

**X62****External forces and moments**

Crankshaft type : Full crank pin

Rating R1+ : 2660 kW/Cyl. / 103 rpm / Standard Tier2-EO Tuning

<b>Engine Type</b>	<b>4X62</b>	<b>5X62</b>	<b>6X62</b>	<b>7X62</b>	<b>8X62</b>
Speed	103 rpm	103 rpm	103 rpm	103 rpm	103 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	133	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	660	214	0	130	419
M1h [±kNm]	746	233	0	136	472
M2v [±kNm]	2127	2648	1842	535	0
M2v *) [±kNm]	739	951	1067	-	-
M4v [±kNm]	0	17	128	363	148
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1340	0	0	0	0
Ord.5 [±kNm]	0	1520	0	0	0
Ord.6 [±kNm]	0	0	1119	0	0
Ord.7 [±kNm]	0	0	0	882	0
Ord.8 [±kNm]	296	0	0	0	592
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	122	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	14	0	22	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	528	168	0	100	335
Ord.2 [±kNm]	238	296	206	60	0
Ord.3 [±kNm]	48	168	303	332	425
Ord.4 [±kNm]	0	56	429	1220	496
Ord.5 [±kNm]	129	0	0	92	1152
Ord.6 [±kNm]	195	22	0	13	0
Ord.7 [±kNm]	50	175	0	0	32
Ord.8 [±kNm]	0	94	66	5	0
Ord.9 [±kNm]	15	5	97	11	10
Ord.10 [±kNm]	28	0	24	69	0
Ord.11 [±kNm]	2	1	0	16	21
Ord.12 [±kNm]	0	6	0	1	5
<b>Torque variation</b> [±kNm]	1456	1557	1132	891	602

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

# X62

## External forces and moments

Crankshaft type : Full crank pin

Rating R1+ : 2660 kW/Cyl. / 103 rpm / Delta Tier2-EO Tuning

Engine Type	4X62	5X62	6X62	7X62	8X62
Speed	103 rpm	103 rpm	103 rpm	103 rpm	103 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	133	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	660	214	0	130	419
M1h [±kNm]	746	233	0	136	472
M2v [±kNm]	2127	2648	1842	535	0
M2v *) [±kNm]	739	951	1067	-	-
M4v [±kNm]	0	17	128	363	148
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1288	0	0	0	0
Ord.5 [±kNm]	0	1457	0	0	0
Ord.6 [±kNm]	0	0	1056	0	0
Ord.7 [±kNm]	0	0	0	829	0
Ord.8 [±kNm]	276	0	0	0	553
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	114	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	20	0	30	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	524	166	0	99	332
Ord.2 [±kNm]	258	321	224	65	0
Ord.3 [±kNm]	53	186	336	367	471
Ord.4 [±kNm]	0	54	416	1182	480
Ord.5 [±kNm]	124	0	0	88	1106
Ord.6 [±kNm]	183	21	0	12	0
Ord.7 [±kNm]	47	165	0	0	30
Ord.8 [±kNm]	0	87	61	5	0
Ord.9 [±kNm]	14	5	90	10	9
Ord.10 [±kNm]	26	0	23	64	0
Ord.11 [±kNm]	2	1	0	15	19
Ord.12 [±kNm]	0	9	0	2	7
<b>Torque variation</b> [±kNm]	1390	1487	1067	838	563

