GENERATOR DATA

(AT400240)-ENGINE (BAA126422A)-CEM

MARCH 14, 2023

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Help

Selected Model

Engine: 3520	**Generator Frame:** 3044	**Genset Rating (kW):** 2476.0	**Line Voltage:** 12470
Fuel: Natural Gas	**Generator Arrangement:** 6215930	**Genset Rating (kVA):** 3095.0	**Phase Voltage:** 7200
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 143.3
Duty: CONTINUOUS	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Pending

Version: 20211 /20199 /20211 /677852

Spec Information

Generator Specification

Frame: 3044 **Type:** SR5	**No. of Bearings:** 2
Winding Type: FORM WOUND	**Flywheel:** 21.0
Connection: SERIES STAR	**Housing:** 00
Phases: 3	**No. of Leads:** 6
Poles: 4	**Wires per Lead:** 1
Sync Speed: 1800	**Generator Pitch:** 0.67

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	619.0	92.2
0.5	1238.0	95.5
0.75	1857.0	96.5
1.0	2476.0	96.8
1.1	2723.6	96.9

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1166	5.8584
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1826	9.1757
TRANSIENT - SATURATED X'_d	0.1514	7.6070
SYNCHRONOUS - DIRECT AXIS X_d	1.8986	95.3914
SYNCHRONOUS - QUADRATURE AXIS X_q	1.0935	54.9403
NEGATIVE SEQUENCE X_2	0.1500	7.5360
ZERO SEQUENCE X_0	0.0201	1.0080

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	4.9290
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.4830
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0490
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0380
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.0250
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0040
EXCITER TIME CONSTANT T_e	0.1761
ARMATURE SHORT CIRCUIT T_a	0.0870

Short Circuit Ratio: 0.76	Stator Resistance = 0.3641 Ohms Field Resistance = 1.1095 Ohms

Voltage Regulation	
Voltage level adjustment: +/-	5.0%
Voltage regulation, steady state: +/-	0.5%
Voltage regulation with 3% speed change: +/-	0.5%
Waveform deviation line - line, no load: less than	3.0%
Telephone influence factor: less than	100

Generator Excitation	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	12.41 Volts	43.35 Volts	Volts
Excitation current	1.29 Amps	3.71 Amps	Amps

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Generator Mechanical Information

Center of Gravity

Dimension X	-1233.0 mm	-48.5 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

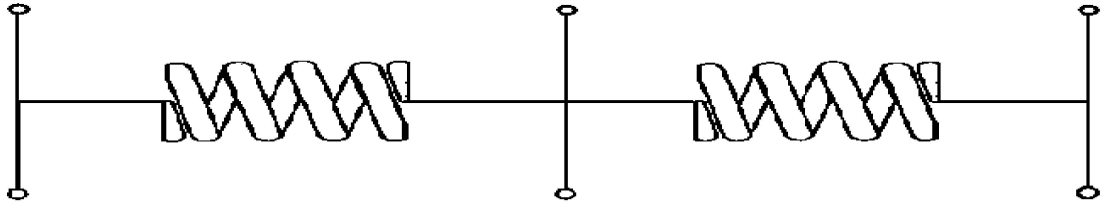
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 7390 kg * Rotor WT = 2361 kg * Stator WT = 5029 kg
16,292 LB 5,205 LB 11,087 LB

Rotor Balance = 0.0508 mm deflection PTP

Overspeed Capacity = 125% of synchronous speed

Generator Torsional Data



J1 = Coupling and Fan | **J2 = Rotor** | **J3 = Exciter End**

TOTAL J = J1 + J2 + J3

K1 = Shaft Stiffness between J1 + J2 (Diameter 1)

K2 = Shaft Stiffness between J2 + J3 (Diameter 2)

J1	K1	Min Shaft Dia 1	J2	K2	Min Shaft Dia 2	J3
115.5 LB IN. s^2	0.0 MLB IN./rad	0.0 IN.	998.5 LB IN. s^2	0.0 MLB IN./rad	0.0 IN.	18.6 LB IN. s^2
13.05 N m s^2	0.0 MN m/rad	0.0 mm	112.811 N m s^2	0.0 MN m/rad	0.0 mm	2.1 N m s^2

