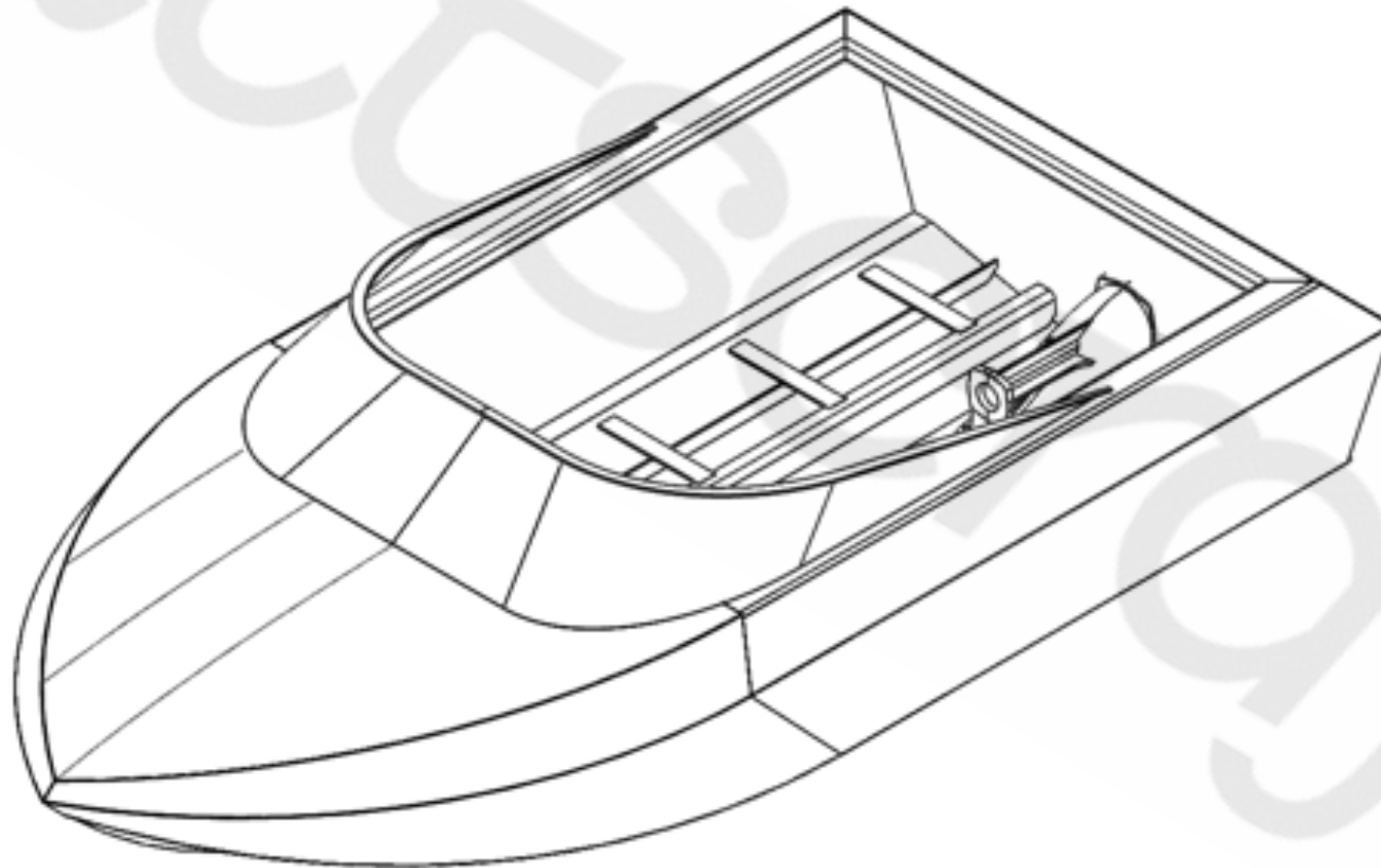


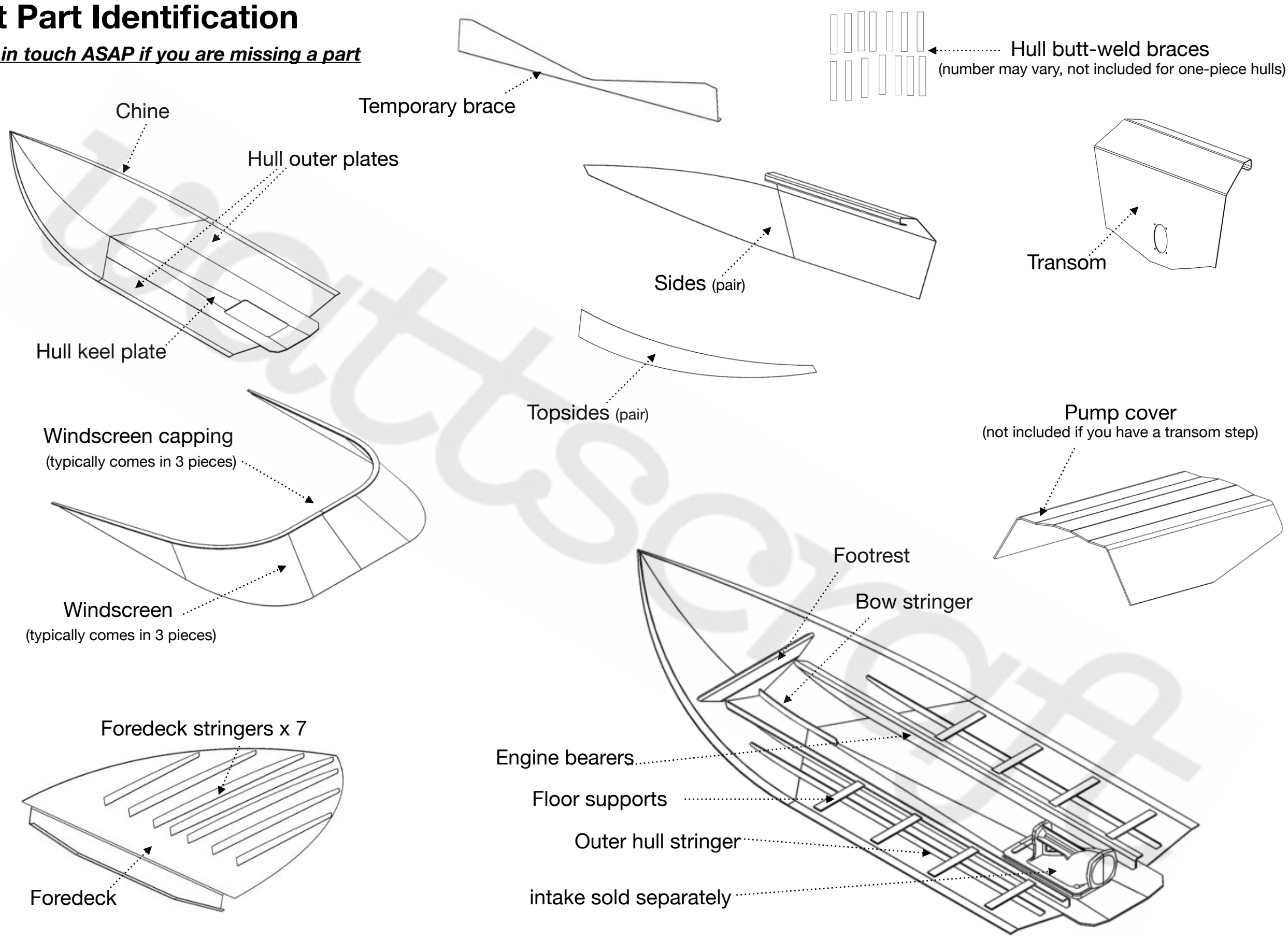
*wattscraft*TM

Hull Construction Instructions



Kit Part Identification

Get in touch ASAP if you are missing a part

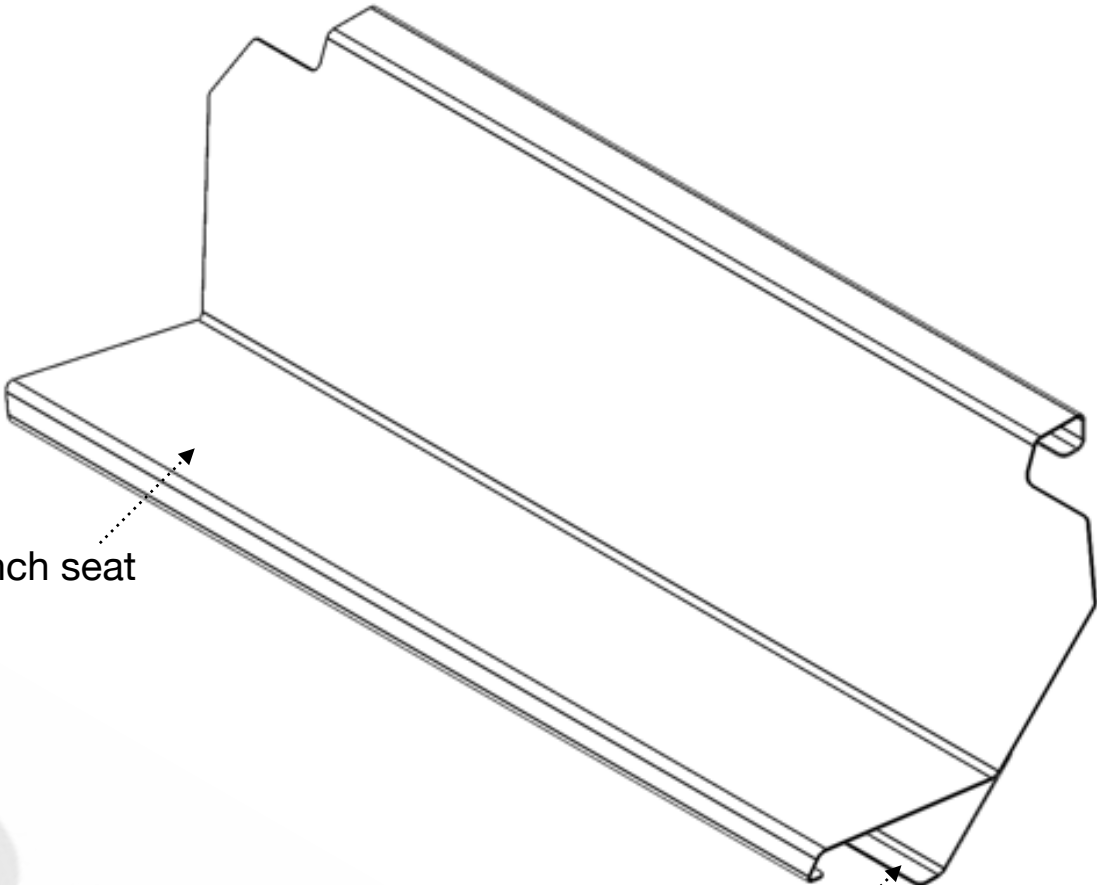


Optional Kit Part Identification

Bolt-in 16mm thick intake block
(To suit ASCNC intakes)



