Beckson Port Installation Instructions

Please read instructions carefully

Not all the tools listed may be necessary for your installation. The following are recommendations to assist the installer. Beckson may not be held responsible for operator error. For special installations seek additional information and/or professional help.

TOOL LIST:

*Pencils *Ruler *Saber saw or key hole saw *3/4" hole saw, Rain Drain port only *3/16" drill bit *17/64" drill bit*1/2" counter sink drill bit *Phillips screw driver *slotted screw driver *2 C-clamps for installing on a curved surface, flush mount barrel nut installation *file *220 grit sand paper *epoxy resin *Foam closed cell in a can - sandwich hull installation *stainless steel pan head 10-24 bolts, length will vary with cabin wall thickness *Caulking gun *100% silicone sealant (1 ten oz. tube per two-three ports) *tongue depressor or flat disposable knife for spreading sealant *soft scrub brush *Truss head or flush mount barrel nuts *razor blade - single edge *paper towels *clean soft rags *liquid soap-very viscous *rubber mallet -*2 chisels 1/2", 3/8"

New Installation:

For ease in installation, the gasket may be removed by pulling it out of the channel grove in the bottom from the frame. It can be replaced later by press fitting it into the channel grove, and firmly seating it with a rubber mallet or plastic tipped hammer. This will make the window more manageable during the installation. When complete, the screen should be replaced with the smooth side facing toward the gasket.

Location:

For a new installation, determine the desired location for the port inside and out.

Tape the trim ring to the location and check visually from a distance.

Place the trim ring in the desired area and drill two small pin holes near the top corners.

Place pins through the holes and hang the trim ring on the pins on the opposite side. Inside and outside locations based on best look may conflict. Also, the spacing between the deck and the cabin top may not permit the desired location. A pin hole is much easier to fill than a 3x10" hole.

Once the location has been verified, place the trim ring's finished side (the finished side will be smooth with no visible marks) facing outward and trace the inside of the trim ring with a pencil perpendicular to the trim ring.

Drill several small holes inside the traced area but close to your pencil lines. This will allow a key hole or saber saw to cut out the area.

Be sure to cut on the outside of your pencil line. This will provide 1/8" extra around the spigot for sealant.

If installing a rain drain port, use a 3/4" (19 mm) hole saw for the bottom of the rain drain channel as traced by your trim ring. File off sharp corners to allow the window to fit properly.

Cabin wall or cockpit:

Is the cabin wall flat or curved? If curved, see Installation in Curved Cabin walls. Now that the hole has been cut, you will need to determine the type of cabin wall your boat has. There are two basic types: solid and multiple liners-more than one wall. Continue for solid wall construction; for multiple lined cabin walls please see "Multiple liners".

Checking the Hole Cut:

With a solid fiberglass or wood cabin wall, place the window in the hole and inspect from the outside to make sure there is enough room around the port for sealant and thermal expansion.

There should be 1/8" around the entire port to provide space for sealant. If the window is tight, use a file to enlarge the hole until the port has the required 1/8" clearance around its circumference.

Hint #1: Centering the Window

In order to keep the window from slipping, center the spigot in the hole and cut several small pieces of electrical wire or wooden matches or wedges (1/2"). This is to ensure sufficient caulking room under the window prior to drilling the fastener holes. Make sure spacer(s) are placed so they can be completely sealed over.

Fasteners

- Thru-bolt 10-24 stainless #107 pan head machine bolts from the interior.
- Truss head barrel nuts - mounted through the outside of the trim ring.
- Flush mount barrel nuts - are counter sunk, covered by the trim ring with no fasteners visible.
- Self tapping stainless steel screws for installing in wood or metal.

Heads of fasteners must fit the holes of the window frame-neither too large or too small. Stainless steel 10-24 bolts of varying length suitable to your cabin wall thickness are available at your local marine chandlery.

Barrel Nuts:

Through bolting with barrel nuts is one of the best ways to secure a window to the cabin wall or cockpit. By mounting the window in a solid, secure surface, through bolting with barrel nuts will help prevent the window from shifting insuring a sound seal (with proper caulking) for years of trouble free use.

