

Floors

These are constructional components fitted in the bilges directly above the wooden keel and their purpose is to tie the garboard plank and the first two or three planks above to the keel rigidly and to attempt to keep the shape of the hull at this point constant. There are various methods of fitting floors and there are various designs of floors. The longest lived design is usually a timber floor, this would be a considerable size section of timber cut to shape and carefully fitted and bolted to the keel although, preferably used as a keelbolt fastening support as well. In this particular case this means the floor fastening can always be replaced when the keelbolt is replaced. However, some builders fitted floors at intermediate positions to the keel bolts with fastenings passing through the floor and wooden keel but not the ballast keel, to replace these floor fastenings the ballast keel would have to be dropped.

Metal floors are often used in some designs and these would either be bronze or more commonly steel/iron. The method of attaching these floors was usually bolts through the planking of the appropriate metal, i.e. that is bronze bolts with bronze floors and steel bolts with steel floors.

Unfortunately it has been known to fit copper nails through steel floors which, because of the interaction of copper and steel in seawater caused significant electrochemical damage to the planking that the fastenings were passing through.

Steel floors in the bilges are a high maintenance issue and in many cases, the steel floors do have to be removed for replacement/refurbishment a few times during the life of the timber vessel.

On Keel stepped masts, these floors are significantly important as they to attempt to hold the garboard plank and the associated planking close and tight to the keel thus preventing any leakage when the boat is under strain however, there will generally be significant leakage of the garboard plank on Keel stepped vessels if there has been any deterioration of the floors, be they timber or steel or bronze and, the floor attachment fastenings, particularly if these are bronze or steel bolts as, they work within the garboard planking and become slack allowing leakage via the fastening drillings. This combined with any electrolytic damage in the planking caused by the metal bolts can give significant problems when the vessel is strained to the point that, in some vessels such as the SCOD (South Coast One Design), new garboards occasionally have to be fitted.

Unfortunately too many owners/repairers suggest re-caulking a garboard seam that leaks when under load when, the basic problem is floor fastenings. The leak stops for a few weeks but then comes back as bad as it was before however, unfortunately because of the extra caulking the fastenings have been further strained and, occasionally the plank will be caulked to excess requiring a new plank to be fitted due to the damage caused by over caulking.

Whenever heavy leakage occurs from the garboard plank when under strain on a Keel stepped mast it is always better to investigate the floors, the floor fastenings and garboard fastenings in the first instance. It is likely that problem will be with these as against any caulking fault.

Deck stepped masts do not strain the garboard to the same degree as the loadings on the hull are slightly different.

Frames etc

All carvel built and clinker built hulls will have internal frames, the majority of these are likely to be steam bent oak or rock elm frames of adequate size.

It is not uncommon for a boat to leave the building stocks with one or two broken frames right from the outset, these will occur usually close to the stern sections particularly on Folkboats where the tuck of the bilges is excessively steep.



Internal framing

Perhaps this is not particularly serious provided it is just one here and there however, if there is a row of broken frames with the break on the same plank or line than these should not be allowed to remain. The cause of these can be varied and can be as simple as supporting the boat incorrectly when ashore (although still damaging and easily preventable) or as extreme as grounding or being crushed.

It is sometimes extremely difficult to see a broken frame because it may commonly appear just as a hairline crack across the frame but , is still a weakness.

Occasionally it can be seen the frame is splintering due to excessive bend, but not fully fractured..

Frames can also show signs of decay, particularly with rock elm. Some vessels will have laminated frames, these have to be individually produced and, will sometimes be of mahogany or Iroko as well as oak.

Some vessels will have sawn frames. These are sections of timber cut to shape from solid. Decay problems will often occur at a low point in the bilges if it continued amount of fresh water has been allowed to lie in the bilges and, high up under the deck if the deck has been leaking.

When supporting a timber boat ashore, the props must be placed at the bulkhead positions primarily, this will generally mean a minimum of three main bearers per side. Others should be fitted at all intermediate points as helpers but not distorting the planking. Too many yards are unaware of the damage poorly supported hulls, both timber & GRP can suffer.

Any timber vessel will have a considerable amount of strengthening members within the hull, these will include bilge stringers, (fore and aft sections of heavy timber) beam shelf ,



Photo showing fore end of stem , beam shelf & frames and breasthook just under deck in the prow

(this is a heavy section of timber running along the top of the frames just under the deck) carlins (these are sections of timber supporting the coach roof) and all of these are subject to deterioration caused by physical damage and decay. The beam shelf (deck shelf) is most prone to decay as it is just below the deck and in the case of any freshwater leakage long term, will deteriorate, this also applies to the Carlin which is subject to freshwater deck leaks.

Deck Problems

Unfortunately, deck problems have been the demise of many a good timber vessel due to the fact that a leaking deck has eventually been the source of coach roof decay, planking decay, and all sorts of internal decay.

Whichever type of construction is used the deck it must be waterproof. The biggest problem is usually found at the deck edge where water finds its way onto the sheerplank directly under the deck and corners of the coach roof construction. This causes significant problems with the sheerplank in the case of deck edge leakage that, in some cases requires complete replacement if preventative maintenance has not been previously carried out, and, in the case of coach roof corners and joints, serious deterioration of underlying beams and carlins.



Various methods of waterproofing have been carried out over the years and some work better than others. GRP sheathing is relatively successful but it cannot be applied directly to a planked deck as, as the vessel moves, the planks move somewhat causing cracking to appear along the line of the planks, in this case, a deck should be first sheathed with thin plywood to present a stable surface.

Chopped strand mat would not be a good choice for deck sheathing, always use epoxy resin and lightweight glass cloth over plywood.

Teak decks can be very beautiful to look at but create nightmare problems in their own right particularly if they have not been maintained.

They will generally be laid upon a plywood sub deck but, if the caulking and seams are not maintained to a high standard, freshwater deterioration will occur to the top surface of plywood unseen until it is too late to prevent substantial damage.

The repair of a laid teak deck that has deteriorated and caused plywood deterioration beneath will be extremely expensive to repair/replace, on a 30ft vessel, possibly exceeding £12000. Solid teak decks are not common in modern vessels because of the obvious expense.



Plywood deck that had water penetration causing rot to plywood & quarter knee. New Knee fitted and preparing for new skin repair, note step joint on plywood

A good indicator of fresh water damage occurring is stained varnish, constantly deteriorating and flaking enamel paint and, of course mildew. Maintaining the deck is perhaps the single most important maintenance issue in increasing the longevity of timber vessel.

Depending on the builder, any deck structures such as coach roof sides will be either solid timber or plywood. Both can suffer from freshwater decay

however, plywood is generally far more vulnerable to severe structural deterioration.

This will occur in nearly all cases close to window piercings and edges such as the fore and aft vertical ends of coach roof and the extreme top and bottom of the side panels. Also anywhere where a piercing has been cut through plywood has to be a vulnerable area for deterioration.

Solid coach roof problems will be in similar areas but generally to a lesser degree, more significantly at positions of vertical exposed end grain such as the fore and aft corners of the trunking. Solid timber coach roofs can also show long longitudinal splits particularly from fastenings for window frames and portholes.



Obvious water penetration under the varnish

These can vary in their severity and, in extreme cases would require repair. One possible repair is to set a router carefully on the length of the split, use a parallel cutter of appropriate width and machine an exact spline up which can be then glued into position and planed back this will make a virtually invisible repair.



Varnished coachroof. Often splits will emanate from the porthole fastenings.

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