

Maintenance Instructions for Stainless Steel Standing Rigging (wire and rod)

Prepared by Rigworks, Inc.



SS STANDING RIGGING is one of the lowest maintenance components on the modern sailboat. Desirable upkeep may be simple, but is also essential to ensure the safety of your rig and those aboard your vessel. The most common cause of a dismasting is lack of care given to the spars and rigging.

For the most part proper maintenance means **routine cleaning**, a bit of **careful inspection**, and **avoidance of a few bad practices**.

ROUTINE CLEANING is imperative for the stainless components on your vessel. Remember that there is a reason it is called "Stain-LESS" and not "Stain-NONE". There are several things you should be doing to keep your SS standing rigging clean to ensure maximum service life out of your rigging.



*Use fresh water to rinse salt spray off accessible stainless steel rigging and lifelines after returning from sailing each time (just as you would your stanchions and pulpits)

*Stainless steel rigging, lifelines and fittings also need to be cleaned and polished several times per year. Usually just a simple wipe down is sufficient, but any rusty spots should be polished out. This includes SS rigging and fittings aloft, and is particularly important in areas with chemical laden environments (such as near an airport)

***NOTE:** The US Coast Guard has classified Southern California area as a hot spot for a corrosive contaminate filled atmosphere (with Los Angeles being the epicenter). In our experience, this has also proven to be particularly rough on stainless steel parts in carbon fiber rigs.

*Rigworks can custom fabricate a bosuns chair and rope purchase system so you can hoist yourself up the rig. Of course, if you are not comfortable going up your own rig, the Rigworks team is happy to do this for you on a routine basis.

*For cleaning and polishing stainless, we suggest is Brite Boy, or Collinite Metal Wax (available at most marine stores)



CAREFUL INSPECTION each time you go aloft to clean the rigging will provide you the peace of mind that your rigging is safe to sail with.

*While cleaning stainless steel rigging, keep an eye out for any corrosion, pitting, cracks, and of course broken strands or "meat hooks" on the wire rigging.



*Look for spots with discoloration or rust as a crack in the stainless will generally promote rust. Any areas showing signs of rust should be thoroughly cleaned, polished and inspected to confirm there are no hairline cracks, or crystallization of the metal.

*During your trips up the rig to perform the cleaning aloft, make sure to carefully inspect all visible hardware on the mast, including sheaves and sheave boxes, spreaders and spreader tips, shroud tangs, etc. Check all hardware, including rope shackles for hairline cracks, corrosion, or deformation.

If anything questionable is found, take a picture and email it to info@rigworks.com or have a rigger come take a second look so you can discuss the proper solution.

PROFESSIONAL RIG INSPECTIONS

*In addition to your own routine inspections, Rigworks suggest that a professional rigger go aloft for a rig inspection once a year. Having your rig and rigging routinely inspected is not only good sense, but often required for insurance coverage. It is also an important service to have done if you are looking at purchasing a used boat.



*Professional inspections can reveal hidden issues before they become critical. Keep your mast and other spars intact, upright, and strong by staying ahead of the maintenance curve.

*We often catch small items like missing pins and fasteners that are easy to fix but would be detrimental if gone unnoticed.

*This will save you money in the long run, keep you from missing out on a season of sailing waiting for your powerboat to become a sailboat again.



*Most importantly you will know that your friends and family are safe sailing on your boat.

*One of our most experienced riggers can inspect your mast, standing rigging, running rigging, hardware, lifelines, and other sailing systems to give you a comprehensive list of prospective issues and concerns. Call us to setup an appointment today, We're here to help!

THE DO'S AND DONT'S OF CARING FOR STANDING RIGGING

DO... Rinse with fresh water and a water soluble detergent. A nozzle will make this easy to do.

DON'T... Use a cleaner containing chlorine as it is destructive to stainless steel.

DO... Inspect all unusual stain and corrosion spots before, during and after cleaning.

DON'T... Use a steel wool or scrubbing pad to remove stubborn stains. They can leave minute particles of steel embedded in the rigging that will rust.

DO... Use spreader boots, turnbuckle covers, and chafe tape where chafing or snagging is possible.

DON'T... Wrap rigging or terminals with tape as that deprives the stainless of oxygen and promotes corrosion.

DO... Ask a Rigworks rep about any unusual signs of corrosion, stress, or cracks found in the rigging.



CAUSES OF CORROSION IN SS WIRE & ROD

Surface rust on the wire is normal and will usually polish right off if you keep up with your suggested cleaning routine. Excessive rust or corrosion on wire and fittings generally comes from one of two common issues.

***Anaerobic Corrosion** is caused by dirt, oil, or other surface contaminates on the wire. Stainless steel does not like to be deprived of oxygen as it cannot passivate itself. This leads to staining and corrosion on the wire itself. Routinely cleaning the wire and fittings will keep this problem at bay.

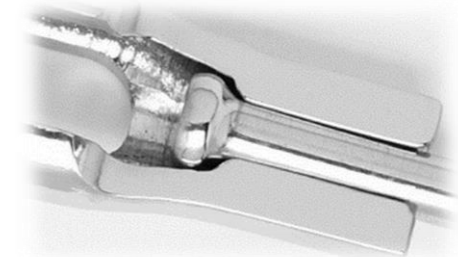
***Chloride Type Corrosion** also happens in an oxygen free environment. Salt water activates the stainless steel and causes it to corrode. This is often seen where the fittings meet the wire, where water settles into the minute spaces between the terminal sleeve and the cable construction. Routine fresh water rinsing of stainless steel at the deck level will help alleviate this common issue.

