New Spray Rails for the Ol' "Marty B"

By Steve Mestler

It was at the 2008 Seaplane fly-in at Greenville, Maine that it came to my attention just how badly my propeller was being eaten alive with water spray. I had always suspected trouble but up to that point I thought that all seaplane/amphibian owners "repaired" their propellers as frequently as I did. "Not so Hartzell shavings breath!" Spray rails, I mean the *right* spray rails, can make all the difference in the world when it comes to minimizing propeller erosion. The Seabee was originally delivered with NO spray rails at all. The panel seams between the vertical fuselage sheets and the hull panels offered a very rudimentary "chine" that offered no protection from water damage to the propeller and served only to "break the suction" as chines are want to do. A small pedestrian step was installed on each side of the Seabee to aid entry and exit into the cabin and that was it. Little if any thought was given to water damage or water handling characteristics back in 1947 as Republic was probably too busy just trying to get the design out the door!

The Ol' "Marty B" before spray rail change

There are currently many spray rail designs out there and most will work splendidly but because of the recommendations made to me by current Seabee owners and the proximity to my home, I chose the Henry Ruzakowski design (STOL Amphibians, Inc.). Henry was only an hour away and the modifications could be done in a reasonable amount of time. Because the airframe is modified, a new 337 form and field approval will be necessary in order to return your Seabee to regular service. The weight and balance numbers in the FAA Approved Flight Manual must also reflect the change in weight and CG location which should be taken care of by you're A&P mechanic. The change on my Seabee added about 10 pounds and a more forward CG and believe me they are worth every ounce!

Before leaving the Ol' "Marty B" at Henry Ruzakowski's place in North Carolina, we decided to take some before-and-after videos of the water pattern as the Seabee got on the step with both the old and new spray rails. The ***before*** videos made it perfectly clear the reason I was here. This was the first time I was able to see first hand what the water spray pattern was really doing behind me. There was water spray everywhere for the first 5-10 seconds. Obviously this is the time the engine is developing full power; 270 horsepower in my case and is the point that most, if not all, the water damage occurs to the propeller.

The ***after*** videos, taken about two weeks later, were a totally different story. They showed the water being guided away from the hull and propeller arc and never even got close to the propeller! The design allowed the water to be thrown outboard before it even got close to the trailing edge of the spray rail. By the time the water got to the trailing edge of the spray rail the Seabee was on the step and the propeller was miles away from the water. What a relief! After viewing this I think my propeller erosion problems are a thing of the past. Unless confronted with the most extreme of circumstances, for example a larger than normal wave action or a "slightly" heavier than normal takeoff weight, I think the propeller is finally safe. I won't be fixing the prop after every day of water flying like I used to.

After removing the old spray rails and cleaning the chines with Scotch Bright pads and MEK.

Trial fitting new spray rails. Notice bolts on aft-most point and in the center. Forward edge is not "trimmed" or bolted yet.

A few added benefits of this design are that they are wider, longer and stronger than any of the original spray rail designs. They extend well past the front door opening allowing for the "copilot" to step out through the front door onto the spray rail while on the water and grab a dock or mooring or anything else worth holding on to; a much easier process than before. It also allows you to clean the windshields in your hangar without the use of a ladder or step stool. The wider design allows for a safer step for your passengers and is truly a solid footing. I weigh over two hundred pounds and they can take my jumping up and down with no problem at all. Henry's performance claims, as noted below, may have some merit after all as I have noticed the Seabee gets up on the step a little quicker than before and after landing on water, the Seabee settles into displacement with a little more stability. The "Ol' Marty B" used to wobble to a stop not knowing which wing float to submerge first. Now it just settles straight ahead with no tendency to drift one way or the other while settling.

After the installation Henry said, "These new spray rails decrease your airspeed by a couple of knots (I have not noticed this), increases lift by four percent and increase stability by twenty two percent."

I said, "Really?"

He then said with a grin, "Well, that's my story and I'm stickin' to it!" Regardless of the airspeed decrease and performance enhancements claimed, these spray rails have convinced me that I should have done this a long time ago. If you are finding yourself making propeller dust in your hangar or at the shoreline, consider finding someone to change your spray rails to a more modern design. The propeller you save may be your own.

Installation Process

Below is the sequence of events that the 'Marty B' endured for the radical but necessary change. As with any change of this magnitude it is highly recommended that you get an A&P mechanic that is very familiar with the Republic Seabee before attempting this!

First step? Drill baby drill!

Your old spray rails are no doubt riveted to the airframe and the old rivets must be drilled out so the old spray rails can be removed. This is a tedious process and must be done carefully to keep the existing holes intact. Oversize holes are definitely going to happen but one must try to minimize this as the new rivet hole spacing may be affected. I noticed the original rivet

More trimming and grinding to final fit. Notice more bolts along the edge and clamp on forward edge to hold in proper alignment.

