GENERATOR DATA

JUNE 21, 2022

(AT400240)-ENGINE (BAA126422A)-CEM

For Help Desk Phone Numbers Click here

Selected Model

Engine: 3516	**Generator Frame:** 2750	**Genset Rating (kW):** 1825.0	**Line Voltage:** 13800
Fuel: Diesel	**Generator Arrangement:** 2524232	**Genset Rating (kVA):** 2281.0	**Phase Voltage:** 7967
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 95.4
Duty: PRIME	**Connection:** SERIES STAR	**Application:** EPG	**Status:** Current

Version: 41205 /40401 /38315 /1955

Spec Information

Generator Specification

Frame: 2750 **Type:** SR4BHV	**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:** 0.667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	456.3	88.6
0.5	912.5	93.4
0.75	1368.8	94.9
1.0	1825.0	95.4
1.1	2007.5	95.5

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1651	13.7855
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.2039	17.0247
TRANSIENT - SATURATED X'_d	0.2139	17.8534
SYNCHRONOUS - DIRECT AXIS X_d	2.1666	180.8690
SYNCHRONOUS - QUADRATURE AXIS X_q	1.1207	93.5607
NEGATIVE SEQUENCE X_2	0.1850	15.4428
ZERO SEQUENCE X_0	0.0244	2.0339

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	4.6620
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.6510
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0470
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0360
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.0230
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0040
EXCITER TIME CONSTANT T_e	0.2220
ARMATURE SHORT CIRCUIT T_a	0.0560

Short Circuit Ratio: 0.79	Stator Resistance = 0.8139 Ohms	Field Resistance = 1.065 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	2.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	13.79 Volts	43.88 Volts	Volts
Excitation current	3.74 Amps	9.79 Amps	Amps

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Generator Mechanical Information

Center of Gravity

Dimension X	-1141.0 mm	-44.9 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

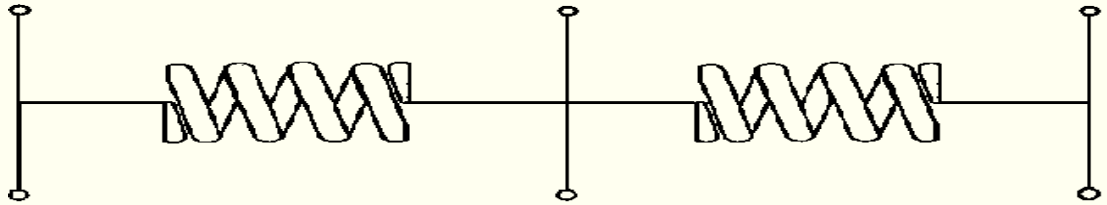
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 5965 kg * Rotor WT = 1933 kg * Stator WT = 4032 kg
13,151 LB 4,262 LB 8,889 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
719.7 LB IN. s^2	238.0 MLB IN./rad	5.5 IN.	88.4 LB IN. s^2	46.8 MLB IN./rad	5.0 IN.	2.5 LB IN. s^2
81.312 N m s^2	26.894 MN m/rad	140.0 mm	9.993 N m s^2	5.2884 MN m/rad	127.0 mm	0.277 N m s^2

Total J

810.6 LB IN. s^2

91.582 N m s^2

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Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:		**Temperature Data: (Ambient 40 ^{0}C)**	
Heat Dissipated:	88.0 kW	**Stator Rise:**	105.0 ^{0}C
Air Flow:	184.2 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:	13800 Volts
B BR 80/40	1973.0 kVA
F BR -105/40	2313.0 kVA
H BR - 125/40	2531.0 kVA
F PR - 130/40	2531.0 kVA

