



FORESPAR[®]
LEISURE FURL[™]

***OFFSHORE
IN-BOOM FURLING SYSTEM***

**UPDATED
VERSION**

September 26, 2014



Installation Manual

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IMPORTANT

Read this first

Installation should only be undertaken by an experienced rigger. Use safety equipment and install during suitable conditions.

Follow the instructions in this manual. Each Leisure Furl system is custom manufactured to the unique specifications of this vessel.

If you do not understand a point in this manual, do not guess, request advice.

We have made every effort to explain the installation process as completely as possible. Nonetheless, it is not possible to anticipate, or address every conceivable problem that might arise during installation. Hence, we can not accept responsibility for errors or omissions in this manual. These installation guidelines are intended to provide general guidance to an experienced rigger. For specific guidance and technical support, contact the person who sold you the Leisure furl system. Specific guidance and technical support are fundamental to the installation process.

An experienced rigger should have a thorough knowledge and understanding of general rigging installation principles. These guidelines should be read in conjunction with such other principles. Such principles shall be deemed to supplement these guidelines.

Installation of the Leisure furl system is entirely at your own risk. We accept no liability for personal injury or property damage resulting from faulty installation. Nor do we accept warranty claims resulting from faulty installation. Do not install a Leisure furl system except on the boat for which it was specifically designed and manufactured.

The Vang Lug & Sheet Bails

All vang lugs and sheet bails are shipped loose and should be positioned during the installation process. This allows for the most precise location of these fittings.

IT IS VERY IMPORTANT THAT THE SAIL COVER BE PULLED TO THE TOP OF THE BOOM PRIOR TO FASTENING THE VANG LUG AND SHEET BAILS. THIS WILL PREVENT DAMAGING THE SAIL COVER DURING THE DRILLING & TAPPING PROCESS.

Line controlled vangs like the Forespar[®] Yacht Rod[™] should be setup to raise the boom above the 87° angle when the line is released.

