

PERFORMANCE DATA [C27DRA1]

NOVEMBER 10, 2021

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Perf No: DM7696

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SALES MODEL:	C27	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,800
ENGINE POWER (BHP):	1,214	HERTZ:	60
GEN POWER WITH FAN (EKW):	800.0	FAN POWER (HP):	39.3
COMPRESSION RATIO:	16.5	ASPIRATION:	TA
RATING LEVEL:	STANDBY	AFTERCOOLER TYPE:	ATAAC
PUMP QUANTITY:	1	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
FUEL TYPE:	DIESEL	INLET MANIFOLD AIR TEMP (F):	120
MANIFOLD TYPE:	DRY	JACKET WATER TEMP (F):	210.2
GOVERNOR TYPE:	ADEM4	TURBO CONFIGURATION:	PARALLEL
ELECTRONICS TYPE:	ADEM4	TURBO QUANTITY:	2
IGNITION TYPE:	CI	TURBOCHARGER MODEL:	GTA5008BS-56T-1.60
INJECTOR TYPE:	EUI	CERTIFICATION YEAR:	2010
REF EXH STACK DIAMETER (IN):	10	PISTON SPD @ RATED ENG SPD (FT/MIN):	1,800.0
MAX OPERATING ALTITUDE (FT):	7,999		

INDUSTRY	SUB INDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

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GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR
800.0	100	1,190	318	0.331	55.6
720.0	90	1,073	286	0.335	50.7
640.0	80	957	255	0.340	45.9
600.0	75	900	240	0.342	43.4
560.0	70	842	225	0.343	40.7
480.0	60	728	194	0.345	35.4
400.0	50	615	164	0.346	30.0
320.0	40	504	135	0.350	24.9
240.0	30	393	105	0.358	19.9
200.0	25	337	90	0.364	17.3
160.0	20	280	75	0.375	14.8
80.0	10	162	43	0.435	9.9

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	IN-HG	DEG F	IN-HG	DEG F
800.0	100	1,190	57.6	119.1	1,222.8	40.4	947.8	60	358.0
720.0	90	1,073	52.4	114.5	1,188.5	36.5	928.9	55	336.7
640.0	80	957	46.8	113.1	1,161.4	32.2	916.5	49	314.8
600.0	75	900	43.7	112.4	1,146.4	29.8	909.6	46	302.1
560.0	70	842	40.0	110.4	1,127.0	27.3	899.9	42	285.8
480.0	60	728	32.3	105.7	1,078.4	22.3	873.1	34	253.8
400.0	50	615	24.7	100.8	1,016.5	17.4	836.5	26	222.4

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
320.0	40	504	18.1	97.0	935.5	13.5	782.1	19	192.2
240.0	30	393	12.4	93.9	835.3	10.2	709.3	13	162.3
200.0	25	337	9.7	92.6	777.5	8.8	665.6	11	147.3
160.0	20	280	7.4	91.9	713.5	7.6	615.6	8	133.7
80.0	10	162	3.9	92.8	564.1	5.7	492.7	5	114.1

GENSET POWER WITH FAN	PERCENT LOAD	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)
EKW	%	BHP	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
800.0	100	1,190	2,200.4	5,943.3	9,469.4	9,863.6	2,076.2	1,881.0
720.0	90	1,073	2,097.2	5,567.7	9,001.3	9,361.3	1,971.4	1,791.5
640.0	80	957	1,963.0	5,142.0	8,402.0	8,727.5	1,837.1	1,673.5
600.0	75	900	1,885.5	4,904.2	8,059.1	8,366.8	1,760.9	1,606.0
560.0	70	842	1,799.8	4,638.3	7,681.5	7,970.5	1,677.4	1,531.7
480.0	60	728	1,618.3	4,074.9	6,886.8	7,138.0	1,503.3	1,376.0
400.0	50	615	1,433.7	3,494.4	6,083.9	6,296.9	1,325.5	1,216.1
320.0	40	504	1,270.3	2,963.8	5,377.5	5,554.2	1,173.5	1,081.6
240.0	30	393	1,120.0	2,452.2	4,733.6	4,874.4	1,031.4	956.7
200.0	25	337	1,049.0	2,200.7	4,431.9	4,554.8	961.6	895.5
160.0	20	280	985.8	1,964.5	4,163.7	4,268.7	898.3	840.7
80.0	10	162	894.5	1,565.5	3,772.7	3,843.3	808.2	766.0

