Selected Model

Engine: 3412	**Generator Frame:** 596	**Genset Rating (kW):** 590.0	**Line Voltage:** 440
Fuel: Diesel	**Generator Arrangement:** 9Y1449	**Genset Rating (kVA):** 737.0	**Phase Voltage:** 254
Frequency: 60	**Excitation Type:** Permanent Magnet	**Pwr. Factor:** 0.8	**Rated Current:** 967.1
Duty: PRIME	**Connection:** SERIES STAR	**Application:** MAR	**Status:** Current

Version: 41205 /40310 /38261 /120

Spec Information

Generator Specification

Frame: 596 **Type:** SR4B	**No. of Bearings:** 1
Winding Type: RANDOM WOUND	**Flywheel:** 18.0
Connection: SERIES STAR	**Housing:** 0
Phases: 3	**No. of Leads:** 6
Poles: 4	**Wires per Lead:** 4
Sync Speed: 1800	**Generator Pitch:** 0.8667

Generator Efficiency

Per Unit Load	kW	Efficiency %
0.25	147.5	92.0
0.5	295.0	94.8
0.75	442.5	95.5
1.0	590.0	95.5
1.1	649.0	95.5

Reactances	Per Unit	Ohms
SUBTRANSIENT - DIRECT AXIS X''_d	0.1249	0.0328
SUBTRANSIENT - QUADRATURE AXIS X''_q	0.1276	0.0335
TRANSIENT - SATURATED X'_d	0.1867	0.0490
SYNCHRONOUS - DIRECT AXIS X_d	2.6472	0.6949
SYNCHRONOUS - QUADRATURE AXIS X_q	1.3424	0.3524
NEGATIVE SEQUENCE X_2	0.1261	0.0331
ZERO SEQUENCE X_0	0.0827	0.0217

Time Constants	Seconds
OPEN CIRCUIT TRANSIENT - DIRECT AXIS T'_{d0}	2.8960
SHORT CIRCUIT TRANSIENT - DIRECT AXIS T'_d	0.2044
OPEN CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_{d0}	0.0093
SHORT CIRCUIT SUBSTRANSIENT - DIRECT AXIS T''_d	0.0069
OPEN CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_{q0}	0.0085
SHORT CIRCUIT SUBSTRANSIENT - QUADRATURE AXIS T''_q	0.0065
EXCITER TIME CONSTANT T_e	0.1400
ARMATURE SHORT CIRCUIT T_a	0.0275

Short Circuit Ratio: 0.48	Stator Resistance = 0.0071 Ohms Field Resistance = 1.79 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	5.0%
Telephone influence factor: less than	50

Generator Excitation

	No Load	Full Load, (rated) pf	
		Series	Parallel
Excitation voltage:	7.67 Volts	32.38 Volts	Volts
Excitation current	1.7 Amps	5.91 Amps	Amps

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Generator Mechanical Information

Center of Gravity

Dimension X	-787.4 mm	-31.0 IN.
Dimension Y	0.0 mm	0.0 IN.
Dimension Z	0.0 mm	0.0 IN.

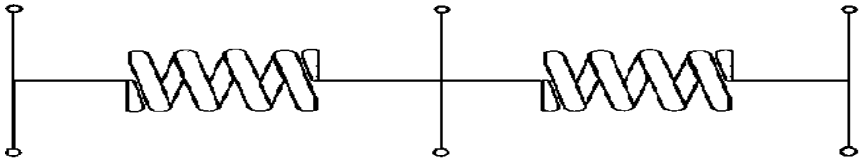
- "X" is measured from driven end of generator and parallel to rotor. Towards engine fan is positive. See General Information for details
- "Y" is measured vertically from rotor center line. Up is positive.
- "Z" is measured to left and right of rotor center line. To the right is positive.

