PERFORMANCE DATA[EM5657]

December 3, 2024

Performance Number: EM5657 **Change Level: 01**

SALES MODEL:	C13B	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	2,100
MACHINE SALES MODEL:		**PEAK TORQUE SPEED (RPM):**	1,400
ENGINE POWER (BKW):	370.0	**TORQUE RISE (%):**	35
PEAK TORQUE (NM):	2,266.0	**ASPIRATION:**	TA
COMPRESSION RATIO:	15.8	**AFTERCOOLER TYPE:**	ATAAC
RATING LEVEL:	B-RATING	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
PUMP QUANTITY:	1	**INLET MANIFOLD AIR TEMP (C):**	50
FUEL TYPE:	DIESEL	**JACKET WATER TEMP (C):**	89
MANIFOLD TYPE:	DRY	**TURBO CONFIGURATION:**	SINGLE
GOVERNOR TYPE:	ELEC	**TURBO QUANTITY:**	1
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	HE500FG A/R 2.19
IGNITION TYPE:	CI	**CERTIFICATION YEAR:**	2021
INJECTOR TYPE:	EUI	**PISTON SPD @ RATED ENG SPD (M/SEC):**	11.0
REF EXH STACK DIAMETER (MM):	127		
MAX OPERATING ALTITUDE (M):	2,037		

INDUSTRY	SUBINDUSTRY	APPLICATION
INDUSTRIAL	GENERAL INDUSTRIAL	INDUSTRIAL
INDUSTRIAL	MATERIAL HANDLING	INDUSTRIAL
INDUSTRIAL	CONSTRUCTION	INDUSTRIAL
INDUSTRIAL	AGRICULTURE	INDUSTRIAL
OIL AND GAS	WELL SERVICING	INDUSTRIAL
OIL AND GAS	LAND PRODUCTION	INDUSTRIAL
INDUSTRIAL	FORESTRY	INDUSTRIAL

General Performance Data

INLET MANIFOLD AIR TEMPERATURE ("INLET MFLD TEMP") FOR THIS CONFIGURATION IS MEASURED AT THE OUTLET OF THE AFTERCOOLER.

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	370	1,682	1,690	219.4	215.2	95.4	93.6
2,000	370	1,766	1,775	212.3	208.2	92.3	90.6
1,900	370	1,859	1,869	208.0	204.0	90.5	88.8
1,800	370	1,963	1,973	204.5	200.6	89.0	87.3
1,700	365	2,051	2,061	203.6	199.8	87.5	85.8
1,600	357	2,132	2,143	200.0	196.2	84.1	82.5
1,500	346	2,205	2,216	197.7	194.0	80.6	79.0
1,400	332	2,266	2,278	197.5	193.7	77.2	75.7
1,300	299	2,199	2,210	195.6	191.9	68.9	67.6
1,200	268	2,131	2,142	200.8	197.0	63.3	62.1
1,100	232	2,014	2,024	204.1	200.3	55.7	54.6
1,000	190	1,814	1,823	212.9	208.8	47.6	46.7
900	138	1,465	1,472	222.7	218.5	36.2	35.5
800	100	1,199	1,205	229.4	225.0	27.1	26.6
700	72.6	991	996	235.9	231.4	20.1	19.7
600	60.6	965	969	238.8	234.2	17.0	16.7

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	370	244.3	50.3	602.5	359.3	416.9	260	208.8
2,000	370	237.6	50.4	599.9	329.6	420.6	251	203.8
1,900	370	233.7	50.4	604.5	306.8	430.6	246	200.1
1,800	370	227.5	50.2	616.8	284.9	445.6	239	197.2
1,700	365	225.1	50.4	625.8	267.5	456.7	235	192.8
1,600	357	213.3	50.4	633.2	239.0	471.8	222	185.0
1,500	346	197.9	50.4	650.7	210.1	496.2	205	180.4
1,400	332	182.7	50.4	673.4	184.0	525.7	189	175.1
1,300	299	156.9	50.3	687.8	150.5	552.7	162	158.4
1,200	268	133.1	50.4	711.2	121.8	587.7	136	147.2
1,100	232	108.0	50.3	734.9	95.9	623.9	110	132.4
1,000	190	81.9	50.2	744.6	71.6	650.1	83	111.0
900	138	51.2	49.1	706.5	46.7	635.6	52	81.0

