

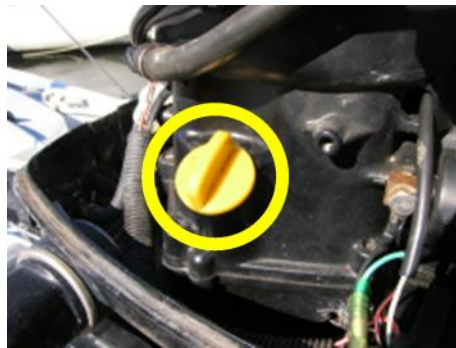
# Keelboat Outboard Motor User Guide

---

## BASIC PROCEDURES

### To start:

- Check that there is enough fuel in the tank for how far you intend to go; fill the spare tank(s) for cruises.
- Tilt the motor down so that the shaft is vertical. Sometimes, the motor will not tilt when the release lever is lifted. If this occurs, try moving the gear shift lever in and out of gear, or try slowly pulling the starting cord a few inches until you feel it engage and turn the motor slightly.
- Check the crankcase oil level and be sure to screw in the dipstick cap all the way.



- Lower the motor mount all the way.
- Make sure the fuel line is connected and that the connector is pushed all the way onto the motor.
- Prime the fuel line by squeezing and releasing the rubber bulb in the fuel line a few times until the bulb becomes firm. If the fuel line was disconnected, it may take more than a few squeezes.
- Make sure the kill switch clip is in place on the kill switch (wiggle it on firmly).
- Rotate the gear lever to neutral (straight up).
- The throttle and choke settings depend on whether the motor is “cold” (off for at least 15 – 20 minutes):
  - COLD START
    - Pull out the choke knob all the way.
    - Set the throttle to the start position (indicated on the handle with: ▲).
  - WARM START
    - Leave the choke knob in.
    - Set the throttle somewhere between start and maximum. Generally, the start position will work if the motor has just been shut off or died. Set the throttle higher if the motor has been off longer.
- Pull the starting cord using the following procedure:
  - **Begin by pulling the starter handle SLOWLY until you feel some resistance.** Usually, this will happen before 6 – 12 inches of cord have been pulled out; if not,

let the cord rewind and try again.

- When you feel resistance on the cord, pull the handle as **VIGOROUSLY** as possible, making sure your arm will not hit anyone or anything behind you as you pull.
- If the motor does not at least sputter in the first few pulls, **STOP**. The motor will become “flooded” (too much gasoline in the cylinder) if the cord is pulled more than three or four times without the motor firing. Wait 10 minutes and try again or see the “Things to Check” section below.

#### Once the motor starts:

- Adjust the throttle as necessary to keep the motor running at a low speed (never let it race). Slowly push in the choke knob all the way while adjusting the throttle. Do not leave the choke on (i.e., the knob fully out) for more than about 30 seconds after the motor starts; otherwise, it will cause problems with the spark plug.
- Check that water is flowing out of the engine in a steady stream from the small hole near the back of the engine at the bottom of the head; **IF NO WATER IS FLOWING, IMMEDIATELY SHUT OFF THE MOTOR**. If water is coming out but not in one, steady stream, insert a piece of wire or a pipe cleaner an inch or two into the hole to clear salt or debris that may be interfering with the flow of water. See the pictures below for the location of the hole (Honda on the right, Mercury on the left).



- The outboard motors are typically checked prior to sailing by warming them up at idle for 5 – 10 minutes and then shutting them off. This tends to promote the buildup of carbon on the spark plug. If the motor is not used during the sail, the buildup will remain on the plug. To avoid this problem, the motor should be run briefly at high speed, in gear, prior to shutting off the motor. This step will help clear the buildup on the plug.

## POSSIBLE CAUSES IF THE MOTOR DOES NOT START OR QUICKLY DIES

- Check the fuel line bulb. If the fuel line bulb does not fill (i.e., become firm) after several squeezes, there may be a problem with the bulb or the fuel line. Remove and reconnect the fuel line connections. Remove and re-tighten the fuel tank cap. If the bulb remains spongy when pumped, try using a spare fuel line or replacing the bulb.
- If the motor dies in less than 10 minutes with a nearly full tank, the vent in the gas tank cap may be bad. Try loosening or removing the gas tank cap.
- The kill switch may be faulty. Try wiggling the kill switch. If the motor starts, try wiggling the switch again to see if the motor stalls.

