

The background is a solid blue color with a faint, light blue technical drawing of a mechanical assembly, possibly a pump or engine component, overlaid. The drawing includes various lines, circles, and hatching, typical of engineering schematics. In the top right corner, there is a small, square inset image showing a close-up of a mechanical part with a blue and white color scheme.

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Imenco Companies

- Imenco AS
 - ✍ Imenco appx. 35 persons, Engineers and managers
- Smedasundet Maritime Senter
 - ✍ Apprx. 12 Companies; Technology, ROV, Diving
 - ✍ Quay for most offshore ships
 - ✍ Workshop Facilities
 - ✍ Excellent infrastructure for under water technology

Location



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Precursor

Play Animation of bolts



- Developed saw for steel foundation removal
- Replace foundation with pull-in porch
- Use remaining foundation for anchoring
- Requirements for firm attachment without play
- Alternative to welding or regular bolting
- Reversible
- Re-install with same accuracy
- ROV Operation at 350 meter depth

Project Description

- Statoil – Sonsub Project
- Imenco as subcontractor to Sonsub
- Short development time
- Full testing requirement
- Design and tests at Imenco
- Construction in Haugesund

Design

- Special bayonet interface coupling
- Choice of material (Stainless, high tensile etc.)
- Reversibility
- Torque testing and documentation
- Special tools for:
 - Installation
 - Torque
 - Removal

Patent application

- "Fixing Device" for use by ROV
- Plate attachment
- Sacrificial anode for plate, bolt and holes
- Electric connections for anodes
- ROV operation
- Installation and torque reaction
- Standard interface for tools and ROV

Products



Alternative bolts for holes and rod

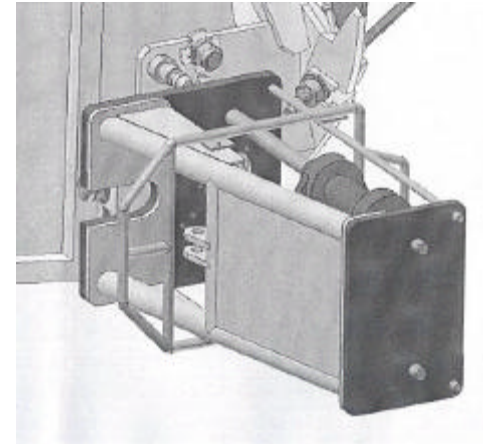
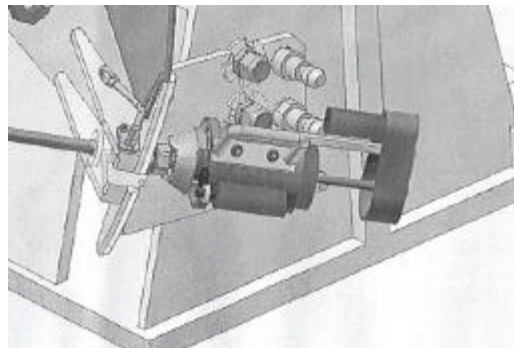


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Plate joining



Attachment of Brackets on Snorre B



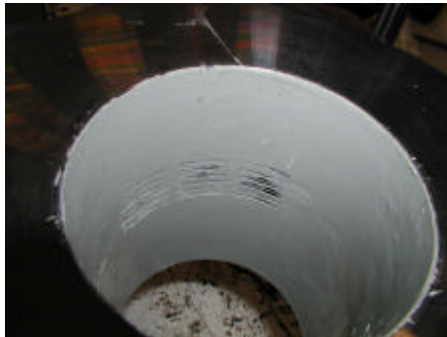
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Testing Sacrificial Anodes



