

INSTALLATION INSTRUCTIONS

Transom Mount Sensor with Integral Release Bracket

Models: P23 and P32

U.S. Patents: 4,555,938; 4,644,787; Des. 334,335. Canadian Patent: 1,233,341

301

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

17-122 rev. 05

WARNING: NEVER USE SOLVENTS!

Certain cleaners, fuel, paint, sealants, and other products may contain strong solvents, such as acetone, which attack many plastics greatly reducing their strength.

Applications

- Powerboats with outboard, inboard/outboard, or jet drives.
Not recommended for use with large or twin screw inboard engines.
- Designed for high speed operation up to 55kn (63MPH)
- Vertically orients sound beam on hull with deadrise angle up to 30°
- Adjusts to transom angles from 3°–20°

Materials Supplied

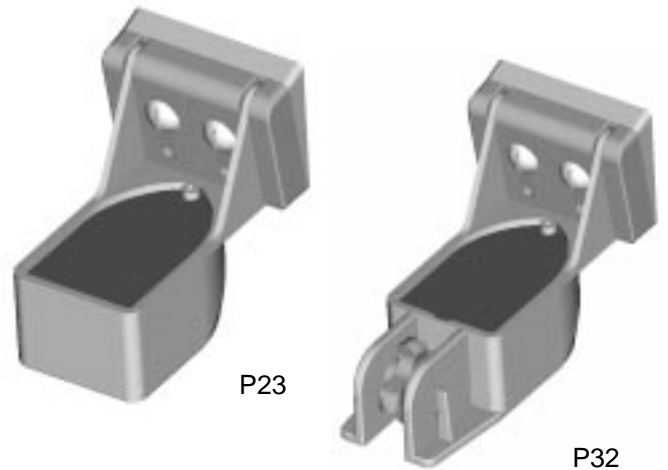
- Sensor
- Bracket
- Two tapered plastic shims
- Cable cover
- Two cable clamps
- Two #10 x 1-1/4" self-tapping screws
- Four #6 x 1/2" self-tapping screws

Tools and Materials Needed

- Scissors
- Masking tape
- Safety goggles
- Dust mask
- Electric drill
- Drill bit, hole saw, or spade bit for:
 - Bracket holes 4mm, #23, or 9/64"
 - Fiberglass hull chamfer bit (preferred), 6mm, or 1/4"
 - Transom hole 19mm or 3/4" (optional)
 - Cable clamp holes 3mm or 1/8"
- Straight edge
- Wire cutters (some installations)
- Marine sealant
- Screwdrivers
- Pencil
- Zip-ties
- Water-based antifouling paint (MANDATORY IN SALT WATER)

Pre-test Speed and Temperature Functions

Connect the sensor to the instrument and spin the paddlewheel. Check for speed reading and the approximate air temperature. If there is no reading, return the sensor to your place of purchase.



Mounting Location

To ensure the best performance, the sensor *must* be submerged in aeration-free and turbulence-free water. Mount the sensor on the transom as close to the centerline (keel) of the boat as possible. On slower, heavier, displacement hulls, positioning it farther from the centerline is acceptable.

Caution: Do not mount the sensor in an area of turbulence or bubbles:

- Near water intake or discharge openings;
- Behind strakes, struts, fittings or hull irregularities;
- Behind eroding paint (an indication of turbulence).

Caution: Avoid mounting the sensor where the boat may be supported during trailering, launching, hauling, or storage.

- **Single drive boat**—Mount on the starboard side at least 75mm (3") beyond the swing radius of the propeller (see Figure 1).
- **Twin drive boat**—Mount the sensor between the drives.

