

INSTALLATION INSTRUCTIONS

TRIDUCER® Multisensor with Valve & Pin

Models: B744V, B744VL, B66V, B66VL

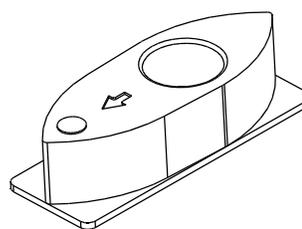
IMPORTANT: Please read the instructions completely before proceeding with the installation. These directions supersede instructions in your instrument manual if they differ.

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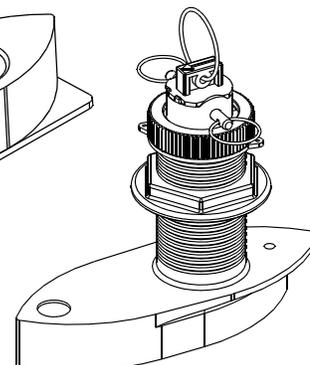
17-118-02 rev. 02

WARNING: NEVER USE SOLVENTS!

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



B66V
Fairing



B66V

Applications

- Bronze housing recommended for fiberglass or wood hulls only
Never install a bronze housing in a metal hull, because electrolytic corrosion will occur.
- *Never* install a metal housing in a vessel with a positive ground system.

Pre-test

After connecting the multisensor to the instrument, spin the paddlewheel. Check for a speed reading and the approximate air temperature.

Tools and Materials Needed

- Fairing (optional)
- Safety goggles
- Dust mask
- Water-based antifouling paint (**mandatory in salt water**)
- Electric drill
- Drill bit: 3mm or 1/8"
- Hole saw:
 - Fiberglass or wood hull: 51 mm or 2"
- Sandpaper
- Mild household detergent or weak solvent (alcohol)
- Digital level (installation with fairing)
- Band saw (installation with a fairing)
- Rasp or power tool (installation with a fairing)
- Marine sealant (suitable for below waterline)
- Slip-joint pliers
- Silicone grease or petroleum jelly (Vaseline®)
- Zip-ties
- Installation in a cored fiberglass hull:
 - Hole saw for hull interior: 60mm or 2-3/8"
 - Cylinder, wax, tape, and casting epoxy (see page 5, #5)

Identify Your Model

The model name is written on the top right corner of the paper tag affixed to the cable.

Mounting Location

Acoustic Noise

Acoustic noise is always present and these sound waves can interfere with the operation of the transducer. Background noise from sources such as: waves, fish, rain, and other vessels cannot be controlled. However, carefully selecting the multisensor's mounting location can minimize the effect of vessel generated noise from the propeller(s) and shaft(s), other machinery, and other echosounders. The lower the noise level, the higher the echosounder gain that can be used.

Placement

Choose a location where:

- The water flowing across the hull is smoothest with a minimum of turbulence and bubbles (especially at high speeds).
- The multisensor will be continuously immersed in water.
- The transducer beam is unobstructed by the keel or propeller shaft(s).
- There is a minimum deadrise angle.
- There is adequate headroom inside the vessel for the height of the housing, tightening the nuts, and removing the valve assembly and insert.

Caution: Do not mount the multisensor in an area of turbulence or bubbles such as:

