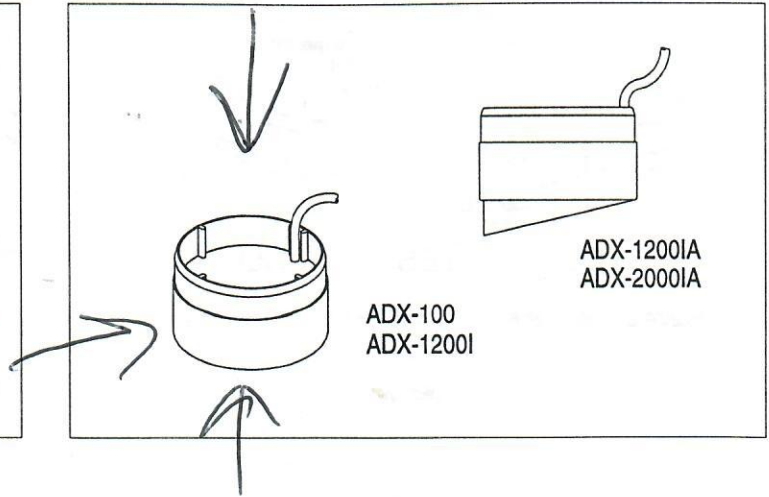


# INSTALLATION INSTRUCTIONS

**Datamarine®**

**ADX-100, ADX-1200I, ADX-1200IA & ADX-2000IA Transducers**

**IMPORTANT:** Please read the instructions completely before proceeding with the installation. These directions supersede instructions in your echosounder manual if they differ.



## Applications

- Recommended for high-speed boats.
- Fiberglass hulls only.
- ADX-100, ADX-1200I—Hulls with a deadrise angle less than 10°
- ADX-1200IA, ADX-2000IA—Hulls with a deadrise angle 10°–22°.
- Can be used in "West" type hulls depending on the design.

## Tools and Materials Needed

- Tape
- Pole
- Epoxy
- Detergent (optional)
- Weak solvent (alcohol)
- Safety goggles (optional)
- Dust mask (optional)
- Disk sander (optional)
- Thin sealable plastic bag (optional)
- Tie-wraps
- Petroleum jelly (Vaseline®) (optional)
- Duct tape (optional)
- For a cored fiberglass hull installation:
  - Electric drill
  - Hole saw: 78mm or 3"
  - Miniature disk sander (Dremel Moto-Tool)
  - Casting epoxy (Polypoxy #7035/7040)
  - Paper cup
  - Stirrer

## Mounting Location

### Placement

Choose a location where:

- The transducer is away from the propeller and other sources of vessel generated noise.
- The water flow is smoothest with a minimum of turbulence and bubbles (especially at high speeds).
- The transducer beam is unobstructed by the keel or propeller shaft.
- There is adequate access space inside the vessel.
- There is a minimum deadrise angle.

**Caution:** Do not mount the sensor above turbulence or bubbles:

- Near water intake or discharge openings.
- Behind strakes, fittings, or hull irregularities.
- Near the keel.

### Boat Type

Consult the boat manufacturer for the best transducer placement. If this information is unavailable, follow the guidelines below (see Figure 1):

- **Outboard**—Install as far aft as is practical.
- **Inboard/outboard**—Install close to the engine(s).
- **Inboard**—Install forward of the propeller(s) and shaft(s).
- **Sailboats**—Install near the centerline and forward of any keel.

