

Designer Boats Australia

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Predator Boats Fuel Tank Cover Repair Scheme

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Introduction

This test procedure has been writtern for all Predator boat owners, who have an existing boat, that may have a leakage problem through the fuel tank floor cover, which the may have discovered or not even know about yet.

Rod and Arron where fantastic boat builders and tradesman and there workmanship was very good. I recently discovered the way they did fuel tank bay covers, could have been done differently, which would have resulted in a more reliable seal. I found this out as I have been contacted by a couple of owners who have experienced some problems with water in this compartment.

The Predator supplied fuel tank covers where usually a 3mm sheet of checker plate with a couple of transverse stiffeners welded to the under side. The cover was then sikaflexed and riveted to the edges of the fuel tank bay. This method relied on the riverts holding the loads being transmitted into the floor, with expantion/contraction and strikes on the floor, the rivets loosen and the sikaflex seal fails. The result is generally the fuel tank bay fills with water and sometimes even with traces of fuel smells in the boat due to small leaks from the pipe connections. The bays generally

didn't have drainage bungs or inspection hatches, so technically you could fill the tank bay completely with water and not even know about it. I had one case where the owner was getting water in the fuel, and couldn't understand how it was getting in. When he opened the floor cover he found that the tank was completely covered with water and the fuel sender had rusted out. Later when he removed the tank, he also discovered the tank was full of little holes, as the water had been there a long time.

“Please check your fuel tank bays now, especially if the fuel tank sender is not working



The theory on the Repair for this problem

Basically the idea is to remove loading the rivet and sikaflex joint up, by adding structure under the floor sheet to transfer the loads into the structure.

I had a person recommended that they fully weld the floor sheet in above the tank and add hatches. I would strongly advise not heading down this path as experience suggests that it is handy to have the availability to remove the tank if there is a problem, ie changing fuel hoses, senders or if a leak/split develops.



Equipment Required to do this Repair

Small length of filler hose (or hose with the same inside diameter)
Small length of breather hose (or hose with the same inside diameter)
Tape measure
Rivet gun capable of doing 5mm rivets.
Electric drill (5mm drill bit)
Hammer & center punch
Cold Chisel
Couple of clamps
Straight edge (900mm spirit level is really good)
Welder, Mig or TIG
Scraper
Sharp Knife
Large screw driver or a small jimmy bar
Couple of wooden wedges

Old Cover Removal

WARNING

- **The tank bay could be full of petrol fumes.**
- **Work to be carried out in a well vented area.**
- **Exercise extreme care, against fume ignition**
- **Remove any risk of heat sources and sparks.**

Step 1 – Using a hammer and cold chisel, remove the tops of the rivets

Step 2 – Using a hammer and punch, carefully drive the rivet through into the RHS cavity.

Note

I prefer to use the chisel to do this, as electric drills and petrol fumes can be dangerous

Step 3 – Drive the scraper under one corner of the fuel tank bay cover floor sheet and lift slightly.

Step 4 – Begin working it around the tank edge, while pushing the screw driver or jimmy bar in behind where you have been. You may find that you will need to use the knife to cut the seal as you go.

Note

If you have some wooden wedges, keep placing them behind you as you work around.

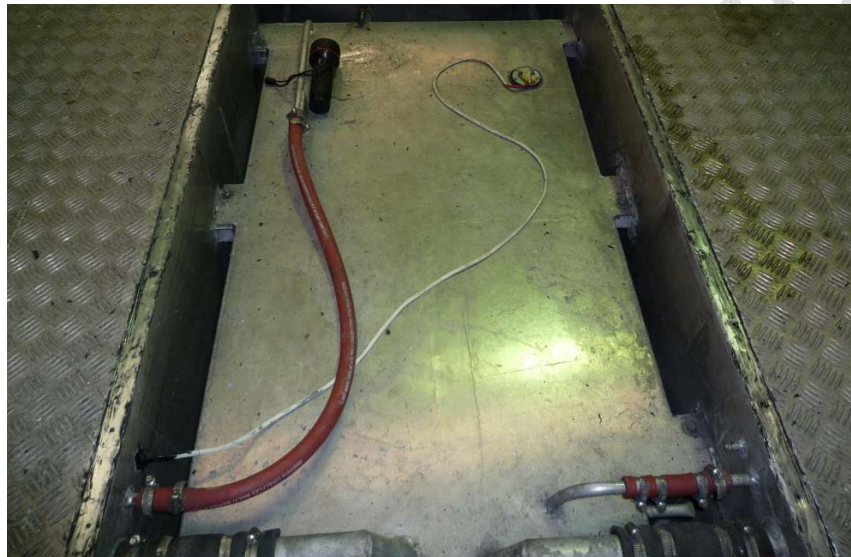
Step 5 – Work your way around the whole edge.

