Section 4 Maintenance

NOTE: Proper maintenance and proper and safe operation is crucial to the life of the generator. Genuine Generac parts MUST be used to ensure warranty coverage.

NOTE: All service to this generator must be performed by a qualified service person only.

4.1 — Performing Scheduled Maintenance

It is important to perform Maintenance as specified in the Service Schedule for proper generator operation and to ensure that the generator complies with the applicable emission standards for the duration of its useful life. Service and repairs may be performed by any qualified service person or repair shop. Additionally, emissions critical maintenance must be performed as scheduled in order for the Emissions Warranty to be valid. Emissions critical maintenance consists of servicing the air filter and spark plugs in accordance with the Service Schedule. The Control Panel will prompt for break-in or regular maintenance, when it is required, to be performed. Break-in maintenance consists of the oil change, valve clearance and tune-up. Regular maintenance includes the oil, tune-up, air cleaner, spark plug and valve clearance.

NOTE: The control panel Maintenance Due light will flash when the initial 20 hour break-in interval has been reached. The same light will be lit solid when following regular maintenance intervals are required (every 1 year/100 hours).

4.1.1 — Clearing a Maintenance Due Condition

After Performing maintenance, the Maintenance Due light must be cleared. To reset the Maintenance Due light, the generator must be in OFF mode. Set the Generator to OFF and press the OFF button to reset Maintenance Due. If an alarm condition exists, the alarm condition must be cleared prior to resetting the Maintenance Due light.

4.2 — Service Schedule

ATTENTION: All service work must be performed by a qualified service person only.

System Component	Procedure			Frequency
X = Action R= Replace as Necessary * = Notify Dealer if Repair is Needed	Inspect	Change	Clean	W = Weekly M = Monthly Y = Yearly
Fuel				
Fuel lines and connections*	X			M
Lubrication				
Oil level	X			M or 24 hours of continuous operation
Oil		X		6 M or 100 hours of operation**
Cooling				
Enclosure louvers	X		X	W
Battery				
Remove corrosion, ensure dryness	X		X	Y
Clean and tighten battery terminals	X		X	Y
Check charge state	X	X		Y
Electrolyte level (unsealed batteries only)*	X	X		Every 6 M
Engine and Mounting				
Air cleaner	X	X	X	3 M / 50 hours - clean / 1 Y / 300 hours - replace
Spark plug	X	X		6 M or 100 hours - inspect / 1 Y or 300 hours - change
Valve Clearance	X			1 Y or 300 hours***
General Condition				
Vibration, Noise, Leakage*	X			M

* Contact the nearest Dealer for assistance if necessary.

** Change oil after the first 20 hours of operation or 1 month. Continue to check at intervals of 100 hours or 6 months, whichever occurs first. Severe duty oil drain intervals: In cold weather conditions (ambient below 40 °F/4.4 °C) change engine oil every 6 months or 50 hours of operation to prevent accumulation of water in the oil. If the unit will be operated continuously in hot ambient conditions (ambient above 85 °F/29.4 °C) or operation in an extremely dusty or dirty environment change the engine oil every 3 months or 50 hours of operation to prevent oil breakdown.

*** Check valve clearance after the first 20 hours of operation. Continue to check at intervals of 300 hours.

4.2.1 — Maintenance Log

1. Battery inspection and charge check (recommended every year (1) for the life of the battery)

NOTE: Check electrolyte level (unsealed batteries only) every 6 months.

Dates Performed:

2. Oil, oil filter and air filter replacement (recommended after the first 20 hours after installation and every 100 hours or 6 months, whichever occurs first)

NOTE: Spark plug replacement (recommended every 1 year or 300 hours, whichever occurs first).

