PERFORMANCE DATA[DM6637]

December 13, 2018

Performance Number: DM6637 **Change Level: 03**

SALES MODEL:	3512B	**COMBUSTION:**	DI
BRAND:	CAT	**ENGINE SPEED (RPM):**	1,500
ENGINE POWER (BHP):	1,757	**HERTZ:**	50
GEN POWER WITH FAN (EKW):	1,200.0	**FAN POWER (HP):**	61.7
COMPRESSION RATIO:	14	**ASPIRATION:**	TA
RATING LEVEL:	PRIME	**AFTERCOOLER TYPE:**	SCAC
PUMP QUANTITY:	2	**AFTERCOOLER CIRCUIT TYPE:**	JW+OC, AC
FUEL TYPE:	DIESEL	**AFTERCOOLER TEMP (F):**	86
MANIFOLD TYPE:	DRY	**JACKET WATER TEMP (F):**	210.2
GOVERNOR TYPE:	ADEM3	**TURBO CONFIGURATION:**	PARALLEL
ELECTRONICS TYPE:	ADEM3	**TURBO QUANTITY:**	4
CAMSHAFT TYPE:	STANDARD	**TURBOCHARGER MODEL:**	BTV7511-50T-0.84
IGNITION TYPE:	CI	**COMBUSTION STRATEGY:**	LOW BSFC
INJECTOR TYPE:	EUI	**CRANKCASE BLOWBY RATE (FT3/HR):**	1,754.9
UNIT INJECTOR TIMING (IN):	64.34	**FUEL RATE (RATED RPM) NO LOAD (GAL/HR):**	9.9
REF EXH STACK DIAMETER (IN):	10	**PISTON SPD @ RATED ENG SPD (FT/MIN):**	1,870.1
MAX OPERATING ALTITUDE (FT):	4,921		

INDUSTRY	SUBINDUSTRY	APPLICATION
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET
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	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	DEG F
1,200.0	100	1,750	293	0.326	81.6	65.8	117.3	1,058.5	738.3
1,080.0	90	1,578	264	0.326	73.4	58.1	113.4	1,033.5	731.7
960.0	80	1,407	235	0.325	65.4	48.9	109.4	1,008.9	725.2
900.0	75	1,322	221	0.325	61.4	44.3	107.7	1,004.5	727.7
840.0	70	1,236	207	0.326	57.5	39.8	106.2	1,000.2	730.6
720.0	60	1,067	178	0.328	50.1	32.0	103.5	977.4	727.2
600.0	50	899	150	0.334	42.9	25.0	100.6	938.9	716.9
480.0	40	733	123	0.344	36.0	18.6	97.7	882.3	700.7
360.0	30	567	95	0.360	29.2	12.8	94.8	804.1	672.5
300.0	25	484	81	0.372	25.7	10.3	93.5	755.4	647.4
240.0	20	401	67	0.389	22.3	7.9	92.1	699.4	613.8
120.0	10	232	39	0.457	15.2	4.1	89.3	560.7	498.0

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
1,200.0	100	1,750	69	399.0	3,824.1	8,940.6	16,919.9	17,491.1	3,669.3	3,335.2
1,080.0	90	1,578	61	369.0	3,531.1	8,160.3	15,361.8	15,875.9	3,367.8	3,061.2
960.0	80	1,407	52	335.5	3,163.7	7,309.1	13,684.8	14,142.5	3,033.0	2,756.8
900.0	75	1,322	47	318.8	2,972.4	6,886.7	12,919.3	13,349.2	2,851.7	2,592.0
840.0	70	1,236	42	302.2	2,786.1	6,465.6	12,164.5	12,567.3	2,670.8	2,427.6
720.0	60	1,067	34	270.9	2,461.2	5,688.8	10,675.1	11,025.7	2,356.7	2,142.1
600.0	50	899	26	239.9	2,168.2	4,972.0	9,253.1	9,553.3	2,077.7	1,888.5
480.0	40	733	20	209.3	1,904.0	4,316.4	7,931.7	8,183.6	1,828.9	1,662.4
360.0	30	567	14	178.8	1,673.2	3,695.3	6,628.0	6,832.3	1,604.8	1,458.7
300.0	25	484	11	164.5	1,574.6	3,393.0	5,955.2	6,135.4	1,506.8	1,369.6
240.0	20	401	9	150.9	1,487.0	3,094.6	5,268.9	5,424.8	1,417.4	1,288.4
120.0	10	232	5	129.1	1,349.3	2,505.6	3,812.5	3,918.7	1,286.4	1,169.3

