

## Weekly inspection, test, and maintenance requirements

- 1. Consumables:**
  - a) Inspect day tank fuel level [gas pressure] and main tank level [gas pressure] [if applicable]. There shall be a minimum supply of 2 h [see Clause 7.3.1].
  - b) Inspect lubricating oil level.
  - c) Inspect engine coolant level.
  - d) Inspect engine, generator, fuel tank(s), and cooling systems for leakage.
  - e) Inspect for proper operation of fuel transfer pump [if applicable].
  - f) Inspect fuel filter for contamination if filter is equipped with a transparent bowl.
- 2. Starter system:**
  - a) Inspect electric starter for cleanliness, mounting, and terminal security.
  - b) Air starter:
    - (i) Inspect air tanks for pressure
    - (ii) Inspect valves for leakage
    - (iii) Test auxiliary engine and compressor for proper operation.
    - (iv) Bleed off any condensation.
- 3. Batteries and Charging Equipment:**
  - a) Inspect all battery cells for correct electrolyte fill level.
  - b) Test all battery cells for correct electrolyte specific gravity.
  - c) Inspect electrical connections for tightness and evidence of corrosion.
  - d) Inspect battery for cleanliness and dryness between terminals.
  - e) Inspect charger electrical connections for cleanliness and tightness.
  - f) Test charger for proper operation of float and equalize modes.
- 4. Engine:**
  - a) Test lubricant and/or coolant heaters for proper operation.
  - b) Inspect governor control linkages and oil level [if applicable]
  - c) Inspect fuel pump oil sump [if applicable]
  - d) Inspect fan belts for correct tension and wear
- 5. Control Panel:**
  - a) Inspect control panel covers for security
  - b) Test annunciator lamps to confirm that they are operational.
  - c) Inspect control panel settings [ensure that the unit is ready for automatic start-up].
  - d) Test remote visual and audible trouble signals at the building fire alarm panel.
- 6. Inspect air control louvre settings to ensure proper operation.**
- 7. Test emergency lighting unit(s).**
- 8. Verify whether room temperature is above 100C.**
- 9. Inspect generator and transfer switch room(s) for cleanliness and accessibility to all components of the emergency system.**
- 10. Correct all defects found during inspections and tests.**
- 11. Record all inspections, tests, and corrective actions in the log [see Clause 11.5.3].**

Note: The person performing the work described in this Table shall have received appropriate training and be qualified to perform the specified tasks.

## Monthly inspection, test, and maintenance requirements

- 1. Complete all items specified in Weekly.**
- 2. Test and verify the entire system as follows:**
  - a) Simulate a failure of the normal electrical supply to the building.
  - b) Operate the system under at least 30% of the rated load for 60 min.
  - c) Operate all automatic transfer switches under load.
  - d) Inspect brush operation for sparking.
  - e) Inspect for bearing seal leakage
  - f) Inspect for correct operation of all auxiliary equipment, e.g. radiator shutter control, coolant pumps, fuel transfer pumps, oil coolers, and engine room ventilation system(s).
  - g) Record the readings for all instruments in the log [see Clause 11.5.3] and verify that they are normal.
  - h) Drain the exhaust system condensate trap.
- 3. Inspect block heater hoses and wires.**
- 4. Correct all defects found during inspections and tests.**
- 5. Record all inspections, tests, and corrective actions in the log [see Clause 11.5.3].**

Note: the person performing the work described in this Table shall have received appropriate training and be qualified to perform the specified tasks.

## Semi-annual inspection, test and maintenance requirements

- 1. Complete all items specified in Weekly and Monthly.**
- 2. Inspect and clean engine crankcase breathers.**
- 3. Inspect and clean all engine linkages.**
- 4. Lubricate the engine governor and ventilation system.**
- 5. Test protective devices for proper operation.**
- 6. Before start-up, perform two full cranking cycles [as specified in Clauses 10.4.1 and 10.4.2]. Near the end of each cycle [and while still cranking], measure and record the lowest indicated battery voltage. If the measured voltage is less than 80% of the battery's rated voltage, replace the battery. Alternatively, perform a battery load test using a suitable load tester.**
- 7. Inspect ventilation system belt(s).**
- 8. Correct all defects found during inspections and tests.**
- 9. Record all inspections, tests, and corrective actions in the log [see Clause 11.5.3]**

Note: Items 2 to 9 require special skill and shall be carried out by a qualified contractor, the system manufacturer, or individuals trained and certified by the system manufacturer.

