

PONTOON HYDROFOIL APPLICATIONS INC.

# VARA<sup>TM</sup>

## FOIL-STRYT-PLATE

### VaraPlate<sup>TM</sup> Instructional Install Manual

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Patent Pending

Version 1.1

12-2022

## Getting Started

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*Examine box and document any damage before opening.*

*Remove ground wire from engine battery and key from ignition.*

*Open Box, Unwrap All Components, Inspect and Inventory All Contents.*

Content List: 1- VaraPlate™, 1- Hardware install kits including Loctite™,

*Gather Minimum Tools Needed for Install: Battery Drill with 3/16" metal drill bit, Temporary Marker/pencil, 1-3/8" Wrench, and a small grinder.*

### **BASIC WARNINGS MOVING FORWARD**

- a) *Check, and double check that ALL Nuts/Bolts are tightened before use or putting boat in water. Do Not Cross Thread screws or bolts, Starting Bolts and screws by hand 2 full before using tool for tightening helps. Do Not Overtighten Bolts and/or Nuts during installation*
- b) Check VaraPlate™ recess for proper fit tolerances on your motor prior to drilling any holes. Watch VaraPlate™ Installation video for best results. Link:  
[https://www.youtube.com/watch?v=TG9aJ3Kz4\\_Y](https://www.youtube.com/watch?v=TG9aJ3Kz4_Y)

### **Installing Your VaraPlate™ (Experience Level-Easy)**

Your VaraPlate™ mounts onto your outboard motor anti ventilation plate. The object of your VaraPlate™ install is to locate the VaraPlate™ with the machined recess on bottom part of VaraPlate™ as far forward and on top of the outboard anti-ventilation plate as possible. The structural integrity will be maintained while keeping the front edge width tightly against the lower unit wall. The tighter the fit on front edge, the less debris that will catch in between VaraPlate™ and the lower unit wall. While dry fitting, we recommend a removable cloth protector between VaraPlate™ and lower unit for scratch resistance while pre-fitting plate on/off lower unit.

Bending the left side higher or lower than right side and tilting plate while going on/off will also help prefit procedure. The small width at front of the plate may need some sanding to match the front curvature of your lower unit wall. (As shown in directions by red line), this is normal for that desired tight fit. **DO NOT** sand motor or lower unit, the VaraPlate™ is made to be sanded. Each motor lower unit is different, each VaraPlate™ model is different. If something doesn't seem correct in your VaraPlate™ fit, there is a chance that you have ordered the wrong Plate for your existing motor. **STOP!** Call or email us and try to send a few pictures for reference.

Recommended Watch video.

**(Estimated time of VaraPlate™ Assembly with tools ready, 40 mins):** Use bolt pattern recommended in video and instruction sheets below for your model:

1. Locate VaraPlate™. Put your 3/16" drill bit into your drill and ready for VaraPlate™ install. Locate hardware kit with proper 10-24 x 1" carriage bolts, 1/4" fender washers, and 10-24 standard nuts. Put carriage bolts into fender washers so they are ready for inserting.
2. Dry fit your VaraPlate™ onto your outboard motor anti-ventilation plate. If you are not sure which lower unit plate this is, it is usually the horizontal plate on lower unit directly above the propellor. If unsure, stop your install until you consult with a professional.
3. Your dry fit may include light sanding of your VaraPlate™ front where it meets the lower unit wall. We use a small disc grinder but 40 grit on a hand block or board file works well also. Use a marker to scribe/mark the lower unit wall shape onto your VaraPlate™ while

it is located properly at back-end recess. It may be best to watch the video at this point. Remember if it seems like you have sanded the front end too much and there is slop as you slide it side to side, squeeze the front end to bring it in tight and close any gaps you have before final bolting.