800	100	29.8	43.8	633.9	28.8	569.0	30	61.2
700	72.6	17.7	37.4	552.7	17.8	492.0	18	46.9
600	60.6	13.8	32.6	538.7	12.8	473.2	14	42.6

General Performance Data (Continued)

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	370	35.7	60.1	2,483.5	2,564.7	23.8	22.0
2,000	370	33.5	57.7	2,325.3	2,403.7	22.7	20.9
1,900	370	31.7	55.8	2,201.1	2,278.1	21.7	19.9
1,800	370	29.9	53.9	2,070.1	2,145.7	20.5	18.8
1,700	365	28.9	53.1	1,983.7	2,058.0	19.9	18.2
1,600	357	26.8	50.7	1,821.8	1,893.2	18.6	16.9
1,500	346	24.0	47.9	1,633.6	1,702.1	17.0	15.4
1,400	332	21.5	45.4	1,461.5	1,527.1	15.5	14.0
1,300	299	18.6	41.2	1,250.6	1,309.2	13.6	12.3
1,200	268	15.5	37.2	1,046.6	1,100.4	11.8	10.5
1,100	232	12.7	32.6	854.8	902.1	9.9	8.8
1,000	190	10.1	27.8	681.3	721.7	8.2	7.2
900	138	7.7	21.4	514.9	545.7	6.4	5.6
800	100	5.7	15.2	381.8	404.8	4.9	4.3
700	72.6	4.5	11.0	296.9	314.0	3.9	3.4
600	60.6	3.7	9.1	248.1	262.5	3.3	2.9

Heat Rejection Data

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	370	150	40.5	357	180	51.4	110	370	964	1,027
2,000	370	145	40.8	339	172	49.7	99.7	370	933	994
1,900	370	141	41.6	330	170	48.7	92.1	370	914	974
1,800	370	138	41.5	323	170	47.9	85.0	370	899	958
1,700	365	136	41.1	320	170	47.1	79.0	365	884	941
1,600	357	133	39.5	307	166	45.2	68.6	357	849	905
1,500	346	130	39.5	292	162	43.4	59.3	346	814	867
1,400	332	128	39.4	280	160	41.5	50.9	332	780	831
1,300	299	122	27.6	254	148	37.1	37.8	299	696	741
1,200	268	118	37.3	230	138	34.1	28.3	268	639	681
1,100	232	108	38.3	202	124	30.0	19.6	232	563	599
1,000	190	96.8	43.2	170	106	25.6	11.6	190	481	512
900	138	79.2	40.6	127	77.3	19.5	4.6	138	365	389
800	100	65.5	38.6	85.2	48.6	14.6	1.9	100	274	292
700	72.6	51.1	34.7	57.7	29.9	10.8	0.8	72.6	204	217
600	60.6	47.4	27.8	46.7	23.5	9.2	0.7	60.6	172	183

Sound Data

SOUND DATA REPRESENTATIVE OF NOISE PRODUCED BY THE "ENGINE AND CEM" AS A UNIT WITHOUT A MUFFLER INSTALLED

EXHAUST:SOUND POWER(1/3 Octave Frequencies)

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	370	104.6	80.0	75.9	79.4	83.5	87.1	90.3	92.5	93.8	94.9	95.2
2,000	370	102.8	81.6	74.3	78.3	85.0	85.7	90.0	90.8	92.1	93.0	93.1