Dates Performed:

3. Valve Adjustment (recommended after the first 20 hours of operation and then after every 300 hours of operation)

Dates Performed:

4.3 — Checking Engine Oil Level

When power outages necessitate running the generator for extended periods, the oil level should be checked daily. To check the engine oil level:

1. If the generator is running during a utility outage, first turn OFF all associated loads running in the residence using the electrical panel's main disconnect. Then, turn the generator's Main Circuit Breaker to the OFF position, press the Control Panel OFF button, remove the 7.5A ATO® fuse and disconnect the battery leads.
2. Remove the enclosure top lid by unscrewing the fasteners, and lift the front panel off.
3. Wait for 1 minute to allow the generator to cool down.
4. Remove the dipstick/fill cap and wipe it dry with a clean cloth.
5. Insert the dipstick/fill cap, **but do not thread into the crankcase threads**, then again remove it.
6. Observe the oil level. The level should be at the "Full" mark on the dipstick/fill cap. See Figure 4-1.

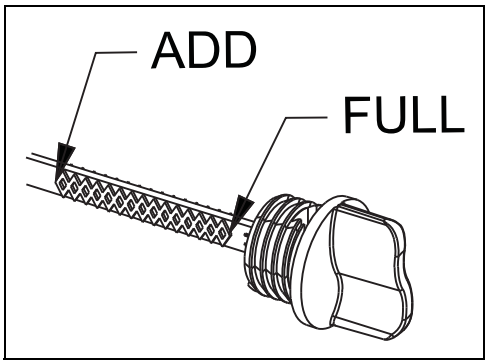

Figure 4-1: Checking Oil Level

7. If necessary, remove the dipstick/oil fill cap and add oil to the engine until the level reaches the "Full" mark and reinsert the dipstick/oil fill cap.
8. If the generator was running during a utility outage, first turn the Main Circuit Breaker to the ON position, connect the battery leads, install the 7.5A ATO® fuse, press the Control Panel AUTO button. Then, turn ON the needed loads in the residence.

⚠ DANGER!

⚠ **Never operate the engine with the oil level below the "Add" mark on the dipstick. Doing so could damage the engine.**

⚠ **Hot oil may cause burns. Avoid prolonged or repeated skin exposure with used oil. Thoroughly wash exposed areas with soap.**

4.3.1 — Engine Oil Recommendations

To maintain the warranty, genuine Generac replacement parts MUST be used, including Generac oil kits (which includes an air filter). Generac oil kits can be obtained through an Authorized Dealer or purchased on-line. To purchase on-line, access the maintenance kits page through **www.generac.com** or directly at **shop.generac.com**. Follow the prompts to enter delivery information and complete the purchase.

All Generac oil kits meet minimum American Petroleum Institute (API) Service Class SJ, SL, or better. Use no special additives. Select the appropriate viscosity oil grade according to the expected operating temperature. Synthetic oil also can be used in the appropriate weight as standard.

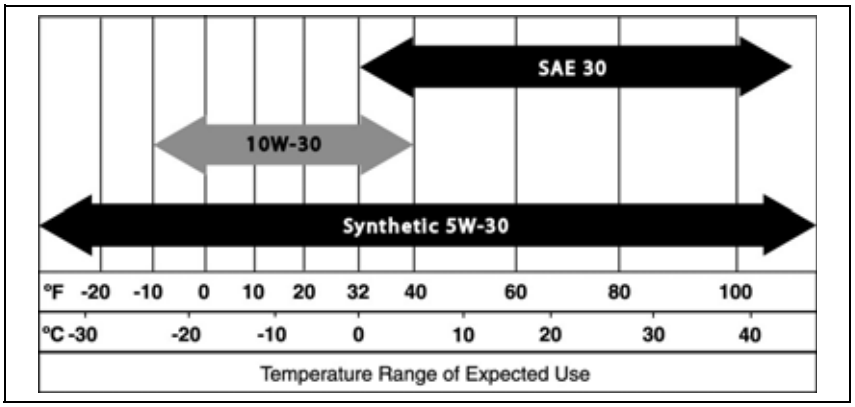

Figure 4-2: Recommended Oil Based on Temperature

- SAE 30 above 32 ºF (0 ºC)
- 10W-30 between 40 ºF and -10 ºF (4 ºC and -23 ºC)
- Synthetic 5W-30 for all temperature ranges*

NOTE: *Synthetic oil should only be used after 100 hours of operation.