Bench seat

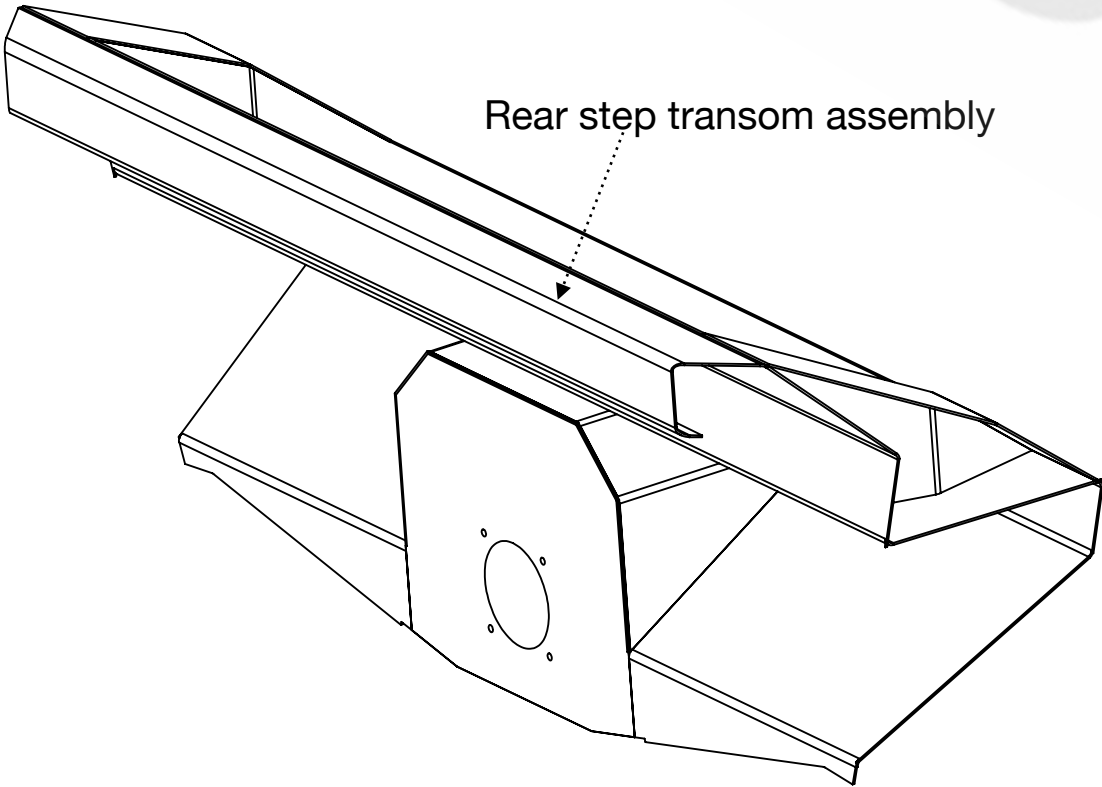


Under-seat bulkhead

Foredeck bulkhead



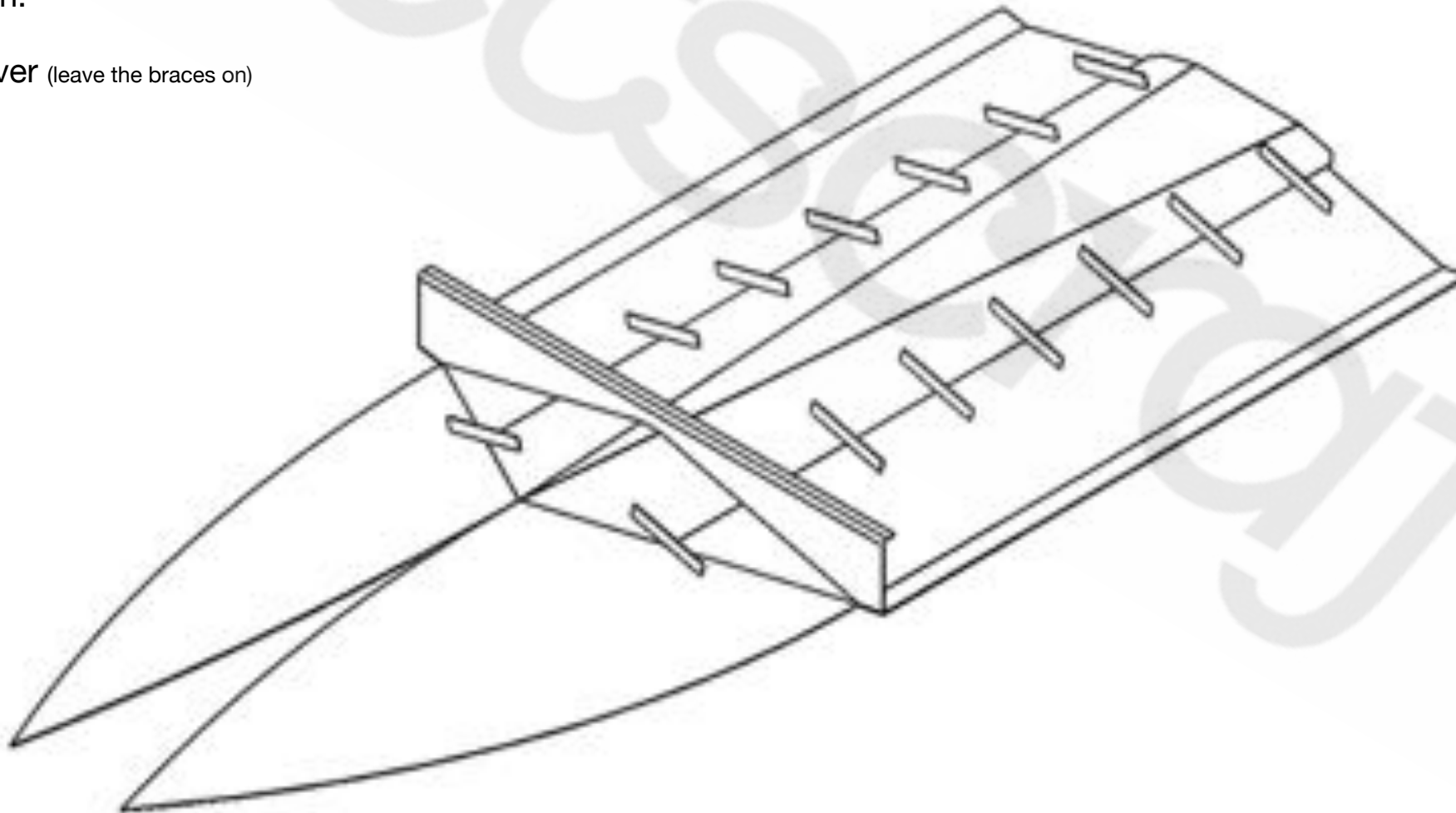
Rear step transom assembly



Assemble the Hull Panels

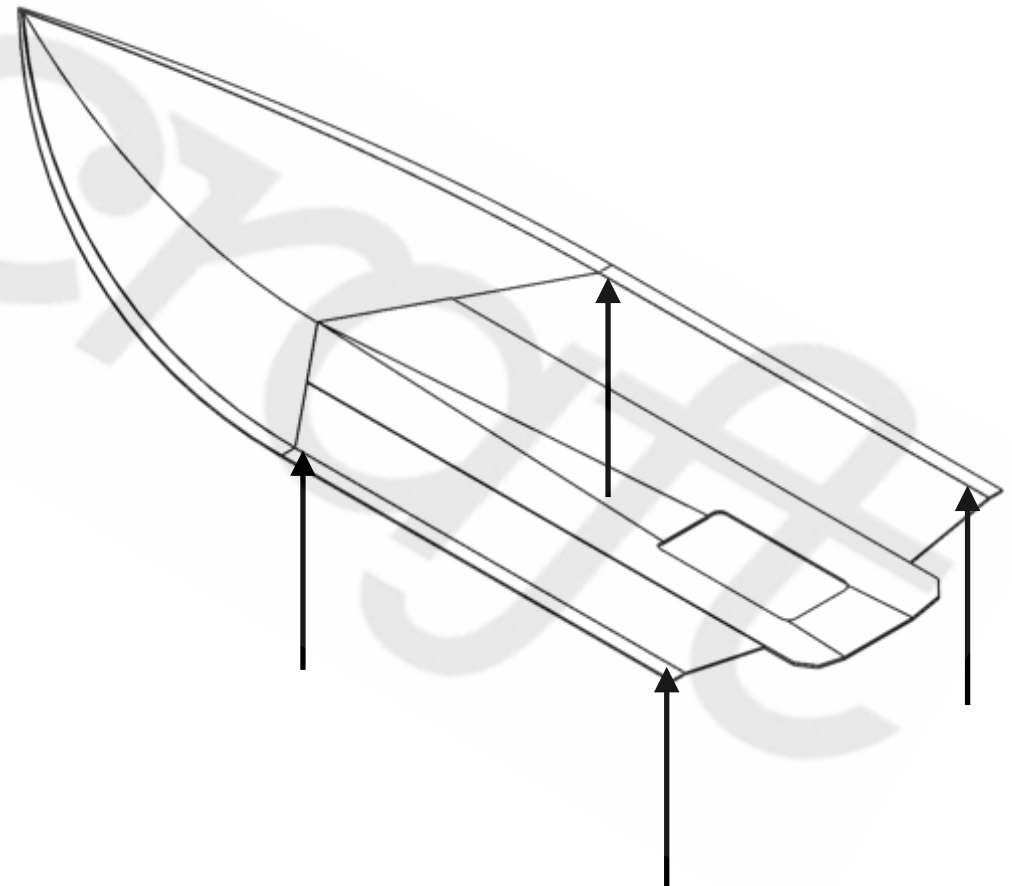
If you have a one-piece hull bottom you can skip this page

1. Support the keel plate upside down on stands (see the video on WattsCraft NZ youtube)
2. Tack the rectangular weld braces to the hull outer panels at even spacings (if you tack only on one side the brace can be easily removed)
3. Align one hull outer panel to the keel plate
4. Tack the weld braces to the keel plate and along the butt-join at ~100mm intervals (work from back to front)
5. Repeat for the other side
6. Tack along the front edge of the keel plate
7. Tack the first 50mm of the hull outer panels together and to the front tip of the keel plate
8. Tack the temporary brace in the position shown below. The outside edges of the chines should line up with the outside corners of the brace as shown.
9. Turn the hull over (leave the braces on)



Support the hull

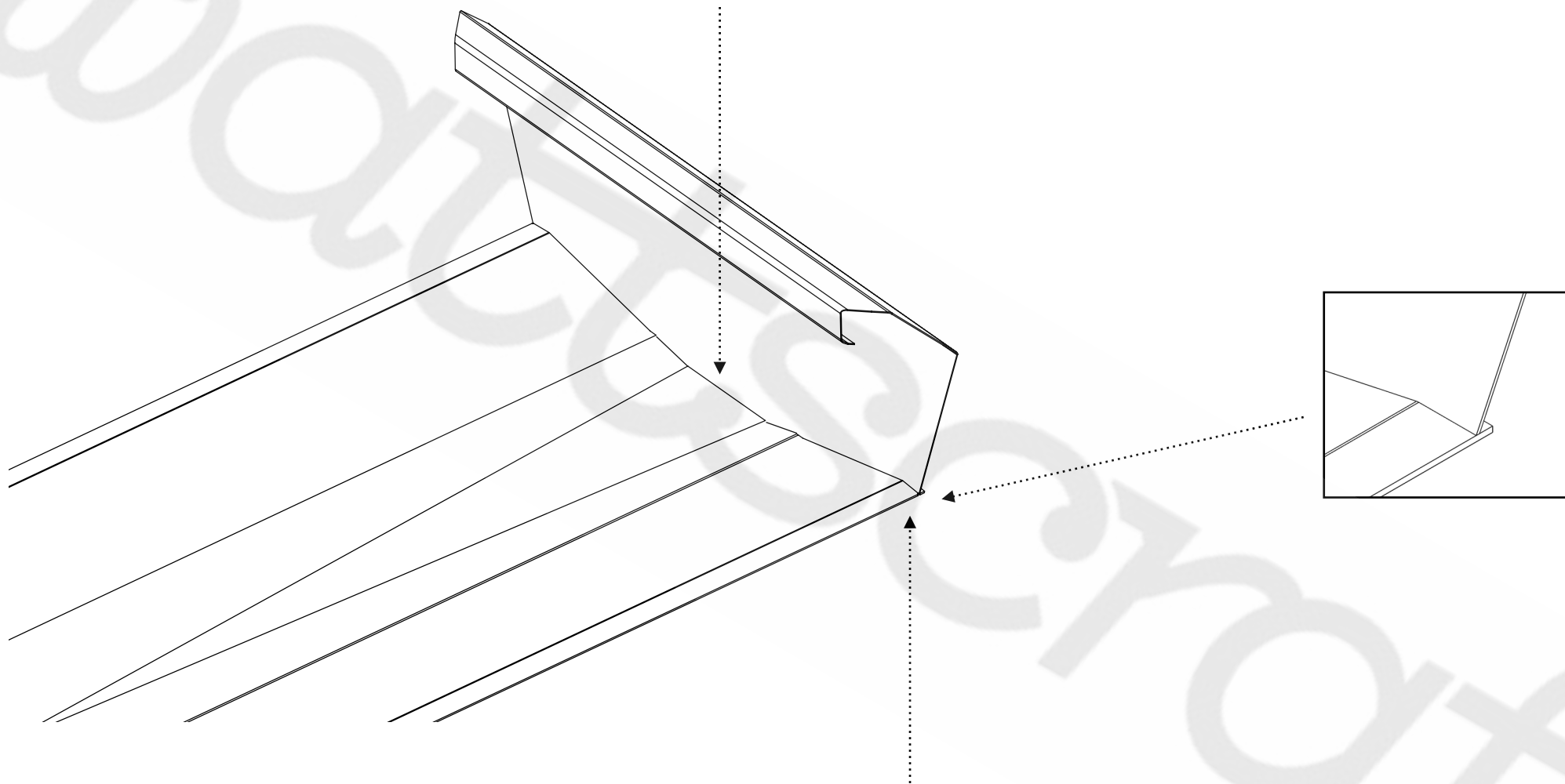
1. At this stage the hull is flexible and can be twisted easily it requires even supports so it will sit flat while assembling
2. Get four supports the same height on a flat floor. If you don't have a flat floor use a spirit level to get supports the same height on each side (they can be a different height front and back).
3. Support the hull under the folded chines on the bend as shown below
4. The hull should touch all supports. Watch the hull is still touching all supports as you tack the boat up. If a corner lifts you have caused a twist and will have to back step until you have found the cause and fixed it.
5. Add some weight in the boat near the transom so there is still some weight on the rear supports when the foredeck etc is added
6. You can mount the engine and pump before putting the sides on for ease of access if you choose.