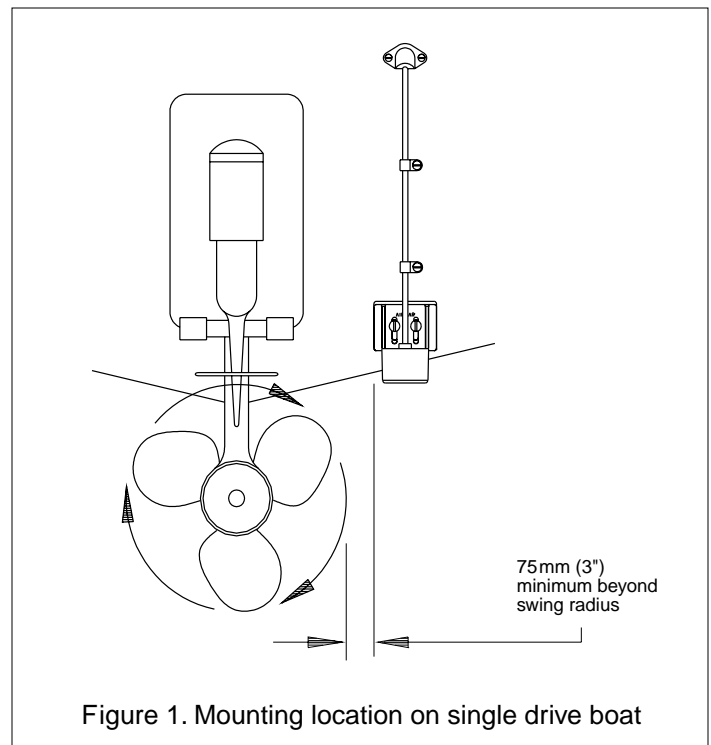
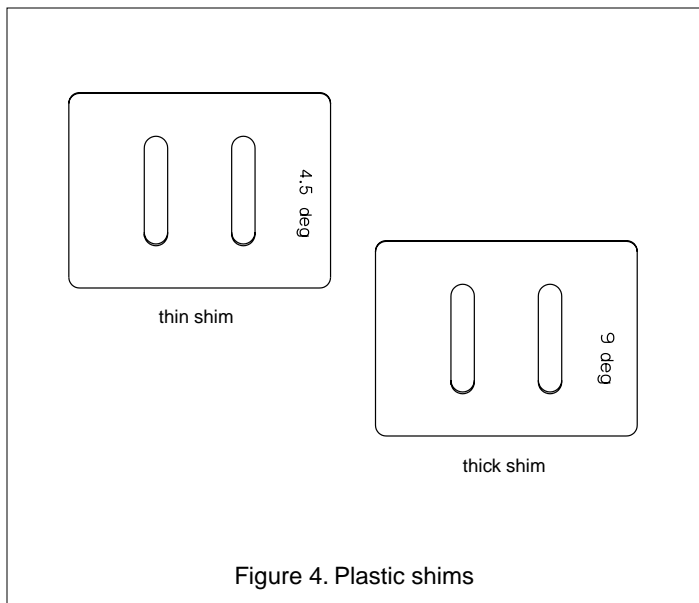
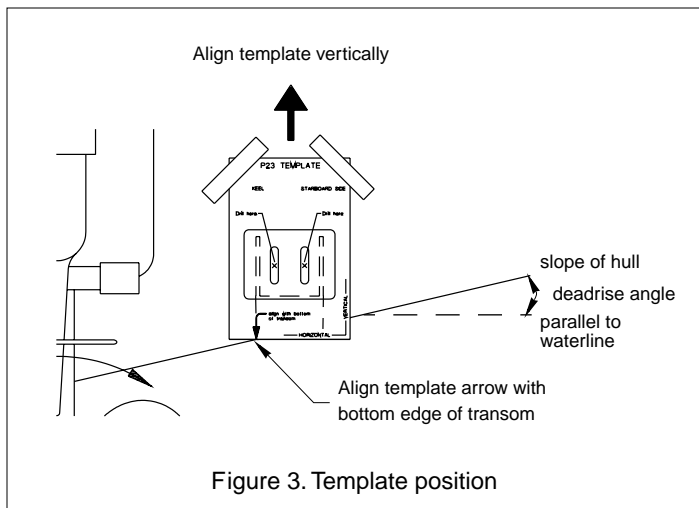
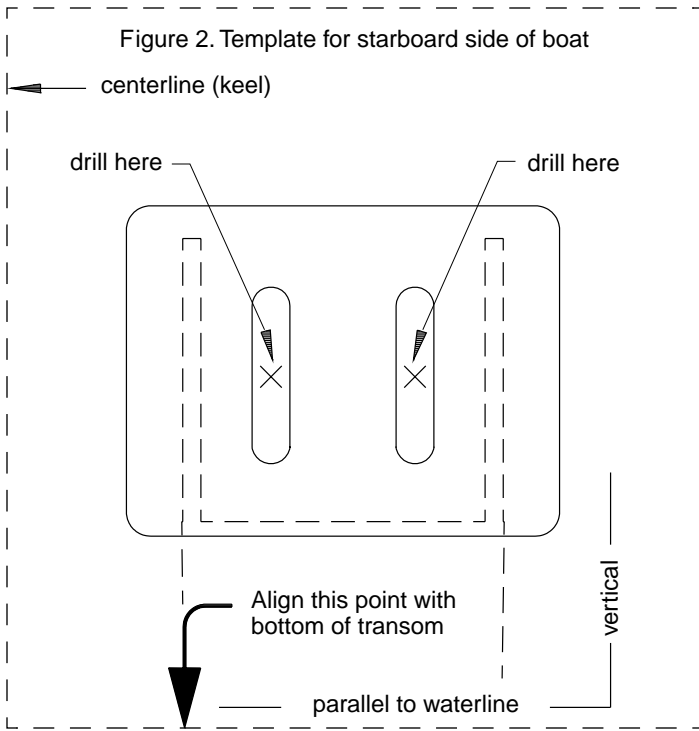


