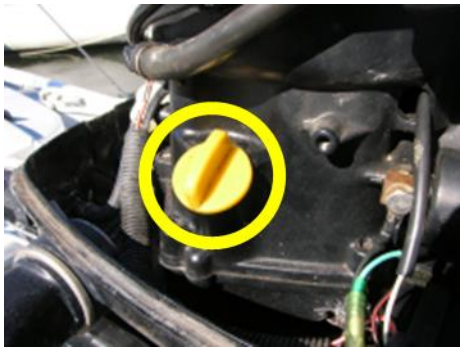
CSC Keelboat Outboard Motor User Guide

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 bracket all the way: move the lever to the “LOWER” position, then give a tug upward on the motor to release the catch, then push the motor down. Use the U-shaped handle on the front end of the motor when pulling up or pushing down.
- Make sure the fuel line is connected and that the connector is pushed all the way onto the motor. Check the other connectors in the fuel line to see that they are secure.
- Some of the fuel tanks have a vent on the filler cap. If the cap has a vent, open it (half a turn on some models and several turns on others).
- 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).
- Move the gear lever to Neutral. The motor must be in neutral to start.
- The throttle and choke settings depend on whether the motor is “cold” (off for at least 20 – 30 minutes):
  - ➢ COLD START
    - Choke on: pull the choke knob all the way out.
    - Set the throttle to the start position (indicated on the arm, next to the grip).
  - ➢ WARM START
    - Choke off: push the choke knob all the way 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 or pull the choke knob out a little 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 four or five times without the motor firing. Wait 10 minutes and try again or see the "Possible Causes…" section below.

Once the motor starts:

- Three things to remember:
  - ➢ Never let the motor race (run at high speed).
  - ➢ Make sure that the engine is pumping water.
  - ➢ Do not let the motor run with the choke on longer than necessary,
- The motor will normally speed up by itself. **Do not let the motor race**. Adjust the choke and the throttle to keep the speed down.
- Check that water is flowing out of the motor in a steady stream from the small hole near the back of the motor, 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.

- It is **important to not let the motor run too long with the choke on** because this causes fouling of the spark plug. Begin easing in the choke knob as soon as the motor is running consistently.
- The goal is to get the motor to run smoothly at idle: gradually push in the choke knob while simultaneously adjusting the throttle to keep the motor running at a low speed.
- It may take a few minutes for the motor to warm up before it will at idle with no choke (knob all the way in). Once it does, test to see if the motor will idle in gear: put the shift lever in forward or reverse and verify that the motor will continue to run at idle without stalling (make sure the dock lines are snug enough that the boat will not hit the dock). If necessary, increase the throttle a bit to keep the motor from stalling and wait 30 – 60 seconds, then try it at idle again. If it does not idle in gear, see the "Possible Causes…" section for things to check.
- If the motor idles reliably in gear, it should be okay and can be shut off, but before shutting off the motor, run it at high speed, in gear, for 20 – 30 seconds (again, make sure the dock lines are secure). This will help clear any buildup of carbon on the spark plug that may have occurred from running the motor with the choke on too long and is also a check for reliable operation.

When putting the boat away:

- Raise the motor bracket: move the lever to the "RAISE" position, then push down on the motor and release. The bracket will lift the motor up most of the way. Give an upward tug on the motor so that it comes all the way up. The motor bracket should latch in the raised position.
- Tilt the motor so it is just clear of the water. Do **not** tilt all the way up, where the motor is nearly horizontal. The gear selector lever needs to be in FORWARD to tilt the motor.
- **Close the vent** on the fuel tank cap if so equipped.

POSSIBLE CAUSES IF THE MOTOR DOES NOT START OR RUNS POORLY

- 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 bulb is the problem, a temporary fix that sometimes works is to hold the bulb vertically, with the arrow pointing down, while squeezing.
- If the motor dies in less than 10 minutes with a nearly full tank, the vent in the gas tank cap may be bad or not open. If the vent is open, 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*)

- Check for water in the fuel system. The motor might not start at all, or it may run faster than normal at low throttle settings when first started and run poorly or not at all at idle.
    - Check the separator in the fuel line (the small, clear plastic vessel with the filter inside, mounted on the transom) to see if there is a distinct layer in the bottom. If there is, the system needs to be drained.
    - Locate the carburetor float bowl drain, a screw near the bottom that can be turned with a small, flat-bladed screwdriver; see photo below. Hold a small container below the carburetor and loosen the screw several turns to let 1 – 2 tablespoons of water drain into the container. Water can show up as small beads or the gas will look cloudy.

