PERFORMANCE DATA[DM8225]

May 28, 2013

Performance Number: DM8225 **Change Level: 02**

SALES MODEL:	3512	**COMBUSTION:**	DI
ENGINE POWER (BHP):	1,455	**ENGINE SPEED (RPM):**	1,800
GEN POWER WITH FAN (EKW):	1,000.0	**HERTZ:**	60
COMPRESSION RATIO:	13.5	**FAN POWER (HP):**	45.6
APPLICATION:	PACKAGED GENSET	**ASPIRATION:**	TA
RATING LEVEL:	PRIME	**AFTERCOOLER TYPE:**	JWAC
SUB APPLICATION:	STANDARD	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC+AC
PUMP QUANTITY:	1	**AFTERCOOLER TEMP (F):**	180
FUEL TYPE:	DIESEL	**JACKET WATER TEMP (F):**	210.2
MANIFOLD TYPE:	DRY	**TURBO CONFIGURATION:**	PARALLEL
GOVERNOR TYPE:	WOODWARD	**TURBO QUANTITY:**	2
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	TV9215-48T-2.00
IGNITION TYPE:	CI	**COMBUSTION STRATEGY:**	LOW BSFC
INJECTOR TYPE:	MUI	**CRANKCASE BLOWBY RATE (FT3/HR):**	727.4
REF EXH STACK DIAMETER (IN):	10	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	8.1
MAX OPERATING ALTITUDE (FT):	5,741	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	2,244.1

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	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	DEG F
1,000.0	100	1,454	203	0.345	71.7	53.9	190.9	1,121.7	855.5
900.0	90	1,312	183	0.348	65.1	46.6	188.1	1,081.0	846.9
800.0	80	1,170	163	0.351	58.7	39.8	185.7	1,044.1	834.6
750.0	75	1,100	153	0.354	55.5	36.5	184.7	1,027.0	828.1
700.0	70	1,030	143	0.356	52.4	33.3	183.7	1,009.8	821.1
600.0	60	890	124	0.363	46.1	27.0	181.9	975.4	804.6
500.0	50	751	105	0.372	39.9	20.8	179.8	935.0	786.0
400.0	40	614	85	0.386	33.8	15.1	177.3	883.4	762.7
300.0	30	476	66	0.409	27.8	9.8	174.7	817.5	729.8
250.0	25	406	57	0.426	24.7	7.5	173.6	778.1	705.2
200.0	20	336	47	0.451	21.7	5.3	172.6	733.7	674.7
100.0	10	193	27	0.560	15.4	2.0	170.6	625.3	586.5

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
1,000.0	100	1,454	50	325.6	3,291.0	8,407.6	14,504.7	15,007.0	3,143.1	2,877.0
900.0	90	1,312	44	301.3	3,029.6	7,683.6	13,168.4	13,624.4	2,891.5	2,646.6
800.0	80	1,170	38	277.2	2,793.0	7,009.0	11,900.8	12,311.9	2,662.6	2,437.1
750.0	75	1,100	35	264.2	2,674.5	6,677.8	11,282.7	11,671.6	2,549.6	2,333.7
700.0	70	1,030	32	251.2	2,556.6	6,349.0	10,669.6	11,036.3	2,437.3	2,230.9
600.0	60	890	26	225.5	2,327.0	5,702.6	9,461.5	9,784.5	2,217.8	2,030.0
500.0	50	751	20	200.5	2,100.9	5,059.8	8,274.7	8,554.2	1,997.1	1,828.0
400.0	40	614	15	177.2	1,880.6	4,432.8	7,116.1	7,353.0	1,783.0	1,632.0
300.0	30	476	10	155.7	1,662.1	3,817.6	5,968.6	6,163.0	1,578.0	1,444.4
250.0	25	406	8	145.8	1,567.5	3,522.0	5,396.9	5,570.0	1,486.5	1,360.6
200.0	20	336	6	136.5	1,480.2	3,233.4	4,826.4	4,978.0	1,401.4	1,282.7
100.0	10	193	3	120.1	1,339.0	2,693.9	3,717.0	3,825.0	1,266.0	1,158.8

PERFORMANCE DATA[DM8225]

