Renovation of Mälar 30 bottom – part 1 of 2.

Linseed oil

Outboard butt blocks

Splines in glued seams

Epoxy primer

Ledgend

- M. = Meter
- MM. = Millimeter
- Stroke = One full stroke on WEST Epoxy dosing pump
- DKK = Danish kroner inclusive VAT
- L = Length
- (xxx) = the precise danish word, there might be severeal translations

Our boat

- DANNEBROG is hull 83 of the Mälar 30 class.
- Build 1950 and possibly launched 1954
- Hull is composite, hot dip galvanized frames with 2 oak ribs inbetween.
- Planking is 17 mm. pine (fyrretræ) glued with unknown glue
- Plank joints was a blend of butt joins (stubstød) supported by rivets through a steel backing plate, and some glued diagonal scars (skråskar).
- Boatyard ”Stockholms Båtsnickeri” had previously replaced garboard and two lower boards in port side and glued 30 meter of seams evenly distributed on both sides of the bottom. These works was still in exellent condition and was left untouched.

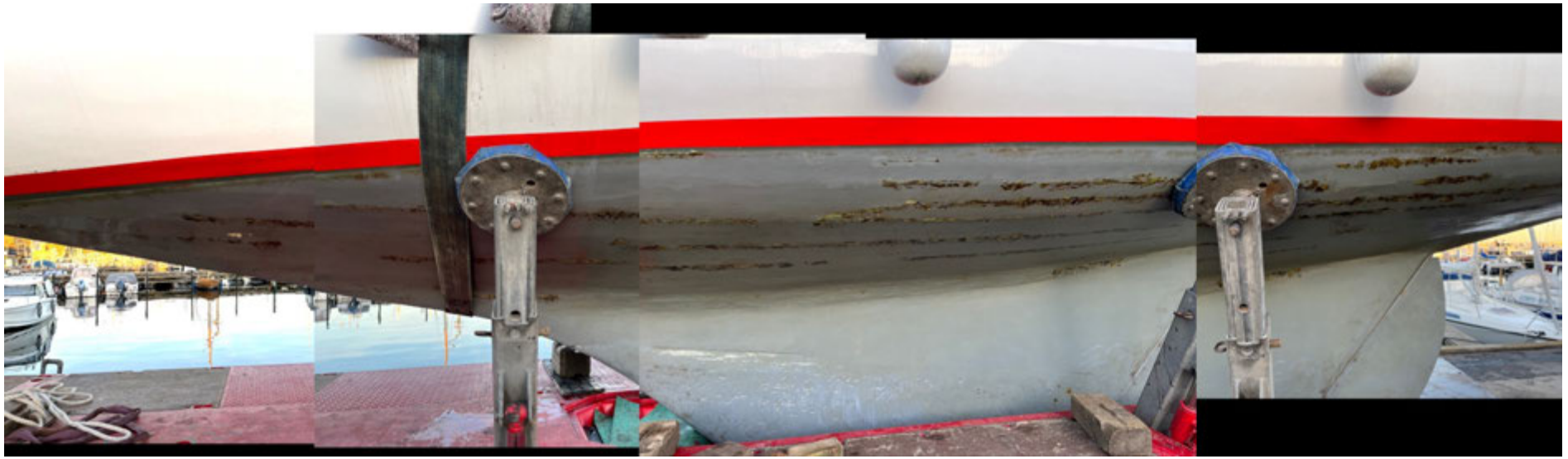
Our references

- Our main source of information was the book ”Wooden boat maintenance” (Träbåtsrenovering) by Thomas Larsson
- We followed - to the letter - all the instruction handbooks and data sheets from WEST Epoxy, INTERNATIONAL and Selder Linolie.
- We participated in WEST Epoxy training day at HF Marine in Svendborg.
- We had great consultansy and support from Stockholm Båtsnickeri, greeting to Andreas Millde and Andreas Tjulander.
- We was inspired for the outboard join block by Totte Bergmann from Swedish Mälar owners club (Mbandsforbundet).

Tools

- We used 2000 W. heat guns and 2000 W. infrared heat lamps (patio heaters) to soften paint and scraped it off – wearing masks!
- We used FESTTOOL ROTEX 120 combined with FESTTOOL M vaccumer – we can only recommend this combo, it is highly effecient.
- Scraper and mill file
- Hand tools
- Personal protection equipment

Condition of bottom October 2022



Stitched picture of Port side before renovation. The seaweed indicates the cracked seams.