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1,900	370	101.9	81.8	74.1	79.8	84.6	85.4	89.3	90.0	91.3	92.1	92.2
1,800	370	100.9	82.0	73.6	81.2	84.1	85.0	88.4	89.1	90.4	91.2	91.1
1,700	365	100.0	73.2	73.3	80.0	80.1	84.2	87.0	88.5	90.0	90.4	90.4
1,600	357	98.5	70.6	73.0	79.1	79.0	83.1	87.5	87.1	88.4	88.8	88.5
1,500	346	96.9	67.9	72.5	78.2	77.6	81.8	87.9	85.5	86.4	86.9	86.6
1,400	332	95.2	68.0	79.1	77.4	80.4	80.4	85.7	84.7	84.8	84.9	84.5
1,300	299	91.2	65.8	75.1	71.5	75.6	77.1	81.9	80.8	80.9	81.3	80.4
1,200	268	89.4	69.5	83.6	70.8	73.3	74.5	80.6	78.0	77.2	78.9	76.6
1,100	232	86.4	80.7	75.7	71.1	71.2	72.5	76.5	75.0	73.3	75.9	72.6
1,000	190	86.6	84.5	67.5	74.0	70.4	69.5	74.3	73.8	70.1	73.5	69.4
900	138	79.3	72.6	68.9	62.1	65.9	67.9	71.5	67.4	68.0	70.1	64.7
800	100	77.1	59.8	70.8	58.4	66.5	66.4	69.5	64.7	64.1	68.4	62.2
700	72.6	74.7	58.7	65.8	58.5	65.2	63.5	67.1	62.0	63.4	66.0	61.1
600	60.6	73.6	58.8	62.4	58.3	63.0	60.8	66.7	60.9	61.7	64.9	60.9

EXHAUST:SOUND POWER(1/3 Octave Frequencies)

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	370	94.9	94.3	93.5	92.6	91.3	91.4	90.6	89.8	89.5	87.8	84.6
2,000	370	92.7	92.1	91.3	90.4	89.2	89.1	88.5	87.8	87.7	85.9	82.7
1,900	370	91.8	91.2	90.4	89.5	88.3	88.2	87.6	86.9	86.8	85.0	81.8
1,800	370	90.8	90.2	89.3	88.4	87.2	87.2	86.5	85.8	85.7	84.1	80.8
1,700	365	90.0	89.3	88.3	87.5	86.3	86.3	85.6	85.0	84.8	83.1	79.8
1,600	357	88.1	87.5	86.5	85.7	84.4	84.5	83.9	83.2	83.1	81.4	78.0
1,500	346	86.2	85.5	84.4	83.7	82.4	82.5	81.9	81.3	81.1	79.6	76.0
1,400	332	84.0	83.2	82.2	81.4	80.2	80.4	79.9	79.3	79.1	77.7	73.9
1,300	299	79.9	79.0	78.1	77.3	76.2	76.4	75.9	75.4	75.0	74.0	70.0
1,200	268	76.0	75.1	74.4	73.7	72.5	72.7	72.4	71.6	71.3	70.2	66.2
1,100	232	71.7	70.7	70.0	69.5	68.2	68.2	67.8	66.9	66.7	65.4	62.2
1,000	190	67.3	66.3	65.7	64.9	63.3	63.4	62.8	61.8	61.5	60.7	59.7
900	138	63.0	62.1	61.3	60.3	59.3	58.3	57.3	56.3	55.3	54.3	53.3
800	100	61.1	59.9	58.7	57.9	56.9	55.9	54.9	53.9	52.9	51.9	50.9
700	72.6	60.2	59.3	58.2	57.2	56.2	55.2	54.2	53.2	52.2	51.2	50.2
600	60.6	60.4	59.6	58.5	57.6	56.6	55.6	54.6	53.6	52.6	51.6	50.6

MECHANICAL:SOUND POWER(1/3 Octave Frequencies)

