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POWERBOAT RIGGING

Better Handling the QL Way

A new, radical solution for adjusting a boat's trim angle is affordably priced, easily installed with standard tools, virtually maintenance-free and the ideal remedy for boats that are slow to plane and poor performers while cornering.

Kit, part number 3841717, includes two interceptor units and mounting fasteners, a control unit, control panel, two cables that connect the control and interceptor units, one cable between the control unit and control panel, plastic transom template and instructions in six languages. All components are easy to identify in clearly labeled, sealed bags.

Story and photos by Jan Mundy

How could two small chunks of plastic make a dramatic difference in the handling of a 22' (6.7m) trailerable walkaround boat with cuddy? I asked myself this question often while testing the Volvo QL Boat Trim System (BTS).

This 4,500 lb (2,041kg) cuddy with a modified-vee and a deadrise of 16° has the outboard mounted on a pipe bracket. Without the added buoyancy of an Armstrong or other outboard bracket, the pipe/outboard combination is a massive weight, loading the stern down and creating excessive bow rise, regardless of engine trim. A hydrofoil mounted on the outboard skeg improved planing speeds considerably but the boat still ran bow high, causing poor forward visibility. In cornering, the boat would dig in (list) and engine rpm dropped to where the boat came off plane. Coming out of the corner, the boat gradually gained speed and came back on plane again. Throttle down too fast and the stern dug in, burying the exhaust outlet on the engine, sometimes stalling it. Replacing the foil with Nautilus Smart Tabs (written up in DIY 2001-#2 issue) seemed like a good solution. These tabs self-adjust to changes in boat speed and the sea conditions. Though performance improved greatly to the hydrofoil, after a few seasons of use it become apparent that this boat was on the upper limit of their usefulness (these tabs are designed for smaller boats). A passive system was not going to fix this boat's trim problems nor improve the handling. Electric and hydraulic trim tabs, typically designed for larger boats, are considered overkill for small powerboats and were not, I thought, a necessity for our cuddy cruiser, until I test drove the Volvo QL BTS.

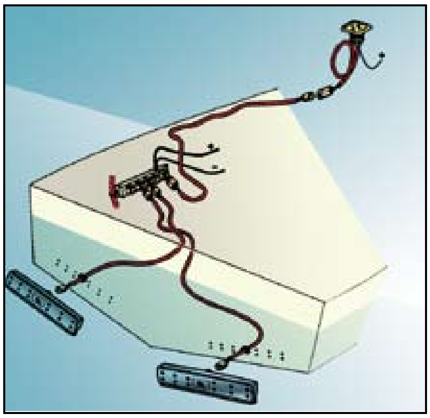
Volvo unveiled the BTS at a marine trade show last summer and the BTS earned the company an Innovation Award. Similar designs are found on megayachts but were not available for smaller boats, until now. Rather than extending a flat, nearly horizontal, plate aft of the hull, the BTS pushes a plate vertically downward, a drop of about 2" (5cm), into the flow of water. Water force on the small blade surface creates upward pressure on the hull bottom, thereby raising the stern and lowering the bow. (On conventional trim tabs, water pushes against the flat tab surface to create upward pressure.)

Two systems with either 12" or 18" (30cm to 45cm) "tabs" are designed for planing and semi-planing boats from 15' (4.5m) to 50' (15m), with maximum speeds to 50 knots. Each BTS is sold as a kit containing two interceptor trim units, one control unit, one control panel with LED trim indicators and three cables. For 32' (9.7m) and larger boats, two interceptors are daisy chained together (side by side). Interceptors are made of a non-corroding, composite material. For larger boats, optional control panels are wired in series to a maximum of four helm stations. Kits retail for US$670 and US$700.

Installation

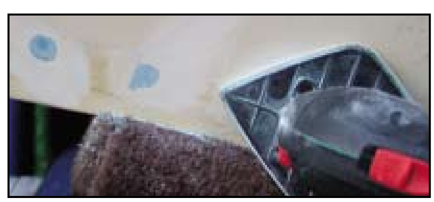
Before I could install the BTS, the old tabs were removed and the transom repaired. This involved scraping off the old sealant, grinding the edges of the existing holes, mixing up a batch of 3M Marine Premium Filler and filling the holes and then sanding the cured filler flush.

