

# FUEL SYSTEM

## FUEL SAFETY CHECKLIST FOR BOARDING

This fuel safety checklist is designed to be used as a quick reference to minimize the risks associated with fuel hazards. You should refer to this checklist every time you board your yacht. Read your owner's manual so that you have a full understanding of the fuel system on your yacht.

**WARNING: Fuel, especially gasoline is extremely flammable. Failure to follow these recommendations and the rules of good common sense could result in fire or explosion; which could cause personal injury or death.**

- Before approaching your yacht, extinguish all smoking materials and make certain there are no other sources of possible ignition near your yacht.
- Approach your yacht alone to make the initial inspection. Have your guests and crew stand by a safe distance away.
- From the dock, visually inspect your yacht for any fuel leaks from the deck fills or hull vents and take notice if there is any odor of fuel.
- Once onboard, open cabin door and sniff at doorway, then inside cabin for fuel odor.
- Open the engine compartment hatch and sniff for fuel odor.
- Inspect the engine compartment and all bilge compartments for fuel leaks and sniff for fuel odor.
- If there are any signs of fuel leakage, either visually or by odor, open doors, hatches, and windows. Evacuate the boat and inform the dock master. Have an authorized service technician inspect your boat.
- If no signs of fuel are present, board your guests and crew.
- Run exhaust blowers for five minutes before starting the engines or generator.
- Always be aware of the hazards associated with fuel and practice good common sense.

**"HAPPY AND SAFE BOATING! "**  
from the MAINSHIP Team

## FUEL SYSTEM



**WARNING:** Fuel, especially gasoline is extremely flammable. Failure to follow these recommendations and the rules of good common sense could result in fire or explosion; which could cause personal injury or death.

The purpose of the fuel system is to maintain the necessary supply of fuel to the engines and generator (if so equipped) upon demand and as needed. The fuel system on your MAINSHIP Trawler is comprised of the following components, which will be described separately.

- Fuel Tanks
- Fuel Tank Fills & Vents
- Fuel Tank Grounding System
- Fuel Distribution Hoses
- Fuel Supply Valves
- Fuel Filtration
- Fuel Gauge

### Fuel Tanks

Your MS 390 PT is equipped with 2 (two) fuel tanks. Each fuel tank will hold 150 gallons of fuel. The engine is supplied by fuel from both tanks. The generator (if so equipped) receives fuel from the starboard side fuel tank.

The fuel tank is equipped with a fuel level sending unit, which provides an electrical signal to the fuel gauge to indicate the fuel level.

The fuel tank should be inspected for signs of leaks, corrosion, and/or pitting at least once a year. Corrosion normally appears as a white chalky or flaky substance on the surface of the tank. Sometimes it also appears as pitting or small pockets of missing aluminum. Another indication of corrosion could be bubbles on the paint that coats

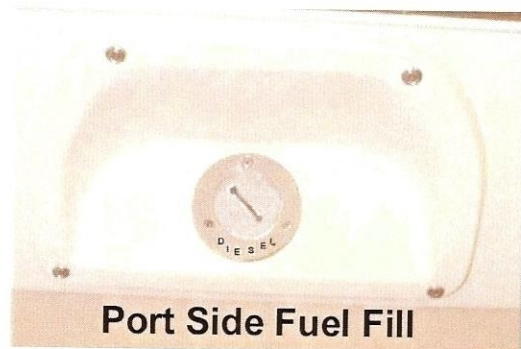
the tank. If any of these conditions are present have an authorized MAINSHIP service technician inspect the tank immediately. If a leak is found, turn off battery switches, disconnect shore power (**see Connecting & Disconnecting Shore Power**), which explains the proper way to disconnect and disable any possible source of ignition). Contact your MAINSHIP dealer or MAINSHIP Customer Service immediately.



**WARNING:** Leaking fuel is a fire and explosion hazard; personal injury or death could occur.

### Fuel Tank Fills & Vents

The fuel tank is filled through its respective fuel fill fitting and the cap is marked DIESEL.



**Port Side Fuel Fill**





**CAUTION:** Using the wrong fuel type will result in severe damage to the engine.

The tank fill fitting is located on both the starboard and port side amidships.

The fuel tanks also have a hull vent fitting. These fittings are located on the starboard and port sides. The vent fittings are connected to the fuel tank with the fuel vent hose. These vents allow air to pass through them when fueling and when the engine or generator is pulling fuel from the tank.