Figure 1. Mounting location on single drive boat



Installation

Assembling and Positioning

1. Insert the top of the sensor's mounting posts into the slots on the top back of the bracket. Rotate the bracket down until the bottom snaps onto the sensor.
2. Cut out the template (see Figure 2).
3. At the selected location on the starboard side of the hull, position the template so the arrow at the bottom is aligned with the bottom edge of the transom. *Being sure* the template is parallel to the waterline, tape it in place (see Figure 3).

Hole Drilling

Warning: Always wear safety goggles and a dust mask.

Using a 4mm, #23, or 9/64" bit, drill two holes 22mm (7/8") deep at the locations indicated. To prevent drilling too deeply, wrap masking tape around the bit 22mm (7/8") from the point.

Fiberglass hull—Minimize surface cracking by chamfering the gelcoat. If a chamfer bit or countersink bit is not available, start drilling with a 6mm or 1/4" bit to a depth of 1mm (1/16").

Plastic Shims

If you know the transom angle of your boat:

Standard transom (13° transom angle)—The bracket is designed for a standard 13° transom angle, so the 9 degree shim is *not* needed for this installation. If your boat is capable of speeds above 30kn (35MPH), install the bracket with the 4.5 degree shim, tapered end *down* (see Figure 4). This ensures that the paddlewheel will be immersed at high speeds.

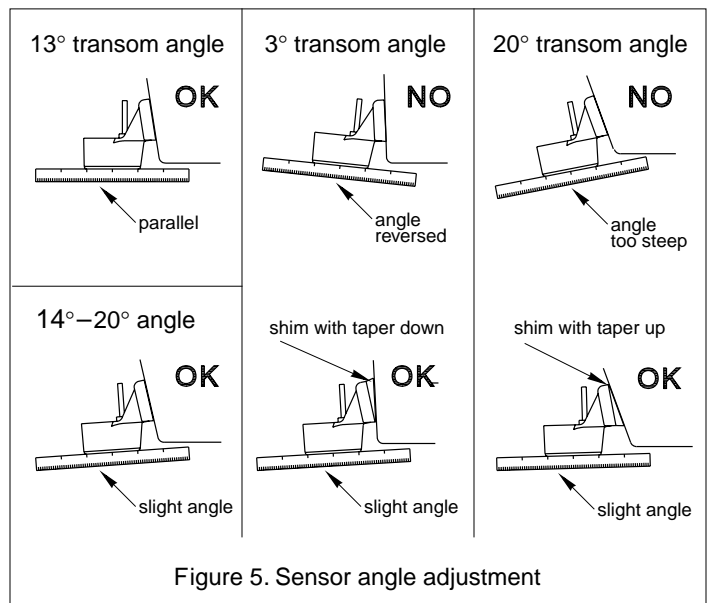
Stepped transom and jet boats (3° transom angle) —Use the 9 degree shim with the tapered end *down*.

