



**UCM 1 – 3.5  
OWNERS MANUAL**

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**[www.nextgenerationpower.com](http://www.nextgenerationpower.com)**

**Sales and Parts Dept. Mon-Fri 8-5 p.m. E.S.T.**

Thank you for purchasing a new generator from Next  
Generation Power Engineering Inc.

We use brand name components such as Kubota engines, Stamford Newage  
Markon generator ends and other high quality components so that our  
compact design will fit small spaces.

**Please record your serial number here for future reference:**

Kubota engine model number: \_\_\_\_\_

Kubota engine SERIAL number \_\_\_\_\_

Date of Purchase \_\_\_\_\_

Dealer Name: \_\_\_\_\_

**\*\*This manual is a general installation guide only\*\*  
If in doubt, it is always recommended to consult or hire an expert.**

# 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 904-642-8555

PLEASE READ THE ENTIRE OWNERS 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 LAID OUT FOR YOU IN THIS MANUAL.

- ELECTRIC SHOCK CAN CAUSE SEVERE INJURY, BURNS OR DEATH. ALWAYS HAVE QUALIFIED ELECTRICAL SERVICEMEN DO ANY A.C. CONNECTION AND SERVICE WORK TO AVOID ANY POSSIBLE DANGER OF ELECTRICAL SHOCK OR DAMAGE TO OTHER ELECTRICAL EQUIPMENT ON BOARD. NEVER PERFORM ELECTRICAL WORK WHEN THE GEN-SET IS RUNNING.
- 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. HOT COOLANT IN AN ENGINE IS UNDER PRESSURE. WEAR EYE PROTECTION WHEN PERFORMING WORK ON COOLING SYSTEMS.
- CHILDREN AND PETS SHOULD BE KEPT AWAY FROM THE GENERATOR SET AT ALL TIMES. LOOSE PARTS FALLING INTO A RUNNING ENGINE CAN BE POTENTIALLY DANGEROUS.
- NEVER CLEAN YOUR GENERATOR SET WITH RUNNING WATER, UNIT SHOULD ONLY BE CLEANED WHEN THE UNIT IS STOPPED WITH A DAMP RAG ON OUTSIDE SURFACES ONLY.
- DISCONNECT BATTERY FROM GEN-SET BEFORE PERFORMING MAINTENANCE AND SERVICE PROCEDURES. ALWAYS WEAR EYE AND HAND PROTECTION WHILE WORKING NEAR OR WITH BATTERIES. BATTERIES CONTAIN ACID AND ARE KNOWN TO EXPLODE.
- INHALATION OF EXHAUST GAS CAN CAUSE PERSONAL INJURY AND/OR DEATH. MAKE SURE ADEQUATE VENTILATION IS PROVIDED WHEN RUNNING ANY ENGINE IN A CONFINED AREA.
- FUEL AND FUMES CAN BE DEADLY, DO NOT SMOKE AROUND FUEL OR WHILE FUELING. ALWAYS SHUT OFF ENGINES WHILE FUELING THE VESSEL AS WELL AS FOLLOWING THE DIRECTIONS GIVEN IN THIS OWNERS MANUAL ALL INSTALLATIONS SHOULD FOLLOW THE RECOMMENDATIONS OF:
  - **A.B.Y.C.** AMERICAN BOAT AND YACHT COUNCIL
  - **N.F.P.A.** NATIONAL FIRE PROTECTION ASSOCIATION
  - **U.S.** COAST GUARD REGULATIONS

# DO's and DON'T's

## Do's:

- **READ SAFETY INSTRUCTIONS AND ALL OTHER CHAPTERS IN THIS MANUAL**
- **Allow 500 hours of exercise workload to break in the new engine. (60-85% load is recommended)**
- **Regular maintenance of fluids and filters. Oil & filters are cheap, engines are not.**
- **Keep fluids filled to their proper levels. Oil that is down 1/3 quart is too low!**
- **Periodic inspection of wires, hoses, and belts for abrasion or wear.**
- **Keep your gen-set clean from salt, dirt, oil, fuel and general debris**
- **Replace worn hoses and belts immediately. Do not wait for breakage.**
- **Use proper mix of anti-freeze coolant NOT to exceed 45% ethylene glycol.**
- **Keep a maintenance journal to record routine service intervals**
- **Use proper replacement parts as noted in this owners manual**
- **Ensure that fuel tanks on vessel remain at least 1/3 full to prevent air intake of the generator fuel system.**
- **Generally keep gen-set loads between 50-90% as much as possible**
- **Use the glow plug for 10 seconds before starting the engine.**

## Don't's:

- **DO NOT start the generator under an electrical load. Turn OFF all air conditioners, stove top elements, microwaves etc.. before starting the set. You may resume appliance load after the engine is running.**
- **DO NOT overload the gen-set by turning on too many appliances at the same time. Calculate your appliance wattage consumption to stay within the generator output limits or budget between electric appliances back and forth if necessary. Heat loads are big users of power. Check your appliance labels for power requirement ratings.**

## **DO's and DON'T's (Continued)**

- **DO NOT USE ETHER-YOU WILL RUIN THE ENGINE AND VOID THE WARRANTY.**
- **DO NOT immerse the generator in water, oil or cleaning materials**
- **DO NOT operate the gen-set without an air filter cartridge**
- **DO NOT use synthetic oil until at least 500 hours of engine break in under a good load is complete.**
- **DO NOT adjust throttle speed linkage. The frequency of the generator Hz is factory set to correspond with proper engine RPM and the pulley drive system. Lowering or raising the engine speed will cause drastic voltage output changes that can damage appliances.**
- **DO NOT attempt any repairs unless you are a qualified technician**
- **DO NOT allow any storage of containers, fuel, tools, etc.. around the generator set during operation.**
- **DO NOT leave genset in a state of dirty condition. Fuel and grease may cause premature wear of rubber engine mounts. Debris should be vacuumed or blown out with compressed air and periodically cleaned with a mild degreaser and very light water mist. (Avoid water in the generator windings)**
- **DO NOT hold the glow plug in for more than 10-15 seconds. If you hold it in longer, you will burn out the glow plug.**
- **DO NOT authorize any warranty repair work by third party repair facilities unless first obtaining consultation and approval by Next Generation Power Engineering Inc. Unauthorized repair bills will be denied.**

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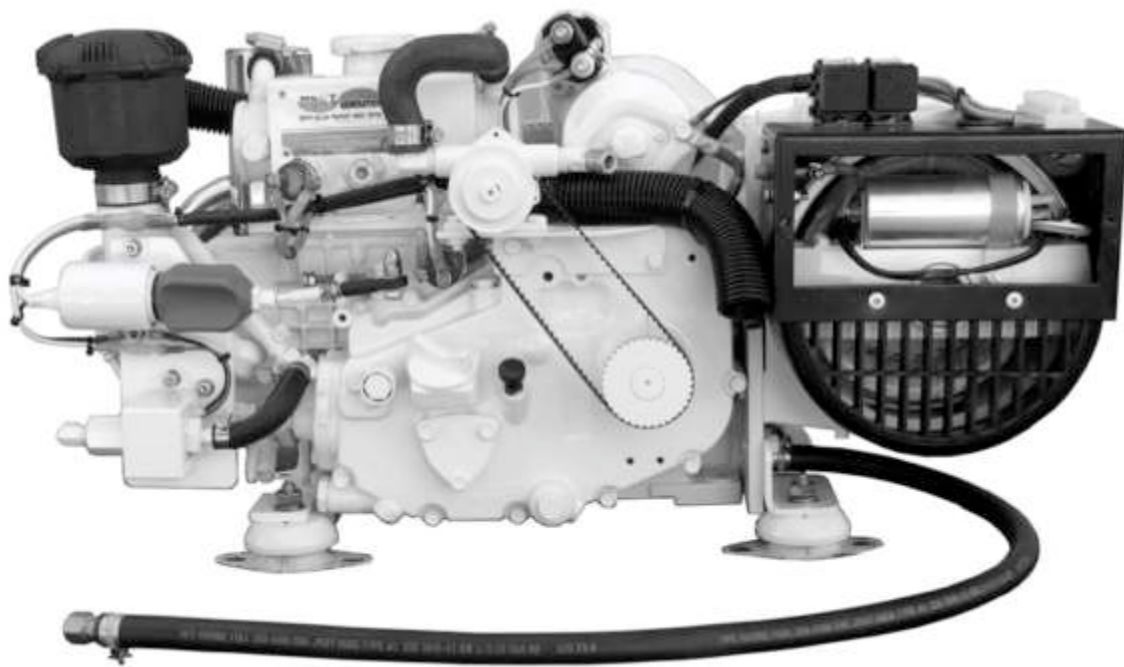
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# UCM 1-3.5 SPECIFICATIONS

