

# OWNER'S MANUAL

# UCM2-5.5

S/N \_\_\_\_\_

# GENERAL/SAFETY PRECAUTIONS

## CAUTION

Unless your **GEN-SET** has been specifically ordered and built as an ignition protection certified unit, this set must not be installed in gasoline powered vessels, or where any flammable or explosive gases are present. If your unit is ignition protection certified, there will be a decal on the starter indicating that the unit is protected. If you have any doubt, please call Next Generation Power at 888-463-9879 before installation.

Please read the entire owner's manual before attempting to install or run your generator set. Safe and proper operation can only be achieved by following the installation, operating and maintenance directions that are laid out for you.

- Always have qualified electrical servicemen do any a.c. connection and service to avoid any possible danger of electrical shock or damage to other electrical equipment onboard.

Frequently inspect all power cables and wiring, initially for proper gauge and connection

- and later for signs of fraying or deterioration. Remember to use extra caution when handling any electrical equipment as neglect, misuse or deterioration can cause dangerous or deadly electrical shock or injury.

Never operate the generator set with any guards or covers removed.

- 
- Engine must be completely stopped and fully cooled down before any maintenance or service can be performed.

Children and pets should be kept away from the generator set at all times.

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- Never clean your generator set with running water, unit should be cleaned only when stopped with a damp or dry rag on outside surfaces only.

Disconnect battery from Gen-set before performing maintenance and service procedures.

- 
- As well as following the directions given in this owner's manual all installations should follow the recommendation of:

**A.B.Y.C.**, American Boat and Yacht Council  
**N.F.P.A.** National Fire Protection Association  
**U.S.** Coast Guard Regulations

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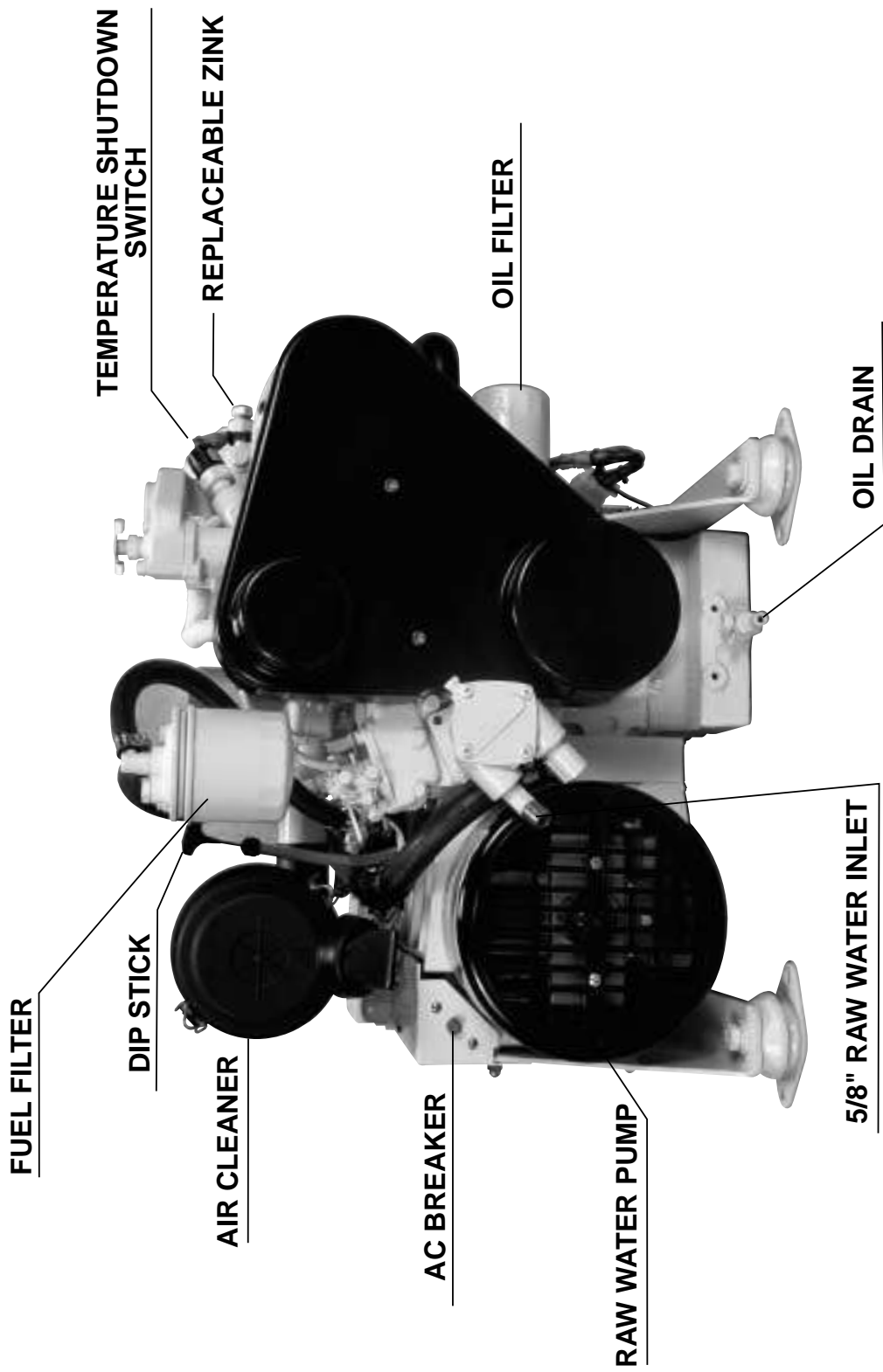
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# UCM2-5.5 SPECIFICATIONS

|                                       |  |
|---------------------------------------|--|
| Type.....                             | Vertical water cooled<br>4 cycle diesel engine |
| # of cylinders.....                   | 2  |
| Bore x stroke [in.].....              | 2.64 x 2.68                                    |
| Displacement [cu. in.].....           | 29.23  |
| SAE net intermittent (HP/rpm).....    | 11.0 @ 2800                                    |
| Combustion system.....                | Three Vortex                                   |
| Compression ratio.....                | 23:1   |
| Fuel injection pump type.....         | Bosch "mini" type                              |
| Nozzle type.....                      | Bosch "throttle" type                          |
| Cooling system.....                   | Fresh water heat exchanger                     |
| Lubricating system.....               | Forced lubricating with filter                 |
| Fuel.....                             | ASTM #2 diesel or equivalent                   |
| Lubricating oil.....                  | Quality better than API service CC class       |
| Fresh water capacity.....             | 2.0  |
| Lubricating oil capacity (US Qt)..... | 2.2  |
| Measurement (L x W x H) in.....       | 23 x 17 x 20                                   |
| Dry weight (lbs.).....                | 230 lbs.                                       |
| Starting system.....                  | 12V Battery                                    |
| Charging System.....                  | Optional                                       |
| Fuel Line diameter.....               | 5/16"  |
| Return line diameter.....             | 1/4"   |
| Raw water diameter.....               | 5/8"   |
| Exhaust diameter.....                 | 1 1/2"   |
| Output Voltage.....                   | 120/240  |
| Output Amps Intermittant.....         | 46/23  |
| Output Amps Continuous.....           | 42/21  |
| Output Watts Intermittant .....       | 5500   |
| Output Watts Continuous .....         | 5000   |

