PERFORMANCE DATA [C18DE6E]

NOVEMBER 10, 2021

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Perf No: DM8518 **Change Level:** 04

General | Heat Rejection | Emissions | Regulatory | Altitude Derate | Cross Reference | Perf Param Ref

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SALES MODEL:	C18	**COMBUSTION:**	DIRECT INJECTION
BRAND:	CAT	**ENGINE SPEED (RPM):**	1,800
ENGINE POWER (BHP):	900	**HERTZ:**	60
GEN POWER W/O FAN (EKW):	621.0	**FAN POWER (HP):**	24.1
GEN POWER WITH FAN (EKW):	600.0	**ASPIRATION:**	TA
COMPRESSION RATIO:	14.5	**AFTERCOOLER TYPE:**	ATAAC
RATING LEVEL:	STANDBY	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, ATAAC
PUMP QUANTITY:	1	**INLET MANIFOLD AIR TEMP (F):**	120
FUEL TYPE:	DIESEL	**JACKET WATER TEMP (F):**	192.2
MANIFOLD TYPE:	DRY	**TURBO CONFIGURATION:**	PARALLEL
GOVERNOR TYPE:	ELEC	**TURBO QUANTITY:**	2
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	S310S089 1.10A/R
IGNITION TYPE:	CI	**CERTIFICATION YEAR:**	2006
INJECTOR TYPE:	EUI	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,161.4
REF EXH STACK DIAMETER (IN):	6		
MAX OPERATING ALTITUDE (FT):	2,953		

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

General Performance Data Top

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
600.0	100	900	358	0.332	42.1
540.0	90	808	321	0.339	38.6
480.0	80	718	286	0.350	35.5
450.0	75	674	268	0.356	33.8
420.0	70	629	250	0.361	32.0
360.0	60	541	215	0.369	28.2
300.0	50	454	181	0.373	23.9
240.0	40	370	147	0.368	19.2
180.0	30	286	114	0.358	14.4
150.0	25	244	97	0.355	12.2
120.0	20	201	80	0.354	10.0
60.0	10	114	45	0.412	6.6

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
EKW	%	BHP	IN-HG	DEG F	DEG F	DEG F	IN-HG	DEG F
600.0	100	900	69.4	120.2	1,296.3	994.3	75	412.3
540.0	90	808	66.3	118.8	1,245.6	957.8	72	394.7
480.0	80	718	63.5	114.4	1,207.1	930.8	69	382.3
450.0	75	674	61.8	112.9	1,186.7	917.0	67	375.0
420.0	70	629	59.7	111.6	1,165.0	902.7	65	366.6
360.0	60	541	53.8	109.2	1,112.0	870.5	59	343.2
300.0	50	454	45.7	106.7	1,046.3	833.0	50	310.5

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	ENGINE OUTLET TEMP	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP
240.0	40	370	33.5	100.1	946.3	779.4	37	257.4
180.0	30	286	20.4	94.1	835.3	712.8	23	199.4
150.0	25	244	14.8	92.9	777.5	675.5	18	174.4
120.0	20	201	9.7	93.2	718.0	635.0	12	151.3
60.0	10	114	5.3	110.2	594.2	543.7	7	126.8

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
600.0	100	900	1,687.8	4,784.4	7,408.0	7,706.8	1,617.9	1,451.6
540.0	90	808	1,642.0	4,527.0	6,835.4	7,109.2	1,570.3	1,408.9
480.0	80	718	1,610.2	4,346.8	6,444.6	6,696.2	1,537.1	1,379.1
450.0	75	674	1,585.8	4,235.0	6,219.7	6,459.3	1,512.6	1,357.1
420.0	70	629	1,553.7	4,103.3	5,966.3	6,193.4	1,480.9	1,328.7
360.0	60	541	1,458.4	3,757.4	5,337.4	5,537.1	1,388.9	1,246.1
300.0	50	454	1,320.6	3,305.0	4,563.8	4,733.3	1,257.1	1,127.9
240.0	40	370	1,111.5	2,682.3	3,553.5	3,689.7	1,064.4	955.0
180.0	30	286	884.9	2,022.7	2,525.0	2,627.5	848.2	761.0
150.0	25	244	785.6	1,730.6	2,088.7	2,175.3	749.5	672.5
120.0	20	201	693.2	1,458.1	1,697.2	1,768.4	654.9	587.6
60.0	10	114	597.1	1,145.6	1,226.4	1,273.3	561.4	503.7

Heat Rejection Data Top

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
600.0	100	900	10,747	4,902	36,053	25,532	4,927	8,700	38,156	92,511	98,547
540.0	90	808	9,782	4,629	33,384	23,204	4,501	8,019	34,283	84,515	90,030
480.0	80	718	8,986	4,214	31,336	21,497	4,132	7,621	30,466	77,572	82,634
450.0	75	674	8,588	3,960	30,201	20,572	3,935	7,343	28,577	73,883	78,704
420.0	70	629	8,190	3,714	28,948	19,564	3,728	6,995	26,691	69,994	74,562
360.0	60	541	7,280	3,361	25,878	17,120	3,276	6,029	22,961	61,507	65,520
300.0	50	454	6,312	3,082	22,121	14,274	2,778	4,777	19,272	52,156	55,559
240.0	40	370	5,495	2,832	17,303	10,690	2,231	3,160	15,694	41,880	44,613
180.0	30	286	4,715	2,598	12,425	7,201	1,677	1,641	12,128	31,482	33,537
150.0	25	244	4,301	2,088	10,360	5,720	1,416	1,113	10,337	26,580	28,314
120.0	20	201	3,873	1,654	8,496	4,395	1,163	687	8,525	21,841	23,266
60.0	10	114	2,853	1,533	5,930	2,515	768	173	4,826	14,415	15,355