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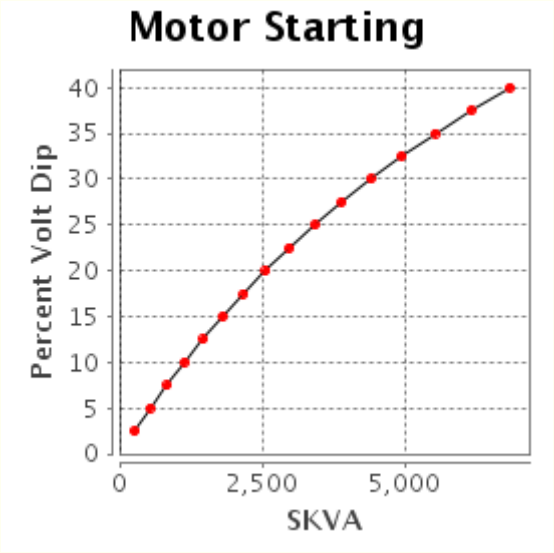
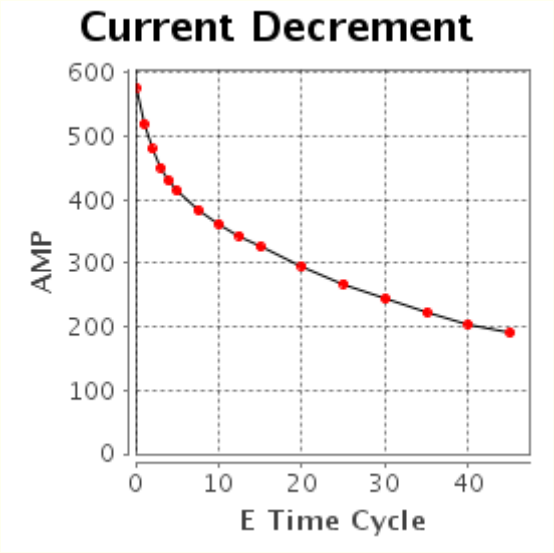
Starting Capability & Current Decrement
Motor Starting Capability (0.4 pf)

SKVA	Percent Volt Dip
263	2.5
540	5.0
831	7.5
1,139	10.0
1,465	12.5
1,809	15.0
2,175	17.5
2,563	20.0
2,976	22.5
3,417	25.0
3,889	27.5
4,394	30.0
4,936	32.5
5,520	35.0
6,151	37.5
6,835	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	577
1.0	520
2.0	480
3.0	451
4.0	430
5.0	414
7.5	384
10.0	362
12.5	343
15.0	326
20.0	295
25.0	268
30.0	244
35.0	223
40.0	204
45.0	191



Instantaneous 3 Phase Fault Current: 577 Amps **Instantaneous Line - Line Fault Current:** 471 Amps

Instantaneous Line - Neutral Fault Current: 763 Amps

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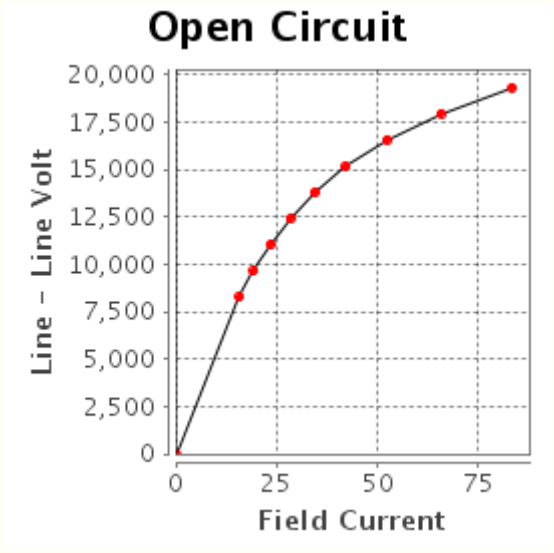
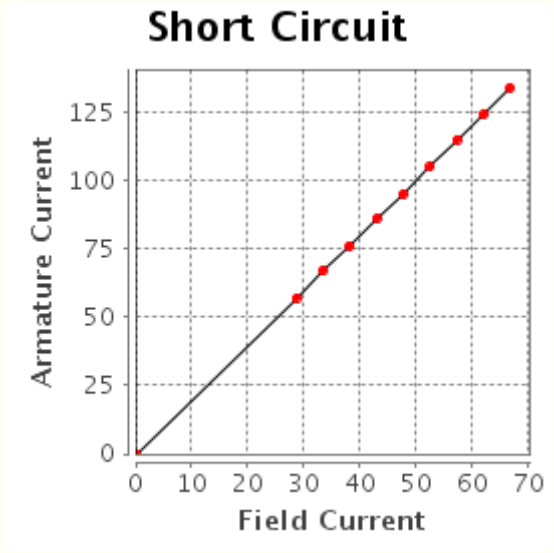
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
15.8	8,280
19.3	9,660
23.4	11,040
28.4	12,420
34.5	13,800
42.2	15,180
52.3	16,560
65.6	17,940
83.3	19,320



