



# Inspection, Testing and Maintenance For Emergency Electrical Power Supply

SIMSON  
MAXWELL

SVO# SVO070509

5039 Keith Avenue Terrace, BC V8G 1K8 Phone: 250.635.5041 Fax: 250.562.6095 Toll free: 1-800-374-6766 Power Generation & Industrial Engines	Date of Service Jan 24, 25 2022	Time 9am	Last Service Date	
	<input type="checkbox"/> Monthly <input type="checkbox"/> Annual	<input type="checkbox"/> Semiannual <input type="checkbox"/> Quinquennial	Fuel Natural Gas <input type="checkbox"/> Diesel <input type="checkbox"/> Other _____	
	Engine Hrs: 411	KW Size: 800		
Cable length:		Manufacturer: CAT		
Building Name: Kitimat LNG Gen 1	Engine Model # C27	Unit Model # P0073		
Address:	Engine Serial # MJE01968	Unit Serial # DWB01968		
City: Kitimat BC	Contact Person: Dave Stein	Phone:		

**Note:** The emergency electrical power system shall be maintained as specified in the manufacturer's manual of operating instructions, provided that the manual includes at least the items listed in Tables 2, 3, 4, 5 & 6 of C282-19 Emergency Electrical Power Supply for Buildings.

√ Yes - Satisfactory X - Unsatisfactory (Explain 'NO' answers in comments) N/A - Not applicable

### Table 2 - Weekly Inspections & Tests

#### 1. Consumables

- Inspect day Fuel tank level
- Inspect Lubricating oil level
- Inspect Engine coolant level
- Inspect engine, generator, fuel tanks and cooling system for leakage
- Inspect proper operation of fuel transfer pump

#### 2. Starter System

**Electric Starter:** cleanliness, mounting, terminal security

**Air Starter:**

- NA Inspect air tanks for pressure
- NA Inspect valves for leakage
- NA Test auxiliary engine and compressor operation

#### 3. Batteries and charging equipment

- Inspect electrical connections for tightness and corrosion
- Inspect cleanliness and dryness between terminals
- Inspect charger electrical connections for cleanliness and tightness

#### 4. Engine

- Test lubricant and/or coolant heaters for operation
- NA Inspect governor control linkages and oil level
- NA Inspect fuel pump oil sump
- Inspect fan belts for correct tension and wear

#### 5. Control Panel

- Inspect control panel check security
- Test annunciator lamps to confirm they are operational
- Inspect control panel settings, ready for auto start up

#### 6-9. Miscellaneous

- NA Inspect air control louvre settings for operation, room temp, emergency lighting, and room cleanliness

### Table 3 - Monthly Inspection, Test, and Maintenance

#### 1. All items in table 2 plus the following

#### 2. Test the entire system

- NA Simulate failure of the normal electrical power supply
- NA Operational Test conducted (40% of the rated load for 60 min)
- NA Operate all automatic transfer switches under load
- NA Inspect brush operation for sparking
- Inspect for bearing seal leakage
- Inspect for correct operation of all auxiliary equipment i.e. radiator shutter control, coolant pumps, fuel transfer pumps, oil coolers, room ventilation controls
- Record readings of all instruments & verify they are normal
- NA Drain exhaust condensation trap

#### 3. Inspect block heater hoses and wires

#### 4. Batteries and charging equipment

- Inspect all battery electrolyte levels
- Test all battery cells for electrolyte-specific gravity
- Test charger for operation of both float & equalizer modes
- Float 27.0 VDC Equalize NA VDC

### Table 4, Semi-annual Inspection, Test, and Maintenance

#### All items in Tables 2 and 3 plus the following.

- Inspect and clean crank case breathers
- NA Inspect and clean all engine linkages
- NA Lubricate engine governor
- Test protective devices for proper operation
- Prior to start up**, perform one full crank cycle as specified in Clauses 10.4.1. and 10.4.2. Near the end of the cycle (and while still cranking), measure and record the lowest indicated battery voltage. Voltage 20.5 VDC
- NA Inspect ventilation system belts