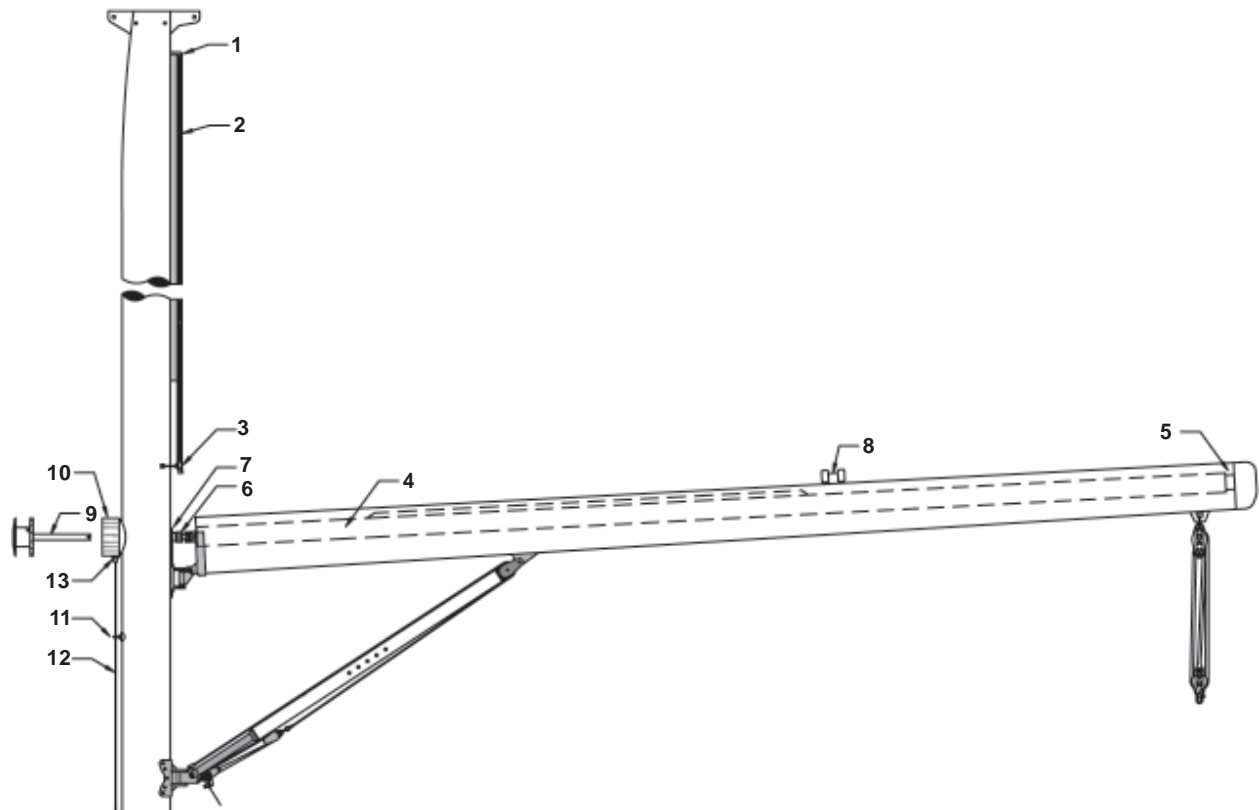
Boom vangs & topping lifts

In-boom furling systems require both a rigid boom vang and a traditional boom topping lift for safety and ease of sail trimming.

When furling or reefing, the boom should be adjusted to the required 87° angle and held at that angle with the support of the boom vang during the furling process. In heavy weather the boom topping lift should be used to arrest the motion of the boom during furling.

When the boat is moored a boom topping lift will extend the life of your boom vang, no matter what type; spring, pneumatic, hydraulic or electric.

COMPONENTS PACKING LIST



- | | |
|--------------------------------|-------------------|
| 1. Luff track top cap | |
| 2. Sail track & Base Extrusion | |
| 3. Flexible feeder | |
| 4. Furling mandrel | |
| 5. Outer bearing | |
| 6. Universal | |
| 7. Inner bearing | |
| 8. Support bracket | |
| 9. Drive shaft | |
| 10. Spool cover | |
| 11. Rope guide | |
| 12. Furling line | |
| 13. Mandrel lock | |
| 14. Sail Cover |) All bracketed |
| 15. Luff lube |) Items not shown |
| 16. Universal sock |) but are |
| 17. Sail lashing |) in parts kit |
| 18. Set up kit |) |
| 19. Spool packers |) |
| 20. Screws – Inner bearing |) |
| 21. Screws – Feeder |) |
| 22. Sail Track aligning plugs |) |
| 23. Seating compound |) |
| 24. Owners manual |) |
| 25. Cardboard template |) |
| |) straight edge |

TOOLING REQUIRED

Pencil

Paper

Hacksaw, including spare blade

Scraper

Soft hammer

Allen key set

Hole saw, See Diagram 1 for size

Electric drill ½" chuck

Electric grinder 4"

Masking tape

Tapping drill sizes – 9/64", 3/16", 1/4" 5/16"

Drills sizes - 3/16", 1/4", 5/16", 3/8"

Intermediate taps – 3/16", 1/4", 5/16", 3/8"