### *More advanced checks (requires removal of the top cover)*

- The spark plug may be fouled. Locate the spark plug and pull off the large wire connected to the free end, as shown in the pictures below.



Remove the spark plug using a spark plug wrench, as shown below (wrenches like the one shown can be found in the “Outboard Motor Parts” box in the dock box). Make sure to use the right size for the plug. Be very careful when loosening or tightening the spark plug that the wrench remains straight or else the plug could be damaged. When installing a spark plug, always make the first few turns by hand and make sure that the plug turns easily. If the plug stops turning (jams) in less than one or two turns, back it out and try again. If the plug is not installed correctly, the motor could be damaged.



Inspect the end of the spark plug: the end that goes inside the motor should be clean metal or slightly tan in color and may be slightly wet. If it is very wet and black in color, the motor is “flooded”; i.e., there is too much gasoline inside. If this is the case, pull the starting cord a few times (with the plug removed) to expel some of the excess gas. If the plug is completely dry, then there may be a problem with the fuel line. If the plug is dry but black or oily looking or has build-up on it, try cleaning the plug or install a new plug.

- Check the wire connectors by the tachometer to see if they are corroded or wet.



- The wire to the kill switch and oil light can short out if the end is exposed and wet.  
[NEED CLARIFICATION FROM P. K.]
- There may be a problem with the fuel system inside the motor. Open the carburetor float bowl drain plug (unscrew a few turns) to release some gas into a small container. On some motors there is a black plastic knob on the drain plug that you can turn by hand; on the other motors there is a screw that you turn with a small, flat-bladed screwdriver; see photos below. If no gas flows out from the drain, there is very likely a problem with the fuel line or the tank. Close the drain and check the bulb, the connectors, and the cap, then pump the bulb again and loosen the drain plug again and see if any fuel comes out.



- Although it is unlikely, the gas may be contaminated with water. Check for water in the bottom of the fuel tank by pouring out the contents of the gas tank into a clean container, waiting the fuel to settle. Water is denser than gasoline and will sink to the bottom of the container. Slowly pour the gas back into the tank, looking for water in bottom of container. Also try draining the carburetor as described in the previous paragraph.

## IF ALL ELSE FAILS

If all else fails and you desperately need a motor that works, you can swap with another boat. The fuel lines on all of the keelboats (except the J/80) have a quick-disconnect coupling 2 – 4 feet from the motor. This last section of the fuel line serves as an “adapter” and should stay with the motor.



Disconnect the motor from the tank at the coupling by pressing the gray plastic tab and pulling apart the male and female parts of the coupling (see photos below). When connecting the line, press the gray tab and firmly push the male and female parts together so that they are fully engaged, then release the tab. You may need to twist side to side while pushing to get the two ends to fully engage. Tug lightly on the two ends to make sure that they are locked together.

Make sure to leave a note that the other motor won't start. Also, after you put a motor on the motor mount, check that the clamp screws are tight before starting the motor, and check them again after the motor has run for a while.





## BROKEN FUEL LINES & CONNECTORS

It is important when raising and lowering the motors that there is adequate slack in the fuel line. Connectors and hoses can be damaged if the fuel line becomes taut. The hose can kink (bend sharply and collapse) when tilting or turning the motor, or the connector on the motor can break. If the connector at the end of the fuel line (at the motor) breaks, there are replacement connectors in the dock box, in a plastic box labeled “outboard motor parts”. There are also spare sections of fuel line (adapters) with the connectors already on. There are two types, one for the Honda motors (on the Merits) and one for the other brands of motors.

## GAS STABILIZER

Because the motors are used infrequently, the gasoline may sit in the tank for long periods of time. The motors will run better if gas stabilizer is used. A bottle of stabilizer is kept in the parts dock box on J dock. You can add the stabilizer to the tank or in a gas can before filling a tank; just use the appropriate amount, which is specified on the bottle.

