



CONTRACTOR SERIES OWNER'S MANUAL

**LR30H, LR30K, LR50H, LR50IP, LR50V, LR60H, LR60HE
LR60IP, LR60K, LR70EHI, LR80EI, LR105EI, LR105EHI, LR105KE, LR150V
LR55R, LR50EL, LR60EL, LR130EL**

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 personal or the equipment.

DANGER

This symbol warns of immediate hazards, which will result in severe personal injury or death.

WARNING

This symbol refers to a hazard or unsafe practice, which can result in severe personal injury or death.

CAUTION

This symbol refers to a hazard or unsafe practice, which can result in personal injury or product or property damage.

DANGER

This 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.

FUEL AND FUMES ARE FLAMMABLE. Fire, explosion and severe personal injury can result from improper practices.

- DO NOT fill fuel tanks with the engine running. Fuel contact with hot engine or exhaust is a potential fire hazard.
- DO NOT SMOKE OR ALLOW AN OPEN FLAME near the generator set or fuel tank.
- DO NOT store or transport the generator set 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.

EXHAUST GASES ARE DEADLY

- Engine exhaust contains CARBON MONOXIDE, a dangerous, invisible gas 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.
- Do not operate the generator set in any type of enclosure that could allow exhaust gases to accumulate. Direct exhaust gas away from areas where people are gathered and away from buildings or enclosures.
- Do not operate this unit in an enclosed compartment such as found in recreational vehicles or enclosed trucks. All warranties are voided if the unit is operated in an enclosed area. Operate only in a 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 stator battery negative - cable on electric start sets) 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. Consult an electrician in regard to emergency power use.
- DO NOT operate unit 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 are 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 that makes the operation of equipment unsafe.

PRESTART OPERATION

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

Oil Filling Instructions

Fill the oil sump to overflowing or to full mark on the dip stick (if applicable). (Fig. 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 13HP, 16HP, 18HP or 25HP engines as damage to engine will occur. Engine damage due to low oil is not covered by the engine manufacturer's warranty.

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 expected temperatures, as indicated below.

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)	5W-30

BREAK-IN PROCEDURE

Controlled break-in with the proper grade of lubricating oil helps to ensure satisfactory service from this electric plant. During the first 2-3 hours of operation, do not apply heavy electrical loads to the plant. 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. Oil should be drained when engine is still slightly warm.

The following only pertains to gasoline fuel models. See separate instruction sheet for LP/Propane and Natural Gas fuel models. The generator must be operated on a firm, dry and clean location. The area must be weather protected and free from heavy dust, sand, dirt, standing water, and snow.

CAUTION

This generator should only be operated by a responsible adult.

Proceed as follows to start the engine:

1. Disconnect all load from the generator.
2. Fully open the fuel valve if the engine is so equipped. It is located under the unit mounted fuel tank of engines or (under fuel tank on all LR units).
4. Adjust the carburetor choke as necessary for temperature conditions. Cold starting requires a full choke
5. Engine may be equipped with rope recoil rewind or electric starter. Start engine by referring to the paragraph for the applicable starter.

DUST, DIRT, RAIN AND SNOW

Operating this unit in extreme dusty or dirty conditions will seriously affect the life of the engine.

Keep the unit clean. Do not allow snow, rain, dust and dirt to accumulate on the unit. Remove all oil deposits and accumulated dirt. When operating this unit outdoors, protect it from the elements.

DANGER

Use extreme care to avoid a lethal shock hazard if this unit is operating outdoors during periods of visible moisture (rain or snow) or near standing water. Service the air cleaner at

least every 25 to 30 operating hours. If operating in extreme dusty or dirty conditions, service the air cleaner more often and change crankcase oil at least every 25 operating hours. See engine operators' manual.

MUFFLER

The muffler on this generator is only designed for portable outdoor applications. Indoor operations requires a special muffler, a seamless flexible exhaust connection to protect solid piping from breakage due to engine vibration, solid exhaust piping, and approved exhaust pipe thimble to pass exhaust piping through flammable walls or roofing. Such an installation is beyond the scope of this manual and is not recommended. A damaged or leaky muffler will allow an increased exhaust noise level and increased exhaust gas emissions. A defective muffler should be replaced. Never operate this unit without a muffler.

SPARK ARRESTOR REQUIREMENTS

The muffler included with this generator is not equipped with a spark arrestor (except Model LV150).

WARNING

If this generator is used in a National Park, any forest covered land, or grass-covered unimproved land, a spark arrestor must be properly attached to the muffler and must be in effective working order.

