

Perf No: EM0265

Change Level: 06

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SALES MODEL:	C18	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	2,100
MACHINE SALES MODEL:		PEAK TORQUE SPEED (RPM):	1,500
ENGINE POWER (BKW):	500.0	TORQUE RISE (%):	29
PEAK TORQUE (NM):	2,930.0	ASPIRATION:	TA
COMPRESSION RATIO:	16.5	AFTERCOOLER TYPE:	SCAC
RATING LEVEL:	B-RATING (HEAVY DUTY)	AFTERCOOLER CIRCUIT TYPE:	JW+OC, AC
PUMP QUANTITY:	1	AFTERCOOLER TEMP (C):	52
FUEL TYPE:	DIESEL	JACKET WATER TEMP (C):	85
MANIFOLD TYPE:	WATER COOLED	TURBO CONFIGURATION:	SINGLE
GOVERNOR TYPE:	ELEC	TURBO QUANTITY:	1
CAMSHAFT TYPE:	STANDARD	TURBOCHARGER MODEL:	S510W IIONJ2 120H/67AA 1.15VOW
IGNITION TYPE:	CI	CERTIFICATION YEAR:	2013
INJECTOR TYPE:	EUI	PISTON SPD @ RATED ENG SPD (M/SEC):	12.8
REF EXH STACK DIAMETER (MM):	152		
MAX OPERATING ALTITUDE (M):	300		

INDUSTRY	SUB INDUSTRY	APPLICATION
MARINE	DREDGE	MARINE PROPULSION
MARINE	FERRY	MARINE PROPULSION
MARINE	GENERAL CARGO	MARINE PROPULSION
MARINE	OFFSHORE	MARINE PROPULSION
MARINE	TUG & SALVAGE	MARINE PROPULSION
MARINE	FISHING	MARINE PROPULSION
MARINE	INLAND WATERWAY	MARINE PROPULSION

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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
2,100	500	2,274	1,576	220.3	216.1	129.6	127.1
2,000	500	2,387	1,655	218.4	214.2	128.5	126.0
1,900	500	2,513	1,742	214.1	210.0	125.9	123.5
1,800	500	2,653	1,838	211.5	207.4	124.4	122.0
1,700	499	2,803	1,943	209.0	205.0	122.7	120.3
1,600	486	2,901	2,010	207.0	203.1	118.4	116.1
1,500	460	2,928	2,030	206.0	202.1	111.5	109.4
1,400	427	2,913	2,019	198.5	194.7	99.7	97.8
1,300	381	2,799	1,940	199.2	195.4	89.3	87.6
1,200	317	2,521	1,747	204.7	200.8	76.3	74.8
1,100	269	2,338	1,620	206.7	202.8	65.5	64.2
1,000	238	2,270	1,573	213.0	209.0	59.6	58.4
900	195	2,069	1,434	220.0	215.8	50.5	49.5
800	139	1,659	1,150	231.1	226.7	37.8	37.1
700	107	1,460	1,012	243.5	238.8	30.6	30.1
600	80.0	1,273	882	236.3	231.8	22.2	21.8

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
2,100	500	205.8	60.8	581.8	223.7	381.3	219	203.1
2,000	500	209.7	60.4	583.1	218.2	384.8	222	200.1
1,900	500	207.9	60.2	582.7	203.4	388.2	219	195.9
1,800	500	209.7	61.4	591.7	194.7	398.7	220	193.0
1,700	499	207.3	60.4	601.8	181.0	412.0	217	189.2
1,600	486	199.3	58.1	611.9	162.9	427.6	208	182.0
1,500	460	181.6	56.9	629.3	136.5	453.6	189	169.7
1,400	427	136.2	54.7	656.7	95.1	479.6	142	141.2
1,300	381	110.6	51.4	675.0	74.1	509.4	115	124.1
1,200	317	83.6	48.1	675.0	54.4	536.5	87	104.4
1,100	269	67.5	44.2	675.0	42.1	552.2	70	89.9
1,000	238	55.6	40.5	675.0	33.0	561.3	58	81.0
900	195	38.5	36.6	640.0	22.9	530.0	40	67.9
800	139	20.7	34.1	539.3	13.3	444.8	22	50.9
700	107	13.1	32.8	483.3	9.2	397.0	14	43.0
600	80.0	7.5	31.8	426.9	6.6	346.6	8	36.5