Transom install

1. Tack the transom on working from the centre out to the chines (see the video on WattsCraft NZ youtube)
2. The transom sets the shape of the hull at the rear
3. If you have a rear step transom consult the instructions later in this document to assemble it before tacking it to the hull

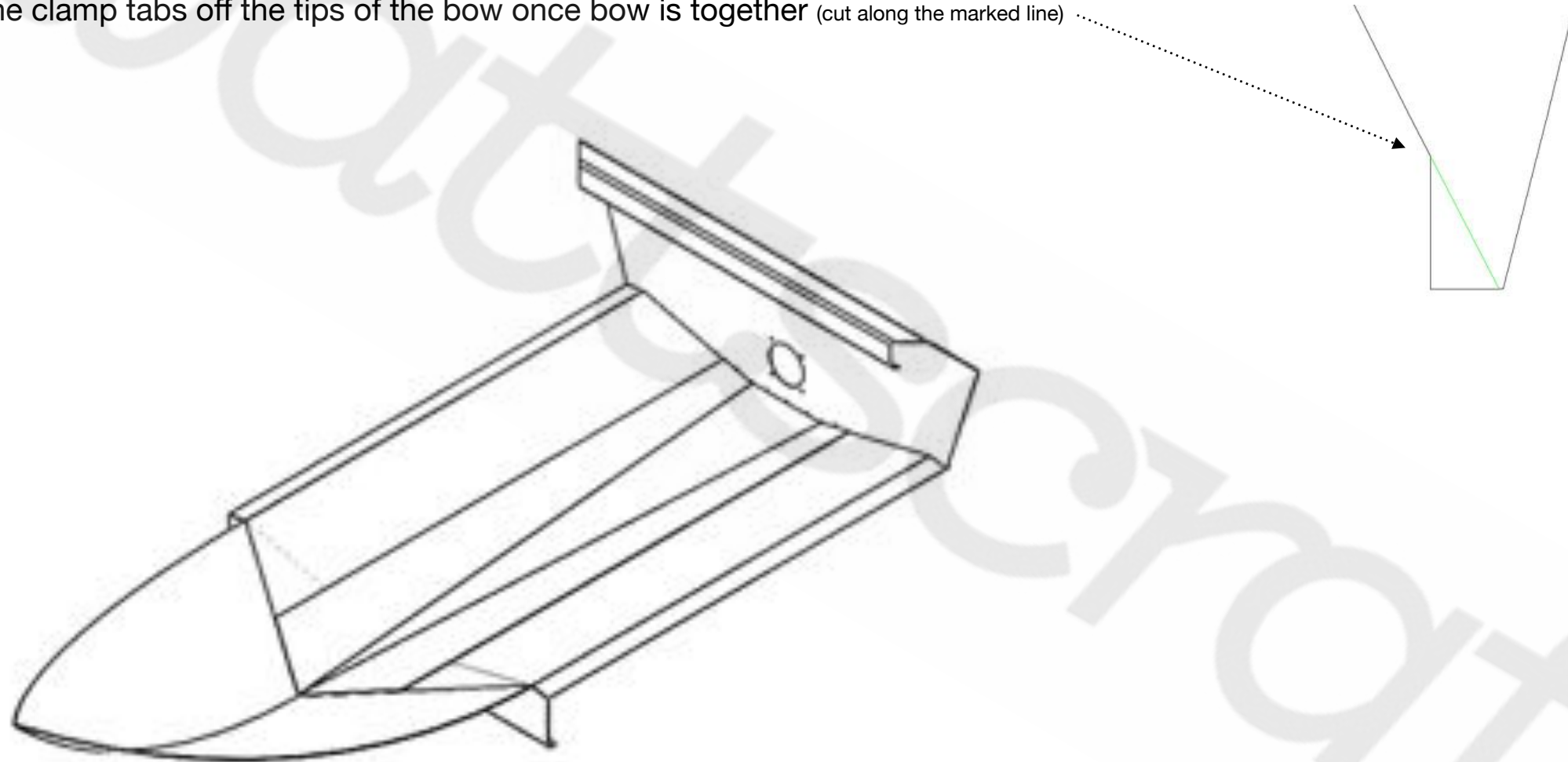
The transom should be vertical and centred on the hull



The inside face of the transom is 15mm forward from the back of the 5mm hull outer plates to the inside face of the transom.

Pull the Bow Together

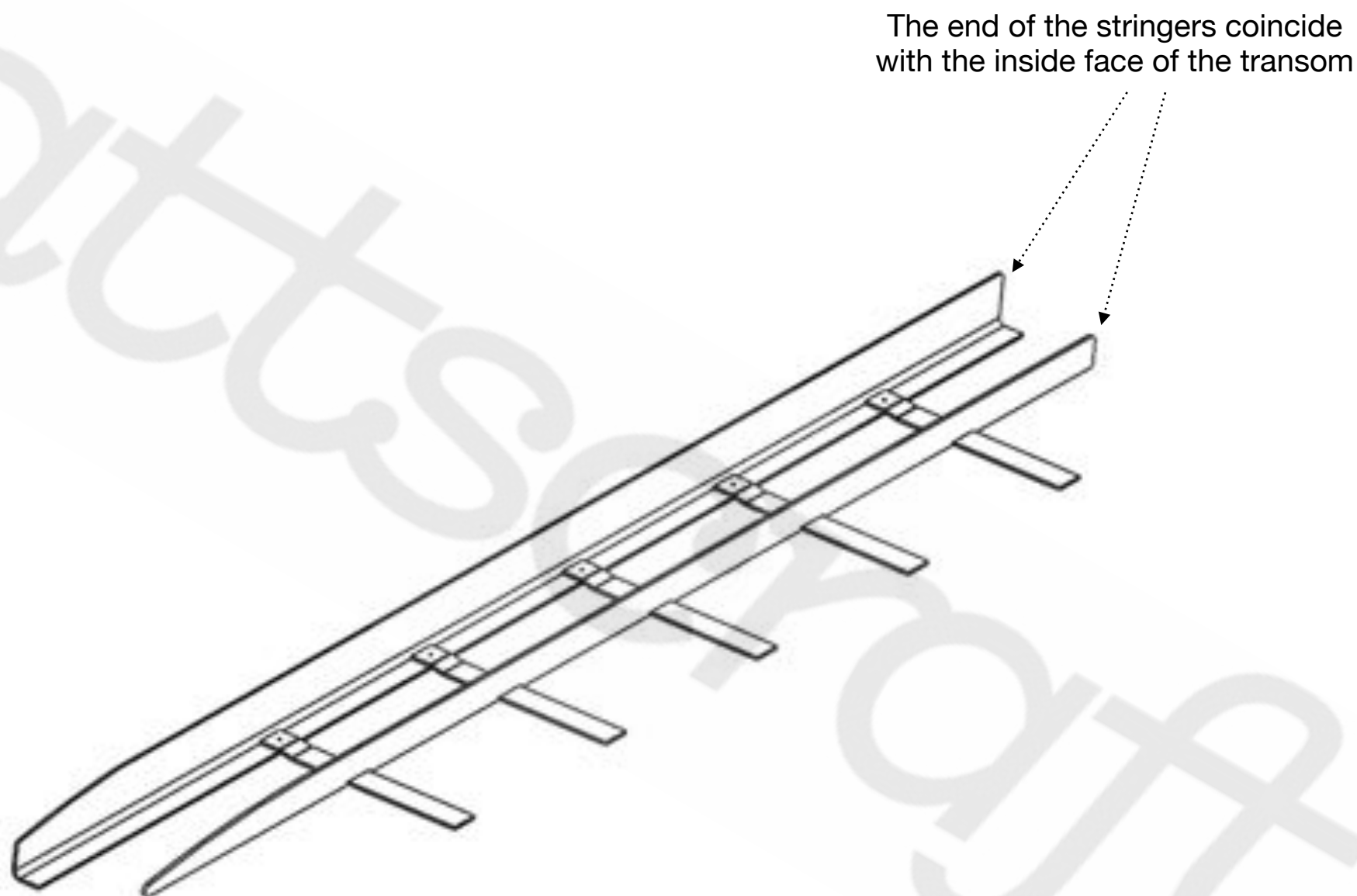
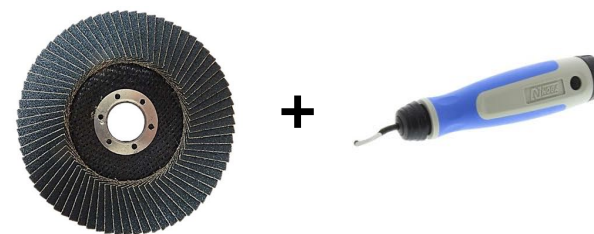
1. Put a clamp across the tips of the hull outer panels & begin too pull them together
2. Tack the hull outer plates together as you pull the bow together (work from back to front)
3. It can help to push up on the seam from below to close the last few mm of gap where you want to tack it
4. Dont do any big welds up the bow stem before the hull is all tacked up (especially on the inside). This will pull the bow together and out of shape, making installing the foredeck much harder.
5. As you weld the last 3rd of the bow seam up you can add a few 15mm long tacks to to underside of the seam to make sure the seam won't break apart
6. Cut the clamp tabs off the tips of the bow once bow is together (cut along the marked line)



Take care to stay clear of the bow panels during this step. If they release they can cause injury.

Assemble the Engine Bearer Assembly

1. Cut off all router tabs and de-burr all sharp edges (use a grinder & a hand held de-burrer tool)
2. Assemble the parts as shown below on a flat workbench or floor
3. Clamp the parts down so the assembly is flat and square with alignment holes lined up
4. Weld the parts together
5. Repeat for the other side

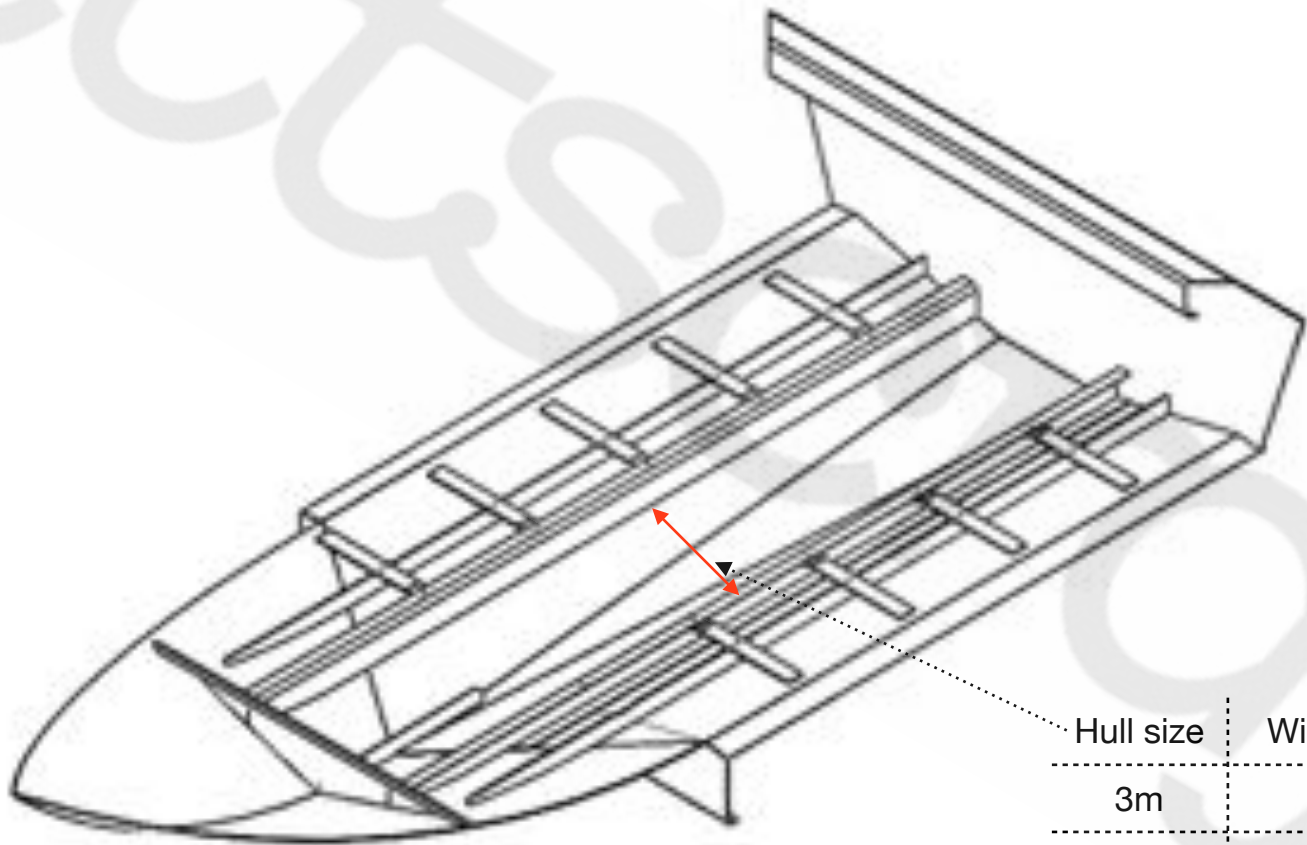


The end of the stringers coincide with the inside face of the transom

The 4.3m and 4.6m have the engine bearer built into the hull panels. For these hulls you only need to assemble the outer stringers and cross members before installing them in the hull. See the picture galley for the bigger hulls on the instruction page of wattscraft.com