Right side is same as the left. With final fit all rivet holes can be drilled with numerous bolts installed on each side.

pattern was totally irregular and appeared that they had been hand drilled in 1947! In any event, be careful and don't drill a hole any bigger than it has to be. There will most likely be rivets forward of the existing spray rails that will need to be drilled out but don't drill out more rivets than you really have to.

Clean Up

After the holes are drilled, care must be taken to remove the old spray rails as some bending of aluminum may take place. If a sealer was used in the previous installation a solvent can be used to soften the old sealer. Once the old spray rails are off, clean the surfaces that the new spray rails are going to come in contact with. This can be done with a solvent and a small circular grinder with a circular Scotch Bright® pad. This makes quick work out of a potentially lengthy job.

Fit and Re-Fit and Re-Fit

The spray rails you decide on will most likely be cut to a rough size and shape that will need to be trimmed to fit your Seabee. As you all know there are no two Seabees that are exactly the same so many trial fits are in order and much trimming and grinding will be necessary to get them exactly right. Bolting the new spray rails from the rear and working forward worked for Henry. A bolt every five feet or so should hold it in place as you mark the "trim" locations with a Sharpie®. This fit and re-fit will most likely occur numerous times. As the trimming commences, new boltholes should be drilled at closer intervals to keep the rail in the proper place as the final fittings take place. A series of clamps and bolts was used to hold the assembly while the drilling took place.

Drill New Holes

Once the fit is right for your Seabee, bolt the spray rails on using bolts every four or five rivet holes. This will allow the new rivet holes to be drilled at the most accurate locations. The remaining holes can then be drilled with the confidence of knowing that they are in the perfect position.

Grind. Fit. Grind. Fit, etc. Henry "fitting" the spray rail. Numerous fittings are necessary.

Primer – Sealer - Rivet

When all holes are drilled, remove the spray rails and break all sharp edges and prime them with an adequate primer. We used epoxy primer and let them dry thoroughly before we handled them. The spray rails will also need a sealer between the "chine" and the new spray rails. We used a two part waterproof sealer that is used in fuel tanks. The stuff is very messy and must be removed while still malleable or it will be

After the final fit, all rivet holes can be drilled into new spray rails.

nearly impossible to remove later. MEK (Methyl Ethyl Ketone) works well to remove soft sealer. Mix only enough sealer for one side at a time and after applying the sealer along the edge of the chine where the new spray rail will touch, install the spray rail with the bolts four or five rivet holes apart as before. Tighten the bolts to "rivet" strength to pull down the rail to the airframe. Once the bolts are tight and alignment is correct, get your rivet gun out. Starting from the rear we worked our way forward to the front of the Seabee. This works best with three men; one guy bucked the rivets (Henry), one guy drove the rivets (My son Cris), and one guy placed the rivets into the holes as we went (guess who?). This worked so well that both sides were completed in less than a day. The messy sealer was removed and the rails were left to "set" overnight.

Paint final color

We didn't paint the spray rails as the weather really wasn't cooperating and I felt I could take care of that job later on without Henry's assistance. However, you can decide what color and technique to use to do it to match or compliment your Seabee. A cat walk paint or non-skid material is essential for the finished spray rail. Make sure you let the paint cure completely before putting any non-skid stuff on there. In most cases a couple of weeks dry time.

The next day was very interesting indeed. The new spray rails were on and a test flight was about to ensue. With Henry onboard and video camera fired up we took off into the wild gray yonder. Heading for the nearest lake I did notice a small difference in the "feel" of the Seabee. I'm not exactly sure what it is yet but I do know it is a good thing. I think it is more stable in flight. Reaching the lake we landed and came to a stop. That is when I noticed the real difference in the stopping characteristics of the Ol' "Marty B". Straight ahead- no wobble at all! A series of taxi tests were done and video shot at a few different angles to get the spray pattern on tape. I immediately noticed a more stable transition to the step than I had with the older spray rails. Ya think the propeller is more efficient with no water going through it? Duh! I have not had a chance to time my takeoffs yet but I would bet they are better than the 25-second average I used to get.

Final fit with bolts installed every other hole or so. Here's Henry checking weight-bearing capacity. Notice how far forward you can get on the spray rail.

If you never get your propeller wet you can forget you ever read this article. But if you even occasionally have to break out the file or get rid of some water nicks on your Seabee propeller, a new set of spray rails are cheaper than even one blade from Hartzell or any other airscrew manufacturer for that matter. This investment will be well worth your time and effort.

Steve Mestler
Seabee Heaven, LLC