

# GEN SET PERFORMANCE DATA

SEPTEMBER 27, 2022

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Performance Number: DM0533

Change Level:

<b>Sales Model:</b> 3516 SITA	<b>Combustion:</b> SI	<b>Aspr:</b> TA
<b>Engine Power:</b> 820 W/O F EKW 1,148 HP	<b>Speed:</b> 1,200 RPM	<b>After Cooler:</b> SCAC
<b>Manifold Type:</b> ASWC	<b>Governor Type:</b> WDWRD	<b>After Cooler Temp(F):</b> 90
<b>Turbo Quantity:</b> 2	<b>Engine App:</b> GS	<b>Turbo Arrangement:</b>
<b>Hertz:</b> 60	<b>Application Type:</b> EPG-CONT	<b>Engine Rating:</b> GS <b>Strategy:</b>
<b>Rating Type:</b> CONT-LP GAS	<b>Certification:</b>	
<b>Fuel:</b> PIPELINE	<b>Fuel Press (PSI):</b> 1.5	<b>NOx Level:</b> LE-2G/BHP HR
<b>IGN:</b> BOTH	<b>JW Temp (F):</b> 210	<b>ELEK A/F CONT:</b> NO
<b>Cam Type:</b> STD	<b>Piston:</b> G/C	
<b>CARB:</b> IMPCO	<b>C/R:</b> 11.0:1	

### General Performance Data

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BHP	ENGINE BMEP PSI	FUEL BSFC BTU-BHP/HR	FUEL RATE CFH	INTAKE MFLD TEMP DEG F	INTAKE MFLD P IN-HG	INTAKE AIR FLOW CFM	EXH MFLD TEMP DEG F	EXH STACK TEMP DEG F	EXH GAS FLOW CFM
820	100	1148	179.85	7,089.07	8,984.06	115.7	34.8	2,320.18	1,077.8	770	5,805.74
738	90	1035	162.3	7,096.14	8,108.26	113.54	27.51	2,027.06	1,069.16	780.44	5,117.1
656	80	922	144.6	7,131.48	7,260.7	111.92	20.7	1,758.67	1,058	788.54	4,477.9
615	75	866	135.76	7,159.75	6,851.05	111.2	17.47	1,635.07	1,051.7	791.6	4,181.26
574	70	810	126.91	7,216.3	6,452	110.48	14.45	1,529.13	1,044.5	794.3	3,919.93
492	60	697	109.22	7,371.79	5,675.07	109.58	8.68	1,324.3	1,028.66	797.18	3,407.87
410	50	584	91.52	7,633.3	4,926.4	109.4	3.32	1,130.07	1,011.2	797	2,906.4
328	40	475	74.41	8,050.3	4,223.64	110.66	-1.66	942.9	993.02	793.04	2,426.12
246	30	362	56.86	8,792.43	3,517.34	113.18	-6.51	752.2	973.22	785.12	1,931.71

### General Performance Data 2

ENGINE SPEED RPM	PERCENT LOAD	ENGINE POWER BHP	COMPRESS IN-HG	COMPRESS OUT TEMP DEG F
1,200	146	1148	40.3	309.2
1,200	146	1035	35.12	294.44
1,200	146	922	30.09	275.36
1,200	146	866	27.63	264.2
1,200	146	810	25.23	249.8
1,200	146	697	20.58	221.18
1,200	146	584	16.08	192.56
1,200	146	475	11.79	167.72
1,200	146	362	7.49	144.14

**Engine Heat Rejection Data**

GEN PWR EKW	PERCENT LOAD	REJ TO JW BTU/MN	REJ TO ATMOS BTU/MN	REJ TO EXHAUST BTU/MN	EXH RCOV TO BTU/MN	FROM OIL CLR BTU/MN	FROM AFT CLR BTU/MN	WORK ENERGY BTU/MN	LHV ENERGY BTU/MN	HHV ENERGY BTU/MN
820	100	35,373.1	10,066.0	47,827.6	19,676.98	7,848.0	8,758.0	48,680.6	135,577.8	150,705.2
738	90	33,155.1	9,042.3	42,766.1	17,629.66	7,336.2	7,165.6	43,903.6	122,384.0	136,032.8
656	80	30,994.1	8,018.6	37,932.2	15,582.35	6,881.3	5,743.9	39,126.5	109,588.3	121,815.3
615	75	29,913.6	7,563.7	35,657.4	14,615.56	6,653.8	5,061.4	36,737.9	103,389.5	114,934.0
574	70	28,833.0	7,108.7	33,553.2	13,762.51	6,369.4	4,379.0	34,349.4	97,361.2	108,223.4
492	60	26,728.8	6,312.6	29,401.7	11,999.54	5,914.5	3,184.7	29,572.3	85,646.0	95,200.2
410	50	24,681.5	5,857.6	25,193.4	10,236.58	5,459.5	2,161.1	24,795.3	74,385.8	82,688.8
328	40	23,032.3	5,175.2	21,155.6	8,473.61	5,118.3	1,364.9	20,131.9	63,751.1	70,859.9
246	30	21,553.7	4,379.0	17,004.1	6,653.78	4,777.1	739.3	15,354.9	53,116.5	59,030.9