Under no circumstances should flat head fasteners (counter sunk) be used. **Damage will result.**

Truss head barrel nut:

Once the window is centered, have someone place and hold the trim ring while the fastener holes are drilled with the 3/16" drill bit from the inside. Once all the fastener holes are drilled, remove the trim ring. Next, change the bit to 17/64" (6.75 mm) (Metric equivalents for drill bits have been estimated). Re drill all the holes on the trim ring with the 17/64" bit. This will provide enough space to fit the truss head barrel nut sleeve into the trim ring with room for caulk.

Enlarge the fastener holes in the cabin wall from the outside with the 17/64" bit to accommodate the 3/8" (9.5 mm) depth. Remember the trim ring is 3/16" (4.75 mm) thick, so the outside fastener hole depth will Only need to be 3/16" (4.75 mm) in depth if using 1/2" (12.5 mm) shank barrel nuts, the outside fastener

hole depth will need to be 1/8". DO NOT ENLARGE THE HOLE IN THE WINDOW FRAME.

Flush mount barrel nut:

Once the window is placed and centered in the hole, drill through the cabin wall from the inside with the 3/16" (4.75 mm) drill bit. Once the holes are drilled, change bits to the 17/64" .
Measure the length of your drill bit 3/8" up from the bottom and place a piece of tape to indicate the distance. Re drill the fastener holes in the cabin wall from the outside to the 3/8" depth. This will provide the appropriate amount of space and length for the shank of the flush mount barrel nut.

Next, change drill bits to the 1/2" counter sink. Carefully use the counter sink bit to create the necessary amount of counter sink. You will need to check periodically with a barrel nut to ensure proper fit. WARNING: the 1/2" counter sink bit is too large, and is only meant to be used to create sufficient taper for the barrel nut to sit flush, not above the surface.

Bolts too long?

You may find during the dry mount installation that the bolts are too long. Often it is difficult to find the correct length due to the variation in the wall thickness. It is a good idea to purchase one size up and down (1/8" longer and shorter) to accommodate the potential differences. A good rule of thumb is hull thickness plus 1/8" for determining the proper bolt length when using flush mount barrel nuts.

Proper Spigot Length

Proper spigot length is imperative for proper drainage involving installations with angles greater than 15 degrees. With the spigots cut flush, the windows are more attractive and functional. Dry mount the port. If the spigot is too long (not flush with the trim ring), now is the time to trim the spigot to provide maximum drainage. Trace a pencil mark around the port at the edge of the trim ring. Remove the port and cut (with a fine tooth saw) on the outside of the pencil line to allow sufficient room for caulk. Lightly sand the cut area with 220 grit sand paper.

Hint #2: - Easy Clean Up

Prior to using the sealant, dry mount the window. Using a wet a rag or sponge and liquid dish soap (non abrasive/no bleach), wipe around the outside where the cabin wall meets the trim ring. The soap will prevent the silicone from sticking.

Silicone will need 2 to 3 days to properly cure in the summer months and 1 week in low humidity. Refer to the manufacturer's recommendations for best results.

Clean up consists of running a single edged razor blade along the outer edge of the trim ring once the silicone has cured. Do not scrape the trim ring with the razor blade. Use a finger nail if necessary. This will make clean up easier and prevent black eyes from forming on the gel coat (excess silicone wiped into the gel coat will stain) after many years of use.

Choice of Sealant:

There are many brands of caulk, adhesive and sealant available in your marine chandlery or hardware store, but be wary, not all are like. Many are for specific applications and may contain solvents that are destructive to thermoplastics. Chemical solvents should not be used for clean up.

Beckson recommends 100% silicone sealant only.

Beckson recommends 100% silicone sealant only. Availability of silicone varies regionally. Please contact your sealant manufacturer for the most up to date information regarding materials and compatibility. Silicone has been around for nearly 50 years without sign of failure. Most other caulks and sealants fail after 10 years. When a port is installed properly, silicone works best for years of enjoyment.

Sanding previously caulked areas:

Previously caulked or sealed areas must be sanded to remove the old caulk. If not removed, a strong bond will not occur. Surfaces may appear to be free of caulk to the eye, but residue may still be present on the gel coat. Sand lightly with 220 grit paper to prepare for the silicone sealant.

Sealing the window:

Check the gap around the spigot and cabin wall to make sure there is 1/8" clearance around the port to fill With sealant. If not, file the edge around the hole to provide enough space. This will also help widen the hole to fit the tip of the caulking gun in the gap.

Insert the fastener bolts and dab a small amount of silicone in the fastener hole from the outside. Do not over fill. Space must be left for the barrel nut sleeve.