|                                    |  |
|------------------------------------|--|
| Type.....                          | Horizontal, water-cooled 4 cycle engine  |
| # Of Cylinders.....                | 1  |
| Bore & Stroke (in.).....           | 2.95 x 2.76                              |
| Displacement (cu. In.).....        | 18.86                                    |
| SAE net Intermittent (HP/rpm)..... | 7/2800                                   |
| Combustion system.....             | Spherical                                |
| 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 by Trochoid pump      |
| Fuel.....                          | ASTM #2 Diesel or equivalent             |
| Lubricating Oil.....               | Quality Better than API service CC class |
| Fresh Water Capacity.....          | 1.2 Quart                                |
| Lubricating Oil Capacity.....      | 1.0 U.S. Quart                           |
| Measurement (L x W x H).....       | 28" x 15" x 15"                          |
| Dry Weight (Lbs.).....             | 160 lbs.                                 |
| Starting System.....               | 12 Volt Battery                          |
| Charging System.....               | None                                     |
| Fuel Line Diameter.....            | .5/16"                                   |
| Fuel Return Line Diameter.....     | 1/4"                                     |
| Raw Water Diameter.....            | 5/8"                                     |
| Exhaust Diameter.....              | 1 _ "                                    |
| Output Voltage.....                | 120/240                                  |
| Output Amps.....                   | 30/15                                    |
| Output Watts.....                  | 3.5Kw or 3500                            |

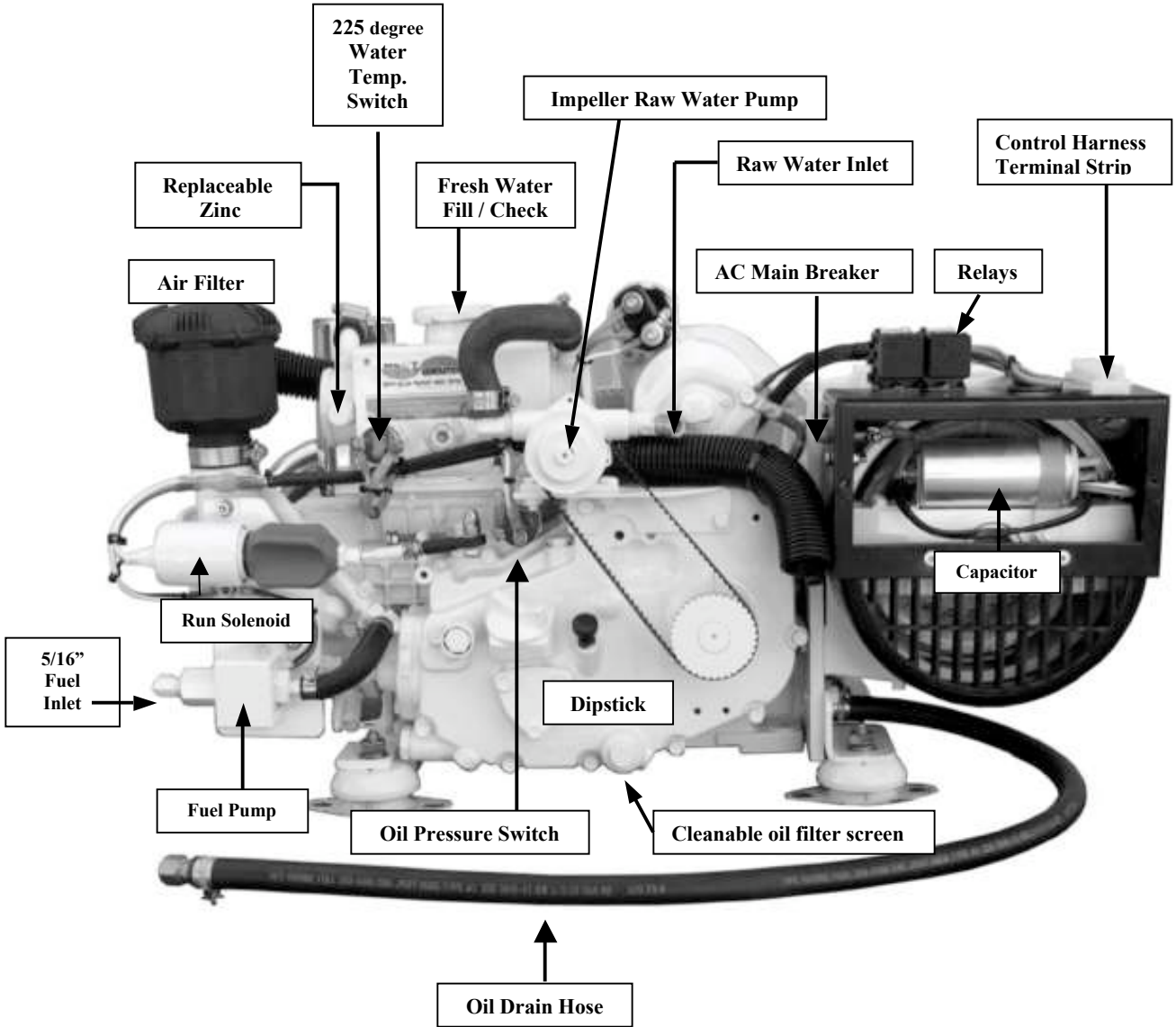
# UCM 1-3.5 SPECIFICATIONS (Con't)

|                                   |          |         |                    |
|-----------------------------------|----------|---------|--------------------|
| 60 Hz Rating.....                 | 3.5 k.w. | 3.5 KVA | 1.0 P.F.           |
| 50 Hz Rating.....                 | 3.5 k.w. | 3.5 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 Maximum.....       |          |         | 3 Feet             |
| Water Pump Lift Maximum.....      |          |         | 4 Feet             |
| Cooling Water Flow.....           |          |         | 3.0 Gal. Per/Min   |
| Fuel Consumption Maximum.....     |          |         | .40 Gal/Hr.        |
| Fuel Consumption Average.....     |          |         | .20 Gal/Hr.        |