**EXHAUST Sound Data: 4.92 FEET**

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
820	100	109	97	101	103	100	101	103	105	98

**EXHAUST Sound Data: 22.97 FEET**

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
820	100	96	87	89	91	87	90	90	90	83

**EXHAUST Sound Data: 49.21 FEET**

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
820	100	89	81	83	84	81	83	83	83	76

**MECHANICAL Sound Data: 3.28 FEET**

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
820	100	99	98	94	89	90	92	94	91	82

**MECHANICAL Sound Data: 22.97 FEET**

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCJ 8000HZ DB
820	100	87	86	83	77	78	81	82	79	71

**MECHANICAL Sound Data: 49.21 FEET**

GEN PWR EKW	PERCENT LOAD	OVERALL SOUND DB(A)	OBCF 63HZ DB	OBCF 125HZ DB	OBCF 250HZ DB	OBCF 500HZ DB	OBCF 1000HZ DB	OBCF 2000HZ DB	OBCF 4000HZ DB	OBCF 8000HZ DB
820	100	82	81	77	72	73	75	77	74	65

**EMISSIONS DATA**

Certification:

EMISSIONS DATA MEASUREMENT IS CONSISTENT WITH THOSE DESCRIBED IN EPA CFR 40 PART 89 SUBPART D & E AND ISO 8178-1 FOR MEASURING HC, CO, CO2 AND NOX. THESE PROCEDURES ARE VERY SIMILAR TO THE METHODS DESCRIBED IN EPA CFR 40 PART 60 APPENDIX A METHOD 25A FOR HYDROCARBONS, METHOD 10 FOR CO, METHOD 7E FOR NOX. DATA SHOWN IS BASED ON STEADY STATE ENGINE OPERATING CONDITIONS OF 77 DEG F, 28.43 INCHES HG AND FUEL HAVING A LHV OF 911 BTU PER CUBIC FOOT AT 30.00 INCHES HG ABSOLUTE AND 32 DEG F. FUEL RATE IS BASED ON A STANDARD CUBIC FOOT AT 30.00 INCHES HG ABSOLUTE AND 32 DEG F.

To properly apply this data you must refer to performance parameter DM1176 for additional information...

REFERENCE EXHAUST STACK DIAMETER	0 IN
WET EXHAUST MASS	10,714.5 LB/HR
WET EXHAUST FLOW (768.20 F STACK TEMP )	5,735.11 CFM
WET EXHAUST FLOW RATE ( 32 DEG F AND 29.98 IN HG )	2,145.00 STD CFM
DRY EXHAUST FLOW RATE ( 32 DEG F AND 29.98 IN HG )	1,964.91 STD CFM
FUEL FLOW RATE	152 CFM

**RATED SPEED "Potential site variation"**

EKW	PERCENT LOAD	ENGINE POWER BHP	TOTAL NOX (AS NO2) LB/HR	TOTAL CO LB/HR	TOTAL HC LB/HR	NON-METH HC LB/HR	OXYGEN IN EXHAUST PERCENT	LAMBDA
820	100	1148	5.1500	3.9700	13.4300	2.02	8.6600	1.55
615	75	1035	8.7200	3.1600	7.7800	1.17	7.4500	1.43
410	50	922	7.8000	2.2800	5.6500	0.85	6.9600	1.37
205	25	866	6.8000	1.4500	2.8300	0.43	4.9800	1.24

