PERFORMANCE DATA [RPM01542]

APRIL 21, 2023

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Perf No: DM9449 **Change Level:** 06

General Heat Rejection Sound Emissions Regulatory Cross Reference Supplementary Data Perf Param Ref

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SALES MODEL:	C32	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	2,300
MACHINE SALES MODEL:		**PEAK TORQUE SPEED (RPM):**	1,600
ENGINE POWER (BKW):	1,193.0	**ASPIRATION:**	TA
PEAK TORQUE (NM):	6,100.0	**AFTERCOOLER TYPE:**	SWAC
COMPRESSION RATIO:	15	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, AC
RATING LEVEL:	D-RATING (INTERMITTENT DUTY)	**AFTERCOOLER TEMP (C):**	32
PUMP QUANTITY:	2	**JACKET WATER TEMP (C):**	85
FUEL TYPE:	DIESEL	**TURBO CONFIGURATION:**	PARALLEL
MANIFOLD TYPE:	WET	**TURBO QUANTITY:**	2
GOVERNOR TYPE:	ADEM4	**TURBOCHARGER MODEL:**	S510WG-1.04 VOW
ELECTRONICS TYPE:	ADEM4	**CERTIFICATION YEAR:**	2013
IGNITION TYPE:	CI	**PISTON SPD @ RATED ENG SPD (M/SEC):**	12.4
INJECTOR TYPE:	EUI		
REF EXH STACK DIAMETER (MM):	203		
MAX OPERATING ALTITUDE (M):	300		

INDUSTRY	SUB INDUSTRY	APPLICATION
MARINE	PLEASURE CRAFT	MARINE PROPULSION
MARINE	GOVERNMENT	MARINE PROPULSION

General Performance Data Top

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)
RPM	BKW	NM	KPA	G/BKW-HR	G/BKW-HR	L/HR	L/HR
2,300	1,193	4,953	1,939	229.7	225.3	322.4	316.2
2,200	1,193	5,178	2,027	226.8	222.5	318.3	312.3
2,100	1,193	5,425	2,124	220.8	216.6	309.9	304.0
2,000	1,185	5,658	2,215	215.7	211.6	300.7	295.0
1,900	1,167	5,865	2,296	211.5	207.5	290.4	284.8
1,800	1,137	6,032	2,361	207.9	203.9	278.1	272.8
1,700	1,085	6,095	2,386	205.5	201.6	262.3	257.3
1,600	1,026	6,123	2,397	204.5	200.6	246.9	242.2
1,500	919	5,851	2,290	205.5	201.6	222.2	218.0
1,400	756	5,157	2,019	210.2	206.2	186.9	183.4
1,300	636	4,672	1,829	214.0	209.9	160.1	157.0
1,200	557	4,432	1,735	219.7	215.6	144.0	141.3
1,100	465	4,037	1,580	225.6	221.3	123.4	121.1
1,000	375	3,581	1,402	230.0	225.6	101.5	99.5
800	251	2,996	1,173	232.8	228.4	68.8	67.4
700	149	2,033	796	217.6	213.4	38.1	37.4
600	109	1,735	679	223.2	218.9	28.6	28.1

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
RPM	BKW	KPA	DEG C	DEG C	KPA	DEG C	KPA	DEG C
2,300	1,193	226.2	56.8	614.3	255.8	416.6	232	199.8
2,200	1,193	229.0	55.8	615.9	247.4	415.0	234	198.9

ENGINE SPEED	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
2,100	1,193	228.2	54.7	609.2	235.9	410.8	233	195.7
2,000	1,185	227.6	53.8	603.9	225.4	406.9	232	193.1
1,900	1,167	224.2	52.8	600.0	212.5	403.8	228	189.9
1,800	1,137	219.6	51.9	597.6	200.5	400.8	223	187.1
1,700	1,085	209.1	50.1	608.2	183.9	412.1	212	182.5
1,600	1,026	196.2	48.2	622.9	165.0	426.4	199	176.9
1,500	919	168.9	45.9	630.8	133.9	438.4	172	161.4
1,400	756	124.0	41.3	630.0	91.0	446.9	126	134.0
1,300	636	91.9	39.0	640.7	64.9	463.9	93	112.5
1,200	557	72.0	38.7	662.3	49.7	483.8	73	98.2
1,100	465	54.3	39.0	657.3	36.9	489.6	55	84.1
1,000	375	36.7	37.5	610.1	24.4	436.0	37	66.9
800	251	21.5	38.4	509.4	13.0	358.3	22	51.9
700	149	10.4	39.3	355.6	7.5	270.2	11	40.7
600	109	7.1	39.7	302.8	5.4	213.6	7	36.3