Four hours later the transom was ready but I took a break and read the installation instructions, which



Installation of single interceptors with one helm station.

(left) Residue of 3M 4200 sealant is first cut off with a sharp utility knife, then scraped with a putty knife and then the area is sprayed with BoatLife Release and excess wiped off; Entire repair area is taped with 3M 2080 Safe Release tape and then wiped with acetone to remove contaminants; Using a Dremel with cone-shaped bit, edges of all holes are carefully beveled. (below) 3M Marine Premium Filler is mixed until one uniform color and then forced into the holes with a putty knife. Once cured, filler is sanded flush with gelcoat.



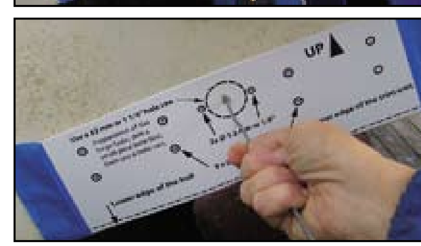
at first glance seemed confusing and why Volvo suggests you read all pages before beginning. There were a few installation hiccups, as noted below, but overall it was a very neat installation job, taking four hours to complete once I had collected all the needed tools.

Step 1

Template is positioned on the transom per the guidelines in the instruction manual. Positioning varies with engine type and chine location. Volvo recommends the farthest outboard position possible for optimum side-to-side control. This template locates the placement of the drilled holes for the interceptor unit, grommet and fasteners. Once sited, I fixed the template ends with tape.

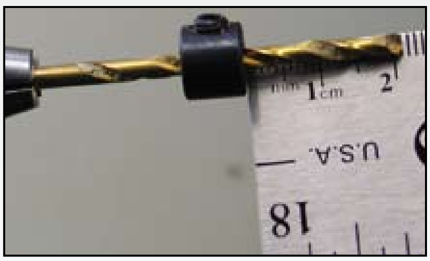
Step 2

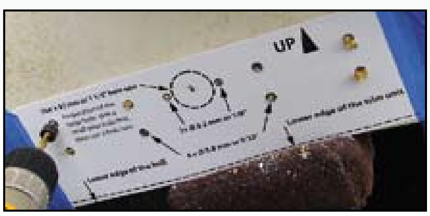
After checking that there are no obstacles on the inside of the transom, I drilled the center hole for the grommet using a pilot bit smaller than the holesaw mandrel. Because the drill bit was too short to extend through the foam that filled the lower bilge, I inserted an aluminum



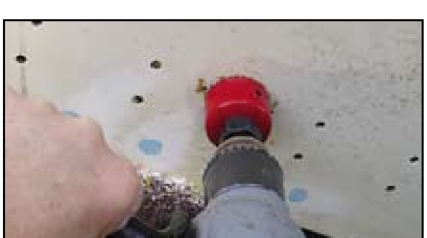
rod, which I keep in my toolbox for such jobs, through the hole and foam. The sole access to the interior on this boat is through the aft cockpit locker and, luckily for me, the rod just cleared the top of the foam on both sides; any lower and I would have had to dig through the foam to find it.

Step 3
Rather than mark all the fastener holes and then remove the template, I drilled directly through the template using the suggested bit size. Attached to the bit is a drill stop set at a depth of 20mm plus the 1mm thickness of the template or about 7/8" (measurements are in metric), the required drill depth for the interceptor and grommet fasteners.



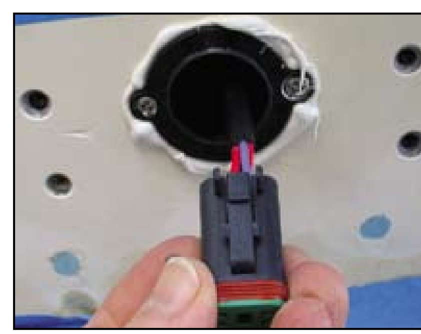


Step 4
Centering the hole for the grommet with a 1-1/4" (32mm) holesaw is next. Holding the drill perpendicular to the transom ensures the grommet mounts flush. (A bevel gauge held against the drill housing helps to set the proper angle.) To obtain a clean-cut edge, it's normally best to drill the hole from both sides. Since it was impossible to reach the transom from inside the bilge, luck was on my side again and the holesaw cut cleanly through the transom, cutting deep enough to allow just enough clearance for the grommet. Punching beyond the cut hole through the foam with a wooden dowel opened a 1" (25mm) gap to route the plug and cable. I like to countersink all drilled fastener holes with a countersink attachment. This prevents gelcoat cracking and increases the surface area for sealant bonding.