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	370	118.8	77.2	87.0	92.3	92.1	94.7	96.6	96.1	99.4	103.3	105.5
2,000	370	117.8	76.3	84.5	91.5	91.7	93.4	91.4	95.4	96.8	103.3	104.5
1,900	370	117.5	76.5	86.2	89.7	90.8	92.2	91.9	94.5	97.7	102.6	103.8
1,800	370	117.3	76.7	88.0	88.0	90.0	90.9	92.4	93.6	98.7	101.7	103.0
1,700	365	116.2	75.9	82.6	85.3	87.3	88.4	92.3	94.6	98.0	100.2	103.0
1,600	357	114.7	74.5	84.7	88.5	86.3	88.0	90.5	92.2	97.3	99.9	101.1
1,500	346	113.2	73.2	86.8	91.3	85.3	87.7	88.8	89.7	96.3	99.4	99.3
1,400	332	112.6	73.9	84.2	83.7	85.1	86.0	87.0	89.6	95.4	98.6	97.4
1,300	299	111.2	77.7	81.4	83.7	84.1	84.4	86.1	87.5	94.2	95.7	97.0
1,200	268	110.7	70.4	78.7	81.5	82.9	84.5	86.9	86.7	91.7	94.2	95.2
1,100	232	109.8	70.8	79.2	80.9	83.1	83.6	86.5	85.5	91.7	92.8	95.0
1,000	190	109.3	69.5	80.6	80.4	82.1	82.1	85.4	85.0	92.5	93.1	94.2
900	138	108.8	66.6	77.3	79.0	81.6	80.2	84.3	84.9	91.6	94.6	95.6
800	100	110.0	67.2	75.0	75.4	79.3	82.3	83.5	84.6	91.9	96.1	97.1
700	72.6	108.8	66.3	73.6	75.4	78.5	80.6	82.3	83.7	90.5	95.4	96.8
600	60.6	107.6	66.3	73.9	75.3	77.8	79.1	81.0	82.3	89.8	94.6	95.9

MECHANICAL:SOUND POWER(1/3 Octave Frequencies)

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	370	108.7	109.1	108.8	109.5	110.7	110.5	105.7	102.9	101.4	97.7	107.3
2,000	370	107.9	106.9	107.7	108.6	110.3	109.6	105.0	101.7	100.0	96.4	105.8
1,900	370	107.7	106.7	107.3	108.4	110.4	109.6	104.6	101.3	99.9	96.3	105.3
1,800	370	107.5	106.3	106.6	108.1	110.3	109.4	104.1	100.9	99.8	96.0	104.5
1,700	365	105.2	105.0	105.4	107.0	109.3	109.1	102.7	99.7	99.2	95.5	101.6
1,600	357	104.2	104.3	104.4	105.5	107.6	106.9	100.8	98.2	97.9	95.3	99.3

1,500	346	103.1	103.5	103.1	103.9	105.9	104.4	98.9	96.6	96.3	95.5	96.7
1,400	332	102.5	102.3	102.7	103.6	105.3	104.5	98.7	96.5	96.8	95.1	95.5
1,300	299	101.4	101.5	101.2	102.1	103.5	102.7	97.8	95.4	95.9	96.4	93.2
1,200	268	101.6	101.0	100.6	101.2	102.8	101.8	97.0	94.7	95.6	99.3	90.4
1,100	232	100.5	100.4	100.4	100.3	101.7	101.0	96.3	94.2	95.3	95.9	88.7
1,000	190	101.0	100.1	100.3	99.9	101.6	99.7	95.8	94.0	94.6	89.6	87.4
900	138	101.2	98.7	98.9	99.9	100.8	98.7	96.0	95.3	92.9	87.3	86.7
800	100	104.0	101.1	98.9	99.8	100.7	97.0	98.3	99.3	90.7	86.7	83.6
700	72.6	102.7	99.7	97.7	99.0	99.3	96.1	96.9	96.7	90.1	84.9	81.5
600	60.6	101.2	97.7	96.0	97.5	97.7	95.2	96.0	97.5	89.2	83.7	81.0

