OWNER'S GUIDE & INSTALLATION INSTRUCTIONS

Side Scan Transducer

with Anti-rotation Hardware

Model: **SS903 SS904**

06/06/23

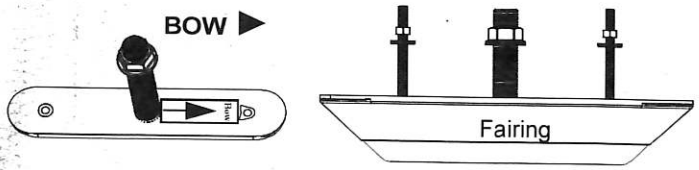
102366-rev.3

D-20553-rev.3

Record the information found on the cable tag for future reference.

Part No:_____ Serial No:_____

Date_____ Frequency_____ kHz



Follow the precautions below for optimal product performance and to reduce the risk of property damage, personal injury, and/or death.

WARNING: Installation of the anti-rotation studs/screws is mandatory! The anti-rotation studs/screws hold the fairing firmly in place. Failure to install the anti-rotation studs/screws may result in the fairing rotating while the boat is underway. The effect may be violent movement and loss of steering.

WARNING: The transducer must be installed parallel to the keel/centerline to ensure proper boat handling and water flow under the transducer.

WARNING: Always wear safety glasses, a dust mask, and ear protection when installing.

WARNING: Immediately check for leaks when the boat is placed in the water. Do not leave the boat in the water unchecked for more than three hours. Even a small leak may allow a considerable amount of water to accumulate.

WARNING: **Fairing**—The fairing must be screwed to a block of wood before cutting. It is too thin to cut safely without additional material. Failure to do so may result in the fairing moving on the band saw.

WARNING: **Fairing**—Do not install a fairing that has been mis-cut. Replace it.

- Cutting the fairing at an angle greater than the maximum allowed will cut into the transducer and/or anti-rotation pockets, thus weakening the fairing.
- Do not allow any gap between the fairing and the hull that is greater than 1.5mm (1/16"). When the boat is underway, water will enter any gaps and push against the fairing with considerable force, possibly rotating it.

WARNING: **Fiberglass hull**—The transducer must be installed in solid fiberglass, not in coring.

CAUTION: Never install a metal transducer on a vessel with a positive ground system.

CAUTION: Never pull, carry, or hold the transducer by the cable as this may sever internal connections.

CAUTION: Never strike the transducer.

CAUTION: **Stainless steel transducer in a metal hull**—Stainless steel must be isolated from a metal hull to prevent electrolytic corrosion. Use the isolation sleeving supplied.

CAUTION: **Transducer Orientation** —Be sure to install the transducer in the correct orientation to the bow. If the transducer is installed in reverse, the display will not work properly.

CAUTION: **Installation without a Fairing** —The transducer must be installed on a nearly flat hull with less than 10°of deadrise. Do not install on a V-hull. If the transducer is installed without a fairing on a hull with a deadrise greater than 10°, the display will not work properly.

CAUTION: **Transducer Pair** —Be sure to install the port transducer and the starboard transducer in the correct orientation to the bow. If the transducers are installed in reverse, the display will not work properly.

CAUTION: Never use solvents. Cleaner, fuel, sealant, paint, and other products may contain solvents that can damage plastic parts, especially the transducer's face.

IMPORTANT: Read the instructions completely before proceeding with the installation. These instructions supersede any other instructions in your instrument manual if they differ.

Applications

- Stainless steel is compatible with all hull materials. Recommended for aluminum hulls to prevent electrolytic corrosion, provided the stainless steel transducer is isolated from the metal hull.
- Recommended for boats capable of speeds up to 30kn (35MPH). Optimal speed is 1.5 - 8.5kn (2 - 10MPH).
- A fairing is strongly recommended if the deadrise angle of the hull exceeds 10°. The fairing can accommodate a deadrise angle of up to 22°.
- **Transducer Pair** - On a boat with a steep deadrise angle, a pair of transducers, one on the port side and one on the starboard side, can be installed and connected to the echosounder module.
- For stepped hulls, to be installed just ahead of the first step.

