



**MARINE POWER SYSTEMS**  
SUPPLEMENTAL MANUAL

**Power Technology Southeast, Inc.**  
634 State Road 44 Leesburg, FL 34748-8103  
◆ (352) 365-2777 ◆ Fax (352) 787-5545 ◆

**POWER TECHNOLOGY S.E., INC.**  
**MARINE POWER SYSTEMS**

This supplement to your Owners Manual provides essential information pertaining to the installation and maintenance of Marine Power Systems manufactured by Power Technology S.E., Inc. The information contained within this supplement is relative to components designed specifically for marine applications. Information pertaining to the Engine, Alternator and Control Box may be found within the Owners Manual for your generator.

**NOTE:** Marine Power Systems manufactured by Power Technology S.E., Inc. ARE NOT “Ignition Protected”. United States Coast Guard (USCG) regulation 33CFR183 requires a generator to be “Ignition Protected” when used in a gasoline fueled environment.

Power Technology recommends all persons involved in the installation, operation, maintenance and/or repairs of the generator carefully read this manual and all accompanying literature. Safety is of the greatest concern; follow all Safety recommendations as outlined in your Owners Manual. Be sure to read the Power Technology S.E., Inc. Limited Warranty as your rights as a Marine Power System owner may vary from other applications. In the event you should experience a problem with your generator please contact the sales dealer, one of our authorized service centers or Power Technology’s Customer Service Department directly at 1-800-760-0027 from 8:00 a.m. to 5:00 p.m. EST. Please have the generator model and serial numbers available when you call. This will help expedite service and parts to you. Parts may be obtained directly through Power Technology S.E., Inc. and shipped the same day if ordered by 3:00 p.m. EST.

Generator Model Number \_\_\_\_\_

Generator Serial Number \_\_\_\_\_

POWER TECHNOLOGY SOUTHEAST, INC.  
634 STATE ROAD 44  
LEESBURG, FL 34748-8103  
(352) 365-2777  
FAX (352) 787-5545  
www.PowerTech-Gen.com

# INSTALLATION

## GENERAL:

The installation of a Marine Power System may vary significantly from one craft design to another. To ensure safe trouble free service Power Technology S.E., Inc. recommends that a boatyard or installer who is knowledgeable and experienced in this type of marine application perform the installation. Proper location of the Marine Power System in the vessel is of prime importance; therefore it may be advisable to contact the vessel manufacturer with questions relating to location and installation. It is also important for the owner/operator to become familiar with the details of the installation. Periodic checks and routine maintenance will assure optimum performance and safe operating conditions for all personnel on board.

Several key factors must be considered in the installation.

1. Location:
  - a) Size and accessibility of a hatchway.
  - b) Structurally sound to support the unit's weight at all angles.
  - c) Above low-lying bilge water and vapor area.
  - d) Avoid water splash from above deck.
  - e) Accessible for maintenance and repairs.
  - f) Accessibility to a fire extinguisher. NFPA rating of ABC.
2. Ventilation:
  - a) Provide air for engine combustion.
  - b) Provide cooling air for the engine and generator end.
  - c) Expel hot air produced by the engine and generator end.
  - d) Prevent the accumulation of hazardous fumes.
3. Cooling Water Supply:
  - a) Properly located.
  - b) Sufficiently sized.
4. Fuel System:
  - a) Independent of other engine fuel supply and return lines.
  - b) Safely routed and secured.
5. Exhaust System:
  - a) Properly discharges cooling water (seawater).
  - b) Completely expel exhaust gases.
  - c) Sufficiently quiets exhaust noise.
  - d) Installation of Zinc Anode.
  - e) Safely routed and secured.
6. AC/DC Electrical Systems:
  - a) Proper voltage connections.
  - b) Electrically grounded.
  - c) Wiring safely harnessed and secure.

Depending upon the location of your Marine Power System; either above or below the water line, some additional components may be required to complete the installation. See the following pages for details on each system.

Cooling Water Supply	Through-Hull Seacock Fitting (Flush Hull Type)
	Shut OFF Valve
	Seawater Strainer
Fuel System	Primary Filter / Water Separator
	Shut OFF Valve
Exhaust System	Siphon Break
	Hydro-Muffler
	Zinc Anode
	Shut OFF Valve or Cover
AC/DC Electrical Systems	Ship to Shore Transfer Switch
	Remote Gauge Panel

INSPECTION of EQUIPMENT:

Prior to accepting your Marine Power System, check the unit for any shipping damage and be sure all accessories ordered are present. Check the contents against the packing list and report any loss or damage to the transportation company.

