

A Galling Subject

October 2

The PT 11 Nesting Dinghy Connective system is unique and it makes up a decent portion of the cost of the kit. After roughly 200 PT 11's sold to date, there have been very few issues with this connective system. In this article we are aiming to share some lessons learned about these parts based on customer feedback and experience.

A brief description

Our key to easy and fast assembly (of the two hull-halves) is to separate the two main functions of aligning the two halves and joining them. The alignment hardware is molded from carbon fiber, but it is robust and affordable for us to produce.

The connective hardware, used to join the two hull halves as they are correctly registered by the alignment hardware, are CNC-machined from 316 stainless steel. This hardware consists of threaded sockets bonded into the forward half of the hull, and sockets with threaded pins and knobs bonded into the aft half; these parts are pre-positioned in the structure. Clip rings ride on the pins to make them captive, and this system allows assembly of the boat in the water without leakage.

The manual instructs builders to keep the stainless parts clean throughout the process of gluing and painting the boat. It is after the boat is finished that we instruct builders to lightly grease their hardware.

Here is where some additional explanation is needed.

A few customers have had a pin get stuck at some point in the completion of their boat. The why of this has been a challenging topic but when it happens, it is terrifying for us as well as for the builder and can be costly to remedy.

According to Wikipedia, "*Galling is caused by a combination of friction and adhesion between the surfaces, followed by slipping and tearing of crystal structure beneath the surface.[2] This will generally leave some material stuck or even friction welded to the adjacent surface, whereas the galled material may appear gouged with balled-up or torn lumps of material stuck to its surface. Galling is most commonly found in metal surfaces that are in sliding contact with each other. It is especially common where there is inadequate lubrication between the surfaces.*"

Why and What to DO:

So, the question is why do the pins sometimes seize and what do we do about it?

The why is a bit of a mystery to all of the experts. One recently seized after it had been greased, so it's not just the lack of grease. We could also change the material of just the pin but hundreds of these have worked fine in all stainless steel.

Tight clearances are probably the cause, but we think we need the snug fit in both the forward and aft sockets to keep the hardware aligned when it's being installed. We are opening up the tolerances a bit on the next run of hardware but it looks like the best

insurance is going to be using a never-seize style of grease, applied after your boat has been finished (to keep grease from screwing up your painting and finishing). It seems that the seizing is mostly happening at the tail end of the building process, so apply never-seize when re-installing the hardware after finishing. Clean the sockets and pins and apply a tiny bit (with a skinny stick of similar) in the threaded sockets and in the aft sockets and rub a little bit on the shiny part of the pins.

If you feel anything like seizing when assembling your boat, STOP. Is there misalignment? If you back out the rest of the pins, will the problem pin loosen up? Do your epoxy shims under the alignment clips need to be block sanded down just a bit? Are the outside edges of your alignment clips contacting the bulkhead edges?

If a pin feels stuck, remove the knob using two wrenches; 14mm and/or 9/16" to remove the knob, nuts and washer.



Put two nuts together on either end of the pin and tighten them together very tightly with the wrenches. (photos below)

Stand the hull half on end so that a bit of penetrating oil can be applied and run down into the socket. Now try tapping and banging on either end with a hammer and

wrenching on the end with the double nuts. Remember that the pin can only be removed from the socket in the forward direction because of the captive pin clip.

Still stuck? Get in touch with us.



If the pin leaves any roughness or scoring on the inside of the socket, that can be removed with a custom tool. Here's how:

Take a short piece of 3/8" dowel, chuck one end up in your drill, wrap sandpaper around the other end, hit the trigger and sand the dowel down until it fits loose enough in the socket that you can wrap some fine (400 or finer grit) sandpaper around the dowel and have it just barely fit in the socket. The sandpaper can be spray glued and rolled tightly on the dowel before using it to sand away any and all burrs and roughness. Finishing with an even finer



paper is probably a good idea.

Spray-glue a bit of sandpaper to a flat stick to remove burrs from the pin before cleaning, applying the never-seize, and re-assembling the hardware.

- **Caring for your connective hardware;**
 - Keep it clean before and after installation.
 - As soon as grease is no longer a threat to gluing or painting, grease or ant-seize your hardware.
 - At the first sign of binding, stop and assess alignment and possible causes.
 - Refer to the chapter in your manual titled: Re-ASSEMBLY of Connective Hardware (p.288) including installation of the alignment clips. Precision parts require precision alignment.
 - After a season of use, consider removing your pins, clean and reapply grease or anti-seize, and re-install. Refer to manual pgs. 319-**320**, "PT11 User Guidelines"

We continue to work on this and may update this blog (<http://ptwatercraft.com/blog/?p=3658>) in the near future as we learn more. *Ashlyn & Russell Brown*