

Performance Number: EM1769

Change Level: 03

SALES MODEL:	3512E	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,800
ENGINE POWER (BHP):	2,250	ASPIRATION:	TA
COMPRESSION RATIO:	14.3	AFTERCOOLER TYPE:	SCAC
RATING LEVEL:	A-RATING	AFTERCOOLER CIRCUIT TYPE:	JW+OC+1AC, 2AC
PUMP QUANTITY:	2	AFTERCOOLER TEMP (F):	95
FUEL TYPE:	DIESEL	JACKET WATER TEMP (F):	210.2
MANIFOLD TYPE:	DRY	TURBO CONFIGURATION:	PARALLEL
GOVERNOR TYPE:	ADEM5	TURBO QUANTITY:	2
ELECTRONICS TYPE:	ADEM5	TURBOCHARGER MODEL:	TPC47-A13-CT60-CA13-TT16-TA60
CAMSHAFT TYPE:	STANDARD	CERTIFICATION YEAR:	2016
IGNITION TYPE:	CI	FUEL RATE (RATED RPM) NO LOAD (GAL/HR):	8.0
INJECTOR TYPE:	EUI	PISTON SPD @ RATED ENG SPD (FT/MIN):	2,539.4
FUEL INJECTOR:	4575312		
UNIT INJECTOR TIMING (IN):	64.34		
REF EXH STACK DIAMETER (IN):	14		

INDUSTRY	SUBINDUSTRY	APPLICATION
MARINE	DREDGE	MARINE PROPULSION
MARINE	FERRY	MARINE PROPULSION
MARINE	PLEASURE CRAFT	MARINE PROPULSION
MARINE	OFFSHORE	MARINE PROPULSION
MARINE	GENERAL CARGO	MARINE PROPULSION
MARINE	TUG & SALVAGE	MARINE PROPULSION
MARINE	GOVERNMENT	MARINE PROPULSION
MARINE	CRUISE	MARINE PROPULSION
MARINE	FISHING	MARINE PROPULSION
MARINE	INLAND WATERWAY	MARINE PROPULSION

General Performance Data

THIS RATING IS PACKAGED WITH EXHAUST AFTERTREATMENT. THE ENGINE OUTLET TEMP, AND ENGINE OUTLET WET EXH GAS VOL FLOW RATE, LISTED IN THE GENERAL PERFORMANCE DATA ARE AT TURBINE OUTLET CONDITIONS. FOR AFTERTREATMENT OUTLET VALUES, PLEASE SEE THE AFTERTREATMENT SUPPLEMENTARY DATA.

35 DEG C AFTERCOOLER INLET TEMP IS FOR 80/20 GLYCOL MIX. 43 DEG C AFTERCOOLER INLET TEMP IS ALLOWABLE WHEN RUNNING TREATED WATER (ELI) ONLY.

ZONE 1

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)	BRAKE SPEC DEF CONSUMPTN (32.5%)	BRAKE SPEC DEF CONSUMPTN (40%)	VOL DEF CONSUMPTN (32.5%)	VOL DEF CONSUMPTN (40%)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	GAL/HR	G/HP-HR	G/HP-HR
1,800	2,250	6,566	277	0.337	0.331	107.0	1.265	0.954	2.29	1.76
1,700	2,250	6,952	293	0.331	0.325	105.1	1.322	0.996	2.39	1.84
1,600	2,182	7,162	302	0.322	0.316	99.2	1.413	1.065	2.64	2.03
1,500	2,087	7,306	308	0.318	0.312	93.5	1.415	1.067	2.76	2.12
1,400	1,981	7,431	314	0.315	0.309	87.9	1.443	1.088	2.97	2.28
1,300	1,875	7,574	320	0.311	0.305	82.2	6.634	5.002	14.40	11.08
1,200	1,167	5,106	215	0.327	0.321	53.8	4.601	3.469	16.05	12.35
1,100	799	3,816	161	0.346	0.339	39.0	1.708	1.288	8.70	6.69
1,000	554	2,909	123	0.354	0.348	27.7	0.795	0.599	5.84	4.49
900	436	2,543	107	0.366	0.359	22.5	0.020	0.015	0.19	0.15
800	323	2,122	90	0.360	0.353	16.4	0.024	0.018	0.30	0.23
700	275	2,063	87	0.347	0.341	13.5	0.023	0.018	0.34	0.26
650	260	2,102	89	0.352	0.345	12.9	0.023	0.017	0.36	0.27

ZONE 1

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	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,800	2,250	70.5	125.9	1,103.4	65.1	793.0	76	394.0
1,700	2,250	70.7	125.3	1,113.0	61.7	809.3	76	389.5
1,600	2,182	68.8	124.2	1,097.7	56.9	806.9	74	379.1
1,500	2,087	66.8	123.5	1,097.7	52.1	817.5	71	370.7
1,400	1,981	63.2	122.6	1,112.9	46.6	842.9	67	360.3
1,300	1,875	59.6	115.7	1,120.4	40.7	857.9	62	343.1
1,200	1,167	27.3	115.2	1,156.9	18.3	977.0	29	229.7

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1,100	799	15.5	117.3	1,138.8	10.8	973.3	17	174.1
1,000	554	8.5	117.8	1,037.9	6.6	913.4	10	135.4
900	436	5.1	114.1	953.5	4.4	830.5	6	116.2
800	323	2.6	112.2	775.2	2.8	673.2	3	98.4
700	275	1.7	112.5	743.4	1.9	640.9	2	92.2
650	260	1.4	112.4	737.5	1.8	626.6	2	89.5