Condition of bottom October 2023

Stitched picture of Port side after renovation. All agea on ballast keel sit in the pockets we left to fill in the coming winter 23-24.

Inside condition of bottom October 2022

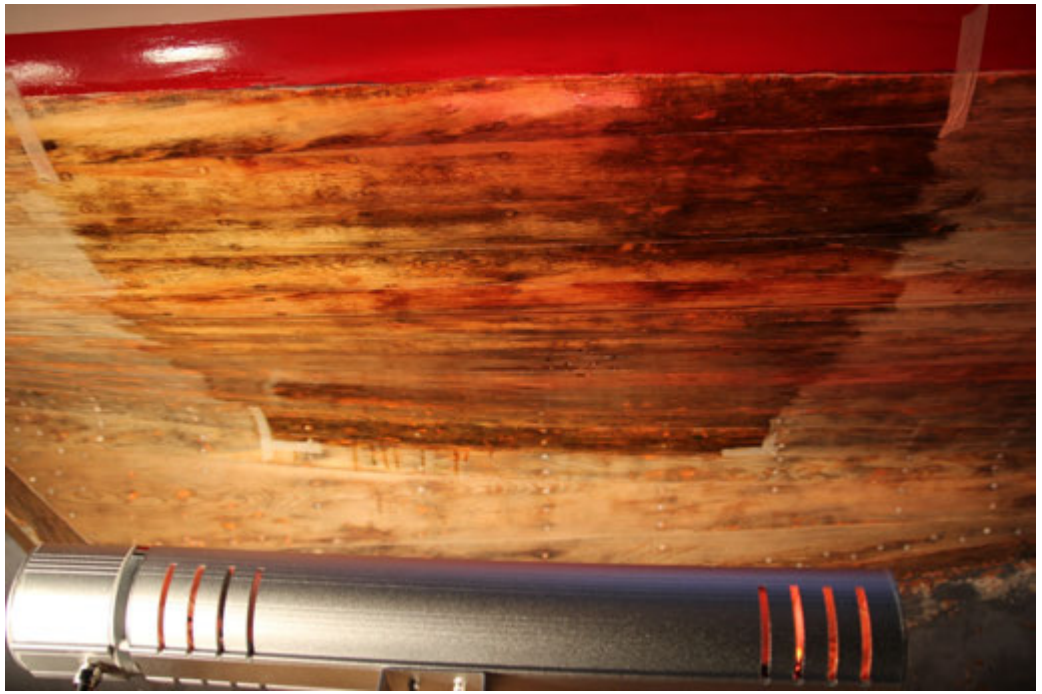
Here you see how black the planks get from water seeping into the wood through the leaking joints. People who say that ”wooden boats always have to swell tight” do no realize how much damage water do to untreated wood, ex. In the seams that are not treated with either paint or varnish. The white stuff you see, is traces of fat that I used to seal the leaks before renovation – a Sisyphos job.

Stripping the bottom

Stripping paint using heat gun and handheld scraper. Workhours app. 18
Sanding, grit 40,60,80,120 (the 120 can be obmittet). Workhours app. 18

