

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: Since most maintenance alerts will occur at the same time (most have two year intervals), only one will appear on the Control Panel display at any one time. Once the first alert is cleared, the next active alert will be displayed.



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 controller will prompt for Schedule A or Schedule B maintenance to be performed. Schedule A maintenance consists of the oil, oil filter and tune-up. Schedule B maintenance includes the oil, oil filter, tune-up, air cleaner, spark plug(s) and valve clearance.

4.2 — Service Schedule

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

System Component	Procedure			Frequency
	Inspect	Change	Clean	
X = Action R= Replace as Necessary * = Notify Dealer if Repair is Needed				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		2Y or 200 hours of operation**
Oil filter		X		2Y or 200 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	R		Y
Electrolyte level (unsealed batteries only)*	X	R		Every 6 M
Engine and Mounting				
Air cleaner	X	R		400 hours
Spark plug(s)	X	R		400 hours
Valve Clearance	X			400 hours***
General Condition				
Vibration, Noise, Leakage*	X			M
Complete Tune-Up*	To be completed by a Dealer			2Y or 200 hours
* Contact the nearest Dealer for assistance if necessary. ** Change oil and filter after the first 25 hours of operation. Continue to check at intervals of 200 hours or 2 years, whichever occurs first. Change sooner when operating under a heavy load or in a dusty or dirty environment or in high ambient temperatures. *** Check valve clearance after the first 25 hours of operation. Continue to check at intervals of 400 hours.				

4.2.1— Maintenance Log

1. Battery inspection and charge check (recommended every 6 months for the life of the battery)

Dates Performed:

2. Oil, oil filter, air filter and spark plug replacement (recommended every 200 hours or 2 years, whichever occurs first)

Dates Performed:

3. Valve Adjustment (recommended after the first 6 months after installation or 500 hours of operation, whichever occurs first, and every 500 hours thereafter)

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.
2. Press the Control Panel OFF button. Wait 5 minutes.
3. Remove the dipstick and wipe it dry with a clean cloth.
4. Completely insert the dipstick and again remove it.
5. Observe the oil level. The level should be at the "Full" mark on the dipstick.
6. If necessary, remove the oil fill cap and add oil to the engine until the level reaches the "Full" mark and reinsert the dipstick and fill cap.
7. Press the Control Panel AUTO button.
8. If the generator was running during a utility outage, first turn the Main Circuit Breaker to the ON position. Then, turn ON the needed loads in the residence.



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 include an oil and 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.

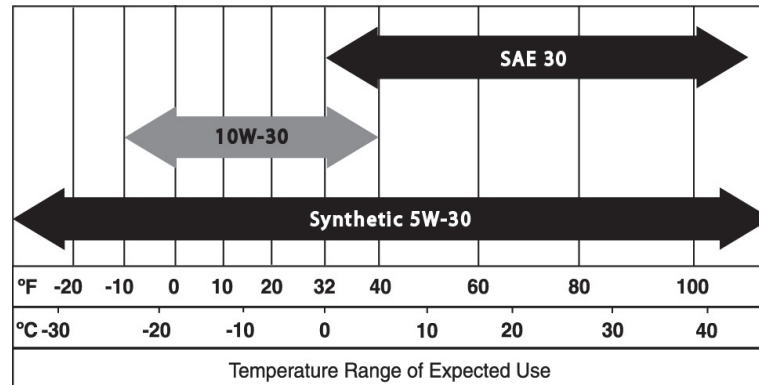


Figure 4-1: Recommended Oil Based on Temperature

- SAE 30 above 32° F (0° C)
- 10W 30 between 40° and -10° F (4° and -23° C)
- Synthetic 5W 30 for all temperature ranges



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 and Oil Filter

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, lift the lid and remove the front panel. Pull the oil drain hose free of its retaining clip. Remove the cap from the hose and drain the oil into a suitable container.
3. After the oil has drained, replace the cap onto the end of the oil drain hose. Reposition and secure the hose with the retaining clip.
4. With the oil drained, remove the old oil filter by turning it counterclockwise. For filter location, see Figure 4-2.
5. Apply a light coating of clean engine oil to the gasket of the new filter.
6. Screw the new filter on by hand until its gasket lightly contacts the oil filter adapter. Then, tighten the filter an additional 3/4 to one full turn.
7. Refill the engine with the proper recommended oil. For recommended oil, see Figure 4-1.
8. Start the engine, run for 1 minute, and check for leaks.
9. Shutdown the engine and recheck the oil level. Add oil as needed. **DO NOT OVER FILL.**
10. Re-insert dipstick and/or reattach fill cap.
11. Press the Control Panel AUTO button.
12. Dispose of the used oil and filter at a proper collection center.

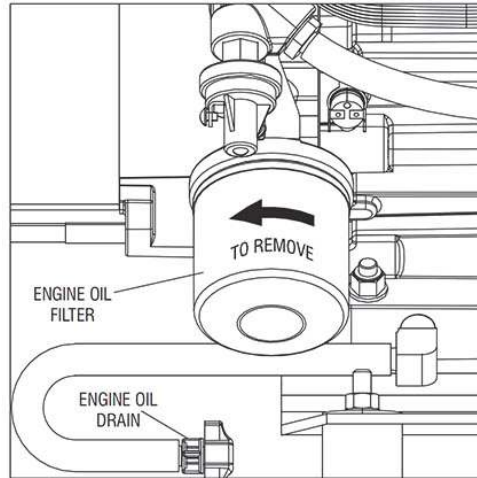


Figure 4-2: Oil Filter and Drain Location

4.4 — Changing the Engine Air Cleaner

1. With the generator shut down, lift the lid and remove the front panel.
2. Remove the cover clips and air cleaner cover (11-20kW), or disengage the wire clip and open the air cleaner access door (8kW).
3. Pull out the old air filter and discard.
4. Thoroughly clean the air cleaner enclosure of any dust or debris.
5. Install a new air cleaner.
6. Install the air cleaner cover and cover clips (11-20kW), or close the air cleaner access door and engage the wire clip (8kW).