RIGGING and LIFTING:

Because of the size and weight of the unit, careful planning for rigging and lifting must be considered. Each unit is equipped with lifting eyes that are designed to carry the full weight of the generator. These lifting eyes are located on the upper engine section of the unit and allow the unit to be hoisted horizontally. In some situations the hatchway may not be large enough to accommodate the unit in the horizontal position. Therefore hoisting the unit in a vertical position will be necessary and specialized rigging may be needed to accomplish vertical hoisting. Be especially careful that the rigging does not interfere with or damage components on the unit. Never attach rigging to components or accessories, remove these parts if necessary and re-attach after the unit is in place. Special rigging work is best done by competent and experienced personnel working with proper equipment. Avoid short cuts.

GENERATOR LOCATION and MOUNTING:

As previously mentioned the location of the Marine Power System in the vessel is extremely important. Follow the vessel manufacturer recommendations should they apply to your installation. All key factors must be considered when choosing the mounting location for the unit. The engine and generator end are mounted to a heavy gauge sheet metal base pan by 4 flexible isolators that help prevent the transfer of vibrations from the generator to the mounting location. The unit must be orientated on a level and structurally sound mounting platform, and securely bolted into place. Once the unit mounting is completed the installer may begin attaching the component systems.

VENTILATION:

Most vessels are equipped with an ambient air ventilation system. If your vessel is not equipped or insufficiently equipped to support the extra demand of a Marine Power System, provisions must be made to install or increase the volume of ambient air into the area while providing for expulsion of hot air and hazardous fumes.

## COOLING WATER SYSTEM:

The Marine Power Systems engine is cooled by a fresh water/anti-freeze system employing a heat exchanger to dissipate engine heat. The engine fresh water-cooling system is a closed loop system similar to non-marine units, with the exception being a heat exchanger instead of a radiator. Seawater is used as the heat exchanger's cooling medium. This system operates by pumping cool seawater into the heat exchanger, which absorbs heat from the fresh water system; it then exits through the engines exhaust manifold, also removing exhaust heat and gases as well. The seawater cooling system incorporates components specifically designed for marine applications. Attention to component selection and mounting location is an important consideration.

**CAUTION: DO NOT** use a scoop-type through-hull fitting for the seawater supply. This type of fitting will cause excessive pressure on the seawater pump, actually forcing seawater pass the impeller into the engine exhaust manifold and cylinders. Engine damage resulting from this is not a warrantable issue.

The seawater is supplied through a flush-type hull seacock fitting located in an area of the hull which must remain submerged at all times during operation. From the seacock fitting a positive shut OFF valve should be placed ahead of the seawater strainer. A visual-type seawater strainer should be used and mounted at or below the water line to be assured the supply line remains primed. The use of high quality wire reinforced hose is recommended to prevent the hose from collapsing during operation. Non-reinforced hose may collapse from the seawater pumps' suction. All hoses and fittings must be of adequate size to prevent any restrictions in the flow of seawater throughout the system. Machined fittings with true inside diameters are preferred over standard pipefittings.

## FUEL SYSTEM:

The diesel fuel system for a Marine Power System must be designed to operate independently from the vessels main engine. In most installations both engines operate from a common fuel tank with separate pick-up and return lines for each engine.

**NOTE:** Never use a simple Tee fitting to supply both engines from a common fuel line. This practice may cause a fuel starvation situation to either or both engines. Additionally, excessive pressure may build up in the main supply line and possibly cause a fuel line or connector failure resulting in a hazardous fuel leak.

The unit comes equipped with a spin-on type fuel filter installed between the fuel pump and the injector pump. It is recommended however; that a positive shut OFF valve and marine approved primary filter/water separator be installed between the fuel tank and fuel pump. Mount these components in an area that is readily accessible for service. Use only high quality 1/4" ID fuel line and fittings suitable for marine applications throughout the system. Carefully plan and route the fuel supply and return lines, secure them with the proper clamping devices to prevent vibration and chaffing. Routine inspections and service of all fuel system components will assure safe trouble free operation.

**IMPORTANT:** A fire extinguisher with the NFPA rating of ABC should be in close proximity to the unit and easily accessible. Maintain it in good working order and be familiar with its use.

## EXHAUST SYSTEM:

When connecting the exhaust system to your Marine Power System special consideration must be taken in its design, components used and Safety issues encountered with the installation. The design and components used are relative to the location of the unit. That is, above or below the water line. In all cases Safety is of prime importance. A well-designed leak free exhaust system is essential to the operation and performance of the generator and to the Safety of the vessel and its occupants.

**WARNING:** Carbon Monoxide gas is present in exhaust gases produced by diesel engines. Carbon Monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal. Prevent the accumulation of exhaust gases in closed areas or from being drawn into such areas. Avoid still/calm conditions, always exhaust downwind and away from others.

