

## Before Each Use

### Inspect the Battery Connections and Hold-Downs

Because poor connections or hold-downs may result in erroneous voltmeter readings, MasterCraft recommends doing this before starting the boat.

Step 1: Ensure the engine is OFF and the engine safety starting switch disconnected. **Be certain that the throttle/shift control lever is in neutral.** Locate the battery. Batteries are placed in a variety of locations, depending on the model. Check under the observer seat or behind the rear seat.



the terminals with a water-and-baking-soda solution and rinse with fresh water.

- Check the battery box that normally holds the battery in place to determine whether there is evidence of battery fluid inside it. Battery fluids are corrosion and can cause permanent damage to the battery box. If fluid is evident, wash out the box with the water-and-baking-soda solution as is used in cleaning the terminals. Rinse with fresh water and dry with a cloth.
- Reconnect the positive terminal first, then the negative. Tighten the terminals. Coat both terminals completely with a thin covering of marine grease. Be sure that the rubber boot covers the positive terminal completely.

**Note:** Your boat's engine is designed to work with the standard electronics installed in your boat. Adding other electrical components or accessories can change the way the fuel injection controls the engine or the overall electrical system functions. Before adding electrical equipment, consult an authorized MasterCraft dealer's service department. Otherwise, the engine may not perform properly.

## SCHEDULED MAINTENANCE

Step 2: Check that the battery post connections are clean and tight. If not:

- Loosen and remove the negative terminal connection first. Be careful not to touch the positive terminal with the wrench.
- Loosen and remove the positive terminal connection.
- Remove the battery hold-downs and remove the battery from the boat.
- Clean corrosion from the battery posts with a battery terminal cleaner.
- Clean the battery with a water-and-baking-soda solution. Use care to avoid allowing the solution to enter the battery vents. Rinse the battery with fresh water.



**Battery electrolyte fluid is dangerous. It contains sulfuric acid, which is poisonous, corrosive and caustic. If electrolyte fluid is spilled or placed on any part of the human body, immediately flush the area with large amounts of clean water and immediately seek medical attention.**

- Use a battery terminal cleaning brush to remove corrosion from the inside of the battery terminals. Clean



**Add-on equipment may adversely affect the alternator output or overload the electrical system. Such damage may not be covered by the warranty.**

If a replacement battery is required, be certain to select a marine battery with at least seven-hundred-fifty (750) cold-cranking-amps at zero degrees (0°) Fahrenheit. Before disconnecting the battery, make sure the ignition key and all accessories are in the OFF position. Also remember to re-attach the cables in the proper order, with the negative cable connected to the negative [-] post and the positive cable connected to the positive [+] post.

## **WARNING**

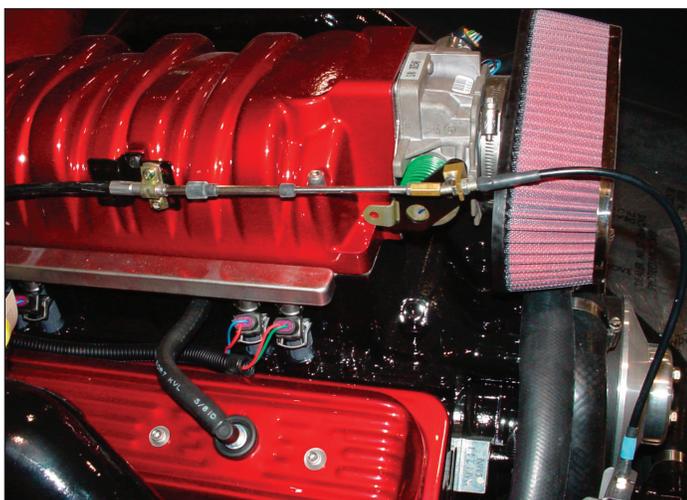
When charging, batteries generate small amounts of dangerous hydrogen gas. This gas is highly explosive. Keep all sparks, flames and smoking well away from the area. Failure to follow instructions when charging a battery may cause an electrical charge or even an explosion of the battery, which could result in death or serious injury.

MasterCraft recommends the use of a spiral cell type battery, such as the Optima brand. These batteries exceed other batteries in holding and extending a charge.

## **Inspect the Throttle and Shift Cables for Kinks, Wear and Interference (RTP-1 and Twin MCX Installations Only)**

## **CAUTION**

Some engine parts become very hot during operation. This inspection must be completed while the engine is cool to prevent burns to your skin. Perform this task before starting the boat.