Tools & Materials

Safety glasses
Dust mask
Ear protection
Angle finder (installation with fairing)
Band saw (installation with fairing)
Block of wood (installation with fairing) — min. 4" x 4" x 18"
Screws (4) (installation with fairing) — No. 8
Screwdrivers
Rasp *or* power tool (installation with fairing)
Electric drill
Drill bits and hole saws:
- Pilot hole — 3mm *or* 1/8"
- Transducer stem — 25mm *or* 1"
- Anti-rotation studs in solid fiberglass or wood hull — 9mm *or* 11/32"
- Anti-rotation studs in metal hull — 10mm *or* 3/8"
- Sandpaper

Mild household detergent *or* weak solvent (such as alcohol)
File (installation in metal hull)
Marine sealant (suitable for below waterline)
Slip-joint pliers
Grommet(s) (some installations)
Cable ties
Water-based anti-fouling paint (**mandatory in salt water**)
Installation in a cored fiberglass hull: (see page 8)
Drill bits and hole saws for hull interior:
- Transducer stem — 38mm *or* 1-1/2"
- Anti-rotation studs — 19mm *or* 3/4"
- Cylinder, wax, tape, and casting epoxy

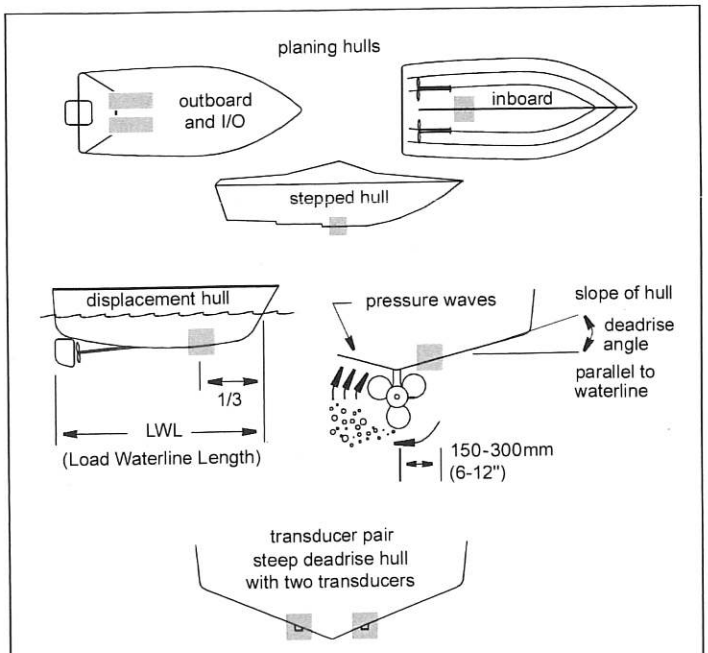


Figure 1. Best location

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Mounting Location

Guidelines

CAUTION: Do not mount in line with or near water intake or discharge openings or behind strakes, struts, fittings, or hull irregularities that will disturb the water flow.

CAUTION: Do not mount the sensor where the boat may be supported during trailering, launching, hauling, or storage to avoid damaging the transducer's face.

- The water flowing under the hull must be smooth with a minimum of bubbles and turbulence (especially at high speeds).
- The transducer must be continuously immersed in water.
- The transducer beam must be unobstructed by the keel or propeller shaft(s).
- Choose a location away from interference caused by power and radiation sources such as: the propeller(s) and shaft(s), other machinery, other echosounders, and other cables. The lower the noise level, the higher the echosounder gain setting that can be used.
- Choose an accessible spot inside the vessel with adequate space for the height of the stem and tightening the nuts.
- Choose a location with a minimal deadrise angle. If the hull has a steep deadrise, mount a pair of transducers.

Boat Types (Figure 1)

- **Planing hull powerboat**—Mount well aft near the centerline and *well inboard of the first set of lifting strake*s to insure that it is in contact with the water at high speeds. The starboard side of the hull where the propeller blades are moving downward is preferred.
  Outboard and I/O—Mount just forward and to the side of the engine(s).
  Inboard—Mount well ahead of the propeller(s) and shaft(s).
  Stepped hull—Mount just ahead of the first step.