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

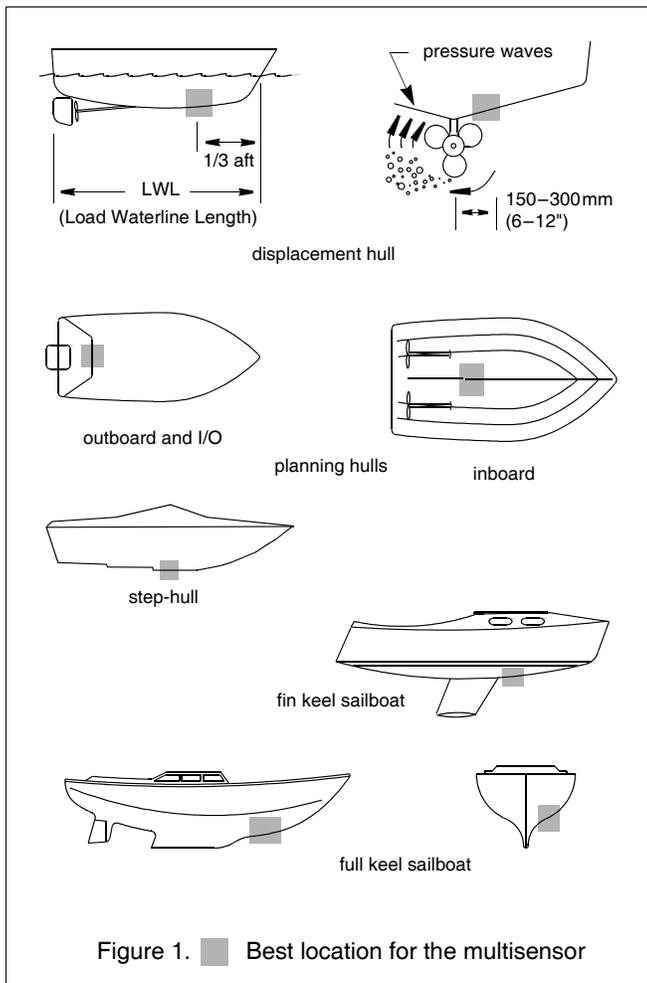


Figure 1. ■ Best location for the multisensor

Boat Types (see Figure 1)

- **Displacement hull powerboat**—Locate 1/3 aft LWL and 150–300mm (6–12") off the centerline on the side of the hull where the propeller is moving downward.
- **Planing hull powerboat**—Mount well aft, on or near the centerline, and *well inboard of the first set of lifting strakes* to insure that it is in contact with the water at high speeds. Mount on the side of the hull where the propeller is moving downward.
Outboard and I/O—Mount just forward of the engine(s).
Inboard—Mount well ahead of the propeller(s) and shaft(s).
Step-hull—Mount just ahead of the first step.
Boats capable of speeds above 25kn (29MPH)—Review multisensor location and operating results of similar boats before proceeding.
- **Fin keel sailboats**—Mount to the side of the centerline and forward of the fin keel 300–600mm (1–2').
- **Full keel sailboats**—Locate amidships and away from the keel at the point of minimum deadrise angle.

Headroom

Allow adequate headroom inside the vessel for the height of the housing, tightening the nuts and removing the insert.

Model	Min. no fairing	Min. with fairing
B744V	270mm (10 ⁵ / ₈ "	255mm (10")
B744VL	394mm (15 ¹ / ₂ "	381mm (15")
B66V	270mm (10 ⁵ / ₈ "	255mm (10")
B66VL	394mm (15 ¹ / ₂ "	381mm (15")

Preparation

Fairing

Nearly all vessels have some deadrise angle at the mounting location. If the multisensor is mounted directly to the hull, the sound beam will be tilted off the vertical at the same angle as the deadrise. A fairing is strongly recommended if the deadrise angle exceeds 10° (see Figure 2).

- Orients the sound beam straight down by mounting the multisensor parallel to the water surface
- Minimizes aerated water flowing over the transducer's face by mounting it deeper in the water
- Reduces drag by directing the water around the multisensor

Airmar Urethane Fairing

Made of a high impact urethane with an integrated cutting guide, an Airmar fairing is safer and easier to cut with a band saw and shape with hand tools than custom fairings (see Figure 3). It can be shaped to accommodate a deadrise angle of up to 25°. (For fairing part numbers, see "Replacement Parts" on page 6.)

Backing Block

A backing block is used inside the hull to provide a level surface for the hull nut to seat against. It is fabricated matching the interior deadrise angle of the boat. After cutting an Airmar fairing, use the remaining section with the cutting guide as the backing block (see Figure 2).

Hull Thickness (measured perpendicular to the waterline)

Model	No fairing	Max. with fairing
B744V	10–72mm (3 ⁷ / ₈ –2 ⁷ / ₈ "	26mm (1")
B744VL	35–133mm (1 ³ / ₈ –5 ¹ / ₄ "	87mm (3 ³ / ₈ "
B66V	10–70mm (3 ⁷ / ₈ –2 ³ / ₄ "	25mm (1")
B66VL	70–133mm (2 ³ / ₄ –5 ¹ / ₄ "	87mm (3 ³ / ₄ "