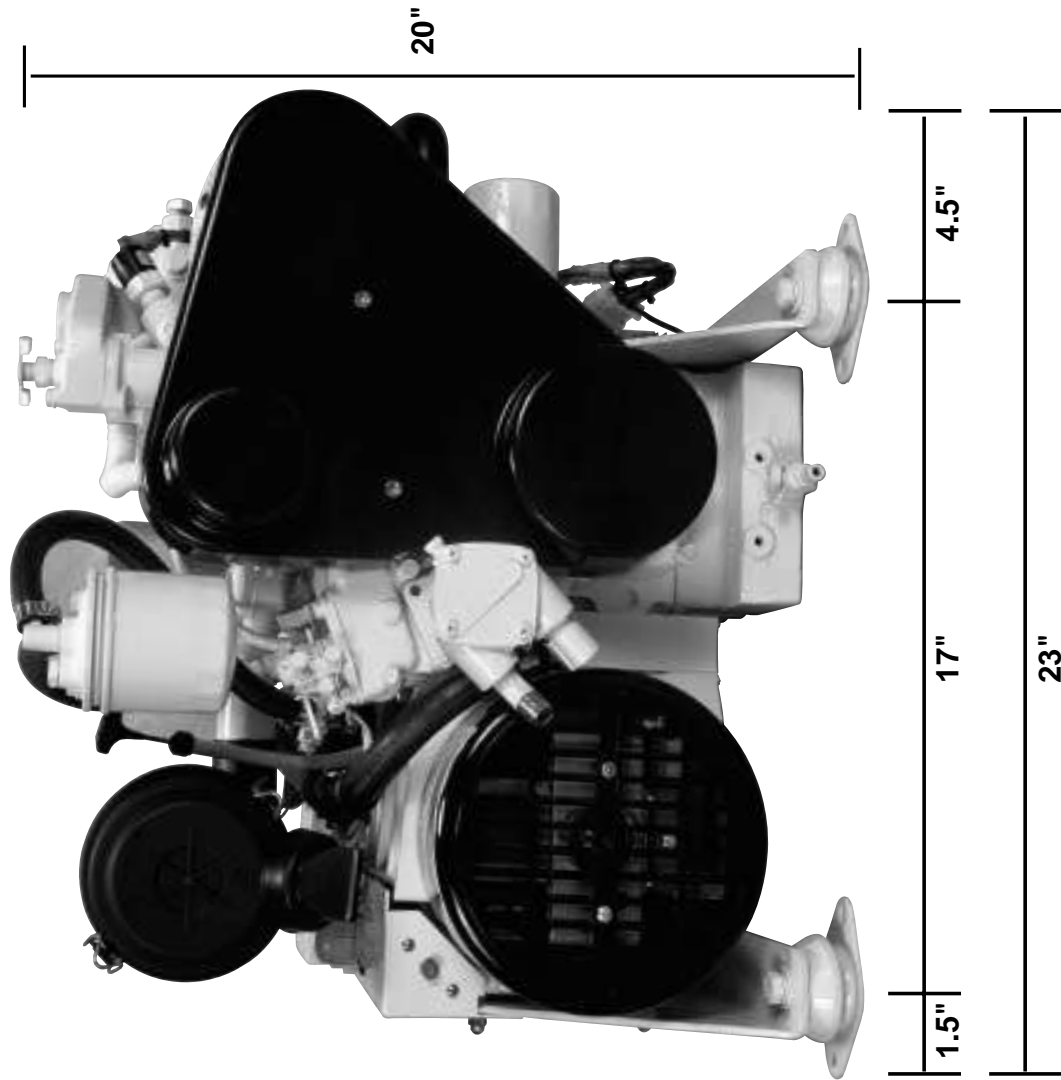
# UCM2-5.5 SPECIFICATIONS

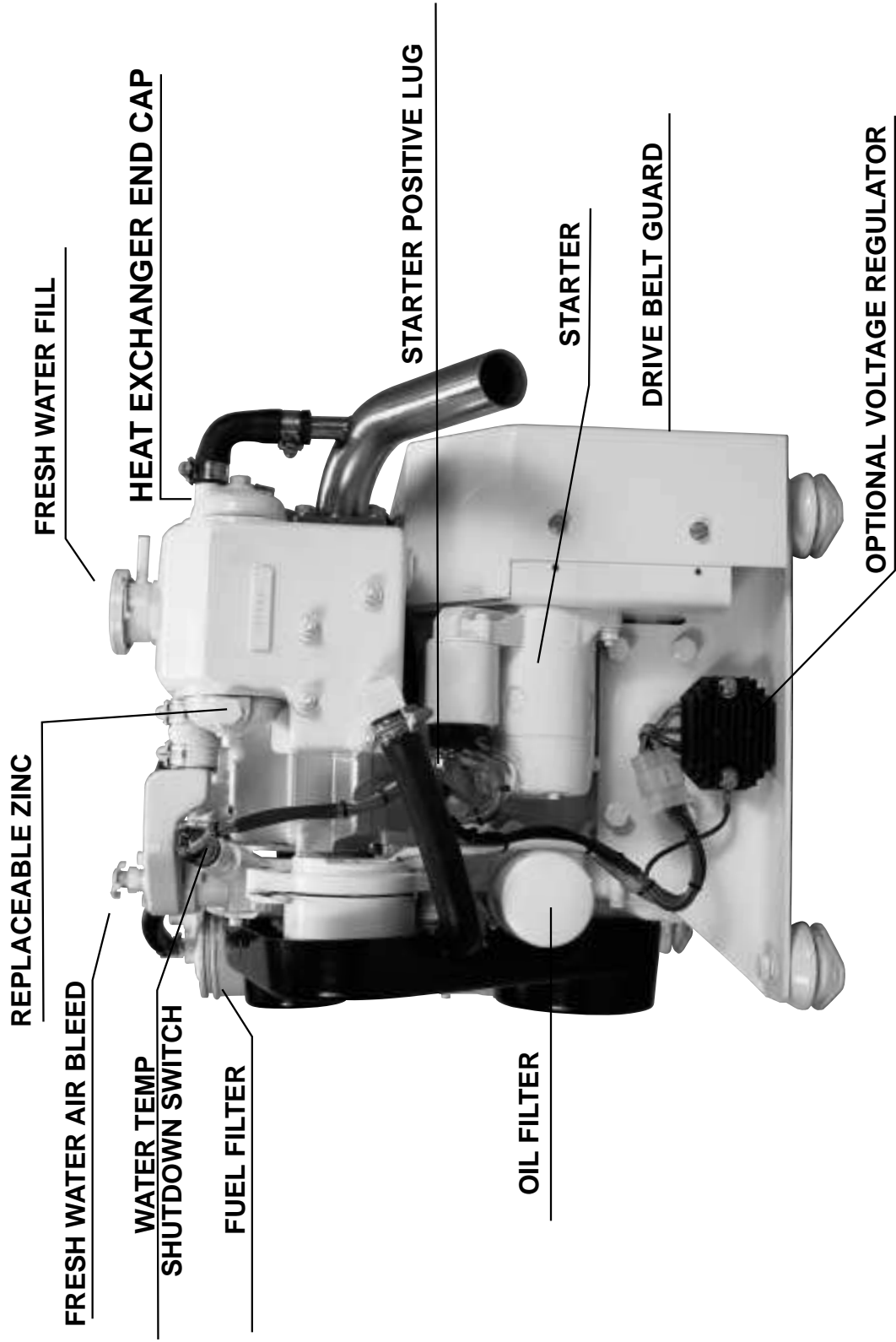
|                              |          |         |                    |
|------------------------------|----------|---------|--------------------|
| 60HZ Rating Intermittant     | 5.5 k.w. | 5.5 KVA | 1.0 P.F.           |
| 60HZ Rating Continuous       | 5.0 k.w. | 5.0 KVA | 1.0 P.F.           |
| 50HZ Rating Intermittant     | 5.5 k.w. | 5.5 KVA | 1.0 P.F.           |
| 50HZ Rating Continuous       | 5.5 k.w. | 5.5 KVA | 1.0 P.F.           |
| Voltage/Frequency Regulation |          |         | ± 5%               |
| Recommended Battery Size     |          |         | 100 A.H. or Larger |
| Total Air Required           |          |         | 150 CFM            |
| Fuel Pump Lift MAX           |          |         | 3.0 FT             |
| Water Pump Lift Max          |          |         | 4.0 FT             |
| Cooling water Flow           |          |         | 3.0 Gal./Min       |
| Fuel Consumption Max         |          |         | .50 Gal/Hr         |
| Fuel Consumption Avg.        |          |         | .25 Gal/Hr.        |