⚠ DANGER!

⚠ **Any attempt to crank or start the engine before it has been properly serviced with the recommended oil may result in an engine failure.**

4.3.2 — Changing the Oil

1. Start the engine by pressing the MANUAL button on the control panel and allow the engine to run until it is thoroughly warmed up. Then, press the control panel OFF button to shut down the engine.
2. A few minutes after the engine shuts OFF, when it has cooled slightly, remove the enclosure top lid by unscrewing the fasteners, and lift the front panel off.
3. Remove the battery access panel by loosening the two hex head screws, disconnect the battery and remove the fuse.
4. Remove the drain hose from the retaining clamp and direct the hose end into a suitable container. See Figure 4-3.
5. Unscrew the drain hose cap and allow engine oil to drain. Remove dipstick/ fill plug to permit oil to drain faster. Ensure that the oil is drained to a pan placed at lower level than the engine to ensure proper drainage.
6. After the oil has drained, replace the drain hose cap.
7. Secure the drain hose, in position, with the drain hose retaining clamp
8. Refill the engine with the proper recommended oil. For recommended oil, see Figure 4-2.
9. Reconnect the battery, secure the battery access panel, insert the fuse, and switch the unit to manual before starting the generator. Start the engine, run for 1 minute, and check for leaks.
10. Shut down the generator and recheck the oil level. Add oil as needed. DO NOT OVER FILL.
11. Re-insert dipstick/fill cap.
12. Install the front panel and install the enclosure top lid. Tighten fasteners securely.
13. Press the control panel AUTO button.
14. Dispose of the used oil at a proper collection center.

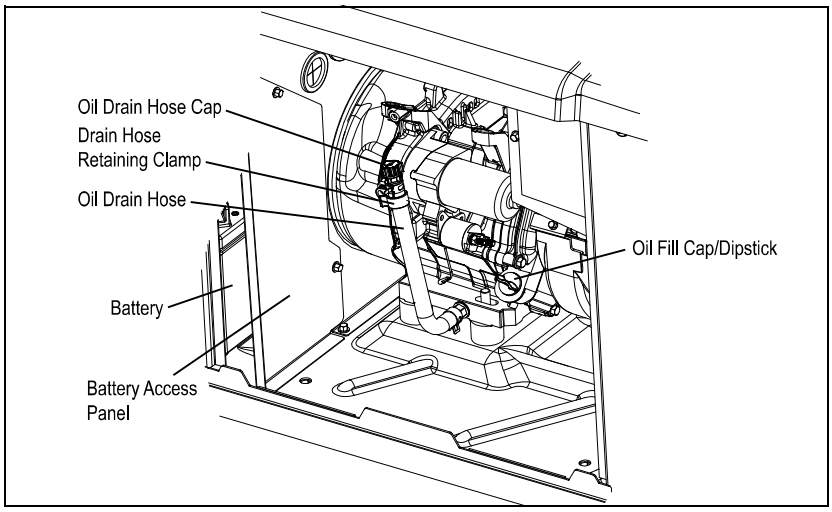

Figure 4-3: Oil Drain Location

4.4 — Changing the Engine Air Cleaner

1. With the generator shut down, remove the top lid.
2. Disengage the wire clip and remove the air cleaner access cover. See Figure 4-4.
3. Remove the old air filter and discard.
4. Thoroughly clean the air cleaner enclosure of any dust or debris while ensuring that none of the debris falls in to the engine intake.
5. Install a new air cleaner.
6. Install the air cleaner cover and engage the wire clip.
7. Install the enclosure top lid. Tighten fasteners securely.
8. Place generator in AUTO.