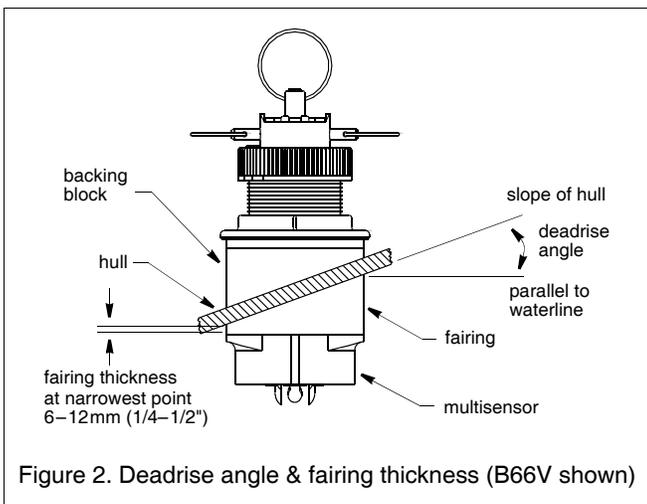


Figure 2. Deadrise angle & fairing thickness (B66V shown)

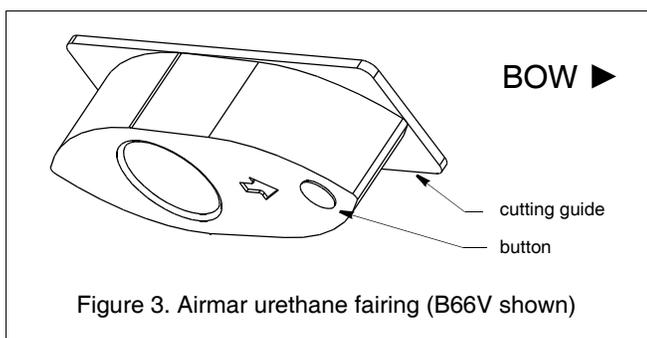


Figure 3. Airmar urethane fairing (B66V shown)

Antifouling Paint

Marine growth can accumulate rapidly on the multisensor's surface reducing performance in weeks. Surfaces exposed to salt water must be coated with antifouling paint. Use **water-based** antifouling paint only. *Never* use ketone-based paint since ketones can attack many plastics possibly damaging the transducer. Reapply paint every 6 months or at the beginning of each boating season.

It is easier to apply antifouling paint before installation, but allow drying time. Paint the following surfaces (see Figure 4):

- Exposed areas of the housing including the acoustic window
- Bore of the housing up 30mm (1-1/4")
- Outside wall below lower O-ring
- Exposed end of the paddlewheel insert
- Paddlewheel cavity
- Paddlewheel
- Blanking plug below the lower O-ring and the exposed end

Installation

Cored fiberglass hull—Follow separate instructions on page 4.

Caution: *Never pull, carry, or hold the multisensor by the cable as this may sever internal connections.*

Hole Drilling

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

1. Drill a 3mm or 1/8" pilot hole perpendicular to the waterline from inside the hull (see Figure 2). If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside. If the pilot 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 hole saw, cut a hole from outside the hull.

Fiberglass or wood hull—Use a 51 mm or 2" hole saw.
3. 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.

Cutting the B66V and B66VL Fairing

B744V, B744VL—Follow the supplemental instructions that came with your high-speed fairing.