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
2,300	1,193	97.1	234.1	6,781.0	7,055.0	92.7	84.4
2,200	1,193	94.8	227.5	6,599.1	6,870.0	90.3	82.1
2,100	1,193	91.6	217.7	6,351.2	6,614.7	86.9	79.0
2,000	1,185	88.5	208.2	6,108.5	6,364.1	83.6	75.9
1,900	1,167	84.6	197.5	5,811.7	6,058.2	79.7	72.3
1,800	1,137	80.1	185.6	5,484.3	5,720.7	75.2	68.1
1,700	1,085	74.1	174.3	5,048.4	5,271.6	69.5	62.8
1,600	1,026	67.8	162.1	4,604.6	4,814.6	63.3	57.1
1,500	919	59.0	143.0	3,984.9	4,174.0	54.9	49.3
1,400	756	46.5	113.8	3,126.6	3,285.5	43.2	38.5
1,300	636	37.2	93.4	2,495.8	2,631.8	34.6	30.7
1,200	557	31.1	80.0	2,073.7	2,196.1	28.9	25.4
1,100	465	25.8	66.4	1,719.6	1,826.6	23.8	20.8
1,000	375	20.5	49.9	1,368.9	1,455.0	19.2	16.7
800	251	14.5	31.2	967.2	1,025.6	13.5	11.8
700	149	11.2	20.7	752.6	784.9	10.4	9.4
600	109	7.7	14.0	517.9	542.3	7.8	7.1

PROP DEMAND CURVE P

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)
RPM	BKW	NM	KPA	G/BKW-HR	G/BKW-HR	L/HR	L/HR
2,300	1,193	4,953	1,939	229.7	225.3	322.4	316.2
2,200	1,044	4,532	1,774	230.6	226.2	283.2	277.8
2,100	908	4,129	1,616	234.6	230.1	250.6	245.8
2,000	784	3,745	1,466	220.0	215.8	203.1	199.2
1,900	673	3,380	1,323	215.4	211.3	170.5	167.2
1,800	572	3,034	1,188	220.6	216.4	148.4	145.6
1,700	482	2,706	1,059	216.3	212.2	122.6	120.2
1,600	402	2,397	938	211.5	207.5	99.9	98.0
1,500	331	2,107	825	212.3	208.2	82.6	81.1
1,400	269	1,835	718	213.5	209.5	67.6	66.3
1,300	215	1,582	619	215.0	210.9	54.5	53.4
1,200	169	1,348	528	217.9	213.8	43.4	42.6
1,100	131	1,133	444	223.9	219.6	34.4	33.7
1,000	98.1	936	367	231.6	227.2	26.7	26.2
800	50.2	599	235	251.8	247.0	14.9	14.6
700	33.6	459	180	269.3	264.2	10.7	10.5
600	21.2	337	132	297.8	292.2	7.4	7.3

PROP DEMAND CURVE P

ENGINE SPEED	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
RPM	BKW	KPA	DEG C	DEG C	KPA	DEG C	KPA	DEG C
2,300	1,193	226.2	56.8	614.3	255.8	416.6	232	199.8
2,200	1,044	223.6	55.3	572.5	243.9	377.4	229	195.1
2,100	908	216.2	53.8	544.0	227.5	357.1	221	187.8
2,000	784	182.5	49.1	485.4	181.8	320.4	187	164.7
1,900	673	150.6	45.0	467.9	140.9	316.5	154	144.9
1,800	572	124.6	42.5	464.5	113.0	324.1	128	129.0
1,700	482	85.8	39.7	453.9	77.6	328.0	88	101.8
1,600	402	54.3	37.7	434.2	50.1	324.1	56	78.7
1,500	331	37.7	36.8	405.5	36.0	311.4	39	64.9
1,400	269	25.9	36.4	369.5	26.1	291.9	27	54.2
1,300	215	17.9	36.6	331.0	19.3	267.0	19	46.3
1,200	169	12.4	37.0	292.9	14.4	241.8	13	40.7
1,100	131	8.3	37.1	254.8	10.5	214.4	9	36.8
1,000	98.1	5.5	37.3	221.0	7.6	192.5	6	34.2
800	50.2	2.3	38.4	171.3	4.0	165.8	3	30.9
700	33.6	1.3	39.0	148.1	2.7	144.6	2	29.8
600	21.2	0.7	39.5	127.0	1.7	120.2	1	29.2