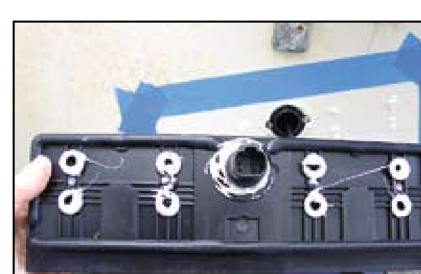


Step 5
Feed the cable with the plug socket end through the center hole until the grommet is about 4" (10cm) out from the transom. Dry fit the grommet, which should fit perfectly in a hole cut with no uneven edges. It's necessary to spray the cable with a soapy water solution so the grommet slides easily onto the cable casing. Turn the grommet so the "Up" mark faces up and twist the cable so the plug fits into the grommet.

Step 6
After solvent wiping the mounting surface to remove contaminants, the grommet and matching surface on the transom are well caulked with 3M 4200 or equivalent. Now push the grommet into the hole and line up the two pre-drilled holes and then fasten with the supplied screws and tighten. Rather than clean up the excess sealant, it is left to aid in sealing the interceptor. At this point, pull the cable out so the plug protrudes about 4" (10cm) from the grommet.

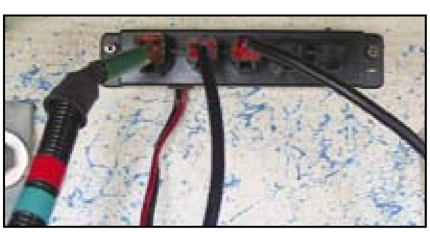


Step 7
"Grease" the inside of the grommet with soapy water so the plug slides easily without twisting in the grommet when mounted. The Interceptor has a thick integrated gasket that waterproofs the unit, except directly above the grommet. Apply ample sealant around each of the screw holes and the grommet neck as illustrated in the instructions. Press the plug into the

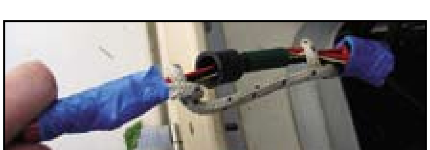


corresponding socket in the interceptor until a “click” sound is heard. Line up the plug with the grommet and push the interceptor into position, aligning the screw holes. Drive the supplied screws into the predrilled holes, just seating each screw. Set the drill clutch at “15” and then alternately tighten each screw. (You risk stripping the stainless-steel screw heads if you don’t set the clutch to free wheel when tightening fasteners.) I tightened the screws in the order marked 1 through 8 on the photo below. Masking all edges is an unnecessary step as shown in the photos as excess sealant passed through the gasket only above the grommet.

Step 8
The control unit fit nicely on the inside of the transom, just under the deck and accessible through the aft cockpit locker door. Though this was a dry location, I still caulked the fastener holes before attaching the unit. A long stretch and I fished the cables from the bilge and then inserted the plug ends into each corresponding socket and listened for the “click.” This installation used the sockets marked “P1” and “SB1” for the interceptor cables and “AUX” for the cable to the control panel.



Step 9
Next, route the cable forward to the helm under the cockpit floor. A messenger line fed through the gunwale during a previous wiring installation makes short work of this job. Just tie a few half hitches on the cable, wrap both with tape and then feed the end through while pulling from the helm.