**GENERAL LAYOUT FRONT VIEW  
FIGURE 1**

# DIMENSIONS

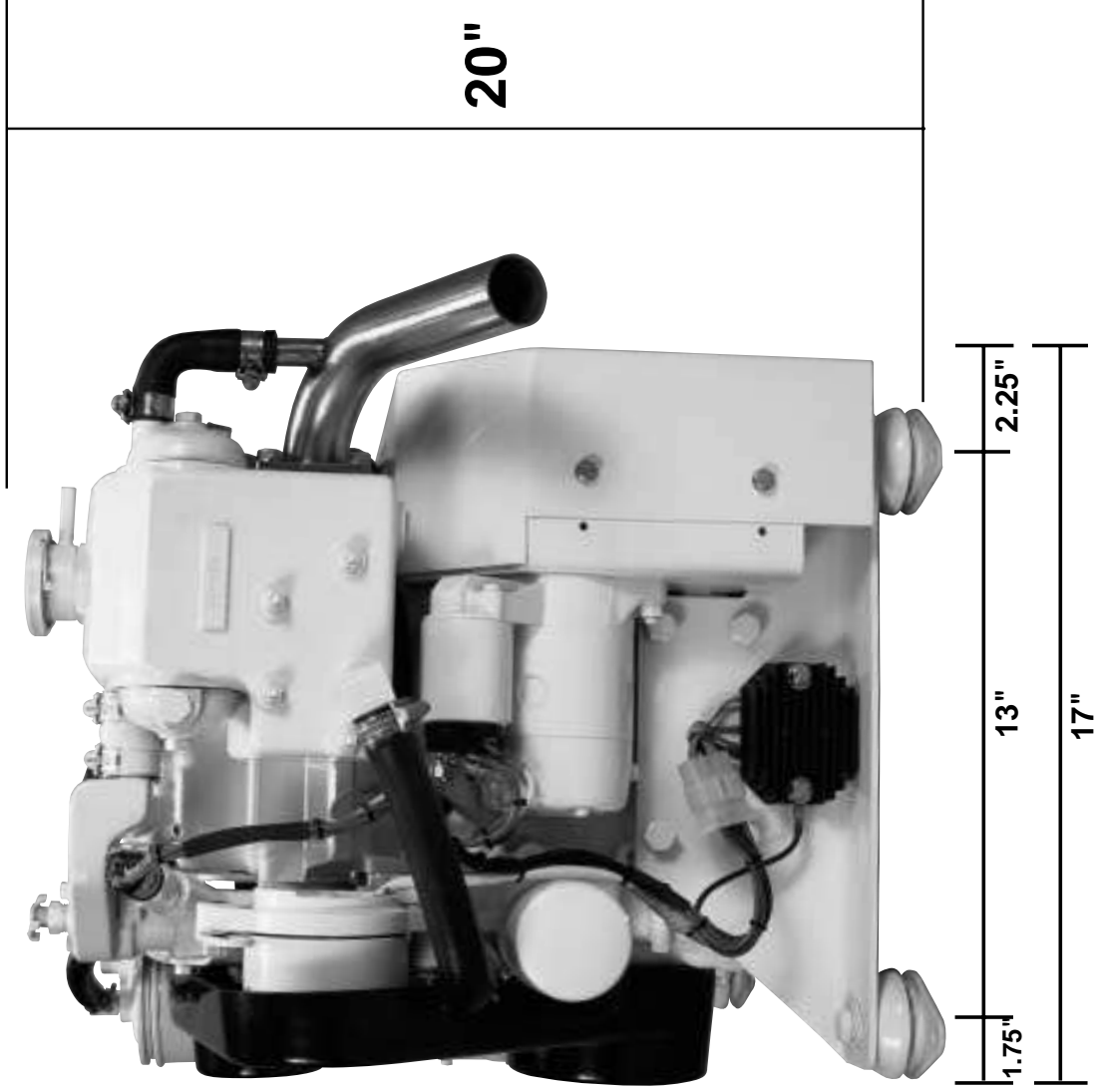


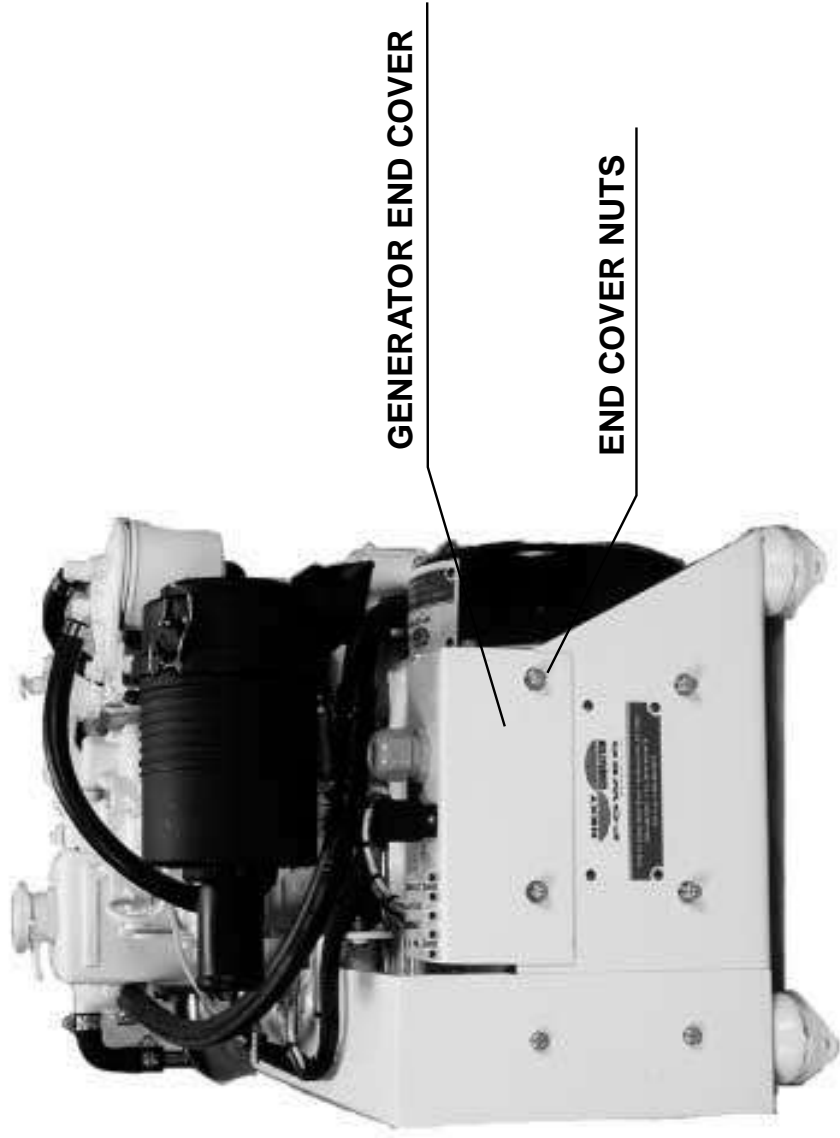


**GENERAL LAYOUT STARTER SIDE VIEW  
FIGURE 2**



# DIMENSIONS





**GENERAL LAYOUT GENERATOR SIDE VIEW  
FIGURE 3**

# SELECTING A LOCATION

The following factors should be considered before selecting the location where your Gen-set will be installed.

## **PROXIMITY TO LIVING QUARTERS**

- If several locations are available it is advisable to install the set furthest away from living/sleeping quarters to keep noise levels in these areas to a minimum.

## **DRYNESS OF LOCATION**

- Where at all possible try to keep the Gen-set from under outside hatches where water (especially salt water) may drip or splash.
- If a location under a hatch is chosen, provisions should be made to divert any water away from the set. If a damp location is the only option a sound shield may be advisable to keep as much moisture away from the set as possible.

## **\*REMEMBER WATER AND ELECTRICITY DO NOT MIX.**

## **VENTILATION**

- Air must be available to the Gen-set for both combustion and generator cooling, therefore you should try to select a spot that already has adequate air flow or where inlet and exhaust fans can be installed.

## **PLUMBING**

- Consideration must be given to fuel, raw water, exhaust and electrical connections

## **SERVICING**

- Unit must be accessible for regular and long term maintenance.

## **SPACE**

- There must be enough space around all sides of the set for movement on the isolation mounts. One to two inches on all sides with extra room on the front side for maintenance would be the minimum required.

All of the above factors should be considered before deciding on the permanent location of your generator set. Keep in mind while selecting your location that the easiest place to install the set may not be the best long term home for the unit. It is always better to spend more time routing plumbing etc. initially, than to select an easy install spot where the unit can't be serviced later, or is under a leaky hatch where it will rust away.

In most cases where space permits the engine room is usually the best place for a Gen-set as it usually has adequate ventilation, access to plumbing, sound proofing etc.

# MOUNTING

Due to wide variations in boat styles and designs, it is impossible to give a complete description of any one particular installation. Following are guidelines to which one may follow to achieve an acceptable and safe installation.

The **NEXT GENERATION** Ultra Compact set is of a very rugged design with a fully pressurized oil delivery system allowing continuous running at angles up to 20 degrees in any direction. It is slightly advantageous to mount the set on the vessels centerline but if not possible mount where otherwise suitable.

No matter where the unit is placed it must be securely attached to a platform, rails or stringers. If a flat relatively level platform is not available, one should be constructed out of a minimum 3/4" thick marine grade plywood or 1/4" aluminum plate. Base must be lagged, bolted or glassed securely to the stringers.

Through bolting is the best way to secure the isolators to the base, 5/16" diameter stainless steel bolts with large washers should be used. If you have a wood base and do not have bottom access for through bolting 5/16" diameter stainless lags with large washers may be used. If at all possible when lag bolting a unit in place try to align as many mounts over stringers as possible so that extra long 2" or 2 1/2" lags secure the mounts through the base to the stringers. A spot of silicone or marine caulking on the lag bolts works well in sealing moisture out of wood where lags penetrate.

Some isolator mounting bolts may be hard to reach once the set is in place, if so the following procedure is very helpful.

- 1) Position generator set in exact desired location on platform with mounts rotated for easiest access.
- 2) With a pencil or marker trace around as much of the four mounts as possible including mounting holes.
- 3) Lift Gen-set back out of location and remove the four isolation mounts by loosening the center nuts on mount studs.
- 4) Using one of the mounts as a template you can finish marking any of the 8 mount holes that could not be marked with the unit in place.
- 5) Bolt or lag the mounts to the base as already discussed, (mounts are not attached to the Gen-set at this time).
- 6) Gen-set may now be lowered back onto mount studs and center nuts replaced and tightened.

**\*NOTE:** All 8 mounting holes must be used. ie; two lags or bolts per mount.

# VENTILATING

As previously mentioned, the Gen-set needs air for both combustion and for generator winding cooling. By far generator cooling requires the most air (approx. 125-150 CFM) and since it is not consumed it must be evacuated from around the set.

If the Gen-set is installed in a reasonably sized engine room with good natural airflow, it is possible that no blowers or fans need to be used, especially while the vessel is in motion. It is possible for excessive temperature to be reached in the same engine room under various conditions, such as in very hot climates, when vessel is not in motion, or when main engines are running while Gen-set is running etc.

The only sure way to know if there is adequate air-flow is to monitor engine room temperature on a hot day under various operating conditions. Temperature should be checked near the black plastic air inlet of the generator and should not exceed 140 degrees fahrenheit.

If the Gen-set is to be installed in a smaller separate enclosure or compartment, an opening of 25-35 square inches is needed to admit air in. This combined with a blower fan of 125-150 CFM or more to force air out is required. It is best to have the air inlet near the black plastic air intake or the generator with the evacuation fan being on the far side of back wall of the compartment. In general we are trying to draw cool air into the compartment near the air inlet end of the generator to cool the window, than draw the air over the Gen-set and out the opposite end.

The blower fan may be a 12 volt D.C. unit operated off of a switch or could be a 120V A.C. unit connected directly up to the output of the generator. A 120 volt A.C. model running off of the generator would of course start and stop automatically. It has been our experience that the more expensive squirrel cage style blowers are far quieter in operation than the axial type units.

**\* CAUTION - IF YOU ARE INSTALLING IN A GASOLINE POWERED VESSEL ALL ELECTRICAL COMPONENTS MUST BE IGNITION PROTECTION CERTIFIED.**

# SOUND PROOFING

Due to reduced running speed, special air intake modifications, helical offset tooth drive design and excellent vibration mounts it is seldom necessary to purchase a sound blanket or shield for your **Next Generation Gen-set**. Most engine room installations provide sound and vibration levels totally acceptable to most owners. Nextgen offers optional fiberglass sound enclosures to further reduce noise.

In many installations a small amount of deadening material attached to bulkheads and hatches changes a reasonable installation into a great one with minimal cash outlay.

Generally it is our opinion that when and where possible it is better in terms of serviceability and heat build up to install a Gen-set without a sound shield and to spend some of the money saved on a bit of sound dampening material.

If your set is placed in a separate small compartment with ducting and venting as advised, the entire compartment can be insulated to provide the ultimate noise reduction.

When a set is placed near living quarters or under floorboards, a reduction in noise may be found by remote mounting an air intake silencer as far away as possible using flexible intake hose. Consult **Next Generation Power** for our recommendation on this.

# FUEL SYSTEM

The Fuel Filter supplied is a fine 2 micron secondary filter and must be used in conjunction with a customer supplied 20-30 micron primary filter/separator. All filters should be mounted in a spot that is easy to access for servicing. Make sure to leave enough room below the filter bowl for easy draining and changing of filters.

If possible it is best to use a separate fuel pickup for the Gen-set as well as a dedicated primary filter. This generally will eliminate fuel starvation problems due to suction created by other engines running off of the same supply.

When it is not feasible to run a separate fuel pickup and filter, it may be possible to use a second fuel outlet on a main engine primary filter. If you do this, both the main engine, and Gen-Set should be carefully monitored after initial installation to determine that fuel starvation is not happening. Fuel starvation would show up as loss of speed and frequency on the Gen-Set and would typically occur at high load conditions.