PROP DEMAND CURVE P

ENGINE SPEED	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
2,300	1,193	97.1	234.1	6,781.0	7,055.0	92.7	84.4
2,200	1,044	94.4	212.8	6,559.7	6,798.1	89.3	81.9
2,100	908	90.0	195.3	6,228.6	6,441.6	84.6	78.0
2,000	784	79.1	159.7	5,415.0	5,587.5	73.5	68.0
1,900	673	68.4	134.4	4,644.5	4,789.7	62.3	57.7
1,800	572	59.2	118.7	4,007.1	4,133.2	54.3	50.3
1,700	482	46.7	93.9	3,142.3	3,246.5	42.7	39.4
1,600	402	36.5	72.8	2,446.8	2,531.8	33.3	30.7
1,500	331	30.8	60.2	2,060.8	2,131.0	28.1	25.9
1,400	269	26.3	49.6	1,761.5	1,818.9	24.0	22.2
1,300	215	23.0	41.3	1,538.0	1,584.2	20.9	19.4
1,200	169	20.4	34.7	1,360.3	1,397.2	18.4	17.2
1,100	131	18.0	28.9	1,203.1	1,232.3	16.2	15.2
1,000	98.1	15.8	24.2	1,057.9	1,080.6	14.2	13.4
800	50.2	12.2	17.6	819.4	832.1	10.9	10.4
700	33.6	9.9	13.6	662.3	671.4	8.9	8.5
600	21.2	7.5	9.6	501.4	507.7	6.7	6.4

MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)
RPM	BKW	NM	KPA	G/BKW-HR	G/BKW-HR	L/HR	L/HR
2,300	1,193	4,953	1,939	229.7	225.3	322.4	316.2
2,200	1,193	5,178	2,027	226.8	222.5	318.3	312.3
2,100	1,193	5,425	2,124	220.8	216.6	309.9	304.0
2,000	1,185	5,658	2,215	215.7	211.6	300.7	295.0
1,900	1,167	5,865	2,296	211.5	207.5	290.4	284.8
1,800	1,137	6,032	2,361	207.9	203.9	278.1	272.8
1,700	1,085	6,095	2,386	205.5	201.6	262.3	257.3
1,600	1,026	6,123	2,397	204.5	200.6	246.9	242.2
1,500	919	5,851	2,290	205.5	201.6	222.2	218.0
1,400	756	5,157	2,019	210.2	206.2	186.9	183.4
1,300	636	4,672	1,829	214.0	209.9	160.1	157.0
1,200	557	4,432	1,735	219.7	215.6	144.0	141.3
1,100	465	4,037	1,580	225.6	221.3	123.4	121.1
1,000	375	3,581	1,402	230.0	225.6	101.5	99.5
800	251	2,996	1,173	232.8	228.4	68.8	67.4
700	149	2,033	796	217.6	213.4	38.1	37.4

ENGINE SPEED	ENGINE POWER	ENGINE TORQUE	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)
600	109	1,735	679	223.2	218.9	28.6	28.1

MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
RPM	BKW	KPA	DEG C	DEG C	KPA	DEG C	KPA	DEG C
2,300	1,193	226.2	56.8	614.3	255.8	416.6	232	199.8
2,200	1,193	229.0	55.8	615.9	247.4	415.0	234	198.9
2,100	1,193	228.2	54.7	609.2	235.9	410.8	233	195.7
2,000	1,185	227.6	53.8	603.9	225.4	406.9	232	193.1
1,900	1,167	224.2	52.8	600.0	212.5	403.8	228	189.9
1,800	1,137	219.6	51.9	597.6	200.5	400.8	223	187.1
1,700	1,085	209.1	50.1	608.2	183.9	412.1	212	182.5
1,600	1,026	196.2	48.2	622.9	165.0	426.4	199	176.9
1,500	919	168.9	45.9	630.8	133.9	438.4	172	161.4
1,400	756	124.0	41.3	630.0	91.0	446.9	126	134.0
1,300	636	91.9	39.0	640.7	64.9	463.9	93	112.5
1,200	557	72.0	38.7	662.3	49.7	483.8	73	98.2
1,100	465	54.3	39.0	657.3	36.9	489.6	55	84.1
1,000	375	36.7	37.5	610.1	24.4	436.0	37	66.9
800	251	21.5	38.4	509.4	13.0	358.3	22	51.9
700	149	10.4	39.3	355.6	7.5	270.2	11	40.7
600	109	7.1	39.7	302.8	5.4	213.6	7	36.3

MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
RPM	BKW	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
2,300	1,193	97.1	234.1	6,781.0	7,055.0	92.7	84.4
2,200	1,193	94.8	227.5	6,599.1	6,870.0	90.3	82.1
2,100	1,193	91.6	217.7	6,351.2	6,614.7	86.9	79.0
2,000	1,185	88.5	208.2	6,108.5	6,364.1	83.6	75.9
1,900	1,167	84.6	197.5	5,811.7	6,058.2	79.7	72.3
1,800	1,137	80.1	185.6	5,484.3	5,720.7	75.2	68.1
1,700	1,085	74.1	174.3	5,048.4	5,271.6	69.5	62.8
1,600	1,026	67.8	162.1	4,604.6	4,814.6	63.3	57.1
1,500	919	59.0	143.0	3,984.9	4,174.0	54.9	49.3
1,400	756	46.5	113.8	3,126.6	3,285.5	43.2	38.5
1,300	636	37.2	93.4	2,495.8	2,631.8	34.6	30.7
1,200	557	31.1	80.0	2,073.7	2,196.1	28.9	25.4
1,100	465	25.8	66.4	1,719.6	1,826.6	23.8	20.8
1,000	375	20.5	49.9	1,368.9	1,455.0	19.2	16.7
800	251	14.5	31.2	967.2	1,025.6	13.5	11.8
700	149	11.2	20.7	752.6	784.9	10.4	9.4
600	109	7.7	14.0	517.9	542.3	7.8	7.1