*Anode bolts
Testing*

*For penetration in
structures*



For bolts and rods

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Sacrificial anodes



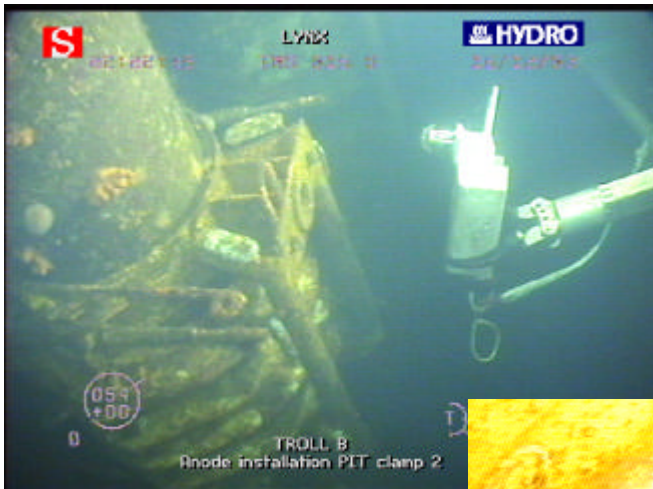
*Anodes for
installation on
Troll B*



Installation Experience

- 10 ea. Anodes installed in 9 h 40 min by ROV
- Best 14 min. from leave deck to return to deck
- Time includes ship relocation, prep. and inspection
- Time includes ROV maintenance
- Preparation includes wire removal and cleaning
- Conditions up to 30 knots, 3 - 4,2 meter max
- Sites includes 2 ea. Structure - 8 ea. Anchor Anodes
- Depth varies from 20 meter to 300 meter
- Operation stopped for WOW (3,2 - 5,2 meter max)

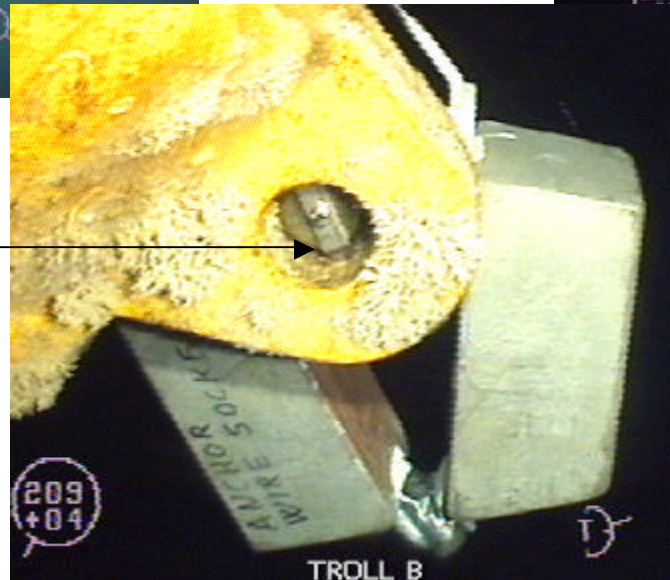
Anchor line and PIT Clamp



Anodes installed on PIT Clamp and on Anchor lines



Expansion
retainer spring



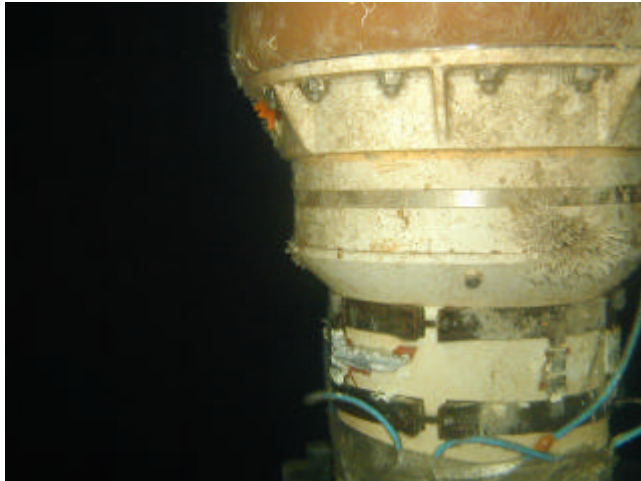
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Video presentation

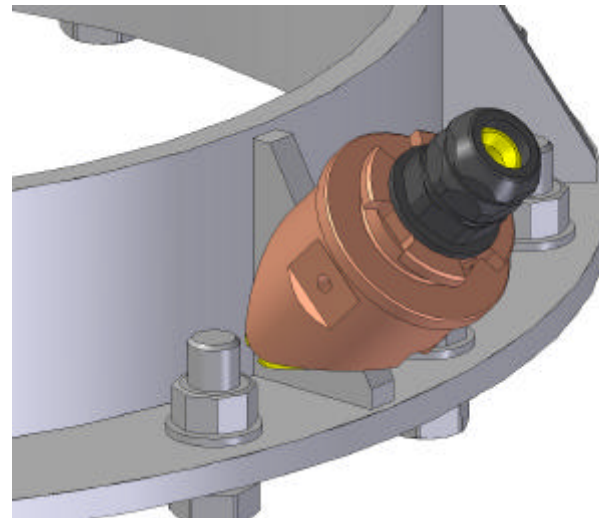
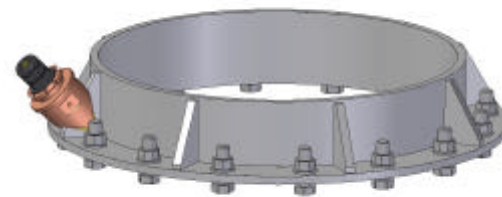
Play Video of Anode
Installation