The fuel fill and fuel vent hoses, fittings, and connections should be inspected for leaks and signs of dry rot or swelling at least once a year. If any of these conditions are present have an authorized MAINSHIP service technician inspect the fuel system immediately. If a leak is found, turn off battery switches, disconnect shore power (**see Connecting and Disconnecting Shore Power**), and disable any possible source of ignition. Contact your MAINSHIP dealer or MAINSHIP Customer Service immediately.



**DANGER**

**DANGER:** NEVER ENTER THE ENGINE ROOM WITHOUT PROPER VENTILATION FIRST. A SPARK CAUSED BY POWER TOOLS OR LIGHTING EQUIPMENT COULD RESULT IN FIRE OR EXPLOSION WHICH COULD CAUSE PERSONAL INJURY OR DEATH.



**WARNING**

**WARNING:** Leaking fuel is a fire and explosion hazard; personal injury or death could occur.

If hoses need to be replaced, make sure that only USCG TYPE A1 or A2 are used.



**WARNING**

**WARNING:** The use of any hose other than USCG TYPE A1 or A2 could result in fuel leakage. Leaking fuel is a fire and explosion hazard; personal injury or death could occur.

### Fuel Tank Grounding System

The fuel tank and fuel fill on your MAINSHIP are electrically grounded (or bonded) to the ground buss bar of the bonding system. This grounding system is designed to prevent the discharge of static electricity when fueling your yacht. An authorized MAINSHIP service technician should inspect this system at least once each year.



**WARNING**

**WARNING:** While fueling, a spark caused by static electricity could result in fire or explosion, which could cause personal injury or death.



## Fuel Distribution Hoses

Your engine and generator (if so equipped) has a fuel supply hose that runs from the pickup tube in the tank to the engine. Also, the engine and generator has a fuel return hose that runs from the engines and generator back to the fuel tanks. All of the supply and return hoses are USCG TYPE A1.

The fuel supply and return hoses, fittings, and connections should be inspected for leaks and signs of dry rot or swelling at least once a year. A good way to examine the fuel hoses is to run your hand along the length of the hose, including the fittings. Small leaks will be revealed as wet spots on your hand. If any evidence of hose deterioration is present, have an authorized MAINSHIP service technician replace all of the hoses with USCG TYPE A1 hoses immediately. If a leak is found, turn off battery switches, disconnect shore power (See **Connecting and Disconnecting Shore Power**), and disable any possible source of ignition. Contact your MAINSHIP dealer or MAINSHIP Customer Service immediately.



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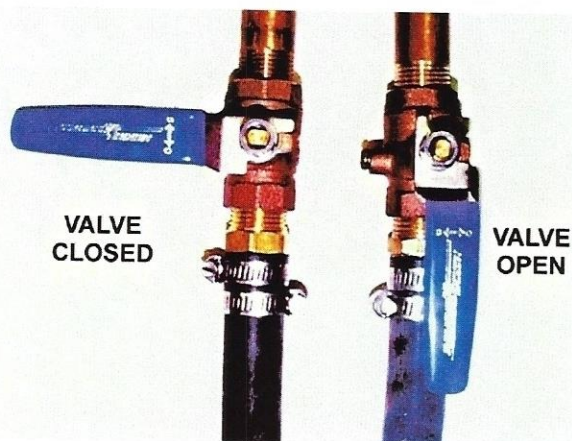
If hoses need to be replaced, make sure that only USCG TYPE A1 are used.



**WARNING:** The use of any hose other than USCG TYPE A1 for fuel distribution, could result in fuel leakage. Leaking fuel is a fire and explosion hazard; personal injury or death could occur.

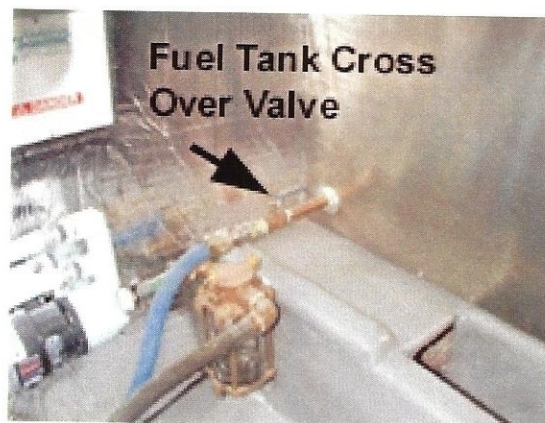
## Fuel Supply Line Valves

Your MAINSHIP TRAWLER has a fuel shutoff valve on the supply line for the respective engine and generator (if so equipped) on each fuel tank. The fuel shutoff valves are located aft of each engine on top of each fuel tank. Turning the handle so it is perpendicular to the fuel line as shown on figure # 1 closes the valve. Turning the handle so it is in line with the valve body opens the valve.



