



ENGINE DRIVEN GENERATOR SET OWNER'S MANUAL GASOLINE AND DIESEL

CONTRACTOR SERIES

LR30 THROUGH LR180 (WITH IDLER SYSTEMS)

DIESEL SERIES

LR50 THROUGH LR130 (NO IDLER SYSTEMS)

STANDARD DUTY SERIES

A25 THROUGH A60 SERIES (NO IDLER SYSTEMS)

LA50 THROUGH LA60 SERIES (NO IDLER SYSTEMS)

LR70 THROUGH LR105 SERIES (NO IDLER SYSTEMS)

THREE PHASE SERIES

LR50 THROUGH LR180 SERIES (GASOLINE AND DIESEL NO IDLER SYSTEMS)

LIQUID PROPANE(LP) AND NATURAL GAS(NG) SERIES

LR105 THROUGH LR150's SERIES

SAFE GEN SERIES

LR70 THROUGH LR150's SERIES

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Safety Precautions

Before operating the generator set, read the Owner's Manual and become familiar with it and your equipment. Safe and efficient operation can be achieved only if the equipment is properly operated and maintained. Many accidents are caused by failure to follow fundamental rules and precautions.

The following symbols found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel or the equipment.



This symbol warns of immediate hazards, which if not avoided, will result in severe personal injury or death.



This symbol refers to a hazard or unsafe practice, which if not avoided, could result in severe personal injury or death.



This symbol refers to a hazard or unsafe practice, which if not avoided, might result in minor or moderate injury or product or property damage.



The engine exhaust from this product contains chemicals known to the state of California to cause Cancer, Birth Defects or other reproductive harm.

Fuels, electrical equipment batteries, exhaust gases and moving parts present potential hazards that could result in severe personal injury. Take care in following these recommended procedures.

FUELS AND FUMES ARE FLAMMABLE:

Fire, explosion and severe personal injury can result from improper practices. When transporting generator set, always close the fuel shut off valve located beneath the bottom of the fuel tank.

- DO NOT fill fuel tanks with the engine running. Fuel contact with the engine or exhaust is a potential fire hazard. Let the engine cool down before removing gas cap.
- DO NOT SMOKE OR ALLOW AN OPEN FLAME near the generator set or fuel tank.
- DO NOT store or transport the generator wet without first removing the fuel from the tank.
- DO NOT SMOKE while servicing batteries. Lead acid batteries emit a highly explosive hydrogen gas that can be ignited by electrical arcing or by smoking.
- DO NOT mix lubricating oil with gasoline.
- When refueling always wait until the unit has cooled down before opening/removing the fuel cap.

EXHAUST GASES ARE DEADLY

- Engine exhaust contains CARBON MONOXIDE, a dangerous, invisible gas that you cannot smell that is potentially lethal. Avoid carbon monoxide inhalation by operating the generator set outdoors where exhaust gases can be discharged directly into the open air. Use a battery-powered carbon monoxide detector when running generator.
- Do not operate the generator set in any type of enclosure that could allow exhaust gases to accumulate such as inside garages, crawl spaces or inside vehicles of any type. Using a fan and opening doors or windows does NOT provide enough fresh air. Direct exhaust gas away from areas where people are gathered and away from building or enclosures. If you start to feel sick, dizzy or weak while using generator, shut it off and get fresh air immediately. See a doctor. You may have carbon monoxide poisoning.
- Do not operate the generator set in an enclosed compartment such as found in recreational vehicles or enclosed trucks (even with the tail gate open). All warranties are voided if the unit is operated in an enclosed area. Operate only in well-ventilated area.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Before performing any maintenance on the generator set, disconnect the spark plug wire (and the starting battery negative cable on electric start models) to prevent accidental starting.
- Keep hands away from moving parts
- Do not wear loose clothing or jewelry while servicing any part of the generator set. Loose clothing and jewelry can become caught in moving parts. Jewelry can short out electrical contacts and cause shock or burning.
- Make sure that fasteners on the generator set are secure. Tighten supports and clamps, keep guards in position over fans, drive belts and heat shields, etc.
- If adjustment must be made while the generator set is running, use extreme caution around hot manifolds and moving parts, etc.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Disconnect starting battery before removing protective shields or touching electrical equipment. Use rubber insulated mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment. Do not wear wet damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling electrical equipment.
- Use extreme caution when working on electrical components. High voltages can cause injury or death. DO NOT tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- DO NOT CONNECT GENERATOR SET DIRECTLY TO ANY BUILDING ELECTRICAL SYSTEM. Hazardous voltages can flow from the generator set into the utility line. This creates a potential for electrocution or property damage. Connect only through an approved device and after building main switch is open. The National Electrical Code and Canadian Standards Association require an approved switch device between the generator set and the utility power. Consult a licensed electrician in regard to emergency power use.
- DO NOT use the generator set in rain, snow, sleet or wet ground conditions.