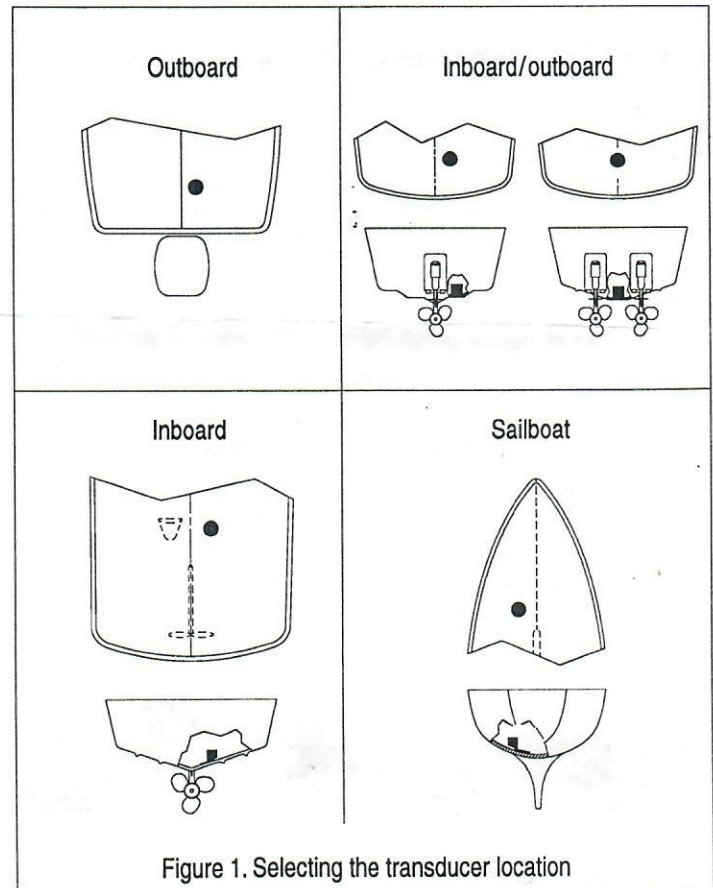
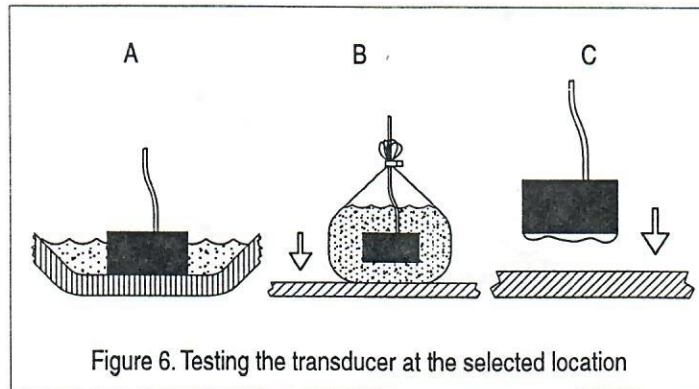
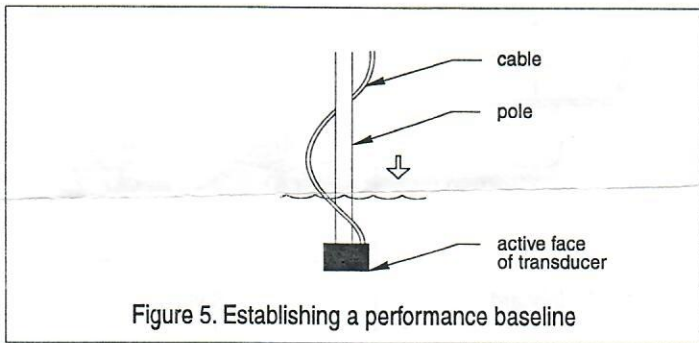
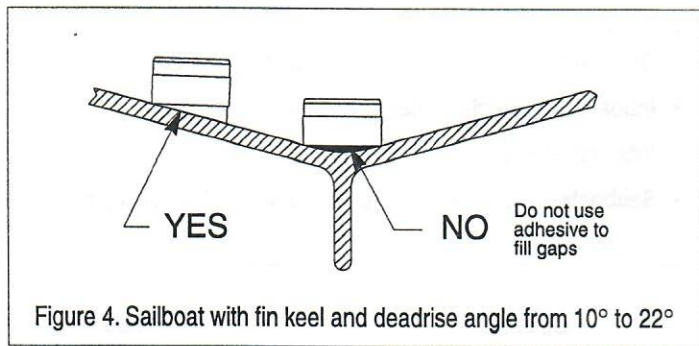
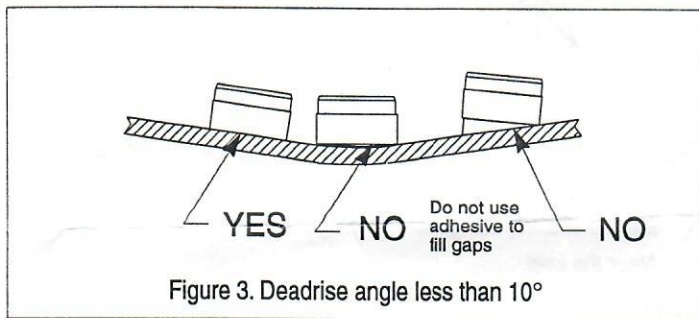
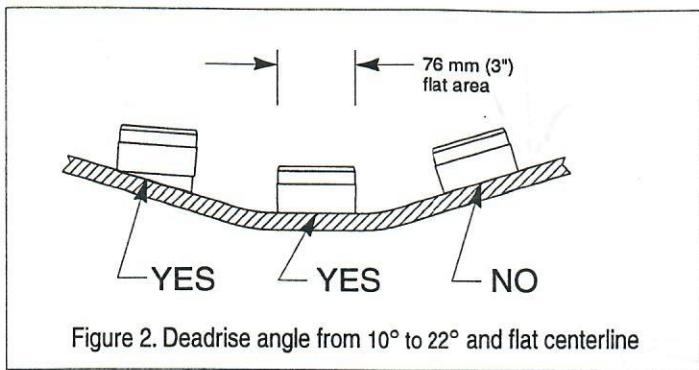


Figure 1. Selecting the transducer location



### Deadrise Angle

Be sure the transducer you have chosen is designed for the degree of deadrise angle in your boat (see Figures 2 and 3).

