

PERFORMANCE DATA [N5F01091]

AUGUST 29, 2023

(N5F01091)-ENGINE (CDE128616A)-CEM (PET011870M)-PETU

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Perf No: EM0287

Change Level: 02

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SALES MODEL:	C15	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	2,100
MACHINE SALES MODEL:		PEAK TORQUE SPEED (RPM):	1,400
ENGINE POWER (BKW):	403.0	TORQUE RISE (%):	35
PEAK TORQUE (NM):	2,472.0	ASPIRATION:	TA
COMPRESSION RATIO:	17	AFTERCOOLER TYPE:	ATAAC
RATING LEVEL:	INDUSTRIAL C - INTERMITTENT	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
ELECTRONICS TYPE:	ADEM4	TURBOCHARGER MODEL:	GT4502 1.06 A/R
CAMSHAFT TYPE:	STANDARD	CERTIFICATION YEAR:	2013
IGNITION TYPE:	CI		
INJECTOR TYPE:	EUI		
REF EXH STACK DIAMETER (MM):	152		
MAX OPERATING ALTITUDE (M):	2,286		

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

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Note(s)

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	403	1,833	1,515	219.9	217.8	105.0	104.0
2,000	403	1,924	1,591	217.7	215.7	103.8	102.8
1,900	403	2,025	1,675	211.8	209.8	100.9	99.9
1,800	402	2,133	1,763	204.4	202.4	97.6	96.7
1,700	398	2,236	1,848	202.4	200.5	95.4	94.5
1,600	390	2,328	1,924	201.2	199.3	92.8	92.0
1,500	378	2,406	1,990	203.2	201.3	90.6	89.8
1,400	362	2,469	2,041	202.5	200.5	87.0	86.2
1,300	328	2,409	1,992	201.0	199.1	78.1	77.3
1,200	292	2,324	1,921	203.5	201.6	70.4	69.8
1,100	253	2,196	1,816	210.7	208.7	63.2	62.6
1,000	211	2,015	1,666	211.2	209.2	52.8	52.3
900	173	1,836	1,518	204.1	202.2	41.6	41.2

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)
800	138	1,647	1,362	211.4	209.4	34.4	34.1
700	101	1,378	1,139	212.7	210.7	25.4	25.2
600	69.0	1,098	908	219.0	216.9	17.8	17.6

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	403	208.4	50.0	599.5	286.7	437.4	218	185.2
2,000	403	212.3	50.0	604.2	275.3	446.7	222	184.6
1,900	403	210.3	50.0	598.5	255.0	446.8	219	180.2
1,800	402	202.4	50.0	598.5	230.0	452.2	210	175.5
1,700	398	197.5	50.0	603.0	215.5	459.6	204	172.9
1,600	390	196.4	50.0	611.9	208.5	469.6	203	172.4
1,500	378	195.3	50.0	625.9	201.3	482.9	201	172.9
1,400	362	190.8	50.0	639.8	191.7	496.8	197	172.6
1,300	328	165.2	50.0	647.1	156.1	514.7	170	160.9
1,200	292	147.9	50.0	665.3	132.9	540.7	152	153.1
1,100	253	130.8	50.0	684.3	112.4	566.0	134	144.9
1,000	211	111.3	50.0	656.3	98.6	549.8	114	131.8
900	173	68.3	50.0	618.6	59.4	535.3	70	98.8
800	138	44.8	50.0	595.7	39.1	528.2	46	78.2
700	101	26.3	50.0	554.4	24.5	498.4	27	60.6
600	69.0	13.9	50.0	473.0	14.9	431.4	15	46.3