### Table 5, Annual Inspection, Test and Maintenance

#### 1. All items in Tables 2, 3, and 4 plus the following.

#### 2. Control Panel

- Inspect and tighten all electrical connections
- Test breakers for proper operation
- NA Clean insulators and bushings
- Test voltage regulator for proper operation
- Operate all moving parts to ensure that they move freely
- Inspect charger for electrical connections, clean & tight
- NA Clean and dress contacts as required
- Remove all dust
- Check gauge calibration

#### 3. Engine

- NA Change fuel in fuel tank if used
- Change engine lubrication oil and filter
- Test strength of antifreeze -37 C
- Change fuel filters
- Inspect and clean exhaust system
- NA Clean and lubricate linkages
- Inspect air filters
- Inspect all mechanical connections
- Inspect all electrical connections
- Inspect heat exchanger
- Inspect belts & hoses
- NA Test & inspect ignition system
- Inspect coolant pump



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**Table 5, Annual Inspection, Test and Maintenance Continued**

**4. Fuel Storage tank.**

- NA Fuel maintained as per table 11.5.5
- Fuel passes Clear and Bright visual test 11.5.5
- Chemical test for water
- NA If fuel oil test fails; drain and refill fuel tanks or full filter fuel

**5. Generator**

- Test surge suppressor & rotating rectifier on brushless unit
- Grease bearings (replaced old grease with new if applicable)
- NA Clean commutator and slip rings if applicable
- Clean rotor & stator windings using clean compressed air
- Inspect coupling bolts and alignment
- Inspect conduits for tightness
- Inspect windings at rotor and stator slots
- Inspect all electrical connections

**6. Overcurrent protective devices**

- Electrically isolate all overcurrent protective devices
- Remove all dust
- Test devices for proper operation

**7. Transfer Switches**

- NA Isolate transfer switch, open all inspection covers, and inspect all electrical connections
- NA Operate all moving parts to ensure they move freely
- NA Clean and dress contacts as required
- NA Remove all dust
- NA Clean and lubricate linkages

**8. Infrared Thermal Imaging**

- Perform infrared thermal imaging as defined in Table 5 of CSA 282-19, section 8 subsections a) through e)
- Additionally to all points a) through e) scan all electrical connection, contacts and energized components
- NA a)Thermal image normal power supply of transfer switch ensuring a minimum 40% load.
- NA b)Upon completion of the 1hr load test (Item 2c, Table 3 of CSA282-19) scan where load bank cables will be connected for the 2hr load test.
- c)After 60 min of full load test (see clause 11.3 od CSA 282-19) scan all load terminals from alternator to load bank.
- d)Correct any components or connections that displayed high temperatures or differences in temperature between phases during tests in above a) through c)
- NA e)Repeat the infrared thermal imaging for repairs completed in point d)

**9. Lubricate door locks and hinges**

- 10. Conduct 2h full load test (11.3)