FOR ANTICIPATED LIFE SPAN OF SS SAILBOAT RIGGING, THE INDUSTRY STANDARD is 10-12 years for wire and 15-20 years for rod. This projected life span is for properly maintained and inspected mono-hulls. There are many factors involved that can decrease this life expectancy such as load to strength ratio of the rigging, typical sailing conditions, mileage sailed, age of rigging, fatigue from cycling loads, environmental conditions such as extreme

salinity or contaminants in the air and frequency of care and maintenance given to the rigging. For example: Boats in tropical regions have a 2-5 year decrease on their standing rigging life expectancy, due to warm water temperatures and high salinity levels.



In addition to the industry standard of a life span based on age, Navtec suggests that boats with rod rigging complete a Level C inspection after six years or 40,000-60,000 miles before, whichever comes first. This maintenance schedule would include inspection of all the rod heads and end fittings.



If any are found to be worn, or cracked, the rod must be re-headed. That doesn't necessarily mean the entire rod section needs to be replaced. If there is enough throw on the turnbuckle, then the rod in that section can be re-used. The rod will typically last significantly longer than the cold heads at the ends.

*For wire rigging, Navtec recommends a complete Level C inspection after six years or 40,000 miles, whichever comes first. Selden suggests that wire standing rigging should be replaced after a circumnavigation, without exception.

INSPECTION SCHEDULE recommendations are determined predominately by the boat's displacement and type of usage. Heavy displacement yachts falling into Category I & II will have different inspection criteria based on tensile fatigue issues rather than those of category III & IV, which will base inspection intervals on usage and potential Safe Working Load issues. At bare minimum, a level A mast system inspection is suggested at least once a year, regardless of the yacht classification category.

*Additional inspection criteria will depend on the same factors that affect your standing rigging life expectancies including environment, strength to load ratio, miles sailed, and age of rigging. Give us a call or shoot us an email and Rigworks will be happy to over a suggested inspection schedule for your boat



DISPLACEMENT & USAGE CATEGORIES

TYPICAL PURPOSE CHARACTERISTICS	CATEGORY
Ocean Going	I
Offshore	II
Coastal Pleasure Cruising/Club Racing	III
Racing	IV

TYPICAL HANDLING CHARACTERISTICS	CATEGORY
Handled by Crew	I
Handled by Crew, Owner or Shorthanded	II
Handled by Crew, Owner or Shorthanded	III
Handled by Professional Crew	IV

DISPLACEMENT CHARACTERISTICS	CATEGORY
Motor Sailor/Heavy Cruiser	I
Mid Displacement	II
Light Displacement	III
Ultra Light Displacement	IV



MAST SYSTEM INSPECTION CATEGORIES

LEVEL A
Visual Inspection with Mast In
Comprehensive general mast system visual inspection
Check all fittings/terminations, rod/fiber/wire, spreaders, sheaves, halyards, headstay, backstay, mast base, partners, haylard blacks and chainplates
Check for cracks, corrosion, pitting, rust
Service log/update schedule for next service

LEVEL B
Visual Inspection with Mast In - Jack Down
Pre-check rig to assess service (Level A Inspection)
Un-jack mast
General visual inspection
Check for bends/kinks in fittings and rod
Check/lubricate all accessible fittings
Properly re-tune to align and seat all cold heads and hardware, and generate proper tension/tuning
Service log/update schedule for next service



LEVEL C
Full service with Mast Out
Pre-check rig to assess servicing schedule (Level A Inspection)
Un-step mast
Complete disassembly of mast/fittings
Visual Inspection. Clean/polish rod, cold heads and fittings to facilitate inspection process. Visual inspection for cracks, corrosion, pitting, rust, general discoloration: remember rust indicates cracks
Non-Destructive Testing (NDT) of Rod. Navtec recommends: Dye penetrate testing (liquid penetration testing) by authorized professional. Alternative methods: x-ray, ultrasound testing, eddy current testing
Visually inspect and Safe Working Load (SWL) pull test all fiber rigging
Make repairs as needed: re-head rod, replace any fittings or rigging screws
Reassemble mast system
Update service log/update schedule for next service
Re-step/re-tune mast

NEW STANDING RIGGING

*All new shrouds will stretch and stretch and settle after the first couple uses, and when put under higher than usual loads. Wire will stretch more than rod as it has more constructional stretch. The result is that the rigging will feel looser after the first couple of sails in good pressure. Rigworks attempts to accommodate for this in their initial dock tune following standing rigging replacement. But, it is still not uncommon for us to do a follow up rig tune a few months down the line (depending on how often the boat is sailed)

*New standing rigging should be immediately wiped down and polished to remove any particles or scratches from the fabricating, shipping, swaging, and stepping process.

***To ensure your stainless steel rigging and hardware last to its full life expectancy, it must be routinely rinsed with fresh water, polished, and inspected.**

Please feel free to contact with any questions regarding inspecting, maintaining, or replacing your standing rigging.

We are here to help!

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