

An All Plastic Add-on Skeg for a Sevylor Inflatable Kayak, Version 1.0

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My previous prototype has an aluminum frame with a plastic plate for the skeg.



A wooden plate wedges between the gunnels to secure the frame.

This prototype taught me enough that I was ready to move on to an all-plastic frame and skeg.



The new design has a few advantages over the prototype:

- The frame can be made with common hand tools and readily available parts.
- The assembly is sealed so it won't take on water and does float.
- There are no sharp edges that could damage the kayak.

As with the prototype, this design has the advantage of not modifying the kayak so there is no lasting harm if it doesn't work out for you. And of course, the plastic skeg does work as well the aluminum version to resist weathercocking, reduce bow side to side motion during paddling, and reduce rotation when I stop paddling.

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Needed Tools

- A means of cutting ½ inch PVC pipe. A pipe cutter² gives the cleanest cuts although a hacksaw will work if you clean up the cut with a file.
- A belt sander or hand file. It is used to form flats on the side of two PVC pipe fittings.

Needed Materials



- 6 feet of ½ inch schedule 40 PVC pipe
- (6) ½ inch right angle couplers
- (2) ½ inch T couplers
- PVC primer³
- PVC cement
- A piece of PVC flat stock about 0.1 inches by 7 inches by 10 inches. If you can't find PVC, any flexible plastic will work but you will also need a small amount of epoxy.
- Optional: spray paint designed to adhere to PVC⁴.



The Build

1. Cut a piece of pipe about 5 inches long. It can be off by plus or minus 1/8 inch. This will be your reference length.
2. Align the end of the reference length with the end of the remaining pipe. Use a sharp pencil to mark off where to cut to get your second 5-inch piece of pipe. Make the cut. Verify the two pieces are the same length. Repeat until you have (6) pieces of pipe.
3. Cut a piece of pipe about 16 inches long plus or minus 1/8 inch. Use it to mark off and then cut the second piece of pipe.

² Search for “PVC ratcheting pipe cutter”.

³ The clear variety of cleaner and cement will look best.

⁴ I like Krylon Fusion spray paint.

4. Cut a piece of pipe about 8 inches long.
5. Round all four corners of the plate. Round all edges.
6. Clean and cement a piece of 5-inch long pipe to two right-angle couplers. After pushing the parts together, push it down on a flat surface to ensure that the couplers are on the same plane.



7. If you have a belt sander, gently place the assembly down on the moving belt and abrade off flats on the flanks of the couplers. The goal is to have two "L" shaped flats about 1/4 inch wide.



This machining can be performed with a hand file. Just keep a close eye on the flats to be sure they are of uniform width. A straight edge will verify they are on the same plane.



8. Place the assembly on the plate, flat side down. The top of each coupler is aligned with the top edge of the plate. The left side of the left coupler is aligned with the left edge of the plate. Use the pencil to trace around each coupler on to the plate.

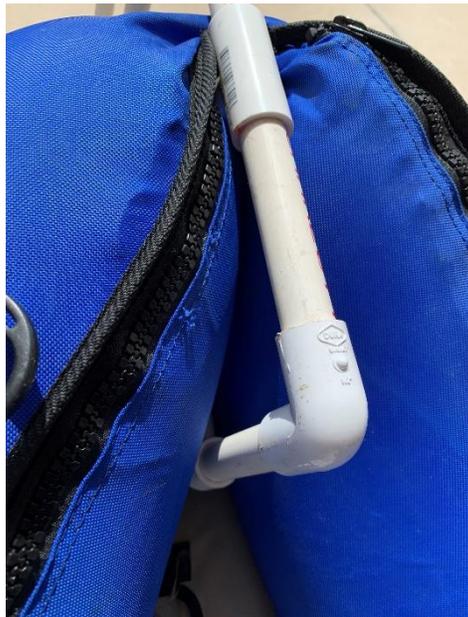
9. Remove the assembly. Apply cleaner and cement to the flats plus to the area defined by the pencil lines.

10. Push the assembly down on the plate, quickly make any final adjustments to the position, and then push down as hard as you can for 30 seconds.



11. Complete the assembly process being careful to keep all pipes and couplers on the same plane.
12. Give the PVC cement about 1 hour to fully set before stressing the joints.
13. Optionally, spray paint the frame and skeg.

User's Guide



After fully inflating the kayak, slide the square part of the frame between the gunnels at the stern. Run a tether from this square part to a D ring on the gunnel. We don't want to lose the skeg *when* the kayak capsizes.



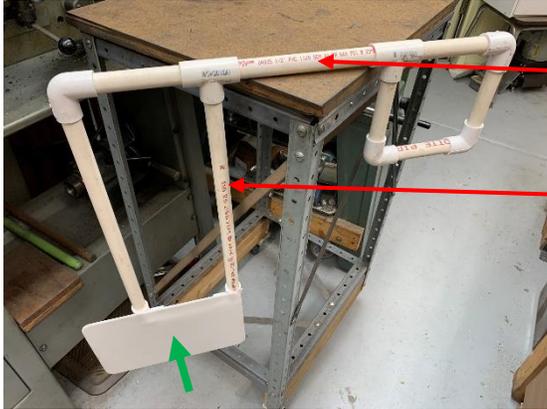
In shallow water, rotate the frame up.



Deploy by rotating the frame down.



Because there is so little surface exposed to the flow of water when the kayak is moving forward, there is little force trying to rotate the frame upward.



The weakest part of the frame is the horizontal pipe running between the small square and the large rectangle. A side force applied to the skeg (green arrow) acts through those long pipes that define the large rectangle so there is a large mechanical advantage here that will twist that horizontal pipe. So how bad is it?



I pushed on the right face of the skeg and could see that the small square part of the frame twisted between the gunnels. Therefore, the entire frame rotates due to a side force rather than just the horizontal member. The aluminum frame behaves the same way. Therefore, there is no need to stiffen that horizontal member.

You may wonder why I have no pictures of this new skeg on the water. We are all sheltering-in-place to avoid getting COVID-19. May you be reading this article during happier times.

Acknowledgments

Thanks to Les Garlinghouse for suggesting that I use pipe because it is best for resisting a twisting force. The other benefits were just gravy.

I welcome your comments and questions.

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