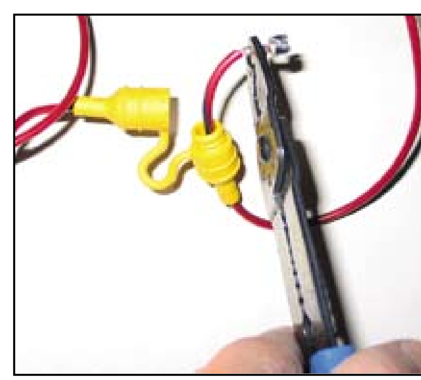


Step 10
The helm location for mounting the panel should give the driver good access and visibility. The template in the instruction manual has incorrect measurements so I used the panel gasket as a position guide. Check for wiring and other obstacles and then, using a holesaw, cut a 2" (52mm) hole. Dry fit the panel (I needed to file the edge as it was too tight) and install. Although the kit includes a machine cut gasket, I opted to coat the fitting with sealant for extra insurance. I’m not a big fan of rubber gaskets and the helm had already endured water damage to the fiberglass laminate because of improperly bedded gauges. Thread the plastic nut and tighten while holding the panel in place so it doesn’t turn.

Step 11
Push the plug into the socket until it “clicks.” The instructions recommend connecting the red positive wire from the panel to the engine wiring harness, specifically the start lock. Since it is impossible to connect to the ribbon cable on the Mercury Keyless Ignition system,

I connected the red power wire to the last spare fused switch on the waterproof accessory panel to the left of the steering wheel. Rather than an automatic on/off operation in sequence with engine starting, these blades are manually operated at the switch panel, which prevents damaging the blades if accidentally lowered while on the trailer.

Step 12
Lastly, connect the 22 AWG power supply cables from the control unit. These cables are long, likely longer than you’ll need. I connected both the positive and negative wires directly to the appropriate battery posts. (I’ll install a master switch and buss bars sometime later.) Terminal connections were waterproofed with heat-shrink tubing and an 8-amp inline fuse inserted into the positive wire.



Step 13
System calibration is next but, as the tabs sat on the edge of the trailer bunks, this waited until launching the next day. Once off the trailer, I closely followed the calibration instructions. If the panel didn't light up as instructed, an error code would appear. It’s good practice to calibrate the interceptors prior to every trip to be sure the blades are not clogged with debris or barnacles.

Step 14
Four buttons on the control panel operate the interceptors either in parallel or separately. Unlike conventional controls that

show trim tab positioning in degrees as well as percentage of deflection, the BTS control registers blade positioning in incremental steps. A green LED at the top indicates both blades are fully retracted; a yellow LED at the bottom shows they are lowered. Pressing the right or left buttons for one second moves the LEDS one more step down to compensate for a list to starboard or port.

Sea Trials

The moment that the DIY test team had waited for had arrived. I throttled up and held the bottom button on the control panel to retract the blades. The boat lurched ahead with a barely noticeable bow rise. There was no step to get up on plane. The boat stayed nearly level from a stop position to planing at speed. This boat always ran bow high but now the horizon appeared on a level plane whether the boat was

at rest or at wide open throttle; the effect was beyond our expectations. Results of the timed runs were astonishing. Time-to-plane numbers in seconds read 4.9, 4.8, 5.1, 4.7. Planning speeds in mph were just as amazing: 14.9, 15, 15.2, 15.5. (Remember, this is a stern-heavy cuddy not a performance runabout.) Even more impressive was that the boat held a cruising speed of 21.6 mph while solidly on plane, compared to 30 mph with the previous set up. While the boat still didn't corner like a tournament bass boat, for the first time it stayed on plane, averaging a low 20.4 mph rather than the engine dropping rpm and stalling in corners. To see how the boat handled in waves, we drove in circles (besides, cornering was now fun) to stir up the water. Cutting boat speed to reduce pounding while driving into the waves, the new blades kept the boat on plane, resulting in a bow-low attitude, which reduced pounding. We didn't have a fuel flowmeter to check consumption but it's logical that getting on a plane quicker and maintaining a plane at lower speeds is sure to improve fuel economy. Volvo claims additional benefits of faster response, less drag and less chance of damage from debris, being stepped on or when loaded on a trailer, provided they are always fully retracted.

With the boat loaded for cruising (I had removed all gear for winter storage) handling should be comparable and I can correct for any off-center loads with the port and starboard list buttons.

This simple device improves boat-operating efficiency and handling safety. Boat's plane earlier and more consistently and gain stability in cornering. With the proper trim angle there's also the promise of fuel savings. Enjoy the ride!

About the author: Jan Mundy is editor of DIY.