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	403	31.4	56.4	2,181.6	2,270.9	21.7	19.7
2,000	403	30.6	56.0	2,122.0	2,210.2	21.2	19.3
1,900	403	29.3	54.3	2,022.3	2,108.0	20.6	18.7
1,800	402	27.5	52.4	1,885.4	1,968.4	19.7	17.8
1,700	398	26.3	51.4	1,800.2	1,881.3	19.2	17.3
1,600	390	25.6	51.0	1,746.6	1,825.5	18.8	16.9
1,500	378	24.4	50.2	1,660.2	1,737.2	18.1	16.3
1,400	362	23.2	49.1	1,579.9	1,653.9	17.4	15.7
1,300	328	20.1	44.9	1,359.9	1,426.3	15.6	14.0
1,200	292	17.7	41.9	1,196.8	1,256.8	14.1	12.5
1,100	253	15.6	38.7	1,052.0	1,105.8	12.6	11.2
1,000	211	14.2	34.9	955.8	1,000.7	11.6	10.4
900	173	10.2	25.9	687.8	723.1	8.8	7.8
800	138	7.8	20.2	525.1	554.4	6.9	6.1
700	101	5.9	14.9	397.9	419.5	5.3	4.7
600	69.0	4.6	10.6	309.1	324.2	4.1	3.7

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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	403	244	58.8	345	175	48.6	84.8	403	1,061	1,130
2,000	403	235	57.0	346	177	48.0	82.7	403	1,049	1,117
1,900	403	227	55.4	328	169	46.7	76.0	403	1,019	1,085
1,800	402	221	53.6	309	161	46.2	69.3	402	986	1,050
1,700	398	210	50.3	306	158	45.2	65.7	398	964	1,027
1,600	390	196	47.0	307	159	43.0	62.9	390	938	999
1,500	378	187	44.9	306	159	41.9	61.4	378	916	975
1,400	362	178	43.1	298	159	40.3	57.1	362	879	937

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
1,300	328	161	39.5	270	145	37.8	43.7	328	789	840
1,200	292	147	35.6	250	138	35.6	35.6	292	712	758
1,100	253	133	32.0	235	131	33.3	29.3	253	639	680
1,000	211	111	26.7	204	113	29.0	20.5	211	534	568
900	173	91.7	22.4	157	78.4	25.5	10.3	173	420	447
800	138	83.4	20.0	123	59.1	24.8	4.4	138	348	371
700	101	67.3	16.4	88.8	40.7	20.2	1.1	101	257	273
600	69.0	46.3	11.1	63.1	24.6	13.8	-0.4	69.0	180	191

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Note(s)

SOUND DATA REPRESENTATIVE OF NOISE PRODUCED BY THE ENGINE AND AFTERTREATMENT.

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	403	98.3	70.1	70.0	74.1	77.8	81.5	85.7	88.2	89.2	88.6	88.6
2,000	403	98.1	71.5	69.5	74.8	77.8	81.2	85.6	88.0	89.0	88.4	88.5
1,900	403	97.0	74.7	69.4	73.3	77.7	80.4	84.7	87.0	87.7	87.1	87.2
1,800	402	94.8	71.6	72.0	72.1	76.2	79.2	83.8	84.9	85.0	84.6	84.7
1,700	398	94.2	68.3	73.0	72.5	75.1	79.0	83.3	84.5	84.6	84.3	84.2
1,600	390	93.8	65.1	71.9	72.9	74.3	78.7	83.1	84.1	84.1	84.0	83.8
1,500	378	92.7	66.0	69.8	72.3	73.7	78.3	82.3	82.8	83.1	82.7	82.7
1,400	362	91.4	66.8	69.0	71.8	72.9	77.6	81.3	81.4	81.6	81.2	81.2
1,300	328	88.8	66.9	70.0	69.5	71.1	75.6	78.9	78.4	78.9	78.4	78.7
1,200	292	86.2	67.1	71.7	67.0	69.6	74.1	76.3	75.5	76.3	75.9	76.3
1,100	253	83.6	66.7	69.6	64.7	68.0	72.5	73.1	72.5	73.3	73.0	73.9
1,000	211	80.1	64.4	61.3	64.5	65.2	68.4	69.5	68.3	69.3	69.2	70.3
900	173	76.0	61.9	50.2	62.3	61.6	63.3	65.3	64.1	64.9	65.1	65.7