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
2,100	500	45.3	101.9	3,127.6	3,237.7	42.5	39.1
2,000	500	44.8	100.5	3,066.8	3,176.0	41.7	38.3
1,900	500	42.7	96.7	2,933.0	3,040.0	39.9	36.6
1,800	500	41.3	94.7	2,823.7	2,929.8	38.5	35.2
1,700	499	39.3	91.8	2,682.7	2,786.9	36.6	33.4
1,600	486	36.7	87.5	2,495.2	2,595.9	34.1	31.0
1,500	460	32.9	81.1	2,225.7	2,320.4	30.5	27.6
1,400	427	25.9	65.9	1,735.5	1,820.3	23.9	21.4
1,300	381	21.8	57.9	1,459.9	1,535.6	20.2	18.0
1,200	317	17.8	48.4	1,191.0	1,256.0	16.3	14.5
1,100	269	15.1	41.0	1,008.9	1,059.5	13.6	11.9
1,000	238	12.9	35.7	859.9	904.9	11.7	10.2
900	195	10.4	28.4	690.9	733.8	9.7	8.5
800	139	8.0	19.5	531.6	563.7	7.4	6.5
700	107	6.4	14.7	427.3	453.5	6.0	5.2
600	80.0	5.0	10.6	336.3	355.2	4.7	4.1

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
2,100	500	2,274	1,576	220.3	216.1	129.6	127.1
2,000	432	2,062	1,429	222.6	218.4	113.1	111.0
1,900	370	1,861	1,290	225.9	221.6	98.4	96.5
1,800	315	1,670	1,158	220.4	216.2	81.7	80.1
1,700	265	1,490	1,033	220.7	216.5	68.9	67.6
1,600	221	1,320	915	228.7	224.3	59.5	58.4
1,500	182	1,160	804	232.0	227.6	49.7	48.8
1,400	148	1,011	700	226.2	221.9	39.4	38.7
1,300	119	871	604	222.1	217.8	31.0	30.4
1,200	93.3	742	515	222.4	218.2	24.4	23.9
1,100	71.9	624	432	225.7	221.4	19.1	18.7
1,000	54.0	516	357	230.8	226.4	14.7	14.4
900	39.4	418	289	238.6	234.0	11.0	10.8
800	27.6	330	229	250.2	245.4	8.1	8.0
700	18.5	253	175	269.5	264.4	5.9	5.8
600	11.7	186	129	303.1	297.3	4.2	4.1

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
2,100	500	205.8	60.8	581.8	223.7	381.3	219	203.1
2,000	432	192.4	59.0	548.3	195.8	364.8	204	185.0
1,900	370	173.4	57.6	527.7	164.2	357.9	184	168.1
1,800	315	137.6	56.1	507.6	122.3	360.1	146	141.0
1,700	265	106.6	54.0	504.9	90.5	371.0	113	118.7
1,600	221	85.5	52.2	505.5	70.6	381.1	91	102.8
1,500	182	62.4	45.4	478.4	52.7	369.4	67	82.8
1,400	148	38.6	42.2	453.3	35.0	359.0	42	65.7
1,300	119	24.0	39.7	403.6	24.7	327.8	27	53.3
1,200	93.3	15.1	37.9	355.8	18.2	292.0	17	44.3
1,100	71.9	10.6	36.2	308.9	14.4	264.4	12	39.6
1,000	54.0	7.3	34.8	264.7	11.9	240.3	9	36.9
900	39.4	4.8	34.0	224.8	10.1	218.7	6	35.2
800	27.6	2.9	33.1	191.2	8.1	194.6	4	33.0
700	18.5	1.5	32.1	162.1	6.3	170.7	2	30.9
600	11.7	0.6	30.9	135.8	4.8	146.3	1	29.0