*Step 1:* Ensure the engine is OFF and the engine safety starting switch disconnected. **Be certain that the throttle/shift control lever is in neutral.**

*Step 2:* Open the engine compartment and locate the throttle and shift cables. Follow each cable back under the floorboards and feel for any kinks and wear on the outer jacket. Any sign of cable damage is cause for replacement. See your authorized MasterCraft dealer's service department.

## **Inspect the Propeller Shaft Log for Water Entry**

*After approximately three (3) to five (5) minutes of boat operation in the water, shut off the engine and open the engine compartment. Be careful to avoid burns from contact with hot engine parts. The boat is equipped with a dripless shaft log and if it is showing any signs of dripping, the boat must be taken to an authorized MasterCraft dealer's service department for correction.*



## **WARNING**

The engine box serves as a machinery guard. The engine must be OFF whenever the box is open. Clothing or body parts can get caught in moving parts, causing death or serious injury. Keep away from moving parts!

## **CAUTION**

Attention must be paid to any leakage occurring in the propeller shaft log area. Water intrusion into the transmission, which can happen if excessive leakage is occurring may cause serious damage. Such damage may not be covered by the warranty.

## Inspect the Fuel System for Leaks

*This function should be performed prior to starting the engine; and then again after about three (3)-to-five (5) minutes to determine whether any leaks are apparent.*

**Step 1:** First ensure that the engine is OFF and that the engine safety starting switch is disconnected. **Be certain that the throttle/shift control lever is in neutral.** The engine must be cool.



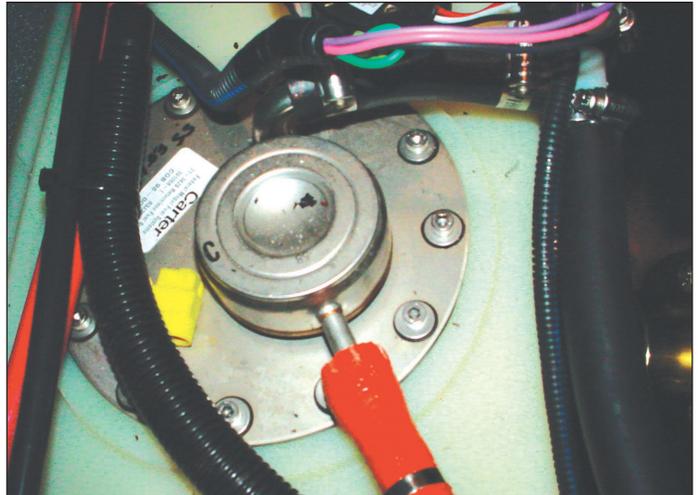
**Gasoline is highly flammable and its vapors may ignite, resulting in fire or explosion. Be sure to keep all sparks and flames away from the area while inspecting the boat's fuel system.**

**Step 2:** Open the engine compartment and visually check as much of the fuel system from the tank to the engine as you can see. If the odor of gasoline is strong or if you see visual evidence of fuel outside the system, cease all operations and take the boat immediately to an authorized MasterCraft dealer's service department to determine the source of the leak. The leak must be repaired before the engine is restarted. Because the lines on late model MasterCraft boats are pressurized, they can be disconnected and/or removed **ONLY** by using specialized tools that are not available to the public.



**The engine box serves as a machinery guard. The engine must be OFF whenever the box is open. Clothing for body parts can get caught in moving parts, causing death or serious injury. Keep away from moving parts!**

**Step 3:** After three (3) to five (5) minutes of operation, shut down the engine again and ensure that the engine safety starting switch is disconnected. **Be certain that the throttle/shift control lever is in neutral.** Again, inspect the fuel system as well as possible. If the odor of gasoline is strong or if you see visual evidence of fuel outside the system, cease all operations and take the boat immediately to an authorized MasterCraft dealer's service department to determine the source of the leak. The leak must be repaired before the engine is restarted. Because the lines on late model MasterCraft boats are pressurized, they can be disconnected and/or removed **ONLY** by using specialized tools that are not available to the public.



**This is important! Fuel leakage can lead to a build-up of potentially explosive fumes within the engine compartment. DO NOT IGNORE OR OVERLOOK THIS INSPECTION AND REPAIR AS NECESSARY!**

## Inspect the Exhaust System for Leaks

*This function should be performed prior to starting the engine; and then again after about three (3) to five (5) minutes to determine whether any leaks are apparent.*

**Step 1:** First ensure that the engine is OFF and that the engine safety starting switch is disconnected. **Be certain that the throttle/shift control lever is in neutral.** The engine must be cool.



