

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		Generator Efficiency		
Frame: 596 Type: SR4B	No. of Bearings: 1	Per Unit Load	kW	Efficiency %
Winding Type: RANDOM WOUND	Flywheel: 18.0	0.25	147.5	92.0
Connection: SERIES STAR	Housing: 0	0.5	295.0	94.8
Phases: 3	No. of Leads: 6	0.75	442.5	95.5
Poles: 4	Wires per Lead: 4	1.0	590.0	95.5
Sync Speed: 1800	Generator Pitch: 0.8667	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 SUBTRANSIENT - DIRECT AXIS T'' _{d0}	0.0093
SHORT CIRCUIT SUBTRANSIENT - DIRECT AXIS T'' _d	0.0069
OPEN CIRCUIT SUBTRANSIENT - QUADRATURE AXIS T'' _{q0}	0.0085
SHORT CIRCUIT SUBTRANSIENT - 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
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Voltage Regulation		Generator Excitation		
Voltage level adjustment: +/-	5.0%	No Load	Full Load, (rated) pf	
Voltage regulation, steady state: +/-	0.5%		Series	Parallel
Voltage regulation with 3% speed change: +/-	0.5%	Excitation voltage:	7.67 Volts	32.38 Volts Volts
Waveform deviation line - line, no load: less than	5.0%	Excitation current	1.7 Amps	5.91 Amps Amps
Telephone influence factor: less than	50			

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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:		Temperature Data: (Ambient 50 °C)	
Heat Dissipated: 27.8 kW		Stator Rise:	90.0 °C
Air Flow: 112.2 m ³ /min		Rotor Rise:	90.0 °C
Insulation Class: H			
Insulation Reg. as shipped: 100.0 MΩ minimum at 40 °C			
Thermal Limits of Generator			
Frequency:	60 Hz		
Line to Line Voltage:	440 Volts		
Marine 90/50	813.0 kVA		

Selected Model

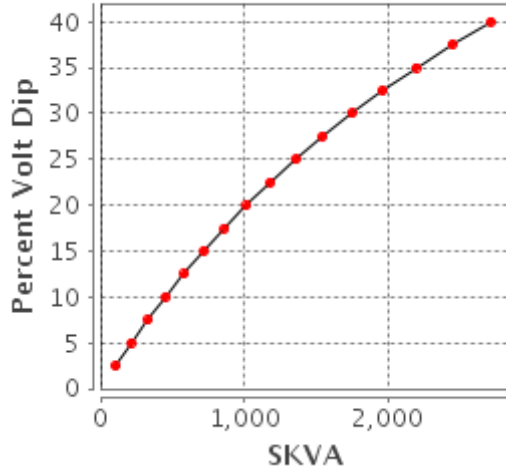
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**Starting Capability & Current Decrement
Motor Starting Capability (0.4 pf)**

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

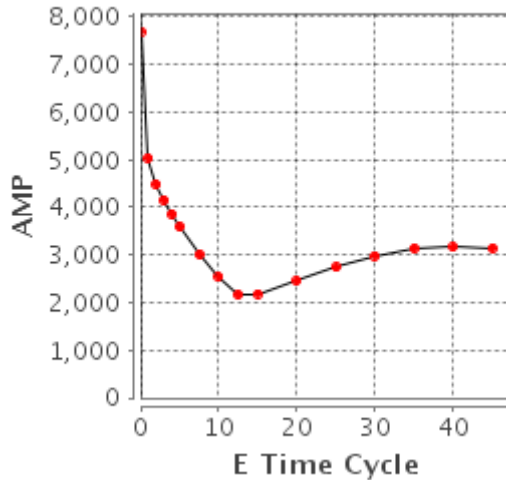
Motor Starting



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

Current Decrement



Instantaneous 3 Phase Fault Current: 7691 Amps

Instantaneous Line - Line Fault Current: 6623 Amps

Instantaneous Line - Neutral Fault Current: 8631 Amps

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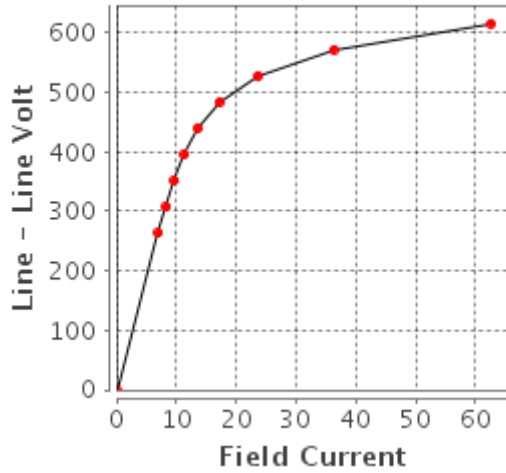
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Generator Output Characteristic Curves

Open Circuit Curve

Open Circuit

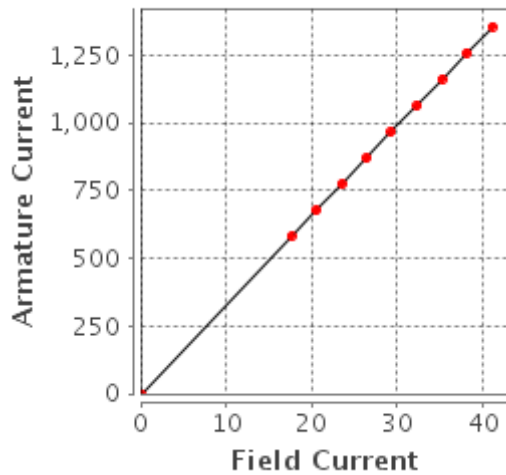
Field Current	Line - Line Volt
0.0	0
7.0	264
8.3	308
9.7	352
11.4	396
13.6	440
17.2	484
23.7	528
36.3	572
62.6	616



