

ENGINE SPEED	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
2,100	475	50.8	118.9	1,207.8	25.2	950.2	54	344.2
2,000	475	52.3	123.9	1,216.2	24.0	959.9	56	346.3
1,900	475	53.4	124.6	1,219.5	22.7	965.8	56	345.2
1,800	475	54.0	121.8	1,215.0	21.6	961.9	57	341.1
1,700	462	54.7	117.0	1,199.3	21.2	947.7	57	341.3
1,600	446	55.8	120.2	1,201.7	20.4	955.9	58	344.0
1,500	430	56.1	115.5	1,199.6	19.6	957.4	58	343.3
1,400	412	55.7	110.9	1,190.8	19.0	952.4	57	341.3
1,350	394	53.0	107.4	1,191.6	17.8	961.4	55	332.0
1,300	376	49.7	103.8	1,199.3	16.5	977.0	51	322.6
1,200	337	41.3	96.3	1,231.5	13.4	1,025.1	43	300.3
1,100	299	34.9	89.8	1,280.6	10.7	1,075.6	36	277.0
1,000	268	29.8	85.6	1,348.1	8.7	1,137.7	31	257.6
900	201	19.0	83.4	1,310.6	5.8	1,077.0	20	205.5
800	164	12.6	83.6	1,267.8	4.2	1,054.1	13	171.7
700	127	7.5	85.0	1,205.4	3.3	990.3	8	139.4

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
2,100	475	1,087.7	2,961.8	4,732.7	4,906.2	1,032.9	944.7
2,000	475	1,062.4	2,908.1	4,616.5	4,787.6	1,007.3	920.8
1,900	475	1,027.3	2,824.0	4,459.2	4,627.5	974.1	889.2
1,800	475	987.8	2,709.3	4,285.3	4,450.6	937.1	854.1
1,700	462	952.6	2,580.8	4,124.8	4,283.6	901.6	822.1
1,600	446	907.9	2,468.5	3,920.5	4,073.3	857.4	780.9
1,500	430	860.8	2,335.4	3,706.3	3,852.8	810.3	737.0
1,400	412	810.1	2,189.3	3,480.9	3,621.5	762.3	692.7
1,350	394	762.4	2,067.6	3,270.2	3,404.1	715.4	649.5
1,300	376	710.1	1,943.4	3,040.2	3,167.5	665.1	602.7
1,200	337	591.5	1,675.4	2,523.1	2,636.1	554.8	499.9
1,100	299	505.8	1,454.1	2,137.7	2,239.2	465.7	417.0
1,000	268	429.8	1,272.2	1,802.8	1,896.4	391.6	346.9
900	201	311.2	912.9	1,306.1	1,377.8	292.1	257.4
800	164	241.7	695.3	1,012.7	1,072.7	225.8	197.9
700	127	184.0	507.5	769.8	817.5	172.1	150.0

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ENGINE SPEED	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM 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
2,100	475	7,854	2,672	21,694	12,531	2,832	4,271	20,149	53,170	56,640
2,000	475	7,541	2,554	21,412	12,438	2,788	4,113	20,149	52,353	55,769
1,900	475	7,393	2,522	20,889	12,152	2,745	3,938	20,149	51,529	54,891
1,800	475	7,348	2,629	20,091	11,620	2,699	3,764	20,149	50,674	53,981
1,700	462	7,312	2,293	19,062	10,914	2,597	3,705	19,574	48,765	51,947
1,600	446	6,837	2,344	18,318	10,532	2,497	3,514	18,932	46,886	49,945
1,500	430	6,623	2,343	17,407	9,993	2,399	3,382	18,232	45,048	47,987
1,400	412	6,336	2,525	16,339	9,320	2,294	3,212	17,464	43,067	45,877
1,350	394	6,032	2,471	15,538	8,901	2,185	2,942	16,708	41,015	43,691
1,300	376	5,757	2,396	14,748	8,512	2,076	2,664	15,963	38,984	41,528
1,200	337	5,300	2,246	13,021	7,674	1,845	2,061	14,280	34,647	36,908
1,100	299	5,101	2,232	11,733	7,055	1,667	1,603	12,665	31,291	33,332

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Units Filter ▼

DIESEL

RATED SPEED NOMINAL DATA: 2100 RPM

ENGINE POWER	BHP	475	356	237	119	47.5
PERCENT LOAD	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	1,316	778	397	223	159
TOTAL CO	G/HR	630	564	931	280	252