Install the Hull Structure

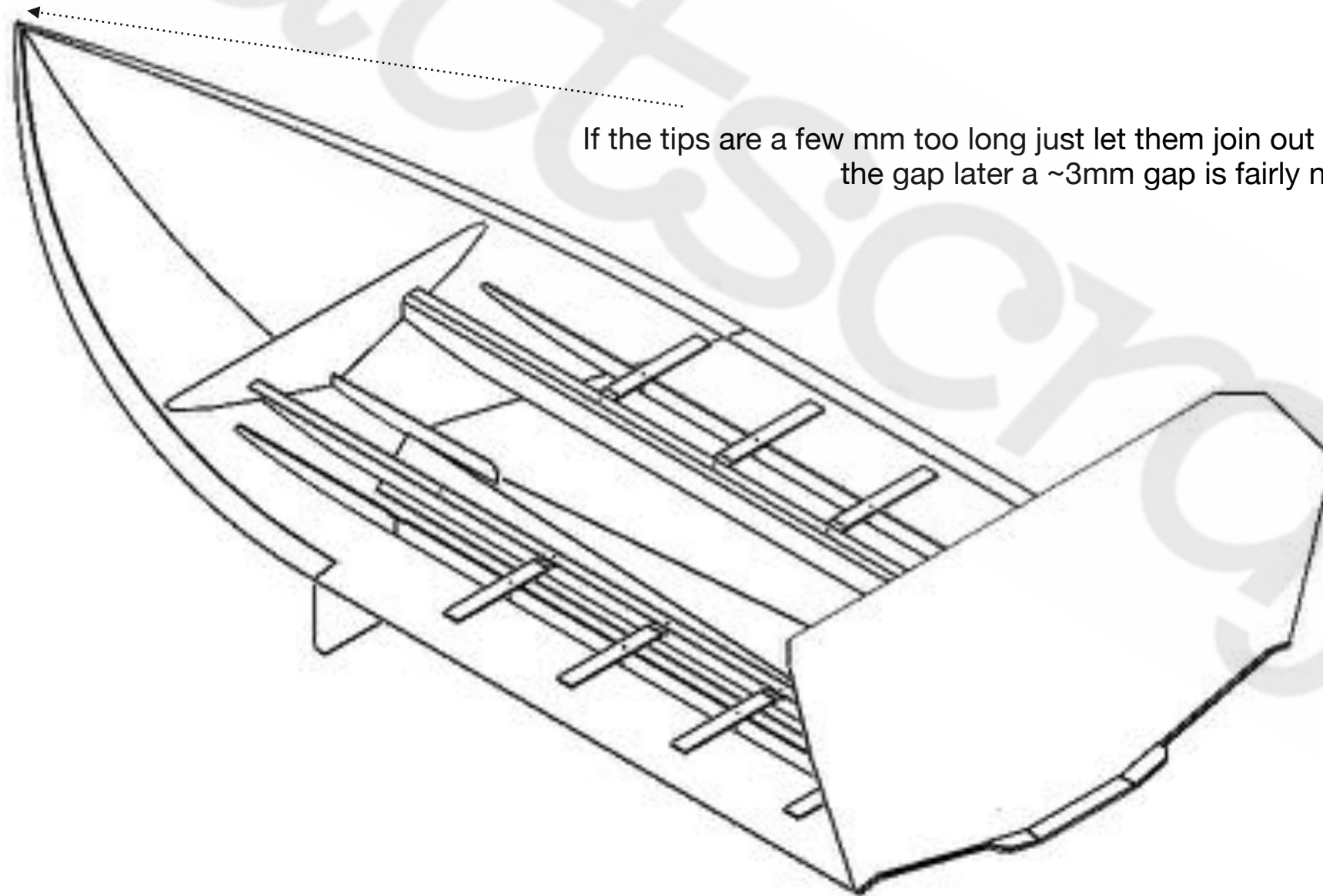
- 1. Tack the engine bearer assemblies into the hull
 - 1. Work from back to front ensuring no gap along the flat section of hull
 - 2. The curved bow section can have a bit of unavoidable gap (~5-10mm)
- 2. Tack the footrest in place
 - 1. The footrest is installed at the end of the engine bearers
 - 2. Push the bow vee in or out to get a perfect match with the footrest (this helps to shape the bow correctly)
- 3. Tack in the centre bow stringer in the position shown



| Hull size | Width between engine bearers |
|-----------|------------------------------|
| 3m | 410mm |
| 3.3m | 460mm |
| 3.6m | 470mm |
| 3.8m | 485mm |
| 4.3m | 560mm |
| 4.6m | 570mm |

Add the Chines

1. Tack the transom end of the chine to the folded chine on the hull outer panel
2. Dont worry about the exact angle of the chine just tack it on as it wants to sit. However, do avoid doing excessive tacks that will pull the chine up a lot or warp it.
3. You want decent tacks that won't come apart but all the tacks in the bow area need to allow for some flex as the shape of the bow will change as each part is tacked on. Until the foredeck is tacked on the bow will not be in its final shape.
4. Tack the chine on from the back to the tip (the bottom edge of the hull outer panel and chine should be perfectly aligned)



If the tips are a few mm too long just let them join out a bit from the hull and fill the gap later a ~3mm gap is fairly normal

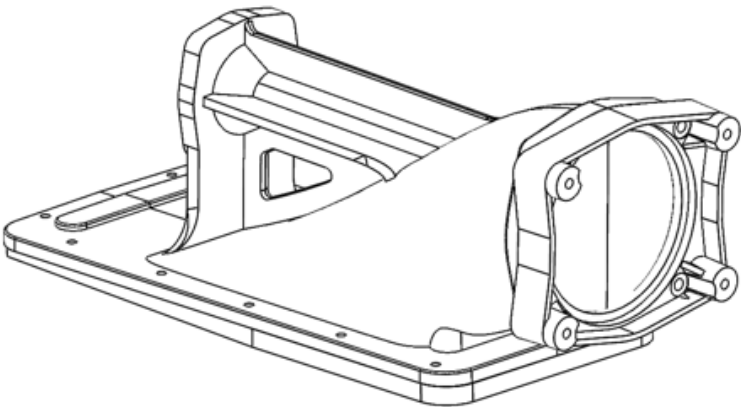
Assemble ASPCNC Intake *(this guide assumes the mounting faces are already machined flat)*

Pump adaptor

1. Clamp pump adaptor to the back face of the intake & rotate so adaptor bolt holes are parallel with the horizontal plane as shown below
2. Drill and tap the intake for the four adaptor mounting bolts using the adaptor as a template. It's easy to get these a bit off if your not careful to punch centres and drill vertically.

Grill

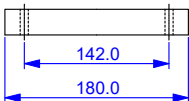
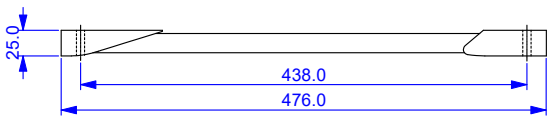
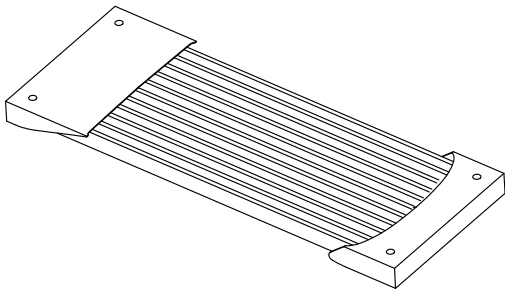
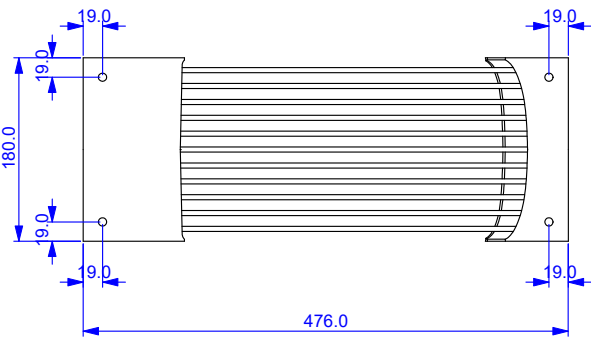
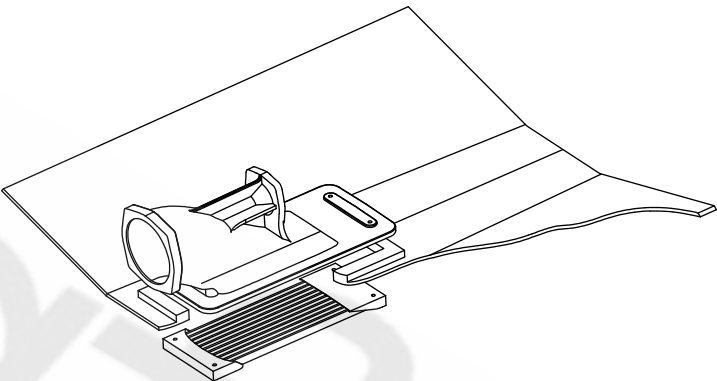
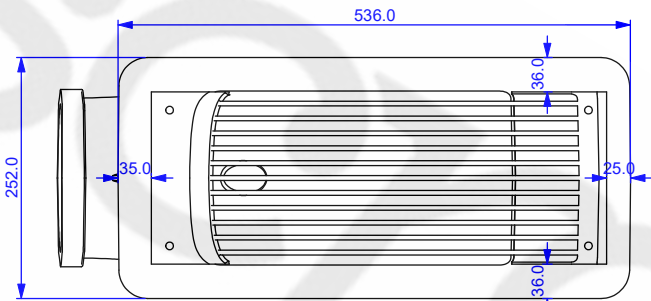
1. Clamp the grill to the intake using the digram below
2. Drill two 8mm holes at the front though the grill & intake. The location for the holes is shown below (make sure the front holes are perfectly in the middle of the grill bars).
3. Drill two 7mm holes at the back through the grill & intake.
4. Remove the grill & drill the 7mm holes in the grill out to 8mm. Tap the two back holes in the intake to M8.
5. Counterbore the holes on the bottom of the grill for M8 socket head bolts. Use a 12.5-13mm drill bit to counterbore so the bolt heads are flush with the grill bottom.
6. Bolt the grill on



Intake block

1. Clamp intake spacer block in place
2. Drill 8mm holes through the intake foot using the intake spacer block as a template