Generously seal around the spigot completely filling the gap around the window. Use a popsicle stick or tongue depressor and jam the sealant into the gap around the port. Fill the gap completely.

If using flush mount barrel nuts, squeeze sealant into the fastener holes from the outside, and install fasteners. The excess will squeeze out of the top. Fully tighten. If any curve is present see "Installation Curved in Cabin Walls".

Sealing the Trim Ring: - Truss head barrel nut installation.

Partially fill holes for the fasteners with dabs of silicone. Do not fill completely, or you may have difficulty attaching the barrel nut. Lay a generous 3/8" bead of sealant along the inside edge of the trim ring. For best adhesion, spread to fully cover the surface. Insert the barrel nuts and carefully place the trim ring. Tighten the barrel nuts until you begin to see the sealant squeeze out. DO NOT TIGHTEN COMPLETELY. Over tightening will squeeze out all the sealant leaving no gasket which is critical for thermal expansion and contraction

Hint #3 Proper Curing

Leave the last 1 to 2 turns until after curing is completed. By not tightening completely, enough sealant is left in place to provide a strong seal and a gasket for climatic changes. DO NOT WIPE OFF EXCESS AT THIS TIME. (Also see Hint#2 Easy Clean Up)

Sealing the Trim Ring: - Flush mount barrel nut installation.

Dab the tops of the flush mount barrel nuts with silicone. Lay a 3/8" bead of sealant along the inside edge of the trim ring. Carefully press the trim ring onto the flat surface. If the surface is curved, see next section. Press down until the sealant begins to squeeze out and stop. DO NOT PRESS DOWN COMPLETELY.

(See Hint#2 & #3 Easy Clean Up & Proper Curing)

Installation in Curved Cabin Walls

When Installing a Beckson port in a curved surface, several additional steps are required.

Follow the preceding port installation instruction, however, read the following tips below for shimming and trimming the window body and trim ring, including the use of flush mount barrel nuts on curved surfaces.

Inside:

Dry mounting the ports is essential in determining the shape of the shims to support the center of the port. Shims are necessary to maintain support in the center of the port. This will prevent the port from "bowing". A bow in the port creates a curved surface on the frame affecting the sealing surface causing the port to leak.

Outside:

Dry mounting will also help determine the shape of the spigot outside the port. If the curve is drastic, the port will appear shorter at the center of the trim ring, and longer in length at opposite ends. For esthetics, place a small spacer (wooden match or plastic coated wire) centered top and bottom and bend the trim ring to the contour to the cabin wall. Mark a pencil line around the protruding spigot using the trim ring as your guide. Next, remove the window and, with a fine-tooth saw, carefully saw on the outside of the pencil line to remove the excess spigot. Soften the sharp edges with 220 grit sand paper. Removal of the excess spigot will also aid in proper drainage for the window.

Hint #4: - Spacers - Trim Rings - curved installations.

The trim ring will need to have a thin spacer at the center top and bottom to leave room for sealant in the center of the trim ring. If the curve is severe, more than one spacer may be necessary.

Trim ring: Flush Mount Barrel Nut Installation-Curved Surfaces

Seal with generous 3/8" diameter bead of silicone sealant along the inside edge of the trim ring. (see Hint #2 Easy Clean Up, Hint #3 Proper Curing & Hint#4 Spacers).

After the trim ring is placed, C-clamps will need to be located at opposite ends on the corners to make the trim ring bend to the proper contour of the boat. DO NOT TIGHTEN COMPLETELY. Tighten until the sealant begins to squeeze out.

Trim ring: Truss Head Barrel Nut Installation on Curved Surfaces

Tighten bolts until the sealant begins to squeeze out. DO NOT TIGHTEN COMPLETELY. (see Hints #2 Easy Clean Up, #3 Proper Curing & #4 Spacers Trim Ring Curved Installations).

Replacing an Existing Port:

Questions to be considered before starting.

Is the old port a Beckson port? If so, the installation will be relatively simple.

If not..., What was the maximum area the previous port covered? Will previous holes need to be filled? Will the new port's trim ring cover most of the previous hole? If not, will the area need to be built up be all on one side or divided?

Remove the old port and carefully clean off excess silicone from the cabin wall with a sharpened putty knife.