Short Circuit Curve

Field Current	Armature Current
0.0	0
28.6	57
33.3	67
38.1	76
42.9	86
47.6	95
52.4	105
57.2	115
61.9	124
66.7	134



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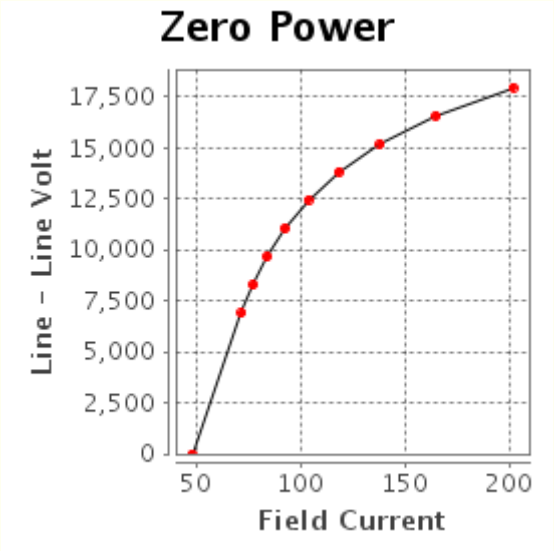
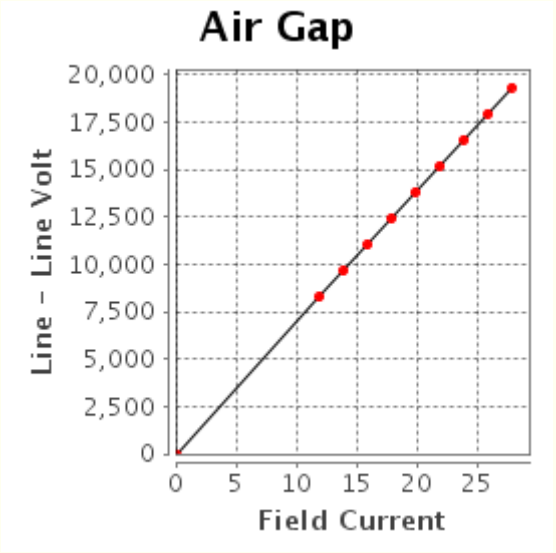
Generator Output Characteristic Curves
Zero Power Factor Curve

Field Current	Line - Line Volt
47.6	0
71.5	6,900
77.0	8,280
83.7	9,660
92.3	11,040
103.5	12,420
118.2	13,800
138.1	15,180
164.9	16,560
201.7	17,940



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
11.9	8,280
13.9	9,660
15.9	11,040
17.9	12,420
19.9	13,800
21.9	15,180
23.9	16,560
25.9	17,940
27.9	19,320



