

CRANKSHAFT COMPARISON



Volvo D13

International®
MaxxForce® 11/13*

Volvo D13 vs. International® MaxxForce® 11/13

This document compares crankshafts from the Volvo D13 12.8L engine and the International® MaxxForce® 11/13 (10.5L & 12.4L) engines.*

*The crankshaft photos depict the crankshaft from the 10.5L engine. All critical machined crankshaft surfaces are exactly identical between the 10.5L crankshaft and the 12.4L crankshaft except for the connecting rod offset, which is greater on the 12.4L engine due to its longer stroke.



INTERNATIONAL® MAXXFORCE® 11/13

VOLVO D13

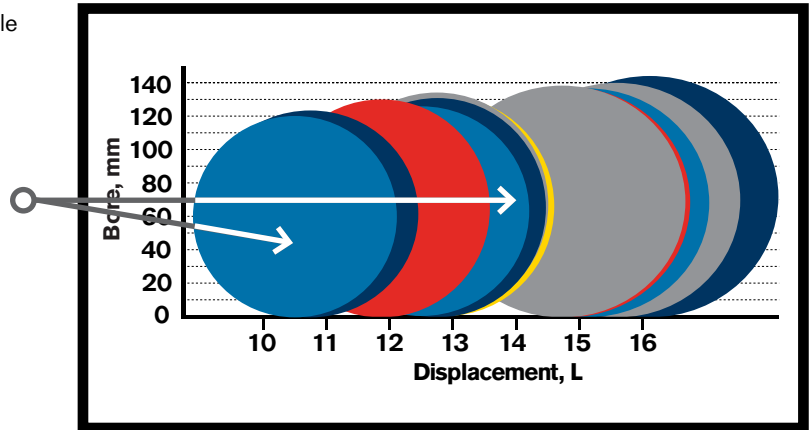
	Displacement	Crankshaft Length	Bore	Stroke	Connecting Rod Offset
MaxxForce® 11	10.5L 642 in ³	1010.5 mm 39.8 in.	120 mm 4.72 in.	155 mm 6.10 in.	77.5 mm 3.05 in.
MaxxForce® 13	12.4L 758 in ³	1010.5 mm 39.8 in.	126 mm 4.96 in.	166 mm 6.54 in.	83 mm 3.27 in.
Volvo D13	12.8L 780 in ³	1150.5 mm 45.3 in.	131 mm 5.16 in.	158 mm 6.22 in.	79 mm 3.11 in.

BORE/STROKE COMPARISON

International® calls its 11 and 13L engines “Big-Bore,” while the industry generally uses that term for displacements of 14L and higher.

Yet the International® “Big-Bore” engines have a relatively small bore. The 12.4L MaxxForce® 13 has a bore only 3 mm greater than the Volvo D11 with 10.8L displacement. And its stroke is 1 mm greater than the Volvo D16, the largest displacement truck engine sold in North America!

MaxxForce® 11/13’s very low bore-to-stroke ratio means less bearing area, greater piston speed, and more piston travel per mile compared to other engines of the same displacement with same vehicle specs.



	Displacement, Liters	Bore, mm	Stroke, mm	Bore/Stroke Ratio
MaxxForce® 11	10.5	120	155	0.77
Volvo D11	10.8	123	152	0.81
Cummins ISX11.9	11.9	130	150	0.87
MaxxForce® 13	12.4	126	166	0.76
Volvo D13	12.8	131	158	0.83
Detroit DD13	12.8	132	156	0.85
PACCAR MX	12.9	130	162	0.80
Detroit DD15	14.8	139	163	0.85
Cummins ISX	14.9	137	169	0.81
MaxxForce® 15	15.1	137	171	0.80
Detroit DD16	15.6	139	171	0.81
Volvo D16	16.1	144	165	0.87

BEARING COMPARISON

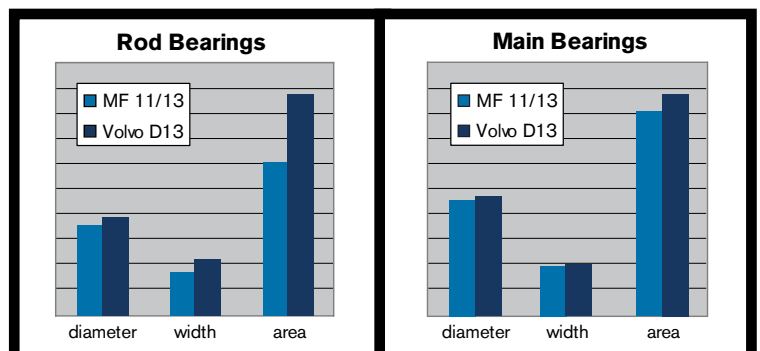
International®’s small bore design means a shorter crankshaft with less room for bearing width, meaning less bearing area. Bearing area is directly related to bearing wear and the useful life of the engine.