Emissions Data Top

Units Filter All Units

DIESEL

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	600.0 900	450.0 674	300.0 454	150.0 244	60.0 114
PERCENT LOAD		%	100	75	50	25	10
TOTAL NOX (AS NO2)		G/HR	5,128	2,257	1,267	1,669	1,075
TOTAL CO		G/HR	414	308	113	121	192
TOTAL HC		G/HR	8	15	35	19	19
TOTAL CO2		KG/HR	422	338	239	122	67
PART MATTER		G/HR	29.9	42.0	24.0	10.2	8.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	2,798.7	1,521.4	1,263.2	3,289.5	3,725.1
TOTAL CO	(CORR 5% O2)	MG/NM3	225.2	208.5	108.6	237.7	691.0

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	600.0 900	450.0 674	300.0 454	150.0 244	60.0 114
PERCENT LOAD		**%**	**100**	**75**	**50**	**25**	**10**
TOTAL HC	(CORR 5% O2)	MG/NM3	3.8	9.3	28.7	31.3	60.5
PART MATTER	(CORR 5% O2)	MG/NM3	13.3	24.3	20.2	17.2	28.1
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,363	741	615	1,602	1,814
TOTAL CO	(CORR 5% O2)	PPM	180	167	87	190	553
TOTAL HC	(CORR 5% O2)	PPM	7	17	54	59	113
TOTAL NOX (AS NO2)		G/HP-HR	5.75	3.37	2.80	6.86	9.46
TOTAL CO		G/HP-HR	0.46	0.46	0.25	0.50	1.68
TOTAL HC		G/HP-HR	0.01	0.02	0.08	0.08	0.17
PART MATTER		G/HP-HR	0.03	0.06	0.05	0.04	0.08
TOTAL NOX (AS NO2)		LB/HR	11.30	4.98	2.79	3.68	2.37
TOTAL CO		LB/HR	0.91	0.68	0.25	0.27	0.42
TOTAL HC		LB/HR	0.02	0.03	0.08	0.04	0.04
TOTAL CO2		LB/HR	930	746	528	269	149
PART MATTER		LB/HR	0.07	0.09	0.05	0.02	0.02
OXYGEN IN EXH		%	9.0	10.9	12.5	13.6	15.9
DRY SMOKE OPACITY		%	0.8	1.1	0.9	0.6	0.5
BOSCH SMOKE NUMBER			0.46	0.74	0.54	0.30	0.22

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN ENGINE POWER		EKW BHP	600.0 900	450.0 674	300.0 454	150.0 244	60.0 114
PERCENT LOAD		**%**	**100**	**75**	**50**	**25**	**10**
TOTAL NOX (AS NO2)		G/HR	5,538	2,437	1,369	1,803	1,161
TOTAL CO		G/HR	774	577	211	226	358
TOTAL HC		G/HR	15	29	65	37	37
PART MATTER		G/HR	58.3	81.9	46.9	19.9	16.8
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,022.6	1,643.1	1,364.2	3,552.7	4,023.2
TOTAL CO	(CORR 5% O2)	MG/NM3	421.1	389.9	203.1	444.4	1,292.1
TOTAL HC	(CORR 5% O2)	MG/NM3	7.1	17.6	54.2	59.2	114.4
PART MATTER	(CORR 5% O2)	MG/NM3	26.0	47.3	39.3	33.4	54.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,472	800	664	1,730	1,960
TOTAL CO	(CORR 5% O2)	PPM	337	312	162	356	1,034
TOTAL HC	(CORR 5% O2)	PPM	13	33	101	111	214
TOTAL NOX (AS NO2)		G/HP-HR	6.21	3.64	3.02	7.41	10.21
TOTAL CO		G/HP-HR	0.87	0.86	0.47	0.93	3.15
TOTAL HC		G/HP-HR	0.02	0.04	0.14	0.15	0.32
PART MATTER		G/HP-HR	0.07	0.12	0.10	0.08	0.15
TOTAL NOX (AS NO2)		LB/HR	12.21	5.37	3.02	3.97	2.56
TOTAL CO		LB/HR	1.71	1.27	0.46	0.50	0.79
TOTAL HC		LB/HR	0.03	0.06	0.14	0.08	0.08
PART MATTER		LB/HR	0.13	0.18	0.10	0.04	0.04

Regulatory Information Top

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

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	900	900	900	900	900	900	900	900	900	900	900	900	900
1,000	900	900	900	900	900	900	900	900	900	898	882	868	900
2,000	900	900	900	900	900	900	900	895	879	864	850	835	900
3,000	900	900	900	900	900	893	877	861	846	832	818	804	900
4,000	900	900	900	893	876	859	844	829	814	800	787	773	885
5,000	900	893	875	858	842	827	812	797	783	770	757	744	857
6,000	876	858	842	825	810	795	780	766	753	740	727	715	830
7,000	842	825	809	793	778	764	750	736	724	711	699	687	803
8,000	809	793	777	762	748	734	720	708	695	683	672	660	777
9,000	777	761	746	732	718	705	692	680	668	656	645	634	751
10,000	746	731	716	703	689	677	664	652	641	630	619	609	726
11,000	716	701	687	674	661	649	637	626	615	604	594	584	702
12,000	686	673	659	647	635	623	611	601	590	580	570	560	678
13,000	658	645	632	620	608	597	586	576	566	556	546	537	655
14,000	631	618	606	594	583	572	562	552	542	533	524	515	632
15,000	604	592	581	569	559	548	538	529	519	510	502	493	610

Cross Reference Top

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K7257	PP5703	2726915	GS338	-	EST00001	
NAP	NAP	4206877	GS338	-	FST00001	

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