Tap wrench

Anti corrosion compound, Lanocote™ or similar compound

LocTite

Center punch

Mixing stick

Sand paper 180 or 220 grit

Cutting knife, long blade

Winch handle

Tape measure

Round file

Pop rivet gun to suit 3/16 rivets

Boson's chair

SET UP DIAGRAM

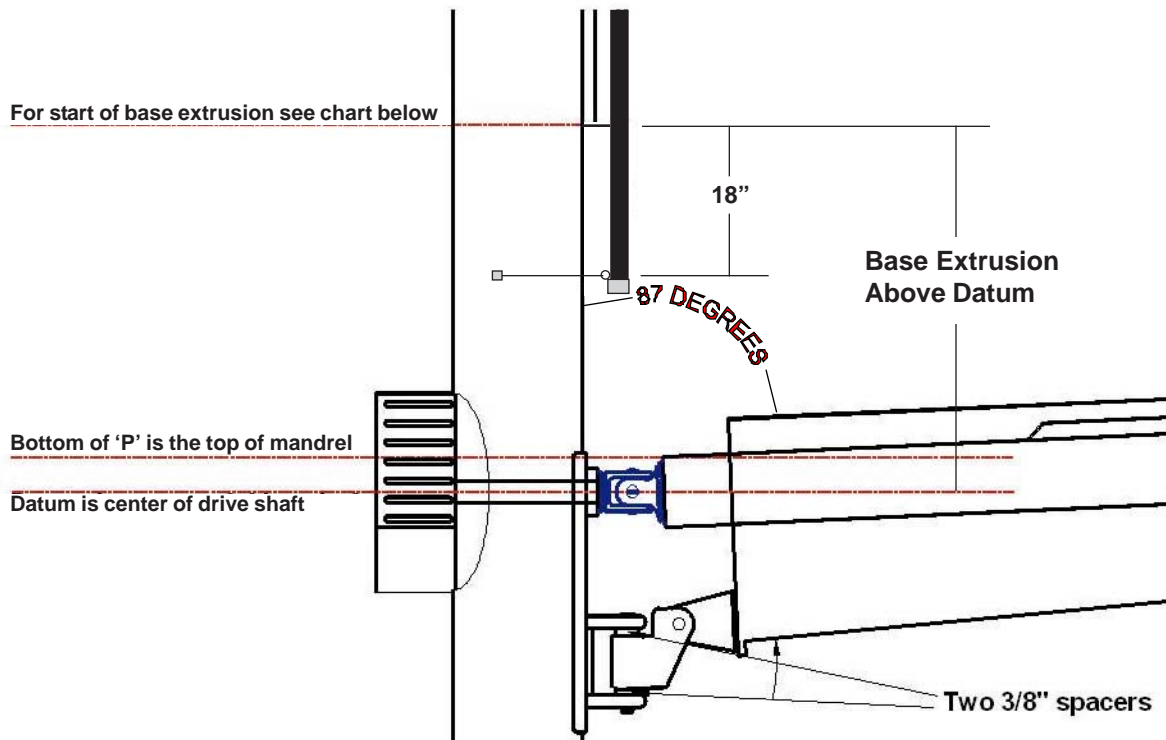


Diagram 1

System size	Shaft size	Shaft hole offset to starboard	Clearance at aft end of	Mandrel size	Datum below bottom of P mandrel	Start of base extrusion above datum	Flexible feeder length
14/5 L	1 "	1/4"	1-7/8"	3-1/2"	1-3/4"	32"	18"
14/5 M	1"	1/4"	1-7/8"	4"	2"	32"	18"
18/6 L	1"	1/4"	1-7/8"	3-3/4"	1-7/8"	32"	18"
18/6 M	1"	1/4"	1-7/8"	3-3/4"	1-7/8"	32"	18"
18/6 H	1"	1/4"	1-7/8"	4"	2"	32"	18"
19/6	1"	1/4"	1-7/8"	4-1/8"	2-1/16"	32"	18"
20/7	1-1/4"	5/16"	2-1/8"	4-1/8"	2-1/16"	34"	18"
25/8	1-1/4"	5/16"	2-1/8"	4-1/8"	2-1/16"	34"	18"
25/8 O/S	1-1/4"	5/16"	2-1/8"	4-1/2" Carbon Fiber	2-1/4"	34"	18"

PRE-INSTALLATION INSTRUCTIONS

There are three stages to fitting the Leisure furl system.

- Fitting the sail track
- Fitting the mast components
- Fitting the boom and mandrel

Each stage is broken into separate step by step instructions, which will guide you through the installation.

Before removing or installing any components check this manual to establish if any special instructions have been given for this job.

If the track is fitted while the mast is in place, it may require two persons, one to assist while the other fits the track in place. While the track is being fitted in position the other person can be preparing the mast for later work.

For purposes of fitting the sail track, the aft face of the mast from the bottom of the luff extrusion to near the deck should be clear from obstructions, or sharp edges. Any winches, which are inside of this area, may need to be repositioned.

Hold the castings in their approximate position to establish if repositioning of any fittings is required. Consider the side of the boom as it articulates from side to side. If the mast has a spinnaker track down its front face, this will need to be cut short, above the spool position and a fixed ring fitted below the spool if later required.

(See Diagram 2)

For installation to an existing vessel, there are several points to consider. As can be seen from Diagram 2 if the gooseneck is positioned in the same place as previously in the case of a retrofit, the bottom of P will rise up around 6 to 8". This will mean a small amount of sail area will be lost but the area can usually be trimmed off the top of the sail so the loss will be minimal. A second consideration is the boom height in the cockpit. Tack angles on conventional sails are normally around 88 deg. and considering that the tack angle is now 87 deg. this will also mean that the boom may be higher anyway. Thirdly, consideration has to be given to the backstay if clearance is getting marginal. While this should have been considered at the start, if the boom ends up higher at the gooseneck end and on a greater angle upwards it could start to become a problem.