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Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHUAST 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
1,000.0	100	1,454	36,795	6,711	59,031	31,165	7,677	7,905	61,670	154,180	164,241
900.0	90	1,312	33,325	6,483	53,570	28,150	6,995	6,028	55,617	139,869	148,995
800.0	80	1,170	29,969	6,256	48,337	25,249	6,312	4,435	49,622	125,986	134,207
750.0	75	1,100	28,316	6,142	45,795	23,822	5,972	3,702	46,642	119,116	126,888
700.0	70	1,030	26,672	6,028	43,279	22,407	5,630	3,014	43,660	112,274	119,600
600.0	60	890	23,430	5,857	38,329	19,620	4,948	1,820	37,732	98,815	105,263
500.0	50	751	20,187	5,630	33,437	16,889	4,265	796	31,833	85,519	91,099
400.0	40	614	17,063	5,430	28,706	14,220	3,602	22	26,018	72,521	77,253
300.0	30	476	13,974	5,231	24,032	11,530	2,954	-571	20,182	59,566	63,453
250.0	25	406	12,433	5,119	21,697	10,105	2,648	-816	17,238	53,065	56,527
200.0	20	336	10,875	5,005	19,356	8,656	2,334	-1,022	14,260	46,502	49,536
100.0	10	193	7,697	4,778	14,645	5,649	1,654	-1,307	8,182	33,129	35,291

PERFORMANCE DATA[DM8225]

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 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		BHP	1,454	1,100	751	406	193
TOTAL NOX (AS NO2)		G/HR	16,389	12,485	8,441	4,520	2,494
TOTAL CO		G/HR	2,432	1,546	1,211	1,224	1,380
TOTAL HC		G/HR	537	596	519	509	582
PART MATTER		G/HR	289.8	233.7	312.1	342.0	261.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	5,693.9	5,768.0	5,309.3	4,442.3	3,396.2
TOTAL CO	(CORR 5% O2)	MG/NM3	844.9	714.6	762.1	1,202.7	1,878.6
TOTAL HC	(CORR 5% O2)	MG/NM3	186.7	275.3	326.5	501.0	793.4
PART MATTER	(CORR 5% O2)	MG/NM3	100.7	107.9	196.3	336.1	356.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	2,546	2,573	2,392	1,984	1,625
TOTAL CO	(CORR 5% O2)	PPM	614	524	567	893	1,391
TOTAL HC	(CORR 5% O2)	PPM	281	408	487	751	1,181
TOTAL NOX (AS NO2)		G/HP-HR	11.27	11.35	11.25	11.12	12.93
TOTAL CO		G/HP-HR	1.67	1.41	1.61	3.01	7.15
TOTAL HC		G/HP-HR	0.37	0.54	0.69	1.25	3.02
PART MATTER		G/HP-HR	0.20	0.21	0.42	0.84	1.36
TOTAL NOX (AS NO2)		LB/HR	36.13	27.53	18.61	9.97	5.50
TOTAL CO		LB/HR	5.36	3.41	2.67	2.70	3.04
TOTAL HC		LB/HR	1.18	1.31	1.14	1.12	1.28
PART MATTER		LB/HR	0.64	0.52	0.69	0.75	0.58

RATED SPEED NOMINAL DATA: 1800 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		BHP	1,454	1,100	751	406	193
TOTAL NOX (AS NO2)		G/HR	13,657	10,405	7,035	3,767	2,079
TOTAL CO		G/HR	1,351	859	673	680	767
TOTAL HC		G/HR	404	448	390	383	438
TOTAL CO2		KG/HR	743	567	407	250	154
PART MATTER		G/HR	207.0	166.9	222.9	244.3	186.9
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	4,744.9	4,806.7	4,424.4	3,701.9	2,830.2
TOTAL CO	(CORR 5% O2)	MG/NM3	469.4	397.0	423.4	668.2	1,043.7
TOTAL HC	(CORR 5% O2)	MG/NM3	140.4	207.0	245.5	376.7	596.5
PART MATTER	(CORR 5% O2)	MG/NM3	71.9	77.1	140.2	240.1	254.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	2,122	2,144	1,993	1,653	1,354
TOTAL CO	(CORR 5% O2)	PPM	341	291	315	496	773
TOTAL HC	(CORR 5% O2)	PPM	211	307	366	565	888
TOTAL NOX (AS NO2)		G/HP-HR	9.39	9.46	9.37	9.27	10.77
TOTAL CO		G/HP-HR	0.93	0.78	0.90	1.67	3.97
TOTAL HC		G/HP-HR	0.28	0.41	0.52	0.94	2.27
PART MATTER		G/HP-HR	0.14	0.15	0.30	0.60	0.97
TOTAL NOX (AS NO2)		LB/HR	30.11	22.94	15.51	8.30	4.58
TOTAL CO		LB/HR	2.98	1.89	1.48	1.50	1.69
TOTAL HC		LB/HR	0.89	0.99	0.86	0.84	0.96
TOTAL CO2		LB/HR	1,639	1,250	898	551	339
PART MATTER		LB/HR	0.46	0.37	0.49	0.54	0.41
OXYGEN IN EXH		%	11.6	12.3	12.9	14.0	15.2
DRY SMOKE OPACITY		%	2.8	2.9	3.2	4.6	5.7
BOSCH SMOKE NUMBER			1.03	1.07	1.19	1.55	1.80