A U.S.D.A. Forestry Dept. approved spark arrestor kit is offered as optional by the engine manufacturer. When installed the spark arrestor must be firmly attached to the muffler and the screen must be kept clean and unplugged for proper operation. Contact your local engine manufacturer's dealer or distributor for more information. They can be found in your local Yellow Pages under "Engines Gasoline."

Even with the spark arrestor installed, extreme care must still be used if the engine is to be operated in an area of dry forest-covered brush or dry grass which could catch fire from the engine heat or an accidental spark passing through the spark arrestor.

NOTE: If this generator is to be operated in the State of California a spark arrestor must be attached to the exhaust system. The spark arrestor must be properly maintained and in working order to comply with Section 4442 and 4443 of the California Public

WARNING

Avoid touching hot engine parts and the rotating or moving parts of unit.

All fan guards and protective covers must be kept in place.

Loose jackets, neckties, etc., should not be worn while starting

or operating this generator because of the danger of becoming caught in moving parts. Hot engine parts and mufflers can cause severe burns.

DANGER

UNIT GROUNDING

This unit must be properly grounded to prevent a lethal electrical shock hazard. Only grounded 3-prong plugs must be utilized with the receptacles of this unit. Use only 3-wire extension cords. Use only 3-wire power tools or double insulated power tools.

There is a ground lug or terminal located on the generator. A #10 copper stranded ground wire must be connected to this ground lug and a suitable ground such as a metal stake or ground rod driven into the ground. You must comply with the National Electric Code and all state and local codes.

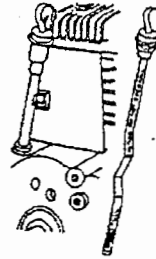
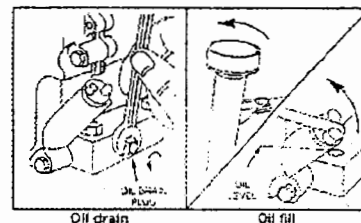
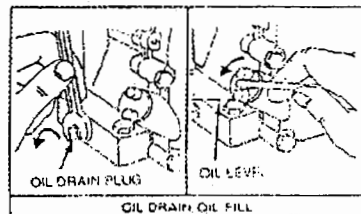


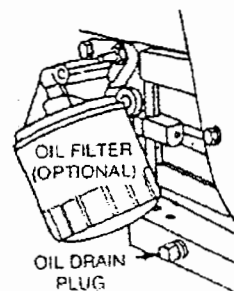
FIGURE 1 11HP
16HP TWIN
18HP TWIN



5HP



8, 11 & 13HP



16HP, 18HP, 20HP
23HP & 25HP

GENERAL OPERATION

MANUAL RECOIL START MODELS

1. With choke closed grasp starter and pull out cord rapidly.
2. Repeat if necessary with choke opened slightly. When engine starts, open choke gradually. Do not jerk rope or let it snap back into the rewind mechanism.

ON ELECTRIC START MODELS

Close the choke if engine is cold and firmly press starter button. Consult engine manual for location of choke.

BATTERY

NOTE: The customer must supply the starting battery. Battery and Battery Cables. The factory-supplied battery cables will accommodate a 32 ampere hour, 12-volt DC lead acid battery. This is the minimum recommended size battery for the electric start generators covered in this manual.

AWARNING

Use extreme care not to tilt the unit with the battery installed. Tipping could cause severe eye damage and skin burns.

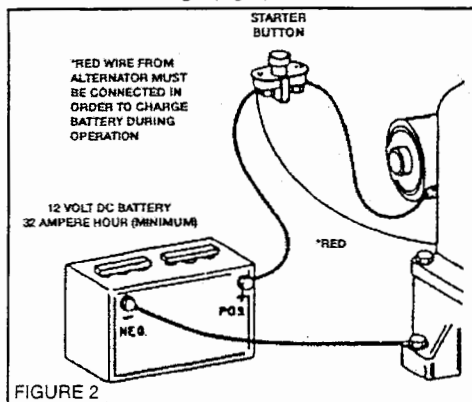
Battery Installation and Servicing

Be sure battery connections are of the correct polarity. All electric start generators use negative ground, 12-volt DC starting systems. The red cable is positive and the green is negative.

DANGER

Battery acid will cause severe eye damage and skin burns. Safety glasses, gloves and an apron must be worn when servicing lead-acid batteries. When connecting or disconnecting battery cables, the engine must not be running or cranking. Batteries give off an explosive gas when being charged. A spark or open flame could result in an explosion.