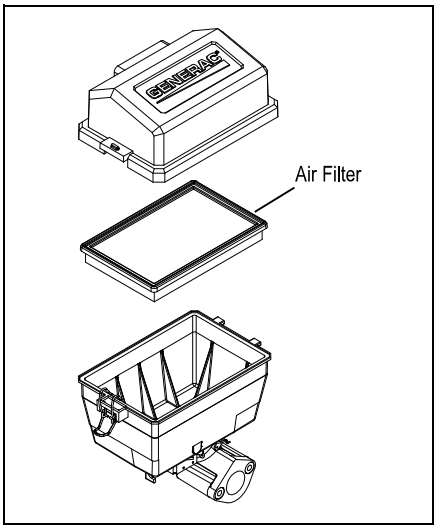

Figure 4-4: Air Filter Location

4.5 — Spark Plug

Reset the spark plug gap or replace the spark plug as necessary:

1. With the generator shut down, remove the top lid.
2. Clean the area around the base of the spark plug to keep dirt and debris out of the engine.
3. Gently pull the spark plug boot off of the spark plug. Remove the spark plug and check the condition. Install a new plug if the old one is worn or if reuse is questionable.

4. Clean the plug by scraping or washing with a wire brush and commercial solvent. Do not blast the plug to clean.
5. Check the spark plug gap using a wire feeler gauge. See Figure 4-5. Adjust the gap by carefully bending the ground electrode to:
   - 7 kW units - 0.76 mm (0.030 in)
6. Install spark plug. Torque to 20-22 ft/lb (27-30 Nm). Install spark plug boot.
7. Install top lid. Tighten fasteners securely.

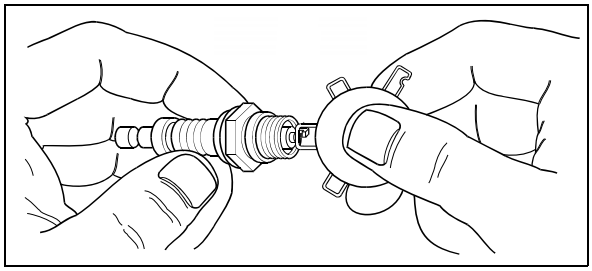

Figure 4-5: Spark Plug Gap Adjustment

4.6 — Valve Lash Adjustment

After the first 20 hours of operation and then after every 300 hours of operation, check the valve clearance. Adjust if necessary.

Important: Please contact the Dealer for service assistance. This is a very important step to ensure longest life for the engine.

To check valve clearance:

1. The engine should be cool before checking. Make sure the engine is at 60 - 80 °F (16 - 27 °C).
2. Turn the generator to OFF.
3. Remove enclosure lid fasteners and lid. Then remove the back panel by undoing the fasteners.
4. Remove spark plug wire and position wires away from plug.
5. Remove spark plug.
6. Make sure the piston is at Top Dead Center (TDC) of its compression stroke (both valves closed). To get the piston at TDC, remove the rubber plug in the center of the intake screen at the front of the engine to gain access to the flywheel nut. Use a 24 mm socket and ratchet to rotate the engine in a clockwise direction. While watching the piston through the spark plug hole. The piston should move up and down. Watch the intake valve open and close. The piston is at TDC, of it's compression stroke, when it is at its highest point of travel.
7. Check clearance between the rocker arm and the valve stem with a feeler gauge.
8. If valve clearance is 0.002 - 0.004 in (0.05 - 0.1 mm), adjustment is not needed.

To adjust valve clearance (after performing steps 1-8) (see Figure 4-6):

1. Make sure the engine is at 60 - 80 °F (16 - 27 °C).
2. Remove enclosure lid fasteners and lid. Then remove the fasteners and the back panel. (if not already removed)
3. Make sure that the spark plug wire is removed from the spark plug and out of the way.
4. Remove the six screws attaching the valve cover.
5. Loosen the rocker jam nut. Using a 13 mm Allen wrench, turn the pivot ball stud while checking clearance between the rocker arm and the valve stem with a feeler gauge. Correct clearance is 0.002-0.004 in (0.05-0.1 mm).

