



Nautilus “Positive Locking” Subsea & ROV Hooks Recommended Maintenance & Inspection Guidelines

Annual Thorough Examination – Test and Inspection Services

- The manufacturer recommends annual re-certification of Nautilus Hooks by a competent and authorised testing and inspection service.
- Testing and inspection services should refer to the manufacturer’s tolerance specifications for re-certification criteria of Nautilus Hooks.

Workplace Best Practice - General Maintenance Guidelines

All lifting equipment, including Nautilus Hooks, should be visually inspected by the users for obvious defects or anomalies prior to use as industry’s best practice.

Subsea & ROV long shank Hooks - Maintenance & Inspection Guidelines

- All lifting equipment, including Nautilus ROV Hooks, should be visually inspected for signs of cracks, nicks, excessive wear, gouges or permanent deformation prior to use
- The NROV series subsea hooks lock mechanism is precision machined from marine grade Stainless Steel providing a smooth easy operation with improved corrosion resistance, in order to maintain operational functionality, the manufacturers recommend regular lubrication with a light, water resistant spray grease applied to the lock slide, pins and bore holes.
- Check for vertical movement or “play” of the locking arm about the main load bearing pin, movement about the main pin indicates wear and tear on the pin, this wear and tear increases proportional to time in service. As a precaution, should there be noticeable, excessive “play” about the main pin and locking arm the hook should be removed from service.
- Observe the hook “tips” to see the gap has not become excessive, this can indicate the hook has been subjected to shock loading or over stressed and should be re-inspected by an authorised inspection agency to ensure it remains within the manufacturer’s tolerances, fit for purpose and re-certification.
- In order to ensure your Nautilus ROV or Subsea Hooks remain in a serviceable condition, and to counter the corrosive effects of the subsea marine environment, the manufacturer recommends that an appropriate water resistant lubrication is applied to the component parts both prior to, and upon conclusion, of each subsea lifting operational exercise/day such that the critical moving components remain well lubricated and free to operate as designed.

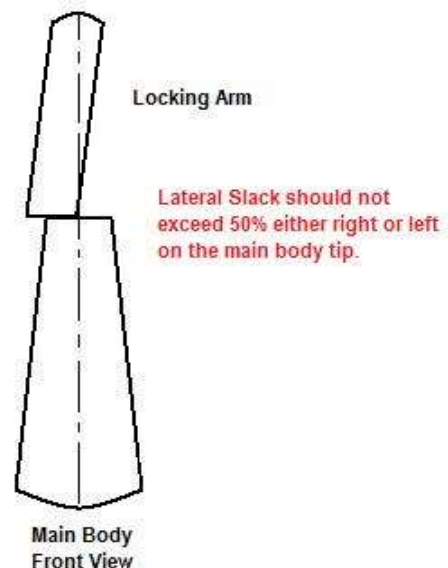
The KEY to Maintaining Nautilus Hooks in a “fit for purpose” condition is regular examination, frequent lubrication and annual inspection for re-certification.

ROV Activation wires

- The primary activation wires/studs are manufactured from 316 marine grade stainless steel, the threaded stud (M6) screws into rear lock shaft. Primary wire max. load rating is 1200kg. Should the primary wire need replacing first pull the lock piece all the way back to expose the rear lock shaft, unscrew the M6 stud with 6mm spanner on the flats located on the stud. New primary activation wires/stud threads should be fitted with medium strength thread lock.
- The 3mm 316 SS secondary/backup activation wire is fitted directly through the 4mm hole in the lock piece and forms a loop (crimped together with copper ferules) over the top of the lock cavity which can be used as a backup means of activating the lock should the primary suffer operational damage.
- **Note:** Nautilus ROV and Subsea hooks should not be subjected to side loading or back loading (when fully opened) this may load the hook components in a manner other than intended, excessive side loading forces will damage or reduce the service life of the hook and may induce “lateral slack” in the locking arm.

Lateral Slack

- Lateral slack refers to the horizontal (sideways) movement of the locking arm in relation to the main body of the hook at the point where the tips come together.(diagram).
- If lateral slack on the locking arm exceeds **50%** this indicates damage or side loading abuse has induced excessive lateral wear in the hook.
- Nautilus ROV Hooks which exceed this tolerance for lateral wear should be removed from service and replaced with new unit.



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Want to Learn More – visit www.nautilushooks.com

** Inspection services should contact the manufacturers to receive Nautilus Hooks inspection guidelines and tolerance specifications for re-certification of the NDH Hook range.

Please Contact : info@nautilushooks.com

**Additional Guidance Notes for Inspection
of Nautilus NH-ROV & NH-SS Series (Original 22t) Subsea Hooks**

- All NautilusHooks are manufactured under BS/EN standard 1677. In addition to this international safety hook manufacturing standard Nautilus Hooks are DNV type approved under regulation 2.22. An independent QA procedure that includes verification of the manufacturing processes, assembly, materials and component testing which are common to the original Nautilus Hooks. (different main body pattern as shown at right)
- Nautilus Subsea and ROV Hooks are assembled from 5 basic components, the main load bearing body, the load bearing locking arm, the load bearing main pin, together with the non-load bearing handle portion and lock mechanism.
- During assembly the non-load bearing handle portion is welded to the main load bearing portion at three points as shown in the diagram at right. These welds are non-structural and do not contribute to the rated WLL of the Hooks.
 1. The 2 top handle welds are both “L” shaped welds, starting from each side of the top of lock opening in an “L shape to the locking arm slot.
 2. The centre weld runs underneath/across the bottom of the lock space.
 3. The bottom weld runs right around the base of the handle.
- The weld material is a Nickel/Stainless Steel alloy (non-corrosive) and the load bearing components are carbon steel. These metals have contrasting magnetic permeability values, the weld material is <003% magnetic and the carbon steel is 100% magnetic. This magnetic differentiation affects MPI test methods as the induced magnetic field is disrupted along either side of the weld line (see right) concentrating the particles at the weld lines and giving a false impression of potential cracking.



***** The MPI test procedure is not suitable for Nautilus Hooks**

***** LPI or Dye Penetration is the recommended test for all Nautilus Hooks.**

- The manufacturing standard for lifting hooks calls for fatigue testing/rating of 20,000 cycles at 1.5 x WLL of the hook. (20,000 cycles is the BS/EN 1677 rated hook life)
Nautilus Hooks exceed this requirement with no indication of metal fatigue.
- Should any minor damage become apparent to the non-load bearing handle, including any slight imperfections of the non-structural welded handle joints, the load bearing integrity of the hook (rated 4:1 safety factor) will not necessarily be compromised. Note : The welded joints serve only to fix the handle in place
- Should minor imperfections develop in a welded joint, for whatever reason, they will not propagate into the main body load bearing portion of the hook. Any Nautilus Hook indicating slight deficiencies in a handle weld joint when LPI/Dye tested may be re-certified at the users discretion, and subject to a 2.5 x WLL proof load test.
- In the unlikely event, and for whatever reason, a handle weld should develop clear visual cracks across the full welded joint, then, as a precaution the hook should be removed from service and replaced.

For more information visit : www.nautilushooks.com or email info@nautilushooks.com