Heat Rejection Data Top

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXH RECOVERY TO 177C	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BKW	KW	KW	KW	KW	KW	KW	KW	KW	KW
2,300	1,193	815	34.0	1,156	499	173	271	1,193	3,257	3,469
2,200	1,193	785	34.0	1,150	483	171	264	1,193	3,215	3,425
2,100	1,193	753	34.0	1,104	457	167	250	1,193	3,131	3,335
2,000	1,185	725	34.0	1,054	432	162	238	1,185	3,037	3,236
1,900	1,167	702	33.5	999	406	156	223	1,167	2,933	3,124

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXH RECOVERY TO 177C	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
1,800	1,137	674	33.0	941	378	150	207	1,137	2,809	2,992
1,700	1,085	632	32.5	886	367	141	187	1,085	2,650	2,823
1,600	1,026	601	32.0	832	356	133	166	1,026	2,494	2,657
1,500	919	601	28.8	714	325	120	129	919	2,245	2,391
1,400	756	546	25.3	603	265	101	81.0	756	1,888	2,012
1,300	636	483	23.0	529	227	86.1	51.2	636	1,617	1,723
1,200	557	440	23.0	495	204	77.5	34.5	557	1,455	1,549
1,100	465	360	23.0	458	174	66.4	21.7	465	1,247	1,328
1,000	375	250	23.0	433	114	54.6	11.2	375	1,025	1,092
800	251	87.4	23.0	375	55.5	37.0	3.7	251	694	740
700	149	64.4	23.0	174	21.3	20.5	0.3	149	385	410
600	109	101	23.0	75.5	5.8	15.4	-0.5	109	289	308

Sound Data Top

EXHAUST:SOUND POWER(1/3 Octave Frequencies) MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BKW	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,300	1,193	127.7	85.8	98.3	120.3	113.1	106.5	116.1	116.8	117.9	117.3	117.4
2,200	1,193	126.8	88.5	98.3	115.7	112.3	105.3	115.0	117.2	117.6	117.0	117.0
2,100	1,193	126.4	91.2	98.2	111.1	111.5	104.1	113.8	117.6	117.3	116.8	116.6
2,000	1,185	126.0	93.9	98.1	106.5	110.8	102.9	112.7	118.0	117.0	116.5	116.2
1,900	1,167	125.1	91.8	108.4	104.5	108.6	105.7	115.5	115.9	115.9	115.4	115.0
1,800	1,137	123.9	87.1	111.2	101.9	103.8	107.3	117.2	111.7	114.3	114.0	113.3
1,700	1,085	123.3	87.8	110.3	102.0	104.0	105.7	115.5	113.3	113.6	113.3	112.7
1,600	1,026	122.6	88.5	108.8	102.2	104.3	102.9	112.6	114.4	112.9	112.5	112.0
1,500	919	123.4	97.9	108.6	104.9	104.8	108.7	112.1	114.3	113.2	114.5	114.3
1,400	756	123.6	100.3	108.1	107.1	105.1	109.9	111.4	113.8	113.5	115.1	115.1
1,300	636	125.7	99.1	112.6	106.6	107.5	113.2	114.2	117.4	116.7	117.5	116.5
1,200	557	126.1	98.4	112.8	109.0	108.8	112.8	115.0	118.6	117.5	117.9	116.5
1,100	465	123.6	103.2	109.8	104.1	106.2	110.1	112.5	116.0	114.9	115.4	114.2
1,000	375	118.1	105.2	91.4	101.0	100.3	101.3	106.8	106.1	107.6	109.4	109.4