Use blue Locktite, Tefgel or anti-seise on all the bolts

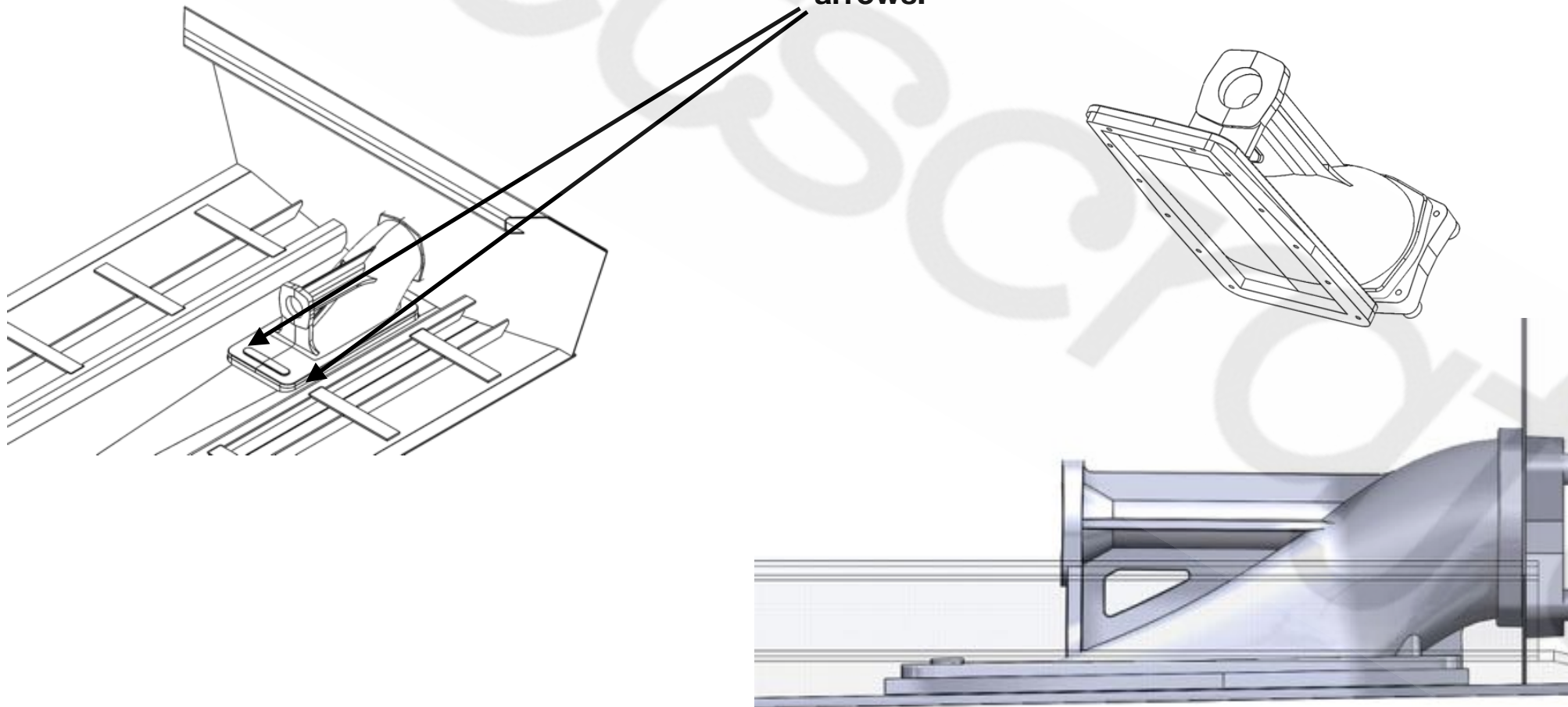


4 x M8 bolts recommended for grill mounting

ASPCNC intake install into hull

1. Centre the intake in the hull and slide back so the back face of the intake is against the inside face of the transom.
2. Mark and cut the hole for the grill to protrude through the delta plate.
3. Bolt the intake and spacer block to the hull plate (no welding). Bolts go Right through the hull, spacer block and intake foot. Bolts are counter sunk into the delta plate to be flush with the hull bottom.
4. With the intake bottom bolted in place mark and cut the hole (inside bore of the intake/adaptor) and bolt holes in the transom.
5. Sandwich the transom between the intake & adaptor and bolt the adaptor on.
6. Use a grinder or rotary tool to smooth the transition from intake bore to pump adapter if necessary. You don't want any sharp edges in front of the pump to mess up water flow.
7. Do the install without sealant until you are happy. Reinstall with sealant once you are sure it won't need to come out,

If you have a 3m or 3.3m hull you will need to grind an angle into the bottom of the intake spacer block so it sits flat on the delta. This angle should be parallel with the angled faces of the hull it touches. The intake spacer block hits the angled bit of hull at the front as shown by the arrows.



Add the Sides

1. Tack the side on from the transom to the front (see the example video on the WattsCraft NZ youtube)
2. Tack up the vertical seam between transom and side panels
3. Repeat with the other side
4. Check the hull is still sitting flat on it's supports and it hasn't become twisted
5. Dont tack the inside of the mitre joint between transom and side panel. Wait until the foredeck is tacked on and then check this joint is square before tacking it. You may need to grind a little material from inside the join if it is touching but not coming together to 90degrees.

Do not trim the panels more than
few mm otherwise
the rest of the topsides wont fit

Dont tack the inside of this mitre
joint yet

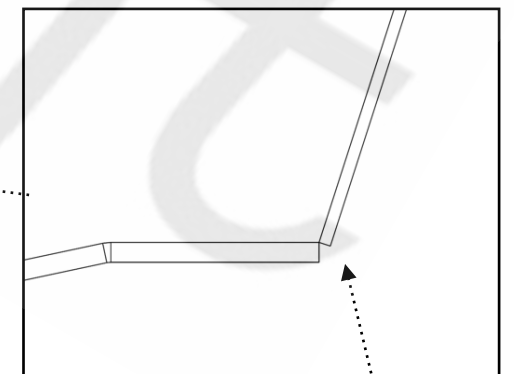
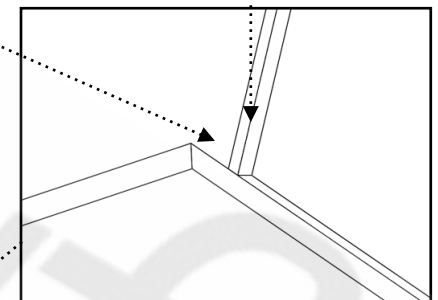
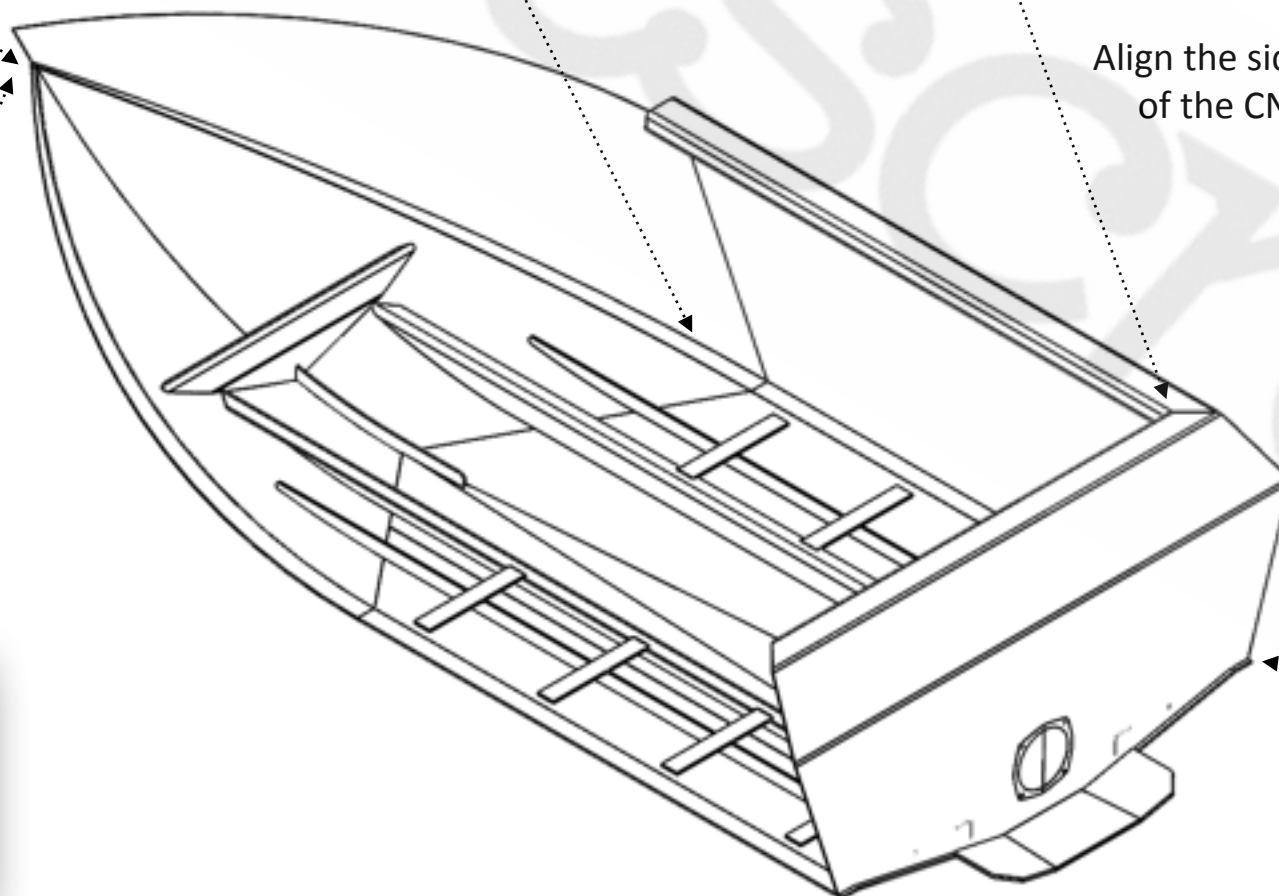
Tack every ~100mm

Align the inner edges of the side & transom

Align the side panel with the centre
of the CNC marked line exactly



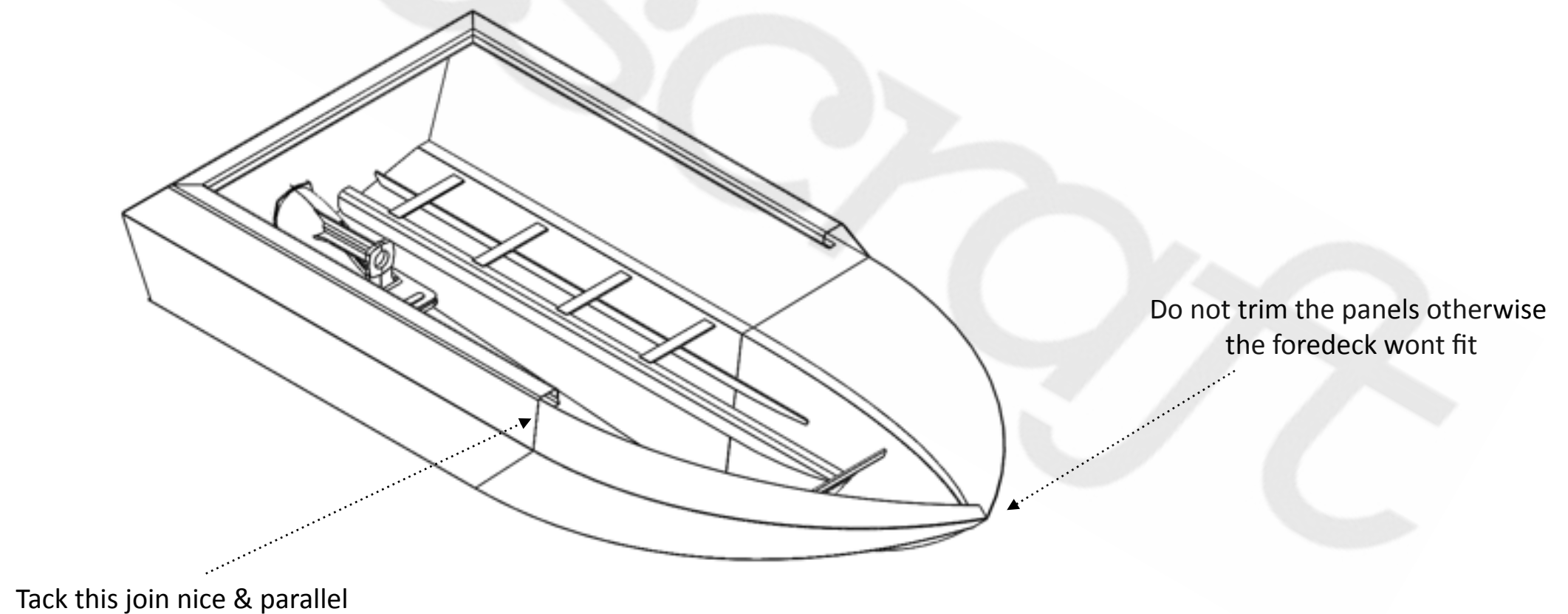
C-clamps are useful to pull up & hold the panel towards the front end



