

OWNER'S GUIDE &

INSTALLATION INSTRUCTIONS

Transom Mount *with* Integral Bracket Speed & Temperature Sensor

Models: S69, ST69

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

Part No. _____ Date _____



Pretest

Connect the sensor to the instrument and spin the paddlewheel. Check for a speed reading and the approximate air temperature. If there is no reading(s) or it is inaccurate, check the connections and repeat the test. If there is still no reading(s) or it is inaccurate, return the product to your place of purchase.

Mounting Location

CAUTION: Do not mount in an area of turbulence or bubbles: near water intake or discharge openings; behind strakes, struts, fittings, or hull irregularities

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

- For the best performance, the sensor must be in contact with smooth water. To identify an area of clean water, observe the water flow off the transom while the boat is underway.
- Mount the sensor as close to the centerline (keel) of the boat as possible to ensure the sensor remains in the water when the boat is turning.
- **Single drive boat**—Mount at least 75 mm (3") beyond the swing radius of the propeller (see Figure 1). The starboard side where the propeller blades are moving downward is preferred.
- **Twin drive boat**—Mount the sensor between the drives.

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

WARNING: Always wear safety goggles and a dust mask when installing

WARNING: When the boat is placed in the water, immediately check for leaks around the screws and any other holes drilled in the hull.

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

CAUTION: Never strike the sensor.

CAUTION: Never use solvents. Cleaners, fuel, paint, sealants, and other products may contain strong solvents, such as acetone, which attack many plastics greatly reducing their strength.

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

Applications

- Not recommended for boats with large inboard engine(s).
- Good operation from 4–50kn (5–58MPH)
- Adjusts to transom angles from 3°–16°

Tools & Materials

- Safety goggles
- Dust mask
- Digital level
- Screwdrivers
- Weak solvent (alcohol)
- Straight edge
- Electric drill
- Drill bits:
 - Mounting holes 5.4 mm, #3, or 13/64"
 - Transom hole (optional) 20mm or 13/16"
 - Cable clamp holes 3mm or 1/8"
- Masking tape
- Marine sealant (suitable for below waterline)
- Putty knife
- Pencil
- Zip-ties
- Water-based antifouling paint (**mandatory in salt water**)