Before connecting cables to the battery the engine must not be running or cranking (engine starting). Batteries give off an explosive gas when being charged by the engine trickle charging circuit. This charging circuit is operational during engine running and cranking. Accidental grounding-out of the battery terminal by tools, gasoline cans, or when installing or removing the battery cables could cause a spark which might result in a battery gas explosion or fire. An open flame or lit cigarette will have the same disastrous effect. Battery terminals and engine starter connections must be clean and tight (Fig. 2).



When installing the battery cables, always connect the negative battery cable last. When disconnecting the battery cables, always disconnect the negative cable first. See BATTERY MAINTENANCE section for more information.

STOPPING THE ENGINE - MANUAL AND ELECTRIC MODELS

The following only pertains to gasoline fuel models. See separate instruction sheet for LP/Propane and Natural Gas fuel models.

Gradually remove all the load from the generator. To stop the engine, turn key or switch off until the engine comes to a complete stop

BATTERY MAINTENANCE AND SIZE (Electric Start Models)

GENERAL INFORMATION

NOTE: The battery manufacturer's instruction must be strictly followed. Battery size is approximately a minimum of 20 ampere hour (180 cold cranking amps) to a maximum of 50 ampere hour (300 cold cranking amps) at 12 volts D.C. It is better to have a higher ampere rating for cold weather starting. The battery tray on the generator is 5" wide, be sure to size the battery to fit in the battery tray.

Use extreme care when handling batteries. Battery acid is extremely corrosive and can cause severe burns to eyes, skins and clothing. Flush immediately with water and contact a physician.

DANGER

Proper storage and care is necessary to insure proper engine starting. Never allow the battery to remain discharged. All electric start models include a 12VDC 2-10 ampere battery trickle charging circuit which operates only when the generator engine is running. This charging circuit is not designed to recharge a dead battery but only maintain the charge in the battery.

Provisions must be made to keep the battery fully charged if the generator will not be frequently run as in a permanent standby installation, or if the battery is to be stored for a long period of time or if it is located in an unheated room to prevent battery freezing. This can be accomplished by a customer supplied automotive type battery trickle charger (usually 2 amps max.). The trickle charger must be plugged into your utility power source and not the generator. If using an automotive type trickle charger it should be of the automatic type. With an automatic type charger as the battery reaches its maximum charge capacity, the charge's current tapers to near zero and then automatically supplies a small pulsating charge that maintains the battery in a charged condition.

Manual trickle type chargers only put out a constant charging rate (2,4,6,10 amperes, etc.). With this type of charger extreme care must be taken not to overcharge the battery. Which can cause severe battery gassing and battery damage. Whatever type of charger is utilized, carefully follow the instructions of the battery charger manufacturer.

BATTERY CARE

The battery should be floor mounted on a wooden box or in a approved battery rack and located close to the engine. The battery must not be in contact with a cement, brick floor or wall. Do not locate battery near engine muffler.

DANGER

Do not smoke or use open flame near the starting battery. The area must be well ventilated because batteries give off an explosive gas when being charged. Do not remove or install battery cables when the engine is cranking or running. An accidental spark could result in a battery gas explosion. Since the battery is receiving a charge from the engine mounted starter /generator during engine cranking or engine running, shut down the engine before servicing, installing, or removing the battery or battery cables. The battery will give off an explosive gas when receiving a charge. An accidental spark or flame could result in dangerous battery explosion.

AWARNING

Only service the battery in a well ventilated area. If the battery or battery cable have to be removed, shut down the engine. Remove the negative (green) cable from the battery first, then remove the positive (red) cable. When reinstalling the battery or battery cables, shut down the engine, then reconnect the negative (green) cable last. Accidental grounding out of the battery terminals from tools, gasoline cans, or when removing battery cables could cause a spark which might ignite the battery gases, resulting in a battery explosion or fire. Do not have a lit cigarette near the battery.

BATTERY INSPECTION

Check battery cells with a hydrometer. The specific gravity reading should be approximately 1.280 at 80 degrees. If one or more cells are low on water, add distilled water, not electrolyte, and recharge. Do not use hydrant or well water. Keep the battery case clean and dry.

An accumulation of moisture will lead to more rapid discharge and battery failure. Keep the battery terminals clean and tight. After making connections, coat the terminals with a light application of petroleum jelly or grease to retard corrosion.

APPLYING ELECTRIC LOADS

Allow the engine to reach normal operating temperature (2-3 minutes) before connecting any load to the generator.

Connect the load by inserting the plugs into the proper receptacles. The load should be applied gradually. If the load consists of large electric motors they should be individually started with the largest first. The other low demand items can be added to the load.