- **Displacement hull powerboat**—Locate 1/3 of the way along the LWL and 150–300mm (6–12") off the centerline. The starboard side of the hull where the propeller blades are moving downward is preferred.

- **Transducer Pair**—Mount the transducers across from one another on opposite sides of the centerline (keel).

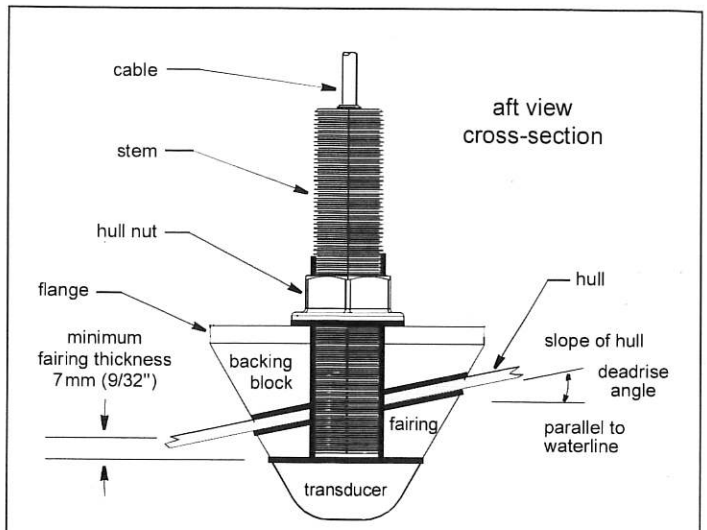


Figure 2.
Deadrise angle and fairing thickness
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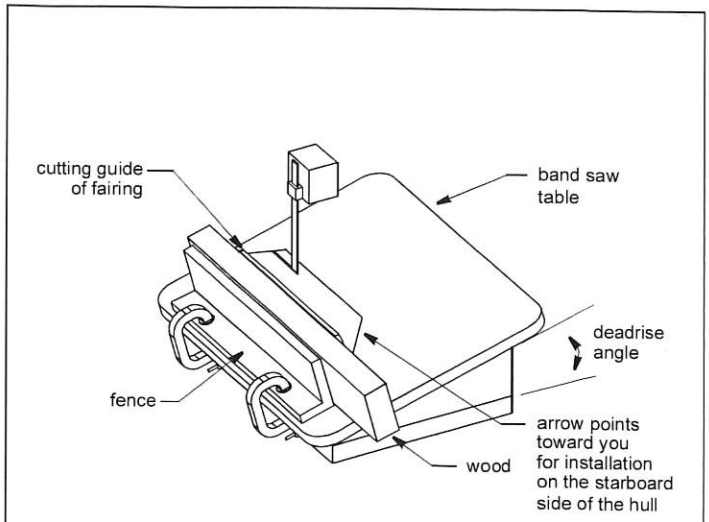


Figure 3. Cutting the fairing
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Installation:

***NOTE**: If you are installing the transducer with NO fairing, disregard all references to a fairing and backing block. Skip to "Hole Drilling" on page 3.*

Cutting the Fairing

CAUTION: The arrow on the fairing points forward toward the bow when installed. Be sure to orient the fairing on the band saw, so the angle cut matches the intended side of the hull and not the mirror image.

CAUTION: Shape the fairing to the hull as precisely as possible. If there are gaps between the fairing and the hull near the ends, cut a new fairing. Over tightening the rods to minimize gaps may crack the transducer and/or crush the fairing.