Play Video of Expansion Bolt
Installation

Plate Grips

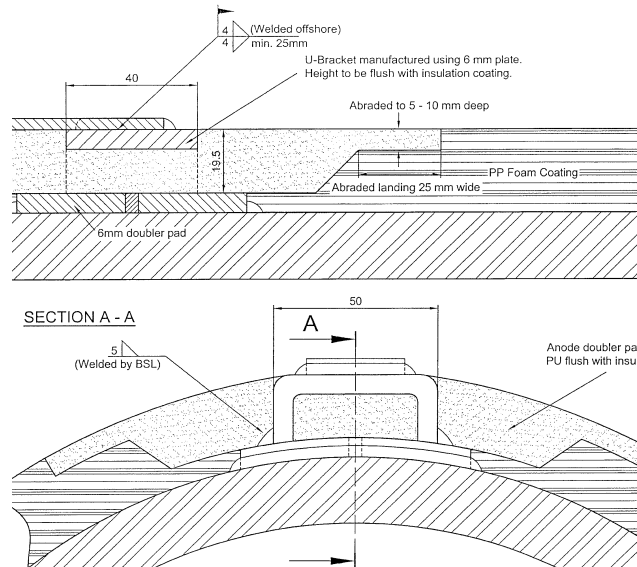


*Anode grounding
on riser Troll B
(Never installed)*

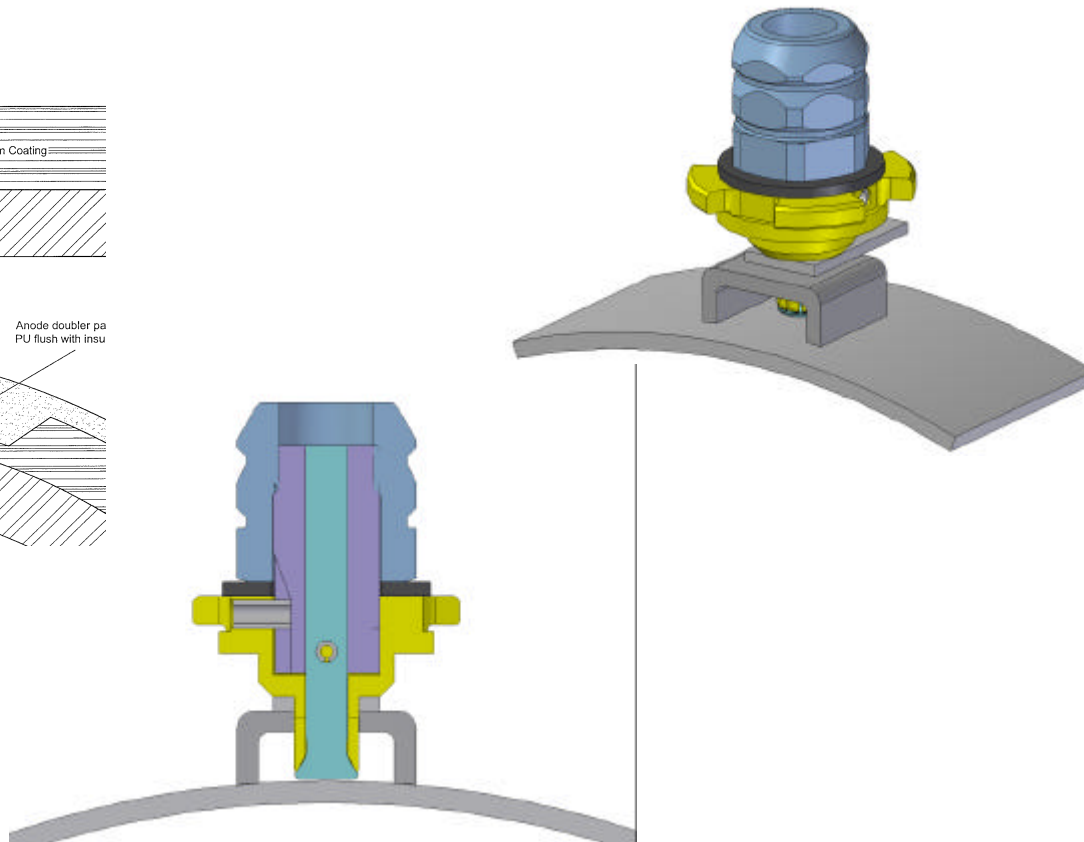


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Skirne Pipeline (proposal)