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

# X62

## External forces and moments

Crankshaft type : Full crank pin

Rating R1+ : 2660 kW/Cyl. / 103 rpm / LowLoad Tier2-EO Tuning

Engine Type		4X62	5X62	6X62	7X62	8X62
Speed		103 rpm	103 rpm	103 rpm	103 rpm	103 rpm
Power		10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type		FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>						
<b>Free Forces</b>						
F1v	[±kN]	0	0	0	0	0
F1h	[±kN]	0	0	0	0	0
F2v	[±kN]	0	0	0	0	0
F4v	[±kN]	133	0	0	0	0
<b>External Moments</b>						
M1v	[±kNm]	660	214	0	130	419
M1h	[±kNm]	746	233	0	136	472
M2v	[±kNm]	2127	2648	1842	535	0
M2v *)	[±kNm]	739	951	1067	-	-
M4v	[±kNm]	0	17	128	363	148
<b>Lateral H-Moments M<sub>LH</sub></b>						
Ord.1	[±kNm]	0	0	0	0	0
Ord.2	[±kNm]	0	0	0	0	0
Ord.3	[±kNm]	0	0	0	0	0
Ord.4	[±kNm]	1289	0	0	0	0
Ord.5	[±kNm]	0	1458	0	0	0
Ord.6	[±kNm]	0	0	1056	0	0
Ord.7	[±kNm]	0	0	0	829	0
Ord.8	[±kNm]	276	0	0	0	552
Ord.9	[±kNm]	0	0	0	0	0
Ord.10	[±kNm]	0	114	0	0	0
Ord.11	[±kNm]	0	0	0	0	0
Ord.12	[±kNm]	20	0	31	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>						
Ord.1	[±kNm]	525	167	0	99	333
Ord.2	[±kNm]	257	321	223	65	0
Ord.3	[±kNm]	53	186	336	368	471
Ord.4	[±kNm]	0	54	416	1183	481
Ord.5	[±kNm]	124	0	0	88	1106
Ord.6	[±kNm]	183	21	0	12	0
Ord.7	[±kNm]	47	165	0	0	30
Ord.8	[±kNm]	0	87	61	5	0
Ord.9	[±kNm]	14	4	90	10	9
Ord.10	[±kNm]	26	0	23	64	0
Ord.11	[±kNm]	2	1	0	15	19
Ord.12	[±kNm]	0	9	0	2	7
<b>Torque variation</b>	[±kNm]	1391	1488	1067	838	563

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

**X62****External forces and moments**

Crankshaft type : Full crank pin

Rating R1+ : 2660 kW/Cyl. / 103 rpm / DeltaBypass Tier2-EO Tuning

<b>Engine Type</b>	<b>4X62</b>	<b>5X62</b>	<b>6X62</b>	<b>7X62</b>	<b>8X62</b>
Speed	103 rpm	103 rpm	103 rpm	103 rpm	103 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	133	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	660	214	0	130	419
M1h [±kNm]	746	233	0	136	472
M2v [±kNm]	2127	2648	1842	535	0
M2v *) [±kNm]	739	951	1067	-	-
M4v [±kNm]	0	17	128	363	148
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1300	0	0	0	0
Ord.5 [±kNm]	0	1473	0	0	0
Ord.6 [±kNm]	0	0	1073	0	0
Ord.7 [±kNm]	0	0	0	846	0
Ord.8 [±kNm]	285	0	0	0	569
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	121	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	22	0	33	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	525	167	0	99	333
Ord.2 [±kNm]	254	317	220	64	0
Ord.3 [±kNm]	51	181	327	357	458
Ord.4 [±kNm]	0	54	419	1191	484
Ord.5 [±kNm]	125	0	0	89	1117
Ord.6 [±kNm]	187	21	0	12	0
Ord.7 [±kNm]	48	168	0	0	30
Ord.8 [±kNm]	0	90	63	5	0
Ord.9 [±kNm]	15	5	94	11	9
Ord.10 [±kNm]	27	0	24	68	0
Ord.11 [±kNm]	3	1	0	18	23
Ord.12 [±kNm]	0	9	0	2	7
<b>Torque variation</b> [±kNm]	1404	1502	1082	852	577