GENERAL SAFETY PRECAUTIONS

- Have a fire extinguisher nearby. Maintain extinguisher properly and become familiar with its use. Extinguisher rated ABC by the NFPS is appropriate for all applications. Consult the local fire department for the correct type of extinguisher for various applications.
- Benzene and lead, found in some gasoline, have been identified by some state and federal agencies as causing cancer or reproductive toxicity. When checking, draining or adding gasoline, take care not to ingest, breathe the fumes, or contact gasoline.
- Used engine oils have been identified by some state or federal agencies as causing cancer or reproductive toxicity. When checking or changing engine oil, take care not to ingest, breathe the fumes or contact used oil.
- Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and engine damage and present a potential fire hazard.
- DO NOT store anything on the generator set such as oil-cans, oily rags, chains, wooden blocks etc. A fire could result or operation could be adversely affected. Keep the generator set clean and dry at all times.
- DO NOT work on this equipment when mentally or physically fatigued, or after consuming alcohol or any drugs.
- Never remove radiator cap or radiator reservoir cap while engine is hot or running. Severe burns or injury can occur by escaping steam or hot engine coolant.

PRESTART OPERATION

Before starting the engine, read the engine manual for the proper type oil type and volume and fuel type.

FUEL AND FILLING FUEL

On all gasoline powered models use unleaded gasoline of at least 87 octane rating. On all diesel powered units fill with diesel fuel No2 (DF2) in normal ambient temperatures or NO1 (DF1) in cold weather. JP5 or JP8 turbine fuel may be used on diesel powered units only with slight engine de-rations. The fuel shut off valve is located on the bottom of the fuel tank. Be sure that the valve is turned counter clockwise (the open position) to permit the flow of fuel from the tank.

OIL FILLING INSTRUCTIONS

Fill the oil sump or to the full mark on the dipstick (if applicable). (Figure 1) Pour slowly to avoid air bubbles. To avoid engine damage always check for full oil level before starting engine. Crankcase pressure can blow hot engine oil out the fill tube causing severe burns, always stop the engine before removing the oil cap. Do not overfill the oil level on 13, 16, 18, 20, 23, 25 and 31 HP gasoline engines and all diesel engines, as damage will occur. Engine damage due to low oil level is NOT covered by the engine manufacturer's warranty. For gasoline engine refill with API Class SG or SH oil (also SG/CD, SG/CE, SH/CD or SH/CE) having an SAE viscosity grade appropriate for the temperatures as indicated below. For diesel engines, see the engine manual for the proper oil selection.

OIL VISCOSITY VS. TEMPERATURE

EXPECTED AMBIENT TEMPERATURES	SAE Viscosity Grade
32° F (0° C) and Higher	30
10° F to 100° F -12° C to 38° C	15W-40
0° F to 80° F -18° C to 27° C	10W-30
	10W-40
-20° F to 50° F -28° C to 10° C	5-W30

OIL FILLING FOR DIESELS

Fill the oil sump with lubricating oil with 15W30 multigrade for warm weather and 5W30 for cold weather. Oil capacity for the LR50/60EL models with the 15LD400 engine is 1.26 quarts and for the LR130EL with the 25LD425 engine is 1.9 quarts (without filter). Check the dipstick each time fuel is added to maintain the proper levels of lubricating oil. **IMPORTANT** Do not overfill with oil or damage will occur to the engine. Maintain the oil level within the minimum/maximum lines of the dipstick. Engines overfilled **MUST** be drained until the oil level is at the above noted levels.