Step 6 – Lift and remove the cover.

Step 7 – Place the cover in a secure area outside the boat. If the cover is bent or buckled, I would recommend sending it for scrap.



Step 8 – Remove the fuel sender and drain the tank through the sender hole, using a siphone or fuel pump.



Step 9 – Remove the fuel lines or loosen them, as they might only come off as the tank is removed.

Step 10 - Remove all fastners holding the tank in position

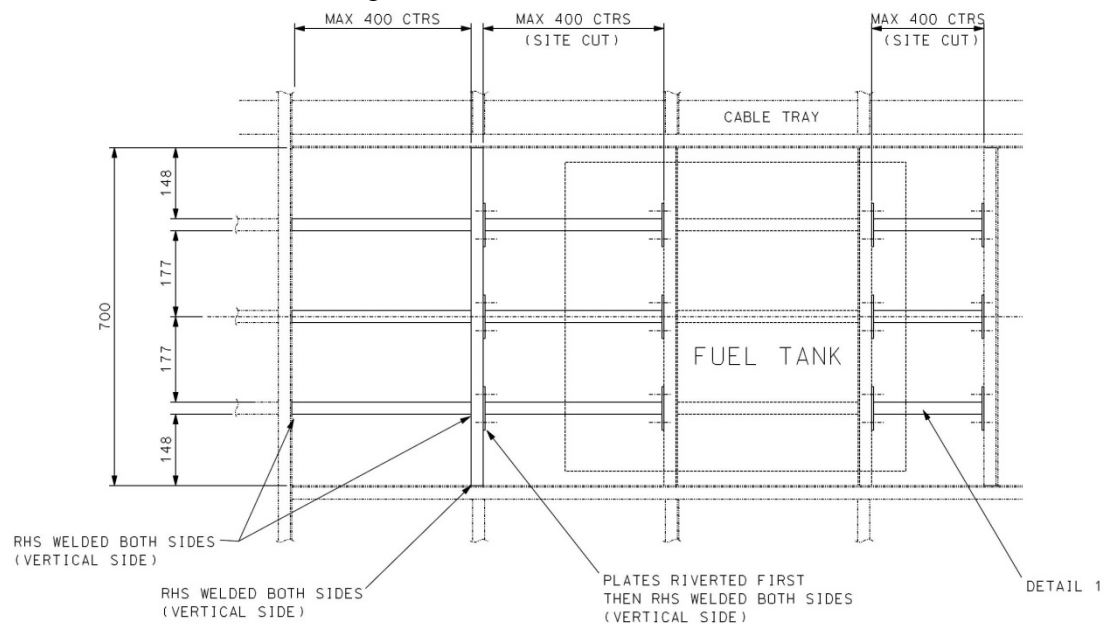
Step 11 – Lift the tank out onto the floor.

Step 12 – Give the tank bay a really good clean with detergent or steam cleaning

Step 13 – Check and make sure that fuel has not leaked into the hull. If it has clean it the best way you can

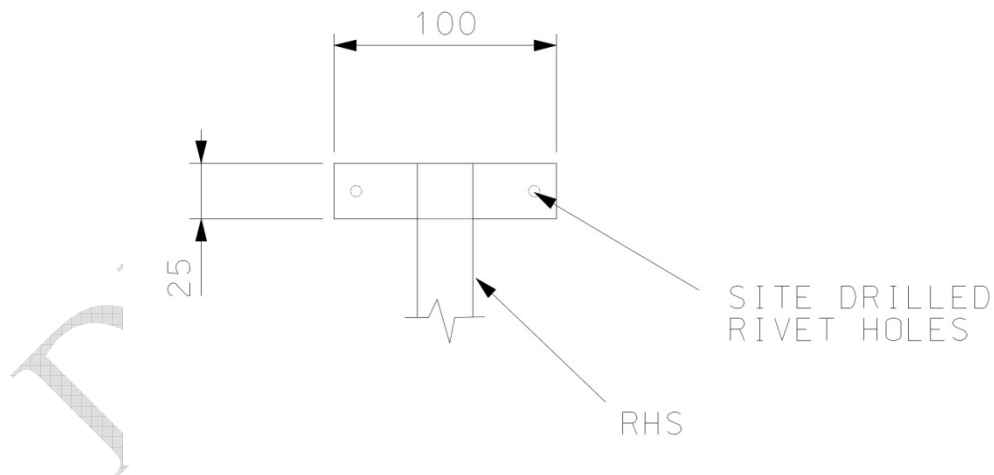
Adding the New Structure

Step 14 – Using the example drawing work out and mark the locations of the new transverse and longitudinal structure.