## Annual inspection, test, and maintenance requirements

- 1.** Complete all items specified in Weekly, Monthly, and Semi Annual.
- 2.** Control panel:
  - a) Open all inspection covers and inspect all electrical connections
  - b) Test breakers for proper operation
  - c) Clean insulators and bushings.
  - d) Test voltage regulator for proper operation
  - e) Operate all moving parts to ensure that they move freely.
  - f) Clean and dress contacts as necessary.
  - g) Remove all dust.
  - h) Check gauge calibration
  - i) With the generator set operating at full load [see clause 11.3], conduct an infrared survey of all electrical connections to identify any high-resistance connections.
  - j) For off-site fueled generators, turn position-indicating gas valve to off-position to ensure valve rotates properly and that the audible alarm on generator control pane is activated.
- 3.** Engine:
  - a) Change engine lubrication oil and filters
  - b) Test strength of coolant and chemical protection level of coolant inhibitors.
  - c) Change fuel filters, clean strainer(s), and verify that the fuel supply valve is open.
  - d) Inspect the exhaust system. Check and record the back pressure of the exhaust system to ensure that it complies with the engine manufacturer's requirements, and compare with previous readings.
  - e) Clean and lubricate linkages
  - f) Inspect air filters
  - g) Inspect all mechanical connections
  - h) Inspect all electrical connections
  - i) For spark ignition engines, inspect all components of ignition system(s) and service or replace as appropriate.
  - j) Inspect all external surfaces of heat exchanger(s) and clean as necessary.
  - k) Inspect all belts and hoses and replace if necessary.
  - l) Test and inspect ignition system(s). Replace any defective components.
  - m) Inspect coolant pump(s) for leaks and external wear [if belt driven, remove the belt(s) first].
- 4.** Diesel Fuel Storage Tank(s):
 

The fuel oil in any storage tank [and day tank , if used] shall be tested in accordance with Clause 11.5.5, and if the fuel oil fails the test, it shall be

  - a) Drained and refilled with fresh fuel in accordance with Article 6.5.1.5 of the Natioanl Fire Code of Canada; or
  - b) Full filtered to remove water, scale, bacteria, and oxidized gums/resins in order to minimize filter clogging and ensure diesel start-up [see Clasue B.22 for commentary]. When the fuel is filtered, it shall be treated with a suitable conditioner and stabilizer to minimize degradation while in storage.

Note: The bottom(s) of the tank(s) shall be also tested chemically for water.

- 5.** Generator:
    - a) Test surge suppressor and rotating rectifier on brushless machines.
    - b) Grease bearings [replace old grease with new ] [ if applicable.]
    - c) Clean commutator and slip rings [if applicable]
    - d) Clean rotor and stator windings using clean compressed air.
    - e) Inspect coupling bolts and alignment.
    - f) Inspect conduits for tightness
    - g) Inspect windings at rotor and stator slots.
    - h) Inspect all electrical connections
    - i) With the generator set operating at full load [see Clause 11.3], conduct an infrared survey of all electrical connections to identify any high-resistance connections.
  - 6.** Transfer switches:
    - (a) isolate transfer switch, open all inspection covers, and inspect all electrical connections.
    - (b) Operate all moving parts to ensure that they move freely.
    - (c) Clean and dress contacts as required.
    - (d) Remove all dust.
    - (e) Clean and lubricate linkages
    - (f) Conduct an infrared survey of all electrical connections, contacts, and energized components while under load on both the normal and the emergency side.
  - 7.** Lubricate door locks and hinges [if necessary], especially those of outdoor enclosures.
  - 8.** Conduct a 2 h full-load test [see Clause 11.3].
  - 9.** As needed, review and provide instruction on the technical requirements specified in Tables 2 to 4 with the person(s) responsible for carrying out the work.
  - 10.** Correct all defects found during inspections and tests.
  - 11.** Record all inspections, tests, and corrective actions in the log [see Clase 11.5.3].
- Note: Items 2 to 11 require special skill and be carried out by a qualified contractor, the system manufacturer, or individuals trained and certified by the system manufacturer.

## Quinquennial (every five years) inspection, test, and maintenance requirements

- 1.** Generator:
 

Inspect insulation of generator windings. Use an insulation tester (megger). The resistance in megohms should be not less than 'Rated voltage + 1000/1000"

If the resistance is less, dry out the insulation using the auxiliary heat process
  - 2.** Engine:
    - (a) Drain and flush the cooling system, Refill the system with new coolant.
    - (b) Clean radiator tubes and cooling fins.
    - (c) Replace thermostats
    - (d) Inspect valve clearances and adjust as appropriate.
  - 3.** Correct all defects found during inspections and tests
  - 4.** Record all inspections, tests, and corrective actions in the log [see Clause11.5.3].
- Note: Items 1 to 4 require special skill and shall be carried out by a qualified contractor, the system manufacturer, or individuals trained and certified by the system manufacturer.