4. **STOP!** Lay VaraPlate™ on anti-ventilation plate to check fit before proceeding. If fit looks good on front, sides and back, you are now ready to move forward with drilling of holes in lower unit for mounting. If not, do not drill and please contact us by phone or email before proceeding.
5. Using a yardstick or measuring tape on outside forward left edge of Anti-Ventilation Plate (AVP), start measuring 3" back from where AVP meets outside walls of lower unit. Then measure in 5/8" from where edge of ventilation plate joins the sidewall of lower unit. Do the same on the right side of plate. The 1<sup>st</sup> hole of each side must be drilled as far forward as possible in this "Zone" 3 x 5/8" "zone". Drill from top where possible but Drilling from the bottom with a 3/16" drill, as usually there is another plate from above that will restrict your drill angle from above. Drill Straight and locate hole in 1/4" from AVP edge.
6. Now locate the aft holes on the aft corners of each side in back end of anti-ventilation plate. Remember hole centers must be at least 1/4" in from outboard edge of plate min. 3/8" max. Measure distance from front to back holes with yardstick pressed on outside edge of AVP. Divide this distance by 3 or 4 depending on diagram supplied for VaraPlate™ version you have. If you have the 40mph max plate divide by 3 or 65 mph max divide by 4. Mark the locations and drill in from edge 1/4" from AVP edge of each hole min, 3/8" maximum.
7. Finally, locate hole on center in back edge of plate 1/4" in and drill final hole. See drawing or call/email with any questions.
8. Once all holes are drilled in anti-ventilation plate, it's time to put the VaraPlate™ on for final drill. Locate VaraPlate™ as far forward as rear end of AVP will allow. Check fit at front. If everything looks good. Drill the back hole upward from bottom of anti-ventilation plate. Put carriage bolt thru fender washer and push down thru hole on center at top. Carriage bolts should be facing downward from VaraPlate™ so bolt head and washer are seen on plate, with nut on bottom of AVP plate. Then, drill 2 holes forward on each side. Make sure to press forward edge of VaraPlate™ tight against lower unit wall on each side as you drill. Be careful that VaraPlate™ fits snug against wall. The top of AVP meets the wall of lower unit with a radius, so the VaraPlate™ must have a radius for proper fit. Put Carriage bolt, fender washer, and nut on loosely.
9. Then, drill the balance of bolts to complete install if all looks good. Tighten using 3/8" wrench after putting Loctite on threads above nut. After checking nuts for even tightness, use vise grips to snap off each excess bolt thread. Do NOT put vise grips tight against nut or you risk bending bolt under nut instead of above it. When all bolts are snapped flush or close to it, hit each snapped bolt over nut with hammer to knock down the sharp edges of bolt and also help lock the nuts from spinning off. **DO NOT FORGET THIS STEP!**
10. Plate is now installed. Double check install and actually test install strength by lifting up on plate with 2 hands on back end of VaraPlate™ firmly. This mimics the lift the VaraPlate™ will create while under way at speed.

## Final Checks Before Using Your VaraPlate™ System

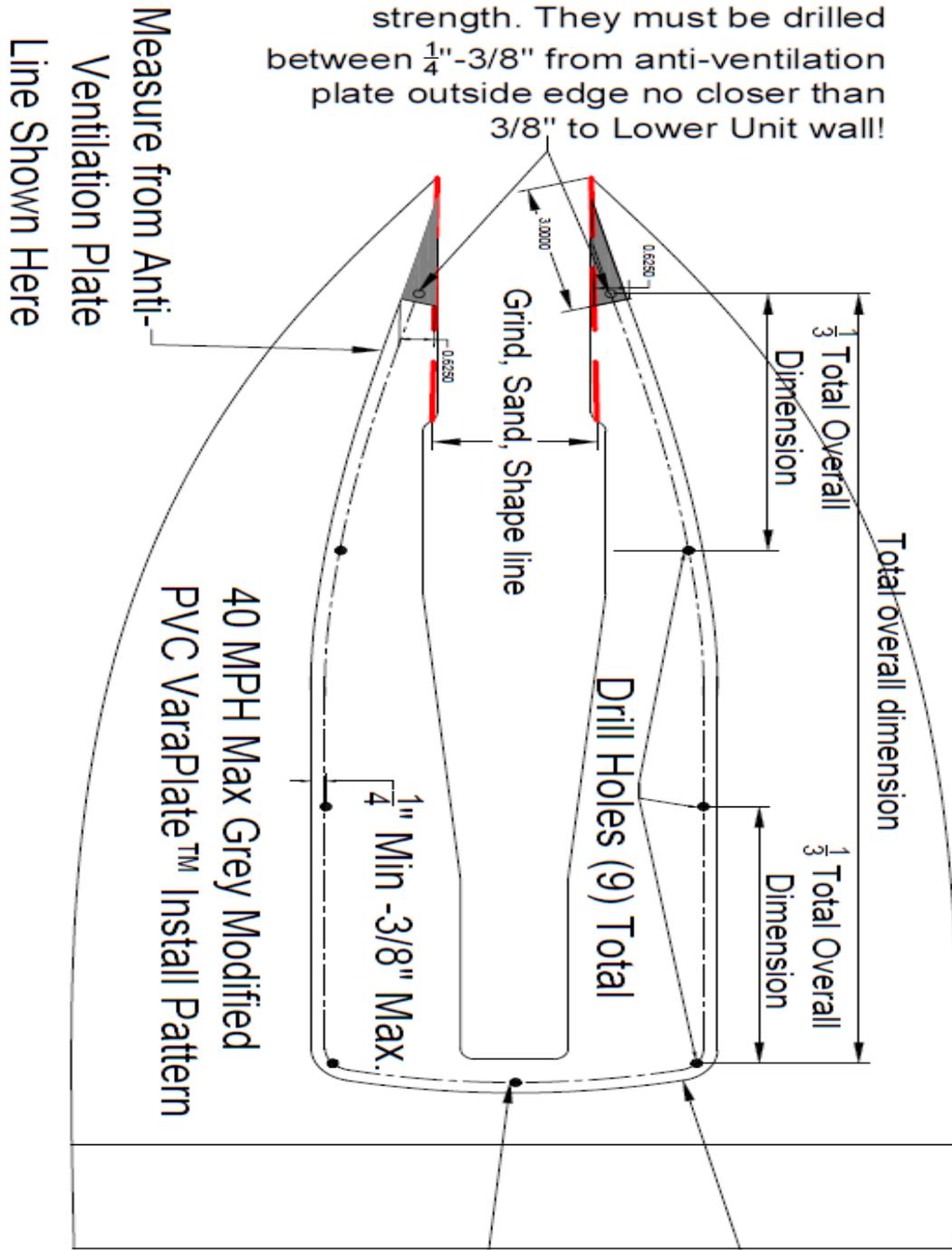
1. Check that ALL fittings and bolts are tight.