1. **Metal hull**—The holes for the anti-rotation studs must be enlarged to accommodate the isolation sleeving. Using a 10mm (3/8") drill bit, enlarge the two holes in the fairing.
2. Measure the deadrise angle of the hull at the selected mounting location using an angle finder or a digital level (Figure 3).
3. Tilt the band saw table to the measured angle and secure the cutting fence (Figure 4).
4. Fasten the fairing to the center of the block of wood using the four corner holes and No. 8 screws.
5. Place the fairing on the table so the cutting guide rests against the fence. The arrow will be pointing *toward* you for installation on the starboard side of the boat or *away* from you for installation on the port side (Figure 5).
6. Adjust the cutting fence, so the fairing will be cut in about two equal parts (Figure 3). *The section that will become the fairing must be a minimum of 7mm (9/32") at its thinnest dimension.* This number corresponds to the flange on the fairing.
7. Recheck steps 1 through 5. Then cut the fairing.
8. **Check the fit of the fairing by placing it against the hull, being sure it is parallel to the centerline of the boat (keel).** Hold the fairing on the ends and try to rock it back and forth. Shape the fairing to the hull as precisely as possible with a rasp or power tool until it no longer rocks.
9. Remove the fairing from the block of wood.
10. Use the remaining section of the fairing with the cutting guide as the backing block.

Hole Drilling

***Cored fiberglass hull**—Follow separate instructions on page 6.*

1. Locate and drill the holes for the transducer stem and anti-rotation studs, using the fairing or the provided template on page 8 as a guide (Figure 4, 5, 6, or 7). Align the fairing or template parallel to the centerline of the boat (keel).
   - Drill 3mm (1/8") pilot holes for the transducer stem and the two anti-rotation studs.
   - Using the appropriate drill bits/hole saw, drill the holes for the transducer stem and the two anti-rotation studs.
     Fairing—Drill through the holes in the fairing to be sure the holes are drilled *perpendicular to the waterline* and not at the angle of the hull.
     NO Fairing—Be sure to drill the holes perpendicular to the hull.
2. Sand and clean the area around the holes, inside and outside, to ensure the marine sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either a mild household detergent or a weak solvent (alcohol) before sanding.
   Metal hull—Remove all burrs with a file and sandpaper.

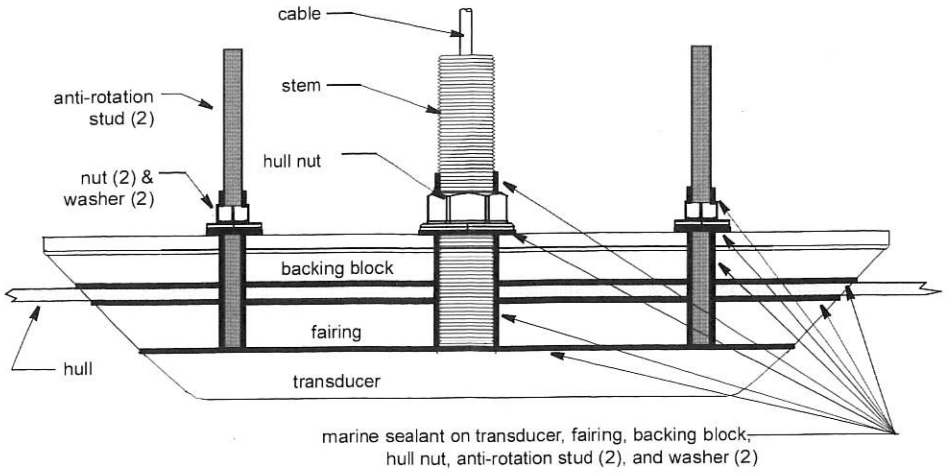


Figure 4. Bedding and installing with a fairing in a fiberglass or wood hull

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Bedding

CAUTION: Be sure all surfaces to be bedded are clean and dry.

CAUTION: When installing the anti-rotation studs, use slip-joint pliers placed near the bottom of the stud. Do not use pliers farther up, as this will damage the threads.