A minimum of 5/16" diameter marine diesel approved fuel line, should be used from the primary filter to the secondary filter, and from the secondary filter to the barbed fuel inlet fitting on the fuel pump. (see fig 4)

1/4" diameter fuel line is to be used for the return line and runs from the fitting on the injector shown in Fig. 4 back to the top of the fuel tank. Fuel return must be returned to the tank and not tied back into fuel system as air will be recirculated and cause intermittent shut down. Very little fuel is actually returned at very low pressure. Return fuel line can run uphill with no problem.

Air is bled from the fuel system at the fuel bleed banjo fitting shown on Fig. 7 . Bleeding of this system only needs to be done at this fitting and not at the injection pipe or the injector itself. Full instructions for this procedure are given under initial start up procedures.

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**\*NOTE:** Most initial run problems and intermittent shut down situations are due to fuel supply leaks introducing air into the system, even small amounts of air will cause erratic running or immediate shut down. All fittings should be double checked for tightness, fuel pickups should be inspected and hose clamps secured.

Always use hose clamps of the correct size, too large a clamp reduced to a very small size will not remain completely round and air leaks will result.

**\*HINT:** When there is excessive lift or a long run from the fuel supply tank to the Gen-Set, there is a small possibility of fuel starvation and a greater chance of air entering the fuel system. If you have a situation such as this a secondary fuel pump mounted near the fuel tank pushing fuel to the set will help cure this situation.

**1/4" DIA FUEL RETURN**



**LIFTING EYE**

**5/16" DIA FUEL INLET**

## **FUEL CONNECTIONS FIGURE 4**



# COOLING SYSTEM

The Next Generation Ultra Compact 2 and 3 cylinder machines are completely fresh water marinized with the following components: Direct coupled self priming raw water pump, water cooled exhaust manifold, heat exchanger built into manifold/expansion tank, stainless steel exhaust elbow.

Fresh water anti-freeze mix is added to the engine through the cap at the top of the heat exchanger tank. Mixture should just cover the heat exchanger tubes leaving 1/4" - 3/8" of space for expansion. In warm climates we recommend approximately 30 % anti-freeze and 70% water mix. If you are operating in cold climates where you have danger of freezing up to 50% antifreeze may be used. If more than 50% antifreeze is used, overheating will almost always result.

Excess water may flow out of the overflow tube located below the pressure cap, this is normal and should only happen during first warm up after filling. A coolant catch can may be used to keep this excess coolant from getting into the bilge.

Because of the cooling design you can see operating temps of 170 degrees to 210 degrees F. These engines are very thermally stable and can be run at temperatures up to 220 degrees F.

Raw water is circulated through the heat exchanger and out the exhaust by a direct driven self priming pump located at the front side of the unit (see Fig. 1). A clean constant supply of raw water must feed the pump, generally via a through-hull, sea cock, and sea strainer. Raw water supply fitting is 5/8" diameter so a through-hull and strainer of 3/4" -or larger is fine.

Scoop type water pickups should never be used as water will be forced through the pump and into the exhaust system while the vessel is in motion. This is very dangerous as the exhaust will eventually fill and raw water will back up into the engine through the exhaust valve. Catastrophic failure will result as soon as the engine is re-started.

**\*NOTE:** All raw water hose fittings and clamps should be of an approved marine grade with all connections double clamped. Any bad connections or loose clamps could cause flooding and sinking of the vessel.

If the top of the heat exchanger is less than 10 inches above water line there is a danger of water siphoning through the raw water pump into the exhaust. This must be corrected by installing an anti-siphon valve or siphon brake into the raw water plumbing. The easiest place to install the siphon brake is between the raw water discharge on the heat exchanger and the raw water inlet of the exhaust mixer. The piece of hose that is in place from the factory is removed and the siphon brake is installed according to the manufacturer of the brake. Usually the siphon brake is mounted 18 - 24" above water line to be effective.

# EXHAUST SYSTEM

The water cooled stainless steel exhaust elbow is 1 1/2" OD and should be used in conjunction with a water lift exhaust muffler and 1 1/2" I.D. approved marine grade exhaust hose. All connections must be double clamped.

Water cooled exhaust systems such as the type used on the Next Generation Ultra Compact Generator should be installed with a waterlock or muffler. There are many different styles and brands of these mufflers that will work fine. Many times the choice made will be based on physical size or inlet/outlet arrangements. We at Next Generation Power have had excellent results with the heavy duty fiberglass "Vernalift" units made by Centek. Two arrangements are available in the 1 1/2" size; top in top out P/N 1500001 and side in top out P/N 1500018.

Most installation situations are shown on the following diagrams supplied by Centek. The most important consideration is that the exhaust run down hill into the waterlock muffler so that exhaust flooding does not occur.

# VERNALIFT INSTALLATION

Please follow these installation instructions carefully for safe operation and to avoid damage to the muffler system or the engine.

1. The Vernalift is a WET marine exhaust muffler.
2. The Vernalift is designed for flow in one direction only, please note labels on muffler carefully.
3. There must be sufficient distance between the water injection point and the Vernalift to adequately cool the exhaust gases. We recommend a minimum of two feet. Maximum operating temperature should not exceed 250° F. A normal, well designed system should run between 150-180° F.
4. If the exhaust manifold is near or below the waterline, a siphon break must be installed to prevent continued water flow after engine shut down (figures 2 & 3).
5. The Vernalift should be installed at the lowest point of the exhaust system with the top of the muffler at least 12" below the manifold outlet. The possibility of reverse flow of water increases if installed at less than 12". When space constraints do not allow for this height difference, it is strongly recommended that a diaphragm ("goose-neck") be installed in the system (figure 3).
6. Install the Vernalift as close to the centerline of the vessel as possible, to minimize the effects of heeling and is especially important on sailboats.
7. Making connections:
  - a. Use approved marine exhaust hose for all connections. This will help to isolate the muffler and other components from vibration. Do not connect other components to the muffler in a rigid fashion by using adhesives and/or FRP reinforcements.
  - b. Do Not coat hose or muffler with oil or grease, use water for lubrication.
  - c. Use minimum of two stainless steel hose clamps per end connection; tighten clamps with screwdriver or small wrench. Do not use air wrenches.
8. Add a loop at outlet side of muffler that is 18" above waterline.
9. This may not be necessary for above waterline installation (figures 1, 2&3). Outlet hose should run continuously downhill for self draining; a Centek Vernalone™ inline muffler can be installed in this line for further silencing.

The Vernalift is recommended for both gasoline and diesel propulsion & generator engines. It is designed to withstand many, many times the normal operating pressures. **This does not mean that it can withstand the extreme instantaneous pressures associated with back-fire.**

**WARNING!** A Back-fire is caused by an unturned or difficult starting engine. Should a back-fire occur, an immediate and thorough inspection of the entire exhaust system is recommended, and the engine must be checked for cause of back-fire.

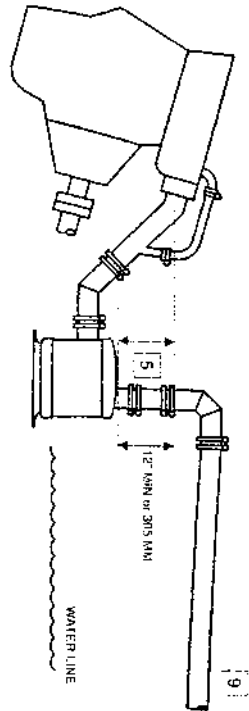


FIG. 1 ENGINE INSTALLATION ABOVE THE WATERLINE

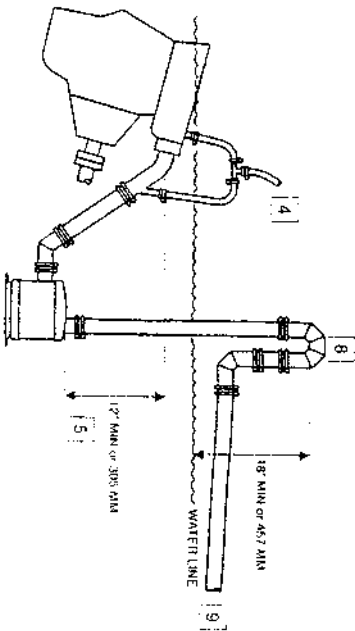


FIG. 2 ENGINE INSTALLATION BELOW THE WATERLINE WITH SPACE AVAILABLE FOR MUFFLER BELOW ENGINE

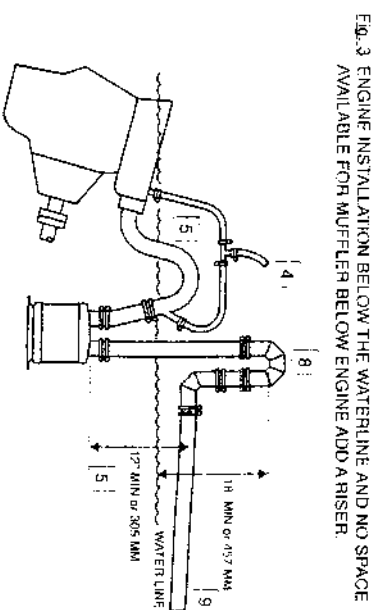
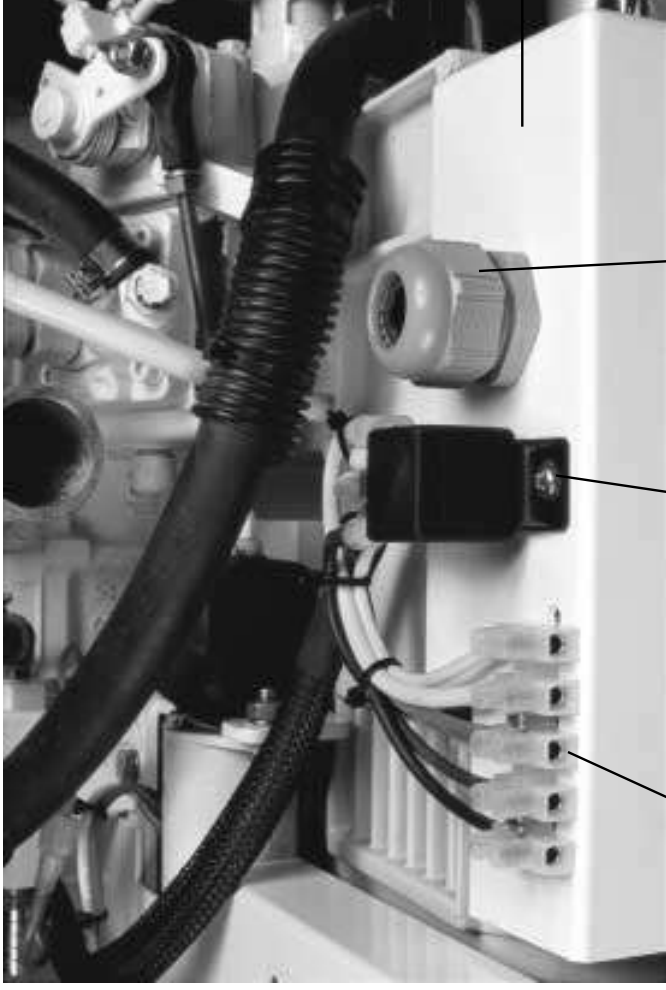