## **WARNING**

**The engine box serves as a machinery guard. The engine must be OFF whenever the box is open. Clothing or body parts can get caught in moving parts, causing death or serious injury. Keep away from moving parts.**

*Step 2:* Open the engine compartment and visually check the exhaust system from the engine to the transom for any obvious damage to exhaust lines or the muffler.

*Step 3:* If leakage is apparent, tighten the hose clamps, being careful to avoid crimping the hose. If the leak is significant, or is occurring at a location other than the joints (such as a split in a hose), see your authorized MasterCraft dealer's service department for parts and service. This is important! **Exhaust fumes can cause illness or impairment, including carbon monoxide poisoning. Equally important to consider, leakage can lead to a build-up of potentially explosive fumes within the engine compartment. DO NOT IGNORE OR OVERLOOK THIS INSPECTION! REPAIR AS NECESSARY!**

### **Check That the Battery Is Fully Charged**

*As the boat is started, check all gauges, but pay particular attention to the voltmeter.*

While starting the engine, check that the voltmeter reads between 12.4 and 14.5 volts. An erratic reading may be a sign of low voltage. The voltmeter is the best indication of the state of your battery. However, it is not fool-proof. While the reading may indicate that the battery is producing current, if during a previous operation you had reason to suspect a problem with your battery, check with an authorized MasterCraft dealer's service department.



Current models are equipped with a low-voltage battery alarm. In the event that the stereo has been functioning when the boat engine is OFF, the voltage drain on the battery may result in difficulties re-starting the boat. To avoid

this situation, when the voltage level falls to 11.5 volts, the system will shut off the stereo system and sound an alarm for a period of two (2) minutes to allow the operator time to turn the ignition key ON and start the engine. Doing so will allow the engine's alternator to recharge the battery.

Charge dead batteries with a battery charger before attempting to start the engine. (Some MasterCraft models offer an optional battery charger; but never jump-start the battery.) **Jump-starting from another boat or battery is dangerous!** Charging a dead battery from an engine will put undue stress on the alternator, which may cause it to fail.

## **WARNING**

**When charging, batteries generate small amounts of dangerous hydrogen gas. This gas is highly explosive. Keep all sparks, flames and smoking well away from the area. Failure to follow instructions when charging a battery may cause an electrical charge or even an explosion of the battery, which could cause death or serious injury.**

## **CAUTION**

**Crossing cables or jumper cables may result in damage to the electrical components due to incorrect battery connections. Such damages may not be covered by your warranty.**

## Quarterly (Every Fifty [50] Hours)

MasterCraft recommends that your quarterly—or fifty (50) hour—maintenance requirements be performed by an authorized MasterCraft dealer. The staff there has the proper equipment and technical training to best meet your service needs.

### Lubricate the Engine Starter Gear and Shaft



Some engine parts become very hot during operation. This maintenance must be completed while the engine is cool to prevent burns to your skin. Perform this task before starting the boat.

*Step 1:* Ensure that the engine is OFF and that the engine safety starting switch is disconnected. **Be certain that the throttle/shift control lever is in neutral.** The engine must be cool.

*Step 2:* Disconnect the positive (+) battery terminal.

*Step 3:* Open the engine cover and locate the starter on the lower starboard side of the engine.

*Step 4:* Disconnect the starter and carefully remove it.



*Step 5:* Lubricate the starter bendix with a light coating of waterproof grease or white lithium grease.

*Step 6:* Return the starter to the engine and reconnect. After closing the engine compartment, reconnect the positive (+) battery terminal.

MasterCraft recommends that your quarterly—or fifty (50) hour—maintenance requirements be performed by an authorized MasterCraft dealer. The staff there has the proper equipment and technical training to best meet your service needs.

## ANNUALLY (Every One Hundred [100] Hours)

MasterCraft recommends that your annual—or one hundred (100) hour—maintenance requirements be performed by an authorized MasterCraft dealer. The staff there has the proper equipment and technical training to best meet your service needs.

### Annual Maintenance

Some boat owners choose to personally execute some maintenance procedures on their boats. MasterCraft has provided information on several procedures. For safety reasons, a few must be performed by authorized MasterCraft service technicians only, such as anything involving checks and repairs on the fuel line, which is under pressure.