1. Remove the hull nut (Figure 4,5, 6, or 7).
2. Apply a 2mm (1/16") thick layer of marine sealant to the surface of the transducer that will contact the hull/fairing and up the stem. *The sealant must extend 6mm (1/4") higher than the combined thickness of the hull, fairing and backing block (if used), and the hull nut.* This will ensure there is marine sealant in the threads to seal the hull and hold the hull nut securely in place.
3. Apply a 2mm (1/16") thick layer of marine sealant around the anti-rotation studs *including the bottom*. This will ensure there is marine sealant in the threads to secure the studs in the transducer, seal the hull, and hold the nut securely in place.
4. Screw the anti-rotation studs into the holes in the transducer. Using slip-joint pliers placed *near the bottom of the stud*, tighten each one in turn. Do not use pliers farther up, as this will damage the threads.
5. **Metal hull**—Use the isolation sleeving to cover the transducer stem and the two anti-rotation studs. Cut the length of each sleeve greater than the thickness of the hull. *Note that the sleeves must not interfere with tightening the nuts.* Slide the larger diameter isolation sleeve over the bedded transducer stem. Slide the two remaining isolation sleeves over the bedded anti-rotation studs. Slide the sleeves as far down as possible. Apply a 2mm (1/16") thick layer of the marine sealant to the outside of the three isolation sleeves.
6. **Fairing**—Thread the transducer cable through the fairing. Seat the transducer firmly within the recess in the fairing. Apply a 2mm (1/16") thick layer of marine sealant to the following surfaces:
   - Fairing that will contact the hull
   - Backing block that will contact the hull
   - Hull nut that will contact the backing block
   - Washers for the anti-rotation studs that will contact the backing block