2. Check VaraPlate™ for proper fit and clearance on propellor. Plate should NOT be hitting prop or any closer than bottom of anti-ventilation plate distance before VaraPlate™ install.
3. Replace ground wire and ignition key once ALL checks are complete and everyone is clear from area.
4. Check plate is tight by lifting motor up/down using sides of plate towards back.



**Above install was completed on 75 Hp Etech and has 7 bolts total, as middle aft is missing. 90 Hp-150Hp we recommend using 9 total bolts as shown in diagram. 150-350Hp we recommend using 11 total bolts as shown in 2<sup>nd</sup> diagram.**

Forward 2 holes and bolts must fall inside this grey zone for strength. They must be drilled between  $\frac{1}{4}$ "- $\frac{3}{8}$ " from anti-ventilation plate outside edge no closer than  $\frac{3}{8}$ " to Lower Unit wall!



Aft end of VarraPlate recess must be tight to aft end of ventilation plate for entire process and final mount. Gap MUST be NO larger than  $\frac{3}{16}$ " or must be reshaped manually. Drill holes between  $\frac{1}{4}$ "- $\frac{3}{8}$ " inside Edge of Ventilation Plate

40 MPH Max Grey Modified PVC VarraPlate™ Install Pattern

Measure from Anti-Ventilation Plate Line Shown Here

Grind, Sand, Shape line

Drill Holes (9) Total

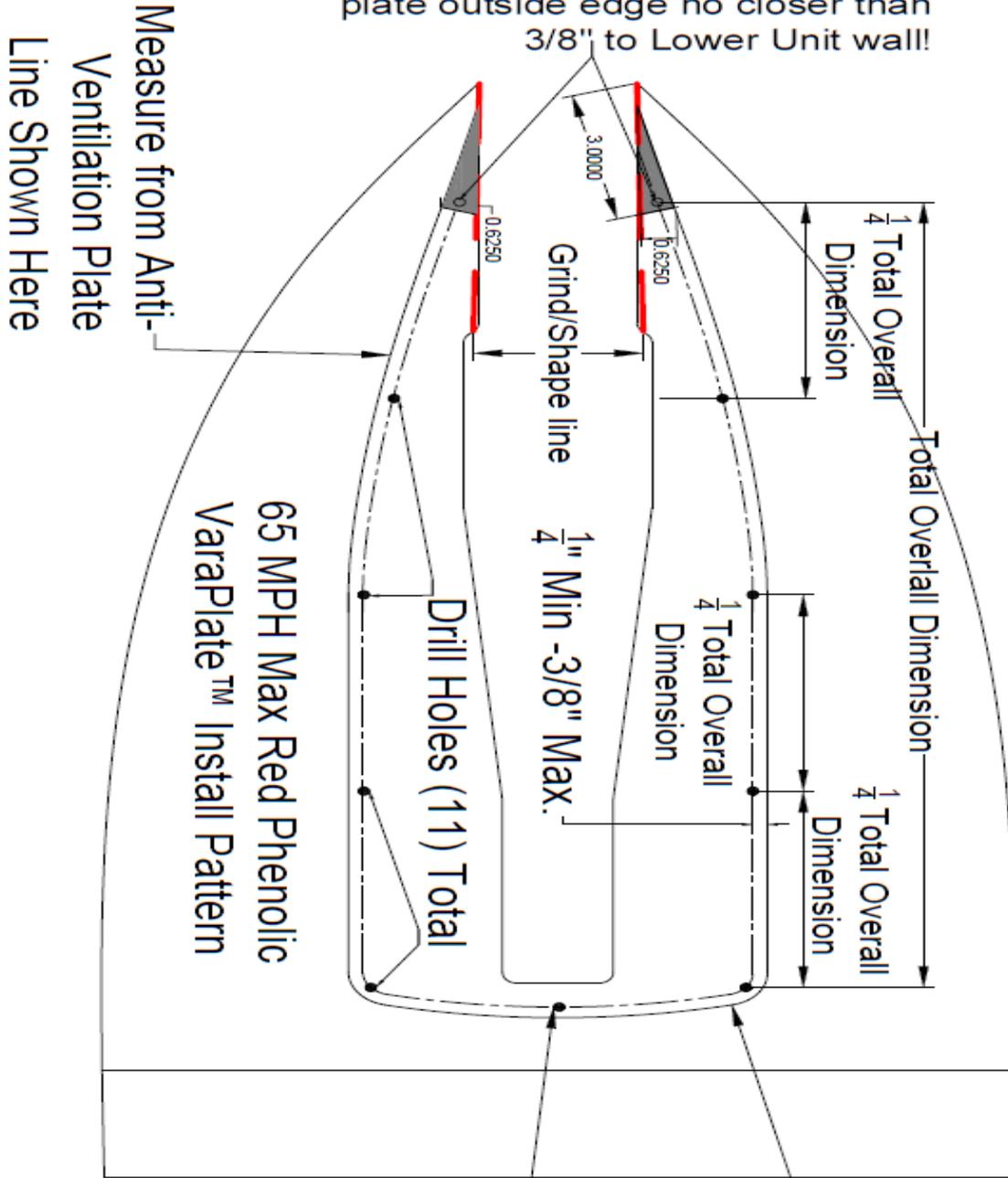
$\frac{1}{4}$ " Min - $\frac{3}{8}$ " Max.

$\frac{1}{3}$  Total Overall Dimension

$\frac{1}{3}$  Total Overall Dimension

Total overall dimension

Forward  $\frac{3}{16}$ " holes and bolts must fall inside this grey zone for strength. They must be drilled between  $\frac{1}{4}$ "- $\frac{3}{8}$ " from anti-ventilation plate outside edge no closer than  $\frac{3}{8}$ " to Lower Unit wall!



Aft end of VaraPlate recess must be tight to aft end of ventilation plate for entire process and final mount. Gap MUST be NO larger than  $\frac{3}{16}$ " or must be reshaped manually