These matters must be addressed on a regular basis, at one hundred (100) hours or annually, whichever comes first, and these procedures are in addition to seasonal preparation and winterization (see Storage and Winterization section for additional details). All of these issues are extremely important to continued boating pleasure, long life for the boat, and the critical matter of safety.

Even if the annual maintenance work is completed by an authorized MasterCraft service technician, boat owners and operators should still review this section and

ensure that they have some understanding of what is necessary to keep the boat in top condition.

**MasterCraft recommends that your annual—or one hundred (100) hour—maintenance requirements be performed by an authorized MasterCraft dealer. The staff there has the proper equipment and technical training to best meet your service needs.**

## Check the Engine Mounts



**Some engine parts become very hot during operation. This inspection must be completed while the engine is cool to prevent burns to your skin. Perform this task before starting the boat.**

*Step 1:* Ensure that the engine is OFF and disconnect the engine safety starting switch. Be sure that the throttle/shift control lever is in neutral. The engine must be cool.

*Step 2:* Open the engine box and locate the four (4) motor mounts.

*Step 3:* Check the tightness of the mounting hardware and the adjustable lock-nuts. Tighten any loose hardware securely.



## Check the Propeller Shaft Coupling Alignment

Later-model MasterCraft boats are equipped with a drip-less propeller shaft log. If it is showing signs of drips, it must be corrected by an authorized MasterCraft dealer's service technician.

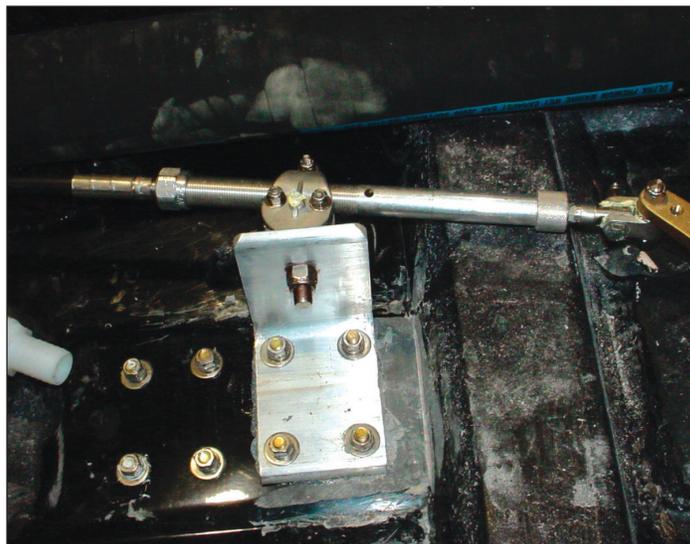
## Inspect the Exhaust Flaps for Damage

*Step 1:* Ensure that the engine is OFF and disconnect the engine safety starting switch. **Be sure that the throttle/shift control lever is in neutral.**

*Step 2:* Inspect the exhaust flap hinge for signs of deterioration. Replace the flap if necessary.

## Lubricate the Steering System

*Because this process should be completed while all movable components of the drive train are NOT in motion, MasterCraft recommends this be done while the boat is out of the water.*



*Step 1:* Ensure the engine is OFF and disconnect the engine safety starting switch. **Be sure that the throttle/shift control lever is in neutral.** The engine must be cool.

*Step 2:* Remove the access panel in the rear trunk compartment in direct drive boats. In V-drive models the steering is located in the engine compartment, beneath the engine.



*Step 3:* Turn the steering wheel so that the maximum amount of steering cable is seen.

*Step 4:* Use solvent to clean old lubricant from the cable end, pivot and rudder shaft.

*Step 5:* Spread a generous amount of white lithium grease over the cable end. Work the steering wheel back and forth and re-apply grease if necessary.

*Step 6:* Using the flexible end of a grease gun, give two (2) full shots of white lithium grease to the two (2) grease fittings: one on the rudder shaft, and one on the pivot. Clean up any old grease purged from the areas.

*Step 7:* Rotate the steering wheel back and forth several times to work the lubricant in.

*Step 8:* Re-install the access panel.

### **Lubricate the Shift and Throttle System**

*Because this process should be completed while all movable components of the drive train are NOT in motion, MasterCraft recommends this be done while the boat is out of the water.*

*Step 1:* Ensure that the engine is OFF and disconnect the engine safety starting switch. **Be sure that the throttle/shift control lever is in neutral.** The engine must be cool.