General Performance Data (Continued)

ZONE 1

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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,800	2,250	5,257.7	10,716.4	23,037.0	23,796.2	4,206.1	3,879.4
1,700	2,250	5,044.9	10,468.0	22,018.2	22,763.8	4,055.7	3,733.9
1,600	2,182	4,737.2	9,900.6	20,533.8	21,236.9	3,843.3	3,536.1
1,500	2,087	4,398.5	9,371.0	18,970.5	19,633.6	3,607.7	3,314.1
1,400	1,981	3,988.3	8,786.3	17,106.0	17,729.4	3,316.6	3,038.4
1,300	1,875	3,715.4	8,258.1	15,606.9	16,190.3	3,081.6	2,819.8
1,200	1,167	2,185.6	5,548.4	9,123.8	9,505.5	1,898.8	1,721.9
1,100	799	1,581.8	4,132.6	6,588.6	6,865.0	1,417.9	1,285.1
1,000	554	1,246.1	3,121.0	5,189.9	5,386.2	1,117.5	1,021.1
900	436	989.7	2,438.4	4,140.1	4,299.6	929.2	848.0
800	323	821.0	1,777.1	3,435.6	3,551.8	771.3	710.1
700	275	701.3	1,485.8	2,936.9	3,032.4	663.8	612.7
650	260	647.6	1,364.3	2,713.0	2,804.5	617.5	568.5

ZONE 1-2

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)	BRAKE SPEC DEF CONSUMPTN (32.5%)	BRAKE SPEC DEF CONSUMPTN (40%)	VOL DEF CONSUMPTN (32.5%)	VOL DEF CONSUMPTN (40%)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	GAL/HR	G/HP-HR	G/HP-HR
1,800	2,250	6,566	277	0.337	0.331	107.0	1.265	0.954	2.29	1.76
1,700	2,250	6,952	293	0.331	0.325	105.1	1.322	0.996	2.39	1.84
1,600	2,250	7,387	312	0.323	0.316	102.3	1.510	1.139	2.73	2.10
1,500	2,219	7,771	328	0.319	0.313	99.7	1.582	1.193	2.90	2.23
1,400	2,093	7,853	331	0.315	0.309	93.0	1.585	1.195	3.08	2.37
1,300	1,965	7,937	335	0.311	0.305	86.0	6.998	5.276	14.50	11.15
1,200	1,234	5,400	228	0.325	0.319	56.5	5.138	3.874	16.95	13.04
1,100	817	3,899	165	0.346	0.339	39.8	1.618	1.220	8.06	6.20
1,000	657	3,451	146	0.356	0.349	33.0	0.659	0.497	4.08	3.14
900	499	2,911	123	0.370	0.363	26.0	0.021	0.016	0.17	0.13
800	359	2,359	100	0.367	0.360	18.6	0.022	0.016	0.24	0.19
700	299	2,244	95	0.350	0.344	14.8	0.024	0.018	0.32	0.25
650	284	2,297	97	0.349	0.343	14.0	0.023	0.018	0.33	0.26

General Performance Data (Continued)

ZONE 1-2

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	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,800	2,250	70.5	125.9	1,103.4	65.1	793.0	76	394.0
1,700	2,250	70.7	125.3	1,113.0	61.7	809.3	76	389.5
1,600	2,250	69.9	124.7	1,117.1	57.6	821.9	75	382.8
1,500	2,219	69.3	124.3	1,138.7	53.8	848.5	74	378.9
1,400	2,093	66.4	123.4	1,139.9	48.6	859.5	70	370.2
1,300	1,965	64.3	116.8	1,125.0	44.1	851.9	67	356.0
1,200	1,234	29.3	115.7	1,169.1	19.3	985.1	31	238.2
1,100	817	16.0	117.4	1,150.3	11.0	982.4	17	177.0
1,000	657	11.2	117.3	1,140.3	7.7	980.0	12	151.3
900	499	6.7	113.2	1,050.3	4.9	893.1	8	124.9
800	359	3.0	111.9	839.1	2.8	714.4	4	100.8
700	299	1.9	112.1	792.4	1.9	671.7	2	93.4
650	284	1.6	112.0	789.2	1.8	657.9	2	90.6

ZONE 1-2

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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,800	2,250	5,257.7	10,716.4	23,037.0	23,796.2	4,206.1	3,879.4
1,700	2,250	5,044.9	10,468.0	22,018.2	22,763.8	4,055.7	3,733.9
1,600	2,250	4,777.2	10,083.9	20,720.2	21,445.0	3,868.6	3,554.2
1,500	2,219	4,496.1	9,773.1	19,421.8	20,129.2	3,673.2	3,364.9
1,400	2,093	4,107.0	9,129.8	17,646.7	18,306.3	3,402.8	3,111.6
1,300	1,965	3,921.9	8,589.8	16,472.6	17,082.5	3,220.1	2,946.6
1,200	1,234	2,258.6	5,746.7	9,430.5	9,831.2	1,955.6	1,770.8
1,100	817	1,598.2	4,205.5	6,659.0	6,941.3	1,433.8	1,298.3
1,000	657	1,314.4	3,514.5	5,476.3	5,710.3	1,200.2	1,086.2
900	499	1,037.0	2,704.9	4,335.4	4,519.9	983.1	890.1
800	359	831.8	1,881.3	3,480.4	3,612.1	787.9	719.4
700	299	707.1	1,550.0	2,960.8	3,065.6	673.6	618.5
650	284	650.2	1,419.5	2,724.2	2,823.4	624.5	571.9

General Performance Data (Continued)