Emissions Data

DIESEL

RATED SPEED NOMINAL DATA: 2100 RPM

ENGINE POWER		**BKW**	**370**	**278**	**185**	**92.5**	**37.0**
PERCENT LOAD		**%**	**100**	**75**	**50**	**25**	**10**
TOTAL NOX (AS NO2)		G/HR	91	88	43	6	19
TOTAL CO		G/HR	42	38	32	26	19
TOTAL HC		G/HR	7	7	6	5	6
TOTAL CO2		KG/HR	251	192	134	80	48
PART MATTER		G/HR	2.7	1.8	1.1	1.0	0.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	87.3	108.9	58.2	23.8	80.0
TOTAL CO	(CORR 5% O2)	MG/NM3	38.4	44.5	53.9	74.9	91.1
TOTAL HC	(CORR 5% O2)	MG/NM3	5.8	7.2	9.0	13.5	23.4
PART MATTER	(CORR 5% O2)	MG/NM3	2.1	1.8	1.6	2.5	3.9
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	32.4	40.4	21.6	8.8	29.7
TOTAL CO	(CORR 15% O2)	MG/NM3	14.3	16.5	20.0	27.8	33.8
TOTAL HC	(CORR 15% O2)	MG/NM3	2.1	2.7	3.3	5.0	8.7
PART MATTER	(CORR 15% O2)	MG/NM3	0.8	0.7	0.6	0.9	1.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	42	53	28	12	39
TOTAL CO	(CORR 5% O2)	PPM	31	36	43	60	73
TOTAL HC	(CORR 5% O2)	PPM	11	14	17	25	44
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	16	20	11	4	14
TOTAL CO	(CORR 15% O2)	PPM	11	13	16	22	27
TOTAL HC	(CORR 15% O2)	PPM	4	5	6	9	16
TOTAL NOX (AS NO2)		G/HP-HR	0.18	0.24	0.18	0.05	0.38
TOTAL CO		G/HP-HR	0.09	0.10	0.13	0.21	0.39
TOTAL HC		G/HP-HR	0.01	0.02	0.02	0.04	0.12
PART MATTER		G/HP-HR	0.01	0.00	0.00	0.01	0.02
TOTAL NOX (AS NO2)		G/KW-HR	0.25	0.32	0.24	0.07	0.51
TOTAL CO		G/KW-HR	0.12	0.14	0.18	0.29	0.53
TOTAL HC		G/KW-HR	0.02	0.03	0.03	0.06	0.16
PART MATTER		G/KW-HR	0.01	0.01	0.01	0.01	0.03
TOTAL NOX (AS NO2)		LB/HR	0.20	0.19	0.10	0.01	0.04
TOTAL CO		LB/HR	0.09	0.08	0.07	0.06	0.04
TOTAL HC		LB/HR	0.02	0.02	0.01	0.01	0.01
TOTAL CO2		LB/HR	553	423	296	177	107
PART MATTER		LB/HR	0.01	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	11.2	12.4	13.5	15.1	16.8
DRY SMOKE OPACITY		%	2.1	3.1	4.5	4.8	3.2
BOSCH SMOKE NUMBER			1.15	1.41	1.75	1.82	1.45

SECONDARY SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER		**BKW**	**370**	**278**	**185**	**92.5**	**37.0**
PERCENT LOAD		**%**	**100**	**75**	**50**	**25**	**10**
TOTAL NOX (AS NO2)		G/HR	28	19	5	5	13
TOTAL CO		G/HR	35	33	29	21	14
TOTAL HC		G/HR	6	5	3	3	3
TOTAL CO2		KG/HR	239	180	125	71	40
PART MATTER		G/HR	1.6	1.2	1.1	0.8	0.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	27.7	22.9	9.3	18.3	67.9
TOTAL CO	(CORR 5% O2)	MG/NM3	33.6	41.6	52.1	67.3	77.8
TOTAL HC	(CORR 5% O2)	MG/NM3	4.9	5.1	5.4	8.1	16.1
PART MATTER	(CORR 5% O2)	MG/NM3	1.3	1.3	1.7	2.4	3.9