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
2,100	500	45.3	101.9	3,127.6	3,237.7	42.5	39.1
2,000	432	42.8	92.7	2,924.9	3,021.1	39.7	36.6
1,900	370	38.8	82.8	2,644.9	2,728.5	35.9	33.2
1,800	315	32.7	69.4	2,209.7	2,279.1	30.0	27.7
1,700	265	27.2	58.6	1,833.2	1,891.7	24.9	23.0
1,600	221	23.4	50.9	1,566.8	1,617.4	21.3	19.7
1,500	182	19.3	41.5	1,291.3	1,333.6	17.6	16.3
1,400	148	15.7	33.0	1,046.7	1,080.7	14.2	13.2
1,300	119	13.2	26.3	880.0	906.6	11.9	11.1
1,200	93.3	11.3	21.2	756.4	777.1	10.2	9.5
1,100	71.9	10.0	17.5	668.7	684.9	8.9	8.4
1,000	54.0	8.9	14.8	591.5	604.0	7.9	7.4
900	39.4	7.8	12.5	520.5	529.9	7.0	6.6
800	27.6	6.8	10.4	452.6	459.5	6.1	5.8
700	18.5	5.8	8.4	385.5	390.5	5.2	4.9
600	11.7	4.8	6.5	318.3	321.8	4.2	4.1

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
2,100	500	2,274	1,576	220.3	216.1	129.6	127.1
2,000	500	2,387	1,655	218.4	214.2	128.5	126.0
1,900	500	2,513	1,742	214.1	210.0	125.9	123.5
1,800	500	2,653	1,838	211.5	207.4	124.4	122.0
1,700	499	2,803	1,943	209.0	205.0	122.7	120.3
1,600	486	2,901	2,010	207.0	203.1	118.4	116.1
1,500	460	2,928	2,030	206.0	202.1	111.5	109.4
1,400	427	2,913	2,019	198.5	194.7	99.7	97.8
1,300	391	2,872	1,991	198.5	194.7	91.3	89.6
1,200	342	2,722	1,886	204.0	200.1	82.1	80.5
1,100	291	2,526	1,751	208.8	204.8	71.5	70.1
1,000	247	2,359	1,635	215.6	211.5	62.6	61.4
900	195	2,069	1,434	220.0	215.8	50.5	49.5
800	139	1,659	1,150	231.1	226.7	37.8	37.1
700	107	1,460	1,012	243.5	238.8	30.6	30.1
600	80.0	1,273	882	236.3	231.8	22.2	21.8

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
2,100	500	205.8	60.8	581.8	223.7	381.3	219	203.1
2,000	500	209.7	60.4	583.1	218.2	384.8	222	200.1
1,900	500	207.9	60.2	582.7	203.4	388.2	219	195.9
1,800	500	209.7	61.4	591.7	194.7	398.7	220	193.0
1,700	499	207.3	60.4	601.8	181.0	412.0	217	189.2
1,600	486	199.3	58.1	611.9	162.9	427.6	208	182.0
1,500	460	181.6	56.9	629.3	136.5	453.6	189	169.7
1,400	427	136.2	54.7	656.7	95.1	479.6	142	141.2
1,300	391	114.5	51.5	678.6	76.3	509.8	119	126.7
1,200	342	92.3	48.4	690.6	59.3	542.7	96	111.6
1,100	291	73.2	44.5	699.7	47.1	567.1	76	97.5
1,000	247	59.9	40.4	693.4	35.4	574.6	62	84.8
900	195	38.5	36.6	640.0	22.9	530.0	40	67.9
800	139	20.7	34.1	539.3	13.3	444.8	22	50.9
700	107	13.1	32.8	483.3	9.2	397.0	14	43.0
600	80.0	7.5	31.8	426.9	6.6	346.6	8	36.5