EXHAUST:SOUND POWER(1/3 Octave Frequencies) MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BKW	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,300	1,193	117.2	116.4	114.4	114.7	112.6	110.5	108.6	103.8	98.9	91.1	84.2
2,200	1,193	116.8	116.1	114.0	114.8	112.5	110.3	108.4	103.5	98.4	90.5	83.3
2,100	1,193	116.4	115.8	113.6	115.0	112.5	110.1	108.2	103.1	97.9	90.0	82.3
2,000	1,185	115.9	115.5	113.2	115.2	112.4	109.9	108.0	102.8	97.4	89.5	81.4
1,900	1,167	114.4	114.0	112.0	114.2	111.6	109.2	107.4	102.1	96.7	89.0	80.7
1,800	1,137	112.0	111.3	110.3	112.8	110.7	108.4	106.6	101.1	95.8	88.4	79.7
1,700	1,085	111.6	110.9	109.8	112.4	110.7	108.2	106.0	100.1	94.8	87.4	78.2
1,600	1,026	111.2	110.4	109.2	111.9	110.6	108.0	105.2	98.9	93.5	85.9	75.4
1,500	919	113.3	111.7	110.2	111.8	110.4	107.7	105.0	98.6	92.9	85.3	75.1
1,400	756	113.6	111.9	110.3	110.9	109.4	106.6	104.0	97.0	90.9	83.3	73.4
1,300	636	115.2	113.3	111.0	110.7	108.9	105.7	103.9	97.1	91.1	84.0	75.3
1,200	557	115.0	112.9	110.4	110.4	108.6	104.8	104.4	97.5	91.5	84.5	75.7
1,100	465	112.7	110.6	108.6	109.4	107.3	103.6	103.2	95.9	90.4	83.0	73.6
1,000	375	107.9	105.8	105.3	108.2	105.3	102.2	101.5	92.6	88.8	80.4	69.8

MECHANICAL:SOUND POWER(1/3 Octave Frequencies) MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
RPM	BKW	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,300	1,193	125.5	84.7	89.1	96.6	103.8	106.9	104.6	106.9	109.4	113.2	111.0
2,200	1,193	125.7	84.3	89.3	97.2	103.5	105.3	104.0	106.9	109.3	113.1	110.8
2,100	1,193	125.8	83.8	89.6	97.7	103.3	103.8	103.4	106.8	109.2	113.0	110.6
2,000	1,185	125.9	83.3	89.9	98.3	103.1	102.3	102.8	106.7	109.0	112.9	110.4

ENGINE SPEED	ENGINE POWER	OVERALL SOUND	100 HZ	125 HZ	160 HZ	200 HZ	250 HZ	315 HZ	400 HZ	500 HZ	630 HZ	800 HZ
1,900	1,167	125.6	84.7	92.8	98.4	103.5	101.3	102.7	106.9	108.7	112.3	110.4
1,800	1,137	125.2	85.7	94.5	98.5	103.9	100.1	102.6	107.3	108.5	111.5	110.5
1,700	1,085	124.8	84.3	93.7	97.4	101.5	99.0	102.0	108.1	110.9	111.3	110.1
1,600	1,026	124.3	82.3	92.7	96.1	95.3	97.5	101.3	108.9	112.5	111.2	109.6
1,500	919	123.5	82.5	91.4	95.4	95.2	96.7	100.6	108.3	111.3	110.8	109.5
1,400	756	121.2	81.9	89.4	93.7	94.4	95.5	100.0	106.9	107.7	110.1	108.7
1,300	636	119.9	82.0	88.5	92.3	93.6	94.8	99.2	104.9	106.5	108.9	107.6
1,200	557	118.7	82.7	87.9	91.0	93.0	93.9	97.9	102.2	105.4	107.7	106.9
1,100	465	117.5	81.0	86.3	89.4	92.7	92.3	97.2	101.1	104.2	106.6	105.7
1,000	375	115.8	78.4	83.3	86.2	92.4	90.0	96.4	99.4	102.0	105.3	104.2

MECHANICAL:SOUND POWER(1/3 Octave Frequencies) MAXIMUM POWER CURVE M

ENGINE SPEED	ENGINE POWER	1000 HZ	1250 HZ	1600 HZ	2000 HZ	2500 HZ	3150 HZ	4000 HZ	5000 HZ	6300 HZ	8000 HZ	10000 HZ
RPM	BKW	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
2,300	1,193	111.9	113.4	113.1	112.7	111.3	111.0	111.1	111.6	110.1	112.4	121.6
2,200	1,193	111.8	113.7	112.9	112.6	111.3	111.1	111.0	112.1	110.1	112.7	121.8
2,100	1,193	111.6	113.9	112.8	112.5	111.4	111.2	111.0	112.7	110.1	113.0	122.1
2,000	1,185	111.5	114.2	112.6	112.5	111.4	111.2	110.9	113.3	110.1	113.3	122.4
1,900	1,167	111.1	114.1	112.3	112.4	111.5	111.3	111.0	111.8	110.2	113.5	121.9
1,800	1,137	110.7	114.0	112.1	112.2	111.5	111.4	111.0	109.5	110.2	114.0	121.2
1,700	1,085	110.8	112.8	111.8	112.1	111.5	111.6	110.1	109.1	110.3	115.6	119.8
1,600	1,026	110.9	111.3	111.6	112.0	111.5	111.7	109.1	108.6	110.3	117.0	117.4
1,500	919	110.2	110.6	111.0	111.4	110.7	110.9	108.5	108.1	110.8	115.6	116.7
1,400	756	109.4	109.0	109.9	110.2	108.8	108.8	107.5	107.1	111.2	113.6	104.3
1,300	636	109.1	108.4	108.8	109.5	107.8	107.6	106.6	107.0	109.7	110.4	102.2
1,200	557	109.4	108.0	107.5	109.2	107.7	106.7	105.1	107.4	109.4	101.9	99.8
1,100	465	107.8	106.9	107.2	108.4	106.5	105.2	106.1	105.1	106.7	100.0	97.6
1,000	375	105.5	105.4	106.6	107.2	104.2	103.5	106.9	99.7	98.2	96.4	92.3