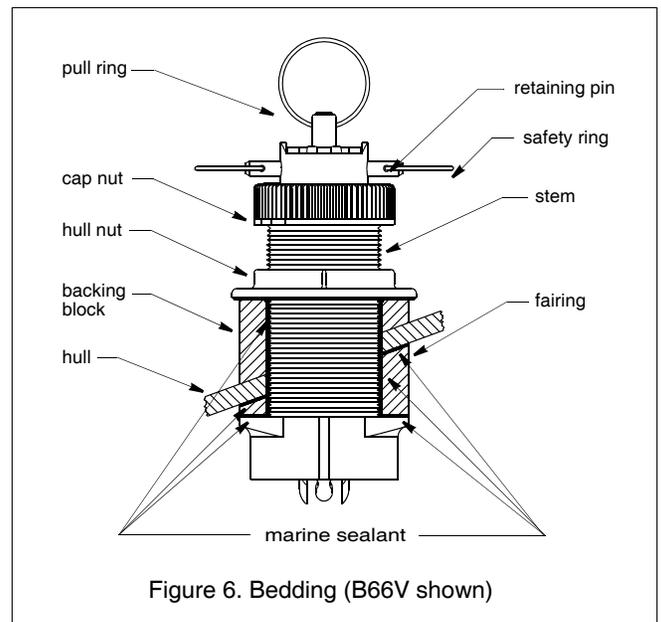
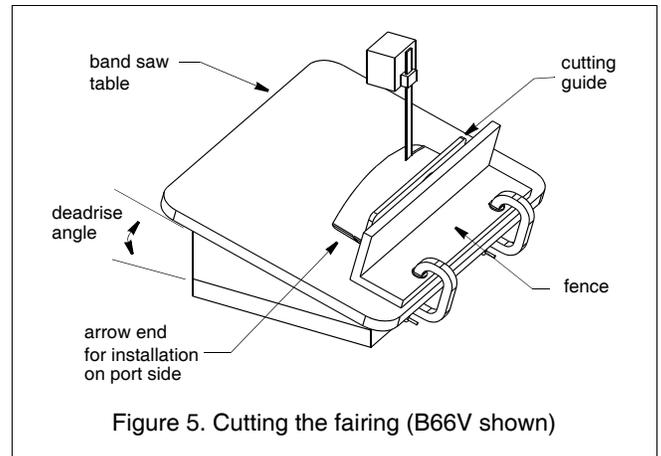
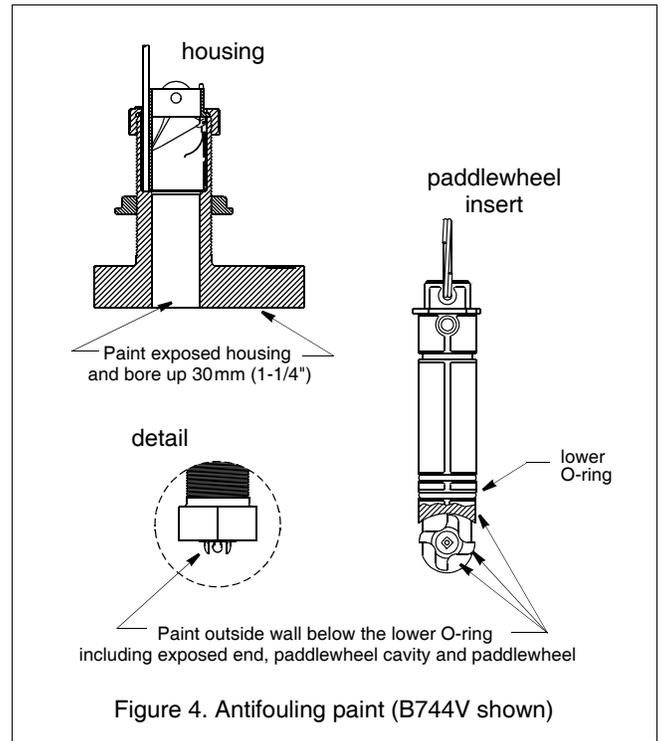
1. Measure the deadrise angle of the hull at the selected location using a digital level (see Figure 2).
2. Tilt the band saw table to the measured angle and secure the cutting guide fence (see Figure 5).
3. Place the fairing on the table, so the cutting guide rests against the fence. The arrow will point toward you for installation on the port side and away from you for installation on the starboard side of the boat.

Caution: *The **ARROW** always points forward toward the bow. 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.*

4. The fairing must be between 6–12mm (1/4–1/2") at the narrowest spot (see Figure 2).

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

5. Recheck steps 1 through 4; then cut the fairing.
6. Shape the fairing to the hull as precisely as possible with a rasp or power tool.



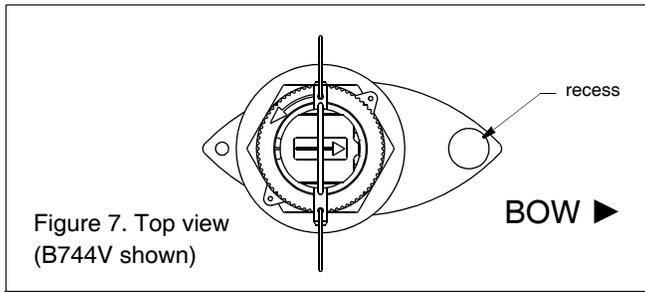


Figure 7. Top view (B744V shown)

Bedding the B66V and B66VL

B744V, B744VL—Follow the supplemental instructions that came with your high-speed fairing.