CAUTION

Keep generator load within the receptacle and generator nameplate rating. Overloading may shorten unit life and could cause internal generator damage. Do not exceed receptacle ampere rating.

The ampere and voltage rating items to be powered by this generator can be found on the nameplate of the electric tool or appliance.

The total output ampere rating stamped on the generator nameplate always refers to the highest voltage the unit is equipped to produce. On 120/240 volt units this should be 240 volts. To determine the total 120-volt ampere rating double the 240-volt amperage provided on the nameplate.

NOTE: The nameplate ampere rating on load items to be powered by this generator can be misleading if they are large power tools or electric motors. These items might require 2-3 times the ampere rating shown on their nameplate to get them started. See wattage requirements for detailed information for figuring the load wattage requirements.

Do not increase engine speed to get more output from generator. Engine will operate at 3600 RPM at full rated load. Racing engine could cause internal damage to the generator.

CAUTION

Excessive engine speed could damage internal components or the generator and will result in excessive generator voltages which could damage items being powered by generator such as TV sets, light bulbs, etc.

DISCONNECTING THE LOAD

The generator is inherently self-regulating and its output automatically adjusts to the load. The generator will not be damaged if it is operated at no load condition. The engine governor will compensate for load variations, therefore, the load can be disconnected in any desired sequence. It is desirable to gradually remove the load if possible. Voltage sensitive load items such as TV, computers, amplifiers and light bulbs should be removed first.

RECEPTACLE UTILIZATION



Do not exceed the amperage rating on the outlet receptacles. This will cause receptacle burnouts and could cause internal damage to the generator. Proper utilization of the outlet receptacles found on this

generator is necessary to avoid generator and receptacle damage and to assure satisfactory operation. The operator must realize that this generator is not an unlimited source of power and heed generator and receptacle voltage and ampere ratings. The nameplate ratings can be obtained thru a combination of the receptacles or a single receptacle if the generator and/or the receptacle ampere rating is not exceeded. All 120 volt plugs on items to be powered from the generator receptacles should be of the 3-prong grounded type. Only 3-wire extension cords and 3-wire or double insulated power tools should be used with the generator. The operator must not overload either the generator or generator receptacles.

FULL POWER SWITCH (LR50 and LR60's)

Always place the full power switch in the up (120 volts) position when only using 120 volt devices to obtain the full power of the generator. All Models series LR50's and LR 60's units feature a 120 volt full power switch. When the switch is in the up position (marked 120 volts) the stator windings are connected in a parallel mode making all the output of the generator 120 volts. In this mode the 240 volt receptacle is not functional. This switch should be in this position whenever there is no need for 240 volt output and large 120 volt loads are required such as compressors, pumps, saws, welders etc. If the switch is in the down position, that stator windings are connected in series making all 120 volt and 240 volt receptacles functional. The 240 volt receptacle(s) have the full power of the generator and the 120 volt receptacles have half of the total wattage. It is recommended to remove electric loads when changing switch positions. If the full power switch is in the 120/240 position (down) and full load is required at 120 volts, possible damage to the generator may result. The position of the switch affects the voltmeter reading.

GENERATOR OPERATION VENTILATION



Adequate ventilation must be provided for safe efficient operation. The exhaust products of the engine contains invisible carbon monoxide, which is poisonous and can

cause death if inhaled.

Only operate this generator outdoors in a well ventilated area. Operation of the generator indoors is not recommended.

OPERATION IN CONFINED SPACES

If generator is operated in a small compartment an engine fire or over heat damage could occur because of restricted or obstructed air flow for proper engine cooling.



Operation in an enclosed compartment is a potential fire or asphyxiation hazard and is not authorized. Mounting

this generator in a RV/Motor Home generator compartment could result in a generator set engine fire. Asphyxiation of the occupants of the RV/Motor Home is also possible because of invisible deadly carbon monoxide gases.

PERMANENT INDOOR INSTALLATIONS

Installing a portable generator indoors is not a do-it-yourself project. A qualified contractor experienced in such installations must be utilized. He must be familiar with engine exhaust piping and muffler installations, provisions, fuel piping and fuel storage, and electrical connections. He must also be familiar with the National Fire Protection Association recommendations and all the local and national codes involved in indoor installations.

Since the factory does not recommend indoor installations, detailed instruction for installing a portable generator indoors is not considered within the scope of this manual.

See HOME STAND-BY INSTALLATION section of this manual for the factory recommended method of using this generator for home standby protection during a utility power failure.