NOTE: Hold the rocker arm jam nut in place as the pivot ball stud is turned.

6. When valve clearance is correct, hold the pivot ball stud in place with the Allen wrench and tighten the rocker arm jam nut. Tighten the jam nut to 174 in-lb (19.68 N-m) torque. After tightening the jam nut, recheck valve clearance to make sure it did not change.
7. Install new valve cover gasket.

NOTE: Make sure the new valve cover gasket is in place. Start all six screws before tightening or it will not be possible to get all the screws in place.

8. Install the valve cover. Tighten the fasteners to 35-62 in/lb (4-7Nm).

9. Install the rubber plug into the fan screen.
10. Install the spark plug and attach the spark plug wire.
11. Install the back panel. Ensure that the alternator intake bellow is captured by the frame on back panel securely with out any kinks. Install enclosure top lid. Tighten all fasteners securely.
12. Place the generator in AUTO.

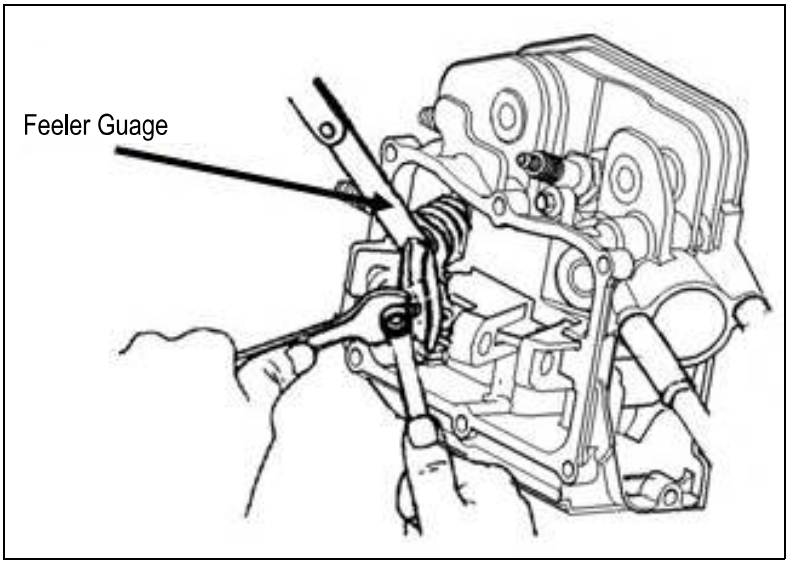

Figure 4-6: Valve Clearance Adjustment

4.7 — Battery Maintenance

⚠ DANGER!

Do not dispose of the battery by incineration. The battery is capable of exploding.

A battery presents a risk of electrical shock and high short circuit current. Strictly observe the following precautions when working on batteries:

- Remove the 7.5 Amp ATO® fuse from the generator control panel.
- Remove all jewelry—watches, rings, metal objects, etc.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metallic objects on top of the battery.
- Disconnect the charging source (remove T1 fuse from Transfer Switch) prior to connecting or disconnecting battery terminals.

⚠ WARNING!

Do not open or mutilate the battery. Released electrolyte has been known to be harmful to the skin and eyes, and to be toxic. The electrolyte is a dilute sulfuric acid that is harmful to the skin and eyes. It is electrically conductive and corrosive. Strictly observe the following precautions:

- Wear full eye protection and protective clothing.
- Where electrolyte contacts the skin, wash it off immediately with water.
- Where electrolyte contacts the eyes, flush thoroughly and immediately with water and seek medical attention.
- Wash down spilled electrolyte with an aid neutralizing agent. A common practice is to use a solution of 1 lg (500 gr) bicarbonate of soda to 1 gal (4 l) of water. The bicarbonate of soda solution is to be added until the evidence of reaction (foaming) has ceased. The resulting liquid is to be flushed with water and the area dried.