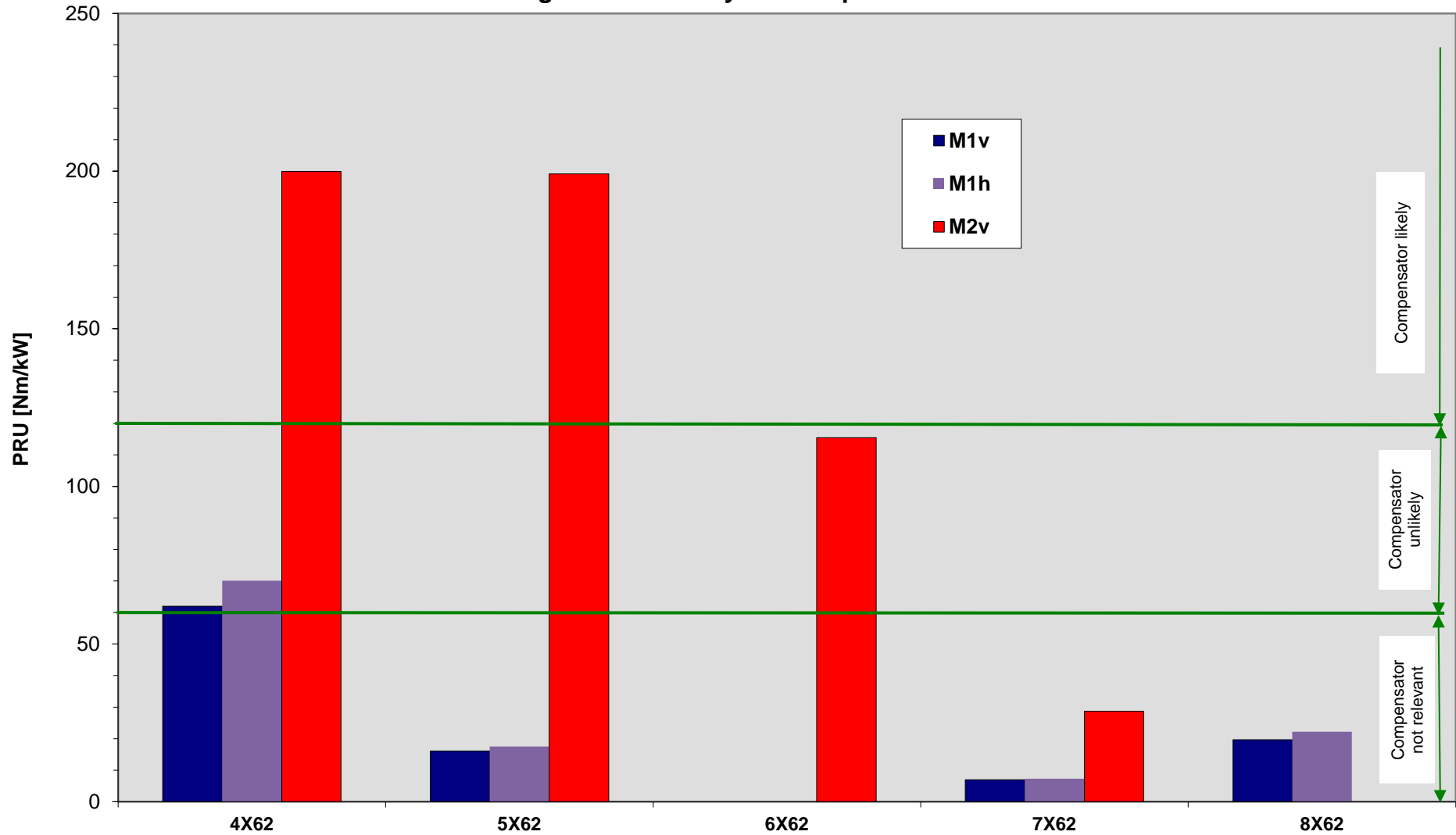
\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