HIGH TEMPERATURE OPERATION

Be sure air flow to and from unit is not obstructed. Keep the unit as free from dirt as possible. Engine air housings must be properly installed and undamaged.

LOW TEMPERATURE OPERATION

To aid in cold weather engine starting use the recommended SAE no. oil for existing temperature conditions. (See Engine Manual).

Preferably, change oil when the engine is still slightly warm.

Only use fresh, unleaded gasoline. Protect against moisture condensation and extreme temperatures. If possible keep the generator in a warm location until needed, then carry outside and immediately start engine.

IDLER OPERATION

All LR units feature an easy idle option that automatically reduces engine speed to 2200 to 2400 rpm when there is no electrical load on the generator. The unit should be started with the idler switch in the off position. After the engine has warmed up (2 to 3 minutes), turn the idler switch on. The engine speed will decrease if there is no electrical load on the generator. When an electrical load is applied the engine speed will automatically return to normal operating speed and produce the rated voltage. IMPORTANT - A battery must be connected to the engine for the idler to work on all 7000, 8000, 10000 and 15000 watt models.

Some Models have a delay circuit that keeps the engine operating at 3600 RPM for 10 to 15 seconds after the load is removed.

INSTALLATION

General Information

This generator does not have output capacity to power your entire home. Most home utility commercial electric service is in excess of 100 amperes at 240 volts which will exceed the output of this generator. Because of this, only key items can be powered (up to the ampere rating of the generator) during a utility power outage.

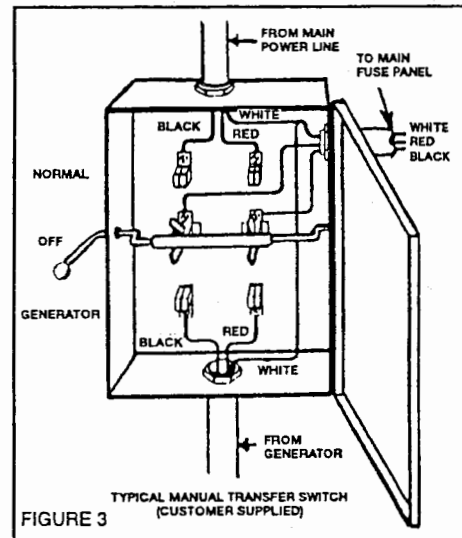


FIGURE 3
TYPICAL MANUAL TRANSFER SWITCH
(CUSTOMER SUPPLIED)

GENERATOR AND UTILITY POWER ISOLATION METHODS



If utilizing existing home electric circuits to power the emergency load, provide a positive means of insuring that the commercial power and portable generator powered are never fed to the load at the same time.

Never connect the generator output to any live home electric circuit(s). If the generator will be connected to existing home electric circuits during a commercial power outage, a positive means of isolating the commercial and generator power must be provided. The usual means of providing this isolation protection is to incorporate a suitably rated double throw, double pole manual transfer switch (Fig. 3). Installations must comply with all local and national codes.

California law requires isolation of the resident electrical system before connecting a generator to the electrical system.

A potential hazard exists during a power outage if the generator output is connected to the dead home electric circuits and no means is provided to isolate the home electric circuits from the commercial power source. A power company lineman working to return electric service to normal will open a switch between the main power supply and the spot where he is working. He has every right to believe that the line is dead. If the home electric circuits are not isolated the generator output will backfeed through the home electric circuits up to the power line and the line repairman may be electrocuted when he attempts repairs. If normal power and generator power are not isolated and the normal power is suddenly restored while the generator is still powering the home electric circuits, severe damage to the generator will occur and the possibility of a home electric fire and damage to home electric wiring circuits exists.

SUGGESTED HOME STANDBY INSTALLATION

A typical installation with an outdoor connection box, cord set and manual transfer switch is shown in Figure 4. The installation of the outdoor connection box and manual transfer switch must be performed by a licensed electrician or electrical contractor. The factory does not recommend operating or installing the generator indoors, instead an installation shown in Figure 4 is suggested. Store the generator in a warm dry location. During a utility power failure carry it outdoors to a flat dry area such as a drive way or walkway. Use a connection box and cord set (Fig. 4) to connect your home electric circuits to the 240 volt receptacle on your generator. Turn off the lights and appliances that were on before the utility power failure. This prevents possible overloading of the generator due to immediate demand for a large amount of power. Start the generator and then throw the manual transfer switch to the generator position. Turn load emergency items back on. Be careful not to exceed the output capacity of the generator.