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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
800.0	100	1,190	18,779	5,849	44,601	25,213	6,438	9,057	50,481	120,880	128,767
720.0	90	1,073	17,808	4,992	41,200	23,106	5,876	8,008	45,509	110,318	117,517
640.0	80	957	16,691	4,461	37,677	21,034	5,311	6,786	40,598	99,707	106,213
600.0	75	900	15,607	4,786	35,758	19,900	5,022	6,124	38,160	94,283	100,435
560.0	70	842	14,638	4,988	33,616	18,603	4,718	5,397	35,720	88,579	94,359
480.0	60	728	13,512	4,464	29,060	15,798	4,100	4,083	30,880	76,976	81,999
400.0	50	615	11,598	4,504	24,410	12,913	3,477	2,962	26,073	65,288	69,549
320.0	40	504	10,383	3,959	19,934	10,055	2,886	2,050	21,390	54,180	57,716
240.0	30	393	9,677	2,739	15,613	7,277	2,301	1,296	16,686	43,193	46,011
200.0	25	337	9,195	2,146	13,533	5,943	2,007	969	14,304	37,688	40,147
160.0	20	280	8,507	1,714	11,540	4,657	1,717	697	11,882	32,236	34,340
80.0	10	162	6,156	1,807	7,874	2,218	1,152	322	6,882	21,629	23,040

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Units Filter ▼

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER	EKW	800.0	600.0	400.0	200.0	80.0
PERCENT LOAD	BHP	1,190	900	615	337	162
TOTAL NOX (AS NO2)	%	100	75	50	25	10
TOTAL NOX (AS NO2)	G/HR	5,956	3,529	2,229	1,524	818
TOTAL CO	G/HR	280	349	332	272	326
TOTAL HC	G/HR	33	46	47	37	51
TOTAL CO2	KG/HR	553	431	296	169	97
PART MATTER	G/HR	27.0	28.2	46.7	51.5	52.4
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,510.3	1,919.2	1,785.7	2,213.4	2,077.7

GENSET POWER WITH FAN ENGINE POWER PERCENT LOAD		EKW BHP	800.0 1,190	600.0 900	400.0 615	200.0 337	80.0 162
TOTAL CO	(CORR 5% O2)	MG/NM3	118.7	192.5	268.7	409.6	929.9
TOTAL HC	(CORR 5% O2)	MG/NM3	12.0	22.0	33.0	49.4	126.4
PART MATTER	(CORR 5% O2)	MG/NM3	9.4	12.9	31.8	65.1	130.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,223	935	870	1,078	1,012
TOTAL CO	(CORR 5% O2)	PPM	95	154	215	328	744
TOTAL HC	(CORR 5% O2)	PPM	22	41	62	92	236
TOTAL NOX (AS NO2)		G/HP-HR	5.05	3.94	3.64	4.53	5.06
TOTAL CO		G/HP-HR	0.24	0.39	0.54	0.81	2.02
TOTAL HC		G/HP-HR	0.03	0.05	0.08	0.11	0.31
PART MATTER		G/HP-HR	0.02	0.03	0.08	0.15	0.32
TOTAL NOX (AS NO2)		LB/HR	13.13	7.78	4.91	3.36	1.80
TOTAL CO		LB/HR	0.62	0.77	0.73	0.60	0.72
TOTAL HC		LB/HR	0.07	0.10	0.10	0.08	0.11
TOTAL CO2		LB/HR	1,219	950	652	372	214
PART MATTER		LB/HR	0.06	0.06	0.10	0.11	0.12
OXYGEN IN EXH		%	9.0	10.1	11.3	13.5	16.2
DRY SMOKE OPACITY		%	0.3	1.3	2.8	4.8	5.3
BOSCH SMOKE NUMBER			0.15	0.44	1.05	1.58	1.69