**Figure # 1 Fuel Valve Close/Open**

The fuel tanks have a crossover line that runs from the front of the port side tank to the front of the starboard side tank. The valves work the same as they do with the fuel line shutoff valves. The crossover lines **MUST** be in the open position when ever the engines of the generator is running.

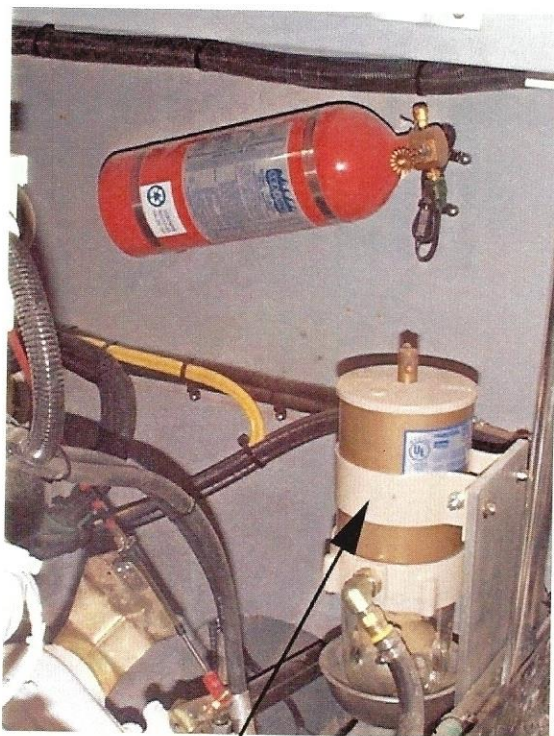




## Fuel Filtration

The fuel that is supplied to the engine and generator (if so equipped) may contain impurities found in the fuel tanks or contained in the fuel from your supplier. If these impurities are not removed prior to entering the engine or generator, performance may be seriously affected. Removal of the fuel impurities is accomplished by external fuel filters.

Your MAINSHIP is equipped with a diesel power engine. The fuel system has a separate filtration system. The Racor filter can be found mounted in the engine room, aft of the engine.



**Fuel Filter Is Located Aft Of The Engine**

If your MAINSHIP is equipped with a generator, a fuel filter is mounted directly to the generator engine. Refer to the Manufacturer's owner's manual for maintenance and precautions.

An authorized MAINSHIP service technician should replace all filters annually prior to spring launch. They may need more frequent replacement if you notice poor engine/generator performance due to contaminated fuel.

## Fuel Gauge

The purpose of the fuel gauge is to constantly monitor the fuel level in the fuel tanks. The gauges on your MAINSHIP TRAWLER are located at both the upper and lower helm stations. Sit idle to receive the most accurate reading from your fuel gauge.

## Fueling Your Boat

### Fuel Quality

Refer to your **Engine Manual** for specific fuel requirements for your engine (i.e., recommended octane level).

### Fuel Additives

Refer to your **Engine Manual** for recommendations.

Refer to the **Winterization and Storage** section of your owner's manual concerning the use of fuel stabilizers. Always follow the manufacturer's recommendations when using fuel additives or stabilizers.

## General Guidelines for Fueling



**WARNING:** Leaking fuel is a fire and explosion hazard; personal injury or death could occur.





## CAUTION

**CAUTION:** Using the wrong fuel type in the engines or generator will result in severe damage to the engines. Check with the engine and generator manufacture's owner's manual before fueling your yacht.

Improper fueling procedures are the most common cause of boat fires. Careful fueling is very important for reducing the danger involved and making sure your boat is fueled properly. Fuel evaporates at a very low temperature, and the vapors can be carried into the boat where they can collect and become an explosion hazard.



## DANGER

**DANGER:** Fuel leaking from any part of the fuel system can lead to fire and explosion that can cause serious bodily injury or death. Inspect system before fueling.

Here are some general guidelines for fueling your boat:

- Before fueling, check the fuel system for leaks. Check components for weakening, swelling, or corrosion. See your MAINSHIP dealer for replacement of any leaking or defective fuel system components before starting your engines.
- If possible, fuel your yacht only during the hours of daylight. Fuel spills are easier to detect when visibility is good.
- To reduce condensation and the accumulation of moisture in the fuel system, keep your fuel tank as full as possible, especially during overnight docking or mooring.

- In warm and hot weather, allow for expansion of the fuel and DO NOT "top off" the fuel tank. The fuel tank may overflow when the fuel expands after being pumped from cool underground tanks or when the air temperature is cool, such as early morning or evening.
- Never hurry through the fueling procedure. In your haste, you may overlook an important step, resulting in improper fueling.
- Make sure you use the correct fuel type.



