



KONGSBERG

# ***Simrad SP90/SX90/SU90***

## ***Transducer replacement procedure***

This document explains how to replace the transducer on a Simrad SP90, SX90 and SU90 Series hull unit.

Note \_\_\_\_\_

*This procedure is not intended for end users. See Personnel requirements on page 6.*

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## Revision status

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# About this document

This document explains how to replace the transducer on a Simrad SP90/SX90/SU90 Series hull unit.

The document is used for the following sonar systems:

- Simrad SP90
- Simrad SX90
- Simrad SU90

## Note

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*In order to ensure a safe and correct operation, make sure that you comply to this procedure.*

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# Logistics

## Topics

- *Personnel requirements* on page 6
- *Required tools for transducer replacement* on page 6

## Personnel requirements

### Note

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*This procedure is not intended for end users. Transducer replacement can only be done by representatives from Kongsberg Maritime/Simrad or from an authorized dealer or agent.*

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The tasks related to transducer replacement are provided for technical personnel; qualified maintenance engineers and technicians. It is assumed that you are conversant with the general principles of maritime electronic equipment, in particular sonar, echo sounder and catch monitoring systems. You must also be familiar with traditional troubleshooting and parts replacement on electronic and electromechanical products.

## Required tools for transducer replacement

Transducer replacement is normally done with the vessel in dry dock. The work then involves shipyard workers and their specialised tools.

The following tools are recommended for SP90/SX90/SU90 transducer replacement, and must be regarded as a minimum. Each tool must be provided in various sizes. We recommend that all tools are demagnetized prior to use to protect your equipment.

### **Recommended tools for troubleshooting and parts replacements on electronic and electromechanical products**

- Screwdrivers (flat, cross pointed, Phillips, Pozidrive etc)
- Allen keys
- Cable cutters and wire strippers
- Flat nose pliers

- Cable stripper
- Wrenches
- Spanners
- Tweezers

The following test and measuring instruments are also recommended for electronic troubleshooting and repair:

- Digital multimeter
- Oscilloscope
- Signal generator

Whenever special tools or test instruments are required by a specific procedure, these are identified in the procedure.

# Procedures

## Topics

- *Replacing the transducer* on page 8
- *Replacing the zinc anodes* on page 12

## Replacing the transducer

This set of procedures explain how to replace the transducer. The procedure is used for the following sonar systems:

- Simrad SP90
- Simrad SX90
- Simrad SU90

### Note

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*The illustrations provided are those for the SP90/SX90 transducer. The SU90 transducer is slightly longer.*

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## Topics

- *Transducer replacement introduction* on page 8
- *Relevant spare parts* on page 9
- *Unpacking a new transducer* on page 9
- *Dismounting the transducer from the bottom of the transducer shaft* on page 10
- *Mounting a new transducer to the bottom of the transducer shaft* on page 11

## Transducer replacement introduction

The transducer is mounted at the lower end of the transducer shaft.

Once the vessel is docked, the transducer can be replaced in two different ways:

- by lowering the transducer below the keel
- by lifting the complete hull unit up from the sonar trunk



In the following procedure it is assumed that the transducer is accessible, and that the 3-phase mains voltage to the hull unit is disconnected.

### Important

If the hull unit is dismantled from the trunk, we strongly recommended that you also replace the zinc anodes. New zinc anodes are included in the transducer delivery. For replacement, refer to section *Replacing the zinc anodes* on page 12.

## Relevant spare parts

SP90/SX90 Complete transducer		
Item	Item / Unit	Part no
–	Complete transducer & mounting hardware	KSV-206270

SU90 Complete transducer		
Item	Item / Unit	Part no
–	Complete transducer & mounting hardware	387096

Mounting hardware		
Item	Item / Unit	Part no
1	Zin anodes (4 ea)	629-204660
2	O-rings for shaft flange (3 ea)	540-096230
3	M8x50 fastening bolts (16 ea)	560-053677
4	M10x60 bolts for dismounting (4 ea)	560-017871
5	Loctite, 10 ml bottle	317634
6	6 mm Allen key	317732

## Unpacking a new transducer

### Purpose

This procedure explains how to unpack the new transducer from the wooden transportation crate.

## Description

The transducer is provided in a wooden transport crate. During unpacking, make sure that the crate is not damaged.