    - If no gas flows out from the carburetor 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.
    - If water is found in either the separator or the carburetor, check for water in the bottom of the fuel tank by pouring out the contents of the gas tank into a clean container using a separator funnel (there is one in the dock box and one in the yard where the gas is stored).

    - If there are no signs of water in the gas, the carburetor may be partly clogged with emulsified gas as a result of previous water contamination or prolonged lack of use. Removal of the carburetor may be necessary. Carburetor cleaner sometimes helps.

- 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.

- A less likely problem is if wires are corroded or wet.
- Report motor problems to the Third Vice Commodore(s).

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. Wiping with a little kerosene will lubricate them and allow for easier connection. 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.

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.

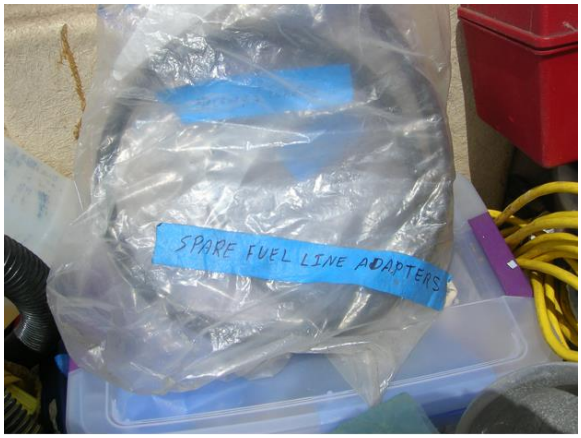
BROKEN FUEL LINES & CONNECTORS

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 on the outboard does break, there are two options, explained in the following: (A) replace the fuel line adapter section, or (B) replace the connector. Replacing the connector is preferred, but if time is limited, replacing the adapter section is faster.

A. Replace the adapter section:

Find the large plastic bag in the parts dock box labeled “Spare Fuel Line Adapters”:



Simply disconnect the broken adapter at the coupling in the fuel line and replace it with the new adapter, as described in the “If All Else Fails” section. Remove the broken connector from the outboard, and firmly push the connector on the new adapter onto the port on the outboard. Give a slight tug on the connector to make sure that the catch has engaged. Note that the end of the connector might not sit flush against the motor port. This is normal, but make sure the connector does not leak when you run the motor.

Leave the broken adapter next to the dock box. Please **DO NOT** put the broken adapter in the bag with the other adapters or in the dock box.

B. Replace the connector:

Replacement connectors are kept in the parts dock box:

Look for the clear plastic container labeled “Outboard Parts”:

Inside this box, look for a bag labeled “Fuel Connectors”:

The connectors may look somewhat different depending on the brand. Some will say on the package what types of motors they will fit. If in doubt, compare the holes in the ends of the connector with the broken one.

You will need a knife to cut the end of the fuel line and a screwdriver to loosen the hose clamp. There are pieces of wood in some of the dock boxes and parts of the dock that can be used for a cutting surface (DO NOT USE THE BOAT FOR A CUTTING SURFACE). It is recommended that you disconnect the adapter section from the fuel line and work on the dock since there will likely be some gasoline remaining in the line that will leak out.

Loosen the hose clamp and slide it back from the end of the hose.

Cut through the hose approximately ¾ of an inch (2 cm) from the end. If you hit the broken piece of the connector, make cuts around the hose until you can remove the broken piece.

Insert the barbed tube on the connector into the hose. Some twisting may be needed, but be careful not to break the connector. Wiping a little kerosene on the barbed tube will lubricate it and allow it to slide more easily into the hose (a bottle of kerosene is kept in the dock box).

Slide the hose clamp along the hose until it is approximately ½ inch (10 – 15 mm) from the body of the connector and tighten the clamp.

Remove the broken connector from the outboard if you have not already done so. Firmly push the new connector onto the port on the outboard until the catch engages (often you can hear a click). Give a slight tug on the connector to make sure that the catch has engaged. Reconnect the coupling on the other end of the adapter section if necessary. Note that the end of the connector might not sit flush against the motor port. This is normal, but make sure the connector does not leak when you run the motor.