

Performance Number: EM0679

Change Level: 00

SALES MODEL:	C32	COMBUSTION:	DIRECT INJECTION
BRAND:	CAT	ENGINE SPEED (RPM):	1,500
MACHINE SALES MODEL:		HERTZ:	50
ENGINE POWER (BKW):	1,089.0	FAN POWER (KW):	37.0
GEN POWER WITH FAN (EKW):	1,000.0	ASPIRATION:	TA
COMPRESSION RATIO:	15	AFTERCOOLER TYPE:	ATAAC
RATING LEVEL:	STANDBY	AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
PUMP QUANTITY:	1	INLET MANIFOLD AIR TEMP (C):	49
FUEL TYPE:	DIESEL	JACKET WATER TEMP (C):	89
MANIFOLD TYPE:	DRY	TURBO CONFIGURATION:	PARALLEL
ELECTRONICS TYPE:	ADEM4	TURBO QUANTITY:	2
IGNITION TYPE:	CI	TURBOCHARGER MODEL:	S510S-0.79A/R
INJECTOR TYPE:	EUI	COMBUSTION STRATEGY:	LOW BSFC
REF EXH STACK DIAMETER (MM):	203	PISTON SPD @ RATED ENG SPD (M/SEC):	8.1
MAX OPERATING ALTITUDE (M):	1,300		

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)	ISO BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	ISO VOL FUEL CONSUMPTN (VFC)
EKW	%	BKW	KPA	G/BKW-HR	G/BKW-HR	L/HR	L/HR
1,000.0	100	1,089	2,713	194.5	191.7	249.0	245.5
900.0	90	981	2,446	192.7	189.9	222.5	219.3
800.0	80	875	2,181	189.7	187.0	195.3	192.5
750.0	75	822	2,049	189.2	186.5	183.0	180.4
700.0	70	770	1,918	189.3	186.6	171.4	168.9
600.0	60	664	1,656	190.1	187.4	148.6	146.5
500.0	50	560	1,396	192.3	189.6	126.7	124.9
400.0	40	457	1,139	196.6	193.8	105.7	104.2
300.0	30	354	883	203.2	200.3	84.7	83.5
250.0	25	303	754	207.8	204.8	74.0	72.9
200.0	20	251	624	213.5	210.4	62.9	62.0
100.0	10	145	361	234.4	231.0	39.9	39.4

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
EKW	%	BKW	KPA	DEG C	DEG C	KPA	DEG C	KPA	DEG C
1,000.0	100	1,089	255.2	53.2	652.1	209.3	464.6	270	218.2
900.0	90	981	226.6	49.6	619.5	181.0	443.6	240	199.7
800.0	80	875	189.9	46.3	589.5	147.6	428.2	202	178.4
750.0	75	822	172.2	44.8	576.7	133.0	422.9	184	168.0
700.0	70	770	155.6	43.3	565.1	120.0	418.9	167	158.0
600.0	60	664	124.1	40.7	541.5	96.7	410.7	134	138.1
500.0	50	560	94.9	38.6	513.9	76.7	399.0	105	118.7
400.0	40	457	69.8	38.0	476.8	59.2	377.9	78	99.6
300.0	30	354	48.1	36.9	428.9	44.4	346.4	55	80.9
250.0	25	303	38.4	35.9	400.8	38.0	326.6	45	71.7
200.0	20	251	29.9	34.4	366.2	32.2	299.8	36	63.4
100.0	10	145	16.1	29.7	278.4	22.7	226.4	21	49.0

General Performance Data (Continued)

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	ENGINE OUTLET WET EXH VOL FLOW RATE (0 DEG C AND 101 KPA)	ENGINE OUTLET DRY EXH VOL FLOW RATE (0 DEG C AND 101 KPA)
EKW	%	BKW	M3/MIN	M3/MIN	KG/HR	KG/HR	M3/MIN	M3/MIN
1,000.0	100	1,089	74.2	192.9	5,220.1	5,431.5	71.4	65.1
900.0	90	981	69.0	173.9	4,856.7	5,045.8	66.3	60.5
800.0	80	875	62.7	152.1	4,342.5	4,508.6	59.2	54.2