# GENERAL LAYOUT – FRONT VIEW



**FIGURE 1**

# GENERAL LAYOUT - side view

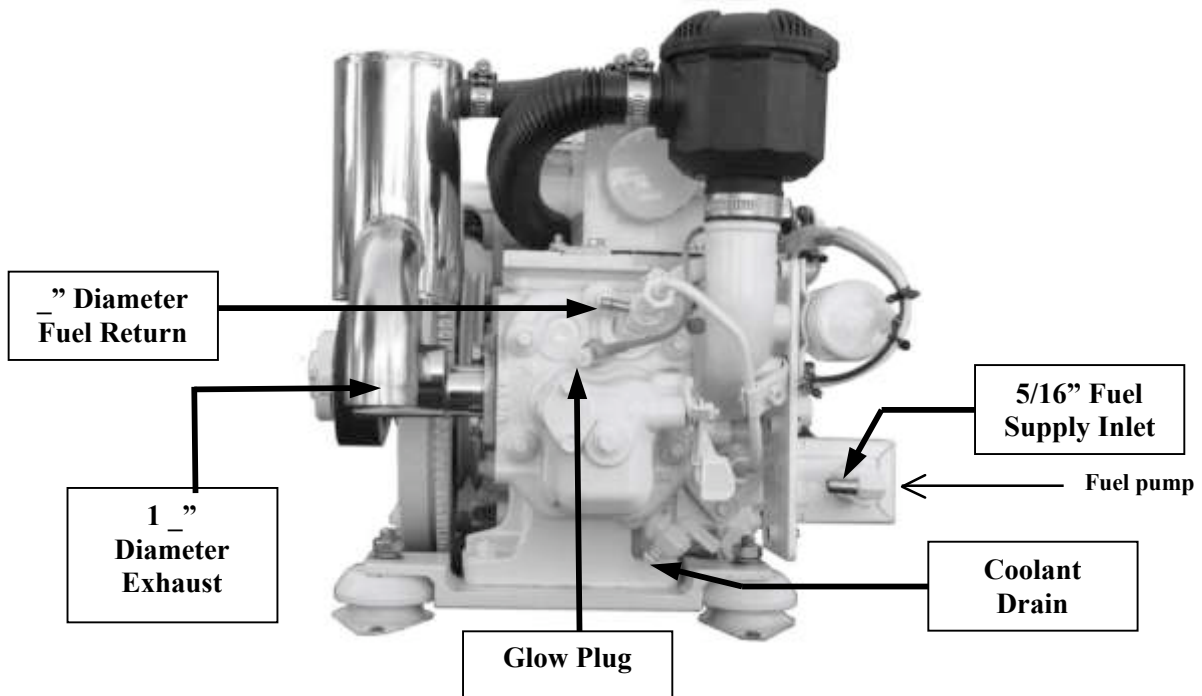


FIGURE 2

# GENERAL LAYOUT - Belt side view

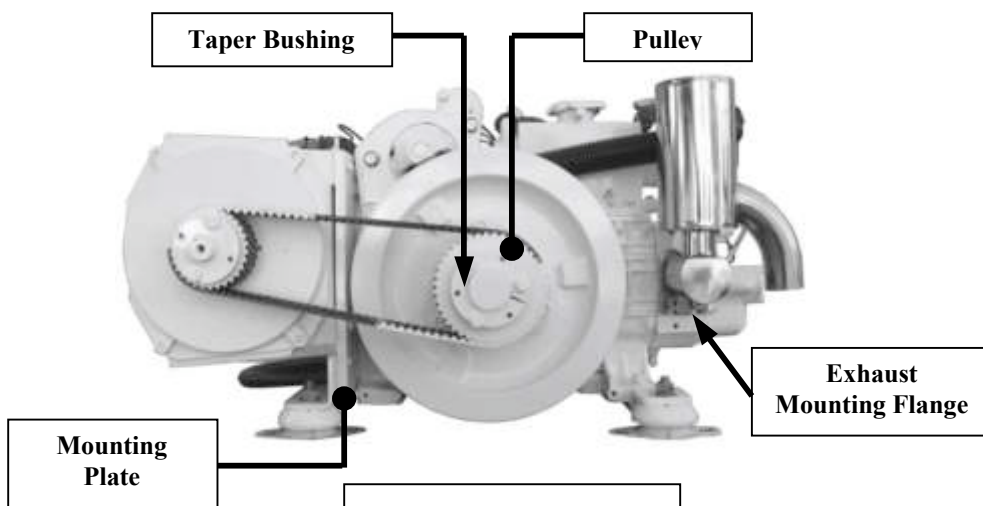
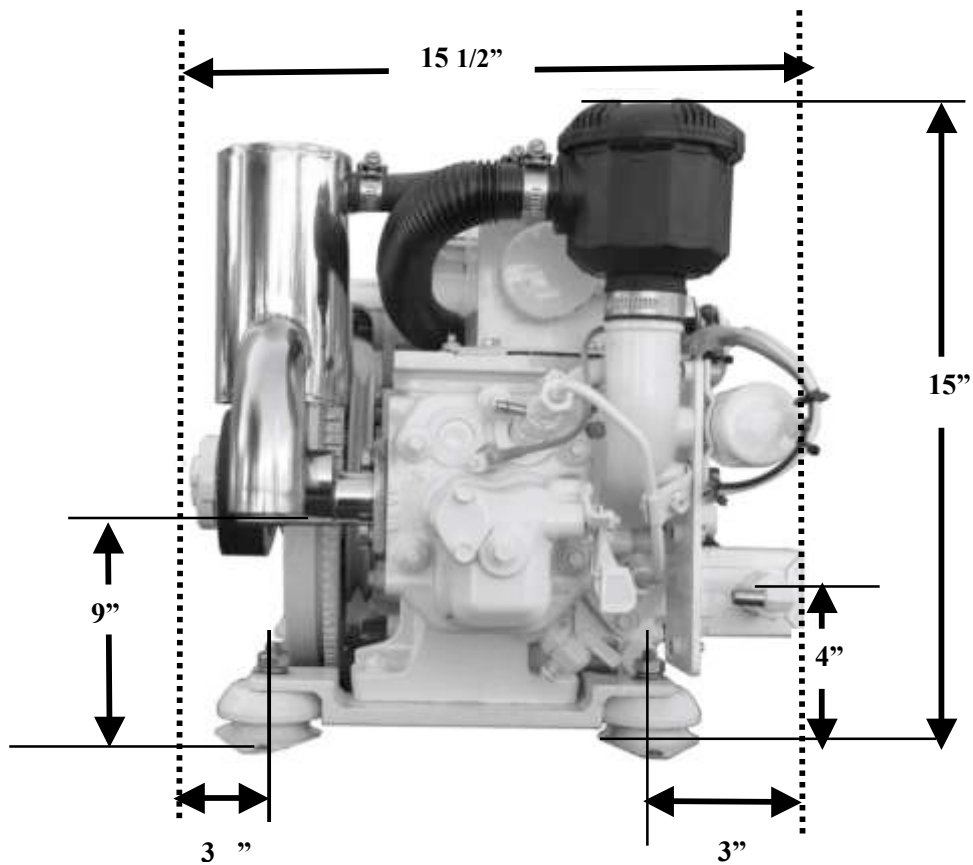
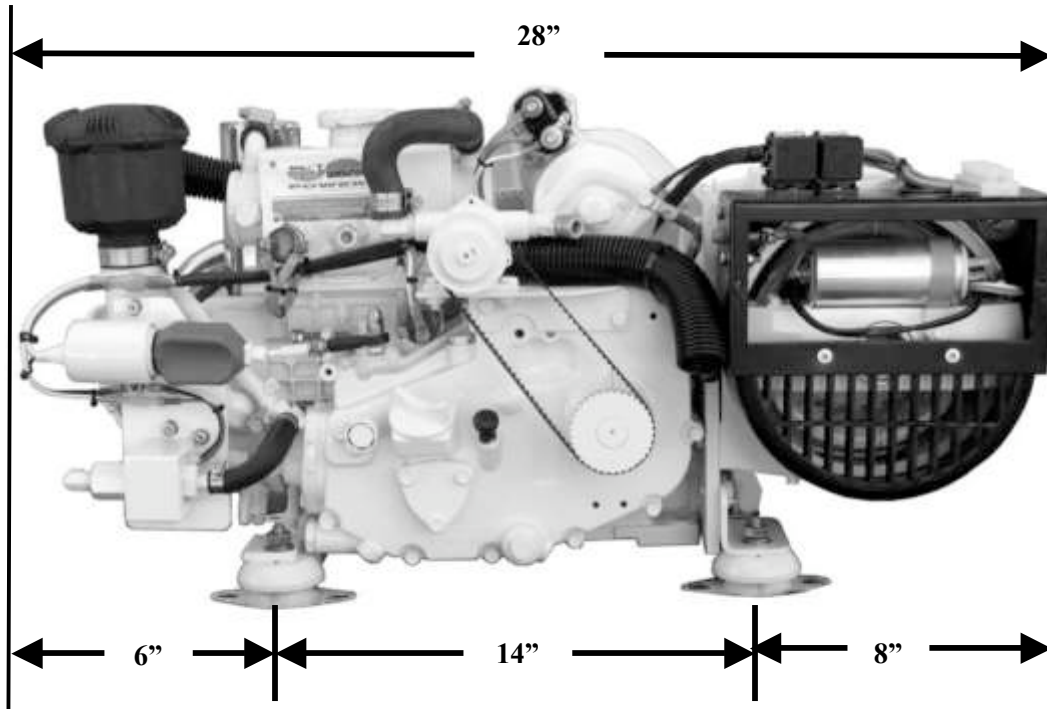


FIGURE 3

# DIMENSIONS



# 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**

- 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 GEN-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 THE PLUMBING ETC. INITIALLY THAN TO SELECT AN EASY 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 UCM1-3.5 IS OF A VERY RUGGED DESIGN INCORPORATING ROLLER MAIN BEARING AND A PRESSURIZED OIL DELIVERY SYSTEM. AS SUCH THE SET MAY BE PLACED IN ANY DIRECTION AND POSITION IN THE VESSEL AS LONG AS IT WILL NOT BE RUN AT AN ANGLE OF MORE THAN 30 DEGREES CONTINUOUSLY.

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 1/2" THICK MARINE GRADE PLYWOOD OR 1/2" 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 STEEL 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 THE 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.

