

# OUTBOARD SPECIALTY TOOLS

Thanks you for your purchase of the Bubble Purge Pro™ Hydraulic Steering Bleed Kit!

Please take the time to fully read these instructions before attempting to bleed or flush your hydraulic steering system.

**\*\*\*Your safety is extremely important to us, always wear eye protection and appropriate gloves while using our products. For all steering systems with power assist, autopilot, dual cylinder with or without liquid tie bar we strongly recommend familiarizing yourself with and following manufacturer bleed sequence or damage can result to your steering system and/or Bubble Purge Kit. If you have questions, please contact OST support at 843-607-1973**

## **Bubble Purge Instructions:**

For an introduction to the basic operation of the Bubble Purge Pro Kit, please view [\*\*“Bubble Purge Pro Hydraulic Steering Bleed Demo Unedited”\*\*](#)

**Materials to have on hand:** Oil absorber or oil absorbent cloth, gloves, protective eyewear, ½” open end or box end wrench to open and close bleeders.

**Your Bubble Purge Pro DC Kit includes the following parts:**

**Fill Tube (OST-PBB.001-1)**

**Flush/Fill Attachment (OST-PBB.001-02)**

**Helm Fitting (OST-PBB.001-3)**

**Helm Tee (OST-PBB.001-7)**

**Cylinder Attachment (OST-PBB.001-12)**

**Return Hose (OST-PBB.001-11)**

**Optional Bubble Purge Pro DC equipment:**

**Dual cylinder bleed attachments (OST-PBB.001-23)**

## **Instructions:**

- 1) **Prep the fluid bottle for use:** Remove bottle cap and any loose debris near bottle top before threading **Fill Tube (OST-PBB.001-1)** onto fluid bottle. Fill tube and brass cap ship assembled, but can be disconnected as needed. Verify that the locking collar on the quick connect fittings are in their forward locked position when re-connecting.

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- 2) **Check fluid levels inside helm:** Fluid should be visible near the top of the helm fill fitting. To add fluid, attach the **Fill Tube (OST-PBB.001-1)** fluid bottle. Remove helm fill cap and insert fill tube into helm fill hole, allowing some space for helm to vent air as it fills with fluid. Squeeze fluid bottle **GENTLY** to fill the helm. Once fluid is visible near the threads of the helm fill, helm is adequately filled and primed. If the steering system is new or has been completely flushed out, it may be necessary to fill the helm more than once during the bleed process. **For helms with remote fill attachments,** visually inspect the remote fill tube inside the console to verify fluid levels and check for airlock. **If remote fill tube is airlocked it may be difficult to prime the helm. To displace air lock, thread the helm fitting into the remote fill port, connect the fill tube, verify that the locking collar is in forward locked position, and gently squeeze the fluid bottle. This should displace some of the air in the remote fill and allow the helm to take fluid.** Vent the fluid bottle as needed.
- 3) **Thread Helm Fitting (OST-PBB.001-3)** into helm fill hole until O-ring is seated/sealed. Seat adapter by hand only, there should be no need to use tools. Connect the **Helm Tee (OST-PBB.001-7)** to the helm fitting.
- 4) Connect **Bubble Purge Cylinder Attachment (OST-PBB.001-12)** with **Return Hose (OST-PBB.001-11)** to the bleed valves on the steering cylinder and verify that the quick release locking collars are in their forward locked position. Connect the end of the return line to the aft facing port on the Helm Tee. Then open bleed fittings one full turn. Slowly push motor to full lock in either direction by hand and verify that Cylinder Attachment quick connects are not coming into contact with the bottom of the engine. Repeat the process on the opposite steering lock. If quick connects are coming into contact with the underside of the engine, contact OST support for further assistance. As the motor moves, you should see fluid and/air moving freely in both directions inside the Cylinder Attachment tube. **Once the Cylinder Attachment is connected and bleeder valves are open, do not disconnect the Cylinder Attachment until the bleeder valves have been completely closed. Do not turn the wheel to bleed/pressurize the steering hoses with bleed valves closed/shut as this can over pressurize Bubble Purge hoses when pressurized bleed valves are opened.**
- 5) Connect Fill Tube and fluid bottle to upward facing port on the Helm Tee. Verify that quick release locking collar is in forward locked position.