FIG. 3 ENGINE INSTALLATION BELOW THE WATERLINE AND NO SPACE AVAILABLE FOR MUFFLER BELOW ENGINE AND A RISER



ELECTRICAL COVER

AC ELECTRICAL OUTPUT  
CONNECTOR

STOP RELAY

REMOTE PANEL  
CONNECTION BLOCK

**GENERATOR END DETAIL  
FIGURE 5**

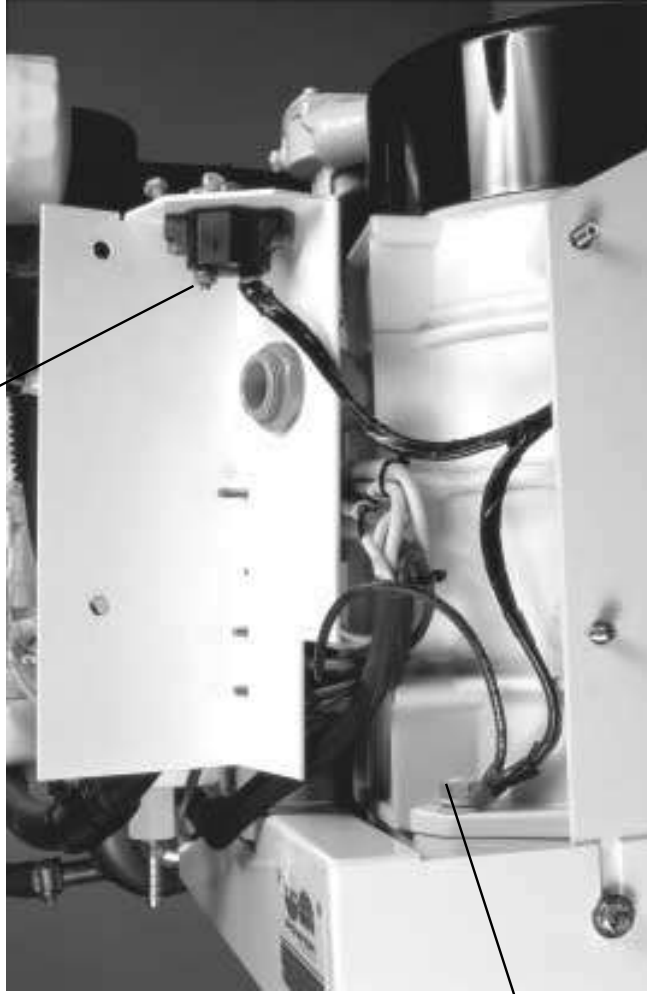
## D.C. ELECTRICAL

The Ultra Compact series of generators uses a very simple 12V D.C. system for starting, running, and shutdown. The standard model does not have battery charging capability but it is available as an option. Most installations simply use a house or main engine battery for starting, when the generator is running an AC battery charger is used. While the Gen-set is in operation it uses 3-4 amps of 12 Volt D.C.current to operate the fuel solenoid and fuel pump.

Battery cable size should be determined by length of run but 4 gauge is usually adequate. Battery positive is connected to the top lug on the starter solenoid shown in Fig. 2. Battery negative may be connected to any convenient stud or bolt connected to the engine above the isolation mounts.

The remote panel wiring harness is color coded and should be connected to the connection block shown in Fig. 5. Ten and twenty foot extension harnesses are available from **Next Generation Power.**

**120 VOLT  
"HOT" CONNECTION**



**GROUND LUG**

**AC ELECTRICAL CONNECTIONS  
FIGURE 6**

# A.C. ELECTRICAL

\*All A.C. Electrical connections should be made or inspected by a licensed marine electrician.

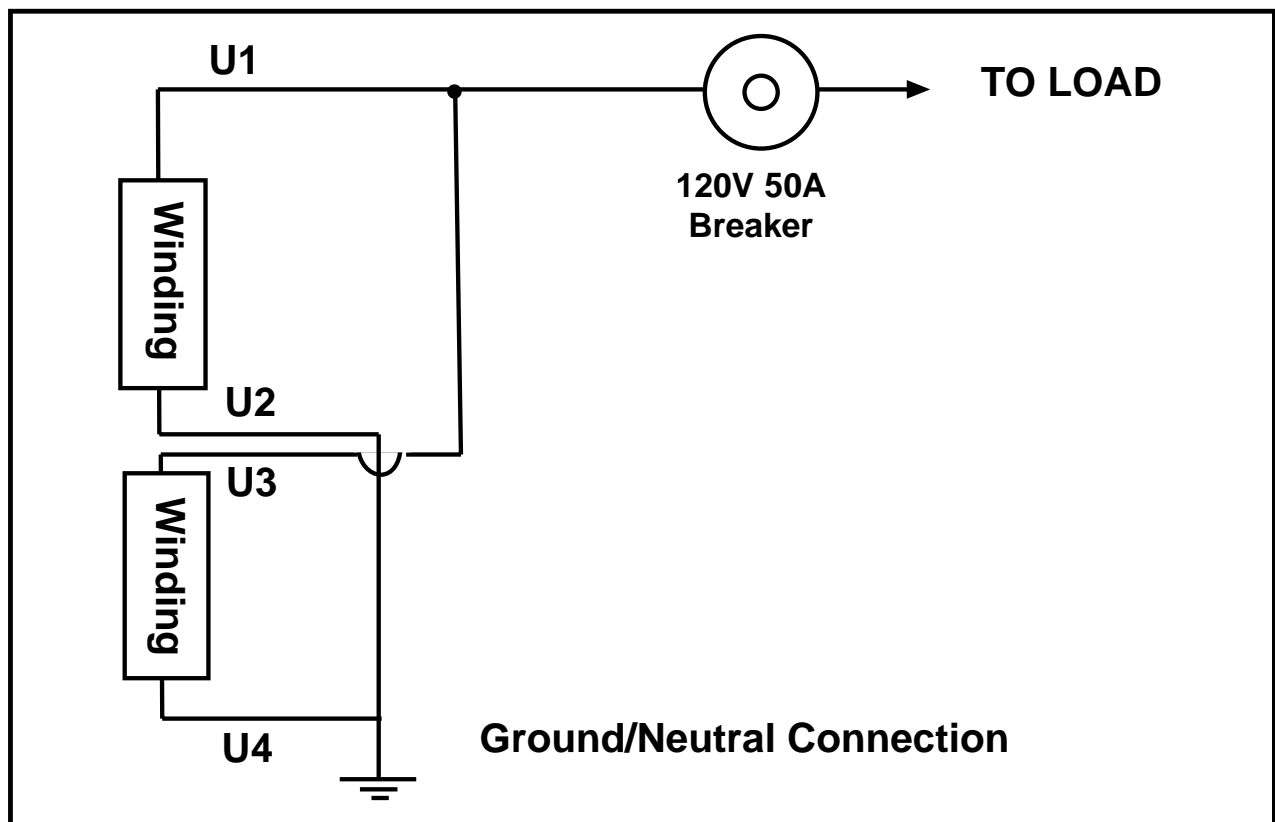
## **Standard 120V 60 HZ Output**

Unless otherwise specified the **UCM2-5.5** is manufactured using a standard four wire capacitor regulated brushless generator. Standard wiring is 120V 60 HZ output.

Access to the A.C. output connections is made by first removing the two stainless steel acorn nuts holding the end cover in place (see Fig. 3).

The hot leg (usually the black wire) of the vessel should be connected to the unused output terminal of the breaker (see Fig. 6). Ground and neutral wires (usually green and white) should be connected to the neutral/ground lug shown in Fig. 6.

\*CAUTION - Many vessels are either built or have had changes made to the wiring where standard colors are not used and do not match colors mentioned above. If this is the case a licensed marine electrician must be consulted to determine the proper connection of wires.



\*THIS DIAGRAM ALSO APPLIES TO  
OPTIONAL VOLTAGE  
REGULATED GENERATOR.