LOW OIL SHUT DOWN

All contractor diesel welder/generators and three phase and some medium duty units are equipped with either low oil volume or low oil pressure shut down systems. Insufficient oil volume or pressure will cause the engine to stop. See engine manual for complete details.

BREAK IN PROCEDURE

Controlled break in with the proper grade of lubricating oil helps to ensure satisfactory service from the generator set. During the first 2-3 hours of operation, do not apply heavy electrical loads to the generator. Oil should be changed after the first 3 hours of operation. The oil changes should then be scheduled at the recommended times shown in the engine manual. Two cylinder air cooled diesel powered units **MUST** be run with at least 25% load at all times or damage to the engine may occur. Oil should be drained when the engine is still slightly warm.

For units operating on liquid propane L/P or natural gas N/G, see addendum instruction sheets for proper installation and operation.

BREAK IN & CONTINUOUS OPERATION/LOAD**APPLICATION FOR DIESELS ONLY**

After the engine operates properly, it is strongly recommended to ALWAYS have an electrical load of at LEAST 25% of the nameplate rating on the generator when operating the unit. **Operating the engine without an electrical load for prolonged periods of time (one hour or more) will eventually cause damage to the diesel engine (sometimes called wet stacking which is NOT covered by the engine manufacturer's warranty)** or damage to the rings, fuel oil entering the lubricating oil and excessive vibration. Breaking in the diesel engine can require 5 to 10 hours of operation. It is extremely important to have electrical loads of at least 25% to 50% of the rated capacity of the generator's nameplate rating to have the valves properly seat. Be sure to change the oil and oil filter after several hours of initial operation. All oil and fuel filters should be changed every 250 hours of operation and air filters as often as necessary depending on the environment. Dirty filters WILL cause erratic operation, dark exhaust fumes and erratic voltage from the generator. Consult the engine owner's manual for complete engine operation. If the diesel engine does not stop when the start/stop switch is turned off, the oil in the engine sump has been over filled and the engine is using over pressurized sump oil as fuel. To stop the engine with this condition you must block the air intake flow which will stop the engine. Eventually the engine will consume the excess sump oil and stop on it's own but this could take some time. If this situation has occurred, you must check the air filter as pressurized oil has gone through the engine breather and saturated the air filter. The air filter **MUST** be replaced before restarting the engine.



This generator set should only be operated by a responsible adult.

To start the engine:

1. Disconnect all loads to start the engine.
2. Fully open the fuel valve if the engine is so equipped. The valve is located under the unit-mounted fuel tank of the engine or under the fuel tank on all LR units.
3. Adjust the carburetor choke as necessary for temperature conditions. Cold starting requires a full choke. L/P and N/G fueled engines do not require a choke. There is no choke on all diesel powered generator sets.
4. The engine may be equipped with a rope recoil starter or electric starter. Start the engine by referring to the paragraph in the engine manual for the applicable starter.

STARTING ELECTRIC START DIESELS WITHOUT A BATTERY

The models LR50EL and LR60EL are electric start models with auxiliary recoil starters. If a battery is not available, the red or black lever near the fuel pump **MUST** be in the up position to start and to stop the engine turn the red or black lever to the down position. Without a battery, the key start/stop switch will NOT stop the engine and you **MUST** use the red or black lever. When using the electric start switch to start and stop the engine and a 12 volt battery is installed, the red or black lever **MUST** be in the down position at all times.

INITIAL STARTING OR UNIT RUN OUT OF FUEL ON DIESELS ONLY

Air pockets in the fuel line will cause difficulty in engine starting and normal operation when fueling the unit for the first time or the unit is run out of fuel. It is strongly recommended to manually pump the pump lever 20 plus times before starting to release the air pockets. Models LR50EL and LR60EL have clear fuel filters and air pockets can be visually observed. Even one air bubble will cause erratic engine operation. ALL air pockets must be pumped out to operate properly. The model LR130EL has a solid metal fuel filter and air pockets cannot be observed in this model. Always avoid running a diesel out of fuel or near the bottom of the fuel tank as air pockets may be induced causing erratic operation of the engine. Once all diesels have been initially started and the engine runs smoothly, there is no need to bleed out air pockets in future starting of the unit.