

# OBI Integrated Helm Control Installation for Hydraulic Systems

Also known as All-in-one Indicator Control



## Tools Required

- Power drill
- 5/16 Drill bit
- 2.5" Hole saw bit
- 7/16 & 1/2 wrench
- Wire cutter/strippers (for certain retrofits)
- Heat gun (for certain retrofits)

## PN: OBI9000H

For information on a complete hydraulic Trim Tab System, please visit [BennettTrimTabs.com/Hydraulic](http://BennettTrimTabs.com/Hydraulic)

## Contents

The OBI9000H has been designed to accommodate new installations, as well as common retrofit installations. Be sure to read the full instructions to determine which items you will need. For less common installations and retrofit scenarios please email [BMI\\_Info@Yamaha-Motor.com](mailto:BMI_Info@Yamaha-Motor.com) for customized instructions.



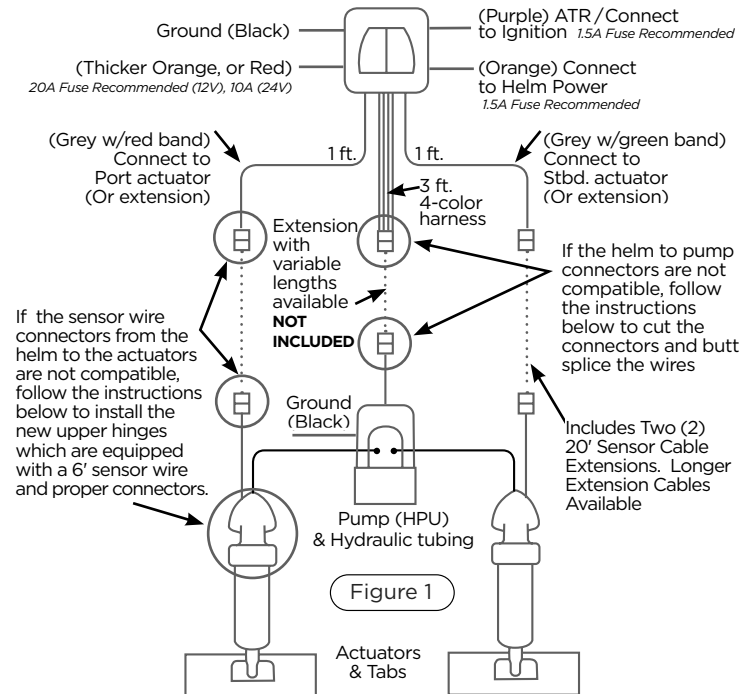
- 1 Helm Control
- 2 (2) Upper hinges w/6 ft. sensor wires
- 3 (2) 20 ft. Actuator extension cables
- 4 (2) Actuator Spacers
- 5 (2) Connector plug wedges
- 6 Port & Stbd labels
- 7 (2) Long sensor rods (8 5/8")
- 8 (2) Short sensor rods (5 5/8")
- 9 (2) PVC clips
- 10 (4) Butt splice heat shrink sleeves

## Helm Control Installation

- **Before drilling any holes, read the entire instructions and make sure the battery power is disconnected.**
- Using the included drilling template, mark the location 2.5" center hole.
- Check carefully to ensure there are no obstructions behind the console before drilling, and using a 2.5" diameter hole saw, drill the center hole.
- Feed the helm control cables through the 2.5" center hole.
- Once the helm control is properly seated, tighten the large lock nut hand tight (do not over-tighten).
- Connect the thicker orange (or red) wire from the helm control to (+) 12V (20A) power, and the black wire to ground. The power circuit must be protected with a 20A circuit breaker or fuse.
- Connect the thin orange wire to helm power. This will turn the unit on and off.
- Connect the purple wire to the ignition to enable ATR (Auto Tab Retraction on ignition power-off).
- Connect the ground (black wire) to a ground bus.
- Connect the helm control to the pump and actuator (see the next section)

## Component Compatibility Overview

The OBI9000H helm control wire connectors will not be compatible with previous generation pump or actuator sensor connectors. For this reason butt splice connectors have been included to resolve connector incompatibility between the helm control and the pump. Additionally new screw-on actuator upper hinges have been included to resolve connector incompatibility between the helm control and previous generation actuator sensor connectors (or for actuators without sensors). See figure 1 below for an overview of component installation and compatibility scenarios.