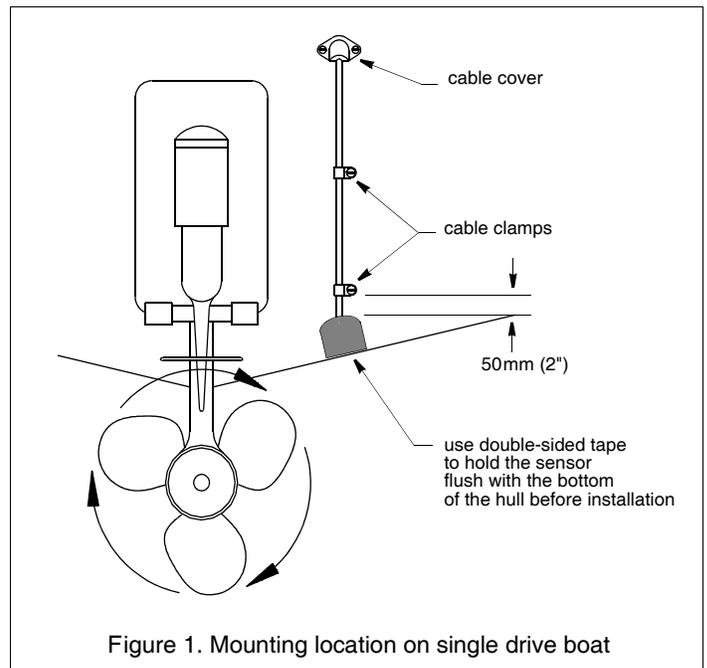


Figure 1. Mounting location on single drive boat

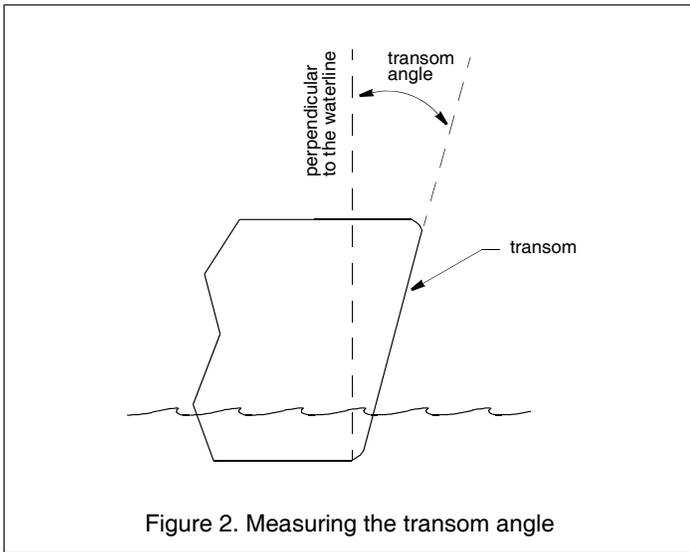


Figure 2. Measuring the transom angle

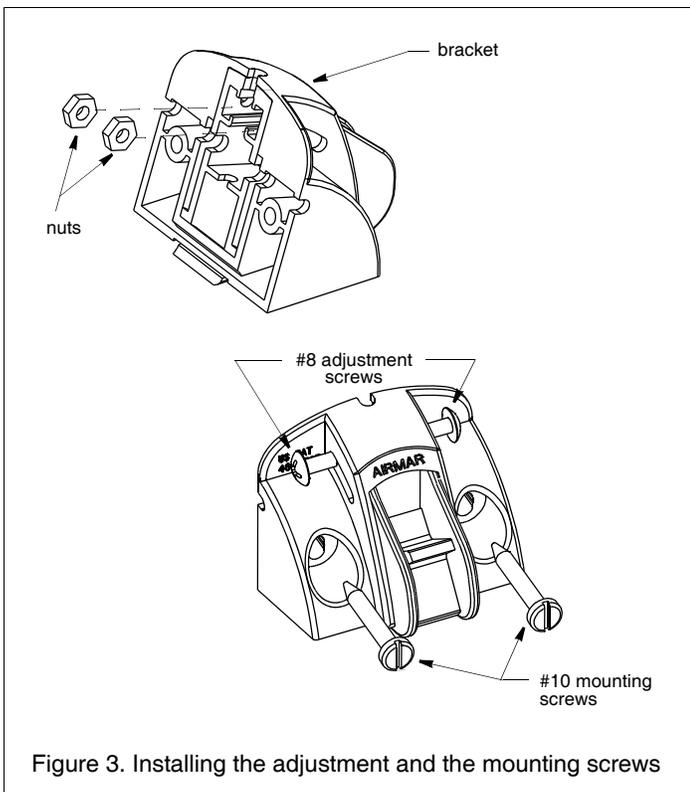


Figure 3. Installing the adjustment and the mounting screws

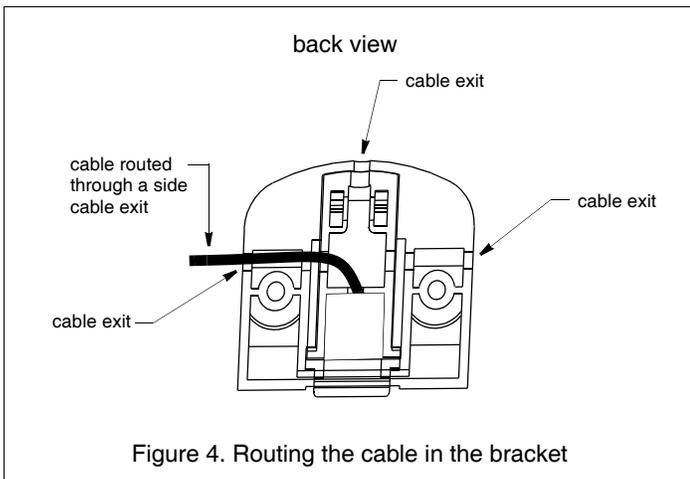


Figure 4. Routing the cable in the bracket

Installation

CAUTION: Measure and drill carefully, since the bracket is only slightly adjustable.

CAUTION: To prevent drilling too deeply, wrap masking tape around the bit 22mm (7/8") from the point.

CAUTION: Fiberglass hull—Minimize surface cracking by running the drill in reverse until the gelcoat is penetrated.

NOTE: If the adjustable paddlewheel assembly separates from the bracket, refer to Figure 10 on page 4 to reassemble.

Preparation

1. Measure the transom angle of the hull at the selected location using a digital level (see Figure 2).
2. Insert the two nuts into the slots in the back of the bracket. Install the #8 adjustment screws (see Figure 3). *Do not tighten the screws at this time.*
3. There are three possible cable exits in the back of the bracket: left, center, and right (see Figure 4). Choose the best cable exit for your installation and route the cable through the notches in the back of the bracket.