## CAUTION

**CAUTION:** Using the wrong fuel type will result in severe damage to the engines and generator.

### Fueling Procedure

Follow these procedures to fuel your boat:

1. Safely and securely moor your boat to the dock.
2. Turn off engine and generator. Turn main battery switches off to prevent sparks from electrical equipment (lights, blowers, pumps, etc.).
3. Disconnect shore power if connected. (**See Connecting and Disconnecting Shore Power**, which explains the proper way to disconnect).
4. Extinguish all smoking materials and any other items that may produce a spark or flame.



## WARNING



**WARNING:** A spark or open flame can ignite fuel or fuel vapor, which could cause personal injury or death.



**DANGER**

**DANGER:** Fuel evaporates at a very low temperature. Vapors can collect in areas inside your yacht and create an explosion hazard. An explosion will cause serious personal injury or death. Close all ports, windows, hatches, doors, and compartments before fueling.



**DANGER**

**DANGER:** Fuel vapors can explode. Do not smoke at the dock. Extinguish all flames, stove, and other ignition sources before you approach a fuel dock.

5. Completely close all ports, hatch covers, and doors. Ask guests to leave the boat during fueling.
6. Touch the nozzle of the fueling hose to the fuel fill cap to discharge any existing static electricity.
7. Remove cap from the fill pipe, (fuel cap is marked with the word DIESEL on it). The fill pipes are located port and starboard side amidships. Insert the fuel hose nozzle into the fill pipe.



**Stbd. Side Fuel Fill & Waste Clean Out**

8. Always maintain contact between the fuel hose nozzle and the fuel fill pipe to avoid the possibility of static electricity buildup. If static electricity forms during the fueling process, it may generate a spark, resulting in igniting of the fuel.
9. After pumping several gallons of fuel, **STOP**. Inspect engine compartment for any signs of fuel leakage. **DO NOT** continue the fueling process if leaks are noted. Have an authorized MAINSHIP service technician inspect and repair the leak before proceeding.



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10. If no leaks are noted, continue filling the fuel tank and be certain to allow for fuel expansion in warm weather. As the fuel tanks fill near the top, slow the fuel entry to avoid overflow through the fuel tank vent.

11. Remove nozzle after tank is full, and replace fill cap. Make sure cap is tight. If any fuel has spilled, clean it up immediately.
12. After fueling is complete, open all hatches, doors, and compartments. Visually check all fuel fittings, lines, and tanks for fuel leakage. Check all lines up to engines and generator. Smell for fumes. Correct any problem before you start the engines.
13. Turn main battery switches on to operate the bilge blower motor to ventilate the engine compartment.
14. Restart engines and restore boat to operating condition. **Do not smoke until your boat is clear of the fuel dock.**

Refer to section **UNDERWAY** of this manual for starting instructions.

## BEFORE STARTING THE ENGINES

Before starting the engines or generator (if so equipped), inspect engine and generator compartments for fuel leakage. Sniff to detect any odor of fuel. If leakage or fuel odor are present, open all doors and windows for ventilation and evacuate the boat immediately.

Notify the dockmaster and have a MAINSHIP service technician inspect and repair the leak before proceeding.



**WARNING:** Leaking fuel is a fire and explosion hazard; personal injury or death could occur.

If you do not detect any fuel odors and there are no fuel leaks, open doors and windows to ventilate.

**Run blowers for five (5) minutes before starting engines or generator.**



## TROUBLESHOOTING

Problem	Cause	Solution
Fuel overflows at fill plate (tank not full)	Fill or vent line blocked	Check lines. Clear obstruction from line or straighten line if kinked.
Water or moisture in fuel tank	Cap on deck fuel fill plate not tight	Check cap; tighten.
	Condensation forming on walls of partially filled tank	Diesel engines: Check fuel/water separators; drain if necessary. Check with your dealer.
	Poor quality fuel from marina tanks	Follow remedies for "Condensation" above. If remedies fail to correct problem, fuel tank and lines may need to be drained and flushed. See your dealer for service.
Engine cranks but will not start (fuel system)	Lack of fuel	Clean fuel filter, check fuel level; check whether anti-siphon valve, if so equipped, is stuck shut.  Improper starting procedure. Review starting procedures in engine manual.
	Clogged fuel filter	Check and replace fuel filter.
	No fuel reaching engine with all fuel valves open	Check fuel pump, fuel pump filter, carburetor fuel filter, and fuel tank line for cracked flanges or restricted fittings.
	Contaminated fuel	Inspect for water or other contaminants in fuel. If contaminated, drain tank and flush with fresh fuel.