Miles

Up to 60 Months, 500,000 Miles

9,176

2,553

50,000

B50

1,000,000

2 Years, 250,000 Miles

2 Years, 200,000 Miles

N/A

8,528

1,905

35,000

B50

1,200,000

2 Years, 250,000 Miles

2 Years, 200,000 Miles

N/A

10,447

5,358

40,000

TARGET MARKET SEGMENTS



Dump



Mixer



Refuse



Construction



Regional Haul



Bulk Haul



PACCAR MX-11

PACCAR MX-11

The 10.8-liter PACCAR MX-11 engine is characterized by its combination of proven technologies and state-of-the-art innovations that lead to superior fuel economy. Broad power offerings including a 430 horsepower rating with 1,550 lb-ft of torque along with best-in-class weight provides a powerful combination. The new PACCAR MX-11 engine's common rail system, with injection pressures to 36,000 psi, helps achieve the lowest possible fuel consumption, emission and noise levels. The PACCAR MX-11 engine is designed to meet the demands of pickup and delivery, line haul and vocational heavy-duty truck applications. The PACCAR MX-11 is manufactured in a state-of-the-art facility in Columbus, Mississippi and is the newest engine platform available in the industry.



PACCAR
MX-11

Displacement (Liters)	10.8
Performance	
Horsepower	335 – 430
kW	217 – 329
Torque	
Ft-Lbs.	1,150 – 1,550
Nm	1,550 – 2,100
Bore x Stroke (mm)	123 x 152
Weight	
Lbs.	2,200
Kg	1,000
Introduction Date	2013 – EU 2016 – NA



PETERBILT VALUE

The PACCAR MX-11 Engine has the best power-to-weight ratio among its competitors providing customers with more payload with the power they want. A 430 lb. weight savings can mean up to a \$1,300 advantage in increased payload.



Cummins
ISX12



Detroit Diesel
DD13



Volvo
D13



International
N13

11.9	12.8	12.8	12.4
310 – 425	350 – 470	375 – 500	410 – 450
280 – 317	260 – 351	280 – 373	306 – 336
1,150 – 1,650	1,250 – 1,650	1,450 – 1,850	1,450 – 1,700
1,560 – 2,250	1,700 – 2,250	1,960 – 2,500	1,960 – 2,300
132 x 156	132 x 156	131 x 158	126 x 166
2,640	2,540	2,676	2,400
1,200	1,155	1,216	1,091
2010	2009	2008	2009


PACCAR MX-11

- ▶ The MX-11 uses Compacted Graphite Iron (CGI) to create the **head and block**. CGI is **75% stronger** than gray iron alone, allows for a lighter design **saving weight** and provides **200% better thermal dissipation** improving overall fuel efficiency. CGI is the same material used by NASCAR teams to optimize the performance of their race cars.
- ▶ The MX-11 utilizes **forced fracture technology** for both the **main bearing and connecting rods** to create a **stronger clamping force** and increase the shear strength versus bolted connections.
- ▶ The MX-11's crankshaft provides significant weight savings and features a balanced center countershaft for high reliability.
- ▶ The MX-11 features an **integrated retarder brake** providing 3 levels of braking power with a lighter design using less parts.




PACCAR
MX-11

Upper Mechanical Comparisons

Head Material  CGI

Lower Mechanical Comparisons

Block Material  CGI

Main Bearing Force Fracture

Crankshaft Counterweight

Connecting Rod Force Fracture

Retarder

Integrated or Added On Integrated Retarder Brake

Max Engine Brake Rating (bhp) 427



PETERBILT VALUE

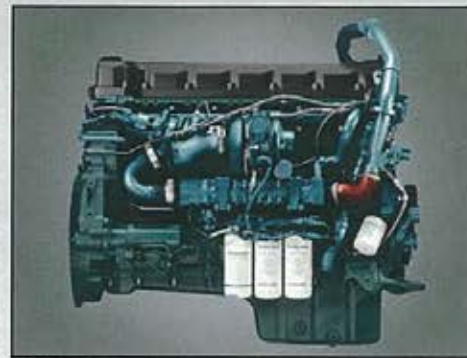
The PACCAR MX-11 Engine is the only engine in its class that uses Compacted Graphite Iron for both the head and the block contributing to its class leading power-to-weight ratio.



Cummins
ISX12



Detroit Diesel
DD13



Volvo
D13



International
N13

Gray Iron

Gray Iron

Gray Iron

Gray Iron

Gray Iron

Gray Iron

Gray Iron

CGI

Machined

Machined

Machined

Force Fracture

Counterweight

Counterweight

Counterweight

Counterweight

Force Fracture

Force Fracture

Machined

Force Fracture

ISX Intebrake

Integrated Jake

Optional Integrated

Retarder Brake

311

546

450

300

PACCAR MX-11

- ▶ The PACCAR MX-11 features a high pressure, common fuel rail system delivering **precisely controlled**, 36,000 psi injection pressure to deliver the **highest fuel economy**.
- ▶ The MX-11's composite oil pan virtually **eliminates all drumming noise** typically seen with metal, rigidly-mounted oil pans. This is one of the many reasons why customers say the PACCAR MX-11 is one of the **quietest engines in the industry**.
- ▶ **Integrated air passages** in the head and block ensure cool lubrication is delivered to needed areas throughout the engine. It's just one of the many features that contribute to the MX-11's **superior fuel economy**.