Emissions Data Top

Units Filter All Units

DIESEL

RATED SPEED NOMINAL DATA: 2300 RPM

ENGINE POWER		BKW	1,193	895	596	298	119
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	5,978	4,826	3,575	1,860	881
TOTAL CO		G/HR	788	468	430	528	736
TOTAL HC		G/HR	92	37	53	51	83
TOTAL CO2		KG/HR	865	638	432	247	150
PART MATTER		G/HR	112.6	103.5	130.3	193.3	359.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	1,612.5	1,768.1	1,940.9	1,762.8	1,381.6
TOTAL CO	(CORR 5% O2)	MG/NM3	211.9	170.3	232.2	500.9	1,152.0
TOTAL HC	(CORR 5% O2)	MG/NM3	21.4	11.8	25.1	41.5	112.2
PART MATTER	(CORR 5% O2)	MG/NM3	25.1	32.3	61.8	164.4	514.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	785	861	945	859	673
TOTAL CO	(CORR 5% O2)	PPM	170	136	186	401	922
TOTAL HC	(CORR 5% O2)	PPM	40	22	47	78	209
TOTAL NOX (AS NO2)		G/HP-HR	3.76	4.05	4.49	4.67	5.52
TOTAL CO		G/HP-HR	0.50	0.39	0.54	1.33	4.61
TOTAL HC		G/HP-HR	0.06	0.03	0.07	0.13	0.52
PART MATTER		G/HP-HR	0.07	0.09	0.16	0.49	2.25
TOTAL NOX (AS NO2)		LB/HR	13.18	10.64	7.88	4.10	1.94
TOTAL CO		LB/HR	1.74	1.03	0.95	1.16	1.62
TOTAL HC		LB/HR	0.20	0.08	0.12	0.11	0.18
TOTAL CO2		LB/HR	1,907	1,406	953	544	331
PART MATTER		LB/HR	0.25	0.23	0.29	0.43	0.79
OXYGEN IN EXH		%	9.2	11.9	13.7	15.4	16.9
DRY SMOKE OPACITY		%	1.6	1.4	2.1	3.4	5.7
BOSCH SMOKE NUMBER			0.71	0.62	0.93	1.42	2.03

RATED SPEED POTENTIAL SITE VARIATION: 2300 RPM

ENGINE POWER	BKW	1,193	895	596	298	119
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	7,233	5,839	4,326	2,251	1,066
TOTAL CO	G/HR	1,473	875	804	987	1,376

ENGINE POWER		BKW	1,193	895	596	298	119
PERCENT LOAD		%	100	75	50	25	10
TOTAL HC		G/HR	174	70	101	95	156
PART MATTER		G/HR	219.5	201.8	254.1	376.9	700.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	1,951.2	2,139.5	2,348.4	2,133.0	1,671.8
TOTAL CO	(CORR 5% O2)	MG/NM3	396.3	318.5	434.1	936.7	2,154.2
TOTAL HC	(CORR 5% O2)	MG/NM3	40.4	22.2	47.5	78.5	212.0
PART MATTER	(CORR 5% O2)	MG/NM3	48.9	63.1	120.4	320.5	1,004.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	950	1,042	1,144	1,039	814
TOTAL CO	(CORR 5% O2)	PPM	317	255	347	749	1,723
TOTAL HC	(CORR 5% O2)	PPM	75	41	89	147	396
TOTAL NOX (AS NO2)		G/HP-HR	4.55	4.90	5.44	5.65	6.68
TOTAL CO		G/HP-HR	0.93	0.73	1.01	2.48	8.63
TOTAL HC		G/HP-HR	0.11	0.06	0.13	0.24	0.98
PART MATTER		G/HP-HR	0.14	0.17	0.32	0.95	4.39
TOTAL NOX (AS NO2)		LB/HR	15.95	12.87	9.54	4.96	2.35
TOTAL CO		LB/HR	3.25	1.93	1.77	2.18	3.03
TOTAL HC		LB/HR	0.38	0.15	0.22	0.21	0.34
PART MATTER		LB/HR	0.48	0.44	0.56	0.83	1.55