1 NOTE: ALL 8 MOUNTING HOLES MUST BE USED. IE; TWO LAGS OR BOLTS PER MOUNT

IF YOU WISH TO LIFT THE GEN-SET BY ROPE OR CHAIN, A CONVENIENT LIFTING SPOT IS THE STARTER MOUNT PLATE. TO USE THIS MOUNT PLATE YOU MUST FIRST REMOVE THE BELT GUARD AND STARTER AS FOLLOWS:

1. USING A PHILLIPS HEAD SCREWDRIVER, REMOVE THE RECTANGULAR BELT INSPECTION PLATE MOUNTED ON THE TOP OF THE BELT GUARD.
2. WORKING THROUGH THE INSPECTIONS HOLE USING A 14 MM SOCKET OR WRENCH, REMOVE THE TWO STARTER MOUNT BOLTS.
3. DISCONNECT ALL WIRES ON THE STARTER AND SLIDE IT OUT FRONT OF THE MOUNT PLATE. LIFT BELT GUARD OFF OF GEN-SET. USING A ROPE OR CHAIN ATTACHED TO THE STARTER MOUNT PLATE, YOU NOW HAVE A STURDY LIFTING POINT TO HOIST THE SET INTO PLACE. ONCE THE SET IS IN PLACE YOU CAN REPLACE ALL COMPONENTS BY REVERSING THE REMOVAL ORDER.

# VENTILATION

AS PREVIOUSLY MENTIONED, THE GEN-SET NEEDS AIR FOR BOTH COMBUSTION AND FOR THE 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 120 VOLT 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 THE AXIAL TYPE UNITS.

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

# SOUND PROOFING

FOR THOSE WANTING THE ULTIMATE IN QUIET PERFORMANCE, NEXT GENERATION POWER OFFERS AN OPTIONAL SOUND DAMPENING FIBERGLASS ENCLOSURE THAT OFFERS EXCELLENT NOISE SUPPRESSION FOR THE UCM 1-3.5.

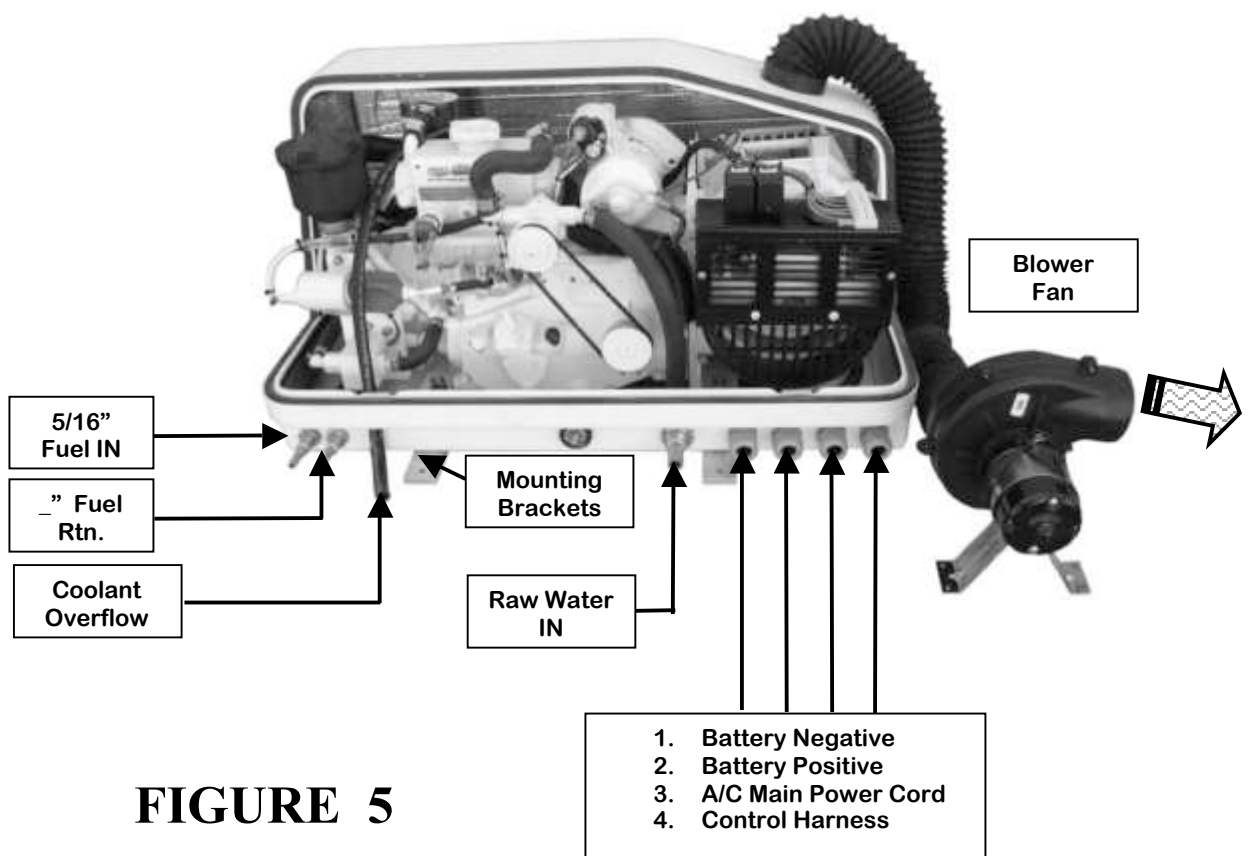
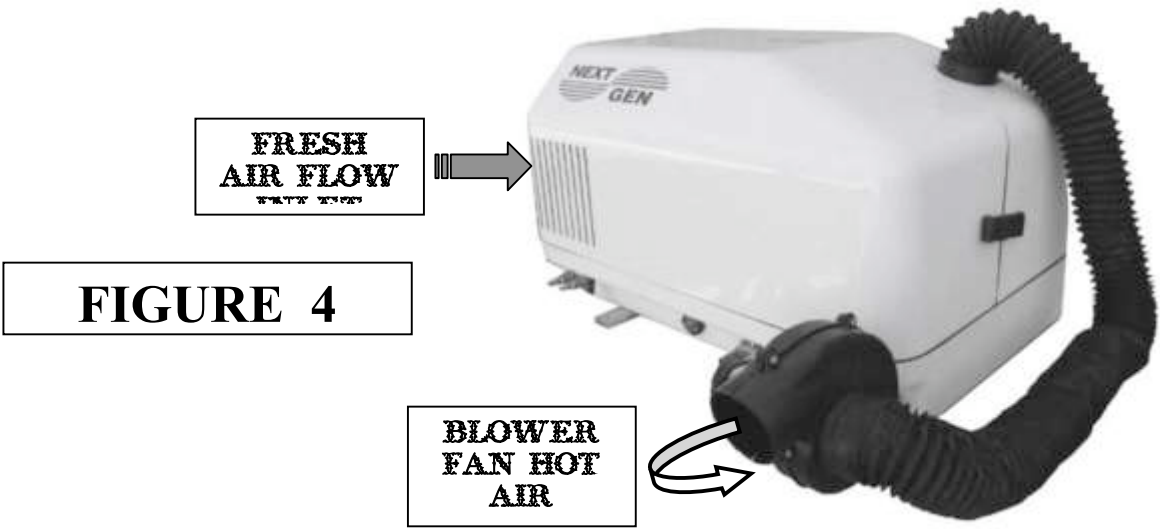
THE ENCLOSURE ALSO OFFERS LIMITED SPLASH PROTECTION FROM LIQUIDS. THIS DOES NOT MEAN IT IS A WATERPROOF ENCLOSURE, SINCE IT WAS DESIGNED MORE FOR NOISE REDUCTION. IF SPACE LIMITATIONS ALLOW FOR THE ADDED ENCLOSURE DIMENSIONS, YOU WILL FIND THE SOUND ENCLOSURE A WORTHWHILE INVESTMENT.

PROPER DUCTING IS REQUIRED TO ALLOW FOR AIR-FLOW IN AND OUT OF THE ENCLOSURE TO MAINTAIN PROPER COOLING OF THE WINDINGS. THE ENCLOSURE HAS CLEVER DESIGN ELEMENTS FOR THE ATTACHMENT OF FUEL LINES, RETURN LINES, POWER CORD, BATTERY CABLE AND CONTROL HARNESS ENTRY POINTS.

IN SOME VESSELS, CRITICAL SPACE REQUIREMENTS MAY NOT ALLOW FOR THE ADDITION OF AN ENCLOSURE, IN THIS CASE CONSIDERATION MAY BE GIVEN TO USING SOUND DAMPENING MATERIALS WITH APPROPRIATE VENTING AND DUCTING TO ACCOMPLISH THE TASK OF REDUCING NOISE.

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.