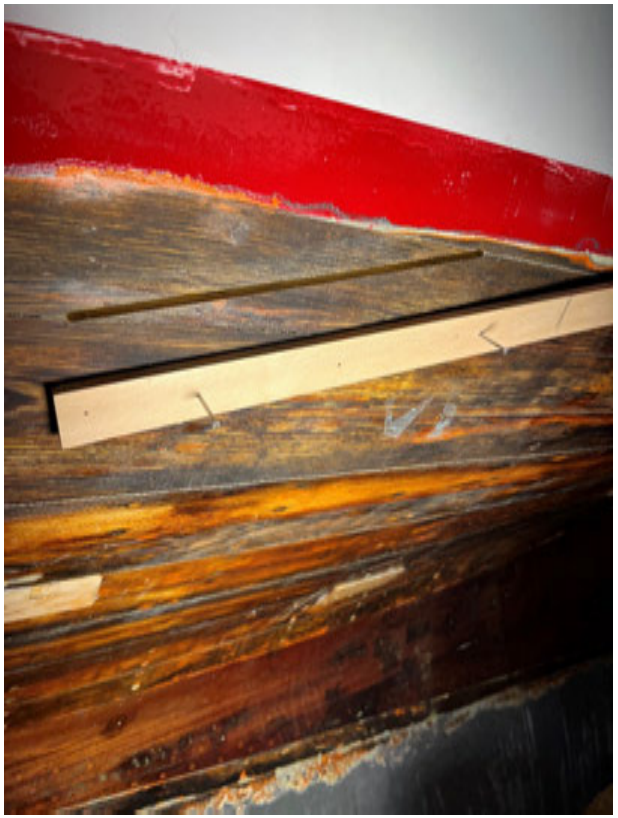
Linseed oil application using heat

We heated area to 20-30 C using infrared pre-heater before applying ”Selder Grundolie” (refined linseed oil) heated to 130 C. The oil is liquid as water at this temperature. There are app. 16m2 of bottom on a Mälar 30. We used one (1) hour/m2. So 16 hours was spend on this part of the project.



Tape indicates 1m2. We used a 2kW infrared-heater at 3 cm. distance to ”boil” the oil into the wood. We made 4 treatments on 1 m2 during 1 hour. This was recommended by Stockholm´s Båtsnickeri and it worked perfectly.

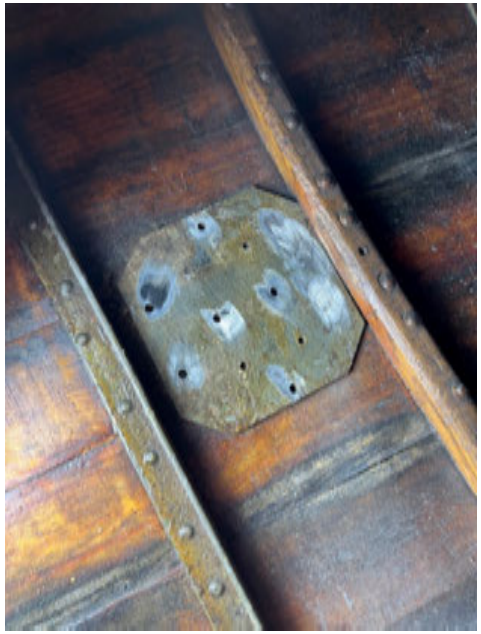
Mitre joint retrofit



Some boards had mitre joints. Here we fitted a teporary support and ran a router with Ø 6 mm bit. We left 2 mm. of wood planking in bottom of joint to hold the glue in. All nailholes later filled with wood-pegs, set in glue.

Butt blocks removal

Carefully remove the plugs over existing fastners. Spend ample time on this job, you really want the rivet heads to come out without damaging the planking.



We used a sidegrinder to remove the inside rivet heads. Yes a lot of steel spray is shattered around inside the boat.
Try to limit the steel sprays if you can – we could not ☺.

Butt blocks removal

After 70 years of service, it was time to say goodbye to the steel blocks.
Be carefull when you prye out the old rivets, the outside head may rip the planking. If so – reglue the splinters a.s.a.p. (while you can still find them).

We used a small piece of wood with a predrilled 12 mm hole, on outside of planking to guide an 12 mm forskner drill bit through all the rivet holes. A helper held a piece of wood on the inside to limit spliters.
We fitted pine plugs set in WEST epoxy.
Apllied heat overnight for curing.

Remark: Throughout this project we used these basic principles.

a. Do not glue on a surface that is more than 48 hours old (meaning – do not drill holes or make plugs unless you use them within same or next day).
b. Stay well within datasheet of glue (meaning – do not glue at the bitter end of the limits).

Butt blocks removal

Ambient temperature in HAL16 is 4 dg. Celcius during winter. Therefore we arrangeded an oilheated radiator and some plastic to get outside surface up to 20 dg. Celcius.

Here we verify that inside surface temperatuer is well within the range of WEST 205 fast hardner. With 12,6 dg. Celcius it is (minimum is 4 dg.C, but I do not like to be on the limit of such).

Remark: You may think we are overdoing things here, but it is not ”just some filling of holes”. These plugs are becoming an intergral part of the boat´s structure.

One day, your life may depend upon these plugs.

Butt blocks removal

Glue new block, adjust height after 24h.

Just before this video starts, I have primed the mating surfaces on the hull with WEST epoxy.

Fairing off butt block

Each joint took 1,5 hours to mill, glue and fair. With a total of 20 joints, we spend app. 30 hours at this part of the project.

- END of part 1.
- Part 2, is in a separate file.