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
2,100	500	45.3	101.9	3,127.6	3,237.7	42.5	39.1
2,000	500	44.8	100.5	3,066.8	3,176.0	41.7	38.3
1,900	500	42.7	96.7	2,933.0	3,040.0	39.9	36.6
1,800	500	41.3	94.7	2,823.7	2,929.8	38.5	35.2
1,700	499	39.3	91.8	2,682.7	2,786.9	36.6	33.4
1,600	486	36.7	87.5	2,495.2	2,595.9	34.1	31.0
1,500	460	32.9	81.1	2,225.7	2,320.4	30.5	27.6
1,400	427	25.9	65.9	1,735.5	1,820.3	23.9	21.4
1,300	391	22.2	59.0	1,487.3	1,564.7	20.6	18.3
1,200	342	18.6	51.5	1,245.7	1,315.5	17.2	15.2
1,100	291	15.9	44.2	1,061.7	1,121.1	14.4	12.6
1,000	247	13.2	37.3	882.6	934.5	12.0	10.5
900	195	10.4	28.4	690.9	733.8	9.7	8.5
800	139	8.0	19.5	531.6	563.7	7.4	6.5
700	107	6.4	14.7	427.3	453.5	6.0	5.2
600	80.0	5.0	10.6	336.3	355.2	4.7	4.1

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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
2,100	500	300	27.9	438	193	69.7	132	500	1,309	1,394
2,000	500	298	27.7	433	193	69.1	127	500	1,298	1,382
1,900	500	294	27.1	419	188	67.8	118	500	1,272	1,355
1,800	500	291	26.8	414	191	66.9	110	500	1,257	1,339
1,700	499	284	26.4	410	193	66.0	102	499	1,239	1,320
1,600	486	274	26.7	398	192	63.7	91.7	486	1,196	1,274
1,500	460	268	25.4	375	191	60.0	73.0	460	1,126	1,200
1,400	427	281	22.5	303	165	53.6	41.6	427	1,007	1,073
1,300	381	279	20.4	271	154	49.1	30.5	391	922	982
1,200	317	266	18.5	239	137	44.2	20.8	342	829	883
1,100	269	254	16.4	204	121	38.5	15.3	291	722	769
1,000	238	245	14.7	167	106	33.7	10.4	247	633	674
900	195	217	12.1	116	79.1	27.2	4.9	195	510	543

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
800	139	190	9.1	67.8	45.6	20.3	1.5	139	382	407
700	107	167	7.5	47.9	29.9	16.5	0.7	107	310	330
600	80.0	125	5.2	29.7	17.9	12.0	0.3	80.0	225	239

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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)
2,100	500	125.6	101.9	96.5	106.6	105.0	106.9	106.9	110.9	112.5	112.9	114.6
2,000	500	125.3	100.7	96.6	104.1	106.2	105.0	107.1	111.5	113.7	112.9	114.9
1,900	500	125.6	105.6	101.5	107.2	103.9	109.3	107.0	110.5	111.9	112.9	114.8
1,800	500	126.0	106.4	104.1	103.0	110.5	111.0	110.3	111.3	113.0	114.1	115.1
1,700	499	124.9	96.1	103.7	106.6	109.0	107.6	108.3	111.1	110.8	112.5	113.9
1,600	486	124.7	92.3	104.8	104.0	108.6	109.5	107.2	111.3	111.3	112.5	113.8
1,500	460	124.0	95.5	99.6	105.1	108.1	109.1	109.4	109.8	111.1	112.2	113.5
1,400	427	124.8	95.2	103.6	107.5	108.9	112.5	113.5	112.1	113.6	114.0	114.0
1,300	391	123.7	97.0	108.4	108.0	108.9	110.4	111.7	111.8	111.8	112.5	112.7
1,200	342	122.6	93.5	104.3	110.2	104.9	106.8	107.3	108.8	110.0	111.2	111.8
1,100	291	121.3	95.1	94.0	98.9	100.4	104.1	103.7	108.0	109.6	111.6	111.4
1,000	247	120.5	99.9	89.4	98.3	101.2	104.5	103.4	103.4	108.8	110.3	111.3
900	195	118.4	101.1	96.6	95.8	99.0	95.4	97.4	101.8	106.0	108.4	109.7
800	139	115.6	84.8	94.4	88.5	91.0	91.4	94.8	100.1	104.2	106.3	107.3
700	107	113.2	94.6	91.3	93.7	90.8	95.1	95.6	99.3	101.8	103.7	103.8
600	80.0	111.0	80.8	80.0	83.0	85.9	88.9	92.7	97.6	101.2	101.6	103.3

