

Generator - Diesel/Gas (Non Hospital sites)

Activity		Type Of Service				
		A	B	C	D	E
Last Issue Date: 21/01/2020						
1	STATIC CHECKS (Items 1-39):		Y		Y	Y
2	INSPECT THE CONDITION OF THE BATTERIES, INCLUDING: a) Check that the batteries are the vented type; b) Check the electrolyte level in each cell & record the results. Electrolyte to be replenished only with water complying with AS2668; c) Check the terminals & connections are tight, clean & corrosion free & apply approved preservative coating to the terminal posts & assemblies; d) Check the battery charger operation incl. the fail alarm & record; e) Check all cell containers for electrolyte leakage; f) Check & record the specific gravity of electrolyte in each cell; g) Before starting the generator, measure and record each battery's voltage; and h) Clean all cells, battery compartments and cabinets.		Y		Y	Y
3	REPLACEMENT OF THE BATTERIES - Refer to Special Comments a) Only Vented (also referred to as Flooded or Wet-Cell) Lead Acid Batteries complying with AS4029.1 are to be used; and b) Write the installation date on the batteries and the calculated date for replacement.					Y
4	Check engine instruments, controls panel and all indicators.		Y		Y	Y
5	INSPECT THE EXHAUST SYSTEM, ESPECIALLY FOR: a) Condition and any leaks or obstructions; b) Integrity of the fittings and fixings; c) Any signs of overheating including checking adjacent components; d) Condition and operation of the rain flap; e) Condition of flashings and the lagging; f) Condition of flexible connections.		Y		Y	Y
6	Check air intake, especially for restrictions.		Y		Y	Y
7	Check air filters.		Y		Y	Y
8	Check air intake hoses and pipes, especially for leaks.		Y		Y	Y
9	Check condition of belts & pulleys, especially for cracks and fraying.		Y		Y	Y
10	Check condition of fan hub, idler and water pump.		Y		Y	Y
11	Check engine oil level and top-up if necessary. Record the level.		Y		Y	Y
12	Check operation of block heater, record standby temperature.		Y		Y	Y
13	Check lubrication system for condition and leaks.		Y		Y	Y
14	INSPECT THE FUEL SUPPLY SYSTEM a) Check the lines for leaks; b) Clean lift pump sediment chamber and guaze strainer; c) Check the quantity; d) Check the bulk tank fuel level and record; and e) Check the day tank fuel level and record.		Y		Y	Y

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15	Check the operation of the fuel solenoid.		Y		Y	Y
16	FUEL ALARM SYSTEM: a) Check the system is operational & correctly calibrated; & b) Check the alarm is correctly connected to the BMS and the BMS effectively transmits the alarm to the maintenance staff.		Y		Y	Y
17	Check tank breather (for diesel fueled).		Y		Y	Y
18	Check engine coolant level and the radiator hoses/connections plus the coolant PH level/condition and record.		Y		Y	Y
19	Check cooling system, especially for leaks.		Y		Y	Y
20	Check condition of all auxillary items especially for correct fixing, damage and stressed components.		Y		Y	Y
21	Check and clean generator inlet and outlet grille.		Y		Y	Y
22	Record engine hours at end of test.		Y		Y	Y
23	Check resilient mounts, all nuts, bolts and clamps.				Y	Y
24	Clean the engine and remove all excess grease, oil, dirt, etc.				Y	Y
25	Analyse the engine oil quality and if required, replace and record.				Y	Y
26	Replace air filters (if necessary).				Y	Y
27	Replace engine oil filters and the by-pass oil filter.				Y	Y
28	Replace the fuel filters				Y	Y
29	Check condensate trap drain, if applicable.				Y	Y
30	LUBRICATION OIL: a) Test & check lubrication oil for evidence of contamination and/or deterioration; & b) Provide a written report including the sample with name of installation, plant identification & date.				Y	Y
31	Check and service all generator set drive equipment.				Y	Y
32	Check earthing connections and continuity and all other electrical connections.				Y	Y
33	Check cable terminations, especially for: a) Integrity. b) Cleanliness. c) Signs of overheating.				Y	Y
34	Check brushes, sliprings and commutator, where applicable.				Y	Y
35	Check bearing lubrication, where accessible.				Y	Y
36	Check circuit breaker and trip setting.				Y	Y

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37	Clean and flush cooling system including: a) Pressure test new coolant. b) Flow test on radiator and engine block.				Y	Y
38	Test that the diesel fuel is to the specification of the generator manufacturer. If required, replace or clean the fuel and flush the fuel and pipes. Note: 1/ The total cost of the fuel replacement or cleaning and flushing of the tanks and pipes is an additional cost. 2/ The cleaning option is to be approved by the site and the cleaned diesel must meet the manufacturer's fuel specification.				Y	Y
39	Undertake a general inspection of the area, including: a) Check the lighting; b) Check the ventilation openings are clear and any mechanical ventilation is operating correctly; c) Check the condition and location of the safety signage; d) Check for general cleanliness; and e) Check the communications (phone lines etc.) operate correctly.				Y	Y
40	DYNAMIC CHECKS (Items 40-67 - With the Generator running): Check the condition and operation of the starting system.		Y		Y	Y
41	For the dynamic B service checks run the generator with no load for a maximum of 30 minutes. (For the annual Load Test see Activity 58).		Y			Y
42	Check instrument panel starting sequence.		Y		Y	Y
43	Check and record battery charging voltage, with set running.		Y		Y	Y
44	Check for noise and vibration.		Y		Y	Y
45	Check and record the actual water temperature against motor gauge indication.		Y		Y	Y
46	Check air flow through radiator.		Y		Y	Y
47	Check actual engine speed against motor tachometer indication.		Y		Y	Y
48	Check the engine speed stability and record.		Y		Y	Y
49	Check condition and operation of fuel pump, including calibration (for diesel fueled).		Y		Y	Y
50	Check operation of speed governor.		Y		Y	Y
51	Check for leaks, especially fuel, water and oil, while motor is operating.		Y		Y	Y
52	Check condition & operation of fuel make up pump & valves, if installed		Y		Y	Y
53	Check the air intake, especially for restrictions.		Y		Y	Y
54	Check the air flow and cooling through the generator.		Y		Y	Y
55	Check fuel supply and top up as required.		Y		Y	Y
56	Check, measure and record generator output amps, voltage and		Y		Y	Y