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750.0	75	822	59.5	142.4	4,095.1	4,250.4	55.9	51.1
700.0	70	770	56.4	133.5	3,864.4	4,009.4	52.7	48.3
600.0	60	664	50.3	116.6	3,423.4	3,549.1	46.6	42.7
500.0	50	560	44.5	100.8	3,008.6	3,116.3	41.0	37.6
400.0	40	457	39.2	85.6	2,637.7	2,727.4	35.9	33.1
300.0	30	354	34.5	71.2	2,311.0	2,382.7	31.4	29.1
250.0	25	303	32.3	64.3	2,163.5	2,226.3	29.3	27.3
200.0	20	251	30.5	57.6	2,035.7	2,089.2	27.5	25.7
100.0	10	145	27.5	45.0	1,834.9	1,868.9	24.6	23.4

## Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXH RECOVERY TO 177C	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BKW	KW	KW	KW	KW	KW	KW	KW	KW	KW
1,000.0	100	1,089	340	139	871	464	134	241	1,089	2,516	2,680
900.0	90	981	313	126	770	398	120	204	981	2,247	2,394
800.0	80	875	285	118	664	334	105	160	875	1,973	2,102
750.0	75	822	272	116	618	308	98.5	141	822	1,849	1,970
700.0	70	770	260	114	577	285	92.2	124	770	1,731	1,844
600.0	60	664	237	105	499	244	80.0	93.2	664	1,501	1,599
500.0	50	560	215	96.9	424	203	68.2	67.3	560	1,280	1,364
400.0	40	457	196	89.1	350	160	56.9	45.4	457	1,068	1,138
300.0	30	354	179	73.0	277	117	45.6	28.4	354	856	911
250.0	25	303	170	60.0	242	96.1	39.8	21.6	303	747	796
200.0	20	251	152	53.1	205	73.5	33.9	16.5	251	636	677
100.0	10	145	89.0	53.8	132	26.1	21.5	9.9	145	403	430

## Emissions Data

DIESEL

### RATED SPEED NOMINAL DATA: 1500 RPM

GENSET POWER WITH FAN	EKW	1,000.0	750.0	500.0	250.0	100.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BKW	1,089	822	560	303	145
TOTAL NOX (AS NO2)	G/HR	8,370	7,777	6,149	2,916	1,225
TOTAL CO	G/HR	662	347	208	283	429
TOTAL HC	G/HR	19	21	47	27	73
TOTAL CO2	KG/HR	671	494	339	199	108
PART MATTER	G/HR	38.9	32.4	33.1	38.0	20.2
TOTAL NOX (AS NO2) (CORR 5% O2)	MG/NM3	2,928.1	3,697.9	4,174.7	3,396.8	2,588.6
TOTAL CO (CORR 5% O2)	MG/NM3	229.6	162.9	140.9	334.7	1,010.1
TOTAL HC (CORR 5% O2)	MG/NM3	5.7	8.8	28.2	30.4	156.4
PART MATTER (CORR 5% O2)	MG/NM3	11.9	12.7	19.5	40.3	35.9
TOTAL NOX (AS NO2) (CORR 5% O2)	PPM	1,426	1,801	2,033	1,655	1,261
TOTAL CO (CORR 5% O2)	PPM	184	130	113	268	808
TOTAL HC (CORR 5% O2)	PPM	11	16	53	57	292
TOTAL NOX (AS NO2)	G/HP-HR	5.80	7.10	8.22	7.19	6.31
TOTAL CO	G/HP-HR	0.46	0.32	0.28	0.70	2.21
TOTAL HC	G/HP-HR	0.01	0.02	0.06	0.07	0.38
PART MATTER	G/HP-HR	0.03	0.03	0.04	0.09	0.10
TOTAL NOX (AS NO2)	LB/HR	18.45	17.15	13.56	6.43	2.70
TOTAL CO	LB/HR	1.46	0.77	0.46	0.62	0.95
TOTAL HC	LB/HR	0.04	0.05	0.10	0.06	0.16
TOTAL CO2	LB/HR	1,478	1,090	748	439	238
PART MATTER	LB/HR	0.09	0.07	0.07	0.08	0.04
OXYGEN IN EXH	%	9.0	9.7	10.4	12.4	15.6
DRY SMOKE OPACITY	%	0.9	1.1	1.3	2.1	0.9
BOSCH SMOKE NUMBER		0.32	0.40	0.56	0.96	0.33