4.5 — Spark Plugs

Reset the spark plug(s) gap or replace the spark plug(s) as necessary:

1. With the generator shut down, lift the lid and remove the front panel.
2. Clean the area around the base of the spark plug(s) to keep dirt and debris out of the engine.
3. Remove the spark plug(s) and check the condition. Install a new plug(s) if the old one is worn or if reuse is questionable.
4. Clean the plug(s) by scraping or washing with a wire brush and commercial solvent. Do not blast the plug(s) to clean.
5. Check the spark plug gap using a wire feeler gauge. See Figure 4-3. Adjust the gap by carefully bending the ground electrode to:
 - For 8, 11, and 20kW units - 0.76 mm (0.030 inch)
 - For 13, 14, 15, 16, 17kW units - 1.02 mm (0.040 inch)

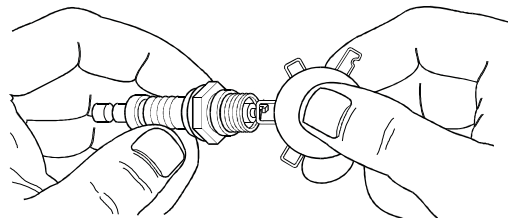


Figure 4-3: Spark Plug Gap Adjustment

4.6 — Valve Lash Adjustment

After the first six (6) months or 500 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:

- The engine should be cool before checking. If valve clearance is 0.002" - 0.004" (0.05 - 0.1mm), adjustment is not needed.
- Remove spark plug wires and position wires away from plugs.
- Remove spark plugs.
- 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 intake screen at the front of the engine to gain access to the flywheel nut. Use a large socket and socket wrench to rotate the nut and hence the engine in a clockwise direction. While watching the piston through the spark plug hole. The piston should move up and down. The piston is at TDC when it is at its highest point of travel.

To adjust valve clearance (see Figure 4-4):

- Make sure the engine is at 60° to 80° F (16° to 27° C).
- Make sure that the spark plug wire is removed from the spark plug and out of the way.
- Remove the four screws attaching the valve cover.
- Loosen the rocker jam nut. Using a 10mm Allen wrench (530cc engine) or a 13mm Allen wrench (410cc, 990cc and 999cc engines), 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 inch (0.05-0.1 mm).

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

- 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-lbs. (19.68 N-m) torque. After tightening the jam nut, recheck valve clearance to make sure it did not change.
- Install new valve cover gasket.
- Re-attach the valve cover.

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

- Install spark plugs.
- Re-attach the spark plug wire to the spark plug.
- Repeat the process for the other cylinder, if necessary.

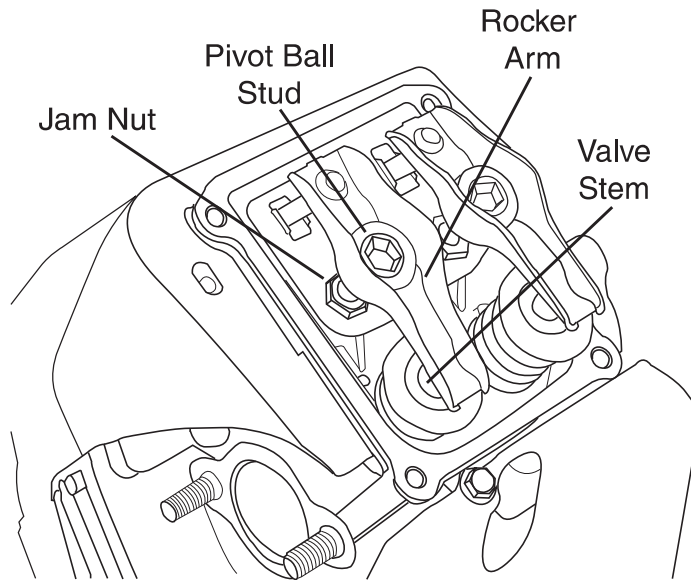


Figure 4-4: Valve Clearance Adjustment

4.7 — Battery Maintenance

The battery should be regularly inspected per the Service Schedule:

1. With the generator shut down, lift the lid and remove the front panel.
2. Inspect the battery posts and cables for tightness and corrosion. Tighten and clean as necessary.
3. 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.

⚠ 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 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 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 acid neutralizing agent. A common practice is to use a solution of 1 pound (500 grams) bicarbonate of soda to 1 gallon (4 liters) 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.



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 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.

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.

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 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 (has white sleeve) at controller.
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(s) and spray a fogging agent into the spark plug(s)' threaded openings. Reinstall and tighten the spark plug(s).

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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 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 (has white sleeve) at controller.
8. Open the fuel shutoff valve.
9. Insert the 7.5 Amp 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 timer and current date and time must be reset.