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER PERCENT LOAD		EKW BHP	800.0 1,190	600.0 900	400.0 615	200.0 337	80.0 162
TOTAL NOX (AS NO2)		G/HR	7,207	4,271	2,697	1,844	990
TOTAL CO		G/HR	523	652	620	510	610
TOTAL HC		G/HR	62	87	89	71	96
PART MATTER		G/HR	52.7	55.0	91.2	100.4	102.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,037.5	2,322.3	2,160.7	2,678.2	2,514.0
TOTAL CO	(CORR 5% O2)	MG/NM3	221.9	360.0	502.4	766.0	1,738.9
TOTAL HC	(CORR 5% O2)	MG/NM3	22.7	41.5	62.3	93.4	239.0
PART MATTER	(CORR 5% O2)	MG/NM3	18.3	25.1	62.1	126.9	254.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,479	1,131	1,052	1,305	1,225
TOTAL CO	(CORR 5% O2)	PPM	178	288	402	613	1,391
TOTAL HC	(CORR 5% O2)	PPM	42	78	116	174	446
TOTAL NOX (AS NO2)		G/HP-HR	6.11	4.77	4.40	5.48	6.12
TOTAL CO		G/HP-HR	0.44	0.73	1.01	1.52	3.77
TOTAL HC		G/HP-HR	0.05	0.10	0.15	0.21	0.59
PART MATTER		G/HP-HR	0.04	0.06	0.15	0.30	0.63
TOTAL NOX (AS NO2)		LB/HR	15.89	9.41	5.95	4.07	2.18
TOTAL CO		LB/HR	1.15	1.44	1.37	1.12	1.34
TOTAL HC		LB/HR	0.14	0.19	0.20	0.16	0.21
PART MATTER		LB/HR	0.12	0.12	0.20	0.22	0.23

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EPA TIER 2	2006 - 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 U.S. (INCL CALIF)	Agency EPA	Regulation NON-ROAD	Tier/Stage TIER 2	Max Limits - G/BKW - HR CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY	2011 - ----			
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII 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 EMERGENCY STATIONARY REGULATIONS.				
Locality U.S. (INCL CALIF)	Agency EPA	Regulation STATIONARY	Tier/Stage EMERGENCY STATIONARY	Max Limits - G/BKW - HR CO: 3.5 NOx + HC: 6.4 PM: 0.20

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STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
1,000	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
2,000	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
3,000	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
4,000	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
5,000	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
6,000	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,197	1,214
7,000	1,214	1,214	1,214	1,214	1,214	1,212	1,191	1,170	1,150	1,214
8,000	1,214	1,214	1,214	1,207	1,185	1,164	1,144	1,124	1,105	1,214
9,000	1,214	1,204	1,181	1,159	1,138	1,118	1,098	1,079	1,061	1,214
10,000	1,178	1,155	1,134	1,113	1,092	1,073	1,054	1,036	1,018	1,195
11,000	1,130	1,108	1,088	1,068	1,048	1,029	1,011	994	977	1,154
12,000	1,084	1,063	1,043	1,024	1,005	987	970	953	937	1,115
13,000	1,039	1,019	1,000	981	964	946	930	914	898	1,077
14,000	996	977	958	940	923	907	891	876	861	1,039
15,000	954	935	918	901	884	868	853	838	824	1,003

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Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K7925	PP5660	2671232	GS327	-	MJE00001	
3704841	GG0523	3495619	GS603	LS	MJE00001	
0K4031	GG0383	3541450	GS582	-	PEN00001	
3704841	GG0523	3884919	GS603	-	MJE00001	
3704841	GG0523	6034727	PG458	-	MJE00001	

Performance Parameter Reference [Top](#)

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