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	403	87.7	87.2	85.6	84.8	87.4	86.4	81.9	79.8	78.6	76.4	73.5
2,000	403	87.6	87.0	85.3	84.6	87.5	86.7	81.6	79.3	78.1	75.8	73.0
1,900	403	86.4	85.8	84.1	83.4	86.5	84.8	80.2	78.0	76.9	74.6	71.7
1,800	402	83.9	83.2	81.3	81.0	85.9	82.5	77.6	75.5	74.3	71.8	68.7
1,700	398	83.5	82.7	80.9	80.7	84.4	81.5	76.9	74.9	73.7	71.3	68.2
1,600	390	83.2	82.4	80.8	80.4	83.5	80.6	76.5	74.5	73.3	70.9	67.8
1,500	378	82.0	81.3	79.7	79.9	82.5	79.4	75.4	73.3	72.1	69.5	66.3
1,400	362	80.6	79.8	78.1	78.9	80.9	77.7	73.8	71.9	70.5	67.9	64.6
1,300	328	77.9	77.0	75.6	76.0	77.0	74.4	71.2	69.0	67.5	64.8	61.1
1,200	292	75.3	74.4	73.2	73.1	73.2	71.3	68.9	66.1	64.7	61.7	57.7
1,100	253	72.8	72.1	70.9	70.9	70.0	68.4	66.7	62.9	61.6	58.3	53.9
1,000	211	69.6	69.2	67.5	68.4	66.9	64.5	63.7	58.4	56.9	53.1	48.8
900	173	66.5	65.7	63.6	65.7	63.9	59.8	60.6	53.1	52.2	47.7	43.7

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	403	115.1	74.9	77.8	88.4	90.8	97.0	93.9	100.5	102.2	104.3	105.5
2,000	403	114.4	73.3	78.8	86.1	90.7	94.0	91.1	102.1	101.3	101.5	104.1
1,900	403	115.0	77.3	78.2	86.5	88.7	91.2	89.9	101.2	102.9	102.7	105.8
1,800	402	113.5	72.0	77.8	82.7	86.7	90.0	89.6	100.8	101.4	100.9	104.0
1,700	398	113.0	71.0	77.5	83.8	86.0	89.2	89.2	99.5	100.9	100.6	103.4
1,600	390	112.7	71.7	77.3	85.4	84.5	87.9	88.1	97.3	100.3	100.3	102.9

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
1,500	378	111.6	70.3	77.8	82.2	82.4	86.1	87.0	97.1	98.9	99.3	101.7
1,400	362	110.7	69.0	77.7	78.5	80.0	83.8	86.5	97.6	98.1	98.3	100.6
1,300	328	110.1	67.2	75.9	75.6	78.1	83.4	86.6	96.4	97.1	97.5	100.0
1,200	292	109.6	65.7	73.9	73.4	76.9	83.4	87.1	95.0	96.2	97.0	99.5
1,100	253	109.0	67.4	70.7	71.9	77.2	83.8	87.0	93.8	95.6	96.1	99.2
1,000	211	108.0	70.8	65.1	71.1	78.3	84.4	85.8	93.2	95.4	94.9	98.3
900	173	106.9	75.0	58.5	69.7	79.6	84.2	84.9	93.2	94.8	94.0	96.3