Regulatory Information Top

EPA TIER 3 **2013 - 2017** **CYCLE : E3**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1042 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THIS ENGINE CONFORMS TO US EPA MARINE COMMERCIAL COMPRESSION-IGNITION EMISSION REGULATIONS. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE MARINE REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	MARINE COMMERCIAL	TIER 3	CO: 5.0 NOx + HC: 5.6 PM: 0.11

EPA TIER 3 **2013 - ----** **CYCLE : E5**

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1042 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THIS ENGINE CONFORMS TO US EPA MARINE RECREATIONAL COMPRESSION-IGNITION EMISSION REGULATIONS. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE MARINE REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	MARINE RECREATIONAL	TIER 3	CO: 5.0 NOx + HC: 5.8 PM: 0.12

EU STAGE IIIA **2009 - 2019** **CYCLE : E3**

GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 97/68/EC (AS AMENDED BY EU 2004/26/EC) AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE MARINE REGULATIONS.

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
EUROPE	EU	MARINE COMMERCIAL	STAGE IIIA	CO: 5.0 NOx + HC: 7.2 PM: 0.20

IMO II **2011 - ----** **CYCLE : E3**

GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN REGULATION 13 OF REVISED ANNEX VI OF MARPOL 73/78 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THIS ENGINE CONFORMS TO INTERNATIONAL MARINE ORGANIZATION'S (IMO) MARINE COMPRESSION-IGNITION EMISSION REGULATIONS.

Cross Reference Top

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
3704864	GG0537	3637036	EE111	-	RPM00139	
3704864	GG0537	4217779	EE111	-	RPM00139	
3704864	GG0537	4884585	EE111	-	RPM00139	

Supplementary Data Top

Type	Classification	Performance Number
CHART	BSFC CONTOUR PLOT	EM0480

Type	Classification	Performance Number
CHART	AMBIENT CAPABILTY CHART	EM0495
SOUND	SOUND POWER	EM4754

Performance Parameter Reference Top

Parameters Reference: DM9600 - 14

PERFORMANCE DEFINITIONS

PERFORMANCE DEFINITIONS DM9600

APPLICATION: Engine performance tolerance values below are representative of a typical production engine tested in a calibrated dynamometer test cell at SAE J1995 standard reference conditions. Caterpillar maintains ISO9001:2000 certified quality management systems for engine test Facilities to assure accurate calibration of test equipment. Engine test data is corrected in accordance with SAE J1995. Additional reference material SAE J1228, J1349, ISO 8665, 3046-1:2002E, 3046-3:1989, 1585, 2534, 2288, and 9249 may apply in part or are similar to SAE J1995. Special engine rating request (SERR) test data shall be noted.

PERFORMANCE PARAMETER TOLERANCE FACTORS: Power +/- 3% Torque +/- 3% Exhaust stack temperature +/- 8% Inlet airflow +/- 5% Intake manifold pressure-gage +/- 10% Exhaust flow +/- 6% Specific fuel consumption +/- 3% Fuel rate +/- 5% Specific DEF consumption +/- 3% DEF rate +/- 5% Heat rejection +/- 5% Heat rejection exhaust only +/- 10% Heat rejection CEM only +/- 10%
Heat Rejection values based on using treated water.
Torque is included for truck and industrial applications, do not use for Gen Set or steady state applications.
On C7 - C18 engines, at speeds of 1100 RPM and under these values are provided for reference only, and may not meet the tolerance listed.
On 3500 and C175 engines, at speeds below Peak Torque these values are provided for reference only, and may not meet the tolerance listed.
These values do not apply to C280/3600. For these models, see the tolerances listed below.

C280/3600 HEAT REJECTION TOLERANCE FACTORS: Heat rejection +/- 10% Heat rejection to Atmosphere +/- 50% Heat rejection to Lube Oil +/- 20% Heat rejection to Aftercooler +/- 5%

TEST CELL TRANSDUCER TOLERANCE FACTORS: Torque +/- 0.5% Speed +/- 0.2% Fuel flow +/- 1.0% Temperature +/- 2.0 C degrees Intake manifold pressure +/- 0.1 kPa
OBSERVED ENGINE PERFORMANCE IS CORRECTED TO SAE J1995 REFERENCE AIR AND FUEL CONDITIONS.

REFERENCE ATMOSPHERIC INLET AIR FOR 3500 ENGINES AND SMALLER SAE J1228 AUG2002 for marine engines, and J1995 JAN2014 for other engines, reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity at the stated aftercooler water temp, or inlet manifold temp. FOR 3600 ENGINES Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JANJAN2014 reference atmospheric pressure is 100 KPA (29.61 in hg), and standard temperature is 25deg C (77 deg F) at 30% relative humidity and 150M altitude at the stated aftercooler water temperature.