Note : With a solid vang, check to ensure the stroke is enough to allow repositioning, if the boom is to be lowered or raised from the current position. Moving the vang lug along the boom may not always be a good option, as the angles may become unrealistic.



Diagram 2 shows a mast section and fittings before conversion to Leisure Furl. When the new inner bearing casting is held at the old gooseneck height, the lower arrow indicates where the shaft hole would end up. The bottom of 'P' would rise up approx. 7". The spinnaker track will need to be cut and removed at the top arrow.

NOTE: The Leisure Furl gooseneck lugs may be positioned lower than the original.

Diagram 2

For installation to a new vessel, the positioning of the gooseneck will be determined as per the information on page 6. It is wise to measure “P” from the top of “P” to the bottom of “P”. This will confirm the gooseneck position as per Diagram 1.

In all instances it would be preferable to check with the owner, for the preferred position, because of the greater depth of the boom.

INSTALLATION INSTRUCTIONS – fitting the sail track, track slugs

1. After confirming the gooseneck position make a reference mark for the position datum which is the center of the drive shaft.
Note : The datum position is the reference for all measurements.
2. See Diagram 1, mark a position above datum where the base extrusion will finish. Refer to Diagram 3a and mark the location of the top of the base extrusion. The top piece of base extrusion is to be the “cut length” so the base assembly spans the distance between the top and bottom reference marks. There must be .020 gap (thickness of two business cards) between each length of base extrusion.
3. **Luff track and track base must be installed before any other fittings are attached to the aft face of the mast.**
4. Insert 18 or more mounting slugs into the mast luff slot, raise to a convenient waist level and place a piece of masking tape across slot to hold up the slugs.
5. Hold the cut length of base extrusion, that has the fairing block attached, against the back of the mast and thread a ¼-20 flat head machine screw (FHMS) through the base and into the slug.
6. While pushing the track base upward as you work, engage a slug for each hole in the base.
7. When the first set of slugs are installed, send the first base section to the person at the masthead for tightening in place while the second track base is being prepared below. Position this first “cut length” section of base extrusion at the reference mark based on diagram 3a for the location in relation to the main halyard sheave.
8. Alternately, if you are working alone, once you have raised this first section to the top of the mast and fixed it in place, you can install successive sections pushing them up the mast as you progress. The base weighs .49 lbs./ft., or 25 lbs./50 ft.
9. Introduce more slugs into the mast luff slot as needed. Progressively add track base sections and tighten the screws. Ensure that there is a .020 gap (thickness of two business cards) between all of these sections and make sure each joint is well aligned. The bottom of the last base extrusion has holes drilled and tapped for securing the flex feeder piece.

10. Refer to Diagram 3a and table below for luff track top cap location. This upper reference dimension is from the center of the main halyard sheave down to the top of the base extrusion.

SYSTEM SERIES	SAIL TRACK TOP CAP REFERENCE DIMENSION
14/5	8.0" [203mm]
18/6	10.5" [267mm]
19/6	11.5" [292mm]
20/7	12.0" [305mm]
25/8	14.0" [356mm]