ZONE 2-3

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)	BRAKE SPEC DEF CONSUMPTN (32.5%)	BRAKE SPEC DEF CONSUMPTN (40%)	VOL DEF CONSUMPTN (32.5%)	VOL DEF CONSUMPTN (40%)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	GAL/HR	G/HP-HR	G/HP-HR
1,800	2,250	6,566	277	0.337	0.331	107.0	1.265	0.954	2.29	1.76
1,700	2,250	6,952	293	0.331	0.325	105.1	1.322	0.996	2.39	1.84
1,600	2,250	7,387	312	0.323	0.316	102.3	1.510	1.139	2.73	2.10
1,500	2,250	7,879	332	0.319	0.313	101.2	1.628	1.227	2.94	2.26
1,400	2,202	8,261	349	0.316	0.310	98.1	1.712	1.291	3.16	2.43
1,300	2,020	8,159	344	0.311	0.305	88.4	7.157	5.397	14.42	11.09
1,200	1,234	5,400	228	0.325	0.319	56.5	5.138	3.874	16.95	13.04
1,100	817	3,899	165	0.346	0.339	39.8	1.618	1.220	8.06	6.20
1,000	657	3,451	146	0.356	0.349	33.0	0.659	0.497	4.08	3.14
900	499	2,911	123	0.370	0.363	26.0	0.021	0.016	0.17	0.13
800	359	2,359	100	0.367	0.360	18.6	0.022	0.016	0.24	0.19
700	299	2,244	95	0.350	0.344	14.8	0.024	0.018	0.32	0.25
650	284	2,297	97	0.349	0.343	14.0	0.023	0.018	0.33	0.26

ZONE 2-3

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	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,800	2,250	70.5	125.9	1,103.4	65.1	793.0	76	394.0
1,700	2,250	70.7	125.3	1,113.0	61.7	809.3	76	389.5
1,600	2,250	69.9	124.7	1,117.1	57.6	821.9	75	382.8
1,500	2,250	69.9	124.4	1,148.4	54.2	855.9	74	380.7
1,400	2,202	69.0	124.1	1,170.7	50.3	880.5	73	378.4
1,300	2,020	67.1	117.8	1,128.7	46.1	849.6	70	364.0
1,200	1,234	29.3	115.7	1,169.1	19.3	985.1	31	238.2
1,100	817	16.0	117.4	1,150.3	11.0	982.4	17	177.0
1,000	657	11.2	117.3	1,140.3	7.7	980.0	12	151.3
900	499	6.7	113.2	1,050.3	4.9	893.1	8	124.9
800	359	3.0	111.9	839.1	2.8	714.4	4	100.8
700	299	1.9	112.1	792.4	1.9	671.7	2	93.4
650	284	1.6	112.0	789.2	1.8	657.9	2	90.6

General Performance Data (Continued)

ZONE 2-3

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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,800	2,250	5,257.7	10,716.4	23,037.0	23,796.2	4,206.1	3,879.4
1,700	2,250	5,044.9	10,468.0	22,018.2	22,763.8	4,055.7	3,733.9
1,600	2,250	4,777.2	10,083.9	20,720.2	21,445.0	3,868.6	3,554.2

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1,500	2,250	4,517.9	9,867.1	19,523.1	20,240.9	3,687.6	3,376.0
1,400	2,202	4,206.0	9,470.7	18,098.4	18,794.5	3,474.6	3,170.4
1,300	2,020	4,043.4	8,794.9	16,986.9	17,613.6	3,302.8	3,022.2
1,200	1,234	2,258.6	5,746.7	9,430.5	9,831.2	1,955.6	1,770.8
1,100	817	1,598.2	4,205.5	6,659.0	6,941.3	1,433.8	1,298.3
1,000	657	1,314.4	3,514.5	5,476.3	5,710.3	1,200.2	1,086.2
900	499	1,037.0	2,704.9	4,335.4	4,519.9	983.1	890.1
800	359	831.8	1,881.3	3,480.4	3,612.1	787.9	719.4
700	299	707.1	1,550.0	2,960.8	3,065.6	673.6	618.5
650	284	650.2	1,419.5	2,724.2	2,823.4	624.5	571.9

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)	BRAKE SPEC DEF CONSUMPTN (32.5%)	BRAKE SPEC DEF CONSUMPTN (40%)	VOL DEF CONSUMPTN (32.5%)	VOL DEF CONSUMPTN (40%)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	GAL/HR	G/HP-HR	G/HP-HR
1,800	2,250	6,566	277	0.337	0.331	107.0	1.265	0.954	2.29	1.76
1,700	2,250	6,952	293	0.331	0.325	105.1	1.322	0.996	2.39	1.84
1,600	2,250	7,387	312	0.323	0.316	102.3	1.510	1.139	2.73	2.10
1,500	2,250	7,879	332	0.319	0.313	101.2	1.628	1.227	2.94	2.26
1,400	2,202	8,261	349	0.316	0.310	98.1	1.712	1.291	3.16	2.43
1,300	2,020	8,159	344	0.311	0.305	88.4	7.157	5.397	14.42	11.09
1,200	1,417	6,204	262	0.322	0.315	64.3	3.670	2.767	10.54	8.11
1,100	960	4,584	193	0.346	0.339	46.8	0.615	0.464	2.61	2.00
1,000	657	3,451	146	0.356	0.349	33.0	0.659	0.497	4.08	3.14
900	499	2,911	123	0.370	0.363	26.0	0.021	0.016	0.17	0.13
800	359	2,359	100	0.367	0.360	18.6	0.022	0.016	0.24	0.19
700	299	2,244	95	0.350	0.344	14.8	0.024	0.018	0.32	0.25
650	284	2,297	97	0.349	0.343	14.0	0.023	0.018	0.33	0.26