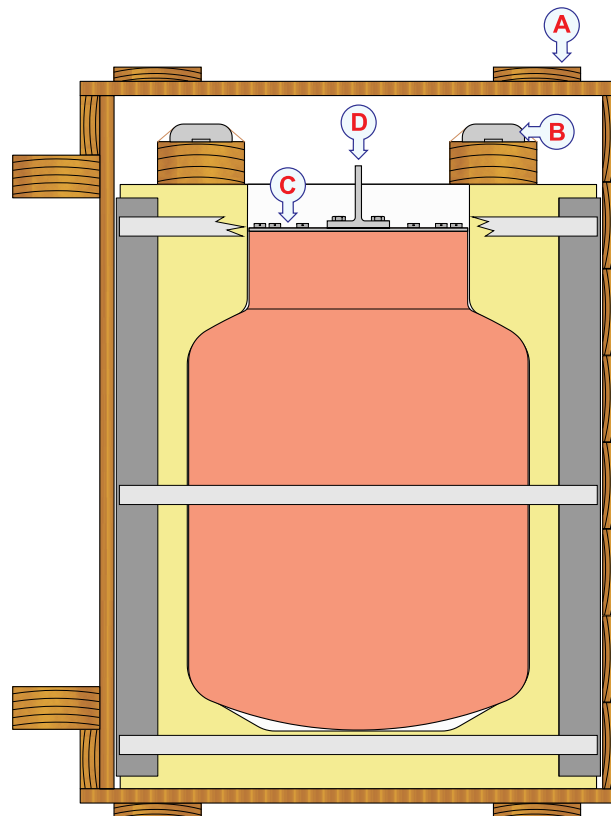
**A** Marking "Top when unpacking"

**B** Zinc anodes

**C** Plastic cover bolted to the top of the transducer to protect the plugs

**D** Lifting bracket, must be removed before the transducer is connected to the shaft.

*The wooden transport crate containing the transducer*



## Special tools and instruments

- Lifting equipment
- Transportation device

## Procedure

- 1 Position the wooden crate with the transducer as close as possible to the hull unit.
- 2 Identify the top of the crate, it is marked *Top when unpacking*.
- 3 Remove the top wooden boards, and dismount the four zinc anodes which are fastened to the two wooden crosspieces.
- 4 Locate the nails holding the two wooden crosspieces in place, and remove them.

The nails are marked with Indian ink rings.

- 5 Use a lifting device to lift the transducer – with the transport protection in place – out of the wooden box.
- 6 Place the protected transducer next to the hull unit.
- 7 Verify that the transducer crate contains the transducer and the mounting hardware listed in the *Spare parts* listing.

## Dismounting the transducer from the bottom of the transducer shaft

### Purpose

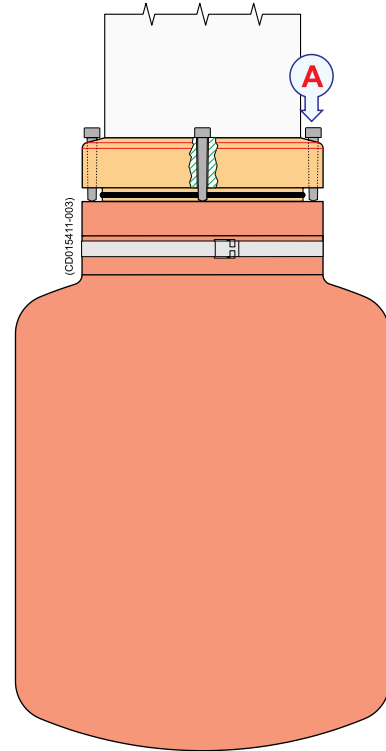
This procedure explains how to dismount the transducer from the bottom end of the transducer shaft.

## Description

If the damage to the old transducer allows it to be returned to Kongsberg Maritime for repair, use one part of the transport protection as a protection bed under the transducer.

- A** *The four Allen key bolts are used to press the transducer downwards.*

*Dismounting the transducer*



## Special tools and instruments

- Lifting equipment
- Transportation device

## Procedure

- 1 Release the Motor Protecting Switch **S301** in the Motor Control Unit by pressing the operating handle downwards to position OFF.
- 2 Set the hoisting/lowering switch **S302** in the Motor Control Unit to position STOP.
- 3 Locate the 6 mm Allen key to unbolt the 16 fastening bolts.
- 4 Locate the four 10 mm Allen bolts in the spare part kit which follows the new transducer.
- 5 Use these bolts in the four threaded holes on the fastening flange to press the transducer off from the shaft.
- 6 Remove the four bolts from the shaft flange.
- 7 Use the lifting yoke from the new transducer to remove the old transducer.

Note \_\_\_\_\_

*The transducer is heavy! Ensure that you have access to proper lifting equipment.*

- 8 Remove the three O-rings carefully from the transducer shaft.

## Mounting a new transducer to the bottom of the transducer shaft

### Purpose

This procedure explains how to mount a new transducer to the bottom end of the transducer shaft.

