PERFORMANCE DATA[DM9630]

August 26, 2020

Performance Number: DM9630 **Change Level: 01**

SALES MODEL:	C18	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	1,500
ENGINE POWER (BHP):	774	**HERTZ:**	50
GEN POWER WITH FAN (EKW):	528.0	**FAN POWER (HP):**	10.7
COMPRESSION RATIO:	14.5	**ADDITIONAL PARASITICS (HP):**	9.1
RATING LEVEL:	STANDBY	**ASPIRATION:**	TA
PUMP QUANTITY:	1	**AFTERCOOLER TYPE:**	ATAAC
FUEL TYPE:	DIESEL	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
MANIFOLD TYPE:	DRY	**INLET MANIFOLD AIR TEMP (F):**	120
GOVERNOR TYPE:	ELEC	**JACKET WATER TEMP (F):**	192.2
CAMSHAFT TYPE:	STANDARD	**TURBO CONFIGURATION:**	PARALLEL
IGNITION TYPE:	CI	**TURBO QUANTITY:**	2
INJECTOR TYPE:	EUI	**TURBOCHARGER MODEL:**	S310S089-1.00
REF EXH STACK DIAMETER (IN):	6	**CERTIFICATION YEAR:**	2007
MAX OPERATING ALTITUDE (FT):	6,499	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	1,801.2

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET

General Performance Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
528.0	100	774	369	0.320	35.0	69.0	123.8	1,330.8	47.9	1,019.6
475.2	90	696	332	0.342	33.6	64.7	118.8	1,286.7	44.8	993.1
422.4	80	619	296	0.339	29.6	56.9	111.4	1,227.1	38.6	957.1
396.0	75	581	277	0.333	27.3	52.8	107.4	1,198.0	35.6	938.2
369.6	70	543	259	0.326	24.9	48.6	103.4	1,169.3	32.6	919.6
316.8	60	468	223	0.327	21.5	39.9	98.1	1,113.2	26.7	899.5
264.0	50	393	188	0.334	18.5	31.2	93.7	1,058.6	21.0	876.2
211.2	40	320	153	0.340	15.3	23.0	89.9	987.8	15.8	834.4
158.4	30	246	118	0.344	11.9	15.6	86.5	877.8	11.6	764.5
132.0	25	209	100	0.347	10.2	12.1	85.1	812.0	9.8	719.4
105.6	20	172	82	0.353	8.6	8.9	83.9	738.4	8.2	666.4
52.8	10	96.7	46	0.395	5.4	4.7	83.1	563.2	6.0	524.9

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	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)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
528.0	100	774	72	402.7	1,367.3	3,916.5	5,937.0	6,185.0	1,301.8	1,182.4
475.2	90	696	67	387.8	1,328.4	3,714.3	5,754.7	5,989.5	1,257.1	1,142.8
422.4	80	619	60	359.6	1,242.3	3,347.8	5,352.2	5,555.8	1,161.8	1,060.8
396.0	75	581	55	344.2	1,193.2	3,166.4	5,127.0	5,316.4	1,113.7	1,019.5
369.6	70	543	51	327.8	1,139.8	2,985.3	4,885.4	5,061.4	1,064.2	976.6
316.8	60	468	42	294.3	1,025.8	2,628.0	4,374.5	4,527.3	950.6	874.0
264.0	50	393	33	259.4	907.2	2,272.8	3,850.4	3,981.8	836.5	770.3
211.2	40	320	25	221.5	791.8	1,919.8	3,345.3	3,454.8	729.4	673.8
158.4	30	246	17	182.3	682.6	1,563.0	2,873.9	2,959.9	627.8	583.3
132.0	25	209	13	164.2	629.7	1,382.6	2,649.3	2,722.8	576.5	537.8
105.6	20	172	10	147.9	579.6	1,205.0	2,438.8	2,499.7	526.1	493.1
52.8	10	96.7	6	123.2	517.6	931.7	2,173.8	2,212.0	465.3	442.4