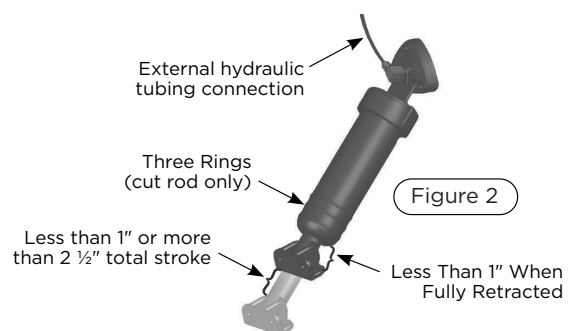
## Installing the Sensor-equipped Actuator Upper Hinges

In this step you will be replacing the actuator upper hinges from the existing actuators.

**Please note:** Special sensor coils are required if (See figure 2):

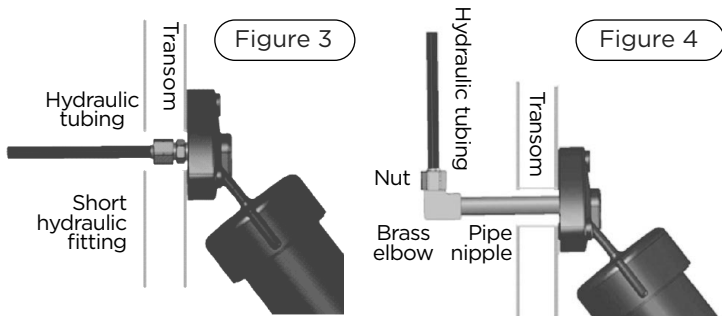
- » Actuator stroke is more than 2 1/2"
- » Less than 1" of piston shaft is exposed when the actuator is fully retracted. The system will not work when actuator stroke is 1" or less.
- » Actuator has external hydraulic connection

This kit contains sensor rods for the two most popular sizes of Bennett hydraulic actuators. Use the short rods if your actuators have three rings on the bottom of the cylinder. Use the long rods if your actuators have four rings on the bottom of the cylinder.



## Installing the Sensor-equipped Actuator Upper Hinges

**Step 1** - Inside the transom, with the tabs in full up position, locate the trim tab hydraulic line. If there is no pipe nipple visible inside the transom, you have a short through-transom fitting connection, (Figure 3).



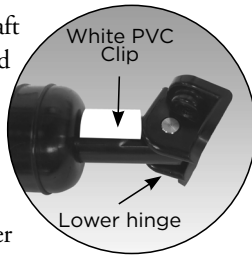
Unscrew the tubing from the upper hinge using a 7/16" wrench and remove the actuator away from the transom. Skip to step 3.

For standard installations, detach the tubing from the brass elbow (some fluid will drip out). Remove the pipe nipple elbow assembly. Do this procedure for both the port and starboard cylinders (see Figure 4).

**Step 2** - Outside the transom, unscrew the 3 transom screws to remove the actuator from the transom.

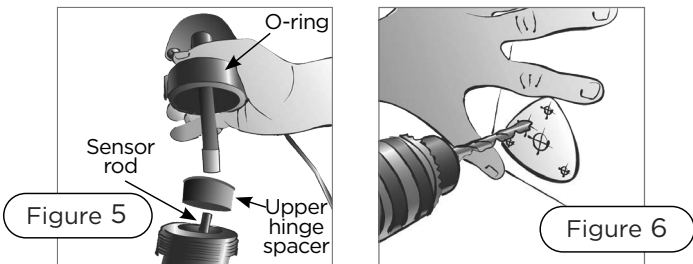
**Step 3** - Snap the white plastic clip onto the shaft protruding from the bottom of the cylinder, and ensure the lower hinge is securely attached.

**Important:** This clip must be used to keep the spring inside the cylinder compressed. Grasp the cylinder and upper hinge with both hands and unscrew counterclockwise from the cylinder body. A small amount of fluid may spill. Discard the old upper hinge.



**Step 4 - Important:** Insert the new sensor rod into the piston (see Figure 5). Make sure that the O-ring is in place inside the new upper hinge. Insert the upper hinge spacer (see Figure 5) into the inside of the cylinder (Flanged edge facing up). Screw the new upper hinge onto the cylinder while keeping the sensor rod inserted into center of the piston. Tighten the upper hinge as tight as you can by hand.