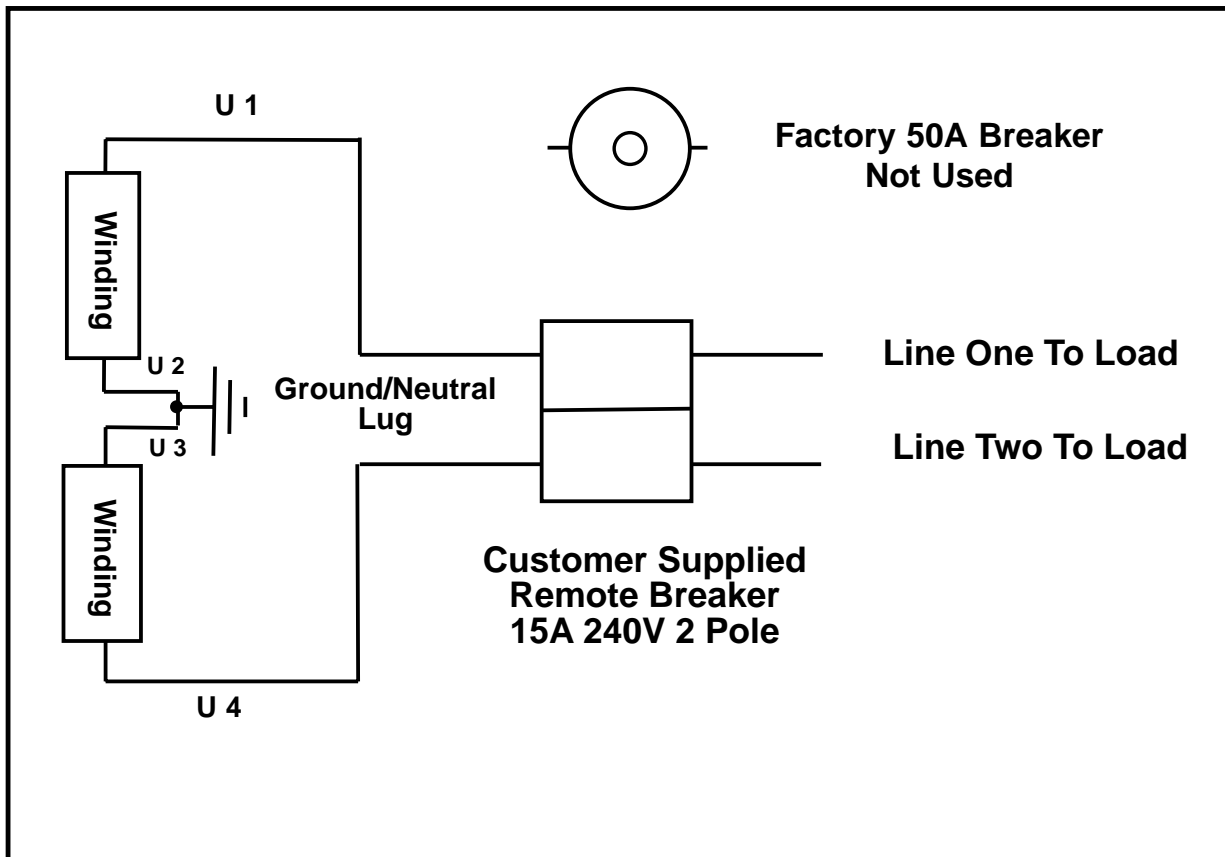
**Rewire to 120/240 Volt 60 HZ**

UCM2-5.5 may be rewired for 120/240 Volt use with the addition of an external customer supplied 2 pole 30 amp breaker.

To rewire, you must gain access to output leads as explained under 120 volt 60HZ output section and then disconnect the four numbered wires that went to the breaker and the ground lug. Leads numbered 2 and 3 should be paired together and attached to the ground/neutral lug. Lead #1 is one of the hot legs and lead #4 becomes the second hot leg. The two hot legs should now be run to a remote two pole 30A. 240 volt breaker.

Factory 50 amp single Pole breaker is not used in this configuration.

\*If the Gen-Set is to be installed in a gas powered vessel the Gen-set must be an ignition protection certified unit and the breaker used must also be Ignition Protection Certified.

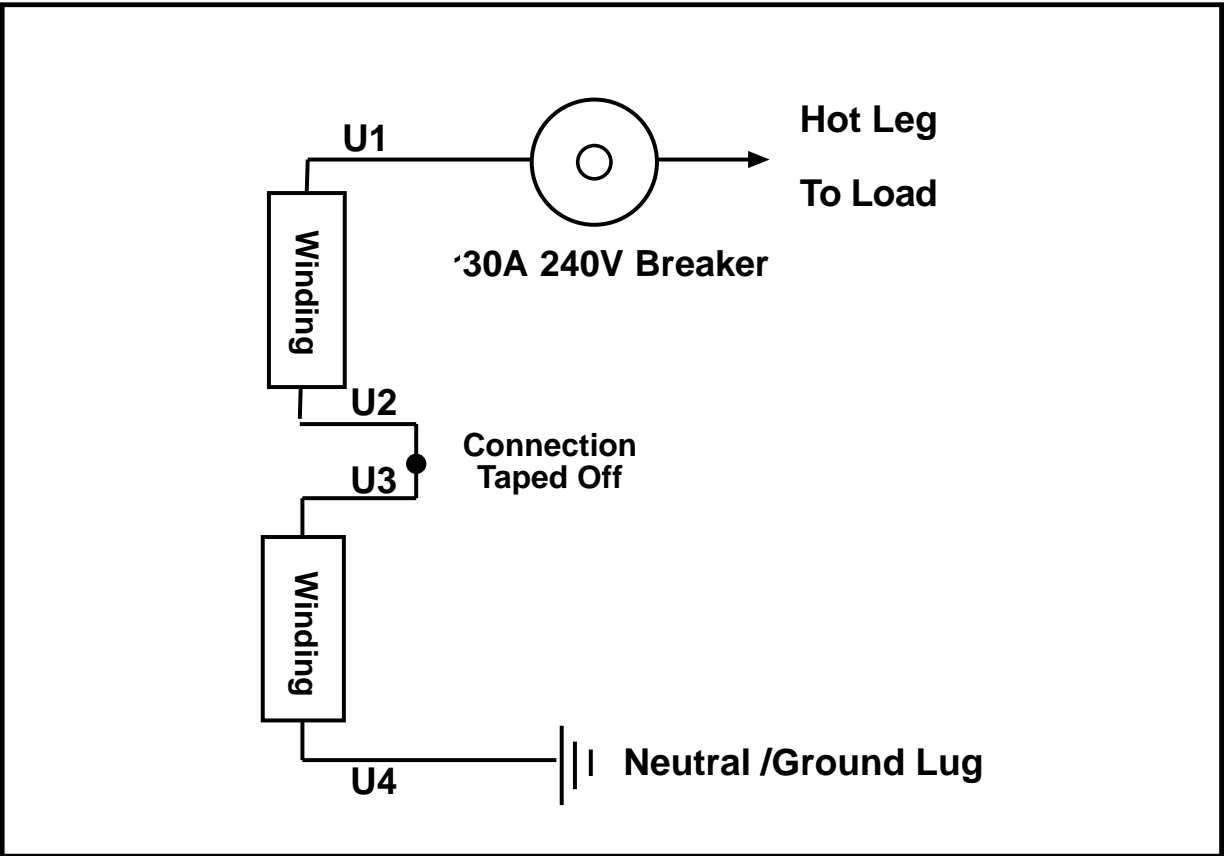


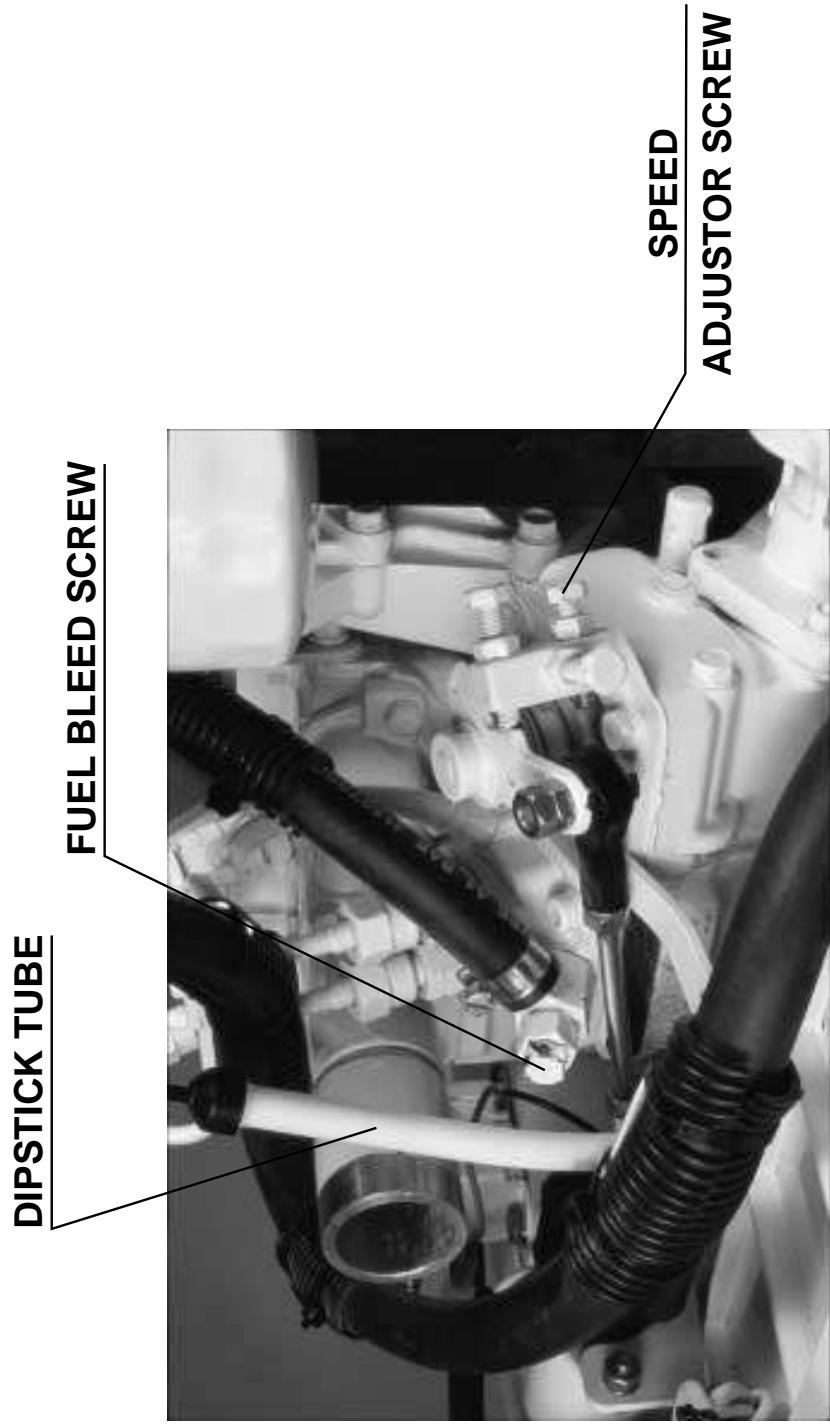
\*THIS DIAGRAM ALSO APPLIES TO  
OPTIONAL VOLTAGE  
REGULATED MACHINES.