If polyurethane caulking was used, window removal may be difficult. The old port may need to be removed in pieces with a sharpened putty knife, chisels and a saw. Remove excess caulk with a razor blade, and then remove the fine film of caulk which may be left with 220 grit sand paper. Next rub the area with fiberglass rubbing compound, be careful not to remove the gel coat.

Once the area is free from caulk or sealant, the actual hole size may be determined.

Is the hole too big or too small?

Too Small:

If the hole is too small, center the trim ring over the desired area and follow the "new" installation instructions.

Too Big:

If the existing hole is too large for the port, the hole will need to be partially filled. The port will need a secure surface for mounting. One inch (25 mm) around the hole, is the maximum area that may be covered by the standard trim ring.

These are all considerations when filling an area that is too large. The main purpose of filling the hole will be to provide a secure area for anchoring the fasteners. Glass work may be localized to the area that will hold the fasteners, with foam filling any other gaps. However, foam may not be suitable for an area that is permanently exposed. Permanently exposed areas will need to be patched with fiberglass cloth, resin and a lot of elbow

grease. Consult your local chandlery for additional suggestions.

Multiple Liners

A multiple liner wall construction consists of an inner and outer wall in your boat's cabin wall - the middle is typically air. This presents a problem when installing ports due to potential movement between the two different liners. The movement may occur from operation, changes in temperature or even hauling the boat. Therefore, there is a need to secure the area where the port is to be placed. There are two different manners in which cabin wall may be reinforced prior to port installation: Foam or plywood and epoxy resin. Foam would be more suitable for lower stress areas; plywood for high stress.

Foam:

Closed cell foam in a can available at most marine chandleries and hardware stores, and can be applied between the two liners for stiffening purposes. Once the foam has cured, the holes can be re drilled for the installation.

Plywood:

A more rigid and durable alternative to foam is to insert plywood between the two liners. Pressure treated or marine grade plywood may be used. The trim ring will act as template for the plywood insert. Once the plywood is cut, it will need to be sectioned into two pieces for installation between the two liners.

Prior to installation, the cut plywood pieces may be coated with epoxy to secure the plywood to the liner. Epoxy will be permanent, so measure and apply carefully.

Once the plywood is secured and cured, you may drill holes for either though bolting (truss head barrel nut) or flush mount barrel nut installation with a 3/16" drill bit. (countersunk on the outside). (see New and Curved Installation for details).

Installation in Plastic

Installation of Beckson ports in plastic fixed windows provides a reasonable and cost effective alternative for installation situations of special size and ports of obsolescence.

Cast sheet acrylic or polycarbonate is available at a local plastics distributor near you. Often, they can cut and rout the plastic sheet and hole (for window) to size for an additional charge. The piece should be large and thick enough to properly handle potential stresses which could occur in the marine environment. Proper overlap around the entire area will become critical for strength and sealing purposes. Flat head self-tapping screws will be needed. Length will depend on your hull thickness. Sufficient pilot holes will need to be drilled.

Improperly drilled holes (under size) and tapered screws will stress and most likely crack the plastic at installation or over time.

Using your trim ring as a template, properly size and determine the best location for the port and mark with a pencil. Drill a small pilot hole to provide access for a saber saw or key hole saw. After the hole has been cut, place the port in the hole cut to determine if there is the proper 1/8" clearance around the port for caulking. (see Hint #1, Centering the Port).

If not, carefully sand the area to provide sufficient clearance.

Dry mount the port with the trim ring. Drill holes with a 3/16" drill bit from the inside. (See Hints #2 Easy Clean Up & #3 Proper Curing).

Truss head barrel nuts are needed for this installation. The flush mount barrel nut is not suitable due to shank length and taper of the countersunk head (Tapered screw heads are not suitable for installation in plastic; stress from the tapered head on the fastener hole will cause plastic to crack). Beckson does have truss head barrel nuts available in chrome and black. Please call or contact your local dealer.

Use a 17/64" bit to widen the holes for the barrel nut shank in the trim ring. Recheck with dry installation.

Carefully caulk with 100% silicone around the port light from the outside filling all gaps around the spigot and hole cut.

Seal the trim ring with a generous 3/8" bead of silicone around the inside edge. Tighten fasteners leaving the last 1 to 2 turns until curing is complete. (see Hints #2 Easy Clean Up & #3 Proper Curing)

Professionals may solvent weld the port light and trim ring to the fixed window with methylene chloride.

It is imperative that Material Data Safety Sheets are reviewed prior to use of this chemical.

Enjoy.