General Performance Data (Continued)

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	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,800	2,250	70.5	125.9	1,103.4	65.1	793.0	76	394.0
1,700	2,250	70.7	125.3	1,113.0	61.7	809.3	76	389.5
1,600	2,250	69.9	124.7	1,117.1	57.6	821.9	75	382.8
1,500	2,250	69.9	124.4	1,148.4	54.2	855.9	74	380.7
1,400	2,202	69.0	124.1	1,170.7	50.3	880.5	73	378.4
1,300	2,020	67.1	117.8	1,128.7	46.1	849.6	70	364.0
1,200	1,417	36.7	118.4	1,190.4	23.7	984.4	39	266.5
1,100	960	20.4	117.5	1,228.4	13.4	1,042.8	22	202.4
1,000	657	11.2	117.3	1,140.3	7.7	980.0	12	151.3
900	499	6.7	113.2	1,050.3	4.9	893.1	8	124.9
800	359	3.0	111.9	839.1	2.8	714.4	4	100.8
700	299	1.9	112.1	792.4	1.9	671.7	2	93.4
650	284	1.6	112.0	789.2	1.8	657.9	2	90.6

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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,800	2,250	5,257.7	10,716.4	23,037.0	23,796.2	4,206.1	3,879.4
1,700	2,250	5,044.9	10,468.0	22,018.2	22,763.8	4,055.7	3,733.9
1,600	2,250	4,777.2	10,083.9	20,720.2	21,445.0	3,868.6	3,554.2
1,500	2,250	4,517.9	9,867.1	19,523.1	20,240.9	3,687.6	3,376.0
1,400	2,202	4,206.0	9,470.7	18,098.4	18,794.5	3,474.6	3,170.4
1,300	2,020	4,043.4	8,794.9	16,986.9	17,613.6	3,302.8	3,022.2
1,200	1,417	2,573.0	6,410.6	10,679.9	11,135.9	2,182.6	1,975.3
1,100	960	1,738.7	4,817.1	7,269.9	7,601.6	1,576.4	1,418.3
1,000	657	1,314.4	3,514.5	5,476.3	5,710.3	1,200.2	1,086.2
900	499	1,037.0	2,704.9	4,335.4	4,519.9	983.1	890.1
800	359	831.8	1,881.3	3,480.4	3,612.1	787.9	719.4
700	299	707.1	1,550.0	2,960.8	3,065.6	673.6	618.5
650	284	650.2	1,419.5	2,724.2	2,823.4	624.5	571.9

General Performance Data (Continued)

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)	BRAKE SPEC DEF CONSUMPTN (32.5%)	BRAKE SPEC DEF CONSUMPTN (40%)	VOL DEF CONSUMPTN (32.5%)	VOL DEF CONSUMPTN (40%)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	GAL/HR	G/HP-HR	G/HP-HR
1,800	2,250	6,566	277	0.337	0.331	107.0	1.265	0.954	2.29	1.76
1,700	1,896	5,857	247	0.328	0.321	87.6	1.073	0.809	2.30	1.77
1,600	1,580	5,188	219	0.324	0.317	72.1	0.958	0.722	2.47	1.90
1,500	1,302	4,560	192	0.328	0.321	60.2	0.743	0.560	2.32	1.79
1,400	1,059	3,972	168	0.336	0.330	50.2	0.598	0.451	2.30	1.77
1,300	848	3,425	145	0.343	0.336	41.0	1.612	1.215	7.74	5.95
1,200	667	2,918	123	0.349	0.342	32.8	1.207	0.910	7.37	5.67
1,100	514	2,452	103	0.352	0.345	25.5	2.084	1.571	16.51	12.70
1,000	386	2,026	86	0.357	0.350	19.4	0.522	0.394	5.51	4.24
900	281	1,641	69	0.365	0.358	14.5	0.022	0.017	0.32	0.24
800	198	1,297	55	0.360	0.353	10.0	0.027	0.020	0.55	0.42
700	132	993	42	0.381	0.373	7.1	0.022	0.016	0.66	0.51
650	106	856	36	0.423	0.415	6.3	0.023	0.018	0.90	0.69

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	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,800	2,250	70.5	125.9	1,103.4	65.1	793.0	76	394.0
1,700	1,896	64.3	123.0	991.5	56.8	716.2	69	367.4
1,600	1,580	50.9	119.7	965.7	42.8	735.2	55	320.3
1,500	1,302	38.2	117.1	979.3	30.7	780.7	41	274.2
1,400	1,059	27.1	116.7	1,015.6	21.7	848.9	30	230.5
1,300	848	19.9	114.7	993.6	15.3	839.8	22	193.0
1,200	667	12.2	116.2	989.3	10.5	875.6	14	155.9
1,100	514	7.8	113.4	886.1	6.6	766.7	9	129.8
1,000	386	4.5	117.3	828.4	4.9	755.2	6	112.0
900	281	2.4	114.2	688.5	3.4	626.9	3	100.0
800	198	1.1	112.7	558.4	2.5	513.4	2	90.9
700	132	0.4	112.8	465.0	1.8	432.3	1	85.7
650	106	0.1	112.8	422.3	1.7	393.1	1	83.8

General Performance Data (Continued)