1. Remove one safety ring, retaining pin, cap nut, and hull nut from the multisensor. Grasp the paddlewheel insert by the pull ring and pull slowly upward (see Figure 6).
2. If a fairing is used, thread the multisensor cable through it.
3. Apply a 2mm (1/16") thick layer of marine sealant over the surface of the multisensor that will contact the fairing (or hull if no fairing is used) and up the stem, 6mm (1/4") higher than the combined thickness of the fairing, hull, backing block, and hull nut. This will seal the hull and to hold the hull nut securely in place.
4. Slide the fairing (if used) onto the stem and mate the button with the recess in the multisensor (see Figures 3 and 7).
5. Apply a 2mm (1/16") thick layer of marine sealant to the side of the fairing that will contact the hull (see Figure 6).

Installing the B66V and B66VL

B744V, B744VL—Follow the supplemental instructions that came with your high-speed fairing.

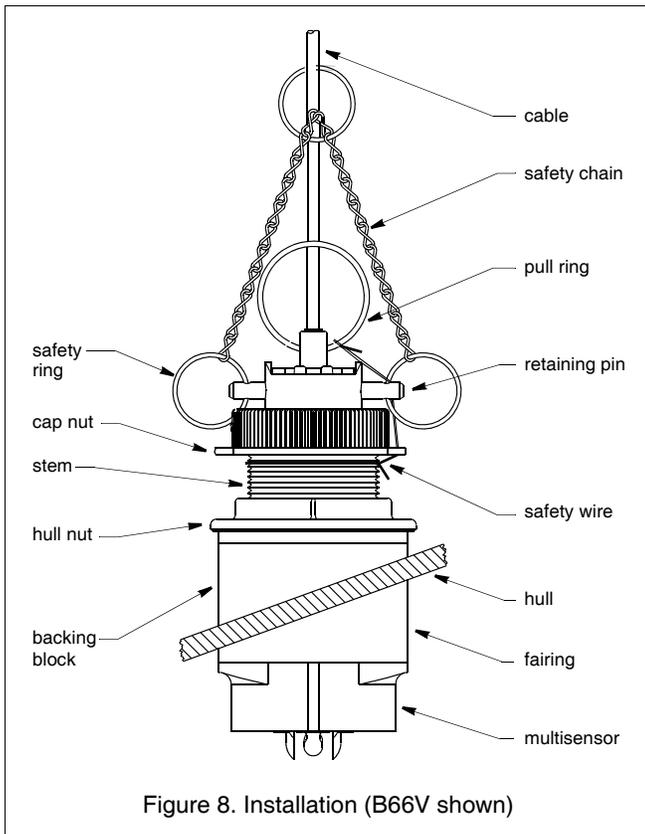


Figure 8. Installation (B66V shown)

1. From outside the hull, thread the cable through the mounting hole.
2. Push the stem of the multisensor (with the fairing in place) into the mounting hole using a twisting motion to squeeze out excess sealant. If an Airmar fairing is used, *be sure* the button on the fairing is mated with the recess in the multisensor, the arrow on the fairing is pointing forward, and the assembly is aligned parallel to the centerline of the boat (see Figures 3 and 7).

3. From inside the hull, slide the backing block onto the multisensor cable and stem seating it firmly against the hull. Screw the hull nut in place and tighten it with slip-joint pliers (see Figure 8).

Wood hull—Allow for the wood to swell.

Caution: Be careful to avoid cross threading the cap nut.

4. Being sure the valve assembly is seated firmly in the housing, carefully screw the cap nut in place. **Hand-tighten** only. *Do not* over tighten.
5. Remove any excess sealant on the outside of the hull to ensure smooth water flow over the multisensor.
6. After the sealant cures, inspect and lubricate the O-rings on the paddlewheel insert with silicone grease or petroleum jelly (see Figure 9).
7. Slide the paddlewheel insert into the valve assembly with the arrow on the top pointing forward until it is fully seated. (The insert fits one way only.) Take care not to rotate the outer housing and disturb the sealant.
8. Slide the center ring of the safety chain onto the cable. Slide the retaining pin in place and reattach the safety ring (see Figure 8).