The Marine Power System comes equipped with the seawater pump, heat exchanger, exhaust manifold and exhaust elbow already mounted to the engine and connected with the appropriate hoses. The installer is responsible for attaching the remainder of the exhaust components in order to complete the installation.

**IMPORTANT:** For installations where the Marine Power System is located below the water line provisions MUST be made to install a siphon-break in the seawater supply hose connected to the water injected exhaust elbow. The siphon-break will prevent the siphoning of seawater through the cooling system. Without the siphon-break seawater will fill the exhaust system to a point that the exhaust manifold and engine cylinders will be flooded. The siphon-break MUST be located at least 12" above the water line at all angles of operation. Engine damage resulting from an un-installed or improperly installed siphon-break is not a warrantable issue.

When installing the hydro muffler follow the manufacturers instructions regarding hose size and location. It is generally recommended to locate the hydro muffler as close to the unit as practical. Always exhaust in a downward direction and never loop the exhaust hose between the exhaust elbow and hydro muffler. Avoid restrictions and unnecessary bends in the exhaust hose as they may cause excessive backpressure and poor performance. It is advisable to check the backpressure with a Mercury Manometer or similar gauge. Backpressure should not exceed 3" of Mercury (0.104 kg/cm<sup>2</sup>). Only use exhaust hose and clamps that are appropriate for marine applications. For a leak free exhaust system, securely mount and tighten all connections.

When the generator is not in operation it is important to prevent seawater from entering the exhaust system. If the vessel experiences heeling/backing down or like conditions, seawater could fill the exhaust system and engine cylinders. To avoid such a situation a closure or valve should be installed near the exhaust seacock fitting. Engine damage resulting from these conditions is not warrantable issue.

Your best protection against exhaust gas leakage is a daily inspection of the complete exhaust system. Check for leaks around all components and junctions. Check surrounding areas for signs of excessive heating. Listen for sound changes in the system. If any of the signs of exhaust leakage are observed immediately shut down the unit and have a qualified mechanic inspect and repair the problem.

**IMPORTANT:** Circumstances may arise in which the engine will not start. Excessive cranking of the engine creates a situation in which the seawater pump will fill the exhaust manifold and flood the engine cylinders. To prevent this from happening, close the valve on the seawater supply line, drain off accumulated seawater in the exhaust system and correct the starting problem. It is important the owner/operator keeps this in mind. Engine damage under these circumstances is not a warrantable issue.

## ELECTRICAL SYSTEMS:

The Marine Power System incorporates two separate electrical systems. DC Voltage is used to start the engine and supply current to engine components such as switches, gauges, and battery charging circuit. The engines DC wiring harness and control box is factory installed, all that is necessary for operation is to connect to a 12V DC battery and connect the wiring to the optional remote gauge panel. The generator end of the unit produces the AC Voltage used throughout the vessel. Follow the vessel manufacturers' recommendations for wiring your generator into the AC circuits of the vessel. Ensure the proper voltage and ground connections are made and all wiring is safely harnessed and secured. A Ship to Shore transfer switch will enable your vessel to operate on generator output power or connect to utility shore power when available. The Ship to Shore transfer switch also prevents the simultaneous connection between utility shore power and the generators output.

**IMPORTANT:** A hazardous situation may occur if utility shore power and generator output power are connected simultaneously. Dangerous back feeding of AC Voltage can cause serious damage and/or injury. Damages resulting from back feeding, improper wiring or faulty components are the responsibility of the installer and are not warrantable issues.

## OTHER IMPORTANT CONSIDERATIONS:

A few components of the seawater cooling system that need regular attention are the seawater pump impeller and the Zinc Anode. The seawater pump impeller is made of neoprene and should never be run dry. Impeller failure may occur due to lack of water or age. It is advisable to have on hand a spare impeller and gasket should a failure occur. If the impeller breaks apart, be sure to locate and remove all fragments from the system.

The heat exchanger in the seawater cooling system has provisions for a Zinc Anode. The purpose of this Zinc Anode is to sacrifice itself to electrolysis action within the system thereby reducing the effects of electrolysis on the other components in the system. The Zinc Anode should be inspected on a monthly basis, cleaned and/or replaced as required. Be sure to clean any anode debris from the area inside the heat exchanger. It is advisable to have a few spare Zinc Anodes on hand.

Maintain the 12V DC charging system in good working order. Make sure the battery is securely mounted and well ventilated. Regularly check the battery and terminal connections. Clean and tighten as required. Maintain the recommended electrolyte level.

**WARNING:** Take all necessary precautions when handling and servicing batteries. Protect your eyes and skin from acid splash. Never smoke or allow an open flame near batteries since they emit highly explosive gas.