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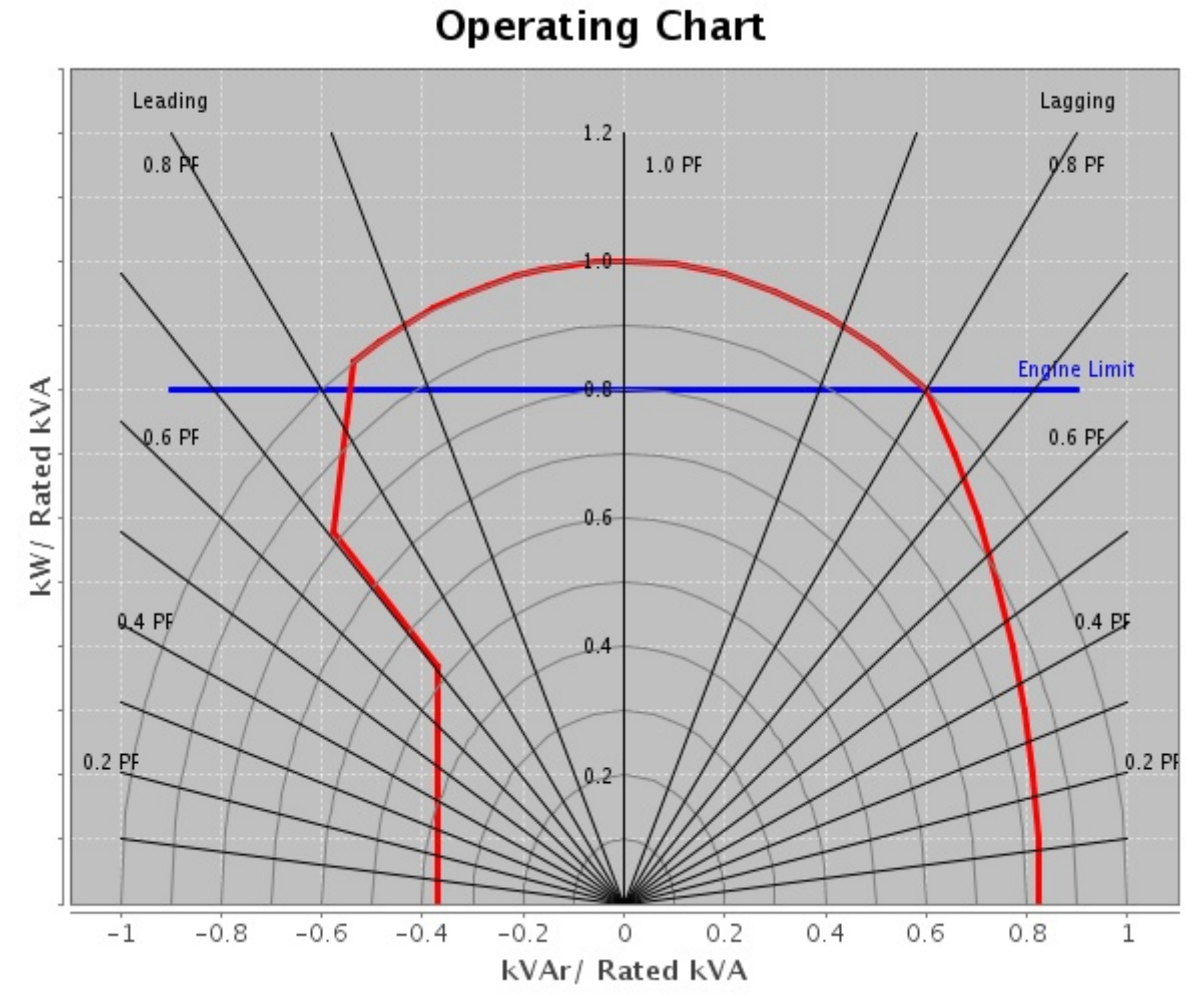
Reactive Capability Curve



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General Information

DM7826 Caterpillar SR4B-HV Generators (50 Hz, 60 Hz)
Data for 2600 and 2700 frames Caterpillar SR4B-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 values and limits.