RATED SPEED POTENTIAL SITE VARIATION: 1500 RPM

GENSET POWER WITH FAN	EKW	1,000.0	750.0	500.0	250.0	100.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BKW	1,089	822	560	303	145
TOTAL NOX (AS NO2)	G/HR	10,128	9,411	7,440	3,528	1,483
TOTAL CO	G/HR	1,237	650	389	529	803
TOTAL HC	G/HR	36	39	88	50	138
PART MATTER	G/HR	75.8	63.3	64.5	74.1	39.3
TOTAL NOX (AS NO2) (CORR 5% O2)	MG/NM3	3,543.0	4,474.5	5,051.4	4,110.1	3,132.2
TOTAL CO (CORR 5% O2)	MG/NM3	429.3	304.6	263.4	625.8	1,888.8
TOTAL HC (CORR 5% O2)	MG/NM3	10.7	16.6	53.4	57.5	295.6
PART MATTER (CORR 5% O2)	MG/NM3	23.2	24.8	38.0	78.6	70.0
TOTAL NOX (AS NO2) (CORR 5% O2)	PPM	1,726	2,179	2,460	2,002	1,526
TOTAL CO (CORR 5% O2)	PPM	343	244	211	501	1,511
TOTAL HC (CORR 5% O2)	PPM	20	31	100	107	552
TOTAL NOX (AS NO2)	G/HP-HR	7.02	8.59	9.94	8.70	7.64
TOTAL CO	G/HP-HR	0.86	0.59	0.52	1.31	4.14
TOTAL HC	G/HP-HR	0.02	0.04	0.12	0.12	0.71
PART MATTER	G/HP-HR	0.05	0.06	0.09	0.18	0.20
TOTAL NOX (AS NO2)	LB/HR	22.33	20.75	16.40	7.78	3.27
TOTAL CO	LB/HR	2.73	1.43	0.86	1.17	1.77
TOTAL HC	LB/HR	0.08	0.09	0.19	0.11	0.30
PART MATTER	LB/HR	0.17	0.14	0.14	0.16	0.09

Regulatory Information

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

Altitude Derate Data

STANDARD

ALTITUDE CORRECTED POWER CAPABILITY (BKW)

AMBIENT OPERATING TEMP (C)	0	5	10	15	20	25	30	35	40	45	50	55	60	NORMAL
ALTITUDE (M)														
0	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,085	1,050	1,089
250	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,069	1,030	1,089
500	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,076	1,032	979	1,089
750	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,076	1,043	990	924	1,089
1,000	1,089	1,089	1,089	1,089	1,089	1,089	1,089	1,081	1,064	1,050	1,011	960	897	1,089
1,250	1,089	1,089	1,089	1,089	1,089	1,089	1,075	1,055	1,036	1,019	987	945	895	1,089
1,500	1,089	1,089	1,089	1,089	1,089	1,074	1,054	1,036	1,017	995	966	932	891	1,089
1,750	1,089	1,089	1,089	1,084	1,067	1,050	1,034	1,025	1,010	986	956	924	880	1,086
2,000	1,089	1,089	1,076	1,056	1,043	1,029	1,013	1,006	991	968	945	915	868	1,065
2,250	1,089	1,079	1,044	1,026	1,015	1,002	993	985	960	943	925	890	849	1,040
2,500	1,027	1,019	1,013	1,005	993	980	969	951	928	890	853	786	715	1,013
2,750	1,022	1,014	1,008	1,000	988	976	965	946	923	887	849	783	712	1,010
3,000	1,017	1,009	1,003	995	983	971	960	942	919	883	846	780	710	1,007
3,250	1,011	1,004	998	990	978	966	955	937	915	879	842	777	708	1,004
3,500	1,006	999	993	985	973	961	950	933	910	875	838	774	705	1,002
3,750	1,001	993	987	980	968	956	946	928	906	870	834	770	702	999
4,000	995	988	982	975	963	951	941	923	901	866	830	767	699	996
4,250	990	983	977	970	958	946	936	919	897	862	826	763	696	998
4,500	985	977	972	965	953	941	931	914	892	857	822	760	693	998

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
4369474	GG0867	4409146	GS471	-	JPE00001	
4369474	GG0867	4409147	GS471	-	JPE00001	
4369474	GG0867	4419371	GS471	-	JPE00001	
4369474	GG0867	5233426	GS471	-	JPE00001	
4369474	GG0867	5233426	GS471	-	PRH00001	
4369474	GG0867	5233427	GS471	-	JPE00001	
4369474	GG0867	5233427	GS471	-	PRH00001	
4369474	GG0867	5233428	GS471	-	MJE00001	
4369474	GG0867	5233428	GS471	-	PRH00001	
4369474	GG0867	5369856	GS856	-	JP500001	
4369474	GG0867	5448648	GS423	D	JPE00001	
4369474	GG0867	5612767	GS471	DK	JPE00001	

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

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),

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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.

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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