# NEXT GEN SOUND PROOF ENCLOSURE





# 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 THE SAME FUEL 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 A LOSS OF SPEED AND FREQUENCY ON THE GEN-SET AND WOULD TYPICALLY HAPPEN DURING 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 FIGURE 2)

1/2" DIAMETER FUEL LINE IS TO BE USED FOR THE RETURN LINE AND RUNS FROM THE FITTING ON THE INJECTOR SHOWN IN FIG. 2 BACK TO THE TOP OF THE FUEL TANK. FUEL RETURN MUST BE RETURNED TO THE TANK AND NOT TIED BACK INTO THE FUEL SYSTEM AS AIR WILL BE RE-CIRCULATED AND CAUSE INTERMITTENT SHUT DOWN. VERY LITTLE FUEL IS ACTUALLY RETURNED AT VERY LOW PRESSURE. RETURN FUEL LINE CAN RUN UPHILL WITH NO PROBLEM.

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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 OF 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.

# COOLING SYSTEM

THE UCM 1-3.5 IS A COMPLETELY MARINIZED, FRESH WATER, HEAT EXCHANGER COOLED MACHINE. THE UNIQUE FEATURE OF THIS PACKAGE IS THAT THE ENGINE IS DESIGNED TO BE COOLED BY NATURAL CONVECTION CIRCULATION OF THE FRESH WATER. THIS SYSTEM IS VERY SIMPLE AND RELIABLE ELIMINATING SEVERAL MAINTENANCE ITEMS SUCH AS THE FRESH WATER PUMP, DRIVE BELT, THERMOSTAT, HOSE ETC

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 1/2" 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% ANTI-FREEZE MAY BE USED. IF MORE THAN 50% ANTI-FREEZE 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 THE FIRST WARM UP AFTER FILLING. A COOLANT CATCH CAN BE USED TO KEEP THIS EXCESS COOLANT FROM GETTING INTO THE BILGE.

BECAUSE OF THE CONVECTION 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 230 DEGREES F.

RAW WATER IS CIRCULATED THROUGH THE HEAT EXCHANGER AND OUT THE EXHAUST BY A BELT DRIVEN SELF-PRIMING PUMP LOCATED AT THE FRONT TOP- SIDE OF THE UNIT. (SEE FIGURE 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 1" 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.**

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" 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 FACTORY PIECE OF HOSE IS REMOVED AND THE SIPHON BRAKE INSTALLED ACCORDING TO THE MANUFACTURER OF THE BRAKE. USUALLY THE SIPHON BRAKE IS MOUNTED 18-24" ABOVE THE WATER LINE TO BE EFFECTIVE.

# EXHAUST SYSTEM

THE WATER-COOLED STAINLESS STEEL EXHAUST MIXER IS 1" OD AND SHOULD BE USED IN CONJUNCTION WITH A WATER LIFT EXHAUST MUFFLER AND 1" I.D. APPROVED MARINE GRADE EXHAUST HOSE. ALL CONNECTIONS MUST BE DOUBLE CLAMPED.

IT IS POSSIBLE TO RUN THE UCM 1-3.5 WITHOUT A WATER LOCK PROVIDING THE ENTIRE EXHAUST SYSTEM RUNS DOWN HILL. EXHAUST NOISE WITHOUT A WATER-LOCK MUFFLER WILL BE MARKEDLY HIGHER AS WELL. THE BEST RESULTS AS FAR AS NOISE LEVEL IS CONCERNED ARE ACHIEVED BY USING A WATER-LOCK MUFFLER AND RUNNING THE EXHAUST SYSTEM OUT THROUGH THE TRANSOM 2-3 INCHES ABOVE WATERLINE.

WE HAVE SEEN SYSTEMS RUN UP TO 20 FEET OF 1" I.D. HOSE WITH NO BACK PRESSURE PROBLEMS. THERE ARE MANY DIFFERENT BRANDS AND STYLES OF WATER-LOCK, OR WATER-LIFT MUFFLERS AVAILABLE THAT WILL WORK FINE. AT TIMES YOUR CHOICE MAY BE BASED ON PHYSICAL SIZE OR INLET/OUTLET ARRANGEMENTS.

WE AT NEXT GENERATION POWER HAVE HAD EXCELLENT RESULTS USING THE HEAVY-DUTY FIBERGLASS UNITS MADE BY "CENTER". BECAUSE OF THE LOW EXHAUST OUTLET ON THE UCM 1-3.5, CENTER MODEL (#1500018) WORKS VERY WELL AS IT HAS A LOW SIDE INLET WITH TOP OUTLET. TOP INLET WITH TOP OUTLET VERSIONS ARE ALSO AVAILABLE (MODEL #1500001).

MOST EXHAUST SITUATIONS ARE SHOWN IN THE FOLLOWING DIAGRAMS SUPPLIED BY CENTER. THE MOST IMPORTANT CONSIDERATION IS THAT THE EXHAUST RUN DOWN HILL INTO THE WATER-LOCK MUFFLER SO THAT EXHAUST FLOODING DOES NOT OCCUR.

# VERNALIFT INSTALLATION

# D.C. ELECTRICAL

THE UCM 1-3.5 USES A VERY SIMPLE 12-VOLT D.C. SYSTEM FOR STARTING, RUNNING AND SHUTDOWN SYSTEMS. CONSIDERATION MUST BE GIVEN TO BATTERY CHARGING CAPACITY AS THE SET DOES NOT HAVE ANY BATTERY CHARGING CAPACITY AT ALL. 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 USUALLY 4-GAUGE IS ADEQUATE. BATTERY POSITIVE IS CONNECTED TO THE TOP LUG ON THE STARTER SOLENOID SHOWN BELOW. BATTERY NEGATIVE MAY BE CONNECTED TO ANY CONVENIENT STUD OR BOLT CONNECTED TO THE ENGINE ABOVE THE ISOLATION MOUNTS. NEGATIVE WIRE CONNECTED TO JUMPER WIRE SHOWN BELOW.

THE REMOTE PANEL WIRING HARNESS IS COLOR-CODED AND SHOULD BE CONNECTED TO THE CONNECTION TERMINAL STRIP BLOCK SHOWN BELOW. TEN AND TWENTY OR 30 FOOT EXTENSION HARNESSES ARE AVAILABLE FROM **NEXT GENERATION POWER**.