Small aluminum and fiberglass boats (20° transom angle)—Use the 9 degree shim with the tapered end *up*.

If you do not know the transom angle of your boat:

To determine if the 9 degree shim is needed, position the sensor at the selected location. Using a straight edge, sight the underside of the sensor relative to the underside of the hull. The stern of the sensor should be 1–3mm (1/16–1/8") below the bow of the sensor or parallel to the bottom of the hull (see Figure 5).

Caution: Do not position the bow of the sensor lower than the stern because aeration will occur.



To adjust the sensor's angle relative to the hull, use the 9 degree shim provided (see Figure 4). Align the posts on the shim with the two holes in the bracket. Snap the shim into place. Using the straight edge, sight the angle again to ensure that it is correct (see Figure 5).

Note: If your boat is capable of speeds above 30 kn (35MPH), it may be necessary to install the bracket with both shims to ensure that the paddlewheel will be immersed at high speeds. Remove the posts from the 4.5 degree shim with wire cutters. Place the 4.5 degree shim, tapered end down, behind the 9 degree shim before "Mounting and Adjusting".

Mounting and Adjusting

1. Apply a marine sealant to the threads of the two #10 x 1-1/4" self-tapping screws to prevent water seepage into the transom. Screw the bracket to the hull. *Do not* tighten the screws completely at this time.

Caution: Do not position the sensor farther into the water than necessary to avoid increasing drag, spray, and water noise and reducing boat speed.

2. Using the vertical adjustment space on the bracket slots, slide the sensor up or down to provide a projection of 3mm (1/8"). Tighten the screws (see Figure 6).

Cable Routing

Route the sensor cable over the transom, through a drain hole or through a new hole drilled in the transom **above the waterline**.

Caution: Never cut the cable or remove the connector; this will void the warranty.

Warning: Always wear safety goggles and a dust mask.

1. If a hole must be drilled, choose a location well above the waterline. Check for obstructions such as trim tabs, pumps or wiring inside the hull. Mark the location with a pencil. Drill a hole through the transom using a 19mm or 3/4" hole saw or spade bit (to accommodate the connector).
2. Route the cable over or through the transom.
3. On the outside of the hull secure the cable against the transom using the cable clamps. Position a cable clamp 50mm (2") above the bracket and mark the mounting hole with a pencil (see Figure 6).
4. Position the second cable clamp halfway between the first clamp and the cable hole. Mark this mounting hole.
5. If a hole has been drilled in the transom, open the appropriate slot in the cable cover. Position the cover over the cable where it enters the hull. Mark the two screw holes.
6. At each of the marked locations, use a 3mm or 1/8" bit to drill a hole 10mm (3/8") deep. To prevent drilling too deeply, wrap masking tape around the bit 10mm (3/8") from the point.
7. Apply marine sealant to the space around the cable and the threads of the four #6 x 1/2" self-tapping screws to prevent water from seeping into the transom. If you have drilled a hole through the transom, apply marine sealant to the space around the cable leading through the transom.
8. Position the two cable clamps and fasten them in place. If used, push the cable cover over the cable and screw it in place.
9. Route the cable to the instrument being careful not to tear the cable jacket when passing it through the bulkhead(s) and other parts of the boat. To reduce electrical interference, separate the sensor cable from other electrical wiring and "noise" sources. Coil any excess cable and secure it in place using zip-ties to prevent damage.