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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,800	2,250	5,257.7	10,716.4	23,037.0	23,796.2	4,206.1	3,879.4
1,700	1,896	4,779.5	9,302.3	20,748.9	21,369.8	3,889.6	3,608.3
1,600	1,580	3,951.6	7,960.7	16,920.5	17,432.1	3,275.8	3,037.4
1,500	1,302	3,168.9	6,824.9	13,449.3	13,875.9	2,705.4	2,500.9
1,400	1,059	2,481.8	5,770.9	10,482.0	10,838.7	2,168.3	1,995.8
1,300	848	2,083.8	4,763.0	8,656.3	8,946.8	1,802.1	1,660.0
1,200	667	1,619.1	3,822.5	6,725.1	6,957.9	1,407.5	1,294.0
1,100	514	1,335.9	2,983.2	5,556.7	5,737.2	1,196.0	1,104.2
1,000	386	1,111.2	2,441.5	4,630.6	4,768.5	988.1	917.0
900	281	915.4	1,855.3	3,830.1	3,932.8	839.5	783.5
800	198	789.6	1,430.3	3,305.9	3,376.5	722.7	681.9
700	132	681.5	1,128.0	2,854.5	2,904.7	621.8	590.7
650	106	630.1	996.7	2,639.4	2,683.8	574.6	546.7

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)	BRAKE SPEC DEF CONSUMPTN (32.5%)	BRAKE SPEC DEF CONSUMPTN (40%)	VOL DEF CONSUMPTN (32.5%)	VOL DEF CONSUMPTN (40%)
RPM	BHP	LB-FT	PSI	LB/BHP-HR	LB/BHP-HR	GAL/HR	GAL/HR	GAL/HR	G/HP-HR	G/HP-HR
1,800	2,250	6,566	277	0.337	0.331	107.0	1.265	0.954	2.29	1.76

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1,700	2,250	6,952	293	0.331	0.325	105.1	1.322	0.996	2.39	1.84
1,600	2,250	7,387	312	0.323	0.316	102.3	1.510	1.139	2.73	2.10
1,500	2,250	7,879	332	0.319	0.313	101.2	1.628	1.227	2.94	2.26
1,400	2,202	8,261	349	0.316	0.310	98.1	1.712	1.291	3.16	2.43
1,300	2,020	8,159	344	0.311	0.305	88.4	7.157	5.397	14.42	11.09
1,200	1,417	6,204	262	0.322	0.315	64.3	3.670	2.767	10.54	8.11
1,100	960	4,584	193	0.346	0.339	46.8	0.615	0.464	2.61	2.00
1,000	657	3,451	146	0.356	0.349	33.0	0.659	0.497	4.08	3.14
900	499	2,911	123	0.370	0.363	26.0	0.021	0.016	0.17	0.13
800	359	2,359	100	0.367	0.360	18.6	0.022	0.016	0.24	0.19
700	299	2,244	95	0.350	0.344	14.8	0.024	0.018	0.32	0.25
650	284	2,297	97	0.349	0.343	14.0	0.023	0.018	0.33	0.26

General Performance Data (Continued)

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	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
1,800	2,250	70.5	125.9	1,103.4	65.1	793.0	76	394.0
1,700	2,250	70.7	125.3	1,113.0	61.7	809.3	76	389.5
1,600	2,250	69.9	124.7	1,117.1	57.6	821.9	75	382.8
1,500	2,250	69.9	124.4	1,148.4	54.2	855.9	74	380.7
1,400	2,202	69.0	124.1	1,170.7	50.3	880.5	73	378.4
1,300	2,020	67.1	117.8	1,128.7	46.1	849.6	70	364.0
1,200	1,417	36.7	118.4	1,190.4	23.7	984.4	39	266.5
1,100	960	20.4	117.5	1,228.4	13.4	1,042.8	22	202.4
1,000	657	11.2	117.3	1,140.3	7.7	980.0	12	151.3
900	499	6.7	113.2	1,050.3	4.9	893.1	8	124.9
800	359	3.0	111.9	839.1	2.8	714.4	4	100.8
700	299	1.9	112.1	792.4	1.9	671.7	2	93.4
650	284	1.6	112.0	789.2	1.8	657.9	2	90.6

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	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
RPM	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
1,800	2,250	5,257.7	10,716.4	23,037.0	23,796.2	4,206.1	3,879.4
1,700	2,250	5,044.9	10,468.0	22,018.2	22,763.8	4,055.7	3,733.9
1,600	2,250	4,777.2	10,083.9	20,720.2	21,445.0	3,868.6	3,554.2
1,500	2,250	4,517.9	9,867.1	19,523.1	20,240.9	3,687.6	3,376.0
1,400	2,202	4,206.0	9,470.7	18,098.4	18,794.5	3,474.6	3,170.4
1,300	2,020	4,043.4	8,794.9	16,986.9	17,613.6	3,302.8	3,022.2
1,200	1,417	2,573.0	6,410.6	10,679.9	11,135.9	2,182.6	1,975.3
1,100	960	1,738.7	4,817.1	7,269.9	7,601.6	1,576.4	1,418.3
1,000	657	1,314.4	3,514.5	5,476.3	5,710.3	1,200.2	1,086.2
900	499	1,037.0	2,704.9	4,335.4	4,519.9	983.1	890.1
800	359	831.8	1,881.3	3,480.4	3,612.1	787.9	719.4
700	299	707.1	1,550.0	2,960.8	3,065.6	673.6	618.5
650	284	650.2	1,419.5	2,724.2	2,823.4	624.5	571.9