Mounting

CAUTION: The bottom edge of the adjustable paddlewheel assembly (not the bracket) must be flush with the bottom of the hull.

1. The hull surface must be free of any dust, oil, grease, or loose paint. Clean the selected location with a weak solvent (alcohol).
2. At the selected location and FLUSH with the bottom of the hull, stick the double-sided tape to the transom (see Figure 1). Peel off the remaining non-stick layer.
3. Holding a straight edge against the bottom of the hull, position the sensor at the selected location (see Figure 5). **The bottom edge of the paddlewheel assembly (not the bracket) must be flush with the bottom of the hull.** Press the bracket firmly in place. Use additional double-sided tape if necessary.
4. Using a 5.4mm, #3, or 13/64" drill bit, drill the two mounting holes *perpendicular* to the transom. To prevent drilling too deeply, wrap masking tape around the bit 13mm (1/2") from the point.
5. Apply marine sealant to the two, #10 x 1-1/4", mounting screws to prevent water seeping into the transom. Screw the sensor to the hull (see Figure 3). Check again that the bottom edge of the paddlewheel assembly (not the bracket) is flush with the bottom of the hull. If necessary, slide the bracket up or down. Tighten the screws. *Do not over tighten.*

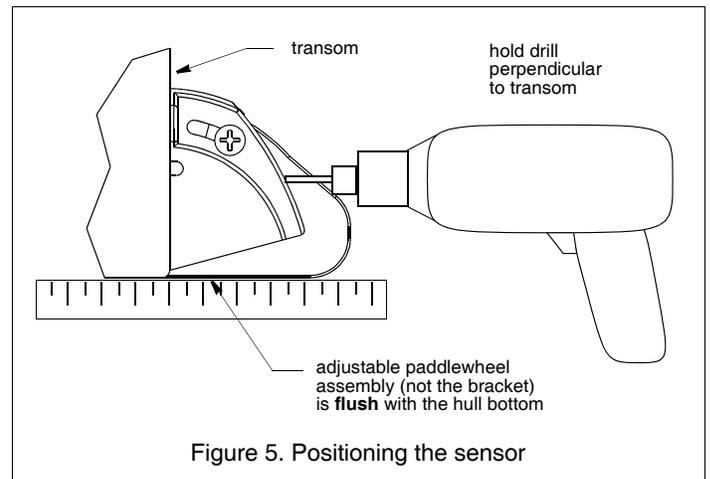


Figure 5. Positioning the sensor

Adjusting

CAUTION: Filling the gap between the sensor and the hull is critical to the proper operation of the sensor.

1. Holding a straight edge against the bottom of the hull, push the adjustable paddlewheel assembly down until it touches the straight edge and is flush with the bottom of the hull (see Figure 6). Tighten the adjustment screws to 1/4 turn past snug. *Do not over tighten.*
2. Fill the gap between the sensor and the hull with marine sealant using a putty knife for smoothing (see Figure 7). Pay particular attention to the transition from the hull to the adjustable paddlewheel assembly. This will ensure smooth water flow over the paddlewheel.

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 decline in performance due to turbulent water flowing over the transducer's active surface.
3. If the decline in performance 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 while turning to the side on which the sensor is installed, the transducer's position probably needs adjustment. It is probably in aerated water.

To improve performance, try the following *one at a time in the order given*.

- a. Increase the sensor's angle in the water. Tilt the adjustable paddlewheel assembly down 2° - 3° or until it is 3mm (1/8") lower than the bottom of the hull (see Figure 8).
- b. Move the sensor deeper into the water if possible.
- c. Move the sensor closer to the centerline of the boat.

NOTE: High-speed operation [above 35kn (40MPH)] may require less projection in the water to improve performance and reduce the chance that water pressure will cause the bracket to release.

5. **Calibration**—To match the speed shown on the display to the actual speed of the boat, you may need to calibrate the instrument. Refer to your instrument owner's manual.

Cable Routing

CAUTION: Do not remove the connector to ease cable routing. If the 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.

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

1. If a hole must be drilled, choose a location **well above the waterline** (see Figure 1). 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 the appropriate size bit to accommodate the connector.
2. Route the cable over or through the transom.