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	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
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN

528.0	100	774	9,089	2,440	30,017	17,800	4,050	6,632	32,819	76,035	80,997
475.2	90	696	8,733	5,027	28,276	16,512	3,888	6,199	29,517	72,990	77,753
422.4	80	619	7,740	4,253	25,052	14,389	3,431	5,321	26,261	64,423	68,626
396.0	75	581	7,164	3,250	23,345	13,304	3,163	4,862	24,647	59,392	63,268
369.6	70	543	6,585	2,148	21,629	12,235	2,889	4,390	23,036	54,248	57,788
316.8	60	468	5,906	1,911	18,816	10,537	2,496	3,438	19,844	46,857	49,915
264.0	50	393	5,303	2,305	16,056	8,851	2,145	2,554	16,679	40,270	42,897
211.2	40	320	4,675	2,396	13,161	7,036	1,778	1,762	13,560	33,376	35,554
158.4	30	246	4,002	1,961	10,158	5,117	1,383	1,102	10,445	25,973	27,668
132.0	25	209	3,668	1,668	8,687	4,172	1,187	839	8,879	22,287	23,741
105.6	20	172	3,339	1,341	7,269	3,260	994	626	7,302	18,659	19,876
52.8	10	96.7	2,710	551	4,755	1,566	623	349	4,103	11,704	12,468

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1500 RPM

GENSET POWER WITH FAN		EKW	528.0	396.0	264.0	132.0	52.8
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	774	581	393	209	96.7
TOTAL NOX (AS NO2)		G/HR	3,671	2,435	1,651	1,083	673
TOTAL CO		G/HR	1,157	487	267	336	513
TOTAL HC		G/HR	50	52	43	34	68
PART MATTER		G/HR	84.3	43.4	31.8	27.0	13.5
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,281.0	1,987.5	1,989.0	2,360.5	2,715.0
TOTAL CO	(CORR 5% O2)	MG/NM3	721.6	355.0	297.1	754.3	2,269.5
TOTAL HC	(CORR 5% O2)	MG/NM3	28.4	37.2	43.4	67.1	266.9
PART MATTER	(CORR 5% O2)	MG/NM3	43.2	27.1	33.9	50.7	46.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,111	968	969	1,150	1,322
TOTAL CO	(CORR 5% O2)	PPM	577	284	238	603	1,816
TOTAL HC	(CORR 5% O2)	PPM	53	70	81	125	498
TOTAL NOX (AS NO2)		G/HP-HR	4.80	4.22	4.21	5.19	6.97
TOTAL CO		G/HP-HR	1.51	0.84	0.68	1.61	5.31
TOTAL HC		G/HP-HR	0.07	0.09	0.11	0.16	0.70
PART MATTER		G/HP-HR	0.11	0.08	0.08	0.13	0.14
TOTAL NOX (AS NO2)		LB/HR	8.09	5.37	3.64	2.39	1.48
TOTAL CO		LB/HR	2.55	1.07	0.59	0.74	1.13
TOTAL HC		LB/HR	0.11	0.12	0.09	0.08	0.15
PART MATTER		LB/HR	0.19	0.10	0.07	0.06	0.03