**11. Review and provide instruction**

**Table 6 Inspection, Test & Maintenance every 5 years**

**(Quinquennial)**

**1. Complete all items in Table 5 plus the following**

**2. Generator**

Inspect insulation of generator windings

**3. Engine**

Drain, flush and refill cooling system with new coolant

Clean radiator tubes and cooling fins

Replace thermostats

Inspect valve clearances

**Note: For Inspection and Tests: All defects shall be corrected.**

**All inspections, tests and corrective actions shall be entered in the system log book. See 10.3.2**

Engine								Generator								
Temperature								Volts			Amps					
Time	Oil press	Water	Oil	Air Dis	Room	Out side	Batt Chg	L1	L2	L3	L1	L2	L3	KW	HZ	
	84	118					26.6	597	595	595	0	0	0	0	60.1	No load
	83	136					27.2	597	596	595	59	60	59	61	60.1	Em load
5min	74	178					27.3	597	596	596	103	103	103	106	60.1	
10min	68	181					27.3	598	597	597	514	513	515	532	60.1	
15min	64	185					27.2	599	596	598	768	765	767	795	60.0	
30min	63	187					27.3	599	596	599	769	766	768	796	60.1	
45min	63	187					27.2	599	597	599	768	765	768	796	60.1	
60min	63	185					27.2	599	597	599	770	766	769	796	60.0	
75min	63	185					27.3	599	597	599	768	765	768	796	60.1	
90min	63	183					27.3	599	597	599	768	765	766	795	60.1	
105m	63	183					27.2	599	597	599	769	765	767	796	60.0	
120m	63	183					27.2	599	597	599	769	767	769	796	60.1	
Utility																
Utility																

Shutdown Test	Oil Press	High Temp	Over Speed	Under Speed	Over Crank	Over Voltage	Under Voltage
Operating Point	ecu	ecu	ecu	ecu	ecu	ecu	ecu
Circuits	x	x	ecu	ecu	x	x	x



# Inspection, Testing and Maintenance For Emergency Electrical Power Supply

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	OK	ACT	DONE	COMMENTS
Logbook		✓		No Logbook onsite
Oil & Filter			✓	Date: Jan 25 2022
Cooling System	✓			Water:                      Date: 2020                      Air:
Water Pump & Belt	✓			
Block Heater & Hoses	✓			Block Temp: 45C                      Room Temp:
Thermostat & Hoses	✓			
Air Filter	✓			Date: 2020
Fuel Filter			✓	Date: Jan 25 2022
Water Separator			✓	Date: Jan 25 2022
Coolant Filter				Date: NA
Injection Pump				NA
Vibration Isolators	✓			
Solenoid Valve				NA
Ignition Parts				NA
Spark Plugs & Wires				Date: NA
Adjust Carburetor				NA
D.C. Alternator	✓			
Battery	✓			Date: 2020
Generator Breaker	✓			
Voltage Regulator	✓			
Hold Over Timer				Seconds: NA manual start from syncpanel/manual transfer switch
Warm-up Timer				Seconds:
Transfer test				Allowed      Declined      ✓      Signature: Manual transfer switch discon
Transfer Return Timer				Minutes NA
Neutral Delay Timer				Seconds: NA
Cool Down Timer				Minutes:
Clear & Bright Test	✓			To Quote Polishing      Yes      No      ✓
Fuel Tank	✓			Day: Yes ✓ No      Size <u>610L</u> **      Main: Yes ✓ No      Size _____ **
Access to fuel tanks	✓			Can we drive beside Yes ✓ No      Meters <u>6</u>
Location of Fuel Tanks	✓			Below Ground Yes      No      Inside Yes ✓ No      Outside Yes ✓ No
Left in Auto			✓	Yes                      No
** If fuel tank size is not available please provide dimensions				

**Parts Used:** -unit failed first loadbanking attempt due to getting close to overtemp shutdown, had rad cleaned then tried again still to much heat so changed thermostats/seals: passed loadbank no problem

**Comments:** -on top of CSA 282, Caterpillar Removal from storage procedure was followed prior to running the unit  
 -small coolant seep @ coolant heater (need to replace coolant heater oring as its baked)  
 -lots of signs of mice ontop of engine and throughout unit (everywhere but behind gen controller), however no wire insulation damage noted  
 -electric lube pump wires not landed (could/should be set up to prelube/post lube)  
 -fuel pressire gauge @ secondary fuel filter needle is broken inside/needs replacement  
 -small oil or fuel leak @ right side bank where exhaust meets turbo...dissappeared after loadbanking: likely from low load running  
 -March 9-10 Layed Up unit as per CAT C27 Layup procedure. Also recommend changing coolant and filling to top of top rad tank

I state that the information on this form is correct at the time and place of my inspection, and that all equipment was tested in conformance with applicable codes and the Manufacturers requirements and at this time was left in operational condition upon

Technician Stamp	Date	Time	Owner or Authorized Agent
Carlin Wilkin			