**OPTIONAL 50HZ 240 Volt Output**

If your **UCM2-5.5** was factory ordered as a 50 HZ 240 volt unit it will be wired as per the following diagram. Connections may be made as per directions under standard 120 volt 60 HZ output.





**FUEL BLEED AND SPEED SCREW DETAIL  
FIGURE 7**

# Initial Start Up Procedure

## ● Initial Checks and Operations

Check oil and water levels

Double check all electrical connections to make sure they are correctly positioned and secured.

Rock Gen-set back and forth on its mounts one final time to make sure the unit is not hitting anything and to be sure that all hoses and lines will have adequate slack to allow Gen-set to move.

Turn off the main and all auxiliary breakers on the vessel's panel.

Open generator seacock and fuel shutoff valves if any.

## ● Priming the Fuel System

Using a 10mm wrench crack the fuel bleed fitting open 1/4 to 1/2 turn to allow air to be bled from system (see fig. 7).

Fuel and air will be forced out from around the loosened banjo fitting once the fuel pump is started so it is a good idea to pack a rag under or around the banjo to catch the fuel that will leak out.

The fuel pump may be energized by jumping the 10 gauge red wire on the remote panel connector block to the 14 gauge yellow wire. You should hear the fuel pump working and fuel will begin to flow from around the fuel banjo fitting.

Run the pump until only clean fuel with no air is seen flowing, at that time the banjo fitting should be re-tightened and the jumper wire removed.

## ● STARTING

Preheat the glow plugs for 10-15 seconds at the remote panel and then crank the unit over. Generator should start up within 5-10 seconds. If not, stop for a minute and try again. Often on initial cold starts the set will run for a few seconds and then stop. This is normal as the oil pressure has not yet built up to override the oil pressure shutdown switch. Unit should remain running on second or third attempt. If the set starts and runs for a bit or stumbles and runs slowly, you will have to reprime the system, as air in the fuel lines is likely to be the problem.

### **CAUTION:**

**If the unit does not start after several cranking attempts or one to two total minutes of cranking, there is a danger of filling the exhaust system with seawater. (This may lead to serious engine damage). Close seacock to prevent further water from being pumped into exhaust and proceed to trouble shooting section.**

As soon as the set is running, inspect the machine for signs of fuel, water, or exhaust leaks as well as unusual noises or smells. If any problems are noted, the set should be shut down immediately until problem is corrected.

While checking for leaks etc., you should also check to make sure there is water exiting the exhaust through-hull indicating the raw water pump is working and that the engine is actually getting the cooling water. Shut unit down if you do not see water flow within 2 minutes of startup.

# MAINTENANCE

\*All Gen-sets or engines should be visually checked frequently during their first 5-10 hours of operation for leaks, loose wires, loose fittings etc.

Following is a chart showing the various maintenance items and intervals that should be attended to, to keep your machine running at peak performance for the longest possible time.

|                             | Daily | Monthly<br>or 100 Hrs. | 6 Months<br>250 Hrs. | Yearly<br>750 Hrs. |
|-----------------------------|-------|------------------------|----------------------|--------------------|
| Inspect the Set             | X     |                        |                      |                    |
| Check Oil Level             | X     |                        |                      |                    |
| Check Coolant Level         | X     |                        |                      |                    |
| Check Fuel Level            | X     |                        |                      |                    |
| *Change Oil and Filter      |       | X                      |                      |                    |
| Check Zinc Anode            |       | X                      |                      |                    |
| Check Air Filter            |       |                        | X                    |                    |
| Change Fuel Filter          |       |                        | X                    |                    |
| Change Air Filter Element   |       |                        |                      | X                  |
| Change Pump/Alternator Belt |       |                        |                      | X                  |

\*Initial oil change should be done after the first 30-50 hours of run time.

- 1) **Inspect The Set**  
Visually inspect the machine for leaks, loose connections, loose clamps, frayed wires etc.
- 2) **Check Oil Level**  
Pull out the dipstick and make sure that the level is at or near the top mark. Add oil if necessary
- 3) **Check Coolant Level**  
Remove the heat exchanger fill cap and make sure the level of coolant is just above the cooling tubes. Add coolant mixture if needed.
- 4) **Check Fuel Level**  
Make sure main or auxiliary tank has enough fuel for intended run time. Running out of fuel will require re-bleeding of the system.
- 5) **Change Oil/Clean Filter**  
Oil should be drained by opening the oil drain valve located on the front side of the oil pan. (See Fig 1). A 3/8" Diameter oil resistant drain hose slipped over the drain valve fitting makes this job much cleaner and easier. After oil is drained, close the drain valve and change spin on oil filter. Fill the crankcase to the full level on dipstick with approved diesel grade oil.

## MAINTENANCE CONTINUED-

6) **Check Zinc Anode**

Using a 5/8 wrench unscrew the zinc to determine how much of it is left. Zinc should be replaced if it less than 1/3 its original size. Rate of decomposition varies from vessel to vessel, but after several inspections rate may easily be determined.

7) **Check Air Filter**

Air cleaner element may be inspected by unclipping the cover on the air cleaner assembly allowing you to slide the filter out. Visually check the element for blockage, rips, tears or excessive moisture of element material. Replace if needed.

8) **Change Fuel Filter**

Remove the spin on fuel filter shown on (Fig. 1) being careful not to spill any if possible. Fill the new filter full of clean fuel to aid in bleeding the system and spin back onto the filter head. Proceed to priming the fuel system as directed under "initial start up procedure".

9) **Change Water Pump/Alternator Belt**

Remove belt guard first, then loosen alternator adjusting bolt allowing you to swing alternator towards engine. Remove old belt, reinstall new belt and tighten. Replace belt guard.

10) **Change Air Filter Element**

Change element as described under "checking air filter".

# LOAD TESTING

Once the generator set is running with no leaks or problems, you should determine that the output voltage is correct, either by gauges on the vessel or by a hand held meter. If using a hand held meter you can test voltage at a convenient receptacle after turning the appropriate breaker on.

If the voltage is in the acceptable range between 115 and 130 volts A.C., you may begin to test load. Start by turning on one breaker at a time on the vessels panel beginning with non critical loads such as a toaster, stove element etc. All devices should be checked one at a time at first for correct function and then in groups to determine what may be run together without overload.

The **UCM2-5.5** will provide up to 46 amps of current at 120 volts. If this is exceeded, overload will result and unit will lose speed, frequency and voltage. A sure sign of overload is black smoke coming out of the exhaust.

Typically the **UCM2-5.5** will carry at least two conditioners up to 16,000 BTU along with a typical battery charger, lights, T.V., etc. and have 1-1 1/2 kw left for another appliance such as microwave, stove element etc.

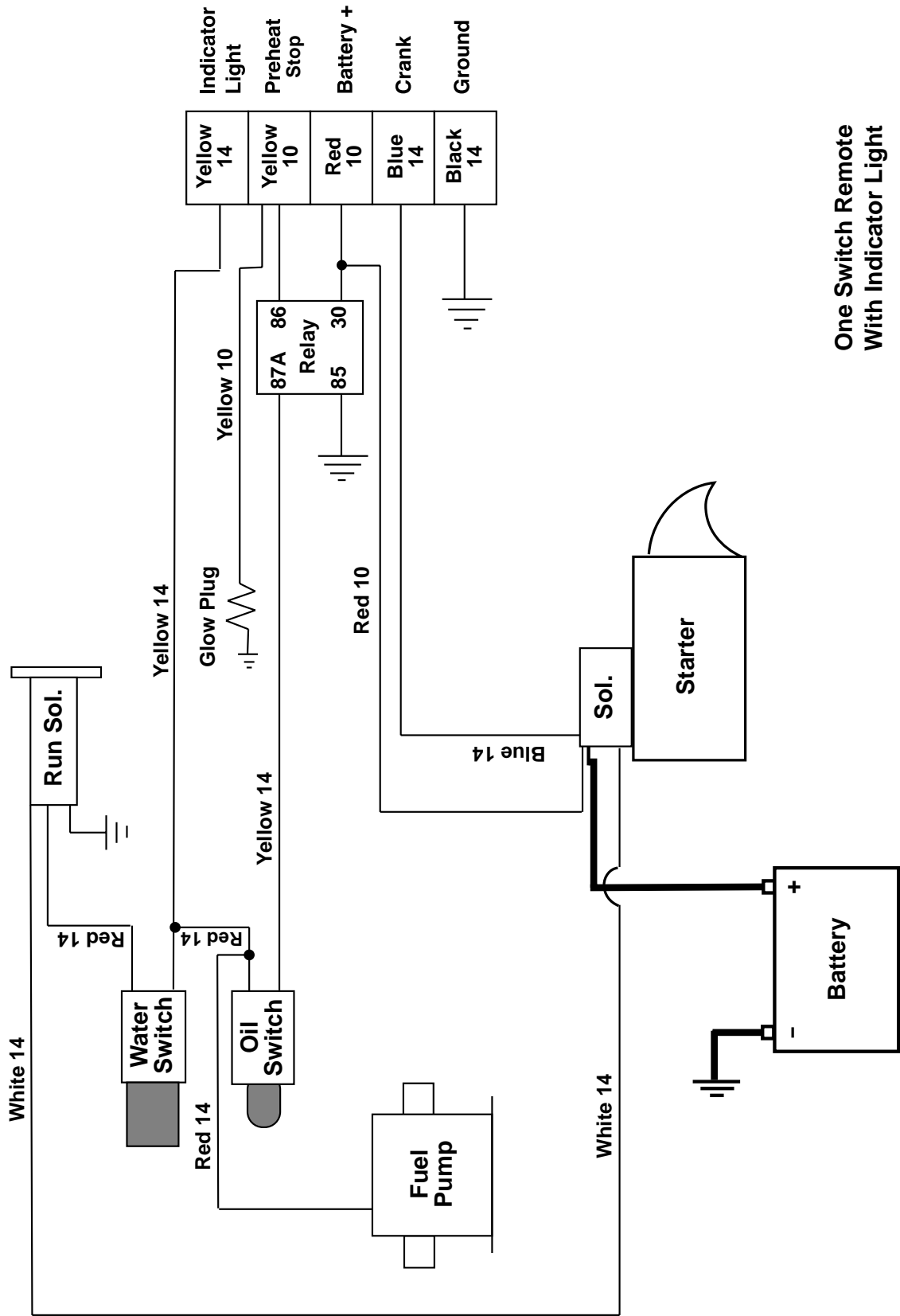
\* Gen-sets should be visually checked frequently during the first 5-10 hours of operation for leaks, loose wires, loose fittings etc.