Generator WT = 2004 kg	* Rotor WT = 741 kg	* Stator WT = 1263 kg
4,418 LB	1,634 LB	2,784 LB

Rotor Balance = 0.0508 mm deflection PTP

Overspeed Capacity = 150% 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
11.8 LB IN. s^2	124.8 MLB IN./rad	5.0 IN.	101.8 LB IN. s^2	22.1 MLB IN./rad	3.3 IN.	1.5 LB IN. s^2
1.336 N m s^2	14.1 MN m/rad	127.0 mm	11.504 N m s^2	2.5 MN m/rad	83.8 mm	0.171 N m s^2

Total J

115.2 LB IN. s^2

13.011 N m s^2

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Generator Cooling Requirements - Temperature - Insulation Data

Cooling Requirements:

Heat Dissipated: 27.8 kW

Air Flow: 112.2 m^3/min

Temperature Data: (Ambient 50 ^{0}C)

Stator Rise: 90.0 ^{0}C

Rotor Rise: 90.0 ^{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: 440 Volts

Marine 90/50 813.0 kVA

Selected Model

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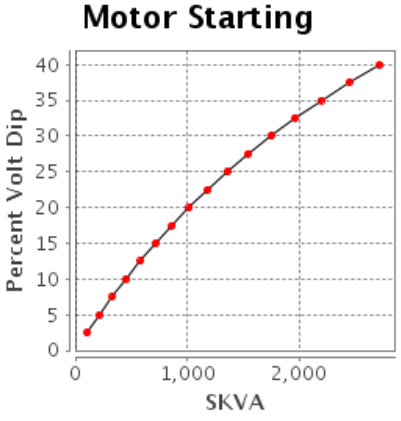
Starting Capability & Current Decrement

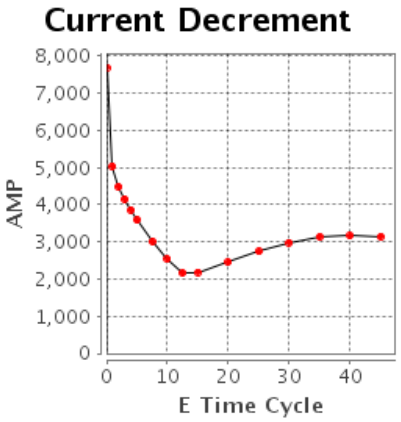
Motor Starting Capability (0.4 pf)

SKVA	Percent Volt Dip
105	2.5
215	5.0
331	7.5
453	10.0
583	12.5
720	15.0
866	17.5
1,020	20.0
1,185	22.5
1,360	25.0
1,548	27.5
1,749	30.0
1,965	32.5
2,198	35.0
2,449	37.5
2,721	40.0



Current Decrement Data

E Time Cycle	AMP
0.0	7,691
1.0	5,039
2.0	4,487
3.0	4,153
4.0	3,860
5.0	3,592
7.5	3,011
10.0	2,537
12.5	2,164
15.0	2,185
20.0	2,463
25.0	2,739
30.0	2,986
35.0	3,141
40.0	3,163
45.0	3,145



Instantaneous 3 Phase Fault Current: 7691 Amps **Instantaneous Line - Line Fault Current:** 6623 Amps

Instantaneous Line - Neutral Fault Current: 8631 Amps

Selected Model

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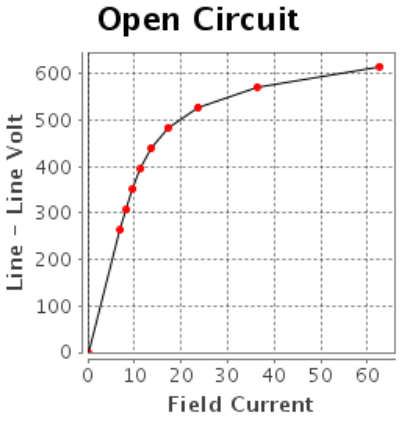
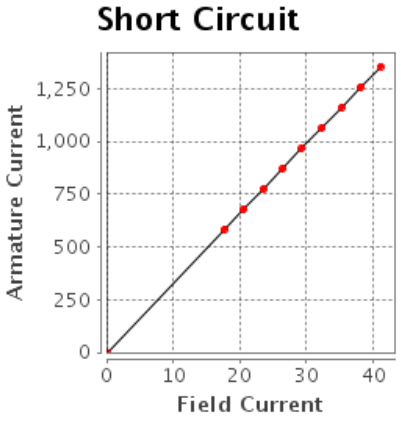
Generator Output Characteristic Curves
Open Circuit Curve

Field Current	Line - Line Volt
0.0	0
7.0	264
8.3	308
9.7	352
11.4	396
13.6	440
17.2	484
23.7	528
36.3	572
62.6	616



Short Circuit Curve

Field Current	Armature Current
0.0	0
17.6	581
20.5	677
23.5	774
26.4	871
29.3	968
32.3	1,064
35.2	1,161
38.1	1,258
41.1	1,355