**Altitude Capability Data(Corrected Power Altitude Capability)**

Ambient Operating Temp.	50 F	68 F	86 F	104 F	122 F	NORMAL
<b>Altitude</b>						
0 FT	1,147.91 hp	1,147.91 hp	1,147.91 hp	1,147.91 hp	1,147.91 hp	1,147.91 hp
984.25 FT	1,147.91 hp	1,147.91 hp	1,133.16 hp	1,096.95 hp	1,063.43 hp	1,139.87 hp
1,640.42 FT	1,147.91 hp	1,145.23 hp	1,106.34 hp	1,071.47 hp	1,037.95 hp	1,117.07 hp
3,280.84 FT	1,115.73 hp	1,078.18 hp	1,041.97 hp	1,008.45 hp	977.6 hp	1,063.43 hp
4,921.26 FT	1,050.02 hp	1,013.81 hp	980.29 hp	949.44 hp	919.94 hp	1,011.13 hp
6,561.68 FT	986.99 hp	953.47 hp	921.28 hp	891.78 hp	864.96 hp	961.51 hp
8,202.1 FT	926.64 hp	895.8 hp	866.3 hp	838.14 hp	812.66 hp	913.23 hp
9,842.52 FT	870.32 hp	840.82 hp	812.66 hp	787.18 hp	763.04 hp	867.64 hp
10,498.69 FT	848.87 hp	819.36 hp	792.54 hp	767.06 hp	742.93 hp	850.21 hp

**The powers listed above and all the Powers displayed are Corrected Powers**

**Identification Reference and Notes**

<b>Engine Arrangement:</b>		<b>Lube Oil Press @ Rated Spd(PSI):</b>	55.8
<b>Effective Serial No:</b>		<b>Piston Speed @ Rated Eng SPD(FT/Min):</b>	1,389.8
<b>Primary Engine Test Spec:</b>		<b>Max Operating Altitude(FT):</b>	728.3
<b>Performance Parm Ref:</b>	TM0001	<b>PEEC Elect Control Module Ref</b>	
<b>Performance Data Ref:</b>	DM0533	<b>PEEC Personality Cont Mod Ref</b>	
<b>Aux Coolant Pump Perf Ref:</b>			
<b>Cooling System Perf Ref:</b>		<b>Turbocharger Model</b>	TW8129-1.37
<b>Certification Ref:</b>		<b>Fuel Injector</b>	
<b>Certification Year:</b>		<b>Timing-Static (DEG):</b>	--
<b>Compression Ratio:</b>	11.0	<b>Timing-Static Advance (DEG):</b>	--
<b>Combustion System:</b>	SI	<b>Timing-Static (MM):</b>	--
<b>Aftercooler Temperature (F):</b>	90	<b>Unit Injector Timing (MM):</b>	--
<b>Crankcase Blowby Rate(CFH):</b>	14.1	<b>Torque Rise (percent)</b>	--
<b>Fuel Rate (Rated RPM) No Load(Gal/HR):</b>	--	<b>Peak Torque Speed RPM</b>	--
<b>Lube Oil Press @ Low Idle Spd(PSI):</b>	20.0	<b>Peak Torque (LB.FT):</b>	--

**Reference  
Number: DM0533** --

**Parameters  
Reference: TM0001**

## **GAS ENGINE PERFORMANCE**

### **TOLERANCES:**

AMBIENT AIR CONDITIONS AND FUEL USED WILL AFFECT THESE VALUES. EACH OF THE VALUES MAY VARY IN ACCORDANCE WITH THE FOLLOWING TOLERANCES:

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>

POWER	+/- 3%
EXHAUST STACK TEMPERATURE	+/- 8%
INLET AIR FLOW	+/- 5%
INTAKE MANIFOLD ABSOLUTE PRESSURE - NA	+/- 5%
INTAKE MANIFOLD ABSOLUTE PRESSURE - TA	+/- 5%
INTAKE MANIFOLD TEMPERATURE	+/- 5 DEG C
EXHAUST GAS FLOW	+/- 6%
SPECIFIC FUEL CONSUMPTION	+/- 5%
FUEL RATE	+/- 5%

### **CONDITIONS:**

POWER FOR GAS ENGINES IS BASED ON FUEL HAVING A LHV OF 33.74 KJ/L (905 BTU/CU FT) AT 101 KPA (29.91 IN HG) AND 15 DEG C (59 DEG F). FUEL RATE IS BASED ON A CUBIC METER AT 100 KPA (29.61 IN HG) AND 15.6 DEG C (60.1 DEG F). AIR FLOW IS BASED ON A CUBIC FOOT AT 100 KPA (29.61 IN HG) AND 25 DEG C (77 DEG F). EXHAUST FLOW IS BASED ON A CUBIC FOOT AT 100 KPA (29.61 IN HG) AND STACK TEMPERATURE.

ENGINE PERFORMANCE IS OBTAINED IN ACCORDANCE WITH SAE J1995, ISO 3046/1, BS5514/1 AND DIN 6271/1 STANDARDS.