## Description

- A** Guide pin
- B** Rotate the transducer to make the guide pin hit its hole,
- C** Mount the 16 fastening bolts. Observe the specified torque.

## Special tools and instruments

- Lifting equipment
- Transportation device
- Silicone grease for O-rings

## Procedure

- 1 Clean the end of the shaft thoroughly.

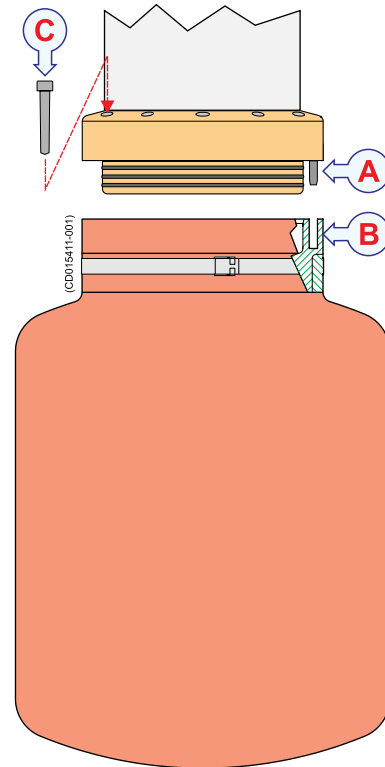
Note \_\_\_\_\_

*Do not use a brush or rag that can leave hair or fibres.*

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- 2 Locate the three new O-rings in the spare parts which follow the new transducer.
- 3 Spread some silicon grease on the O-rings, and put them on to the shaft end.
- 4 Put the new transducer on the transport-protection under the hull unit.
- 5 Turn the transducer so the guide hole is in correct position related to the guide pin on the shaft end.
- 6 Lower the shaft end carefully down while adjusting the transducer in correct position.
- 7 Locate the 16 new fastening bolts and the bottle of Loctite in the spare part kit.
- 8 Apply 2–3 drops of Loctite on each fastening bolt, and fasten the transducer.
- 9 Tighten up the bolts with a torque of 22 Nm.

Mounting the new transducer

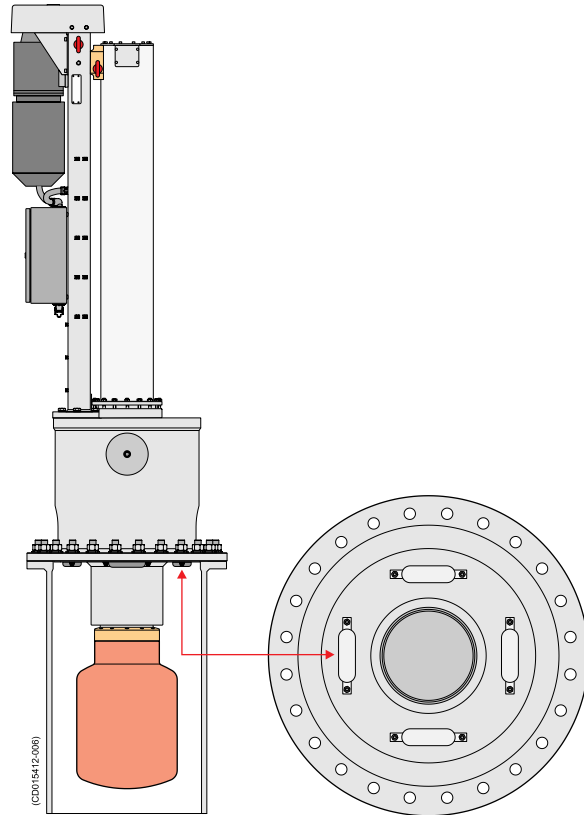


## Replacing the zinc anodes

The zinc anodes are located under the mounting flange on the shaft sleeve. The parts related to this procedure are identified below.

**Important** \_\_\_\_\_

We recommend that you check the zinc anodes every time you dock the vessel, and that you replace them when required. In the event that maintenance tasks are carried out on the hull unit with the unit is dismantled from the trunk, we recommended that you replace the zinc anodes simultaneously.

*Location of the zinc anodes***Spare parts**

- on page

**Prerequisite**

The following procedure assumes that the hull unit has been dismantled from the mounting trunk.

**Procedure**

- 1 Locate the four zinc anodes under the mounting flange on the shaft sleeve.

- 2 Dismount the four zinc anodes.

The zinc anodes are mounted with 8 mm nuts and lock washers made from acid-proof stainless steel.

- 3 Mount new zinc anodes.

If necessary, replace the nuts and washers with new. Ensure that you use a corresponding quality of acid-proof stainless steel. Bolts and nuts are not provided with the new zinc anodes, and must be purchased locally.

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