When the utility power is restored, throw the manual transfer switch to the normal position. Your home electric circuits are now being powered by your utility. Disconnect the cord set from the connector box and generator. Shut down the generator. When the engine cools down service the engine and place the generator back in its warm, dry storage area.

HOME REWIRING

Any home wiring modification or the installation of a manual transfer switch and outdoor connection box (Fig. 4) must be done by a qualified and licensed electrician. He must be sure that the installation meets all applicable local and national codes. NOTE: Any permanent wiring installations must comply with the National Electric Code, and all local and state codes.

⚠ DANGER

Installing and wiring a home standby generator system using existing home electric circuits is not a do-it-yourself project. Consult a qualified licensed electrician or electrical contractor.

A) Emergency Circuit Isolation Method:

One method is to have the emergency circuits (important items to be powered in a power outage) grouped together and rewired into a separate junction box (this emergency circuit must not exceed the ampere rating of the generator) and connected to the generator by a cord set or directly wired into the generator. The manual transfer switch with an ampere rating equal to the ampere rating of the emergency circuit, would then be connected between the home load center panel and the emergency circuit junction box (Fig. 5). With this method it will be difficult to accidentally overload the generator. During a power outage, start the generator (with no load) and then place the manual transfer switch in the generator position. The emergency circuits will now be powered by the generator. When the normal power is restored the manual transfer switch should be placed in the normal position after the generator is shut down. The emergency circuits will now be powered by the normal power source.

B) Total Circuit Isolation Method:

If the emergency circuits are not or can not be rewired together in a separate junction box (Fig. 6), you will have to select the circuits and appliances to be powered by the generator. Caution must then be used to prevent the overload of the generator. The manual transfer switch ampere rating must be equal to the ampere rating of the normal incoming utility service. During a power outage start the generator with no load. All items in the home should be turned off. Place the manual transfer switch in the "generator" position. Selected emergency items can then be turned on. Be sure these items don't overload the generator. The emergency items left on home circuits will now be powered by the generator. When the normal power is restored the manual transfer switch is placed in the "normal" position and the generator is shut down. The home electric circuits will now be powered by the utility power source.

EMERGENCY CIRCUIT ISOLATION METHOD

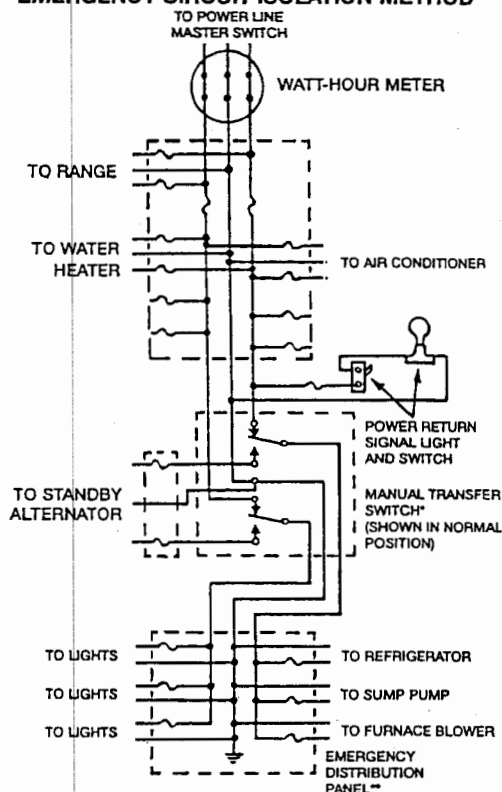


FIGURE 5

* AMPERE RATING MUST EQUAL OR EXCEED THE AMPERE RATING OF THE EMERGENCY DISTRIBUTION PANEL.
 ** AMPERE CAPACITY NOT TO EXCEED THE GENERATOR RATING. ONLY THESE ITEMS WILL BE POWERED BY STANDBY GENERATOR. IF ELECTRICIAN SIZES THE LOAD PROPERLY, THE GENERATOR CAN'T BE OVERLOADED. ALL WIRING MUST CONFIRM TO NATIONAL ELECTRIC CODES AND ALL STATE AND LOCAL CODES. CONSULT A QUALIFIED, LICENSED ELECTRICIAN. THE ILLUSTRATION TO THE SIDE ASSUMES 120/240 VOLT SINGLE PHASE ELECTRIC SERVICE IS BEING SUPPLIED BY THE UTILITY.