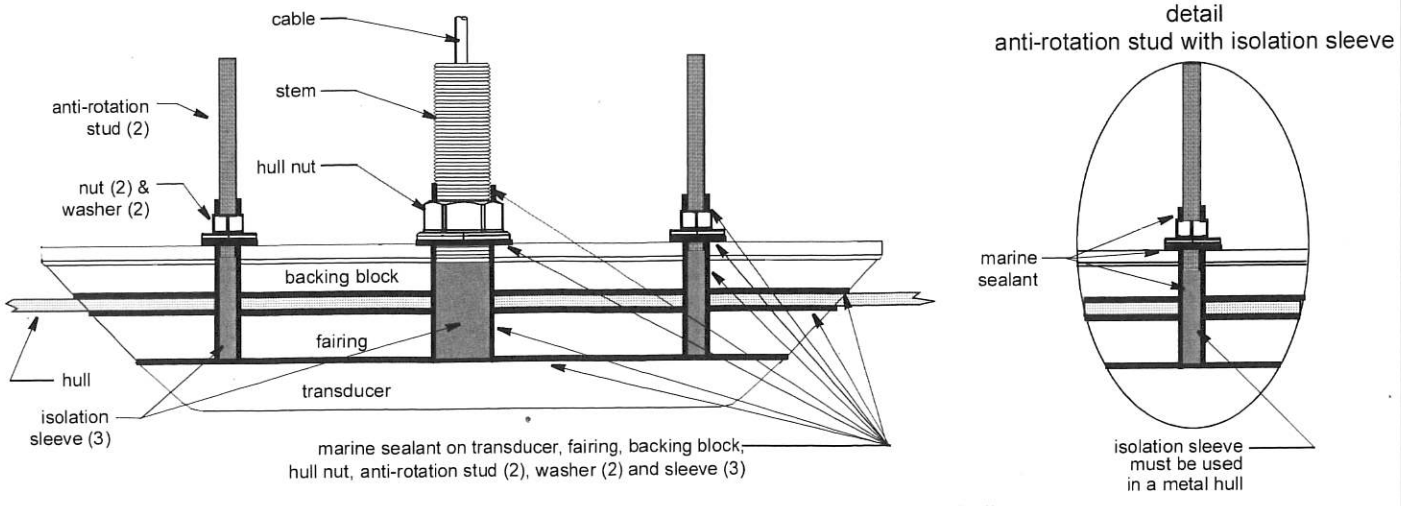


Figure 5. Bedding and installing with a fairing in a metal hull

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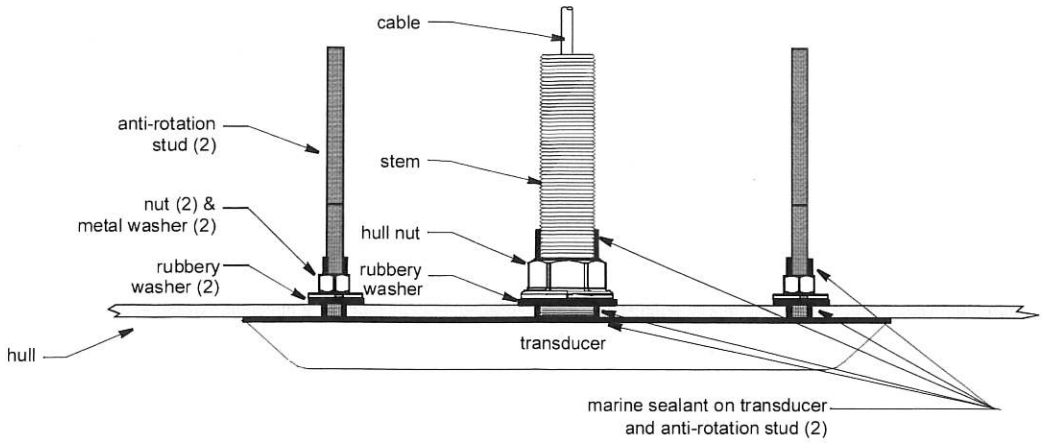


Figure 6. Bedding and installing WITHOUT a fairing in a fiberglass or wood hull

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Installing

CAUTION: Do not over-tighten the nuts possibly damaging the transducer or fairing.

1. From outside the hull, thread the cable through the mounting hole (Figure 4, 5, 6, or 7).
2. Push the stem of the transducer and the anti-rotation studs through the hull.
3. From inside the hull:
   - **Fairing**—Slide the backing block and the hull nut onto the cable. Seat the backing block firmly against the hull. Screw the hull nut in place and tighten it with slip-joint pliers. *Do not over-tighten*. With the bedded side down, slide one washer and nut onto each anti-rotation stud. Tighten the nuts *one full turn only* with slip-joint pliers. *Do not over-tighten.*
     Cored fiberglass hull—*Do not* over-tighten crushing the hull.
     Wood hull—Allow for the wood to swell before tightening.
     Metal hull—Be sure the isolation sleeves are between the transducer stem/studs and the hull. *The isolation sleeves must be below the nuts to prevent the sleeves from interfering with tightening the nuts.* Trim the sleeves if necessary.
   - **NO fairing**—Slide the rubbery washer and hull nut onto the cable. Seat the rubbery washer firmly against the hull. Screw the hull nut in place and tighten it with slip-joint pliers. *Do not over-tighten*. Slide the rubbery washer, metal washer, and nut onto each anti-rotation stud. Seat the rubbery washer firmly against the hull. Tighten the nuts *one full turn only* with slip-joint pliers. *Do not over-tighten.*
     Cored fiberglass hull—*Do not* over-tighten crushing the hull.
     Wood hull—Allow for the wood to swell before tightening.
     Metal hull—Be sure the isolation sleeves are between the transducer stem/studs and the hull. *The isolation sleeves must be below the nuts to prevent the sleeves from interfering with tightening the nuts.* Trim the sleeves if necessary.
4. **Fairing**—When the boat is underway, especially at high speeds, water will enter any gaps and push against the fairing with considerable force, possibly rotating it. Fill any gaps between the fairing and the hull with marine sealant. **If there is any gap greater than 1.5mm (1/16"), replace the fairing.**
5. Remove any excess marine sealant on the outside of the hull, transducer, and fairing if used to ensure smooth water flow under the transducer.