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)
2,100	500	115.7	117.8	118.5	115.6	113.5	113.5	109.6	105.1	100.1	93.6	86.1
2,000	500	115.7	117.3	118.0	114.7	112.9	112.9	109.6	105.5	100.9	94.7	86.4
1,900	500	115.2	116.7	118.0	116.6	114.3	113.4	109.8	104.6	98.7	91.1	83.8
1,800	500	116.0	117.2	117.5	116.6	114.4	113.3	110.1	105.8	101.1	94.3	86.6
1,700	499	114.7	116.4	117.1	115.1	113.6	112.5	108.3	103.5	97.7	89.1	81.5
1,600	486	114.4	115.5	116.7	115.0	113.0	112.1	107.8	102.6	96.1	86.3	79.0
1,500	460	113.6	114.5	115.8	114.5	112.7	111.5	107.4	102.2	95.5	85.8	77.6
1,400	427	113.9	114.1	114.4	114.3	113.2	111.6	108.3	103.5	96.6	87.9	78.5
1,300	391	112.9	113.3	113.8	112.7	112.0	110.7	106.9	101.2	95.1	86.2	76.3
1,200	342	112.3	113.3	114.4	113.2	111.0	109.6	105.6	98.7	91.4	78.5	68.0
1,100	291	110.7	112.0	112.9	112.2	109.8	108.8	106.1	97.6	90.4	78.0	66.9
1,000	247	110.7	111.4	111.5	110.5	108.5	109.4	105.9	96.9	90.0	75.7	64.4
900	195	109.6	110.2	109.1	108.0	106.1	106.4	102.3	96.2	88.0	73.9	63.6
800	139	107.8	107.4	105.1	104.6	103.8	103.3	100.8	92.6	84.0	73.7	66.5
700	107	104.7	103.9	102.9	101.8	100.7	100.5	99.2	92.0	81.6	75.8	71.5
600	80.0	103.6	100.5	99.5	97.9	102.2	102.6	91.0	80.7	73.0	59.8	55.4

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)
2,100	500	119.3	79.8	84.4	92.0	96.9	99.6	99.3	101.9	108.0	105.6	109.6
2,000	500	118.7	80.8	84.1	93.7	99.3	100.8	97.8	103.5	109.8	105.9	109.1
1,900	500	119.4	78.1	81.4	88.5	94.6	94.8	98.6	101.2	106.8	105.1	107.8
1,800	500	117.6	79.7	82.0	90.7	94.0	94.4	94.7	99.8	108.2	103.9	107.8
1,700	499	118.4	72.6	81.1	88.8	90.0	91.0	95.2	101.0	105.9	104.8	107.0
1,600	486	119.2	73.0	83.9	91.2	88.7	91.3	95.8	100.9	106.4	104.2	106.3
1,500	460	118.6	69.3	82.0	92.9	87.6	92.7	96.3	100.0	103.1	102.6	104.9
1,400	427	118.8	72.1	80.6	85.1	87.0	90.4	95.3	100.3	102.0	101.7	104.2
1,300	391	117.5	74.1	81.9	83.5	88.2	87.7	92.9	98.7	100.5	100.1	103.4

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
1,200	342	116.2	70.2	82.7	84.2	88.9	86.8	92.9	98.5	100.7	101.0	102.9
1,100	291	115.5	69.1	76.6	83.2	84.6	86.3	90.5	96.6	98.4	99.1	101.8
1,000	247	112.6	66.5	76.6	81.8	82.7	84.5	90.0	94.6	96.6	96.0	97.8
900	195	110.3	70.2	77.4	76.9	83.8	82.4	87.4	92.5	96.9	94.7	97.3
800	139	107.5	61.8	72.7	77.9	77.3	80.3	83.0	88.9	91.3	95.0	96.7
700	107	106.4	64.6	71.6	74.2	77.4	77.1	82.5	88.4	91.4	93.2	97.1
600	80.0	104.8	57.3	71.2	69.9	74.9	76.3	80.6	85.5	88.0	92.6	96.1