### 4-8 X62 / Free external mass moments Power Related Unbalance (PRU) Rating R1 2660 kW/Cyl @ 103 rpm

Crankshaft type: Full crank pin



# X62

## External forces and moments

Crankshaft type : Full crank pin

Rating R1 : 2660 kW/Cyl. / 97 rpm / Standard Tier2-EO Tuning

Engine Type	4X62	5X62	6X62	7X62	8X62
Speed	97 rpm	97 rpm	97 rpm	97 rpm	97 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	118	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	586	189	0	115	372
M1h [±kNm]	661	206	0	120	419
M2v [±kNm]	1887	2349	1634	474	0
M2v *) [±kNm]	656	844	947	-	-
M4v [±kNm]	0	15	113	322	131
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1409	0	0	0	0
Ord.5 [±kNm]	0	1520	0	0	0
Ord.6 [±kNm]	0	0	1109	0	0
Ord.7 [±kNm]	0	0	0	864	0
Ord.8 [±kNm]	284	0	0	0	568
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	110	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	4	0	7	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	521	166	0	99	331
Ord.2 [±kNm]	109	136	94	27	0
Ord.3 [±kNm]	53	185	335	367	470
Ord.4 [±kNm]	0	56	433	1230	500
Ord.5 [±kNm]	128	0	0	91	1138
Ord.6 [±kNm]	192	22	0	13	0
Ord.7 [±kNm]	49	172	0	0	31
Ord.8 [±kNm]	0	91	63	5	0
Ord.9 [±kNm]	13	4	85	9	8
Ord.10 [±kNm]	26	0	22	64	0
Ord.11 [±kNm]	2	1	0	14	18
Ord.12 [±kNm]	0	4	0	1	3
<b>Torque variation</b> [±kNm]	1517	1558	1123	875	577

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

# X62

## External forces and moments

Crankshaft type : Full crank pin

Rating R1 : 2660 kW/Cyl. / 97 rpm / Delta Tier2-EO Tuning

Engine Type	4X62	5X62	6X62	7X62	8X62
Speed	97 rpm	97 rpm	97 rpm	97 rpm	97 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	118	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	586	189	0	115	372
M1h [±kNm]	661	206	0	120	419
M2v [±kNm]	1887	2349	1634	474	0
M2v *) [±kNm]	656	844	947	-	-
M4v [±kNm]	0	15	113	322	131
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1357	0	0	0	0
Ord.5 [±kNm]	0	1459	0	0	0
Ord.6 [±kNm]	0	0	1050	0	0
Ord.7 [±kNm]	0	0	0	816	0
Ord.8 [±kNm]	266	0	0	0	532
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	103	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	12	0	17	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	518	164	0	98	328
Ord.2 [±kNm]	129	160	112	32	0
Ord.3 [±kNm]	54	189	341	373	479
Ord.4 [±kNm]	0	54	420	1193	485
Ord.5 [±kNm]	123	0	0	87	1094
Ord.6 [±kNm]	181	20	0	12	0
Ord.7 [±kNm]	46	163	0	0	29
Ord.8 [±kNm]	0	84	59	5	0
Ord.9 [±kNm]	12	4	79	9	8
Ord.10 [±kNm]	24	0	21	60	0
Ord.11 [±kNm]	1	0	0	10	13
Ord.12 [±kNm]	0	7	0	1	5
<b>Torque variation</b> [±kNm]	1452	1490	1060	826	542