Align the inner edges of the side & hull panel

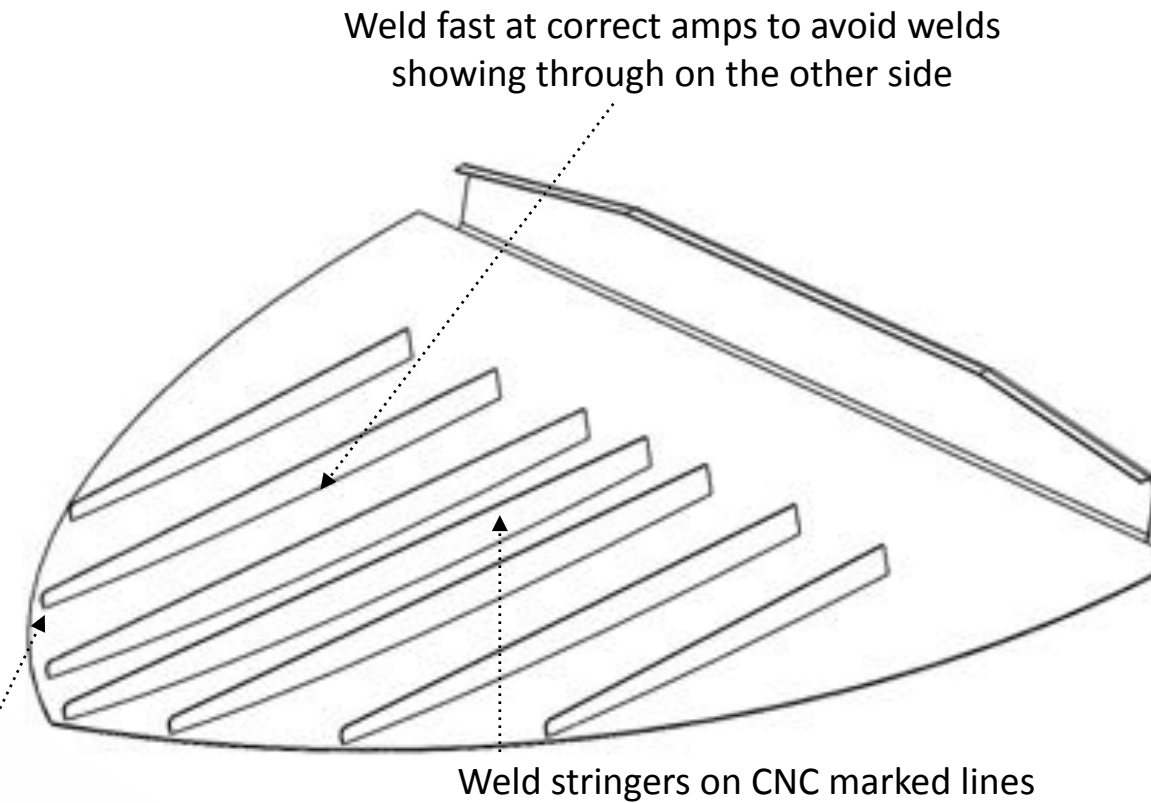
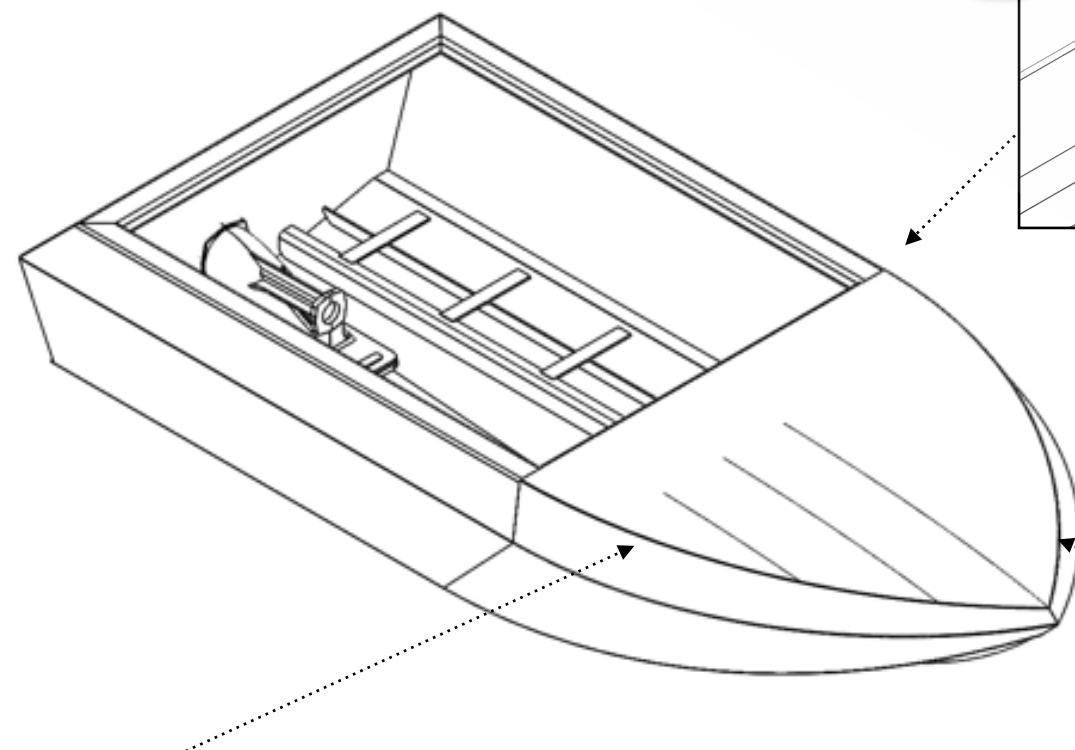
Add the topsides

1. Clamp the butt-join together with small pieces of aluminium on the back to hold the panels parallel while tacking (see the example video on the WattsCraft NZ youtube)
2. Tack the butt-join with three good tacks on either side
3. Pull the topside panel up and in to align the edges at the beginning of the join, do the first tack 50-100mm along the join
4. After the first tack it should be much easier, tack every ~100mm on the outside of the hull.
5. Check the hull is still sitting flat on it's supports and it hasn't become twisted



Add the foredeck

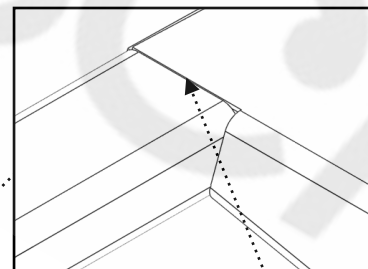
1. Place the windscreen upside down on a surface that won't scratch it or melt/burn during welding
2. Weld the foredeck stringers on (5-7 ~20mm stitch welds on both sides)
3. Add steering column, handrail or any other parts that will be a pain to do with the windscreen installed in the boat
4. Slide the foredeck in between gunnels as shown below
5. The inner edge of the foredeck & topsides should coincide
6. Check the mitre joint between transom and sides for square at this point. Tack this joint and the foredeck to gunwale joint in such a way that they hold the top of the hull square. Don't force a twist into the hull by pulling the top into square. It shouldn't require much force.
7. Check the hull is still sitting flat on its supports and look across the top surface to check for twist (look from the back and from the side of boat)
8. Tack from back to front every ~100mm along the outside seam of the foredeck
9. Weld & finish the join shown flush before adding the windscreen blocks access



Weld fast at correct amps to avoid welds showing through on the other side

Weld stringers on CNC marked lines

Leave ~25mm gap between edge of panel & end of stringer
(not up to edge as shown)



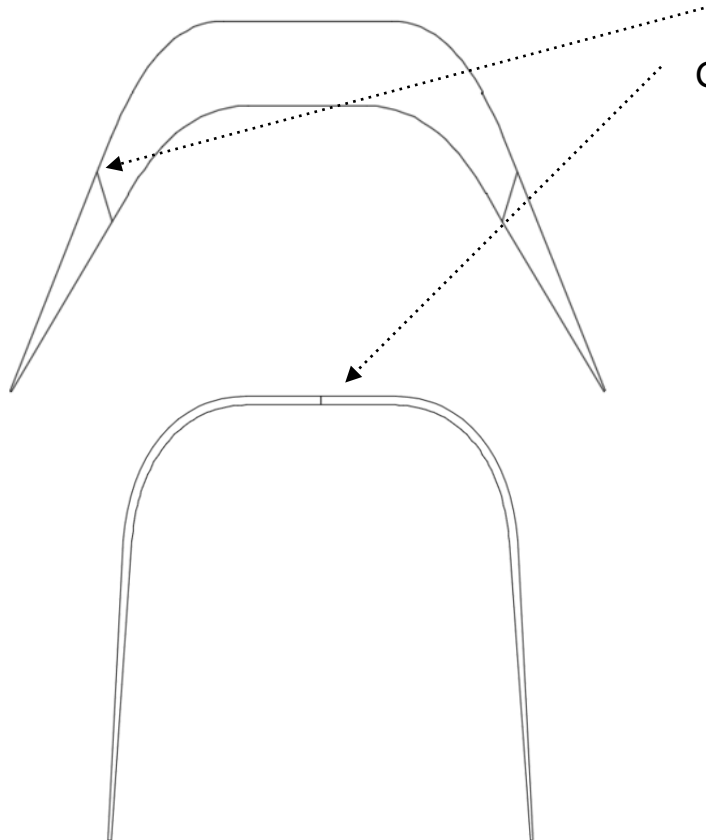
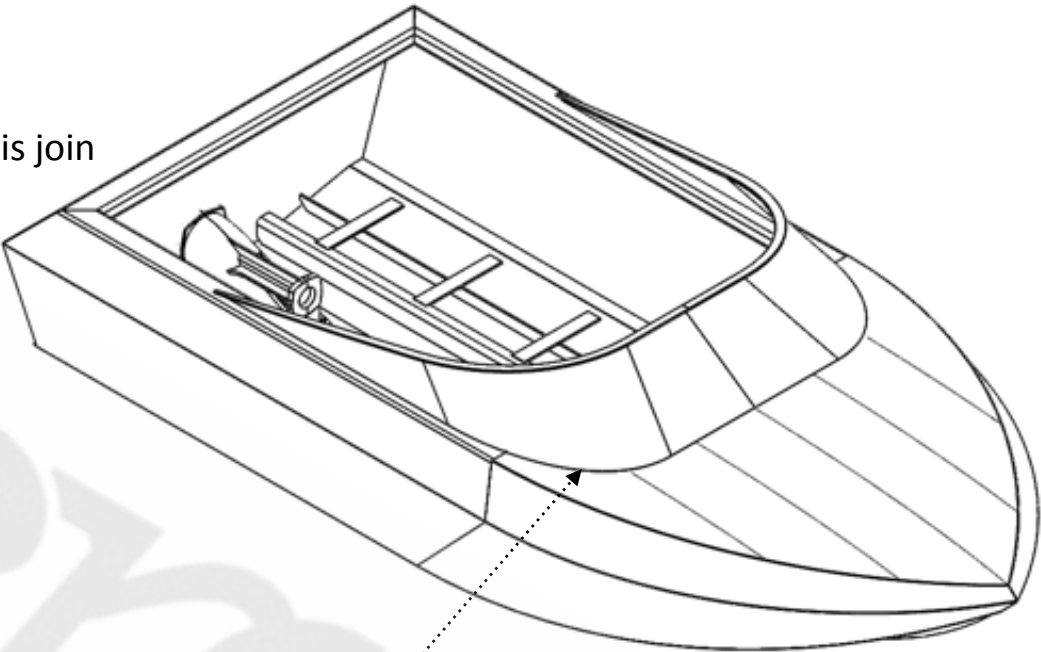
Weld & grind this join before the windscreen gets in the way

Use a prybar/screwdriver to align edges as you go, this may require reasonable force.

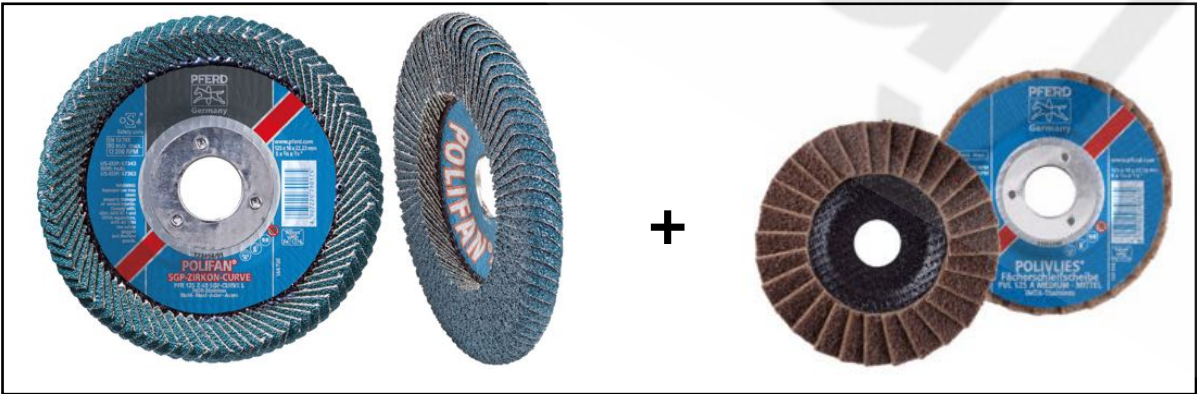
Tack each side evenly as you work forward to avoid forcing the foredeck to one side too much

Add the windscreen

1. Weld the windscreen capping piece together
2. Weld the windscreen pieces together
3. Align windscreen capping lower edge to windscreen outer edge
4. Make sure both centre marks align & tack at the centre
5. Tack screen every ~50mm working around both sides evenly
6. Transfer centreline mark to front of windscreen
7. Place screen in position with front centre point of screen on top of 6mm hole in foredeck
8. Tack screen to foredeck in the centre
9. Align the windscreen visually so its not twisted to one side. Carefully tack 100mm out from the centre tack on either side to hold the screen aligned.
10. Tack screen every ~50mm working around both sides evenly
11. MIG weld the screen to the hull. Try fill the gap evenly to minimise grinding. Using a TIG for this join will be more likely to warp the foredeck due to the higher heat input.
12. TIG or MIG weld the screen to capping join
13. Grind screen to hull join with a coarse curved flap disc
14. Grind capping join with coarse flap disc
15. Finish both joins with a coarse blending disc



Clamp to a flat backing plate to keep plates parallel at butt-joint.
Grind & finish join before installing on boat for best access.