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	403	105.2	104.7	105.7	106.3	105.0	102.8	101.4	98.8	95.4	93.3	91.6
2,000	403	105.0	104.2	104.6	106.6	104.3	102.2	100.8	97.8	94.8	92.7	91.2
1,900	403	105.0	104.5	104.7	107.4	105.0	102.8	101.1	98.2	95.3	92.4	90.9
1,800	402	104.0	102.7	103.3	105.2	103.4	101.6	100.1	97.2	94.7	92.5	90.7
1,700	398	103.1	102.8	103.1	104.8	102.9	101.3	99.3	96.7	94.3	91.9	90.0
1,600	390	102.3	103.2	103.2	105.0	102.8	101.1	98.6	96.3	93.5	91.2	89.5
1,500	378	100.9	101.4	102.2	103.9	102.0	100.4	97.9	95.5	92.6	90.8	89.4
1,400	362	99.4	100.1	101.0	102.9	101.4	100.0	97.1	94.8	92.0	90.5	89.2
1,300	328	99.5	99.8	100.4	101.9	100.8	99.4	96.4	94.0	91.3	89.7	88.5
1,200	292	100.1	100.0	99.9	100.9	100.2	98.6	95.6	92.9	90.4	88.7	87.7
1,100	253	99.8	99.4	99.1	100.0	99.7	97.9	95.4	91.9	89.8	88.2	87.1
1,000	211	98.5	98.0	97.7	99.0	99.1	97.1	95.2	90.7	88.5	87.4	86.6
900	173	97.5	96.3	96.3	98.0	98.2	96.0	94.4	88.8	86.8	86.7	86.9

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DIESEL

RATED SPEED NOMINAL DATA: 2100 RPM

ENGINE POWER	BKW	403	302	202	101	40.3
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	56	13	9	19	113
TOTAL CO	G/HR	2	1	1	1	1
TOTAL HC	G/HR	7	5	4	3	3
TOTAL CO2	KG/HR	284	214	168	98	63
PART MATTER	G/HR	0.2	0.2	0.1	0.2	0.1
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	46.0	14.0	11.6	40.8	413.3
TOTAL CO	(CORR 5% O2) MG/NM3	1.7	1.2	1.5	2.6	3.6
TOTAL HC	(CORR 5% O2) MG/NM3	5.0	4.3	5.2	5.1	9.1
PART MATTER	(CORR 5% O2) MG/NM3	0.1	0.2	0.1	0.4	0.3
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	22	7	6	20	201
TOTAL CO	(CORR 5% O2) PPM	1	1	1	2	3
TOTAL HC	(CORR 5% O2) PPM	9	8	10	9	17
TOTAL NOX (AS NO2)	G/HP-HR	0.10	0.03	0.03	0.14	2.10
TOTAL CO	G/HP-HR	0.00	0.00	0.00	0.01	0.02
TOTAL HC	G/HP-HR	0.01	0.01	0.02	0.02	0.05
PART MATTER	G/HP-HR	0.00	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)	LB/HR	0.12	0.03	0.02	0.04	0.25
TOTAL CO	LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL HC	LB/HR	0.02	0.01	0.01	0.01	0.01
TOTAL CO2	LB/HR	625	472	371	215	140
PART MATTER	LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH	%	8.4	9.9	12.3	14.4	16.4

SECONDARY SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER	BKW	402	302	201	100	40.2
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	37	11	4	2	98
TOTAL CO	G/HR	2	1	1	1	1
TOTAL HC	G/HR	7	5	4	2	3
TOTAL CO2	KG/HR	264	200	151	83	50
PART MATTER	G/HR	0.1	0.2	0.1	0.1	0.1
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	32.3	13.5	3.8	2.7	460.8
TOTAL CO	(CORR 5% O2) MG/NM3	1.5	1.5	1.5	2.9	4.2
TOTAL HC	(CORR 5% O2) MG/NM3	5.2	4.5	4.7	4.3	10.1
PART MATTER	(CORR 5% O2) MG/NM3	0.1	0.2	0.2	0.2	0.2
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	16	7	2	1	224