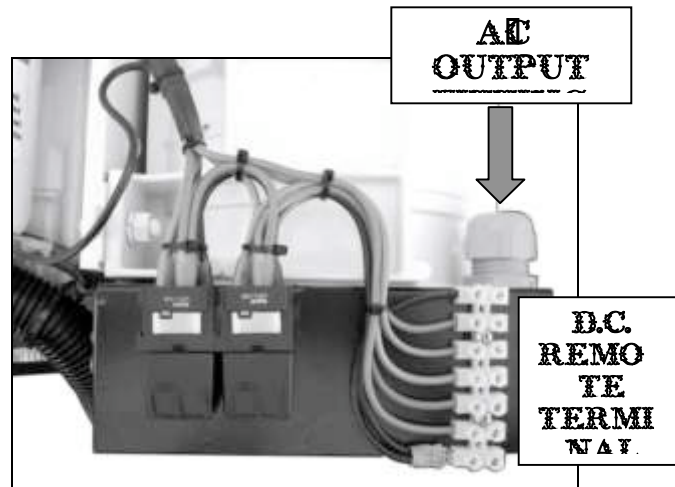


FIGURE 6

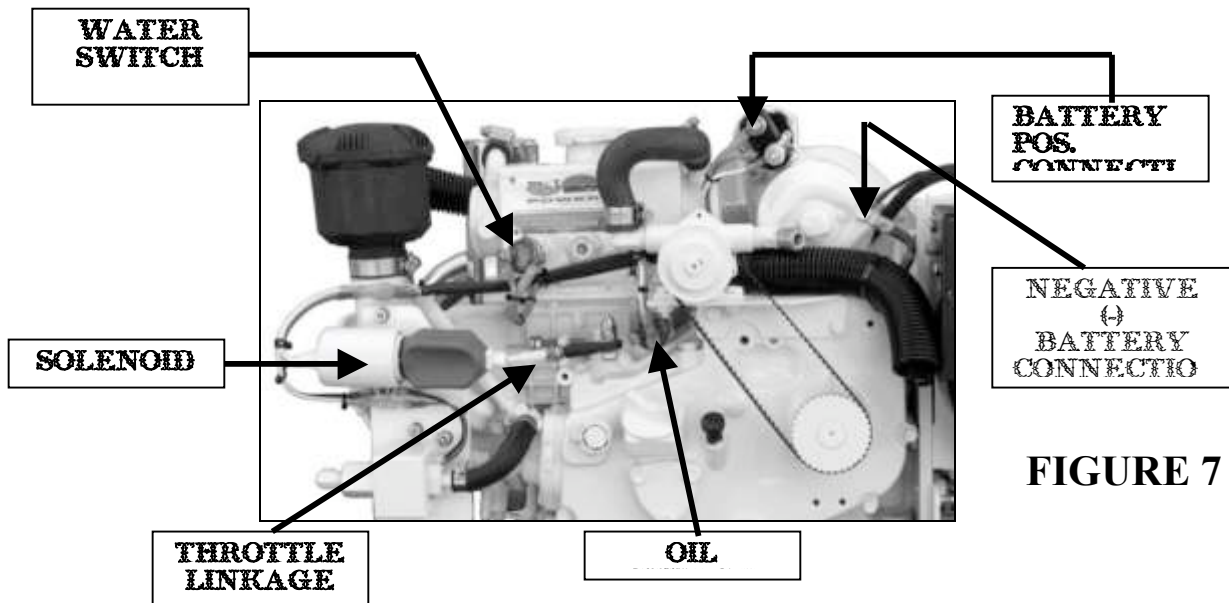
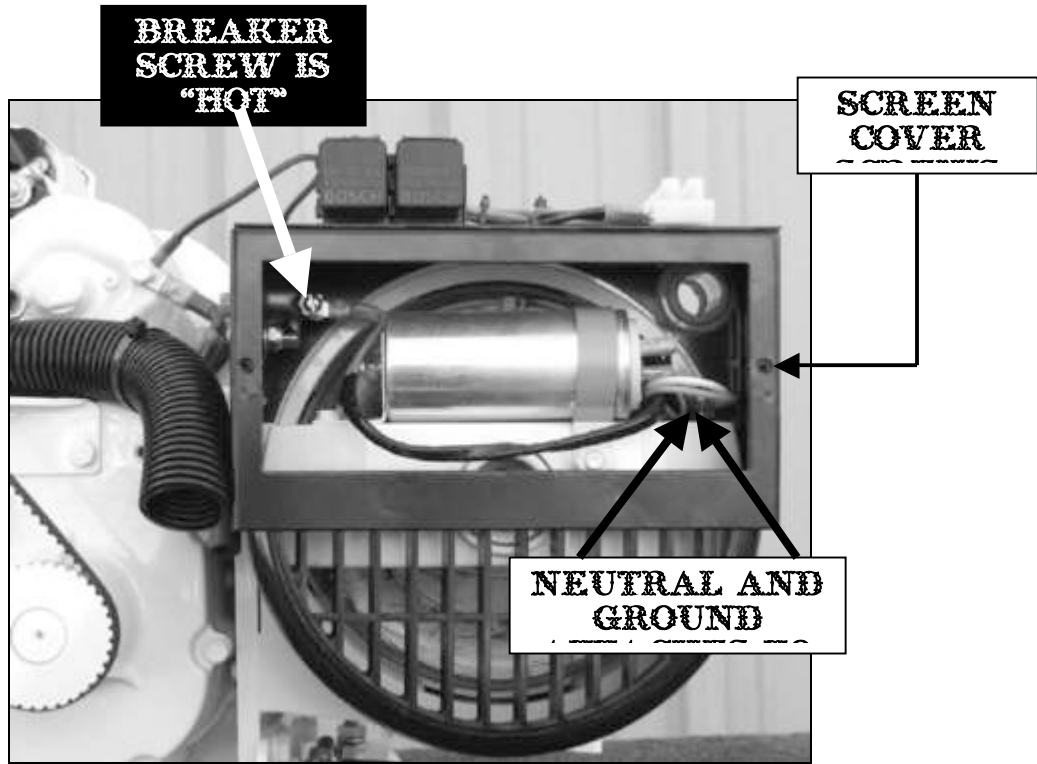


FIGURE 7

# A.C. ELECTRICAL CONNECTION



**FIGURE 8**

**VIEW SHOWING A.C. CONNECTION POINTS**

# A.C. ELECTRICAL WIRING

- ALL A.C. ELECTRICAL CONNECTIONS SHOULD BE MADE BY A LICENSED AND QUALIFIED MARINE ELECTRICIAN.

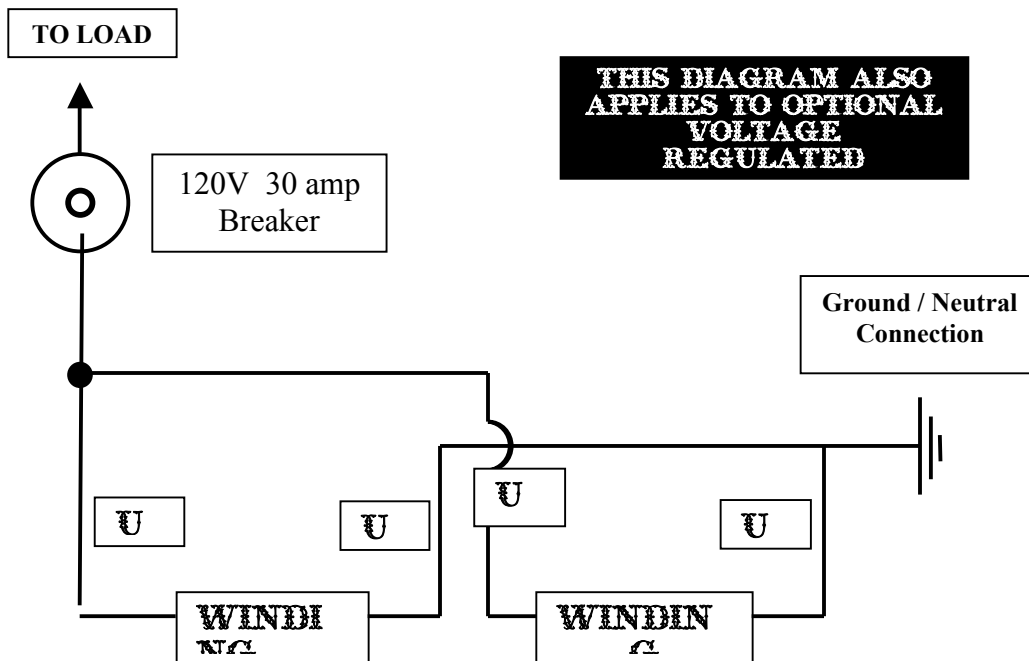
## STANDARD 120 VOLT 60 Hz OUTPUT

UNLESS OTHERWISE SPECIFIED THE UCM 1-3.5 IS MANUFACTURED USING A STANDARD FOUR WIRE CAPACITOR REGULATED BRUSH-LESS GENERATOR. STANDARD WIRING IS 120V 60 HZ OUTPUT.

ACCESS TO THE A.C. OUTPUT CONNECTIONS IS MADE BY FIRST REMOVING THE TWO STAINLESS STEEL SCREWS HOLDING THE SCREEN COVER IN PLACE. (SEE FIG 8.)

THE "HOT" LEG (USUALLY THE BLACK WIRE) OF THE VESSEL SHOULD BE CONNECTED TO THE UNUSED OUTPUT TERMINAL OF THE BREAKER. GROUND AND NEUTRAL WIRES (USUALLY THE GREEN AND WHITE) SHOULD BE CONNECTED TO THE NEUTRALGROUND BOLT SHOWN IN FIGURE 8.