TRANSIENT RESPONSE DATA IS ACQUIRED FROM AN ENGINE/GENERATOR COMBINATION AT NORMAL OPERATING TEMPERATURE AND IN ACCORDANCE WITH ISO 3046/1 STANDARD AMBIENT CONDITIONS. ALSO IN ACCORDANCE WITH SAE J1995, BS5514/1 AND DIN 6271/1 STANDARD REFERENCE CONDITIONS.

ENGINES ARE EQUIPPED WITH STANDARD ACCESSORIES; LUBE OIL PUMP, JACKET WATER PUMP, SEPARATE CIRCUIT AFTERCOOLER WATER PUMP AND MAGNETO (EXCEPT EIS). POWER REQUIRED TO DRIVE AUXILIARIES MUST BE DEDUCTED FROM THE GROSS OUTPUT TO ARRIVE AT THE NET POWER AVAILABLE FOR THE EXTERNAL (FLYWHEEL OR GENERATOR) LOAD. TYPICAL AUXILIARIES INCLUDE COOLING FANS, AIR COMPRESSORS AND CHARGING ALTERNATORS. RATINGS MUST BE REDUCED TO COMPENSATE FOR ALTITUDE AND/OR AMBIENT TEMPERATURE CONDITIONS ACCORDING TO THE APPLICABLE DATA SHOWN ON THE PERFORMANCE DATA SET.

### **DEFINITIONS:**

INDUSTRIAL CONTINUOUS - THE POWER AND SPEED CAPABILITY OF THE

ENGINE WHICH CAN BE USED WITHOUT INTERRUPTION OR LOAD CYCLING.

GENERATOR SET CONTINUOUS - OUTPUT WHICH MAY BE UTILIZED CONTINUOUSLY WITHOUT LOAD CYCLING.

**ALTITUDE:**

ALTITUDE CAPABILITY - THE RECOMMENDED POWER VALUES FOR SUSTAINED ENGINE OPERATION AT SPECIFIC LEVELS AND AMBIENT TEMPERATURES.

COLUMN "N" DATA - THE FLYWHEEL POWER OUTPUT AT NORMAL AMBIENT TEMPERATURE.

AMBIENT TEMPERATURE - TO BE MEASURED AT THE AIR CLEANER AIR INLET DURING NORMAL ENGINE OPERATION.

NORMAL TEMPERATURE - THE NORMAL TEMPERATURE AT VARIOUS SPECIFIC ALTITUDE LEVELS FOUND ON TM2001.

**HEAT REJECTION**

**TOLERANCES:**

LHV OR HHV ENERGY	+/- 5%
WORK ENERGY	+/- 3%
REJECTION TO COOLANT	+/- 10%
REJECTION TO EXHAUST	+/- 10%
EXHAUST RECOVERY	+/- 10%
FROM OIL COOLER	+/- 20%
FROM AFTERCOOLER	+/- 5%
REJECTION TO ATMOSPHERE	+/- 50%

THE FOLLOWING FORMULAS APPLY WHEN DOING AN ENERGY BALANCE:

**STANDARD TEMPERATURE SYSTEM**

HHV ENERGY = REJ TO COOLANT + REJ TO ATMOS + REJ TO EXH + FROM AFTCLR + WORK ENERGY

**COGENERATION (HIGH TEMPERATURE) SYSTEM AND G3600**

HHV ENERGY = REJ TO COOLANT = REJ TO ATMOS + REJ TO EXH + FROM OIL CLR + FROM AFTCLR + WORK ENERGY

**DEFINITIONS:**

REJ TO COOLANT (JACKET WATER) - TOTAL AMOUNT OF HEAT PICKED UP BY THE ENGINE COOLING SYSTEM. FOR STANDARD TEMPERATURE SYSTEMS THE OIL COOLER HEAT REJECTION IS INCLUDED. FOR COGENERATION SYSTEM AND G3600 THE OIL COOLER IS SEPARATE FROM THE JACKET WATER. THEREFORE, THE OIL COOLER HEAT REJECTION IS NOT INCLUDED IN THE REJ TO COOLANT.

REJECTION TO EXHAUST - IS BASED ON COOLING EXHAUST STACK FLOW TO 25 DEG C (77 DEG F) AND IS USED IN THE ENERGY BALANCE.

EXHAUST RECOVERY - IS THE ENERGY AVAILABLE IF THE EXHAUST STACK FLOW IS COOLED TO 177 DEG C (350.6 DEG F).

**SOUND DEFINITIONS:**

Sound Power : [DM8702](#)

Sound Pressure : [TM7080](#)

Date Released : 10/04/11

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