TOTAL CIRCUIT ISOLATION METHOD EMERGENCY CIRCUIT ISOLATION METHOD

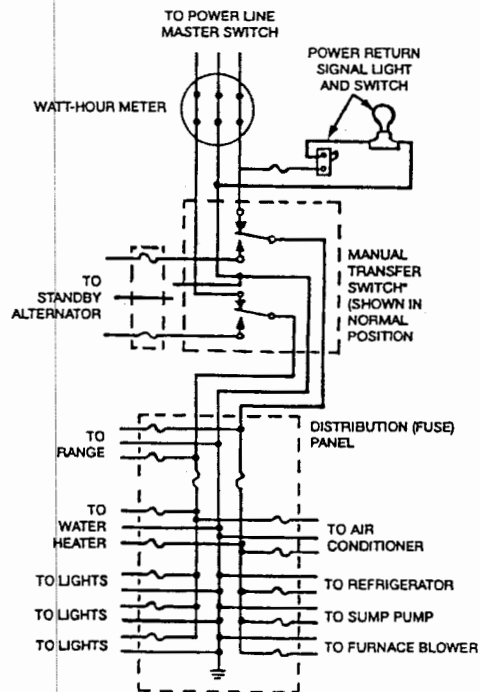


FIGURE 6

NOTE:

WITH THIS SYSTEM, CAUTION MUST BE USED TO PREVENT OVERLOAD OF THE GENERATOR DURING UTILITY POWER FAILURE. ALL LOAD ITEMS IN THE DISTRIBUTION PANEL MUST BE INDIVIDUALLY TURNED OFF. ONLY CERTAIN ITEMS CAN BE TURNED BACK ON DURING GENERATOR OPERATION. THESE ITEMS SHOULD BE SPECIFIED BY YOUR ELECTRICIAN SO AS NOT TO OVERLOAD THE GENERATOR. ALL WIRING MUST CONFORM TO THE NATIONAL ELECTRIC CODE AND ALL STATE AND LOCAL CODES. CONSULT A QUALIFIED LICENSED ELECTRICIAN. THE ILLUSTRATION TO THE SIDE ASSUMES 120/240 VOLT SINGLE PHASE ELECTRIC SERVICE IS BEING SUPPLIED BY THE UTILITY.

* MANUAL TRANSFER SWITCH POSITION DETERMINES WHICH POWER SOURCE, UTILITY OR STANDBY GENERATOR WILL FEED INTO THE DISTRIBUTION PANEL

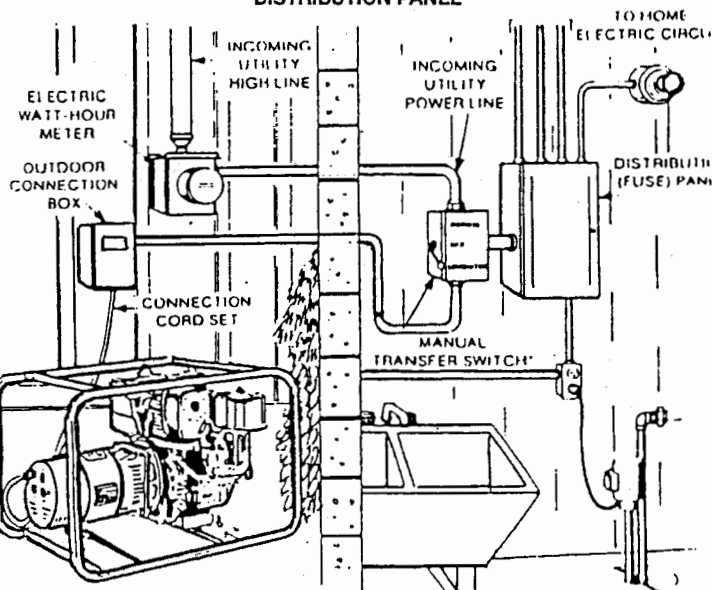


FIGURE 4

INFREQUENT SERVICE

If the unit is used infrequently, extended shut-down periods can result in difficult engine starting. If let to stand in the engine fuel tank for a long period of time, gasoline will tend to form a varnish like substance which will clog up the fuel system and carburetor. The result will be a hard-to-start engine. Check with your local engine manufacturer dealer for his recommendation of a gasoline additive to prevent varnish formations. To eliminate hard starting, run the set at least 10 minutes every 4 to 5 weeks. This will also ensure that the engine seals will not dry out and cause oil leaks and compression problems.

The use of a fuel additive such as Sta-bil® or any other equivalent will minimize the formation of gum deposits.