**Step 5** - Remove the plastic clip from the piston and repeat steps 2 - 4 for the other cylinder.



**Step 6** - Using the included template, drill a 5/16" hole into the transom for the sensor wire (see Figure 6). Screw the pipe nipple into the actuator upper hinge (NO Teflon tape or pipe dope). Tighten the nipple hand tight. Then, with vise grips, tighten two full turns ... NO MORE. Cover the end of the pipe nipple with masking tape. If you have the short through-transom fitting, using a 7/16" wrench, screw it

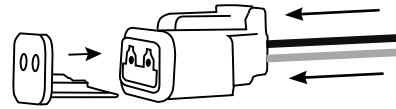
in (NO Teflon tape or pipe dope) until the fitting is snug; the shoulder of the fitting will just touch the plastic of the upper hinge.

**Step 7** - Carefully feed the sensor wire through the 5/16" hole. Apply 3M 5200 sealant to the actuator upper hinge surface, around the pipe nipple, screw holes, and cable. Secure the actuator upper hinge to the transom with the previously removed mounting screws. Grasp the cylinder body with both hands and tighten (clockwise) securely.

**Step 8** - Inside the transom, remove the masking tape from the pipe nipples. Carefully wrap Teflon tape around the male threads of the pipe nipples. Holding the pipe nipples with vise grips (to prevent them from turning) re-secure the 90 degree elbows. Re-attach the hydraulic tubing, and tightening the nut finger tight. Snug the nut with a 1/2" wrench. Do not over-tighten. Note: If you have the short through-transom fittings, omit this step. Repeat for other side.

**Step 9** - On the inside of the transom, install the wiring connector onto the sensor wires:

- » Insert the red wire and black wires into the connector until the pin locks into place. It does not matter which slot the red or black wires are inserted into.



- » Install the orange wedge into the front of the connector. For help visit [BennettTrimTabs.com/ConnectorHelp](http://BennettTrimTabs.com/ConnectorHelp).

**Step 10** - Label the port actuator sensor wire with the provided red port sticker, and using the the 20' extension wire connect to the red banded helm control connector (additional extensions are available at your marine dealer if needed). Repeat these steps for the starboard sensor wire identified with green stickers and bands (See figure 1).

### Connecting the Helm Control to the Pump

As pointed out in figure 7, the helm control will be connected to the pump with a 4-color wire harness (Not included). Variable length extension cables can be purchased at your marine dealer if needed. In scenarios where the connector types are not compatible between the helm control and the pump, connectors will need to be cut off (see figure 8) and the wires connecting the components will need to be butt spliced together with the included heat shrink sleeves.

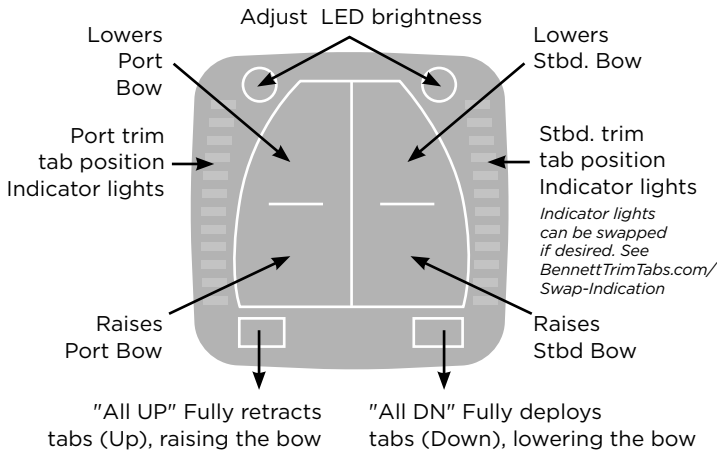


### Butt Splicing Components

In scenarios when the connectors from helm to the to pump are not compatible, cut off the connectors on both ends and butt splice the wires together using the included heat shrink sleeves.