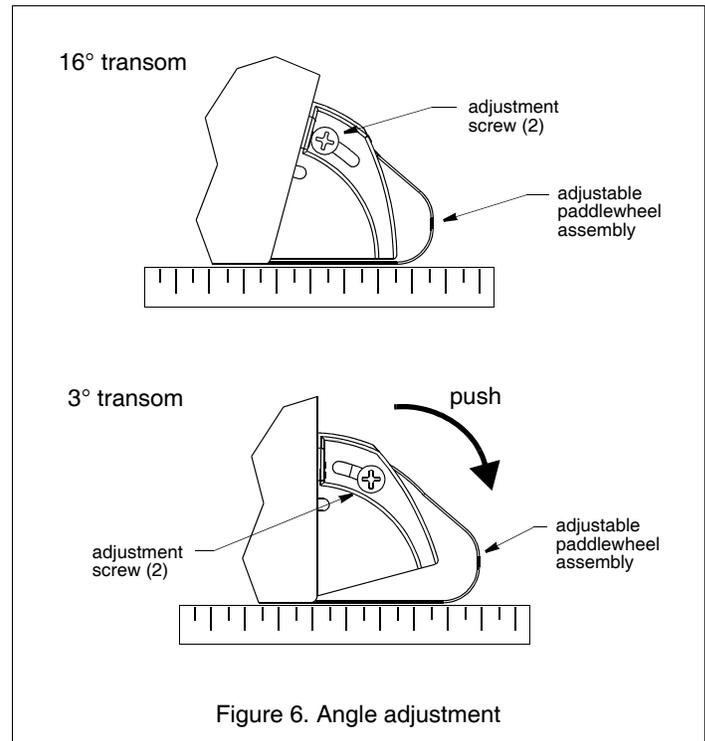


Figure 6. Angle adjustment

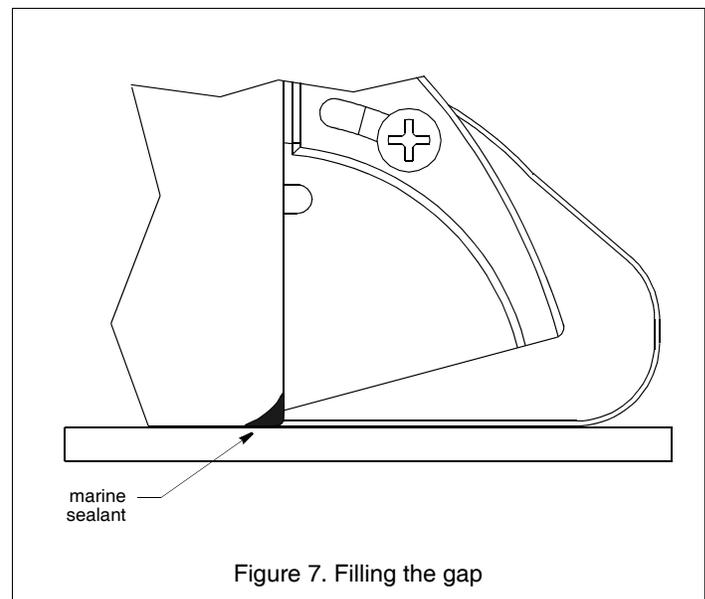


Figure 7. Filling the gap

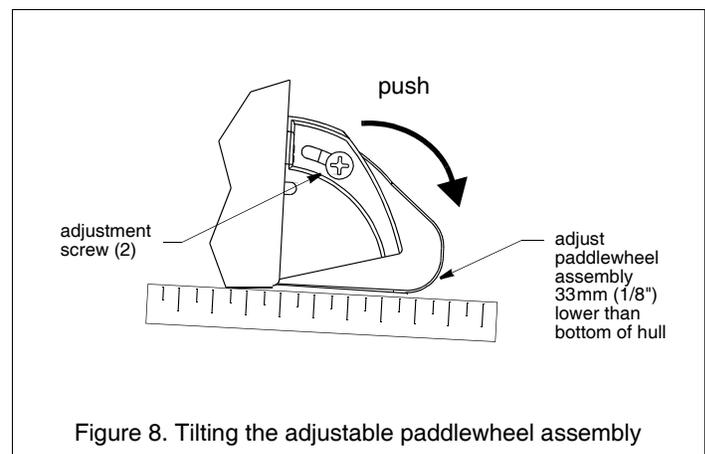


Figure 8. Tilting the adjustable paddlewheel assembly

3. On the outside of the hull secure the cable to the transom using the cable clamps. Position one cable clamp 50mm (2") above the bracket and mark the mounting hole with a pencil.
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 mounting 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 threads of the #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 where it passes 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 the engine(s). Coil any excess cable and secure it in place with zip-ties to prevent damage.
10. Refer to your instrument owner's manual to connect the sensor to the instrument.