Total J

1,132.6 LB IN. s^2

127.961 N m s^2

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Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		**Temperature Data: (Ambient 40 ^{0}C)**	
Heat Dissipated:	81.9 kW	**Stator Rise:**	105.0 ^{0}C
Air Flow:	270.0 m^3/min	**Rotor Rise:**	105.0 ^{0}C

Insulation Class: H

Insulation Reg. as shipped: 100.0 MΩ minimum at 40 ^{0}C

Thermal Limits of Generator

Frequency:	60 Hz
Line to Line Voltage:	12470 Volts
B BR 80/40	2594.0 kVA
F BR -105/40	3125.0 kVA
H BR - 125/40	3438.0 kVA
F PR - 130/40	3438.0 kVA

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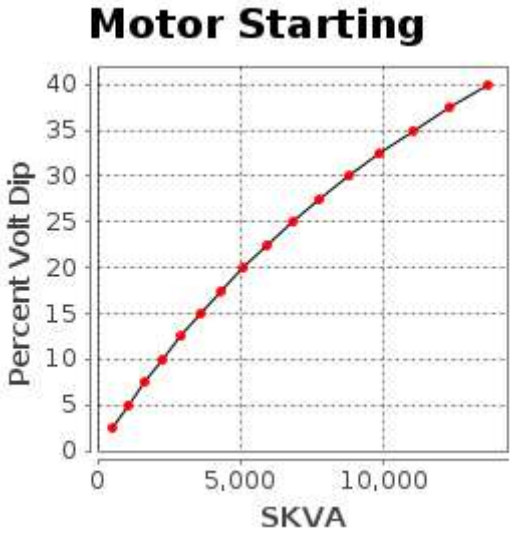
Starting Capability & Current Decrement

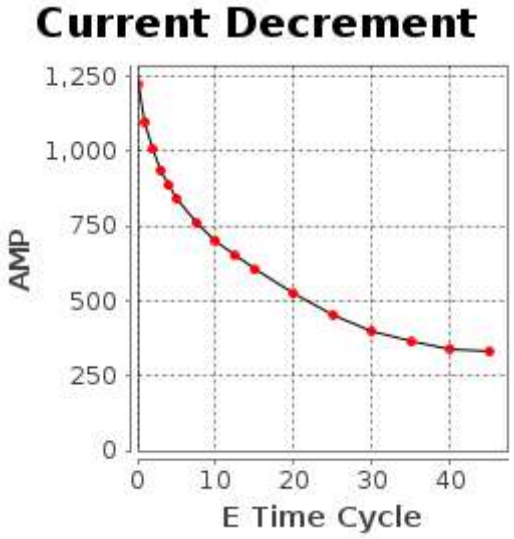
Motor Starting Capability (0.4 pf)

SKVA	Percent Volt Dip
524	2.5
1,076	5.0
1,657	7.5
2,271	10.0
2,920	12.5
3,607	15.0
4,336	17.5
5,111	20.0
5,935	22.5
6,814	25.0
7,754	27.5
8,761	30.0
9,843	32.5
11,007	35.0
12,265	37.5
13,628	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	1,227
1.0	1,100
2.0	1,007
3.0	939
4.0	886
5.0	844
7.5	764
10.0	703
12.5	651
15.0	604
20.0	524
25.0	456
30.0	400
35.0	363
40.0	342
45.0	332



Instantaneous 3 Phase Fault Current: 1227 Amps **Instantaneous Line - Line Fault Current:** 930 Amps

Instantaneous Line - Neutral Fault Current: 1497 Amps

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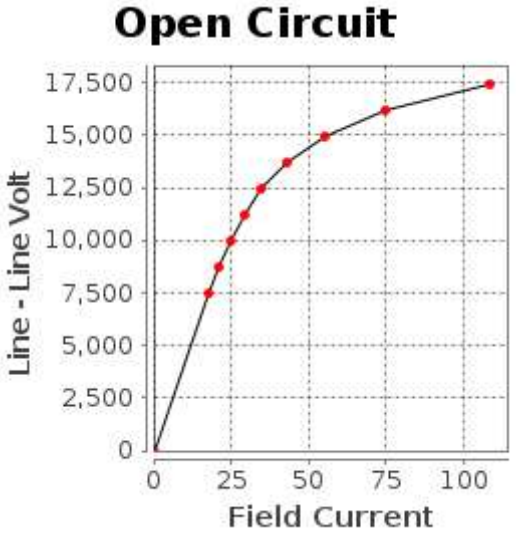
Generator Output Characteristic Curves