ENGINE POWER		BHP	475	356	237	119	47.5
PERCENT LOAD		%	100	75	50	25	10
TOTAL HC		G/HR	28	31	50	46	57
TOTAL CO2		KG/HR	253	196	142	74	40
PART MATTER		G/HR	38.9	16.5	24.0	26.4	30.3
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	1,236.9	952.7	659.4	712.4	934.9
TOTAL CO	(CORR 5% O2)	MG/NM3	595.5	692.9	1,545.1	891.3	1,475.6
TOTAL HC	(CORR 5% O2)	MG/NM3	22.6	32.4	72.1	127.3	291.8
PART MATTER	(CORR 5% O2)	MG/NM3	30.6	17.3	35.1	75.0	162.7
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	459.0	353.5	244.7	264.3	346.9
TOTAL CO	(CORR 15% O2)	MG/NM3	221.0	257.1	573.4	330.7	547.5
TOTAL HC	(CORR 15% O2)	MG/NM3	8.4	12.0	26.8	47.2	108.3
PART MATTER	(CORR 15% O2)	MG/NM3	11.3	6.4	13.0	27.8	60.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	602	464	321	347	455
TOTAL CO	(CORR 5% O2)	PPM	476	554	1,236	713	1,180
TOTAL HC	(CORR 5% O2)	PPM	42	61	135	238	545
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	224	172	119	129	169
TOTAL CO	(CORR 15% O2)	PPM	177	206	459	265	438
TOTAL HC	(CORR 15% O2)	PPM	16	22	50	88	202
TOTAL NOX (AS NO2)		G/HP-HR	2.79	2.20	1.68	1.88	3.36
TOTAL CO		G/HP-HR	1.34	1.60	3.95	2.37	5.33
TOTAL HC		G/HP-HR	0.06	0.09	0.21	0.39	1.21
PART MATTER		G/HP-HR	0.08	0.05	0.10	0.22	0.64
TOTAL NOX (AS NO2)		G/KW-HR	3.75	2.95	2.25	2.53	4.51
TOTAL CO		G/KW-HR	1.79	2.14	5.29	3.17	7.14
TOTAL HC		G/KW-HR	0.08	0.12	0.28	0.52	1.63
PART MATTER		G/KW-HR	0.11	0.06	0.14	0.30	0.86
TOTAL NOX (AS NO2)		LB/HR	2.90	1.72	0.87	0.49	0.35
TOTAL CO		LB/HR	1.39	1.24	2.05	0.62	0.56
TOTAL HC		LB/HR	0.06	0.07	0.11	0.10	0.13
TOTAL CO2		LB/HR	558	432	312	162	88
PART MATTER		LB/HR	0.09	0.04	0.05	0.06	0.07
OXYGEN IN EXH		%	10.3	12.4	13.9	15.1	17.1
DRY SMOKE OPACITY		%	1.8	1.2	1.2	3.8	2.6
BOSCH SMOKE NUMBER			1.14	0.75	0.75	2.02	1.55