⚠ DANGER!

Lead-acid batteries present a risk of fire because they generate hydrogen gas. Strictly observe the following precautions:

- DO NOT smoke when near the battery.
- DO NOT cause flame or spark in the battery area.
- Discharge static electricity from the body before touching the battery by first touching a grounded metal surface.

Be sure the utility power supply is turned off and the 7.5 Amp ATO® fuse is removed from the generator Control Panel, or sparking may occur at the battery posts as the cables are attached and cause an explosion.

- DO NOT cause flame or spark in the battery area.
- Discharge static electricity from the body before touching the battery by first touching a grounded metal surface.

The battery should be regularly inspected per the Service Schedule:

1. With the generator shut down and battery charger power removed, remove the top lid, front panel and battery access panel.

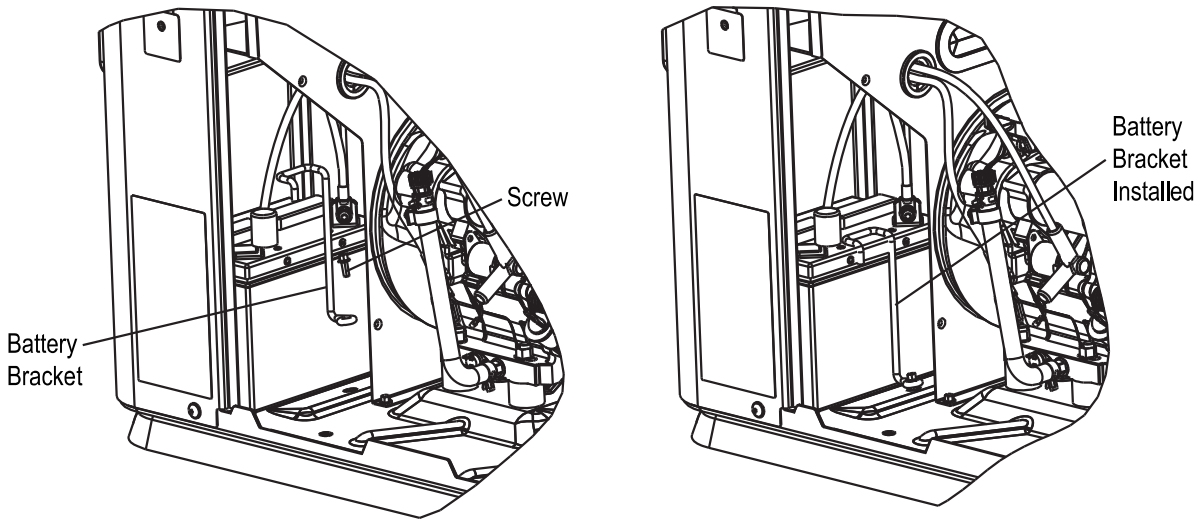

Figure 4-7: Battery Installation

2. Remove the battery bracket and carefully tilt and pull the battery through the battery access window. The battery wires, terminals and other battery service locations are easily accessible in this position.
3. Inspect the battery posts and cables for tightness and corrosion. Remove and clean as necessary using a wire brush on the battery terminals and cable ends. Install and tighten connections securely.