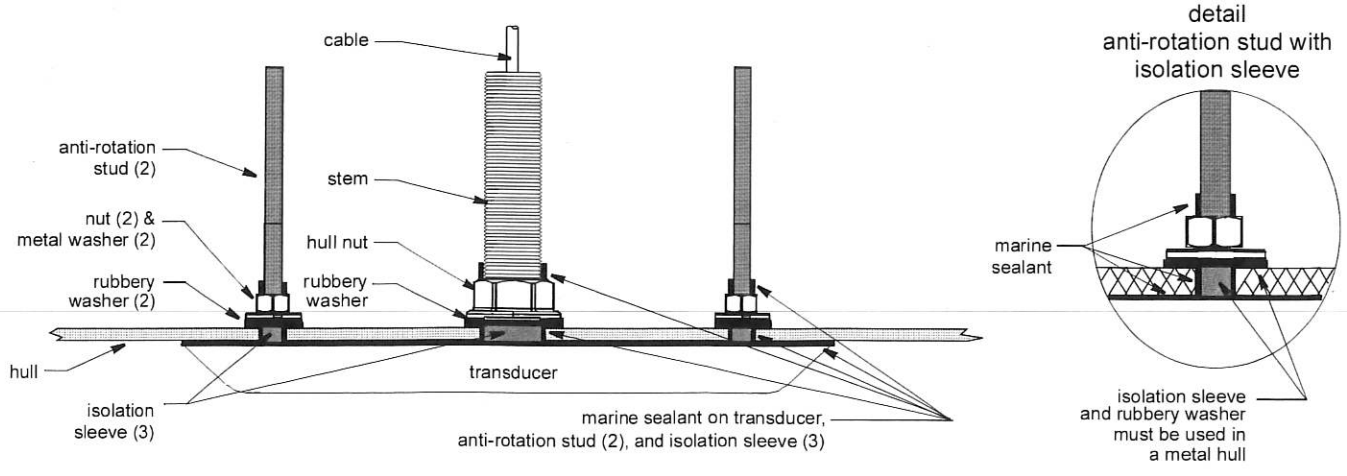


Figure 7. Bedding and installing WITHOUT a fairing in a metal hull

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Installation in a Cored Fiberglass Hull

The core (wood or foam) must be cut and sealed carefully. The core must be protected from water seepage, and the hull must be reinforced to prevent it from crushing under the hull nut allowing the transducer(s) to become loose.

CAUTION: Completely seal the hull to prevent water seepage into the core.

1. Drill a 3mm or 1/8" pilot hole perpendicular to the waterline from inside the hull (Figure 8). If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside. If the hole is drilled in the wrong location, drill a second hole in a better location. Apply masking tape to the outside of the hull over the incorrect hole and fill it with epoxy.
2. Using the appropriate size drill bit/hole saw, cut a hole from outside the hull through the outer skin only. Be sure to hold the drill plumb, so the hole will be perpendicular to the water surface.
3. The optimal interior hole diameter is affected by the hull's thickness and deadrise angle. It must be large enough in diameter to allow the core to be completely sealed.
4. Using the drill bit/hole saw for the hull interior, cut through the *inner* skin and most of the core from inside the hull keeping the drill perpendicular to the hull. The core material can be very soft. Apply only light pressure to the drill bit after cutting through the *inner* skin to avoid accidentally cutting the *outer* skin.
5. Remove the plug of core material so the *inside* of the outer skin and the inner core of the hull is fully exposed. Sand and clean the inner skin, core, and the outer skin around the hole.
6. Coat a hollow or solid cylinder of the correct diameter with wax and tape it in place. Fill the gap between the cylinder and hull with casting epoxy. After the epoxy has set, remove the cylinder.
7. Sand and clean the area around the hole, inside and outside, to ensure that the sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either mild household detergent or a weak solvent (alcohol) before sanding.
8. Follow the same procedure to prepare the hull for each anti-rotation stud/screw (steps 1 through 6).
9. Proceed with "Bedding" on page 4.