ENGINE POWER		BKW	402	302	201	100	40.2
PERCENT LOAD		%	100	75	50	25	10
TOTAL CO	(CORR 5% O2)	PPM	1	1	1	2	3
TOTAL HC	(CORR 5% O2)	PPM	10	8	9	8	19
TOTAL NOX (AS NO2)		G/HP-HR	0.07	0.03	0.01	0.02	1.84
TOTAL CO		G/HP-HR	0.00	0.00	0.00	0.01	0.02
TOTAL HC		G/HP-HR	0.01	0.01	0.01	0.01	0.05
PART MATTER		G/HP-HR	0.00	0.00	0.00	0.00	0.00
TOTAL NOX (AS NO2)		LB/HR	0.08	0.02	0.01	0.01	0.22
TOTAL CO		LB/HR	0.00	0.00	0.00	0.00	0.00
TOTAL HC		LB/HR	0.02	0.01	0.01	0.00	0.01
TOTAL CO2		LB/HR	583	442	333	182	111
PART MATTER		LB/HR	0.00	0.00	0.00	0.00	0.00
OXYGEN IN EXH		%	7.7	8.9	11.0	12.9	16.3

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EPA TIER 4 FINAL		2014 - ----			
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1039 SUBPART F AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.					
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR	
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 4 FINAL	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.02	
EU STAGE IV		2014 - ----			
GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 2010/26/EU, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.					
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR	
EUROPE	EU	NON-ROAD	STAGE IV	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.025	
EU STAGE V		2019 - ----			
GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 2016/1628, ECE REGULATION NO. 96 AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSION VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.					
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR	
EUROPE	EU	NON-ROAD	STAGE V	CO: 3.5 NOx: 0.4 HC: 0.19 PM: 0.015	

Altitude Derate Data [Top](#)

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	403	403	403	403	403	400	398	395	393	391	388	403
250	403	403	403	402	399	397	395	392	390	388	385	402
500	403	402	400	399	396	394	392	390	387	385	383	400
750	401	399	397	396	394	391	389	387	384	382	380	397
1,000	398	396	395	393	391	388	386	384	382	378	370	395
1,250	395	393	392	390	388	386	383	381	378	368	356	392
1,500	392	391	389	387	385	383	381	375	365	354	342	390
1,750	389	388	386	384	382	380	374	364	351	339	328	388
2,000	386	384	382	381	379	375	363	350	337	324	313	385
2,250	382	380	377	374	368	361	346	331	318	307	297	381
2,500	376	372	368	364	356	347	333	318	306	293	282	376
2,750	366	362	358	353	346	335	322	304	287	273	262	369
3,000	354	350	347	343	335	323	307	283	264	252	241	358
3,250	340	338	335	331	322	311	278	251	239	230	222	342
3,500	330	327	324	320	311	298	280	244	233	224	216	336
3,750	322	318	313	309	301	290	277	236	227	219	209	333
4,000	299	294	290	286	274	265	234	226	217	208	198	315

AMBIENT OPERATING TEMP (C)	10	15	20	25	30	35	40	45	50	55	60	NORMAL
4,250	271	266	263	261	244	230	222	214	204	194	184	283
4,500	248	242	237	235	227	219	210	201	190	182	181	259

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Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
3717459	PP6975	3857723	EE126	-	N5F00001	
3717459	PP6975	3857724	EE126	-	N5F00001	
3717459	PP6975	4240053	EE126	-	N5F00001	
3717459	PP6975	4240054	EE126	-	N5F00001	
4486240	PP7719	5099219	EE512	-	PP500001	
4486240	PP7719	5157536	EE512	-	PP500001	
5643937	PP7609	5996454	EE618	-	R5H00001	
5643937	PP7609	5996468	EE618	-	R5H00001	
5643933	PP7604	5996469	EE616	-	N5H00001	
5643933	PP7604	5996470	EE616	-	N5H00001	

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Type	Classification	Performance Number
AMBIENT TEMP	50C (122F)	EM0694

This performance data is supplementary data for:

[EM0694](#)

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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