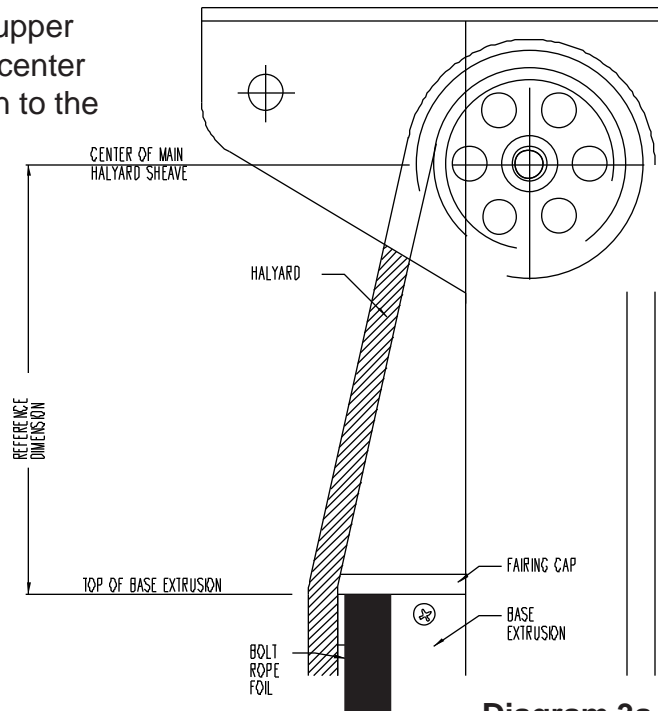


Diagram 3a

**LUFF TRACK ASSEMBLY
FOR 14/5, 18/6, 19/6,
20/7, 25/8 & 25/8 OS
MODELS**

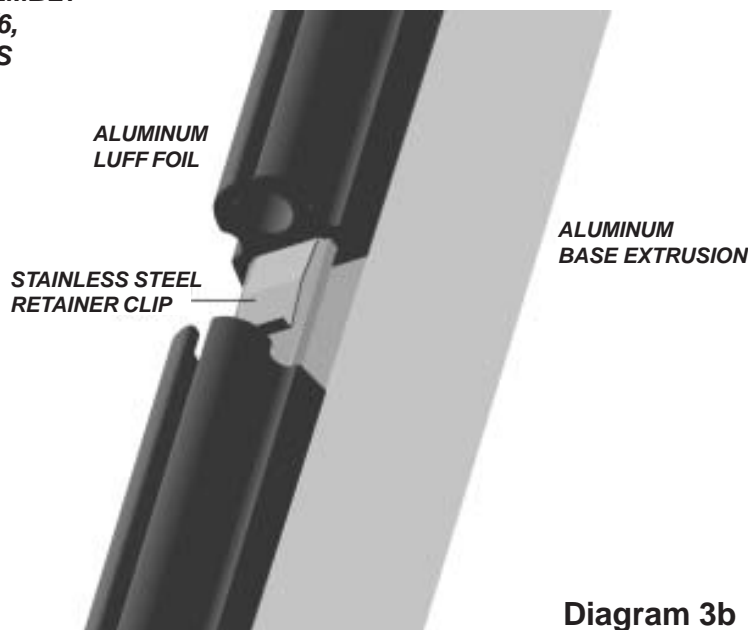


Diagram 3b

11. Models 14/5, 18/6, 19/6, 20/7 & 25/8 & 25/8 OS use a two piece base and foil system. The foil portions are aluminum extrusions and a polymer flex feeder. After mounting the aluminum base extrusion with a .020" gap between lengths, slide on the foil. The foil pieces are held in place during installation by a stainless steel retaining clip which is pushed into the bottom of each length of foil. *Diagram 3b*

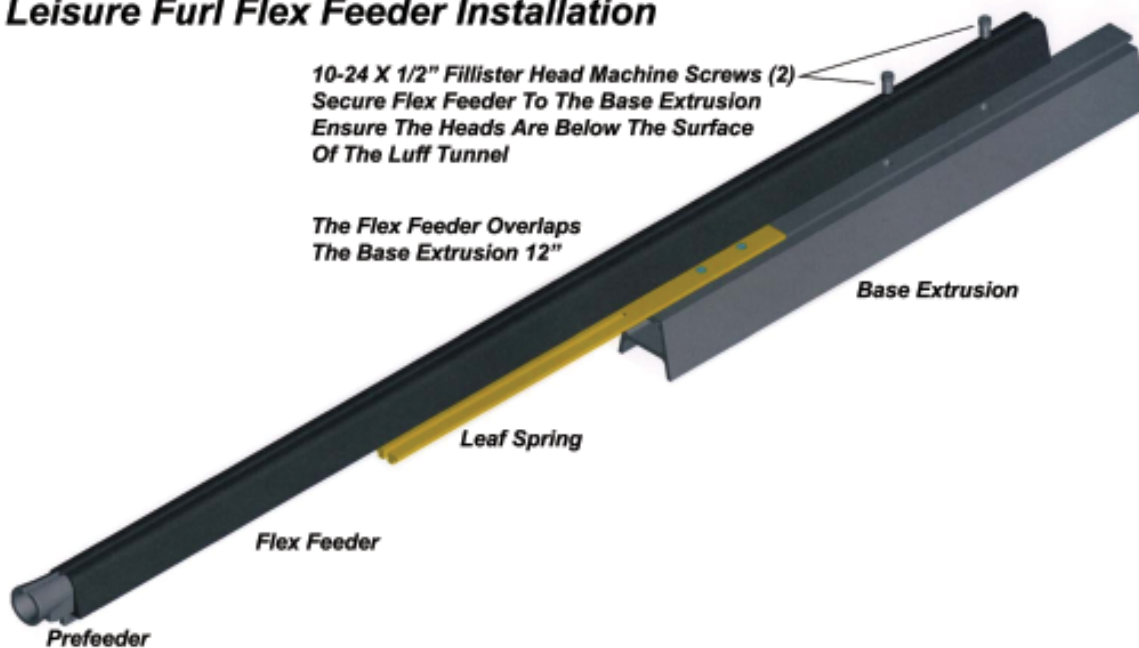
The bolt rope foil sections must have smooth and fair edges