Complete the remaining welding in this order

1. Check the hull is square & not twisted
2. Weld the outside joints that are accessible when the hull is upright:
 1. Foredeck to the topsides (outside corner joint)
 2. Windscreen to foredeck (outside fillet)
 3. Windscreen capping (outside corner joint)
 4. Transom to side panels (outside corner joint)
 5. Transom to bottom panels (outside fillet)
3. Tip the boat onto one side (optional)
 1. Weld the topside to side panel join closest to the roof (outside corner joint)
4. Tip the boat right over
 1. Weld the join between the sides and the hull plates (outside corner joint)
 2. Weld up the centre bow join (outside corner joint)
 3. Back-gouge the butt-joints between the keel plate & hull outers (be careful!)
 4. Weld the joints between the keel plate & hull outers (butt weld)
 5. Do all the grinding on the bottom so you don't have to flip it over agin (see next page)
5. Tip the boat onto the other side (optional)
 1. Weld the topside to side panel join closest to the roof (outside corner joint)
6. Weld the engine bearers to the keel plate (~150mm stitch welds every ~150mm on both sides) (fillet)
7. Weld the outer stringers to the outer hull panels (~150mm stitch welds every ~150mm on both sides) (fillet)
8. Weld the cross members floor support outer ends to the hull outers (fillet)
9. Weld the bottom of the transom inside (inside fillet)
10. Weld the centre bow stringer (fillet)
11. Weld the footrest (fillet)
12. Weld the seam between the keel plate & hull outers (fillet)
13. Weld the foredeck to the topsides (inside fillet)
14. Weld the sides to the topsides (inside fillet)
15. Weld any remaining joins

In general weld symmetrically from back to front to balance weld stress across the hull

We recommend the Helvi machines as affordable single phase machines



MIG

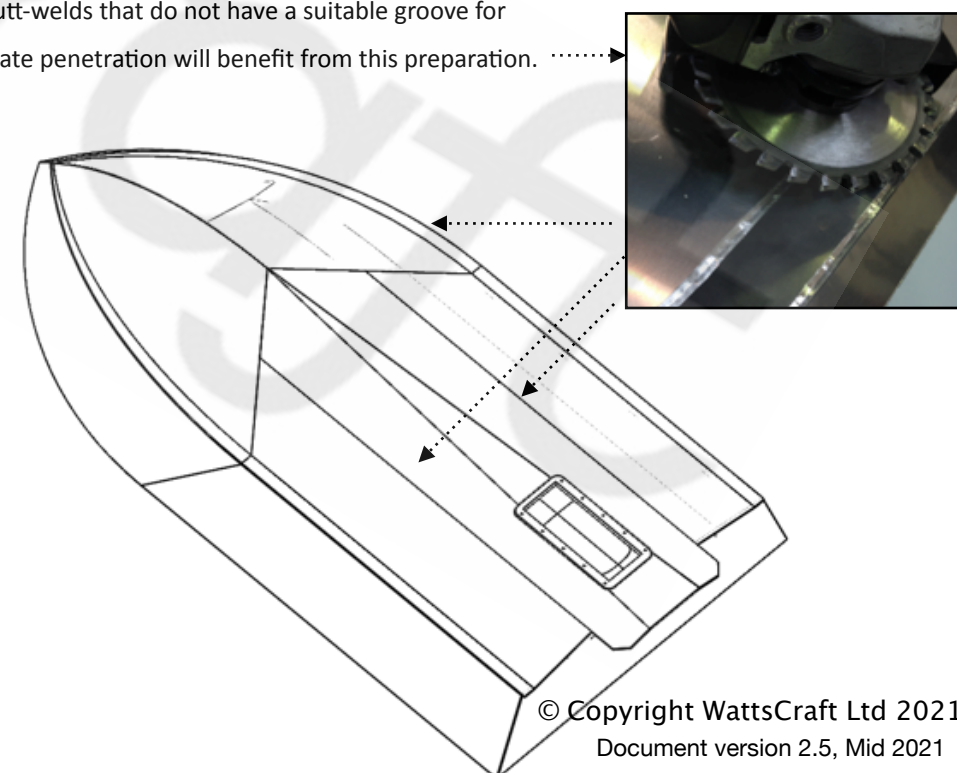


TIG



5056 grade filler for 5052/83/86 grade aluminium

Any butt-welds that do not have a suitable groove for adequate penetration will benefit from this preparation.



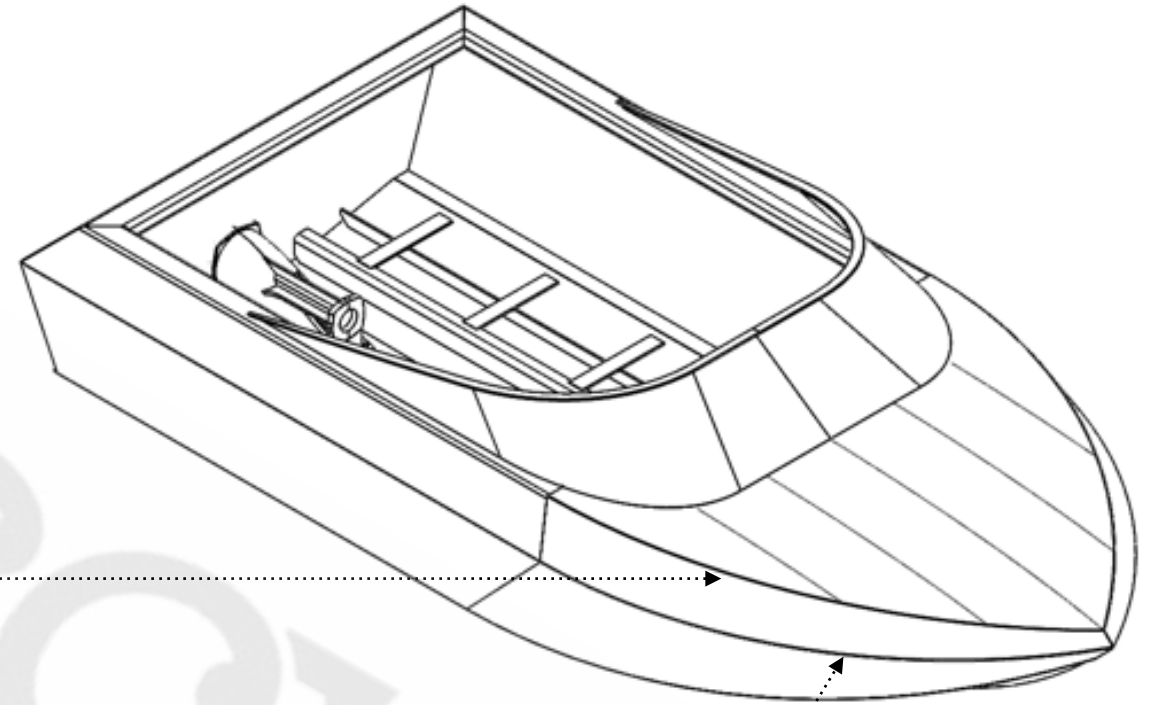
Grind hull

Grind with the join not across it for best results

If using wax to grind back you will contaminate the aluminium a bit so do this when all of your welding in the area is done



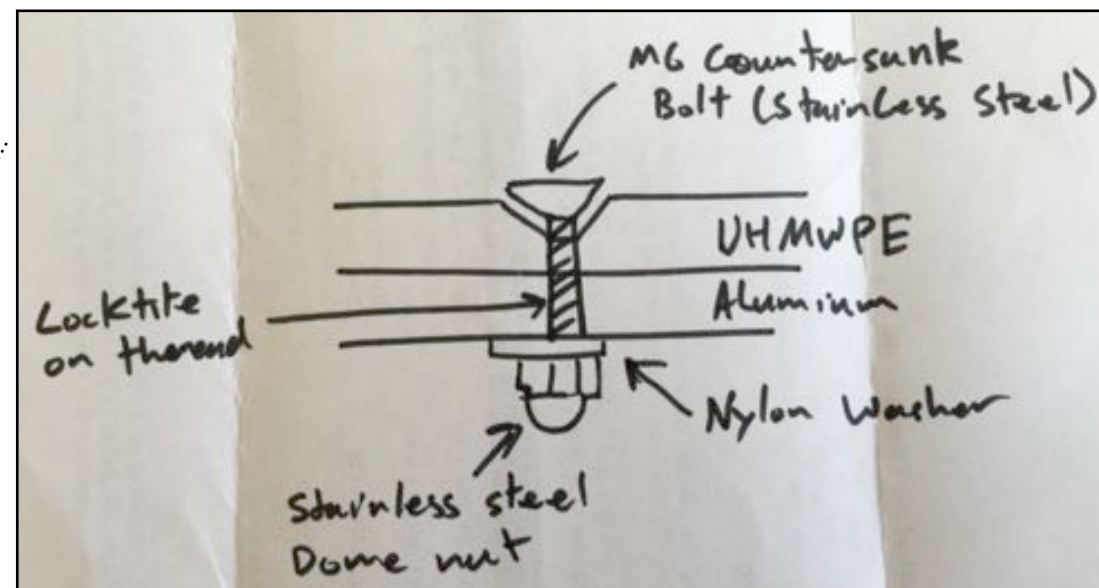
Use a short hand held straight edge with the blending disc to get tidy edges



UHMWPE Plastic

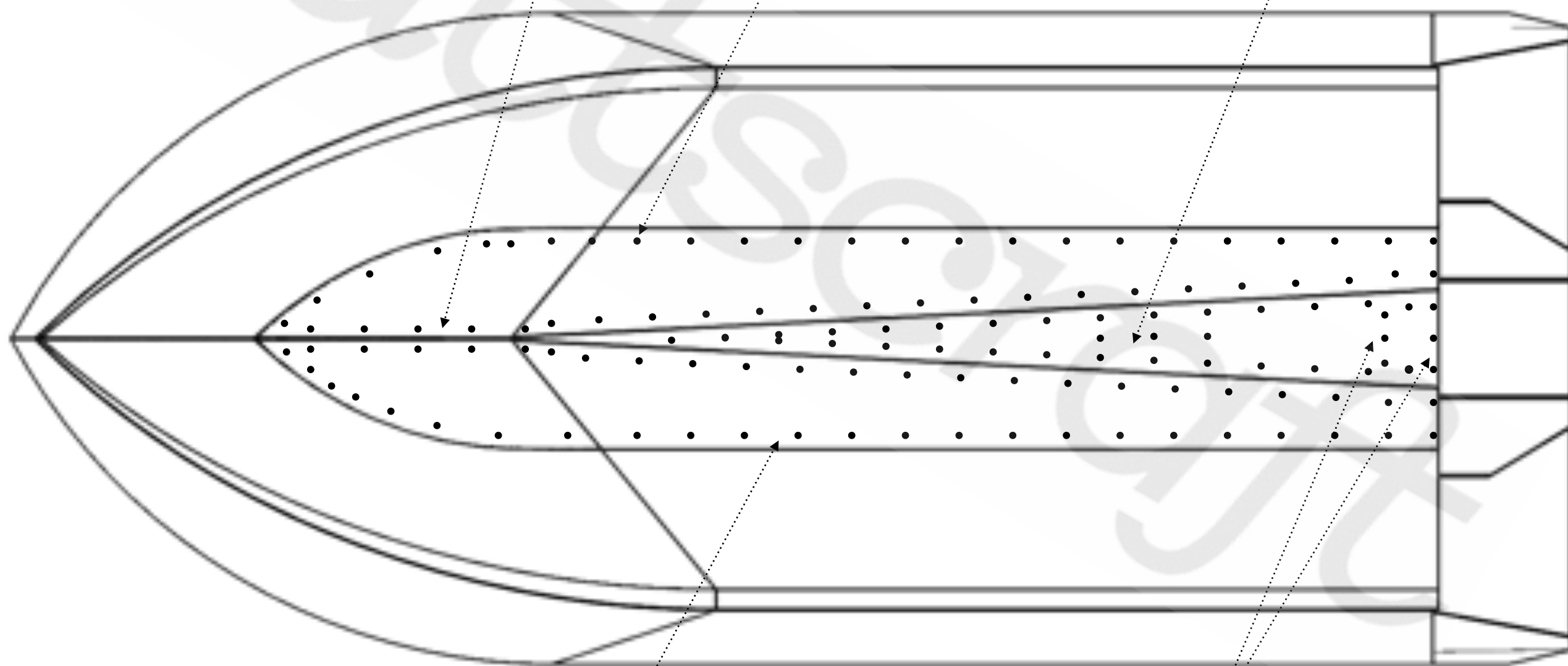
Plastic shrinks and expands with heat. Install the plastic warm so it shrinks on. Direct sun or heating the whole hull with a diesel heater works well.