Short Circuit Curve

Short Circuit

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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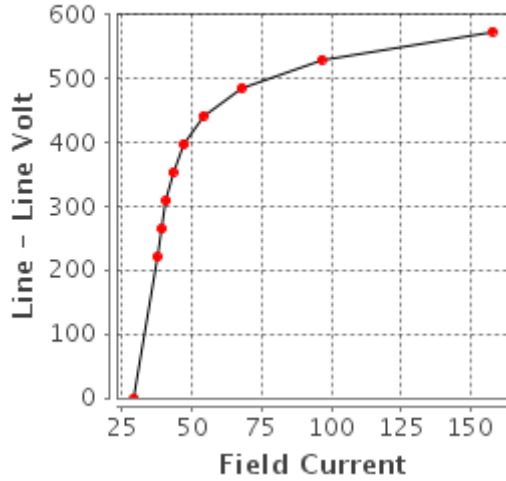
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Generator Output Characteristic Curves

Zero Power Factor Curve

Zero Power

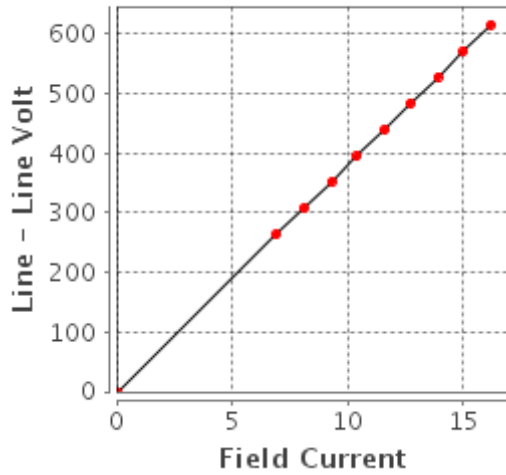
Field Current	Line - Line Volt
29.3	0
37.5	220
39.0	264
40.7	308
43.1	352
47.0	396
54.0	440
67.8	484
96.5	528
157.7	572



Air Gap Curve

Air Gap

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



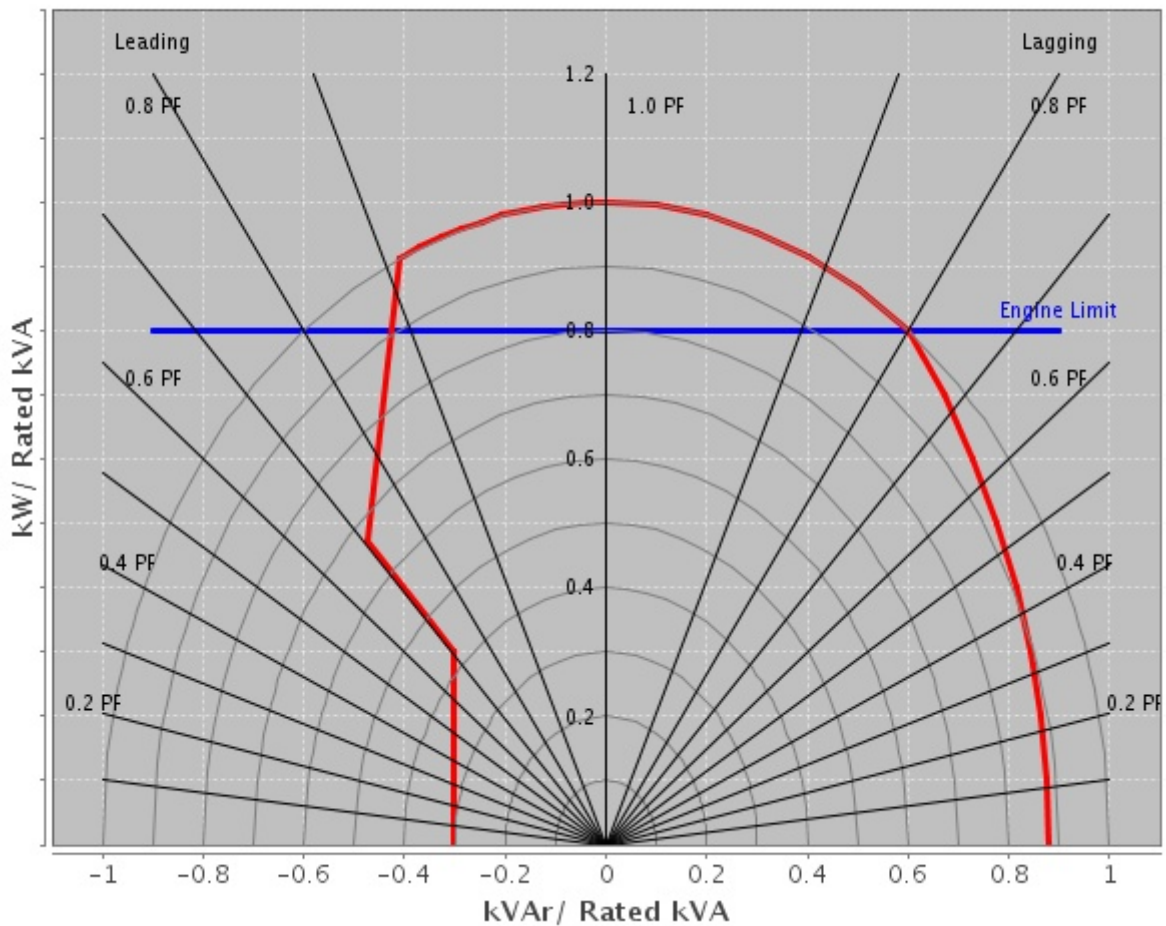
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Reactive Capability Curve

Operating Chart



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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.

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