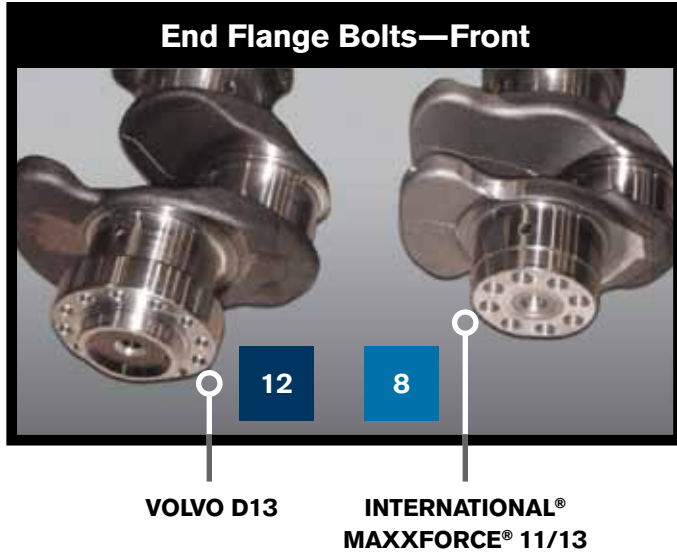
INTERNATIONAL®
MAXXFORCE® 11/13

VOLVO D13

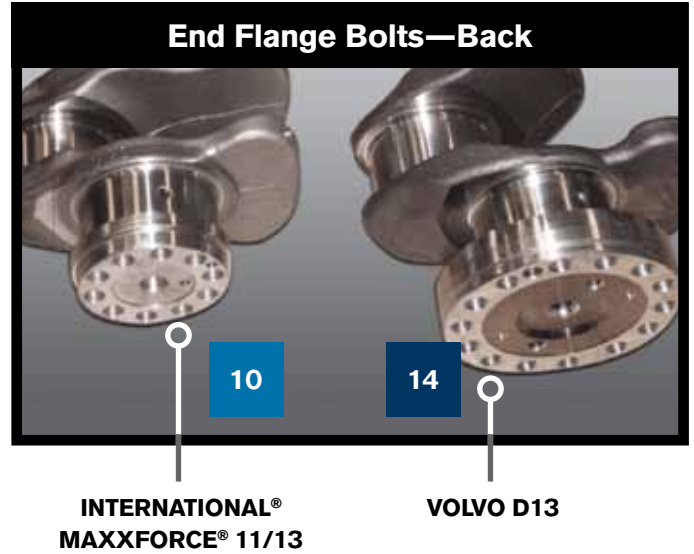
		Diameter	Width	Area
Main Journal Bearing	Volvo D13	108 mm 4.25"	47 mm 1.85"	50.8 cm ² 7.87 in ²
	MaxxForce® 11/13	104 mm 4.09"	45 mm 1.77"	46.8 cm ² 7.25 in ²
Connecting Rod Bearing	Volvo D13	99 mm 3.90"	57 mm 2.24"	56.4 cm ² 8.74 in ²
	MaxxForce® 11/13	90 mm 3.54"	43.5 mm 1.71"	39.1 cm ² 6.07 in ²



END FLANGE COMPARISON



The Volvo D13 crankshaft has larger end flanges that accommodate more bolts per end flange. The improved clamping load provides a stronger joint and helps to keep everything tight.



**MaxxForce® 13 drives
475 hp/1700 lb-ft
through this flange**

**Volvo D13 drives
500 hp/1750 lb-ft
through this flange**

CONN ROD COMPARISON



International®'s small bore design means a shorter crankshaft with less room for bearing width. Volvo D13's 57 mm connecting rod bearing width allows four bolts per connecting rod, while MaxxForce®'s 43.5 mm bearing width allows only 2 bolts per rod.



VOLVO D13 • 57 MM WIDE • 4 BOLTS