## Calibration & Operation



- **Note:** When only one helm display is being installed, skip to step one below. If you have upper and lower helm OBI displays installed, calibration must be done at the primary OBI display. Reconnect the battery power to begin the calibration process. Check trim tab system to ensure it is operational, then put both trim tabs in the full up position by holding down the "Bow Up" position.
1. The port and starboard red LEDs will flash alternately, indicating that the system is not calibrated.
  2. Press and hold the sun and moon buttons on the OBI Display simultaneously for approximately 3 seconds. Both the port and starboard lower yellow LEDs will begin to flash. Release the sun and moon buttons.
  3. Using the OBI display, run both trim tabs to the full down position (DN on the control). Make sure the tabs go all the way down by holding the buttons down for at least 15 seconds or until the lower yellow LEDs stop flashing. (Holding the buttons after the tabs are down will not harm the system).
  4. A few seconds after the tabs are all the way down the port and starboard upper yellow LEDs will begin flashing. Again, using the OBI display, run both tabs to the full up position (Bow Up on the control). Make sure the tabs come all the way UP by holding the buttons down for at least 15 seconds or until the upper yellow LEDs stop flashing.
  5. The upper and lower yellow LEDs will then light up solidly, indicating that the OBI is calibrated and ready to operate. If you wish to recalibrate the OBI at any time, simply bring the tabs to the full up position, press and hold the sun and moon buttons down and repeat the calibration instructions.

## LED Brightness

The brightness of the display may be adjusted by pressing the sun button to brighten and the moon button to dim the display.

## Diagnostic Information

- **Port and starboard red LEDs alternately flash:** OBI requires calibration. Follow steps above.
- **Upper yellow LED flashes on port or starboard side:** Indicates the OBI Display is not receiving a sensor signal. If the port upper yellow LED flashes, the fault is in the port sensor or wires. A flashing yellow LED on the starboard side would indicate a fault on the starboard sensor or wires. Switching the sensor connections on the OBI control will confirm the diagnostic code if the flashing LED switches sides. If the problem switched sides, check the suspected faulty actuator with an Ohm meter at the OBI sensor cable plug. The reading should be in the 220-260 Ohm range. If the sensor readings are good, check for faulty connections (corrosion or broken wires).

## Electro-Hydraulic System Information

- **OBI Relay Module Fuse:** 12 volt system uses 20 amp in-line fuse on positive, 24 volt uses 10 amp. OBI Display Fuses: Both Purple and Orange wire fused at 1.5 amp for both 12 and 24 volts.

## Hydraulic Power Unit and OBI Module Wiring

Red = Port Valve

Green = Starboard Valve

Yellow = Motor Reverse (pump retract)

Blue = Motor Forward (pump pressure)

Black on HPU = Connects to Ground Stud on OBI Module

Orange on OBI Module = Positive

Black on OBI Module = Ground (boat's electrical system)

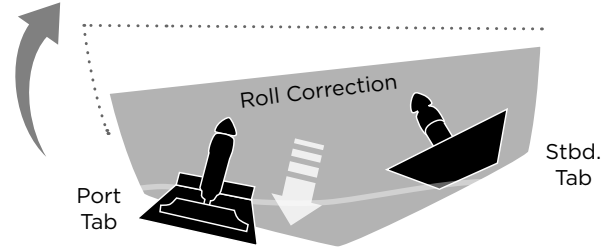
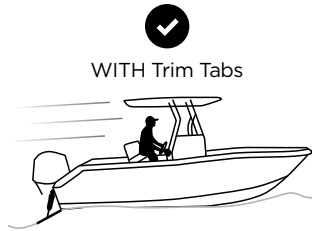
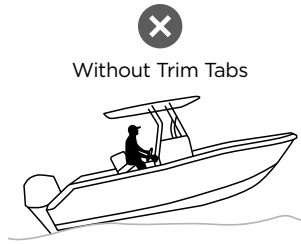
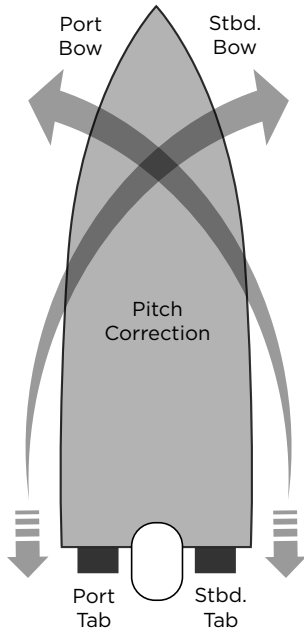
## Troubleshooting Instructions

If you have followed the complete instructions and the system is not functioning properly, a list of troubleshooting steps is available at [BennettTrimTabs.com/Install](http://BennettTrimTabs.com/Install), Keyword "OBI". It is also recommended that you contact your marine dealer service department or email our service department at [BMI\\_Info@Yamaha-motor.com](mailto:BMI_Info@Yamaha-motor.com).