The necessary space of .020" between the foil sections is established by the use of the retainer clips.

The aluminum luff foil system is 12" shorter than the base extrusion system. The "cut length" of foil is the piece which goes at the top, and the cut end must be at the very top of the foil system. This placement ensures that the sail will never be in contact with a cut end of foil. Slide the cut length of foil to the top of the base extrusion and push a stainless steel retainer clip (See Diagram 3b) into the bottom. Continue sliding 6' lengths of foil onto the base extrusion, placing a stainless steel retainer clip into the bottom of each length. These retainer clips help hold the foil lengths in place during installation and establish a .020 gap between each length of foil. **Ensure that the bottom end of the aluminum luff foil is 12" above the end of the base extrusion. This is an important dimension to allow sufficient of the flex feeder fastener and the base extrusion.**

The .020 gaps in the base extrusion joints and luff foil joints allow for modest mast bend without crushing the ends of the extrusions.

Leisure Furl Flex Feeder Installation



INSTALLING THE 30" POLYMER FLEX FEEDER

Any burrs or sharp edges on the ends of the foils will cause luff tape friction, wear and failure. This is why the only "field-cut" length of foil is at the very top of the luff foil assembly where the sail never reaches. Inspect all luff foil ends during installation and smooth as necessary using fine grit emery cloth. **When the luff foils are fully installed, the bottom must be 12" above the bottom of the base extrusion.** Now the 30" polymer flex feeder is slid onto the base extrusion and secured using the two 10-24 X 1/2" fillister head machine screws. Drill using 9/64" bit. Carefully use the flex feeder as a drill guide to locate the fastener locations on the base extrusion. DO NOT drill the base extrusion through the flex feeder. This action could result in the holes in the flex feeder being elongated. It is the shear strength of these screws that holds the flex feeder in place. Apply LocTite and tighten them making sure their heads are below the inside surface of the flex feeder.

INSTALLATION INSTRUCTIONS – Flexible feeder limit line fitting instructions

The limit line assembly consists of two stainless steel termination blocks and a fixed length of Spectra™ line which passes through the eye on the forward face of the luff feeder.

To install the limit line termination blocks on the mast, position the port and starboard blocks at an equal distance from the aft face of the mast. **The limit line should be loose enough to allow the track to flex port and starboard but not aft.** With that in mind, the termination blocks should be installed on the mast sides as shown in the diagrams 4 & 5.

The termination blocks are installed using the 1/4-20 FHMS provided, use an F or 3/16” drill. The knot in each end of the limit line must be pushed out of the termination block to expose the fastener hole. This will allow marking of the mast for drilling and tapping, as well as installing and tightening the screw. This may require flexing the track forward to install the second termination block. A piece of light line, tied around the mast and luff track, may be handy here to hold the track in the forward flexed position.

Each installation is a little different, and the desired amount of flex has to be determined by hoisting and furling the sail. The furling operation should be done several times with eyes on the luff of the sail. Ensure that the 87° boom angle is correct, then watch as sail the rolls into the boom. Furling should be checked at different angles to the wind, since this is the true test of the flexible feeder setup.

Once the termination blocks have been installed on the mast, the only way to affect the amount of flex in the unsupported portion of the luff track is to change the length of the limit line. If less flex is deemed necessary the line can be shortened. If a longer line is required for additional flex, Spectra™ line can be purchased from your local chandlery. Use a figure eight stopper knot in each end then trim the ends as necessary.