Regulatory Information

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	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455
1,000	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455
2,000	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455
3,000	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,438	1,414	1,455
4,000	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,455	1,434	1,409	1,385	1,362	1,455
5,000	1,455	1,455	1,455	1,455	1,455	1,455	1,432	1,406	1,381	1,358	1,335	1,280	1,455
6,000	1,455	1,455	1,455	1,455	1,431	1,404	1,379	1,354	1,330	1,307	1,237	1,164	1,443
7,000	1,455	1,455	1,432	1,404	1,378	1,352	1,328	1,304	1,281	1,259	1,135	1,062	1,399
8,000	1,435	1,406	1,378	1,352	1,326	1,302	1,278	1,255	1,233	1,212	1,019	946	1,356
9,000	1,380	1,353	1,326	1,301	1,276	1,253	1,230	1,208	1,187	1,166	917	844	1,314
10,000	1,328	1,302	1,276	1,251	1,228	1,205	1,183	1,162	1,142	1,122	815	757	1,273
11,000	1,277	1,252	1,227	1,204	1,149	1,077	989	917	858	786	742	684	1,233
12,000	1,228	1,204	1,180	1,120	1,033	960	888	829	771	713	669	626	1,194
13,000	1,180	1,149	1,077	1,004	931	858	800	742	684	640	597	553	1,149
14,000	1,120	1,048	975	902	829	771	713	669	626	582	538	495	1,062
15,000	1,004	931	858	800	742	698	655	597	567	524	480	451	989

PERFORMANCE DATA[DM8225]

May 28, 2013

Cross Reference

Engine Arrangement			
Arrangement Number	Effective Serial Number	Engineering Model	Engineering Model Version
2742000	1KZ00001	GS495	-

Test Specification Data						
Test Spec	Setting	Effective Serial Number	Engine Arrangement	Governor Type	Default Low Idle Speed	Default High Idle Speed
0K6973	GG0273	1KZ00001	2742000	WOODWARD		

Supplementary Data

Type	Classification	Performance Number
SOUND	SOUND PRESSURE	DM8779

General Notes

General Notes DM8225 - 02
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference

Parameters Reference:DM9600-05

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%
Heat rejection +/- 5%
Heat rejection exhaust only +/- 10%

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 reference atmospheric pressure is 100 KPA (29.61 in hg) and standard temperature is 25 (77) at 60% relative humidity.

FOR 3600 ENGINES
Engine rating obtained and presented in accordance with ISO 3046/1 and SAE J1995 JAN90 standard reference conditions of 25, 100 KPA 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.

PERFORMANCE DATA[DM8225]

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 29 (84.2), where the density is 838.9 G/Liter (7.001 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.

ALTITUDE CAPABILITY
Altitude capability is the maximum altitude above sea level at standar d 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.

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. Log on to the Technology and Solutions Divisions (T&SD) web page (http://tsd.cat.com/etsd/index.cfm?tech_id=2635ICAL) for information including federal regulation applicability and time lines for implementation. Information for labeling and tagging requirements is also provided.

NOTES:
Regulation watch covers regulations in effect and future regulation changes for world, federal, state and local. This page includes items on the watch list where a regulation change or product change might be pending and may need attention of the engine product group. For additional emissions information log on to the TMI web page.

Additional product information for specific market application is available.
Customer's may have special emission site requirements that need to be verified by the Caterpillar Product Group engineer.

HEAT REJECTION DEFINITIONS:
Diesel Circuit Type and HHV Balance : DM9500

EMISSIONS DEFINITIONS:
Emissions : DM1176

PERFORMANCE DATA[DM8225]

SOUND DEFINITIONS:
Sound Power : DM8702

Sound Pressure : TM7080

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

Date Released : 11/23/11