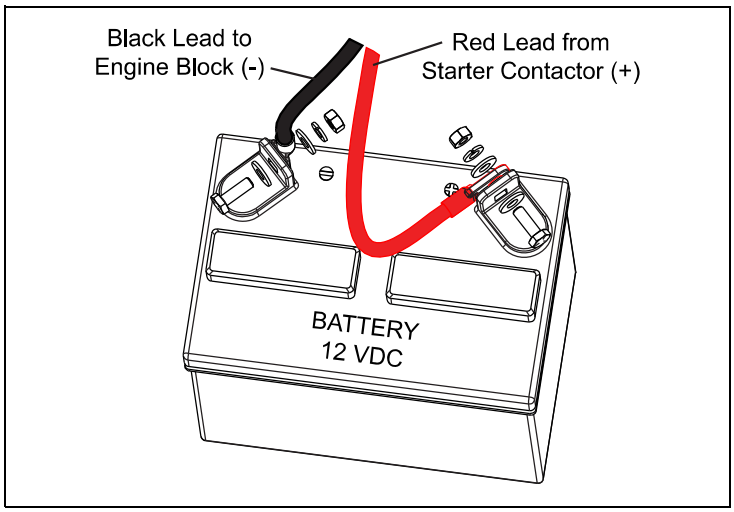

Figure 4-8: Battery Location and Terminals

4. Check the battery fluid level of unsealed batteries, and if necessary, fill with distilled water only. DO NOT use tap water. Also, have the Dealer or a qualified Service Technician check the state of charge and condition.
5. Place the battery into its original location with the battery terminals connected and properly secure with the battery bracket.
6. Install the battery access panel, front panel and top lid. Tighten all fasteners securely.

4.8 — Attention After Submersion

If the generator has been submerged in water, it MUST NOT be started and operated. Following any submersion in water, have a Dealer thoroughly clean, dry, and inspect the generator. If the structure (home) has been flooded, it should be inspected by a certified electrician to ensure there won't be any electrical problems during generator operation or when utility power is returned.

NOTE: When a battery is dead or has been disconnected, the exercise time must be reset.

4.9 — Corrosion Protection

Periodically wash and wax the enclosure using automotive type products. Frequent washing is recommended in salt water/coastal areas. Spray engine linkages with a light oil such as WD-40.

4.10 — Out of Service Procedure

4.10.1 — Removal From Service

If the generator cannot be exercised every 7 days and will be out of service longer than 90 days, prepare the generator for storage:

1. Start the engine and let it warm up.
2. Close the fuel shutoff valve in the fuel supply line and allow the unit to shut down.
3. Once the unit has shut down, set the generator's Main Circuit Breaker (Generator Disconnect) to its OFF (OPEN) position.
4. Turn off the utility power to the transfer switch.
5. Remove the 7.5 Amp ATO® fuse from the generator's Control Panel.
6. Disconnect the battery cables. Remove negative cable first.
7. Remove battery charger AC input T1/Neutral cable (4-pin connector) at Control Panel.
8. While the engine is still warm, drain the oil completely, and then refill the crankcase with oil.
9. Attach a tag to the engine indicating the viscosity and classification of the new oil in the crankcase.
10. Remove the spark plug and spray a fogging agent into the spark plug threaded opening. Install and tighten the spark plug.
11. Remove the battery and store it in a cool, dry room on a wooden board. Never store the battery on any concrete or earthen floor.
12. Clean and wipe down the entire generator.

4.10.2 — Return to Service

To return the unit to service after storage:

1. Verify that utility power is turned off.
2. Check the tag on the engine for oil viscosity and classification. If necessary, drain and refill with proper oil.
3. Check the state of the battery. Fill all cells of unsealed batteries to the proper level with distilled water. DO NOT use tap water. Recharge the battery to 100% state of charge. If defective, replace the battery.
4. Clean and wipe down the entire generator.
5. Make sure the 7.5 Amp ATO® fuse is removed from the generator Control Panel.
6. Reconnect the battery. Observe battery polarity. Damage may occur if the battery is connected incorrectly. Install positive cable first.
7. Reconnect the battery charger AC input T1/Neutral cable (4-pin connector) at Control Panel.
8. Open the fuel shutoff valve.
9. Insert the 7.5 Amp ATO® fuse into the generator Control Panel.
10. Start the unit by pressing the MANUAL button. Allow the unit to warm up for a few minutes.
11. Stop the unit by pressing the control panel OFF button.
12. Turn on the utility power to the transfer switch.
13. Set the control panel to AUTO.

The generator is ready for service.

NOTE: When a battery is dead or has been disconnected, the exercise time must be reset.