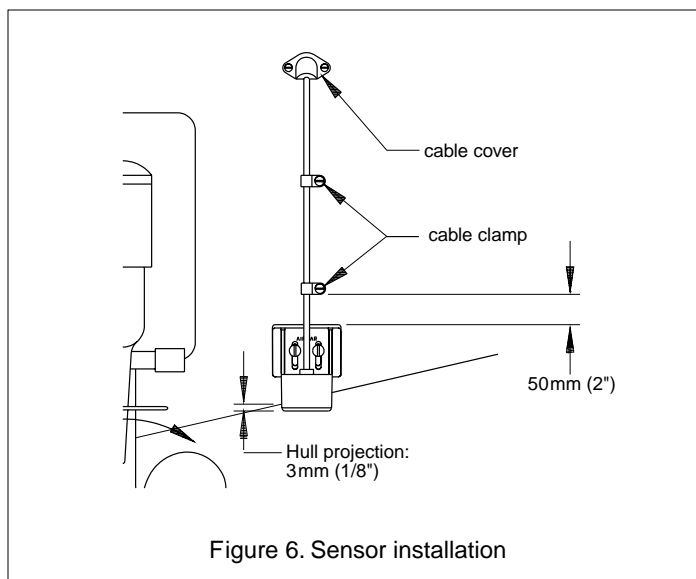


Figure 6. Sensor installation

10. Refer to your echosounder owner's manual to connect the sensor to the instrument.

Checking for Leaks

Warning: When the boat is placed in the water, IMMEDIATELY check for leaks around the screws and any holes drilled in the hull. NEVER install a sensor and leave the boat in the water unchecked for several days.

Antifouling Paint

Marine growth can accumulate rapidly on the sensor's surface reducing performance in weeks. Surfaces exposed to salt water that do not interlock, *must* be coated with antifouling paint. Use WATER-BASED antifouling paint only. Never use ketone-based paint, since ketones can attack many types of plastic possibly causing damage to the transducer. Apply paint every 6 months or at the beginning of each boating season.

Testing on the Water

1. Become familiar with your echosounder's performance at a speed of 4kn (5MPH).
2. Gradually increase the boat speed and observe the gradual degradation of performance due to turbulent water flowing over the transducer's face.
3. If the degradation is sudden (not gradual), identify the boat speed at which the onset occurred. Return the boat to this speed, then gradually increase speed while making moderate turns in both directions.
4. If the performance improves when turning, the sensor's position probably needs adjustment because it is in aerated water. Move the sensor farther down into the water in increments of 3mm (1/8"). If the performance does not improve satisfactorily, move the sensor closer to the centerline of the boat. Fill unused screw holes with marine sealant.
High speed operation—May require less projection in the water.

Maintenance, Repair, and Replacement

Aquatic growth can accumulate rapidly reducing the sensor's performance within weeks. Clean the assembly with a soft cloth and mild household detergent. If fouling occurs, use a stiff brush or putty knife to remove the growth being careful to avoid making scratches on the transducer face. In severe cases, wet sand the surface with fine grade wet/dry paper.

If the P32 paddlewheel becomes fouled or inoperable, it can be removed for cleaning. Gently push back one retaining arm and slide the shaft out. After cleaning, reinsert the shaft by pushing back on the retaining arm. *Be sure* the shaft ends are secure in the retaining arm notches.

Parts and Accessories

Replace broken or worn parts immediately. The water-lubricated paddlewheel bearings have a life of up to 5 years on low-speed boats [less than 10kn (11MPH)] and 2 years on high-speed vessels. Parts can be obtained from your marine dealer or instrument manufacturer.

<u>Part</u>	<u>Part Number</u>
Paddlewheel Kit	33-007
Bracket & Wedge Kit	20-154-04
Portable Bracket Kit (see Figure 7)	33-173

Sensor Replacement

The information needed to order a replacement sensor 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 7. Portable Bracket Kit 33-173

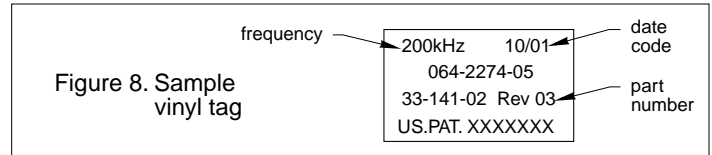


Figure 8. Sample vinyl tag