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- 6) With bleed fittings opened on cylinder, push motor by hand all the way to port or starboard as far as it will go, be careful to check for obstructions, binding or any kinks in hoses or rigging.
- 7) **Turn steering wheel to one direction a minimum of 20 turns** and then alternate to the other direction for another 20 turns. In an empty steering system, the steering wheel will move freely and slowly build a small amount of resistance as the system primes and builds internal pressure. Resistance may be choppy at first but should smooth out to create a uniform but minor level of resistance. **If you feel resistance building up that seems abnormally high (the wheel is becoming difficult to turn) or if the steering wheel binds/stops turning, stop turning wheel immediately and inspect to verify bleed fittings are open and nothing is obstructing the system.** Continuing to turn wheel with an obstruction or bleeders shut will pressurize the entire system and can damage steering components and your Bubble Purge Kit. **If you have any questions regarding any aspect of your steering system or Bubble Purge Kit, call OST support.**
- 8) Move motor to opposite direction all the way to **lock** and repeat the process several turns in each direction, then move the motor to the opposite lock and repeat. Moving the motor lock to lock helps to force air out of the cylinder more efficiently as the bleeder valves become the highest point on the cylinder.
- 9) Air bubbles will be visible in the Cylinder Attachment and flowing through the return line and into the Helm Tee where they will rise into the fluid bottle. As you continue turning the wheel and the motor from side to side, fluid entering the steering system will eventually push all of the air out of your steering system, into the helm and into the bottle.
- 10) **Venting the Bottle: In the event that the fluid bottle begins to build pressure (or vacuum) during bleed, carefully lower the bottle and Fill Tube to a level below the helm fitting to allow fluid to drain back into the bottle and prevent spilling, disconnect the end of the Fill Tube from the Helm Tee. Once disconnected, the bottle will vent to atmospheric air pressure conditions.** After venting, the bottle can be reconnected to the Helm Tee to continue bleed.
- 11) After turning wheel several turns in each direction and no bubbles are passing through Fill Tube or Cylinder Attachment, close the bleeder valves and disconnect the Fill Tube and bottle from Helm Tee, remove Helm Tee and Helm Fitting (have a cloth handy, a full helm may drip until capped off) and cap system off with fill cap. Then disconnect the Cylinder Attachment.

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12) **Flushing your steering system:** Attach the Cylinder Attachment to steering cylinder, open the bleeders and spin the wheel a couple of turns to push fluid into the Cylinder Attachment. Visually inspect the contents of the Cylinder Attachment tubing. Clean fluid looks relatively clear and contains no debris. If fluid is contaminated and you wish to flush your steering system, first disconnect the cylinder attachment from the return line, then gently turn the steering wheel in the multiple turns to one direction and then multiple turns to the opposite direction to push fluid out of the cylinder, through the Cylinder Attachment and into a container for disposal. When all fluid is out of the system, air will push out of the cylinder with little to no fluid. At this point the system should be ready to add new fluid and bleed. Return to Step 1.

13) **Testing Your Steering System: Once you have finished the bleed purge process, the steering system must be tested. With the bleed valves closed and pushing the motor side to side, there should be no more than half an inch of movement of the cylinder along the piston rod. Also, turn the steering wheel. The wheel should be able to turn the motor from lock to lock with a smooth motion using the same number of turns specified by the manufacturer of the helm. The steering motion should be smooth with no sudden changes in resistance.**

## **Bubble Purge Pro DC Dual Cylinder Instructions:**

Connect dual cylinder bleed hoses to corresponding quick connect fittings on the cylinder attachment. Refer to our Pro DC Schematics for proper hose routing. Connect dual cylinder bleed hose to the starboard bleed fitting on the port cylinder. Then connect the opposite end of the same bleed hose to the female quick connect on the tee on the cylinder attachment leg connected to the starboard bleed valve on the starboard cylinder.

Connect the other dual cylinder bleed hose to the port bleed fitting on the port cylinder. Connect the opposite end of the same hose to the female quick connect on the tee on the cylinder attachment leg connected to the port bleed valve on the starboard cylinder.

**If there is a liquid tie bar, set the valve to the open position.**

**SLOWLY** turn the steering wheel to port or starboard to verify that the hoses on the starboard bleed fittings on both cylinders are flowing into the same tee, then turn to the opposite direction to verify that the port bleed fittings on both cylinders are flowing into the same tee. Once proper routing and connections are verified, cylinders can be bled simultaneously using the our instructions and the methods in our YouTube video.

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## **Time saving tips:**

**Closely monitor fluid levels inside helm.** Helm needs to have proper fluid levels to remain primed and have optimal ability to push the rest of the system. With a new steering system or any system containing a lot of air, it may be necessary to periodically disconnect the helm tee and remove helm fitting and directly fill the helm reservoir by squeezing fluid through the fill tube more than once. If the helm loses prime, it will pull air into the reservoir and push air back through the system.

**If Bubble Purge Pro Cylinder Attachment/dual cylinder bleed hoses and return line are new, and/or full of air: leave the male end of the return line disconnected from the HelmTee until cylinder attachment and Return Hose have primed and fluid has pushed the air out of the Return Hose before connecting Return Hose to the helm tee.** Closely monitor the end of the Return Hose and connect it to the Helm Tee when fluid comes close to the end of the hose.

All new users should take a moment to familiarize themselves with the Bubble Purge Kit by viewing our demo video. If you have any questions, please call support at 843 607 1973

**All tech support phone calls will need to have buyer name and order number ready.**

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