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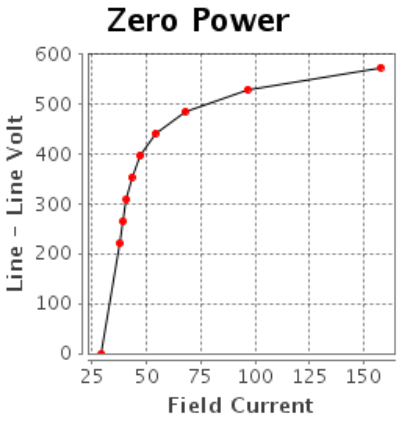
Generator Output Characteristic Curves

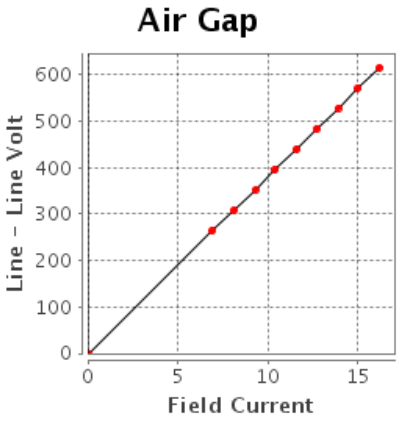
Zero Power Factor Curve

Field Current	Line - Line Volt
29.3	0
37.5	220
39.0	264
40.7	308
43.1	352
47.0	396
54.0	440
67.8	484
96.5	528
157.7	572



Air Gap Curve

Field Current	Line - Line Volt
0.0	0
6.9	264
8.1	308
9.3	352
10.4	396
11.6	440
12.7	484
13.9	528
15.0	572
16.2	616



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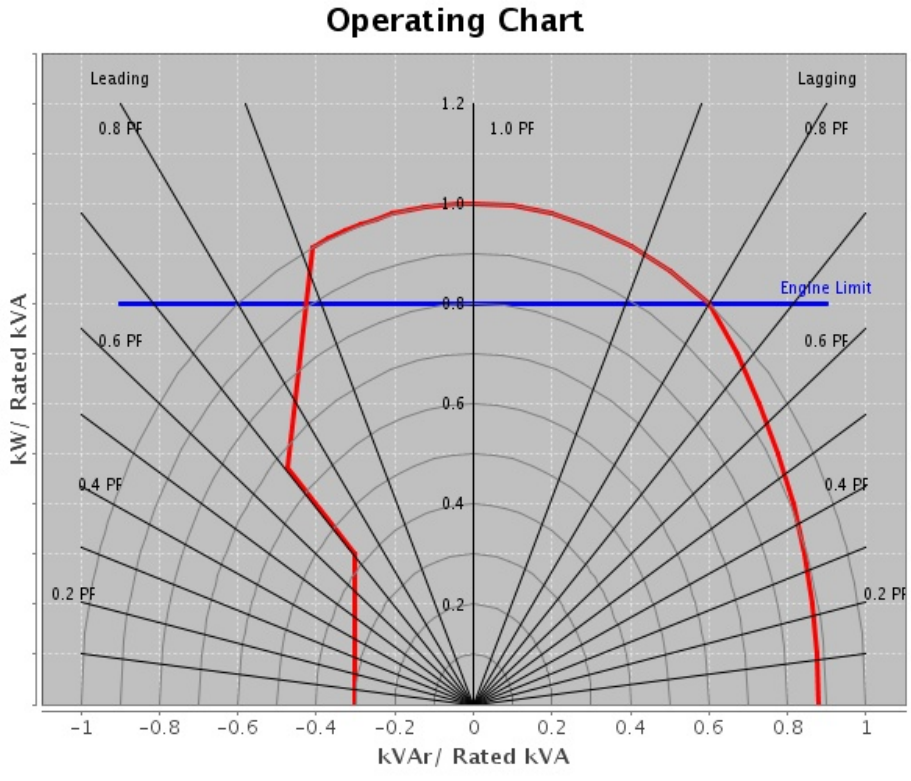
Reactive Capability Curve



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General Information

DM7824 Caterpillar SR4B Generators (50 Hz, 60 Hz)
Data for 360s, 440s, 450s, 490, 590, 660, 690, 820 and 860 frames.
Caterpillar SR4B generators built by Leroy Somer-USA(& predecessors).

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.