# UCM 2-5.5

## QUICK REFERENCE PARTS

|   |                             |                       |                     |
|---|-----------------------------|-----------------------|---------------------|
| 1 | Air Filter                  | Mann & Hummel         | C630                |
| 1 | Raw Water Pump              | Oberdorfer            | 202M-15             |
| 1 | Impeller Kit                | Oberdorfer            | 11691               |
| 1 | Oil Filter                  | Kubota                | 70000-15241         |
| 1 | Zinc                        | Standard              | 3/8 NPT Pencil Type |
| 1 | Fuel Pump                   | Facet                 | 40 - 105            |
| 1 | Pump to Heat Exchanger Hose | Generic               | 5/8" Diameter       |
| 1 | Heat Exchanger              | Next Generation Power |                     |
| 1 | Exhaust                     | Next Generation Power |                     |
| 1 | Fuel Filter                 | Kubota                | 70000-43081         |
| 1 | Shutdown Solenoid           | Synchrostart          | 1751 ES             |
| 1 | Oil Pressure Switch         | Nason                 | SM-2C-10F           |
| 1 | Water Temperature Switch    | Nason                 | TM-2C-210R          |
| 1 | Generator Capacitor         | Generic               | 400V 40UF           |
| 1 | Main Drive Belt             | Goodyear              | W 720 Eagle         |
| 1 | Base Engine                 | Kubota                | Z482                |
| 1 | Generator (standard model)  | Markon                | BL105G              |



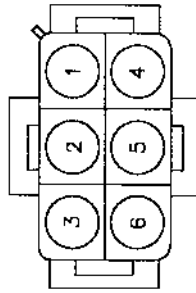
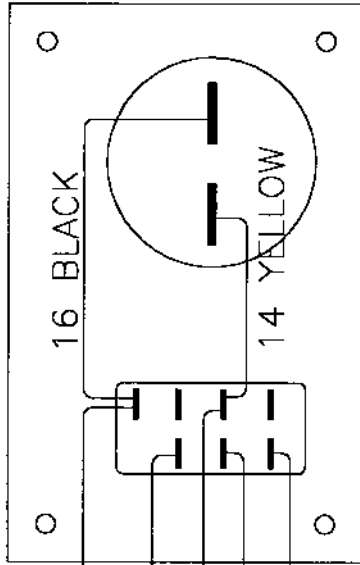


One Switch Remote  
With Indicator Light

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| ZONE/REV | DESCRIPTION | DATE | APPROVED |
|----------|-------------|------|----------|
|          |             |      |          |

16 BLACK  
10 YELLOW  
14 YELLOW  
10 RED  
14 BLUE



REAR VIEW OF PLUG  
KEYWAY UP RIGHT  
AMP 6 WAY MALE  
WITH PIN TERMINALS

1= 14 BLUE  
2= 10 RED  
3= 10 YELLOW  
4= 14 YELLOW  
5= 16 BLACK  
6= EMPTY

NOTES:

1. ALL WIRE IS 105' C TINNED COPPER WIRE, 600 VOLT
2. ALL TERMINALS ARE HEAT SHRINK WITH DOUBLE CRIMP COLLAR AND WIRE CRIMP.
3. TERMINALS IN PLUG ARE AMP MATTE-N-LOCK, TINNED BRASS
4. PLUG IS AMP COMMERCIAL MATTE-N-LOCK SERIES

ASSEMBLY NUMBER = 24-0006

MACHINE & FABRICATION NOTES  
ALL DIMS ARE +/- .010 & ANGLES ARE +/- .1"  
UNLESS NOTED OTHERWISE  
FINISHED EDGES ARE INDICATED BY FINISH MARK "F"  
PERIMETER EDGES ARE TO BE FINISHED. BREAK ALL SHARP EDGES AND CORNERS. PARTS ARE TO BE CLEAR AND FREE OF DEBRIS.

ATLANTIC MARINE PRODUCTS, INC.  
DRN BY: JSM  
CHK BY: GJM  
SHEET 1 OF 1  
DATE DRAWN: 10/1/88  
DATE CHECKED: 10/1/88

NEXT GENERATION POWER  
HOUR METER PHIL WILCOCK

1:1 NGP005 0

# TROUBLESHOOTING

## ● UNIT DOES NOT CRANK

### POSSIBLE CAUSE

### DIAGNOSIS OR REMEDY

- |   |  |
|---|--|
| - Bad Battery or Low Battery  | Make sure battery is in good condition and is fully charged. Charge or replace as required.  |
| - Bad battery cables or faulty wiring between Gen-set and remote panel. | Check all wiring and connectors with a multimeter. Repair wire or cable as required.   |
| - Bad rocker switch.  | Test switch with a multimeter for proper operation. Replace if required.   |
| - Bad starter.  | Feed 12 volts + directly to the cranking spade connection on starter (blue wire). Set should crank, if not, remove starter and have tested by a qualified technician. Replace starter if required. |

## ● UNIT CRANKS BUT DOES NOT START

- |                               |   |
|-------------------------------|---|
| - Air in fuel system          | Bleed air as instructed under initial start up procedures.  |
| - No Preheat                  | Unit must be preheated for 10-20 seconds before every cold start.<br><br>Faulty wire or connections from remote switch. Test to be sure 12 volt + is getting to glow plug.<br><br>Glow plug itself may be faulty, remove from engine and test with 12 volt + and replace if required. |
| - Run solenoid not pulling in | The run solenoid must pull in or the unit will not start. While cranking gently push the solenoid linkage in. If the linkage pulls in and holds you may have a weak battery or bent and binding linkage. Charge battery and retest or check for sticky or binding linkage.            |

## ● **UNIT CRANKS BUT DOES NOT START**

### **POSSIBLE CAUSE**

### **DIAGNOSIS OR REMEDY**

- Run solenoid not pulling in (cont.)

Make sure 12 volt + is getting to the white wire on the solenoid while cranking. If not troubleshoot as required.

If 12 volt + is getting to the white wire on the solenoid and the solenoid does have a good ground assume the solenoid is faulty and replace.
- Clogged Air Intake

Unit must have air to run, if the machine has a plugged air intake, unit will not run.
- Clogged Exhaust System

Unit will not run with a clogged or collapsed exhaust system. Typical symptoms will be popping back through intake system.

## ● **UNIT STARTS BUT IMMEDIATELY STOPS**

- Solenoid Not Holding In

If the solenoid drops out as soon as you quit cranking, the unit will stop. Test the solenoid by feeding 12 volt + to the red hold wire while pushing the solenoid plunger into the fully retracted position. Solenoid should remain in the retracted position even after manually releasing plunger.

If solenoid drops out after 12 volt is applied and manual tension is released, we assume that it is bad and replace.

If the solenoid is o.k., we assume that 12 volt is not getting to the solenoid. First make sure that the engine does have oil and that it is not overheating.

If oil and water are o.k., we assume that 12 volt is not getting through the oil or water switches. These switches should be tested one at a time by jumping across the switches terminals while attempting to start the machine. If the unit remains running while a switch is jumped and it quits when not jumped we have found the bad switch.

Do not rule out the possibility of two bad switches or faulty wiring and connectors feeding the run circuit.

## **•UNIT RUNS BUT SHUTS DOWN INTERMITTENTLY**

### **POSSIBLE CAUSE**

### **DIAGNOSIS OR REMEDY**

- Air In Fuel System  
The number one reason why the set would shut down is air in the fuel system.  
  
All fittings, hoses, clamps, filters, pick-up tubes etc. should be double checked to make sure absolutely no air is entering the system. When in doubt disconnect the entire fuel system and run the machine out of a small fuel supply with short hoses for a period of time to determine if the vessel's fuel system is at fault.
- Bad Oil or Water Switch  
Jump switches as previously discussed under "solenoid not holding" in but you may have to leave the switches jumped for longer periods of time to determine if you have an intermittently bad switch.
- Faulty Wiring  
Inspect all wiring carefully for loose terminals or loose screws that may vibrate and cause intermittent shut down. Correct as required.

## **•UNIT WILL NOT SHUT OFF**

- Solenoid Stuck In  
Check for jammed solenoid or linkage. Free up or replace as required.
- Throttle Stop Misadjusted  
If the unit almost stops but chugs along slowly the throttle stop screw may have to be turned in slightly.
- Bad Shutdown Relay  
If the shutdown relay does not energize the run circuit when stop position is activated, the relay is most likely faulty.

## **•NO OUTPUT VOLTAGE**

- Breaker Tripped  
The circuit breaker will trip if the unit is overloaded or short circuited. The breaker may also trip if the Gen-set is working to capacity in a very hot environment. In any case with a breaker tripping, it is advisable to determine the cause before restarting.

## • **NO OUTPUT VOLTAGE**

### **POSSIBLE CAUSE**

### **DIAGNOSIS OR REMEDY**

- |                     |   |
|---------------------|---|
| - Faulty Capacitor  | It is possible to have a faulty capacitor causing loss of output voltage but this can only be tested by replacing the capacitor and restarting. |
| - Generator Problem | Consult the Markon generator handbook or consult Next Generation Power.   |

## • **WRONG OUTPUT VOLTAGE**

- |                         |   |
|-------------------------|---|
| - Faulty Generator      | Troubleshoot out of Markon Generator Handbook.  |
| - Engine Speed Problems | Generator output voltage may be changed slightly by adjusting the engine speed up or down. This is done at the speed screw shown on Figure 7.<br><br>Speed is factory set and tested. We do not recommend changing the speed unless you have an A.C. frequency meter to determine how much you have changed output frequency. |