Step 15 – Cut the transverse members to length.

Step 16 – Cut the flat bars that are going to weld on under the transverse, ideally 100 x RHS Width x 5mm thk, preferably, but 3mm is sufficient.



Step 17 – Cut enough 100mm lengths of RHS to fit under each end of the transverse members

Step 18 – If the structure is going to be close to the top of the fuel tank, I suggest that you temporarily re-seal the fuel tank and place it back in the bay.

Note

This prevents you from building a structure that you cannot longer get the fuel tank back in.

Step 19 – Tack the short pieces of RHS into position under each end of the transverse member. Make sure that the top of the RHS transverse member will finish

flush with the top of the tank bay rim. Theoretically when you add the floor sheet later the whole floor should finish flush.

Step 20 – After tacking the RHS pieces in place, check that you will be able to remove the tank.

Step 21 – Cut the longitudinal members to length that will fit in between the transverse members.

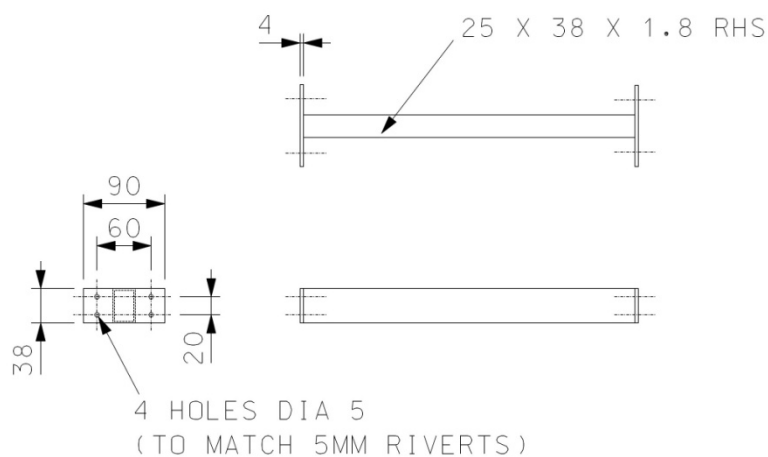
Step 22 – Tack weld the longitudinal members into place, once all are in and you are happy, you can fully weld them.



Note

The picture shows plates going down to the tank, if you are also building a new tank, it would best to have these plates, otherwise it is not recommended to weld to an existing tank, due to the risks involved. Just put the structure in above.

Step 23 – Cut and make the removable longitudinal members as shown in the drawing. This will involve site measuring the distances between the transverse member and the end of tank bay



Note

- Plates may have to be altered to suit different sized RHS being used.
- 40 x 40 x 2 SHS sometimes is used

Step 24 – Cut some more 100mm lengths of RHS to sit under the longitudinal member,

Step 25 – While holding the Longitudinal member RHS in the right spot and flush with the top of the tank bay rim, tack weld the 100m long RHS into position



Note

- This picture show the rHS going onto the tank plate, but the same is added to the end of the tank bay.
- The RHS can be swapped for a piece of flat bar the same length, you only need something for the longitudinal member to sit on and transfer the loads into the structure.

Step 26 – Once you have tacked all RHS or Flat bars into position, trial fit the whole structure.

Step 27 – Remove the fuel tank again

Step 28 – Once you are happy with all the fits, weld each end of the RHS or flat bar. There is no need to weld the top or bottom, the ends are enough to carry the loads

Step 29 – Clean up the welds and remove all sharp edges.

Step 30 – Close up the fuel tank for the last time and re-install it in the fuel tank bay.

Step 31 – Tighten all fuel hoses.

Step 32 – Secure the tank in its right position again.

Step 33 – Install the new structure again.

Step 34 – Site drill and rivet all connections

Step 35 – Vacuum and remove all waste and shavings.

Step 36 – Re connect the fuel sender

Step 37 – Check that there are no tools left in the bay.

Step 38 – With a marking pen, put marks on the floor to line up with, when drilling the rivets in the middle of the structure.

Step 39 – Apply a bead over sikaflex over all members of the new structure and around the tank bay rim.

Step 40 – Place the new floor sheet into position

Step 41 – Secure the coving in position by site drilling and riveting across the new structure and around the rim.

Note

- It is best to start in the middle of the sheet and work your way out, flattening the sheet as you go.
- Leave the rim to last, otherwise bulges can develop in the sheet as you go.

Step 42 – Using a general purpose thinners, clean up and excess sikaflex.

Step 43 – With the sikaflex, fill the hole in the top of the rivet and make sure each rivet rim is sealed.

Step 44 – Allow the sikaflex 24 hours to harden.

Step 45 – Job Completed, re fill with fuel and happy boating