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	frequency at: a) No load conditions. b) Load conditions.					
57	AUTOMATIC TRANSFER SWITCH (IF FITTED) (This service has the same restrictions as the load tests). a) Check the condition and operation; b) Simulate a mains power failure allowing the generator set to start and checking that the automatic change over sequence operates correctly; & c) After mains power is restored check that the generator runs on for the preset period and that the automatic change over resets itself to its normal operating position.				Y	Y
58	ANNUAL LOAD TEST: a) Check on the oil, cooling water and fuel levels before commencing. b) Refer to the manufacturer's Operational Manual for the Test procedure and intervals to record results. With the generator running: - Load the generator to 100% (or as close as practical) of its rated output and run for a minimum 2 hours (ideally 4 hours) to check the overall performance of the system. - Where the standing load is below 100% (or as close to as practical) of its rated output an external load bank must be connected to make up the shortfall. c) Provide a written report. Record as a minimum: - Voltage. - Load amps. - Water temperature. - Oil pressure. - RPM. - Oil used. - Diesel used. - The date, duration and performance of the generator. d) Once the test is done check the oil, cooling water & fuel levels. LOAD TEST NOTES: 1/ If a manual changover switch is installed, extra time and care is to be taken where large motors are installed to avoid excessive inrush currents while energising back to mains supply. For example, a 10 sec delay for a 40kW motor is considered adequate. 2/ Site approval is required before the load test is undertaken.				Y	Y
59	Check shutdown of system by simulating operation of safety devices including: a) High water temperature. b) Low water level. c) Low oil pressure. d) Over-voltage output of generator. e) Over-speed.				Y	Y
60	Check, measure and record load current of generator output per phase during load test.				Y	Y
61	Check actual oil pressure against motor gauge indication.				Y	Y

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Activity						
62	Check exhaust smoke colour and density against 'Ringleman' Chart.				Y	Y
63	Check condition and operation of injectors, including adjustments.				Y	Y
64	Check manifold, especially gasket condition and torque of nuts & bolts.				Y	Y
65	Check breathers.				Y	Y
66	Gas fueled type (if applicable): a) Check gas mixing valve for correct operation. b) Check and clean mixture intercooler. c) Check condition and operation of exhaust gas turbocharger. d) Replace gas filter on module. e) Check condition and operation of all gas regulation and safety devices.				Y	Y
67	Check that all systems are back to their normal positions.				Y	Y
68	Provide a written report on the condition and operation of the generator including any costed remedial work.		Y		Y	Y
69	Record all readings and results in the log book.		Y		Y	Y

Special Comments and Technical Data

B SERVICE MONTHLY

D SERVICE ANNUALLY

E SERVICE REPLACEMENT OF THE BATTERIES - SEE BELOW.

PRIOR TO EACH LOAD TEST APPROVAL IS REQUIRED FROM THE SITE. LOAD TESTS CAN ONLY BE UNDERTAKEN IF THERE IS NO SIGNIFICANT DISRUPTION TO SITE SERVICES.

NOTIFY THE SITE REPRESENTATIVE AND THE FACILITY MANAGER IF IT IS NOT POSSIBLE TO UNDERTAKE A LOAD TEST. LOAD BANKS CAN BE USED TO TOP UP THE LOAD ON THE GENERATOR FOR THE TEST BUT NOT AS A FULL SUBSTITUTE LOAD.

THE ACTIVITIES AND FREQUENCIES DETAILED ABOVE ARE OF A GENERIC NATURE AND MAY NEED TO BE VARIED TO SUIT THE MANUFACTURER'S RECOMMENDATIONS AND SITE REQUIREMENTS.

SEALED BATTERIES THAT CANNOT BE TOPPED UP WITH WATER & ARE ON CONSTANT CHARGE ARE NOT TO BE USED AS THEY MAY EXPLODE.

VENTED STATIONARY LEAD ACID TYPE BATTERIES COMPLYING WITH AS4029.1 ARE TO BE USED.

THE RISK WITH BATTERY FAILURE IS TO BE ASSESSED AND IF HIGH THE REPLACEMENT TIMEFRAME SHOULD BE LESS THAN THE NOMINATED DESIGN LIFE PROVIDED BY THE MANUFACTURER. FOR A 70% (DEFAULT) REDUCTION EXAMPLES ARE:

DESIGN LIFE OF 10 YEARS = REPLACE AT 7 YEARS (DEFAULT)

DESIGN LIFE OF 5 YEARS = REPLACE AT 3.5 YEARS (DEFAULT)

SERVICE TECHNICIANS MUST WEAR CORRECT PPE DUE TO THE POTENTIAL EXPOSURE TO BATTERY (SULPHURIC) ACID.

APPLICABLE LEGISLATION AND STANDARDS: MINISTERIAL BUILDING STANDARD MBS002 AND AS3000.

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