Heat Rejection Data

MAXIMUM LIMIT

ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM 1ST STAGE AFTERCOOLER	FROM 2ND STAGE AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
RPM	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
1,800	2,250	40,773	2,488	87,158	44,214	12,070	11,005	15,529	95,426	226,607	241,394
1,700	2,250	39,243	2,510	85,727	43,943	11,879	10,556	14,659	95,426	223,028	237,581
1,600	2,250	37,359	2,560	83,909	42,614	11,637	9,676	13,480	95,426	218,490	232,747
1,500	2,250	36,678	2,663	83,495	43,298	11,550	9,358	12,722	95,426	216,852	231,002
1,400	2,202	36,510	2,762	80,628	42,300	11,255	8,975	11,804	93,379	211,314	225,103
1,300	2,020	33,017	2,813	72,903	37,208	10,247	6,754	10,540	85,645	192,381	204,934

1,200	1,417	26,093	3,115	55,910	30,318	7,446	2,768	3,682	60,111	139,799	148,921
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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	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1,800	2,250	112.7	78.2	83.6	74.6	95.2	86.8	72.8	78.8	76.9	86.3	94.5
1,700	2,250	117.5	65.1	83.3	79.5	91.1	89.4	77.5	83.3	80.3	86.4	97.7
1,600	2,250	117.9	73.6	75.0	71.9	94.9	91.8	79.5	83.1	82.4	85.2	98.0
1,500	2,250	118.4	81.2	70.6	74.6	89.8	89.6	77.9	77.8	78.0	90.1	96.6
1,400	2,202	115.4	75.9	72.2	79.1	87.6	88.1	66.2	82.1	79.3	91.5	96.2
1,300	2,020	105.0	80.3	77.9	66.9	87.5	87.6	72.1	77.5	78.2	81.9	92.1
1,200	1,417	111.7	75.2	77.5	62.4	86.0	80.1	73.3	69.5	74.6	85.6	90.7
1,100	960	106.0	79.4	69.0	65.6	78.4	81.6	79.0	73.2	81.4	76.1	92.7
1,000	657	107.3	84.0	66.9	67.5	82.0	85.1	74.5	75.2	77.7	76.5	93.4
900	499	105.1	83.1	59.7	72.2	88.5	87.0	62.5	86.2	74.1	82.8	93.3
800	359	99.9	67.0	57.4	80.6	83.5	79.1	63.8	82.0	76.7	90.5	90.9
700	299	98.2	63.2	72.0	63.0	81.9	80.3	62.4	83.6	74.1	87.1	91.3
650	284	93.6	58.3	67.8	58.4	76.8	75.6	56.1	81.2	73.5	83.5	86.6

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	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1,800	2,250	84.2	93.7	97.5	95.0	93.2	99.4	98.9	102.2	104.8	99.6	93.2
1,700	2,250	85.8	82.7	100.4	99.6	98.7	100.1	102.6	108.6	112.4	111.5	110.0
1,600	2,250	85.3	84.6	98.5	98.5	97.8	99.3	102.1	108.6	113.3	113.5	111.3
1,500	2,250	86.4	78.6	97.7	97.1	98.4	104.2	108.8	109.3	113.1	113.3	106.6
1,400	2,202	87.4	86.4	98.1	96.1	95.9	101.4	106.9	106.2	108.5	112.5	104.1
1,300	2,020	81.2	75.3	90.7	85.5	85.1	99.1	91.5	94.5	97.8	97.1	91.0
1,200	1,417	87.7	81.5	90.8	88.1	87.5	94.8	101.4	99.1	104.5	110.0	95.4
1,100	960	79.9	74.9	91.2	88.5	90.1	93.9	94.1	101.0	95.4	93.1	98.8
1,000	657	80.6	78.2	90.9	88.6	91.4	100.9	96.9	101.8	101.3	100.1	95.4
900	499	81.2	90.7	90.7	88.1	89.1	93.5	90.9	97.7	96.3	91.3	87.1
800	359	87.0	89.5	83.7	86.2	89.0	89.3	87.6	92.7	86.6	80.7	77.1
700	299	86.8	87.5	84.0	86.2	84.3	84.5	88.1	89.1	81.8	77.7	70.8
650	284	80.2	84.5	80.0	79.8	82.1	82.8	80.5	74.8	67.4	63.8	55.7

Sound Data (Continued)

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	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
1,800	2,250	125.3	91.0	97.3	109.9	109.1	101.5	106.4	106.8	108.5	110.0	110.8
1,700	2,250	124.6	85.9	97.4	104.4	107.4	100.5	104.3	105.5	107.0	109.4	110.3
1,600	2,250	124.9	86.1	98.7	104.4	105.6	101.1	104.4	105.1	106.5	109.1	110.0
1,500	2,250	123.8	87.2	94.3	104.9	102.0	100.0	104.4	105.9	106.5	108.5	109.6
1,400	2,202	124.1	86.1	96.9	104.0	101.1	98.3	104.5	103.8	105.7	107.8	109.0
1,300	2,020	124.8	90.9	92.5	104.4	102.9	98.4	104.0	105.4	106.6	108.0	108.9
1,200	1,417	122.7	88.5	91.6	103.4	100.3	98.0	103.7	102.8	104.9	107.8	109.0
1,100	960	121.7	86.1	91.4	102.8	98.5	97.9	103.8	101.9	104.1	107.0	108.1
1,000	657	120.9	88.3	91.2	102.8	97.2	97.7	104.2	102.7	105.7	107.1	108.7
900	499	119.8	84.8	91.6	102.0	97.1	98.1	104.0	102.6	106.3	107.7	107.9
800	359	117.3	81.2	89.3	102.9	98.6	96.7	102.6	102.3	104.1	105.5	105.6
700	299	116.8	77.2	88.4	103.7	101.8	95.8	103.8	103.5	104.9	105.4	105.4
650	284	115.5	75.3	86.3	104.2	104.8	94.3	105.1	105.0	105.1	104.7	103.3