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)
2,100	500	108.8	108.6	110.3	110.1	109.8	109.2	106.1	102.1	99.5	96.9	96.3
2,000	500	108.8	110.5	109.9	109.1	109.0	108.1	105.2	103.0	97.9	94.0	91.5
1,900	500	108.2	109.6	109.5	108.7	109.7	107.3	105.8	105.2	101.2	100.1	103.9
1,800	500	107.1	107.8	108.2	108.0	108.3	107.1	104.2	100.7	97.9	95.7	95.0
1,700	499	107.2	107.5	108.3	107.9	108.2	106.4	106.0	104.1	101.7	103.3	103.2
1,600	486	106.3	107.0	108.2	108.3	108.4	107.1	106.4	105.5	104.4	105.7	107.1
1,500	460	105.8	105.6	107.4	107.5	107.6	106.7	105.6	105.1	105.6	106.4	106.8
1,400	427	105.6	104.6	107.3	107.7	107.1	106.1	105.6	106.0	104.9	110.1	102.5
1,300	391	104.8	103.9	106.5	108.0	106.2	105.7	105.7	105.8	105.3	108.4	98.7
1,200	342	102.7	102.3	106.0	104.9	104.8	104.8	105.3	108.3	111.0	101.6	98.5
1,100	291	101.8	102.3	104.1	104.4	104.2	103.6	104.5	111.3	107.6	98.6	97.5
1,000	247	101.0	100.1	101.7	102.7	101.3	101.6	109.5	106.3	98.1	96.7	94.6
900	195	99.6	99.7	100.0	101.6	99.0	100.1	105.2	96.8	94.2	92.6	89.5
800	139	97.6	95.9	98.0	98.9	97.2	99.1	98.8	89.4	90.8	88.0	82.9
700	107	95.9	95.5	97.0	98.0	96.8	95.5	97.4	87.9	88.1	85.3	80.4
600	80.0	95.5	93.8	95.8	96.9	93.0	93.4	96.1	85.1	86.0	82.6	77.6

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Units Filter All Units

DIESEL

RATED SPEED NOMINAL DATA: 2100 RPM

ENGINE POWER	BKW	500	375	250	125	50.0
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	3,185	2,298	1,302	476	292
TOTAL CO	G/HR	211	200	169	181	389
TOTAL HC	G/HR	38	42	43	41	67
TOTAL CO2	KG/HR	345	262	186	118	71
PART MATTER	G/HR	35.3	0.0	0.0	0.0	0.0
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,144.8	2,038.5	1,646.5	952.8	979.8
TOTAL CO	(CORR 5% O2) MG/NM3	142.4	176.9	214.1	362.5	1,305.8
TOTAL HC	(CORR 5% O2) MG/NM3	21.9	32.2	47.1	70.6	195.7
PART MATTER	(CORR 5% O2) MG/NM3	20.1	0.0	0.0	0.0	0.0
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,045	993	802	464	477
TOTAL CO	(CORR 5% O2) PPM	114	142	171	290	1,045
TOTAL HC	(CORR 5% O2) PPM	41	60	88	132	365
TOTAL NOX (AS NO2)	G/HP-HR	4.78	4.59	3.90	2.84	4.37
TOTAL CO	G/HP-HR	0.32	0.40	0.50	1.08	5.81
TOTAL HC	G/HP-HR	0.06	0.08	0.13	0.24	1.00
PART MATTER	G/HP-HR	0.05	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)	LB/HR	7.02	5.07	2.87	1.05	0.64
TOTAL CO	LB/HR	0.47	0.44	0.37	0.40	0.86
TOTAL HC	LB/HR	0.08	0.09	0.09	0.09	0.15
TOTAL CO2	LB/HR	760	577	410	260	157
PART MATTER	LB/HR	0.08	0.00	0.00	0.00	0.00
OXYGEN IN EXH	%	10.7	12.2	13.6	15.1	16.7
DRY SMOKE OPACITY	%	0.9	1.1	1.6	2.6	3.3
BOSCH SMOKE NUMBER		0.59	0.77	1.09	1.56	1.86