Warning: Always attach the safety wire to prevent the insert from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.

9. Wrap one end of the safety wire tightly around the stem of the housing and twist it together with the long end. Lead the wire straight up and through one eye in the cap nut, then through one of the safety rings. Loop the wire through the pull ring and twist it securely to itself.

Caution: If the multisensor came with a connector, do not remove it to ease cable routing. If the cable must be cut and spliced, use Airmar's splash-proof Junction Box 33-035 and follow the instructions provided. Cutting the cable or removing the connector, except when using Airmar's junction box, will void the warranty.

10. 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 multisensor cable from other electrical wiring and the engine. Coil any excess cable and secure it in place using zip-ties to prevent damage.

11. Refer to the echosounder owner's manual to connect the multisensor to the instrument.

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 housing to become loose.

Warning: Always wear safety goggles and a dust mask when drilling.

1. Drill a 3mm or 1/8" pilot hole perpendicular to the waterline from inside the hull. If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside (see Figure 10). 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 51 mm or 2" hole saw, cut a hole from outside the hull through the **outer** skin only.

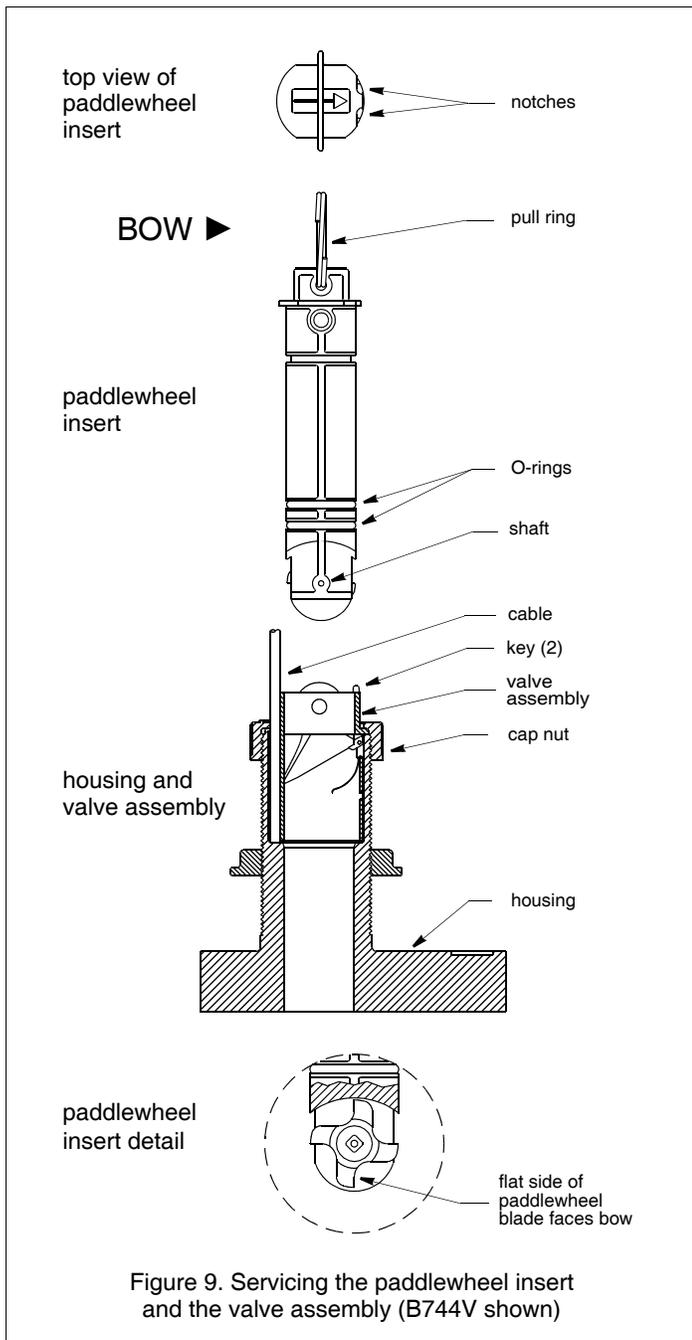


Figure 9. Servicing the paddlewheel insert and the valve assembly (B744V shown)

3. Using the 60mm or 2-3/8" hole saw, cut through the **inner** skin and most of the core from inside the hull. 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.