## How Trim Tabs Work

Properly sized trim tabs improve the performance of your boat by adjusting the running angle of your vessel. Bennett Marine trim tabs help you get on plane faster, correct listing, improve visibility, and increase your fuel efficiency and performance.

- Get up on plane quickly, and at lower speeds
- Increase performance and fuel efficiency
- Increase visibility and safety
- Adjust running attitude for changes in speed and shifting weight
- Correct listing and porpoising



When the port tab is lowered independently, an upward force at the port stern of the boat is created. The inverse applies when lowering the starboard tab independently.

Trim tabs are easy to use. After just a few times using, tab operation will become second nature. The concept is simple but the results are impressive.

**Have questions? We're here to help. Email us at: [BMI\\_Info@Yamaha-Motor.com](mailto:BMI_Info@Yamaha-Motor.com)**

When the tabs are deployed downward, the water force on the trim tab surface creates upward pressure, raising the stern and lowering the bow. The port trim tab lowers the starboard side bow, and the starboard trim tab lowers the port side bow.

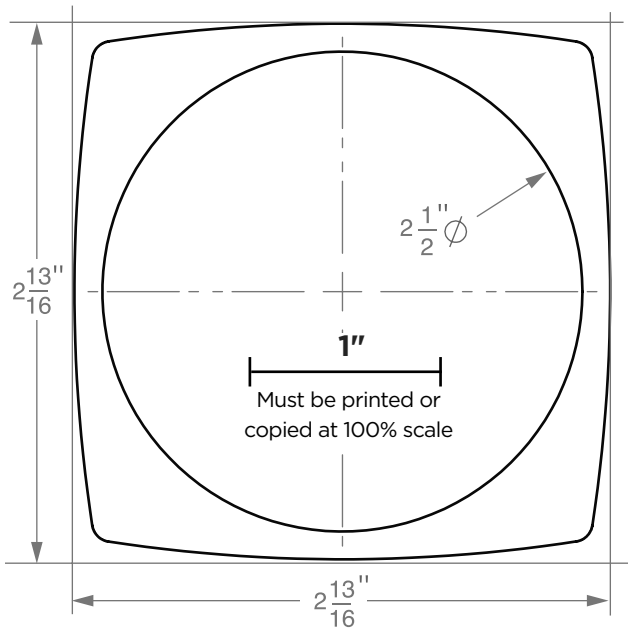
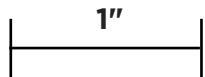


**Learn more about trim tabs at [BennettTrimTabs.com/Guide](http://BennettTrimTabs.com/Guide)**



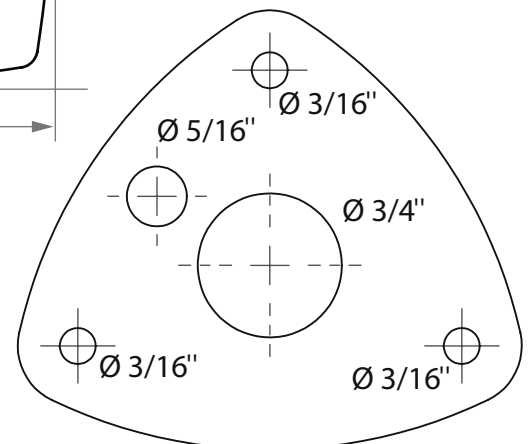
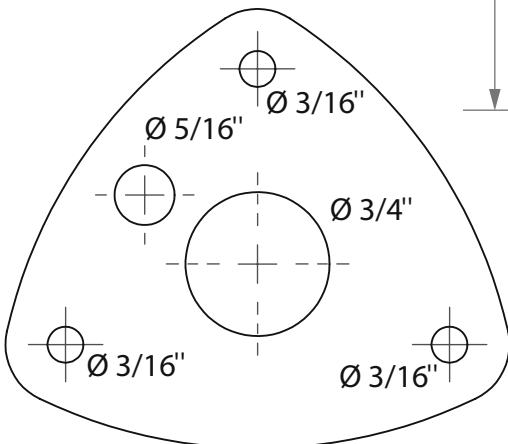
### Helm Control & Actuator Sensor Drilling Template

**Must be printed or copied at 100% scale**



### Have questions? We're here to help.

Email us at: [BMI\\_Info@Yamaha-Motor.com](mailto:BMI_Info@Yamaha-Motor.com)



[BennettTrimTabs.com](http://BennettTrimTabs.com)