**Caution:** Never use adhesive to fill gaps between the transducer and the hull since this will greatly reduce the transducer's performance (see Figures 3 and 4).

### Hull Material

Since the hull absorbs acoustic energy, transmitting through the hull reduces the transducer's performance. Fiberglass hulls are often reinforced in places for added strength. These cored areas contain balsa wood, plywood, or structural foam which are poor sound conductors. For optimal performance, locate the transducer over solid fiberglass where:

- No air bubbles are trapped in the fiberglass resin.
- No coring, flotation material, or dead air space is sandwiched between the inside and outside skin of the hull.

*Note:* If you cannot avoid locating the transducer over coring, follow the instructions for "Installation in a Cored Fiberglass Hull" on page 3.

### Testing

#### Establishing a Performance Baseline

Establish a performance baseline by operating the echosounder with the transducer directly in the water. The results of this test are used as a basis of comparison to determine the best in-hull location for the transducer.

1. Anchor the boat in at least 15m (50') of water. (If you have a digital unit, conduct this test in water as deep as that for which the echosounder is rated.)
2. Tape the transducer to a pole, cable side up, and hold it over the side of the boat. The active face of the transducer must be parallel to the surface of the water (see Figure 5).
3. Observe the echosounder's performance and the gain setting required to obtain a reading on the display. Record the depth reading.

#### Testing at the Selected Location

While the boat is anchored, use one of the methods below to test the echosounder with the transducer at the selected location. The difference in the gain setting needed to duplicate the baseline display is what is lost going through the hull. If the test readings differ markedly from the baseline, you will need to find another location. If the two gain readings are reasonably similar, mark the spot on the hull and proceed with the installation.

If there is no reading or it is erratic, the transducer may be positioned over coring. Choose another location. If no other spot is available, **check with the boat manufacturer to be certain coring is present before proceeding** with the instructions for "Installation in a Cored Fiberglass Hull" on page 3.

- A. This method is practical if the transducer will be located near the stern and the boat has a minimal deadrise angle. Clean away any large build-up of grease and/or dirt with detergent or a weak solvent (alcohol). Place the transducer against the hull and allow bilge water to cover the surface where they touch (see Figure 6A).

**Warning:** Always wear safety goggles and a dust mask.

- B. If the hull surface is not smooth, grind it with a disc sander. Partially fill a thin plastic bag with water, place the transducer inside and close it tightly with a tie-wrap. Wet the surface of the hull and press the transducer face against it through the bag (see Figure 6B).

- C. If the hull surface is not smooth, grind it with a disc sander. Coat the face of the transducer with petroleum jelly and press it against the hull with a twisting motion (see Figure 6C). (This is the least desirable testing method, as it is difficult to remove all traces of petroleum jelly before bonding the transducer to the hull.)

## Selecting the Adhesive

Hard adhesives transmit sound best, but winter temperature extremes and flexing on trailer rollers can cause it to delaminate. However, soft adhesives absorb sound. To compromise, use a viscous slow-cure epoxy or a fairly rigid one-part adhesive sealant. In cold climates, a one-part polyurethane adhesive, such as Boat-Life's Life Seal<sup>®</sup>, may be best. A hard epoxy is available from Datamarine, part # ADH-0001-003.

**Caution:** Do not use "5 minute" epoxies because they are generally brittle. RTV (silicone) adhesives are not recommended because they absorb most of the sound energy.

## Installation

*Note:* Follow separate instructions on this page for installing a transducer in a cored fiberglass hull.

**Warning:** Always wear safety goggles and a dust mask.

1. The hull surface to be bonded must be smooth and free of paint or any other finish. If the surface is rough, use a disk sander to smooth an area 10cm (4") in diameter.
2. Clean and dry both the selected area and the active face of the transducer with a weak solvent, such as alcohol. Be sure to remove any dust, grease, or oil to ensure a good bond.

**Caution:** Do not proceed if the hull temperature is below 15°C (60°F) because the cure time of the epoxy will be greatly extended.