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TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	10.3	8.5	3.5	6.8	25.2
TOTAL CO	(CORR 15% O2)	MG/NM3	12.5	15.4	19.3	25.0	28.9
TOTAL HC	(CORR 15% O2)	MG/NM3	1.8	1.9	2.0	3.0	6.0
PART MATTER	(CORR 15% O2)	MG/NM3	0.5	0.5	0.6	0.9	1.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	14	11	5	9	33
TOTAL CO	(CORR 5% O2)	PPM	27	33	42	54	62
TOTAL HC	(CORR 5% O2)	PPM	9	9	10	15	30
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	5	4	2	3	12
TOTAL CO	(CORR 15% O2)	PPM	10	12	15	20	23
TOTAL HC	(CORR 15% O2)	PPM	3	3	4	6	11
TOTAL NOX (AS NO2)		G/HP-HR	0.06	0.05	0.02	0.04	0.26
TOTAL CO		G/HP-HR	0.07	0.09	0.12	0.17	0.28
TOTAL HC		G/HP-HR	0.01	0.01	0.01	0.02	0.07
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.01	0.02
TOTAL NOX (AS NO2)		G/KW-HR	0.08	0.07	0.03	0.05	0.35
TOTAL CO		G/KW-HR	0.10	0.12	0.16	0.23	0.37
TOTAL HC		G/KW-HR	0.02	0.02	0.02	0.03	0.09
PART MATTER		G/KW-HR	0.00	0.00	0.01	0.01	0.02
TOTAL NOX (AS NO2)		LB/HR	0.06	0.04	0.01	0.01	0.03
TOTAL CO		LB/HR	0.08	0.07	0.06	0.05	0.03
TOTAL HC		LB/HR	0.01	0.01	0.01	0.01	0.01
TOTAL CO2		LB/HR	527	398	276	157	88
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	10.1	11.2	12.4	14.3	16.5
DRY SMOKE OPACITY		%	2.5	4.0	5.2	4.9	6.6
BOSCH SMOKE NUMBER			1.26	1.62	1.91	1.85	2.20

Regulatory Information

CHINA STAGE IV		**2020 - ----**		
THIS ENGINE HAS BEEN TESTED IN ACCORDANCE WITH THE PROVISIONS OF THE PEOPLE'S REPUBLIC OF CHINA NATIONAL STANDARD # GB 20891-2014, AND COMPLIES WITH THE STATED LIMITS OF CO, HC, NOX, AND PM FOR STAGE IV				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
CHINA	CHINA	NON-ROAD	STAGE IV	CO: 3.5 NOx: 2.0 HC: 0.19 PM: 0.025

Altitude Derate Data

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BKW)

AMBIENT OPERATING TEMP (C)	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**NORMAL**
ALTITUDE (M)												
0	370	370	370	370	370	369	368	367	365	364	363	370
250	370	370	370	368	367	366	364	363	362	360	359	368
500	368	367	366	364	363	362	361	359	358	357	355	365
750	367	366	365	363	362	361	359	358	356	355	346	364
1,000	367	365	364	363	361	360	358	357	349	343	337	364
1,250	365	363	362	361	359	358	351	344	339	333	328	363
1,500	362	361	359	358	354	345	340	334	329	323	317	361
1,750	362	361	360	353	345	339	333	327	320	313	306	361
2,000	366	365	361	353	345	338	330	320	311	302	294	365
2,250	363	361	356	346	337	328	317	306	297	288	278	363
2,500	355	353	344	333	323	312	302	291	279	270	262	355
2,750	332	330	329	318	307	296	284	273	264	254	244	332
3,000	312	311	309	300	290	278	267	256	245	235	227	313
3,250	297	296	292	280	269	257	246	237	228	222	216	299
3,500	285	282	271	258	248	238	230	223	218	212	207	286
3,750	272	260	249	240	231	224	219	213	208	203	199	276
4,000	250	241	232	225	220	214	209	204	200	195	191	266
4,250	233	226	221	215	210	205	201	196	192	187	183	255
4,500	221	216	211	206	202	197	193	188	184	179	178	241

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
5643398	PP7340	5746809	EE600	-	KHG00001	
5643297	PP7335	5746810	EE582	-	N3H00001	

Performance Parameter Reference

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.

PERFORMANCE DATA[EM5657]

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

PERFORMANCE DATA[EM5657]

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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