*Step 2:* Open the engine box and locate the shift and throttle cable ends.

*Step 3:* Shift to full-throttle-forward.

*Step 4:* Lubricate the cable ends and connections with a coating of waterproof marine multi-purpose grease.

*Step 5:* Lubricate the pivots and linkages with a light grease.

*Step 6:* Shift the control lever from full-throttle-forward to full-throttle-reverse several times to work the lubricant in.

### **Check the Ballast Pump Impeller**

*This applies only to boats equipped with some type of ballast system. The number of ballast pumps varies from system to system. Authorized MasterCraft dealers can provide guidance to locate any and all pumps.*



*Step 1:* Remove two (2) of the cover screws and retain the screws for the reinstallation process. Swing the cover out of the way to allow access to the impeller location.

*Step 2:* Using needle-nose pliers, pull the old impeller out of the casing.

*Step 3:* Install a new impeller. (It is intentionally larger than the case. While gently squeezing it in, ensure that the paddle wheels angle in the same direction—counter-clockwise—all the way around.)

*Step 4:* Slide the plate back into place. No silicone is necessary. Due to the built-in gasket, tightening the screws should prevent leakage.

## Inspect the Complete Fuel System for Leakage

Although the boat engine is similar to an automobile engine, the engine compartment differs substantially. The underside of an automobile engine compartment is totally open to the atmosphere. This allows complete air circulation and ventilation. A boat engine is housed in a closed compartment, the underside of which is the bottom (hull) of the boat.

The enclosed engine compartment limits the ventilation of gasoline and oil fumes. Because confined gasoline vapors mixed with a little air can form an explosive atmosphere, it is important to be especially vigilant in performing the following two (2) operations:

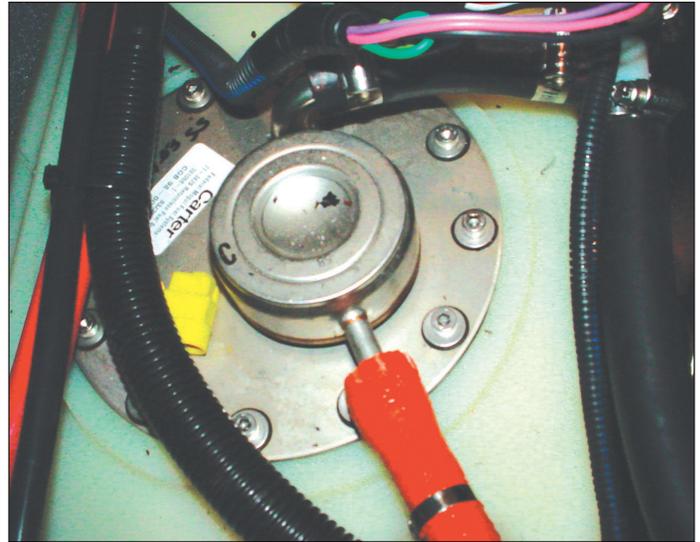
*Step 1:* Run the bilge blower for at least four (4) minutes to ventilate the bilge area each time before starting the engine.

*Step 2:* Inspect the boat bilge area under the engine for the evidence of oil and gasoline—or any gasoline odor. This inspection should take place the first time the boat is started each day. Raise the engine cover and visually look at the bilge area under the engine.



**Gasoline is explosive. If a gasoline odor is present or gasoline is visually observed in the bilge area during inspection, DO NOT START YOUR ENGINE! Remove the ignition key from the ignition switch and call an authorized MasterCraft dealer for service.**

*Note: If there is evidence of loose fuel fittings, deteriorated lines or other problems associated with the fuel system, call an authorized MasterCraft dealer. Fuel system service on later-model MasterCraft boats require special service tools and special training. Due to the potential for serious consequences when errors occur in servicing the fuel system, MasterCraft strongly encourages all boat owners to seek professional assistance from an authorized MasterCraft dealer's service department whenever any service or perceived problems occur within the fuel system.*



**All replaced fuel components must meet United States Coast Guard (“USCG”) and American Boat & Yacht Council, Inc. (“ABYC”) standards, and must be Underwriter’s Laboratory (“UL”)-approved. Inferior quality components pose a serious safety threat to you and others, and the use of inferior components may result in serious injury or death. Resulting damage may void the warranty.**