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	BHP	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)

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1,800	2,250	113.3	116.0	116.5	115.0	113.1	110.5	109.1	112.3	106.0	115.9	106.4
1,700	2,250	112.4	114.6	114.9	113.6	112.3	110.2	109.2	107.6	106.8	119.5	102.4
1,600	2,250	112.3	115.1	115.0	113.4	112.3	110.4	109.6	107.7	109.5	121.0	100.9
1,500	2,250	111.5	114.7	114.7	113.0	111.6	110.3	109.4	107.0	113.6	114.6	99.9
1,400	2,202	111.6	114.7	115.1	112.7	111.7	110.7	108.5	109.4	113.1	115.5	101.8
1,300	2,020	110.6	114.8	115.3	112.8	111.8	111.9	111.7	107.9	116.3	122.0	98.6
1,200	1,417	110.1	113.8	114.1	111.4	111.4	110.6	113.6	110.1	112.2	105.7	99.5
1,100	960	109.3	113.4	112.4	110.5	110.2	112.1	107.9	110.0	104.7	99.4	101.3
1,000	657	109.1	113.1	112.4	109.7	110.1	110.2	107.7	104.3	99.2	99.2	92.4
900	499	108.8	112.7	111.5	108.2	107.2	111.3	102.7	100.6	99.6	94.1	90.9
800	359	106.0	110.2	109.0	105.9	105.2	107.2	100.0	97.2	93.4	90.4	86.3
700	299	104.9	109.3	108.3	103.1	102.1	106.9	97.0	95.5	92.6	89.7	85.7
650	284	103.2	106.2	105.9	101.5	101.5	104.8	95.9	93.9	90.6	87.7	83.5

Emissions Data

CATERPILLAR EMISSIONS CERTIFIED ENGINES TESTED WITHIN EPA SPECIFIED TEST CONDITIONS, AND USING TITLE 40 CFR PART 1065 TEST PROTOCOL, MEET THE NEW SOURCE PERFORMANCE STANDARDS. POTENTIAL SITE VARIATION DATA ACCOUNT FOR PRODUCTION ENGINE AND SYSTEM VARIABILITY IN ADDITION TO MEASUREMENT VARIABILITY FOR TYPICAL FIELD TEST METHODS AS DESCRIBED IN DM1176. THIS DATA ASSUMES SITE CORRECTIONS FOR AMBIENT HUMIDITY TO 75 GRAINS, AND STANDARD CONDITIONS OF 25 C (77 F) AIR TO TURBO TEMPERATURE AND 152.4 M (500 FT) ALTITUDE. GUIDANCE ON HUMIDITY CORRECTION METHODS ARE AVAILABLE IN TITLE 40 CFR SECTION 1065.670. FOR APPLICATIONS WITH GEOGRAPHIC OR AMBIENT CONDITIONS BEYOND THESE PUBLISHED VALUES, CONSULT CATERPILLAR (APPLICATION SUPPORT CENTER) FOR ADDITIONAL VARIABILITY INFORMATION.

EMISSIONS VALUES ARE TAILPIPE OUT WITH AFTERTREATMENT.

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

ENGINE POWER	BHP	2,250	1,688	1,125	563	225
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	1,932	1,552	1,078	649	351
TOTAL CO	G/HR	422	364	463	631	955
TOTAL HC	G/HR	67	63	43	30	47
TOTAL CO2	KG/HR	1,053	801	555	326	186
PART MATTER	G/HR	8.9	7.6	8.5	18.2	24.7
TOTAL NOX (AS NO2) (CORR 5% O2)	MG/NM3	382.7	398.1	395.2	321.5	367.5
TOTAL CO (CORR 5% O2)	MG/NM3	83.1	93.0	169.5	388.7	997.9
TOTAL HC (CORR 5% O2)	MG/NM3	11.5	14.0	13.7	16.4	42.2
PART MATTER (CORR 5% O2)	MG/NM3	1.5	1.7	2.8	17.2	23.7
TOTAL NOX (AS NO2) (CORR 15% O2)	MG/NM3	142.0	147.7	146.6	119.3	136.4
TOTAL CO (CORR 15% O2)	MG/NM3	30.8	34.5	62.9	144.2	370.3
TOTAL HC (CORR 15% O2)	MG/NM3	4.3	5.2	5.1	6.1	15.6
PART MATTER (CORR 15% O2)	MG/NM3	0.6	0.6	1.1	6.4	8.8
TOTAL NOX (AS NO2) (CORR 5% O2)	PPM	186	194	192	157	179
TOTAL CO (CORR 5% O2)	PPM	66	74	136	311	798
TOTAL HC (CORR 5% O2)	PPM	21	26	26	31	79
TOTAL NOX (AS NO2) (CORR 15% O2)	PPM	69	72	71	58	66
TOTAL CO (CORR 15% O2)	PPM	25	28	50	115	296
TOTAL HC (CORR 15% O2)	PPM	8	10	9	11	29
TOTAL NOX (AS NO2)	G/HP-HR	0.87	0.92	0.96	1.15	1.56
TOTAL CO	G/HP-HR	0.19	0.22	0.41	1.12	4.25
TOTAL HC	G/HP-HR	0.03	0.04	0.04	0.05	0.21
PART MATTER	G/HP-HR	0.00	0.00	0.01	0.03	0.11
TOTAL NOX (AS NO2)	G/KW-HR	1.18	1.26	1.31	1.57	2.12
TOTAL CO	G/KW-HR	0.26	0.29	0.56	1.53	5.78
TOTAL HC	G/KW-HR	0.04	0.05	0.05	0.07	0.28
PART MATTER	G/KW-HR	0.01	0.01	0.01	0.04	0.15
TOTAL NOX (AS NO2)	LB/HR	4.26	3.42	2.38	1.43	0.77
TOTAL CO	LB/HR	0.93	0.80	1.02	1.39	2.11
TOTAL HC	LB/HR	0.15	0.14	0.10	0.07	0.10
TOTAL CO2	LB/HR	2,321	1,766	1,225	719	410
PART MATTER	LB/HR	0.02	0.02	0.02	0.04	0.05
OXYGEN IN EXH	%	10.8	12.1	12.7	13.7	15.4
DRY SMOKE OPACITY	%	0.0	0.0	0.0	0.9	1.3
BOSCH SMOKE NUMBER		0.06	0.06	0.10	0.39	0.49