3. If the hull temperature is above 15°C (60°F), mix the epoxy until the color is uniform.
4. Apply the epoxy to the center of the transducer's active face, the side opposite the cable (see Figure 5).
5. Press the transducer face onto the hull with a twisting motion to **expel all air bubbles**. (If the hull is slanted, temporarily secure the transducer with duct tape.) The adhesive is cured in 24 hours at 21°C (70°F). The lower the temperature the longer the cure time.
6. After the adhesive has cured, route the cable to the echosounder being careful not to tear the cable jacket when passing it through the bulkhead and other parts of the boat. To reduce electrical interference, separate the transducer cable from other electrical wiring and noise sources. Coil any excess cable and secure it in place with tie-wraps to prevent damage.

**Caution:** Do not remove the connector to ease cable routing. If the cable must be cut and spliced, use Datamarine's waterproof Junction Box AIR-20-040 and follow the instructions provided. Cutting the cable or removing the connector, except when using Datamarine's junction box, will void the warranty.

7. Refer to your echosounder owner's manual to connect the transducer to the instrument.

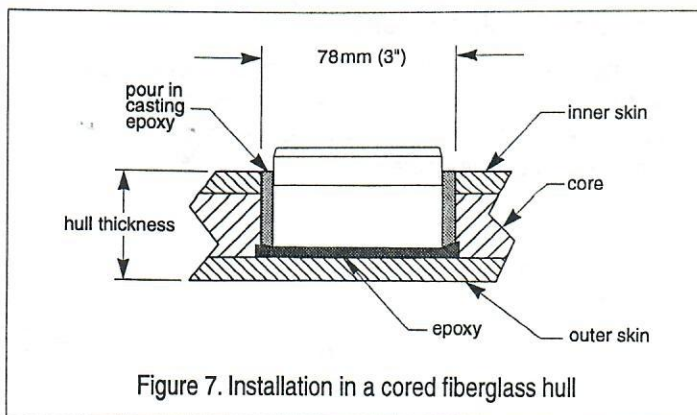


Figure 7. Installation in a cored fiberglass hull

## Installation in a Cored Fiberglass Hull

Installation in a cored hull is difficult. The objective is to bond the transducer to the **inside surface of the hull's outer skin** while preventing any moisture from penetrating the core.

*Note:* There is no way to determine if the outer skin is solid (no trapped air bubbles in the fiberglass resin) before cutting the inner skin.

**Warning:** Always wear safety goggles and a dust mask.

1. Using a 78mm or 3" hole saw, cut through the inner skin and the core at the selected location (see Figure 7). The core material can be very soft. Apply only light pressure to the hole saw after cutting through the inner skin to avoid accidentally cutting the outer skin.
2. Remove the plug of core material so the inner core of the hull is fully exposed. Sand the inside of the outer skin using a miniature disk sander (Dremel Moto-Tool). Slightly undercut the surrounding coring if possible.
3. Clean and dry both the hull surface and the face of the transducer with a weak solvent (alcohol) to remove any dust, grease, or oil.

**Caution:** Do not proceed if the hull temperature is below 15°C (60°F) because the cure time of the epoxy will be greatly extended.

4. If the hull temperature is above 15°C (60°F), mix the epoxy until the color is uniform.

*Note:* The working time of the casting epoxy is only 5 minutes.

5. Fill the cavity with epoxy to 6mm (1/4") and immediately set the transducer in place with a firm twisting motion to expel any air bubbles.
6. Mix a half cup of casting epoxy stirring carefully to avoid trapping air in the mixture. Pour this around the transducer until the cavity is full. Permit the casting epoxy to set for at least 1 hour. If the cavity is at an angle, as is usual, tape over the lower portion of the cavity. Mix more epoxy and pour until the cavity is filled flush with the top of the inner skin. If the transducer is covered with casting epoxy, be sure the cable is bonded tightly so that no water seeps into the core.
7. You may grind the surface smooth, if necessary, but do not damage the cable.
8. If there is doubt as to the strength of the area, apply layers of fiberglass overall to a satisfactory thickness. Be sure bilge water cannot enter the core at the cable.

## Transducer Replacement

The information needed to order a replacement transducer is printed on the vinyl tag affixed to the cable near the connector end. Do not abrade the marking or remove this tag. When ordering, specify the frequency, date code, and part number (see Figure 8).

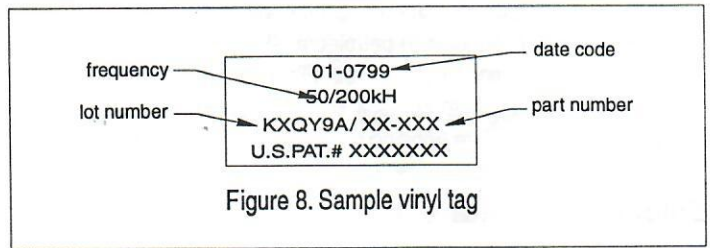


Figure 8. Sample vinyl tag

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