**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 PROPER CONNECTION OF WIRES.

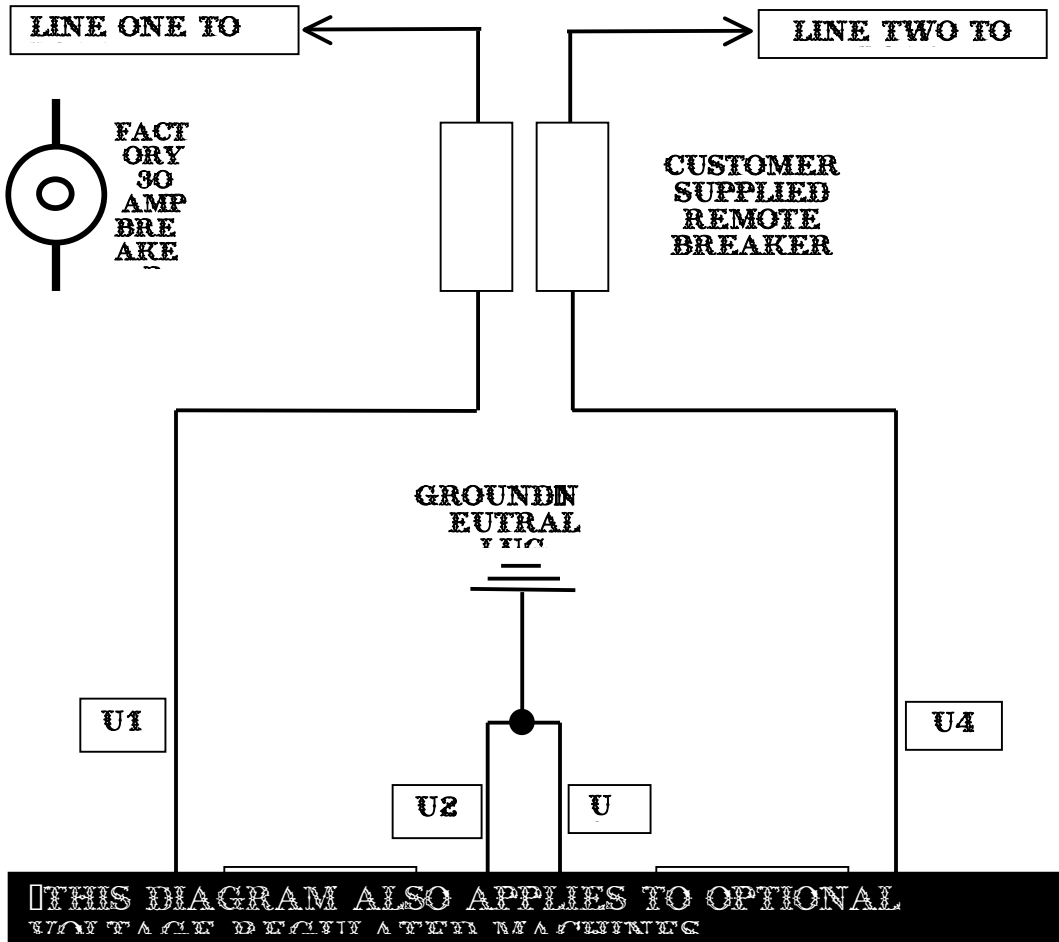


**REWIRE TO 120/240 VOLT 60 Hz**

UCM 1-3.5 MAY BE REWIRED FOR 120/240 VOLT USE WITH THE ADDITION OF AN EXTERNAL CUSTOMER SUPPLIED 2-POLE 15 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 15 AMP 240 VOLT BREAKER. FACTORY 30 AMP SINGLE POLE BREAKER IS NOT USED IN THIS CONFIGURATION.

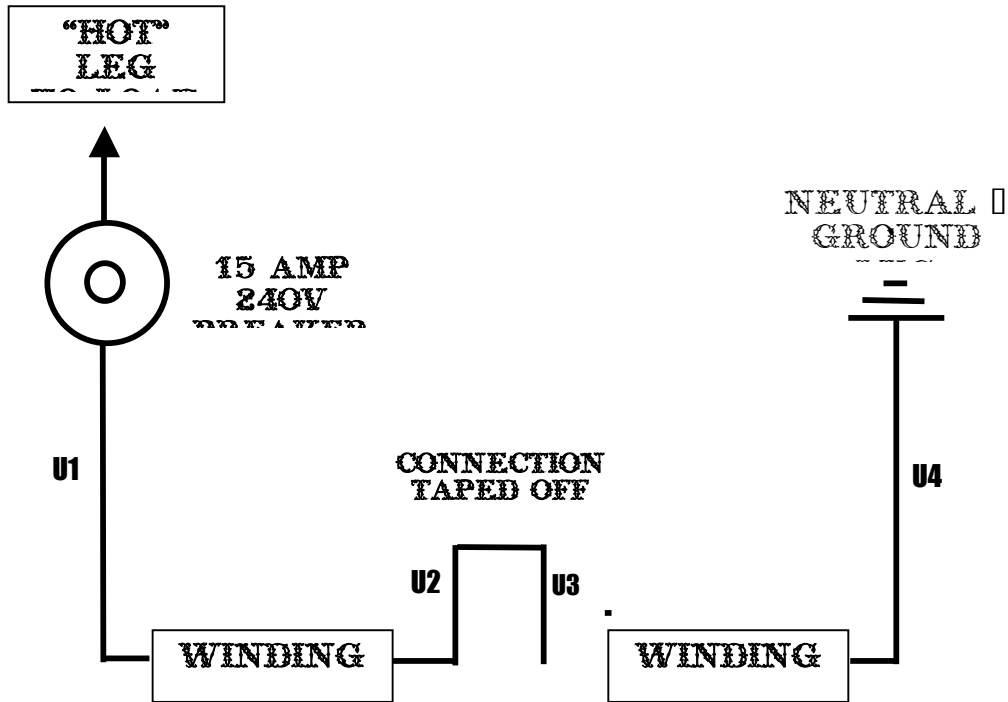
**IF THE GEN-SET IS TO BE INSTALLED IN A GAS POWERED VESSEL THE GEN-SET MUST BE AN IGNITION PROTECTION CERTIFIED UNIT AND THE BREAKER USED MUST ALSO BE IGNITION PROTECTION CERTIFIED.**





**OPTIONAL 50 HZ 240 VOLT OUTPUT**

IF YOUR UCM 1-3.5 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.



# 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 SEA-COCK AND FUEL SHUTOFF VALVES IF ANY.

- PRIMING THE FUEL SYSTEM

THE FUEL PUMP MAY BE ENERGIZED BY JUMPING THE 12 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 FLOW BACK TO THE RETURN ON THE TANK. RUN THE PUMP FOR APPROX. 2-3 MINUTES ALLOWING TIME FOR THE FUEL SYSTEM TO COMPLETELY FILL WITH FUEL. REMOVE JUMPER WIRE.

- 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 RE-PRIME 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 OR REMOVE WATER PUMP DRIVE BELT TO

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 1 MINUTE 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.

| ACTION REQUIRED                    | DAILY | MONTHLY<br>OR 100<br>HRS | 6 MONTHS<br>OR 250<br>HRS | YEARLY<br>OR 750<br>HRS |
|------------------------------------|-------|--------------------------|---------------------------|-------------------------|
| INSPECT THE SET                    | X     |                          |                           |                         |
| CHECK OIL LEVEL                    | X     |                          |                           |                         |
| CHECK COOLANT LEVEL                | X     |                          |                           |                         |
| CHECK FUEL LEVEL                   | X     |                          |                           |                         |
| CHANGE OIL [CLEAN<br>FILTER        |       | X                        |                           |                         |
| DRAIN SEDIMENT FROM<br>FUEL FILTER |       | X                        |                           |                         |
| CHECK ZINC ANODE                   |       | X                        |                           |                         |
| CHECK AIR FILTER                   |       |                          | X                         |                         |
| CHANGE FUEL FILTER                 |       |                          | X                         |                         |
| CHECK WATER PUMP DRIVE<br>BELT     |       |                          | X                         |                         |
| CHANGE WATER PUMP<br>DRIVE BELT    |       |                          |                           | X                       |
| CHANGE AIR FILTER<br>ELEMENT       |       |                          |                           | 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.

## **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 FUEL SYSTEM.

## **5. CHANGE OIL [CLEAN FILTER**

OIL SHOULD BE DRAINED BY REMOVING THE CAP OFF THE DRAIN HOSE LOCATED UNDER THE GENERATOR. (SEE FIGURE 1). A 3/8" DIAMETER OIL RESISTANT DRAIN HOSE SLIPPED OVER THE DRAIN VALVE FITTING MAKES THIS JOB MUCH CLEANER AND EASIER. AFTER THE OIL IS DRAINED, CLOSE THE DRAIN VALVE AND REMOVE THE CLEANABLE OIL FILTER SHOWN IN FIGURE 1, BY UNSCREWING THE NUT ON THE

(MAINTENANCE - Continued -)

FILTER. THE SCREEN TYPE FILTER MAY BE CLEANED IN FUEL OR A DEGREASING CLEANER. OIL THE FILTER AND THREADS AND THEN RE-INSTALL. FILL CRANKCASE TO THE FILL LEVEL ON THE DIPSTICK WITH APPROVED DIESEL GRADE OIL.

**6. DRAIN SEDIMENT FROM FUEL FILTER**

WATER AND SEDIMENT SHOULD BE DRAINED FROM THE FILTER BOWL BY UNSCREWING THE BLACK DRAIN VALVE LOCATED ON THE BOTTOM OF THE BOWL.

**7. 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 IS LESS THAN 1/2 OF ITS ORIGINAL SIZE. RATE OF DECOMPOSITION VARIES FROM VESSEL TO VESSEL, BUT AFTER SEVERAL INSPECTIONS RATE MAY EASILY BE DETERMINED.