Heat Rejection Data

GENSET	PERCENT	ENGINE	REJECTION	REJECTION	REJECTION	EXHUAST	FROM OIL	FROM	WORK	LOW HEAT	HIGH HEAT

PERFORMANCE DATA[DM6637]

December 13, 2018

POWER WITH FAN	LOAD	POWER	TO JACKET WATER	TO ATMOSPHERE	TO EXH	RECOVERY TO 350F	COOLER	AFTERCOOLER ENERGY		VALUE ENERGY	VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
1,200.0	100	1,750	27,297	6,312	58,574	27,524	8,758	18,823	74,224	173,874	185,220
1,080.0	90	1,578	25,250	6,085	53,059	24,966	7,905	15,753	66,913	156,901	167,139
960.0	80	1,407	23,259	5,914	47,769	21,951	6,995	12,738	59,654	140,133	149,277
900.0	75	1,322	22,210	5,801	45,176	20,750	6,594	11,288	56,042	131,906	140,513
840.0	70	1,236	21,156	5,687	42,596	19,620	6,199	9,896	52,435	123,752	131,826
720.0	60	1,067	19,052	5,516	37,478	17,118	5,346	7,450	45,258	107,682	114,709
600.0	50	899	16,891	5,289	32,360	14,673	4,607	5,346	38,122	91,989	97,992
480.0	40	733	14,659	5,004	27,315	12,299	3,866	3,651	31,085	76,692	81,696
360.0	30	567	12,334	4,662	22,279	9,831	3,126	2,329	24,059	61,619	65,640
300.0	25	484	11,132	4,464	19,741	8,466	2,758	1,804	20,537	54,151	57,685
240.0	20	401	9,901	4,266	17,186	7,058	2,390	1,367	16,998	46,694	49,740
120.0	10	232	7,345	3,869	12,018	3,540	1,652	741	9,853	31,764	33,837

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1500 RPM

GENSET POWER WITH FAN		EKW	1,200.0	900.0	600.0	300.0	120.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	1,750	1,322	899	484	232
TOTAL NOX (AS NO2)		G/HR	13,826	12,098	10,208	6,294	3,722
TOTAL CO		G/HR	4,466	3,465	2,569	2,349	2,410
TOTAL HC		G/HR	330	348	283	226	324
PART MATTER		G/HR	159.0	109.9	90.4	65.5	55.2
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,892.5	4,523.5	5,470.3	5,614.9	5,643.0
TOTAL CO	(CORR 5% O2)	MG/NM3	1,257.1	1,295.8	1,376.3	2,096.2	3,655.9
TOTAL HC	(CORR 5% O2)	MG/NM3	93.0	130.3	151.5	201.6	492.4
PART MATTER	(CORR 5% O2)	MG/NM3	44.8	41.2	48.4	58.5	83.6
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,894	2,204	2,674	2,735	2,729
TOTAL CO	(CORR 5% O2)	PPM	1,006	1,037	1,103	1,679	2,910
TOTAL HC	(CORR 5% O2)	PPM	150	210	245	326	814
TOTAL NOX (AS NO2)		G/HP-HR	7.90	9.15	11.35	13.00	16.02
TOTAL CO		G/HP-HR	2.55	2.62	2.86	4.85	10.37
TOTAL HC		G/HP-HR	0.19	0.26	0.32	0.47	1.40
PART MATTER		G/HP-HR	0.09	0.08	0.10	0.14	0.24
TOTAL NOX (AS NO2)		LB/HR	30.48	26.67	22.50	13.88	8.20
TOTAL CO		LB/HR	9.85	7.64	5.66	5.18	5.31
TOTAL HC		LB/HR	0.73	0.77	0.62	0.50	0.71
PART MATTER		LB/HR	0.35	0.24	0.20	0.14	0.12