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

# X62

## External forces and moments

Crankshaft type : Full crank pin

Rating R1 : 2660 kW/Cyl. / 97 rpm / LowLoad Tier2-EO Tuning

Engine Type	4X62	5X62	6X62	7X62	8X62
Speed	97 rpm	97 rpm	97 rpm	97 rpm	97 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	118	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	586	189	0	115	372
M1h [±kNm]	661	206	0	120	419
M2v [±kNm]	1887	2349	1634	474	0
M2v *) [±kNm]	656	844	947	-	-
M4v [±kNm]	0	15	113	322	131
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1357	0	0	0	0
Ord.5 [±kNm]	0	1460	0	0	0
Ord.6 [±kNm]	0	0	1049	0	0
Ord.7 [±kNm]	0	0	0	816	0
Ord.8 [±kNm]	266	0	0	0	532
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	103	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	12	0	18	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	518	164	0	98	328
Ord.2 [±kNm]	129	160	111	32	0
Ord.3 [±kNm]	54	189	342	374	480
Ord.4 [±kNm]	0	54	420	1193	485
Ord.5 [±kNm]	123	0	0	87	1094
Ord.6 [±kNm]	181	20	0	12	0
Ord.7 [±kNm]	46	162	0	0	29
Ord.8 [±kNm]	0	84	59	5	0
Ord.9 [±kNm]	12	4	79	9	8
Ord.10 [±kNm]	24	0	21	60	0
Ord.11 [±kNm]	1	0	0	10	13
Ord.12 [±kNm]	0	7	0	1	5
<b>Torque variation</b> [±kNm]	1452	1491	1060	825	542

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]



# X62

## External forces and moments

Crankshaft type : Full crank pin

Rating R1 : 2660 kW/Cyl. / 97 rpm / DeltaBypass Tier2-EO Tuning

Engine Type	4X62	5X62	6X62	7X62	8X62
Speed	97 rpm	97 rpm	97 rpm	97 rpm	97 rpm
Power	10640 kW	13300 kW	15960 kW	18620 kW	21280 kW
Crank type	FCV2	FCV2	FCV2	FCV2	FCV1
<b>Massmoments / Forces</b>					
<b>Free Forces</b>					
F1v [±kN]	0	0	0	0	0
F1h [±kN]	0	0	0	0	0
F2v [±kN]	0	0	0	0	0
F4v [±kN]	118	0	0	0	0
<b>External Moments</b>					
M1v [±kNm]	586	189	0	115	372
M1h [±kNm]	661	206	0	120	419
M2v [±kNm]	1887	2349	1634	474	0
M2v *) [±kNm]	656	844	947	-	-
M4v [±kNm]	0	15	113	322	131
<b>Lateral H-Moments M<sub>LH</sub></b>					
Ord.1 [±kNm]	0	0	0	0	0
Ord.2 [±kNm]	0	0	0	0	0
Ord.3 [±kNm]	0	0	0	0	0
Ord.4 [±kNm]	1368	0	0	0	0
Ord.5 [±kNm]	0	1474	0	0	0
Ord.6 [±kNm]	0	0	1067	0	0
Ord.7 [±kNm]	0	0	0	834	0
Ord.8 [±kNm]	275	0	0	0	550
Ord.9 [±kNm]	0	0	0	0	0
Ord.10 [±kNm]	0	110	0	0	0
Ord.11 [±kNm]	0	0	0	0	0
Ord.12 [±kNm]	13	0	19	0	0
<b>Lateral X-Moments M<sub>LX</sub></b>					
Ord.1 [±kNm]	518	164	0	98	328
Ord.2 [±kNm]	124	155	108	31	0
Ord.3 [±kNm]	53	186	336	368	471
Ord.4 [±kNm]	0	55	423	1201	488
Ord.5 [±kNm]	124	0	0	88	1105
Ord.6 [±kNm]	184	21	0	12	0
Ord.7 [±kNm]	47	166	0	0	30
Ord.8 [±kNm]	0	87	61	5	0
Ord.9 [±kNm]	13	4	84	9	8
Ord.10 [±kNm]	26	0	22	64	0
Ord.11 [±kNm]	2	1	0	13	17
Ord.12 [±kNm]	0	6	0	1	5
<b>Torque variation</b> [±kNm]	1466	1505	1076	841	557

\*) with iELBA applied at FE + DE

The values for other engine ratings are available on request

The resulting lateral guide force can be calculated as follows: FL=MLH x 0.25 [kN]

**4-8 X62 / Free external mass moments**  
**Power Related Unbalance (PRU)**  
 Rating R1 2660 kW/Cyl @ 97 rpm

Crankshaft type: Full crank pin