Work symmetrically from back to front with bolts to “spread” the plastic on



75mm centres, make sure nuts will clear centre stringer

150mm centres, make sure nuts will clear centre stringer

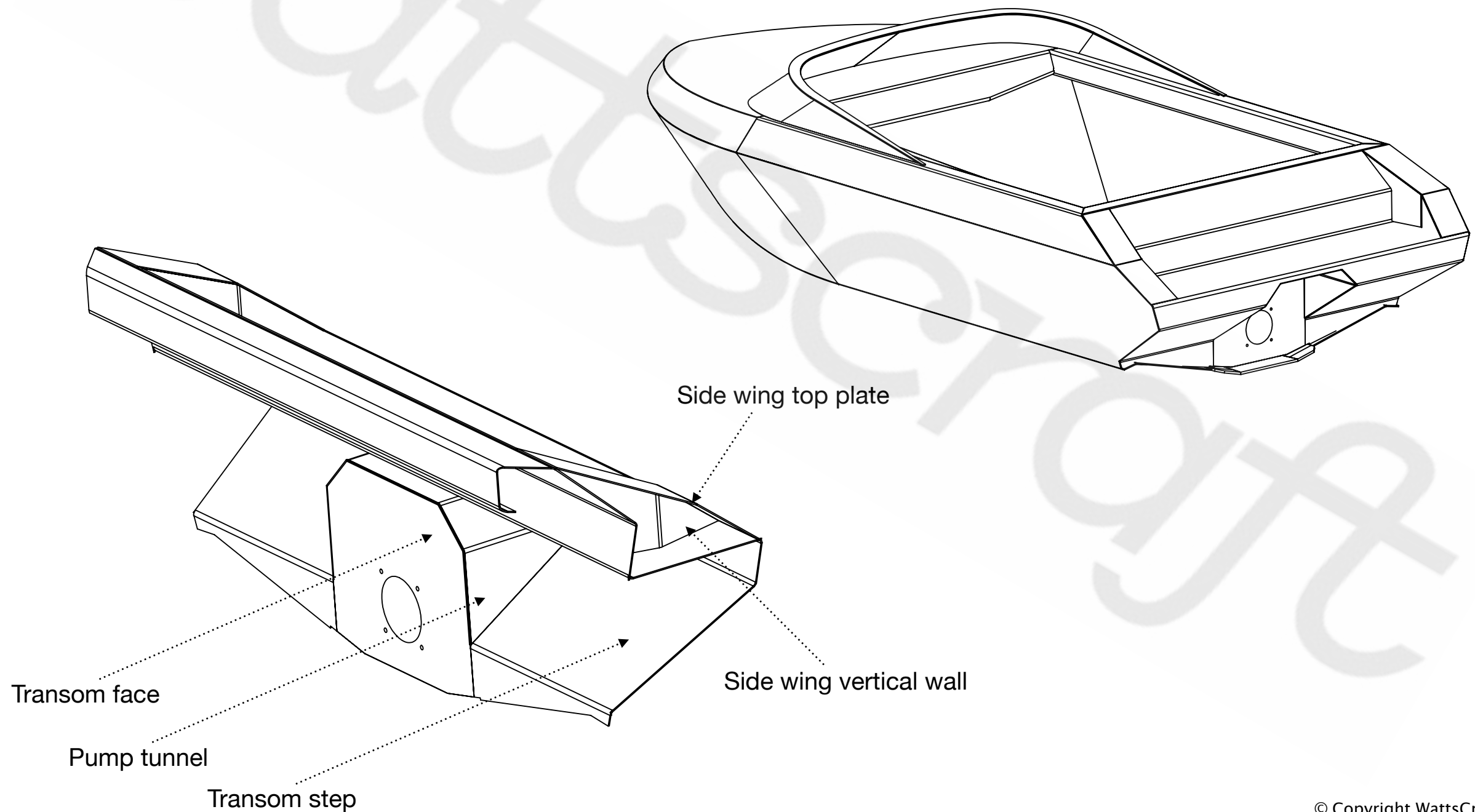


100mm centres, make sure nuts will clear engine bearer

50mm centres around intake, make sure nuts will clear intake and transom

Rear step transom

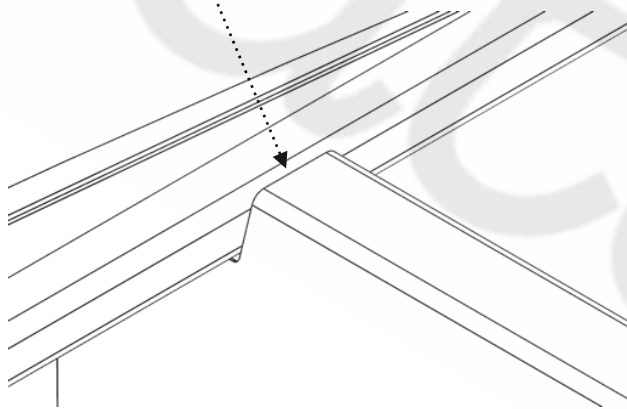
1. Tack the pump tunnel to the Transom step (use bottom edge to locate/align the transom face)
2. Tack the pump tunnel to tunnel and step pieces (transom face and tunnel are an outside corner joint)
3. Tack this transom step assembly to the hull bottom (see transom install page)
4. Tack sides to transom as an outside corner joint up to the top of the step (as per the side install page)
5. Tack the side wing parts on to complete the transom
6. Wait till the whole hull is tacked up to weld out the rear step



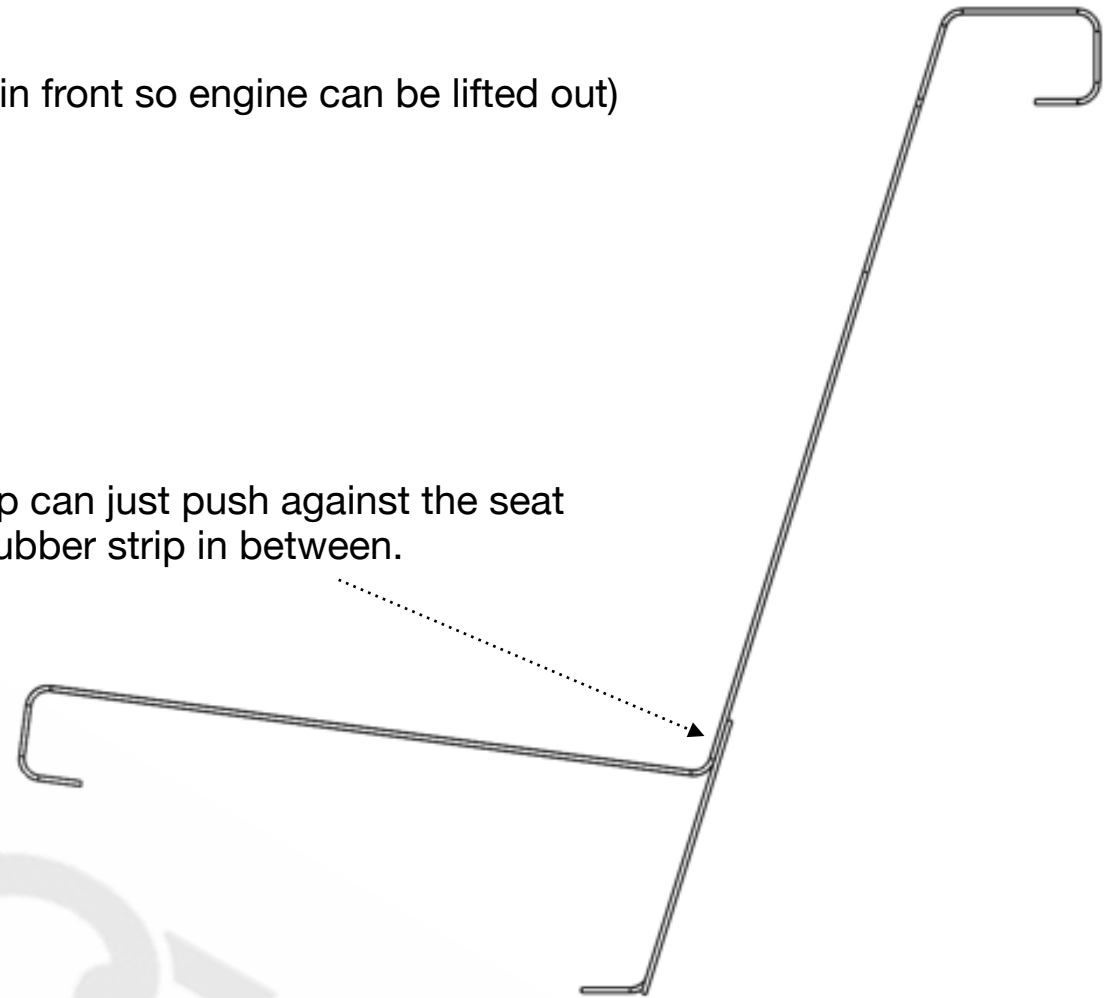
Add the optional bench seat

1. Wait until the motor etc is installed to weld/bolt in seat
2. Slide seat in between sides back to the front of the engine (Leave enough gap in front so engine can be lifted out)

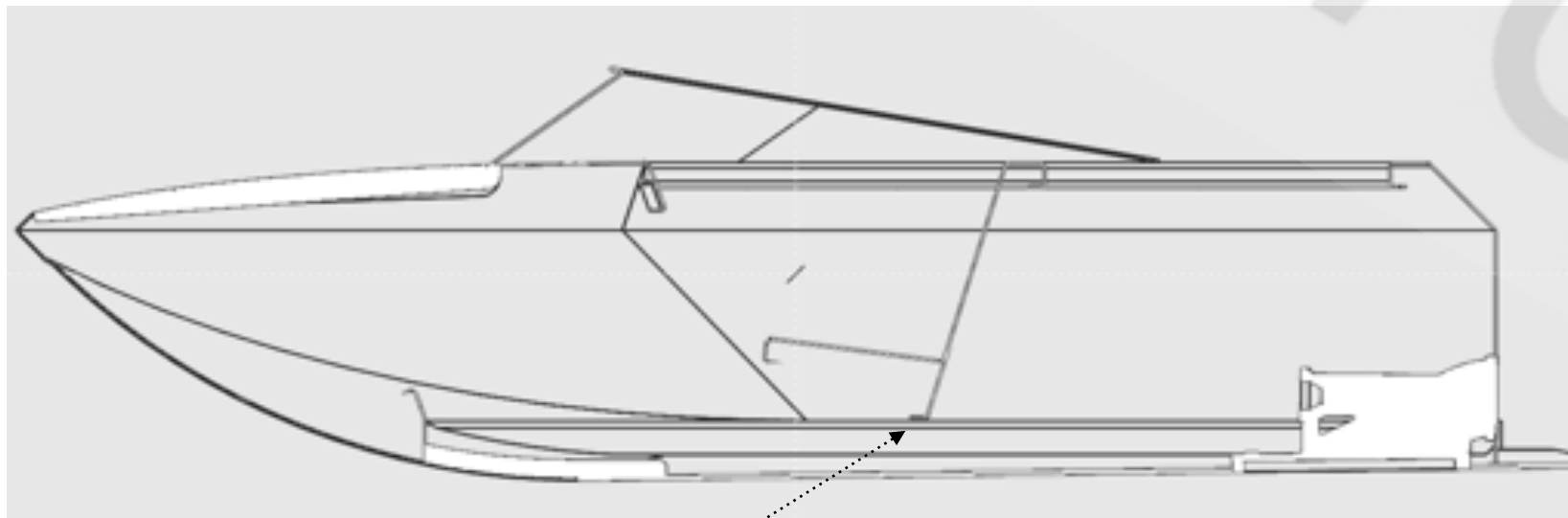
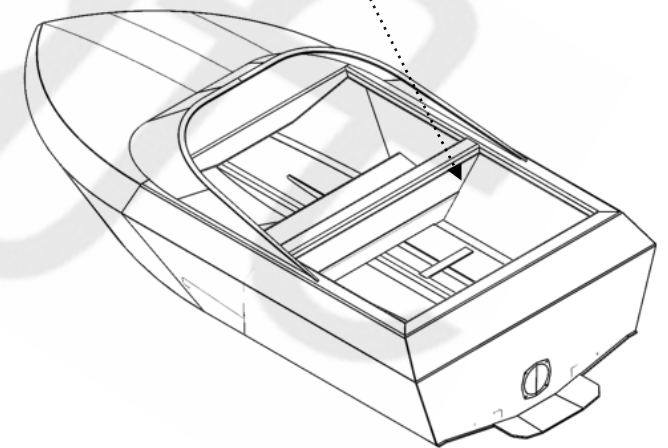
Fully weld around this join (TIG looks good)



The top can just push against the seat with rubber strip in between.



Roughly 4 small stitch welds for the vertical & horizontal join to the side
(MIG good to limit warping)



Bolt under seat bulkhead to the floor.

Complete & install the finger throttle assembly

1. Bolt the assembly between the steering column & the steering wheel
2. Test fit the finger trigger
 1. Workout the position & angle of the finger lever
 2. Carefully work-out & mark where to drill the 6mm grubscrew locating hole in the shaft (the hole is already drilled in the cable lever end, copy this one)
 3. Work out how much excess length to cut off the 8mm shaft
 4. Remove the shaft from the assembly
3. Drill the grubscrew locating hole in the shaft in the correct position for your steering wheel. (use a vee block & a drill press ideally)
4. Cut the excess 8mm shaft off & tidy cut end
5. Reassemble the shaft & tighten the grub screws into their locating holes
6. Use the supplied bolt-on 6mm barrel nipple to install your throttle cable into the cable lever