PACCAR
MX-11

Fuel System Comparisons

Fuel System	Common Rail
Injection Pressure	36,260 psi
Pumps	2 Independent

Lube/Cooling Systems

Oil Pan	Composite
Oil Sump Capacity (U.S. Gallons)	9.2
Turbo	Sliding Nozzle VGT



PETERBILT VALUE

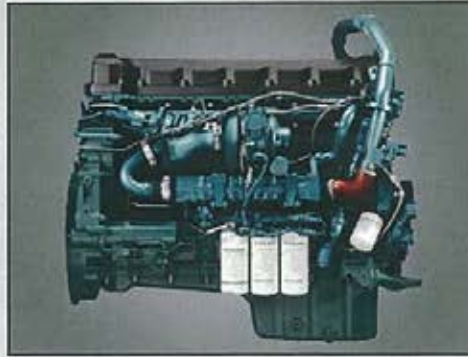
Two independent fuel pumps ensure our customers will always have the ability to return home even if one pump stops functioning. Other OEM's customers could be left stranded. Tow truck and down time costs can reach the \$1,000's.



Cummins
ISX12



Detroit Diesel
DD13



Volvo
D13



International
N13

Adv Common Rail	Common Rail	Common Rail	Common Rail
32,300 psi	30,450 psi	35,000 psi	32,300 psi
Single	Single	Single	Single
Rigid	Rigid	Rigid	Rigid
12	9.8	9.5	10.5
Sliding Nozzle VGT	Single Asymmetric	Sliding Nozzle VGT	Borg Warner Twin Series (Non VG)

PACCAR MX-11

- ▶ The PACCAR MX-11 is the **only engine with a B-10 life rating** meaning at least **90% of all MX-13's will reach 1,000,000 miles without a major overhaul**. For its competitors, 50% of engines will need a major overhaul.
- ▶ The MX-11 is offered with a **competitive standard warranty** with the ability to upgrade to the **longest coverage in the industry**. Aftermarket warranties are also available for the 2nd owner.

Engine	Oil Change Interval	Valve Adjustment (Initial/Regular)	DEF Filter	Total Cost
PACCAR MX-11	60	180/300	300	\$ 6,382
Cummins ISX12	35	250/500	300	\$ 11,709
Detroit Diesel DD13	50	100/500	250	\$ 9,327
Volvo D13	45	150/300	150	\$ 8,886



PACCAR MX-11


Engine Life

Rating	B10
Mileage	1,000,000

Basic Limited Warranty

Engine	2 Years, 250,000 Miles
Injectors	2 Years, 250,000 Miles
Major Components	Up to 84 Months, 700,000 Miles

Maintenance Cost at 600,000 Miles and \$110 Labor

Total Cost (\$) for Linehaul, <20% Idle	\$6,623
Increase Versus MX-11 (\$) 	N/A

Oil Service Interval

Miles – Linehaul, <20% Idle	60,000
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PETERBILT VALUE

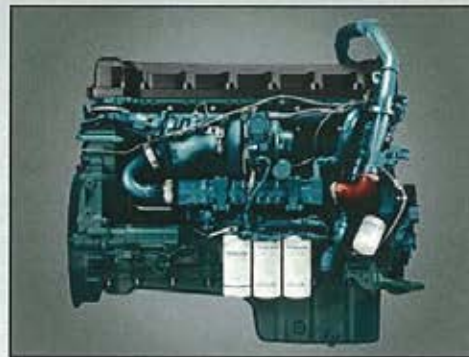
The MX-11 offers the lowest cost of ownership due to longer oil change intervals, superior reliability and lower overall maintenance costs. The MX-11 is lower by up to \$5,300 versus other competitors for a 600,000 mile service life.



Cummins
ISX12



Detroit Diesel
DD13



Volvo
D13



International
N13

B50

1,000,000

2 Years, 250,000 Miles

2 Years, 250,000 Miles

N/A

\$11,709

\$5,327

35,000

B50

1,500,000

2 Years, Unlimited Miles

2 Years, 200,000 Miles

Up to 60 Months, 500,000 Miles

\$9,327

\$2,945

50,000

B50

1,000,000

2 Years, 250,000 Miles

2 Years, 200,000 Miles

N/A

\$8,886

\$2,504

35,000

B50

1,200,000

2 Years, Unlimited Miles

2 Years, Unlimited Miles

N/A

N/A

N/A

40,000