RATED SPEED NOMINAL DATA: 1500 RPM

GENSET POWER WITH FAN		EKW	528.0	396.0	264.0	132.0	52.8
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	774	581	393	209	96.7
TOTAL NOX (AS NO2)		G/HR	3,399	2,255	1,528	1,003	623
TOTAL CO		G/HR	619	261	143	179	274
TOTAL HC		G/HR	26	28	23	18	36
TOTAL CO2		KG/HR	370	283	192	105	56
PART MATTER		G/HR	43.2	22.3	16.3	13.9	6.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,112.0	1,840.3	1,841.6	2,185.7	2,513.8
TOTAL CO	(CORR 5% O2)	MG/NM3	385.9	189.8	158.9	403.4	1,213.6
TOTAL HC	(CORR 5% O2)	MG/NM3	15.0	19.7	23.0	35.5	141.2
PART MATTER	(CORR 5% O2)	MG/NM3	22.1	13.9	17.4	26.0	24.1
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,029	896	897	1,065	1,224
TOTAL CO	(CORR 5% O2)	PPM	309	152	127	323	971
TOTAL HC	(CORR 5% O2)	PPM	28	37	43	66	264
TOTAL NOX (AS NO2)		G/HP-HR	4.45	3.90	3.90	4.80	6.46
TOTAL CO		G/HP-HR	0.81	0.45	0.36	0.86	2.84
TOTAL HC		G/HP-HR	0.03	0.05	0.06	0.09	0.37
PART MATTER		G/HP-HR	0.06	0.04	0.04	0.07	0.07
TOTAL NOX (AS NO2)		LB/HR	7.49	4.97	3.37	2.21	1.37
TOTAL CO		LB/HR	1.36	0.57	0.31	0.40	0.60
TOTAL HC		LB/HR	0.06	0.06	0.05	0.04	0.08
TOTAL CO2		LB/HR	817	623	422	232	123
PART MATTER		LB/HR	0.10	0.05	0.04	0.03	0.02
OXYGEN IN EXH		%	8.4	9.7	10.8	12.7	15.6
DRY SMOKE OPACITY		%	1.0	0.7	0.7	0.9	0.5
BOSCH SMOKE NUMBER			0.64	0.36	0.44	0.56	0.22

Regulatory Information

EU STAGE II		2007 - 2011		
GENERATOR SETS AND CONSTANT SPEED ENGINES USED IN NON-STATIONARY APPLICATIONS ARE SUBJECT TO EU/STAGE-II LIMITS EFFECTIVE 01JAN2007. GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EU 97/68/EC AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE FOLLOWING REGULATIONS:				
Locality	**Agency**	**Regulation**	**Tier/Stage**	**Max Limits - G/BKW - HR**
EUROPE	EU	NON-ROAD	STAGE II	CO: 3.5 NOx: 6.1 HC: 1.0 PM: 0.20

NON-CERTIFIED	1970 - 2100
THIS ENGINE RATING IS NOT EMISSIONS CERTIFIED BY ANY DOMESTIC OR FOREIGN AGENCY.	

Altitude Derate Data

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	774	774	774	774	774	774	774	774	774	774	774	774	774
1,000	774	774	774	774	774	774	774	774	774	774	774	774	774
2,000	774	774	774	774	774	774	774	774	774	774	774	774	774
3,000	774	774	774	774	774	774	774	774	774	774	774	774	774
4,000	774	774	774	774	774	774	774	774	774	774	774	764	774
5,000	774	774	774	774	774	774	774	774	774	760	747	735	774
6,000	774	774	774	774	774	774	771	757	744	731	719	707	774
7,000	774	774	774	774	769	755	741	728	715	702	691	679	774
8,000	774	774	768	753	739	725	712	699	687	675	663	652	767
9,000	767	752	737	723	709	696	683	671	659	648	637	627	742
10,000	737	722	708	694	681	668	656	644	633	622	612	601	718
11,000	707	693	679	666	653	641	630	618	608	597	587	577	694
12,000	678	664	651	639	627	615	604	593	583	573	563	554	670
13,000	650	637	625	613	601	590	579	569	559	549	540	531	647
14,000	623	611	599	587	576	565	555	545	536	526	517	509	625
15,000	597	585	573	562	552	542	532	522	513	504	496	487	603

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K8346	PP5921	2911731	GS402	DK	EFF00517	
0K8346	PP5921	4607414	GS625	DK	ELM00001	
0K8346	PP5921	4607415	GS625	DK	ELM00001	

Performance Parameter Reference

Parameters Reference:DM9600-12

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,

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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.
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.
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 : 07/10/19