MEASUREMENT LOCATION FOR INLET AIR TEMPERATURE Location for air temperature measurement air cleaner inlet at stabilized operating conditions.

REFERENCE EXHAUST STACK DIAMETER The Reference Exhaust Stack Diameter published with this dataset is only used for the calculation of Smoke Opacity values displayed in this dataset. This value does not necessarily represent the actual stack diameter of the engine due to the variety of exhaust stack adapter options available. Consult the price list, engine order or general dimension drawings for the actual stack diameter size ordered or options available.

REFERENCE FUEL DIESEL Reference fuel is #2 distillate diesel with a 35API gravity; A lower heating value is 42,780 KJ/KG (18,390 BTU/LB) when used at 15 deg C (59 deg F), where the density is 850 G/Liter (7.0936 Lbs/Gal).
GAS Reference natural gas fuel has a lower heating value of 33.74 KJ/L (905 BTU/CU Ft). Low BTU ratings are based on 18.64 KJ/L (500 BTU/CU FT) lower heating value gas. Propane ratings are based on 87.56 KJ/L (2350 BTU/CU Ft) lower heating value gas.

ENGINE POWER (NET) IS THE CORRECTED FLYWHEEL POWER (GROSS) LESS EXTERNAL AUXILIARY LOAD
Engine corrected gross output includes the power required to drive standard equipment; lube oil, scavenge lube oil, fuel transfer, common rail fuel, separate circuit aftercooler and jacket water pumps. Engine net power available for the external (flywheel) load is calculated by subtracting the sum of auxiliary load from the corrected gross flywheel out put power. Typical auxiliary loads are radiator cooling fans, hydraulic pumps, air compressors and battery charging alternators. For Tier 4 ratings additional Parasitic losses would also include Intake, and Exhaust Restrictions.

ALTITUDE CAPABILITY Altitude capability is the maximum altitude above sea level at standard temperature and standard pressure at which the engine could develop full rated output power on the current performance data set. Standard temperature values versus altitude could be seen on TM2001.
When viewing the altitude capability chart the ambient temperature is the inlet air temp at the compressor inlet.
Engines with ADEM MEUI and HEUI fuel systems operating at conditions above the defined altitude capability derate for atmospheric pressure and temperature conditions outside the values defined, see TM2001.
Mechanical governor controlled unit injector engines require a setting change for operation at conditions above the altitude defined on the engine performance sheet. See your Caterpillar technical representative for non standard ratings.

REGULATIONS AND PRODUCT COMPLIANCE TMI Emissions information is presented at 'nominal' and 'Potential Site Variation' values for standard ratings. No tolerances are applied to the emissions data. These values are subject to change at any time. The controlling federal and local emission requirements need to be verified by your Caterpillar technical representative.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

EMISSION CYCLE LIMITS: Cycle emissions Max Limits apply to cycle-weighted averages only. Emissions at individual load points may exceed the cycle-weighted limit.

WET & DRY EXHAUST/EMISSIONS DESCRIPTION: Wet - Total exhaust flow or concentration of total exhaust flow

Dry - Total exhaust flow minus water vapor or concentration of exhaust flow with water vapor excluded

EMISSIONS DEFINITIONS: Emissions : DM1176

EMISSION CYCLE DEFINITIONS
1. For constant-speed marine engines for ship main propulsion, including,diesel-electric drive, test cycle E2 shall be applied, for controllable-pitch propeller sets test cycle E2 shall be applied.
2. For propeller-law-operated main and propeller-law-operated auxiliary engines the test cycle E3 shall be applied.
3. For constant-speed auxiliary engines test cycle D2 shall be applied.
4. For variable-speed, variable-load auxiliary engines, not included above, test cycle C1 shall be applied.

HEAT REJECTION DEFINITIONS: Diesel Circuit Type and HHV Balance : DM9500

HIGH DISPLACEMENT (HD) DEFINITIONS: 3500: EM1500

RATING DEFINITIONS: Agriculture : TM6008
Fire Pump : TM6009
Generator Set : TM6035
Generator (Gas) : TM6041
Industrial Diesel : TM6010
Industrial (Gas) : TM6040
Irrigation : TM5749
Locomotive : TM6037
Marine Auxiliary : TM6036
Marine Prop (Except 3600) : TM5747
Marine Prop (3600 only) : TM5748
MSHA : TM6042
Oil Field (Petroleum) : TM6011
Off-Highway Truck : TM6039
On-Highway Truck : TM6038

SOUND DEFINITIONS: Sound Power : DM8702
Sound Pressure : TM7080

Date Released : 10/27/21