RATED SPEED POTENTIAL SITE VARIATION: 2100 RPM

ENGINE POWER		BHP	475	356	237	119	47.5
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	1,421	840	428	240	172
TOTAL CO		G/HR	1,179	1,056	1,741	523	471
TOTAL HC		G/HR	52	58	94	87	109
PART MATTER		G/HR	75.8	32.1	46.7	51.5	59.0
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	1,335.8	1,028.9	712.2	769.3	1,009.7
TOTAL CO	(CORR 5% O2)	MG/NM3	1,113.6	1,295.7	2,889.4	1,666.8	2,759.4
TOTAL HC	(CORR 5% O2)	MG/NM3	42.7	61.3	136.3	240.5	551.5
PART MATTER	(CORR 5% O2)	MG/NM3	59.6	33.7	68.4	146.3	317.2
TOTAL NOX (AS NO2)	(CORR 15% O2)	MG/NM3	495.7	381.8	264.3	285.5	374.7
TOTAL CO	(CORR 15% O2)	MG/NM3	413.2	480.8	1,072.2	618.5	1,023.9
TOTAL HC	(CORR 15% O2)	MG/NM3	15.8	22.7	50.6	89.3	204.6
PART MATTER	(CORR 15% O2)	MG/NM3	22.1	12.5	25.4	54.3	117.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	651	501	347	375	492
TOTAL CO	(CORR 5% O2)	PPM	891	1,037	2,312	1,333	2,207
TOTAL HC	(CORR 5% O2)	PPM	80	114	254	449	1,029
TOTAL NOX (AS NO2)	(CORR 15% O2)	PPM	241	186	129	139	182
TOTAL CO	(CORR 15% O2)	PPM	331	385	858	495	819
TOTAL HC	(CORR 15% O2)	PPM	30	42	94	167	382
TOTAL NOX (AS NO2)		G/HP-HR	3.02	2.38	1.82	2.03	3.63
TOTAL CO		G/HP-HR	2.50	2.99	7.38	4.43	9.96
TOTAL HC		G/HP-HR	0.11	0.16	0.40	0.74	2.29
PART MATTER		G/HP-HR	0.16	0.09	0.20	0.44	1.25
TOTAL NOX (AS NO2)		G/KW-HR	4.04	3.19	2.43	2.73	4.87
TOTAL CO		G/KW-HR	3.36	4.00	9.89	5.93	13.36
TOTAL HC		G/KW-HR	0.15	0.22	0.53	0.99	3.08
PART MATTER		G/KW-HR	0.22	0.12	0.27	0.58	1.67
TOTAL NOX (AS NO2)		LB/HR	3.13	1.85	0.94	0.53	0.38
TOTAL CO		LB/HR	2.60	2.33	3.84	1.15	1.04
TOTAL HC		LB/HR	0.12	0.13	0.21	0.19	0.24
PART MATTER		LB/HR	0.17	0.07	0.10	0.11	0.13

THIS ENGINE HAS BEEN TESTED IN ACCORDANCE WITH THE PROVISIONS OF THE PEOPLE'S REPUBLIC OF CHINA NATIONAL STANDARD #GB 20891-2007, AND COMPLIES WITH THE STATED LIMITS OF CO, HC, NOX, AND PM FOR STAGE II

Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
CHINA	CHINA	NON-ROAD	STAGE II	CO: 3.5 NOx: 6.0 HC: 1.0 PM: 0.20

EPA TIER 3 2005 - 2010

GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D 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 3	CO: 3.5 NOx + HC: 4.0 PM: 0.20

EU STAGE IIIA 2006 - 2010

GASEOUS EMISSION DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 97/68/EC, 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 IIIA	CO: 3.5 NOx + HC: 4.0 PM: 0.20

IMO II 2011 - ----

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.

Altitude Derate Data [Top](#)

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	475	475	475	475	475	475	475	475	475	475	475	475	475
1,000	475	475	475	475	475	475	475	475	475	475	475	475	475
2,000	475	475	475	475	475	475	475	475	475	475	475	475	475
3,000	475	475	475	475	475	475	475	475	475	475	475	475	475
4,000	475	475	475	475	475	475	475	475	475	475	475	475	475
5,000	475	475	475	475	475	475	475	475	475	475	475	471	475
6,000	475	475	475	475	475	475	475	475	475	469	461	453	475
7,000	475	475	475	475	475	475	475	467	458	450	443	436	475
8,000	475	475	475	475	474	465	456	448	440	433	425	418	475
9,000	475	475	473	464	455	446	438	430	423	416	409	402	475
10,000	472	463	454	445	437	429	421	413	406	399	392	386	460
11,000	453	444	436	427	419	411	404	397	390	383	376	370	445
12,000	435	426	418	410	402	394	387	380	374	367	361	355	430
13,000	417	409	400	393	385	378	371	365	358	352	346	340	415
14,000	400	392	384	376	369	363	356	350	344	338	332	326	401
15,000	383	375	368	361	354	347	341	335	329	323	318	313	387

Cross Reference [Top](#)

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K6070	PP5379	2364575	E707	-	LGK00001	
0K6070	PP5379	3605974	E707	-	LGK00001	
0K6070	PP5379	3605974	E707	-	RRA00001	
0K6070	PP5379	3678500	E707	-	RRA00001	
0K6070	PP5379	3684902	E707	-	LGK00001	
0K6070	PP5379	3684902	E707	-	RRA00001	

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4581442	PP7738	5181539	EE382	-	PK300001	
5957732	NAP	6061920	E707	-	RRA00001	
5957732	NAP	6705622	E707	-	RRA00001	

Performance Parameter Reference [Top](#)

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.

Parameters Reference: DM9600 - 15
PERFORMANCE DEFINITIONS

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 output 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

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