RATED SPEED NOMINAL DATA: 1500 RPM

GENSET POWER WITH FAN		EKW	1,200.0	900.0	600.0	300.0	120.0
PERCENT LOAD		%	100	75	50	25	10
ENGINE POWER		BHP	1,750	1,322	899	484	232
TOTAL NOX (AS NO2)		G/HR	11,522	10,082	8,506	5,245	3,101
TOTAL CO		G/HR	2,481	1,925	1,427	1,305	1,339
TOTAL HC		G/HR	248	262	213	170	244
TOTAL CO2		KG/HR	739	554	385	228	133
PART MATTER		G/HR	113.6	78.5	64.6	46.8	39.4
TOTAL NOX (AS NO2)	(CORR 5% O2)	MG/NM3	3,243.7	3,769.6	4,558.6	4,679.1	4,702.5
TOTAL CO	(CORR 5% O2)	MG/NM3	698.4	719.9	764.6	1,164.5	2,031.1
TOTAL HC	(CORR 5% O2)	MG/NM3	69.9	98.0	113.9	151.6	370.2
PART MATTER	(CORR 5% O2)	MG/NM3	32.0	29.4	34.6	41.8	59.7
TOTAL NOX (AS NO2)	(CORR 5% O2)	PPM	1,578	1,837	2,228	2,279	2,274
TOTAL CO	(CORR 5% O2)	PPM	559	576	613	933	1,617
TOTAL HC	(CORR 5% O2)	PPM	113	158	184	245	612
TOTAL NOX (AS NO2)		G/HP-HR	6.58	7.63	9.46	10.83	13.35
TOTAL CO		G/HP-HR	1.42	1.46	1.59	2.69	5.76
TOTAL HC		G/HP-HR	0.14	0.20	0.24	0.35	1.05
PART MATTER		G/HP-HR	0.06	0.06	0.07	0.10	0.17
TOTAL NOX (AS NO2)		LB/HR	25.40	22.23	18.75	11.56	6.84
TOTAL CO		LB/HR	5.47	4.24	3.15	2.88	2.95
TOTAL HC		LB/HR	0.55	0.58	0.47	0.37	0.54
TOTAL CO2		LB/HR	1,628	1,222	849	504	292
PART MATTER		LB/HR	0.25	0.17	0.14	0.10	0.09
OXYGEN IN EXH		%	11.0	11.3	11.7	13.4	15.8

DRY SMOKE OPACITY	%	0.8	0.5	0.8	0.9	0.8
BOSCH SMOKE NUMBER		0.31	0.22	0.31	0.34	0.31

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	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,722	1,669	1,757
1,000	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,722	1,652	1,757
2,000	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,722	1,687	1,616	1,757
3,000	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,757	1,752	1,704	1,634	1,581	1,757
4,000	1,757	1,757	1,757	1,757	1,757	1,757	1,750	1,719	1,688	1,659	1,599	1,546	1,757
5,000	1,753	1,753	1,753	1,753	1,749	1,717	1,686	1,656	1,627	1,598	1,564	1,493	1,753
6,000	1,697	1,697	1,697	1,697	1,685	1,654	1,624	1,595	1,567	1,539	1,511	1,458	1,697
7,000	1,643	1,643	1,643	1,643	1,622	1,592	1,563	1,535	1,508	1,482	1,457	1,406	1,643
8,000	1,592	1,592	1,592	1,592	1,562	1,533	1,505	1,478	1,452	1,427	1,403	1,195	1,592
9,000	1,542	1,542	1,542	1,532	1,503	1,475	1,448	1,422	1,397	1,373	1,124	1,019	1,542
10,000	1,495	1,495	1,495	1,473	1,446	1,419	1,393	1,368	1,344	1,321	984	914	1,495
11,000	1,449	1,449	1,445	1,417	1,390	1,365	1,340	1,142	1,037	949	879	826	1,449
12,000	1,405	1,405	1,389	1,363	1,337	1,230	1,089	984	914	843	791	738	1,405
13,000	1,362	1,362	1,335	1,310	1,142	1,037	949	879	826	773	720	685	1,361
14,000	1,321	1,309	1,247	1,089	1,001	931	861	791	756	703	668	615	1,317
15,000	1,282	1,160	1,054	966	896	826	773	720	685	650	597	562	1,274

Cross Reference

Test Spec	Setting	Engine Arrangement	Engineering Model	Engineering Model Version	Start Effective Serial Number	End Effective Serial Number
0K3158	GG0093	1955875	GS033	-	1GZD0001	
3496348	GG0468	2935407	GS496	DK	1GZD0001	
3496348	GG0469	2935407	GS496	DK		
4577060	GG1292	2935407	GS496	DK	ZN300001	
3496348	GG0468	2958933	GS496	-	1GZD0001	
3496348	GG0469	2958933	GS496	-		
3496348	GG0468	4401648	GS496	DK	1GZD0001	
3496348	GG0469	4401648	GS496	DK		

Supplementary Data

Type	Classification	Performance Number
AFTERCOOLER TEMP	60C	DM6638
AFTERCOOLER TEMP	90C	DM6639
SOUND	SOUND PRESSURE	DM8779

General Notes

General Notes DM6637 - 03
SOUND PRESSURE DATA FOR THIS RATING CAN BE FOUND IN PERFORMANCE NUMBER - DM8779

Performance Parameter Reference

Parameters Reference:DM9600-11

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.
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

29 deg C (84.2 deg F), 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. 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.
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 : 11/29/18