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

ENGINE POWER	BHP	2,250	1,688	1,125	563	225
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PERFORMANCE DATA[EM1769]

November 22, 2021

PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	2,415	1,940	1,348	811	439
TOTAL CO	G/HR	950	818	1,042	1,421	2,150
TOTAL HC	G/HR	120	114	78	53	85
PART MATTER	G/HR	20.0	17.0	19.2	40.9	55.6
TOTAL NOX (AS NO2) (CORR 5% O2)	MG/NM3	478.4	497.6	494.0	401.9	459.4
TOTAL CO (CORR 5% O2)	MG/NM3	186.9	209.2	381.4	874.7	2,245.2
TOTAL HC (CORR 5% O2)	MG/NM3	20.6	25.1	24.6	29.4	75.9
PART MATTER (CORR 5% O2)	MG/NM3	3.4	3.8	6.4	38.8	53.4
TOTAL NOX (AS NO2) (CORR 15% O2)	MG/NM3	177.5	184.6	183.3	149.1	170.5
TOTAL CO (CORR 15% O2)	MG/NM3	69.3	77.6	141.5	324.6	833.1
TOTAL HC (CORR 15% O2)	MG/NM3	7.7	9.3	9.1	10.9	28.2
PART MATTER (CORR 15% O2)	MG/NM3	1.3	1.4	2.4	14.4	19.8
TOTAL NOX (AS NO2) (CORR 5% O2)	PPM	233	242	241	196	224
TOTAL CO (CORR 5% O2)	PPM	149	167	305	700	1,796
TOTAL HC (CORR 5% O2)	PPM	39	47	46	55	142
TOTAL NOX (AS NO2) (CORR 15% O2)	PPM	86	90	89	73	83
TOTAL CO (CORR 15% O2)	PPM	55	62	113	260	666
TOTAL HC (CORR 15% O2)	PPM	14	17	17	20	53
TOTAL NOX (AS NO2)	G/HP-HR	1.08	1.16	1.20	1.44	1.95
TOTAL CO	G/HP-HR	0.43	0.49	0.93	2.53	9.56
TOTAL HC	G/HP-HR	0.05	0.07	0.07	0.09	0.38
PART MATTER	G/HP-HR	0.01	0.01	0.02	0.07	0.25
TOTAL NOX (AS NO2)	G/KW-HR	1.47	1.57	1.63	1.96	2.66
TOTAL CO	G/KW-HR	0.58	0.66	1.26	3.44	13.00
TOTAL HC	G/KW-HR	0.07	0.09	0.09	0.13	0.51
PART MATTER	G/KW-HR	0.01	0.01	0.02	0.10	0.34
TOTAL NOX (AS NO2)	LB/HR	5.32	4.28	2.97	1.79	0.97
TOTAL CO	LB/HR	2.10	1.80	2.30	3.13	4.74
TOTAL HC	LB/HR	0.26	0.25	0.17	0.12	0.19
PART MATTER	LB/HR	0.04	0.04	0.04	0.09	0.12

Regulatory Information

EPA TIER 4 FINAL2016 - ----				
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 1042 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 U.S. (INCL CALIF)	Agency EPA	Regulation MARINE COMMERCIAL	Tier/Stage TIER 4 FINAL	Max Limits - G/BKW - HR CO: 5.0 NOx: 1.8 HC: 0.19 PM: 0.04

EU STAGE IIIA2009 - 2019				
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 EUROPE	Agency EU	Regulation MARINE COMMERCIAL	Tier/Stage STAGE IIIA	Max Limits - G/BKW - HR CO: 5.0 NOx + HC: 7.2 PM: 0.20

IMO III2016 - ----				
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 FOR USE WITHIN DESIGNATED EMISSION CONTROL AREAS.				

Altitude Derate Data

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	30	40	50	60	70	80	90	100	110	120	130	140	NORMAL
ALTITUDE (FT)													
0	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250
1,000	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,213	2,250
2,000	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,199	1,991	2,250

3,000	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,194	1,959	1,794	2,250
4,000	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,250	2,109	1,901	1,762	2,250

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4577155	LL1816	4449163	EE318	-	MR400001	

Supplementary Data

Type	Classification	Performance Number
AFTERTREATMENT	SCR	EM1822
CHART	FUEL AND UREA CONTOUR PLOT	EM2013
CHART	AMBIENT CAPABILITY CHART	EM2021

Performance Parameter Reference

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

# PERFORMANCE DATA[EM1769]

November 22, 2021

## 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