

WELDING SEQUENCE

Your Marine Inspector must check the work at the following weld sequence points, unless you have a written waiver from him/her.

1. Fit-up and Tack Welded
2. Back Gouge of First Pass
3. Final Test
 - A) Visual
 - B) Nondestructive Testing
 - 1) Dye Penetration
 - 2) Vacuum Box
 - 3) Hose Test with 30 PSI of water

For more clarification, be sure to discuss these issues with your inspector.

SPECIAL NOTE

Steels look the same, but when used in the design of a ship, much greater loads are imposed on the special steels; loads which probably could not be sustained if conventional steel was substituted by mistake.

Welding electrodes which are satisfactory for conventional steel would not provide strength, in way of the welded connection, equivalent to the strength of the plates jointed. In most cases, low hydrogen electrodes are recommended for welding high strength steels in order to avoid underbead cracking.

In some high strength steels; for example, the quenched and tempered steels, a heat input during welding which would be acceptable for conventional steel, would drastically reduce the toughness of the special steel in the heat affected zone.

Half rounds, rounds and bulb bars are frequently produced from Bessemer steel and are not permitted.



**What to
Expect
During a
Hull
Inspection
Steel Vessels**

Dry Dock or Hauling Out

The vessel is to be hauled out at the owner's expense and the following should be accomplished prior to the

Inspector arriving:

- The hull should be clean; NOT freshly painted!
- All of the sea valves should be available for inspection. The inspector needs to examine the valve surfaces and valve seats
 - Ball Valves can usually be examined from the exterior of the boat and do not require to be removed.
- All of the exterior thru hull strainers should be removed for inspection so the spool pieces between the valve and hull can be examined.
- Open and air out all internal spaces.

What the Inspector will Be Looking For

1. Hull Structural Integrity
46 CFR 176
2. Watertight Integrity
46 CFR 171
3. Rudders, Propellers, and Tailshafts
 - If single screw, Prop must be removed for inspection of keyway and shaft taper
46 CFR 176
4. Valves and Through-Hull Fittings
46 CFR 176
5. Ground Tackle
46 CFR 184

What to Do if you NEED REPAIRS

1. Marine Inspector and discuss the repairs **BEFORE STARTING ANY REPAIRS.**
2. All repairs shall be completed using Navigation Vessel Inspection Circular (NVIC) 7-68 Send the following documents to your Marine Inspector:
 - A) Plans of intended repairs
 - B) Bill of Materials to be used
 - C) Certs of Materials to be used (as applicable)
3. The inspector will examine your proposal :
 - A) Approved
 - B) Return for Revision or
 - C) Disapproved
4. Discuss what milestones in the project must be witnessed by the attending inspector.

Informational Notes:

- All **INSERT REPAIRS** must be a minimum of 18" X 18" and cover one frame bay with 3" radius corners.
- The existing plate should be cut back to good metal. Examine existing plate edge and internals in way of the cutout.
- The shipfitting and plate edge preparation should be such that welding grooves of proper proportions are provided so that acceptable welds can be made.

LAPPED PATCH PLATES

- In certain cases, a welded patch plate may be used in lieu of insert plates for the permanent repair of small damage areas that lie wholly within an individual panel of plate.
- Patch plates are inadvisable in areas of high corrosion.
- Patch plates should be continuously fillet welded inside and out.

DOUBLER PLATES

- ARE NOT PERMITTED

CROPPING & RENEWING

In the case of structural members such as frames, beams, stiffeners, etc., it is a practical repair measure to crop out the distorted or wasted section of the member and replace with new materials.

- There should be sufficient material in the remaining portion of the member to permit sound attachment of the new metal.
- Good alignment should be made with old portion.
- There should be sufficient clearance to permit the making of welds. If this is not the case the member should be renewed.

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