Checking for Leaks

When the boat is placed in the water, **immediately** check for leaks around the screws and any holes drilled in the hull. Note that very small leaks may not be readily observed. Do not leave the boat in the water unchecked for more than three hours.

Maintenance

Antifouling Paint

Aquatic growth can accumulate rapidly on the sensor's surface reducing performance within 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. Reapply paint every 6 months or at the beginning of each boating season.

Servicing the Paddlewheel

CAUTION: Do not move the assembly past the shaft holes as any gap filler will be damaged.

Clean the sensor with a soft cloth and mild household detergent. If the paddlewheel becomes fouled or inoperable, remove it for cleaning. Remove the two adjustment screws and push the adjustable paddlewheel assembly down until the paddlewheel shaft is exposed (see Figure 9). **Do not move the assembly past the shaft holes as any gap filler will be damaged.** Push out the paddlewheel shaft with a 1/16" punch. Use a stiff brush or putty knife to remove the growth. In severe cases, wet sand the surface with fine grade wet/dry paper.

Orient the short side of the paddlewheel blades as shown in Figure 10. Slide the shaft through the holes in the adjustable paddlewheel assembly and the paddlewheel. Be sure the ends of the shaft are flush with the housing.

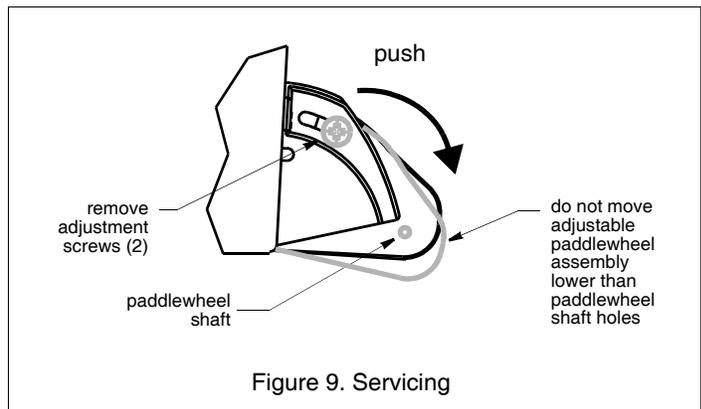


Figure 9. Servicing

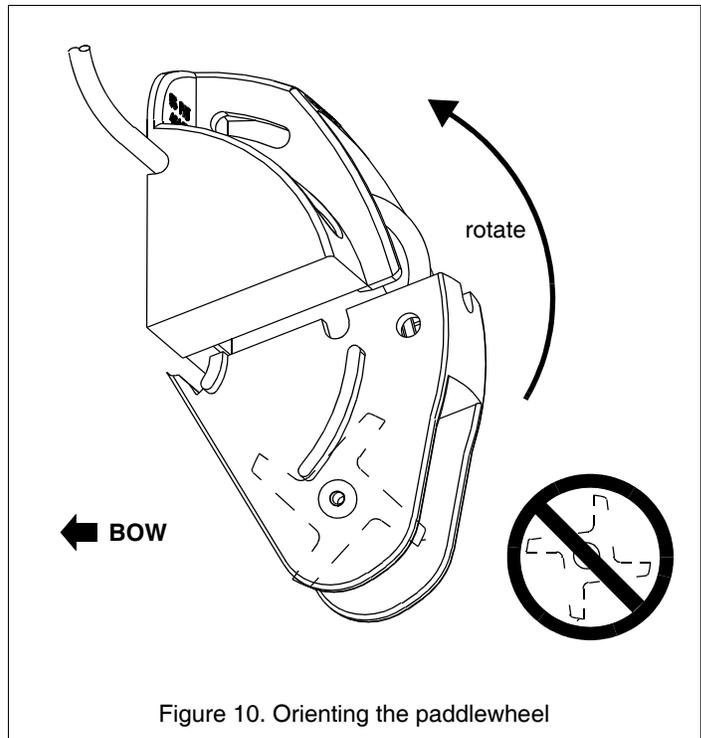


Figure 10. Orienting the paddlewheel

Sensor Replacement & Parts

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

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 10knots (11 MPH)] and 2 years on high-speed vessels. Purchase Paddlewheel Kit 33-398.

Obtain parts from your instrument manufacturer or marine dealer.

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