RATED SPEED POTENTIAL SITE VARIATION: 2100 RPM

ENGINE POWER	BKW	500	375	250	125	50.0
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	3,440	2,482	1,406	514	316
TOTAL CO	G/HR	395	373	315	338	727
TOTAL HC	G/HR	71	79	81	77	127

ENGINE POWER		BKW	500	375	250	125	50.0
PERCENT LOAD		%	100	75	50	25	10
PART MATTER		G/HR	68.8	0.0	0.0	0.0	0.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,316.4	2,201.5	1,778.2	1,029.0	1,058.1
TOTAL CO	(CORR 5% O2)	MG/NM3	266.3	330.9	400.4	677.9	2,441.8
TOTAL HC	(CORR 5% O2)	MG/NM3	41.4	60.8	89.0	133.4	369.8
PART MATTER	(CORR 5% O2)	MG/NM3	39.3	0.0	0.0	0.0	0.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,128	1,072	866	501	515
TOTAL CO	(CORR 5% O2)	PPM	213	265	320	542	1,953
TOTAL HC	(CORR 5% O2)	PPM	77	113	166	249	690
TOTAL NOX (AS NO2)		G/HP-HR	5.16	4.96	4.21	3.07	4.71
TOTAL CO		G/HP-HR	0.59	0.75	0.94	2.02	10.86
TOTAL HC		G/HP-HR	0.11	0.16	0.24	0.46	1.90
PART MATTER		G/HP-HR	0.10	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)		LB/HR	7.58	5.47	3.10	1.13	0.70
TOTAL CO		LB/HR	0.87	0.82	0.69	0.74	1.60
TOTAL HC		LB/HR	0.16	0.17	0.18	0.17	0.28
PART MATTER		LB/HR	0.15	0.00	0.00	0.00	0.00

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EPA TIER 3	2018 - ----	CYCLE : E3
<p>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.</p>		
Locality	Agency	Regulation
U.S. (INCL CALIF)	EPA	MARINE COMMERCIAL
		Tier/Stage
		TIER 3
		Max Limits - G/BKW - HR
		CO: 5.0 NOx + HC: 5.6 PM: 0.10

EPA TIER 3	2013 - 2017	CYCLE : E3
<p>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.</p>		
Locality	Agency	Regulation
U.S. (INCL CALIF)	EPA	MARINE COMMERCIAL
		Tier/Stage
		TIER 3
		Max Limits - G/BKW - HR
		CO: 5.0 NOx + HC: 5.6 PM: 0.11

EU STAGE IIIA	2009 - 2019	CYCLE : E3
<p>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.</p>		
Locality	Agency	Regulation
EUROPE	EU	MARINE COMMERCIAL
		Tier/Stage
		STAGE IIIA
		Max Limits - G/BKW - HR
		CO: 5.0 NOx + HC: 7.2 PM: 0.20

IMO II	2011 - ----	CYCLE : E3
<p>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.</p>		

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Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
3717538	PP6946	3770508	EE129	-	TNA00001	
3717538	PP6946	3770509	EE129	-	TNA00001	
3717538	PP6946	3770510	EE129	-	TNA00001	
3717538	PP6946	3770511	EE129	-	TNA00001	
3717538	PP6946	5798329	EE129	-	TNA00001	
3717538	PP6946	5798330	EE129	-	TNA00001	
3717538	PP6946	5798331	EE129	-	TNA00001	
3717538	PP6946	5798332	EE129	-	TNA00001	
3717538	PP6946	6283058	EE129	-	TNA00001	
3717538	PP6946	6283059	EE129	-	TNA00001	
3717538	PP6946	6283060	EE129	-	TNA00001	
3717538	PP6946	6283061	EE129	-	TNA00001	

Supplementary Data [Top](#)

Type	Classification	Performance Number
SECONDARY RATED SPEED	1800 RPM	EM0377
CHART	AMBIENT CAPABILITY CHART	EM0461
SOUND	SOUND POWER	EM0759
CHART	BSFC CONTOUR PLOT	EM0992

This performance data is supplementary data for:

[EM0377](#)

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Parameters Reference: **DM9600 - 15**

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% Specific fuel consumption (C7-C18) +/- 4% 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 : 03/12/24

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