Repair proposal of earth bar



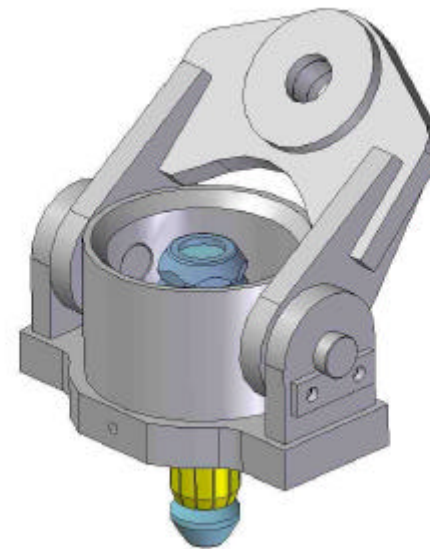
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Concrete and hang off



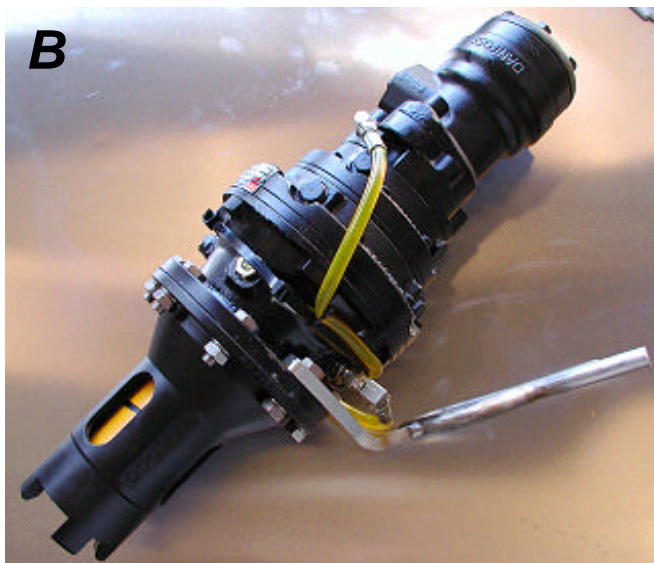
70 mm Concrete Attachment bolt for hang off and installation

5 ton SWL pad eye for steel plate



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Tools

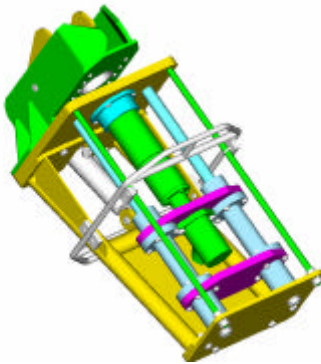


ROV tools for installation

- A. Installation by manipulator*
- B. Torque Tool*
- C. Removal Tool*

Drill Tools

A



B



C



D



Drill Tools

- A. Principe**
- B. Test open profile**
- C. Test operation**
- D. Alternative Tool**

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Range of Use

- Attachment of anodes
- Provide electrical connections for anodes
- Plate Joining
- Attachment of brackets
- Installation of new components
- Strengthening – Structure adding – repair
- Lift attachments (25 ton per bolt)
- Temporary installations

Applications

- Steel Structures
- Concrete Structures
- Pipelines
- Sub sea and Topside
- Installation "Top side" without "Hot work"
- ROV and diver operations

Adaptation

- Steel selection and tool interface is "Standard"
- Expansion area modified for application
- Existing designs
 - 40 mm hole – short delivery
 - 90 mm hole – short delivery
 - 20 mm rod – short delivery
 - 12-16 mm plate – short delivery
- "Reasonable" adaptations simple
- Major modifications in reasonable time
- Steel qualities may be varied

The background is a solid blue color with faint, white technical drawings of mechanical parts, including what appears to be a piston and a valve, overlaid on it.

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**Thanks for
watching**