1/4"-3/8" inside Edge of Ventilation Plate

Drill holes Between

**Above install was completed on 75 Hp Etech and has 7 bolts total, as middle aft is missing. 90 Hp-150Hp we recommend using 9 total bolts as shown in diagram. 150-350Hp we recommend using 11 total bolts as shown in 2<sup>nd</sup> diagram.**





## Using Your VaraPlate™ (Make sure All is clear around boat)

1. Start engine and put into Fwd. gear. Once in forward gear make sure you are trimmed down for the 1<sup>st</sup> use.
2. Slowly come onto a plane. You will notice that the boat will plane off faster than normal.
3. Use your Trim/Tilt your boat just as you would with NO VaraPlate, only short presses or taps. You shouldn't have to hold switch in for long lengths of time. Now you are creating lift and smoother water flow over your prop.
4. This allows you to control your VaraFoil lift, boats bow attitude, and boat speed.

## Troubleshooting and Support

1. **Weeds collecting in front edge of VaraPlate™?** Some weeds are normal especially going thru large clumps of "Turtle Grass" A grass that is approximately ¼" x 12-18" long or thin strands of grass. However, check to make sure that the gap in front of plate is not oversized. The plate should be against the lower unit wall snugly.
2. **My VaraPlate™ is moving back and forth.** Plate should have **NO** movement and should be snug. If not snug, tighten all bolts to a proper tension without breaking. Also check to see if a few have broken off or may be missing as per drawing above.
3. **If you run into other questions please email, call, or text us with any concerns you have and thanks for joining the VaraLife™.**

PHA Inc.

[www.pontoonhydrofoil.com](http://www.pontoonhydrofoil.com)

[www.varaplate.com](http://www.varaplate.com)

[mike@pontoonhydrofoil.com](mailto:mike@pontoonhydrofoil.com)

Phone: 727-455-5576