OUT-OF-SERVICE PROTECTION

If the unit will be out-of-service for more than six months, the following procedures are recommended:

1. Run the unit until it reaches normal operating temperature, 15-30 minutes, then shut it down.
2. Drain the fuel from the carburetor fuel bowl.
3. Drain the oil from the engine base while the engine is still warm. Fill with fresh oil.
4. Remove the spark plug. Pour 1 oz. (two tablespoons) of engine oil into the cylinder. Crank the engine slowly by hand. Reinstall the spark plug but do not tighten.
5. Service the air cleaner.
6. Plug the exhaust outlet to prevent entrance of moisture, bugs and dirt.
7. Clean the entire unit. Coat parts which may rust with a light film of grease or oil.
8. Provide a suitable cover for the unit. Avoid storing the unit where it will be exposed to extreme low or high temperature ambients or excessive moisture.
9. Before restarting, remove all protective material (grease, oil, covers, etc.). Remove spark plug and pull rope starter several times to exhaust excess oil from cylinder.

WATTAGE REQUIREMENTS

Important facts and information on how to determine the load your generator will handle...

When determining the generator load, it is critical for you to decide what equipment and/or appliances you want to operate at the same time. The following 5-step method will help you determine what size load this generator can power. This procedure will help you avoid the mistake of choosing a load that exceeds the capacity of the generator. Electric motors present a special problem when figuring the proper generator size, so please read step 3 very carefully.

Here's how to determine the load...

1. Make two lists, one of the electrical motors and the other of all the lights, small appliances, etc. that must be powered by the portable generator. For stand-by emergency service you should only include essential equipment (refrigerator, sump pump, etc.) which must be kept in operation.
2. Enter the watts required to operate each item (except motors, see step 3). This wattage figure can usually be found on the light bulb or appliance nameplate. If the wattage is not listed, you can determine the wattage by multiplying the amperage by the voltage (both figures are found on appliance nameplate). NOTE-the formula for finding wattage is voltage x amperage = wattage.
3. Electric motors present a special problem. They usually require 3-4 times their nameplate amperage or wattage to start them from a locked condition (motor completely stopped). For example: If the electric motor's nameplate states 10 amps at 120 volts, the $10 \times 20 = 1200$ watts running. This figure has to be multiplied by three times to figure the starting watts needed. In this example that would be 3600 watts. The starting watts figure is the one that must be used., not the nameplate or running watts figure, when figuring the load to be powered by the generator.

IMPORTANT- Air compressors, circular saws, 1/2" drills, submersible pumps inverters and air conditioners require heavy motor starting current (this means at least three (3) times the nameplate amps or wattage). These items are typically rated at 10 amps or 1200 watts running on 120 volt circuits. This means these items require a single circuit rated at least 30 amps at 120 volts. Before starting these devices with your generator, check that your generator has a single circuit of 30 amps at 120 volts.

Consult factory for reconnecting to straight 120 volts, see back cover.

NOTE: Some motors, such as those used in hair dryers, food mixers, etc. require approximately the same wattage to run as to start. See chart below for some examples or check appliance nameplate for wattage.





4. Add the watts required for those items in step 4 to cover forgotten items. Special notes: If more than one motor is to be started, start one motor at a time and always start the largest first. If trying to take the entire load of the generator from a single generator receptacle, be sure the ampere rating of the receptacle is not exceeded.

Typical Motor Wattage






For motor-driven electric appliances and equipment such as refrigerators, washing machines, air conditioners, pumps, oil burners, furnace blowers, barn cleaners sump pumps, check the typical motor wattage requirements listed in chart below. This chart is a guide but always check your specific motors for actual requirements.

RECEPTACLES AND PLUGS

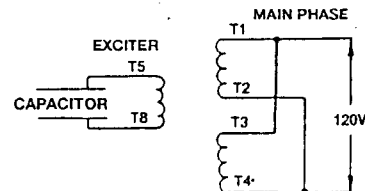
120 VOLTS

RECEPTACLE	REQUIRED PLUG	PART NO.
5-15R 	5-15P	5266
5-20R 	5-20P or 5-15P	—
L5-30R 	L5-30P	6004
CS6370 	CS6361	—

240 VOLTS

RECEPTACLE	REQUIRED PLUG	PART NO.
L14-20R 	L14-20P	2454
L14-30R 	L14-30P	6005
CS6369 	CS6365	3262
6-15R 	6-15P	2020
6-20R 	6-20P	—

SCHEMATIC DIAGRAMS LR30H AND LR30K



LR50H, LR50IP, LR50V, LR60H, LR60HE, LR60IP, LR60K, LR70EHI, LR80EI, LR105EI, LR105EHI, LR105KE, LR150, LA50EL, LA60EL, LR105D