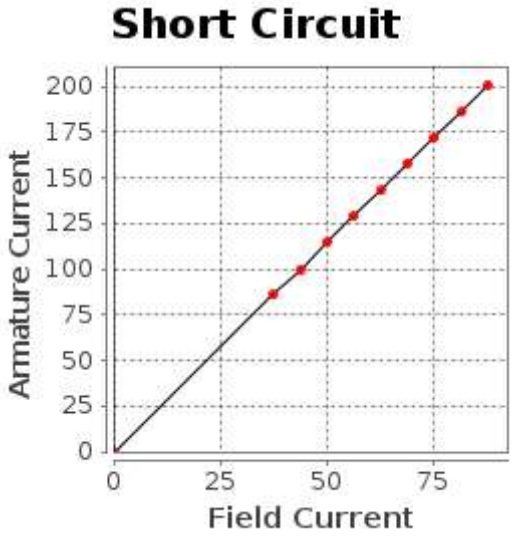
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
17.7	7,482
21.1	8,729
24.8	9,976
29.2	11,223
34.9	12,470
42.9	13,717
55.0	14,964
74.8	16,211
108.4	17,458



Short Circuit Curve

Field Current	Armature Current
0.0	0
37.6	86
43.9	100
50.2	115
56.4	129
62.7	143
69.0	158
75.2	172
81.5	186
87.8	201



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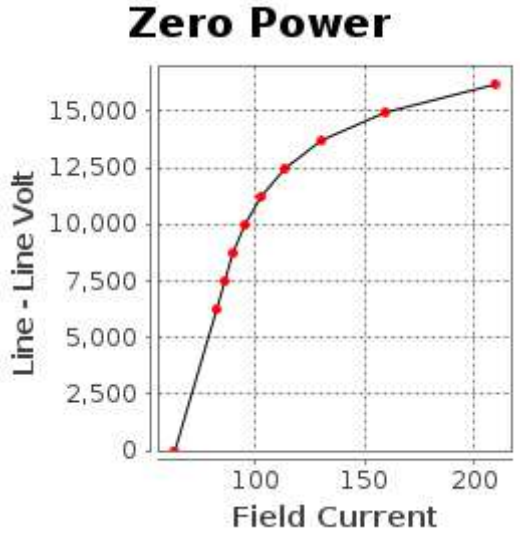
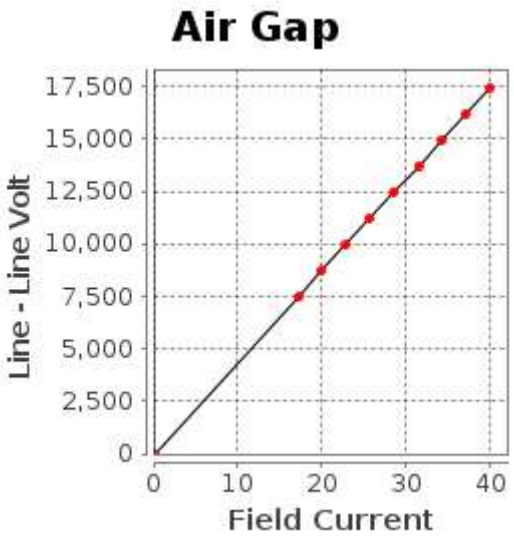
Generator Output Characteristic Curves
Zero Power Factor Curve

Field Current	Line - Line Volt
62.7	0
82.3	6,235
86.0	7,482
90.2	8,729
95.5	9,976
102.7	11,223
113.4	12,470
130.6	13,717
159.5	14,964
209.6	16,211



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
17.2	7,482
20.0	8,729
22.9	9,976
25.7	11,223
28.6	12,470
31.5	13,717
34.3	14,964
37.2	16,211
40.0	17,458