Note: The optimal interior hole diameter is effected by the hull's thickness and deadrise angle. It must be large enough in diameter to allow the core to be completely sealed.

4. Remove the plug of core material so the *inside* of the outer skin and inner core of the hull is fully exposed. Sand and clean the inner skin, core, and the outer skin around the hole.

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

5. 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 (see Figure 10).

- Sand and clean the area around the hole, inside and out, so 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.
- Proceed with "Bedding" and "Installing".

Check for Leaks

Warning: Never install a thru-hull multisensor and leave the boat in the water unchecked for several days.

When the boat is placed in the water, **immediately** check around the thru-hull multisensor for leaks. Note that very small leaks may not be readily observed. It is best not to 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 (probably not enough to cause water damage). If a leak is observed, repeat "Bedding" and "Installing" immediately.

Maintenance, Repair, and Replacement

Blanking Plug

To protect the paddlewheel, use the blanking plug when:

- The boat will be moored in salt water for more than a week
- The boat is removed from the water
- Aquatic growth buildup on the paddlewheel is suspected due to inaccurate readings from the instrument

This multisensor incorporates a self-closing valve which minimizes the flow of water into the vessel when the paddlewheel insert is removed. The curved flap valve in the valve assembly is activated by both a spring and water pressure. The flap valve is pushed upward to block the opening, so there is no plume of water into the boat.

WARNING: THIS IS NOT A WATERTIGHT OR SECURE SEAL! Always use the blanking plug secured with the retaining pin, safety rings, and safety wire to provide a watertight seal when the paddlewheel insert is removed.

- Inspect and lubricate the O-rings on the blanking plug with silicone grease or petroleum jelly.
- Remove the safety wire from the pull ring and cap nut. Remove one safety ring and pull out the retaining pin (see Figure 8). Do not remove the cap nut.
- Grasp the pull ring and remove the paddlewheel insert with a slow pulling motion (see Figure 9).

Note: In the unlikely event that the paddlewheel insert cannot be removed, see "Servicing the Valve Assembly".

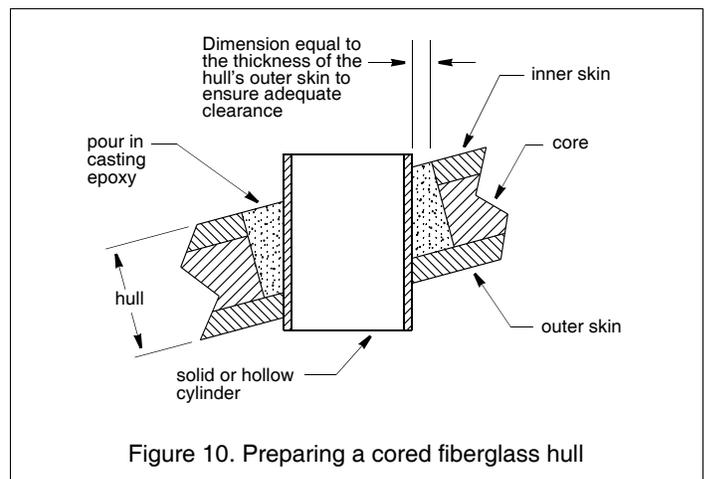


Figure 10. Preparing a cored fiberglass hull

- With the arrow pointing forward, insert the blanking plug. Secure it with the retaining pin, safety rings, and safety wire (see Figure 8).

Cleaning the Multisensor

Aquatic growth can accumulate rapidly on the multisensor's surface reducing its performance in weeks. Clean the surface with mild household detergent. If fouling is severe, use a stiff brush or putty knife to remove the growth being careful to avoid making scratches. The paddlewheel can be removed by pushing out the shaft using a spare shaft or a 4D finish nail with a flattened point. Then, wet sand the paddlewheel with fine grade wet/dry paper.

Servicing the Paddlewheel Insert

The water lubricated paddlewheel bearings have a life of up to 5 years on low-speed boats [less than 10kn (11MPH)] and 1 year on high-speed vessels. Paddlewheels can fracture and shafts can bend due to impact with water borne objects and mishandling in boat yards. O-rings must be free of abrasions and cuts to ensure a watertight seal. A replacement Paddlewheel Kit 33-113 is available.