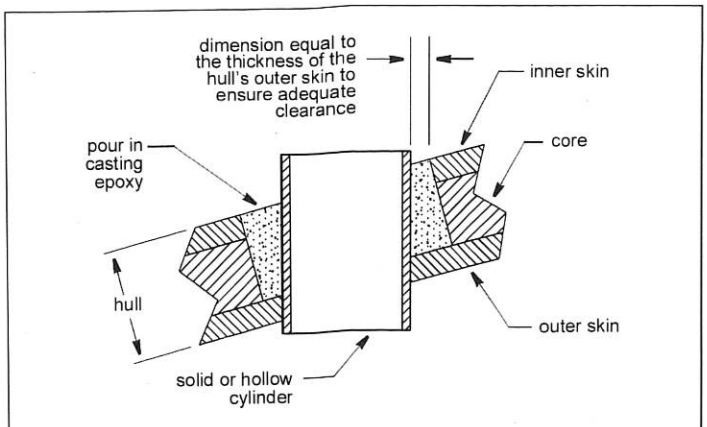


Figure 8. Preparing a cored fiberglass hull

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Cable Routing & Connecting

CAUTION: Do not remove the connector(s) to ease cable routing. If a cable must be cut and spliced, use Airmar's splash-proof Junction Box No. 33-035 and follow the instructions provided. Removing the waterproof connector or cutting the cable, except when using a water-tight junction box, will void the sensor warranty.

1. Refer to the instructions that came with the echo sounder module to connect it to the display and the power supply.
2. **Transducer Pair**—Connect the starboard transducer to the short cable on the port transducer. Rout the longer cable on the port transducer to the echo sounder module (Figure 9).

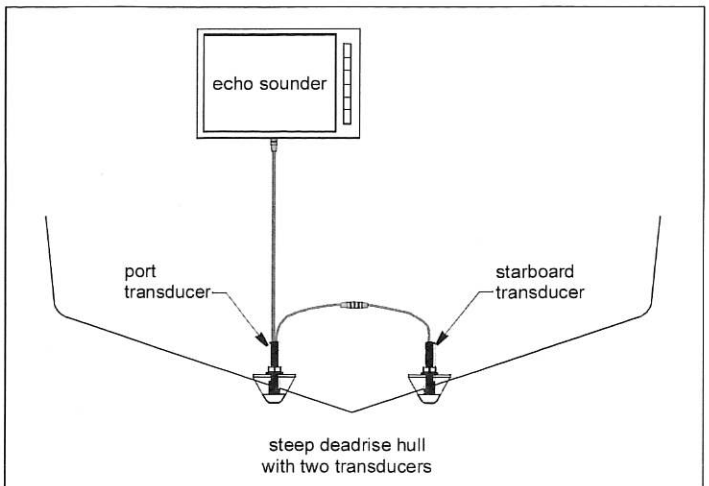


Figure 9. Cable routing transducer pair

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Maintenance, Parts & Replacement

Anti-fouling Coating

Surfaces exposed to salt water must be covered with an anti-fouling coating. Use a *water-based* anti-fouling coating made for transducers only. Never use ketone based paint, since ketones can attack many plastics possibly damaging the transducer. Brush on anti-fouling coating every 6 months or at the beginning of each boating season.

Checking for Leaks

When the boat is placed in the water, **immediately** check around the transducer(s) for leaks. Note that very small leaks may not be readily observed. Do not leave the boat in the water for more than 3 hours before checking it again. If there is a small leak, there may be considerable bilge water accumulation after 24 hours. If a leak is observed, repeat "Bedding" and "Installing" **immediately**.

Cleaning

Aquatic growth can accumulate rapidly on the transducer's surface reducing its performance within weeks. Clean the surface with a Scotch-Brite® scour pad and mild household detergent taking care to avoid making scratches. If the fouling is severe, lightly wet sand with fine grade wet/dry paper.

Transducer Replacement & Parts

The information needed to order a replacement transducer is printed on the cable tag. Do not remove this tag. When ordering, specify the part number, serial number, date, and frequency in kHz. For convenient reference, record this information on the top of page 1.

Lost, broken, and worn parts should be replaced immediately.

Obtain parts from your instrument manufacturer or marine dealer.

Model	Fairing	Hull Nut
SS903, SS904	ACC-FAIR-SS904-01	02-149-01

Gemeco

USA
Tel: 803-693-0777
Email: sales@gemeco.com

Airmar EMEA

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Template

SS903 SS904

IMPORTANT: Some printers and printer settings can alter the size of the template.

Verify the template's size before cutting. Place the transducer on the template to be sure it is the *exact* size. If necessary, redraw the template.