**8. CHECK AIR FILTER**

AIR CLEANER ELEMENT MAY BE INSPECTED BY UNSCREWING THE TOP OF THE FILTER CANISTER LID. VISUALLY CHECK THE ELEMENT FOR BLOCKAGE, RIPS, TEARS OR EXCESSIVE MOISTURE OF ELEMENT MATERIAL. REPLACE IF NEEDED.

**9. CHANGE FUEL FILTER**

CHANGE THE FILTER AS PER SUPPLIED RACOR INSTRUCTIONS.

**10. CHECK WATER PUMP DRIVE BELT**

VISUALLY CHECK THE BELT FOR SIGNS OF CRACKING OR FRAYING, CHANGE IF NEEDED. CHECK THE BELT TENSION BY PRESSING LIGHTLY IN THE MIDDLE OF THE BELTS SPAN. IT SHOULD NOT DEFLECT MORE THAN 1/2 UNDER THE PRESSURE. TIGHTEN IF NEEDED BY LOOSENING THE TWO PUMP HOLD DOWN BOLTS AND SLIDING PUMP SLIGHTLY FORWARD.

**11. CHANGE PUMP DRIVE BELT**

REMOVE OLD BELT BY SLIDING BELT OFF OF LOWER PULLEY FIRST AND THEN LIFTING IT OFF OF THE TOP PULLEY. INSTALL THE NEW BELT BY WRAPPING AROUND TOP PULLEY FIRST AND THEN SLIDING IT AROUND LOWER PULLEY SECOND. USING THIS PROCEDURE IT MAY NOT BE NECESSARY TO READJUST BELT TENSION.

**12. 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, 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 UCM 1-3.5 WILL PROVIDE 30 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 UCM 1-3.5 WILL CARRY AN AIR CONDITIONER UP TO 16,000 BTU'S ALONG WITH A TYPICAL BATTERY CHARGER, SOME LIGHTS, T.V. AND HAVE 1- 1 [] KW LEFT OVER FOR ANOTHER APPLIANCE SUCH AS A 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 1 – 3.5 QUICK REFERENCE PARTS

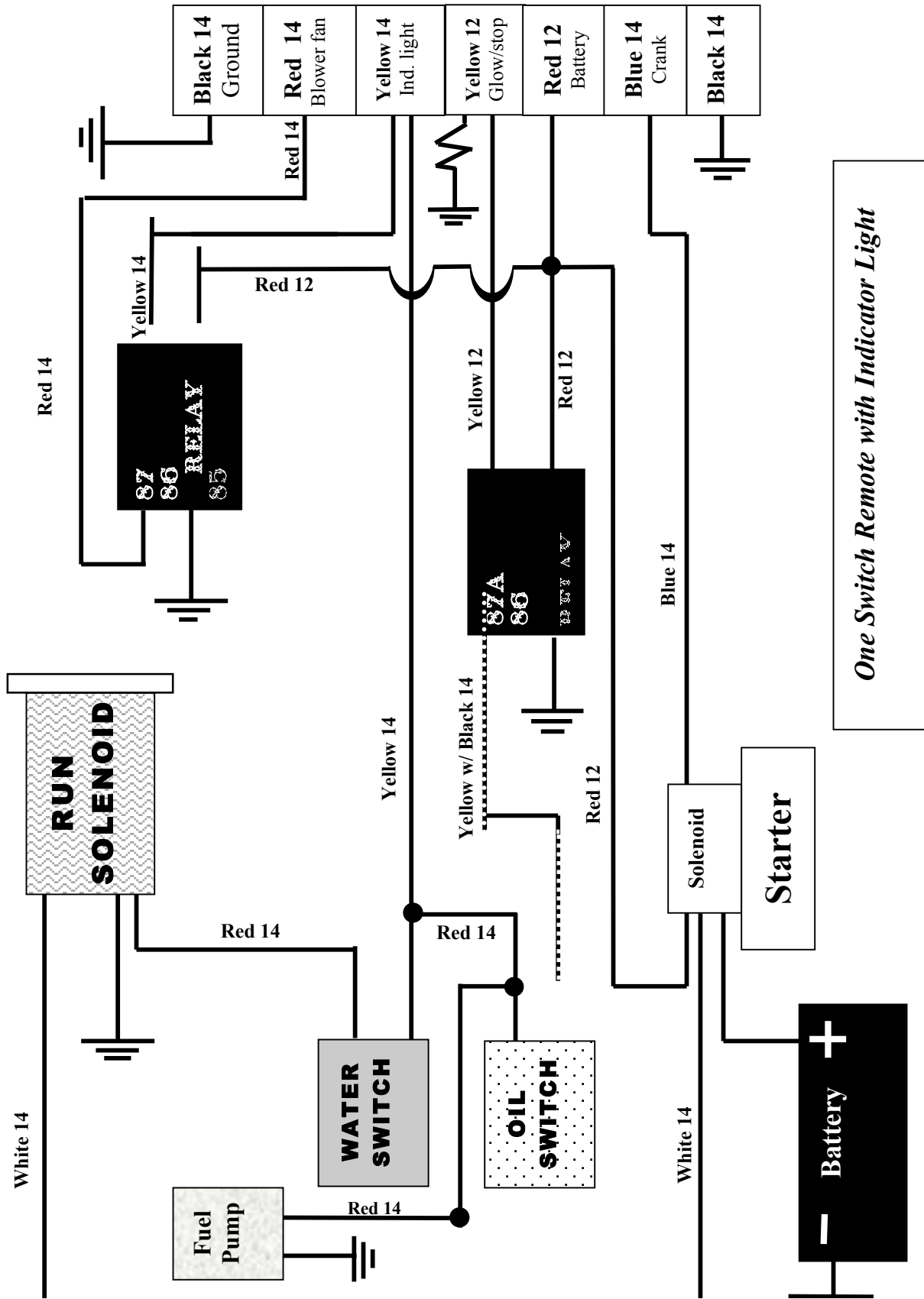
|                            |                       |                     |
|----------------------------|-----------------------|---------------------|
| AIR FILTER                 | MANN & HUMMEL         | C630 (CALL NEXTGEN) |
| RAW WATER PUMP             | JABSCO                | 1510-9001           |
| IMPELLER KIT               | JABSCO                | 22405-0001          |
| PUMP DRIVE BELT            | GOODYEAR              | 190X1037            |
| ZINC                       | STANDARD              | 38 NPT PENCIL TYPE  |
| FUEL PUMP                  | FACET                 | 40 1105             |
| PUMP TO HEAT EXCH. HOSE    | GATES                 | 18746               |
| HEAT EXCHANGER             | CHAMP                 | 2005187 CP          |
| EXHAUST MIXER              | NEXT GENERATION POWER | CALL NEXT GEN       |
| RACOR 2 MICRON FUEL FILTER | RACOR                 | R12S                |
| SHUTDOWN SOLENOID          | SYNCHROSTART          | 1753ES              |
| OIL PRESSURE SWITCH        | NASON                 | SM-2A-10F-ATVT      |
| WATER TEMP. SWITCH         | NASON                 | TM-2B-225 RAT       |
| GENERATOR CAPACITOR        | GENERIC               | 400V 40UF           |
| MAIN DRIVE BELT            | GOODYEAR              | W800 EAGLE PD       |
| BASE ENGINE                | KUBOTA                | EAS00 NB            |
| GENERATOR (STANDARD MODEL) | MARKON                | BL105E              |

PARTS DEPT. HOURS OF SERVICE  
 MONDAY [FRIDAY 8 A.M. [5 P.M. EST

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# UCT 1-3.5 Wiring Diagram





# TROUBLESHOOTING

## *UNIT DOES NOT CRANK*

### POSSIBLE CAUSE

### DIAGNOSIS OR REMEDY

Bad battery or low voltage

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 multi-meter. Repair wire or cable as req'd.

Bad Rocker switch

Test switch with a multimeter for proper operation. Replace if needed.

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.

Faulty wire or connections from remote switch. Test to be sure 12 volt + is getting to glow plug.

Glow plug itself may be faulty, remove from engine and test with 12V + and replace if needed.

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 (Con't)

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 the plunger.

If the 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 volts 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 volts 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 connections 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 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 at fault.

## ***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. |
| 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 with Next Generation Power.  |

## ***WRONG OUTPUT VOLTAGE***

|                       |   |
|-----------------------|---|
| Faulty generator      | Troubleshoot out of Markon Generator Handbook.<br><br>Generator output voltage may be changed slightly by adjusting the engine speed up or down. This is done at the speed linkage shown on Fig. (shortening linkage increases the speed) |
| Engine speed problems | 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.  |