- Using the new paddlewheel shaft, push the old shaft out about 6mm (1/4"). With pliers, remove the old shaft (see Figure 9).
- Place the new paddlewheel in the cavity with the flat side of the blade facing the same direction as the arrow on the top of the insert.
- Tap the new shaft into place until the ends are flush with the insert.
- Install two O-rings in the lower grooves near the paddlewheel. *Do not* place them near the pull ring.
- The remaining two O-rings are placed in a similar position near the bottom on the blanking plug.

Servicing the Valve Assembly

Should the valve fail, remove it for servicing. A replacement Paddlewheel and Valve Kit 33-218 is available.

WARNING: THIS IS NOT A WATERTIGHT OR SECURE SEAL!

The blanking plug cannot be secured without the valve assembly. After removing the valve assembly, **temporarily** insert the blanking plug, but **do not** leave the boat in the water unattended.

- Inspect and lubricate the O-rings on the blanking plug with silicone grease or petroleum jelly.
- Remove the safety wire and unscrew the cap nut. With the blanking plug ready in one hand, remove the paddlewheel insert and valve assembly as one unit by grasping the pull ring and pulling upward (see Figure 8). Rapidly replace the valve assembly with the blanking plug to minimize the flow of water into the boat. Temporarily secure it with the safety wire.

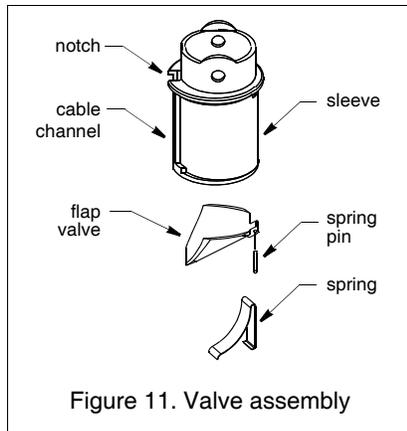


Figure 11. Valve assembly

- Separate the paddlewheel insert from the valve assembly by removing one safety ring and the retaining pin. Grasp the pull ring and pull slowly upward (Figure 9).
- Clean, repair, or replace the valve assembly so that the flap valve moves freely and seats against the sleeve (see Figure 11).

Warning: If a new valve assembly is required and not immediately available, the valve sleeve must be reinstalled in the multisensor housing for a watertight seal. Remove the flap valve, spring pin, and spring from the sleeve.

- To reinstall the valve assembly, inspect and lubricate the O-rings on the paddlewheel insert with silicone grease or petroleum jelly (see Figure 9).
- Slide the paddlewheel insert into the valve assembly. Seat it in place with a twisting motion until the keys fit into the notches. Secure the paddlewheel insert with the retaining pin and safety rings (see Figure 8).

Caution: Be careful to avoid cross threading the cap nut.

- Remove the safety wire from the multisensor. With the valve assembly ready in one hand, remove the blanking plug. Slide the assembly into the multisensor housing with the arrow on the top pointing forward (see Figure 8). *Be sure* the cable fits into the cable channel and the key in the housing fits into the notch in the sleeve (see Figure 11). (A pushing twisting motion will locate the key.) Screw the cap nut in place and **hand-tighten** it only. *Do not* over tighten.
- Reattach the safety wire (see Figure 8).

Warning: Always attach the safety wire to prevent the insert from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.

Winterizing

After the boat has been hauled for winter storage, remove the insert to let the water drain away. This will prevent any water from freezing around the insert and cracking it.

Replacement Parts

Lost, broken, and worn parts should be replaced immediately and can be obtained through your marine dealer or instrument manufacturer.

Model	Cap Nut	Hull Nut	Fairing	Blanking Plug	Insert
B744V	04-234-1	02-030	33-353-01	20-175-5	20-752-1
B744VL	04-234-1	02-030	33-353-01	20-175-2	20-752-3
B66V	04-234-1	02-030	33-029	20-175-5	20-752-1
B66VL	04-234-1	02-030	33-029	20-175-2	20-752-3

Part

Paddlewheel Kit
Paddlewheel & Valve Kit

Part No.

33-113
33-218

Replacing the Multisensor

The information needed to order a replacement Airmar multisensor 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.