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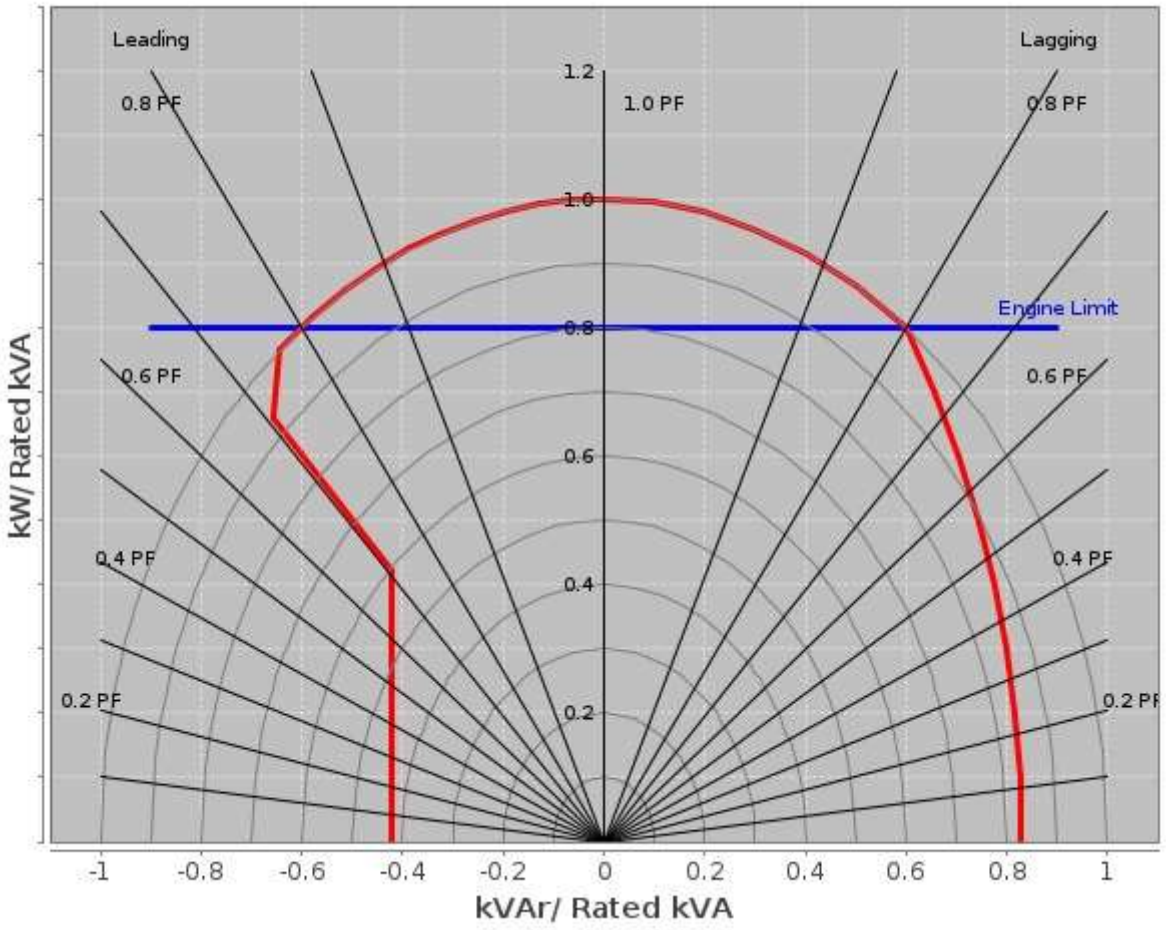
Reactive Capability Curve

Operating Chart



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General Information

DM7827 Caterpillar SR5-HV Generators (50 Hz, 60 Hz)
Data for 3000 frame Caterpillar SR5-HV generators built by Leroy Somer USA.

Refer to DM7821 for explanation of all generator data in Technical Marketing Information (TMI) except generator efficiency for which the explanation is given below.

GENERATOR EFFICIENCY
Generator efficiency is the percentage of engine flywheel (or other prime mover) power that is converted into electrical output. The generator efficiency shown is calculated by the summation of all losses method, and is determined in accordance with the IEC Standard 60034. The efficiency considers only the generator. There is no consideration of engine or parasitic losses here.

Refer to DM7830 for high voltage protective setting values and limits.

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Internal Information

Max Block Load : 0.0	**Max Motor Load :** 0.0	**Max Single Step :** 0.0
Block Kg : 0.038	**Motor Kg :** 0.049	**KVA Derate :** 3125.0
Derate Code : BR	**Temperature Rise:** 105.0	**Target ekW:** 2476.0

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CWS ID: BATTSJD
User Name: BATTS JACOB
Generator Data Uploaded On: December 16, 2021

Current Date: 3/14/2023, 12:22:14 PM