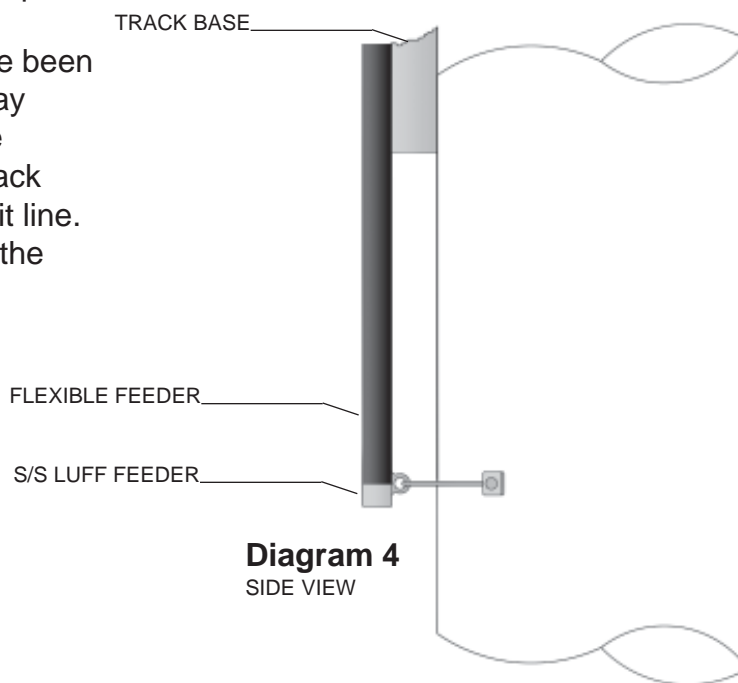


Diagram 4
SIDE VIEW

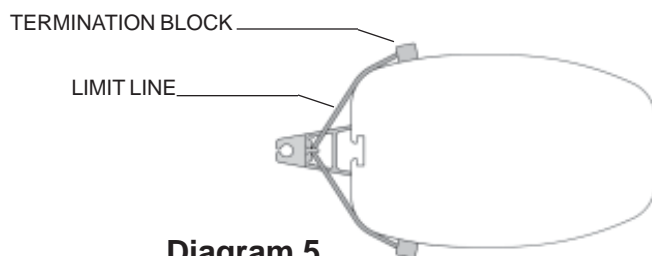


Diagram 5
BOTTOM VIEW

INSTALLATION INSTRUCTIONS – fitting the drive components

Find your previously marked datum position.

Note : The datum position is the reference for all measurements.

Wrap the cardboard straight edge around the mast ensuring that the edges are parallel where they overlap. Tape the ends together, to position securely (See Diagram 6)

Align the top or bottom edge of the straight edge with the datum position and draw neatly around to form a parallel edge at the datum position.

Mark the aft center position on datum line and then measure evenly around both ways to find the center forward position on the front face of the mast. Next mark the indicated distance to Starboard (See Diagram 1) both on the forward and aft face. Use center punch to locate center of drive shaft hole.

Remove the straight edge and put aside to use as a packing gauge when drilling the universal shaft pin hole. Using the correctly sized hole saw, based on shaft diameter, drill the first drive shaft hole at the opposite end of the mast, fore or aft, to the wiring tube. Through this first hole wedge the wiring tube over to one side as you drill the opposing drive shaft hole. With a round file, debur the edges of both holes.

Dry fit the Spool and Inner Bearing castings to ensure that the castings fit the profile neatly. It is important that the **center** of the Spool casting touches against the mast before either of the two side plates. If either side plate touches the mast wall before the center, grind the affected area until the spool fits neatly in position. Thin washers can be used if necessary to ensure spool touches on the center.

Once fitting closely, the Spool and Inner Bearing castings can be temporarily fitted against the mast,

Once the spool cover and inner bearing castings fit properly, Prepare the mast for the seating compound. The seating compound is used to fill any voids between the castings and the mast. It also acts as a corrosion barrier between the mast and the stainless inner casting.

With the inner bearing and the spool cover off, place masking tape on the mast in the area where the castings will sit. Be sure to mask outside the casting an inch or two



Diagram 6



Diagram 7

Place the inner bearing and spool back in their proper position on the mast. Mark the outer edge of both with a felt marker or pencil. Remove the bearing and spool cover. Cut the masking tape inside the perimeter marks. The area of mast now exposed will be covered with seating compound and the castings. (See diagram #7)

The seating compound will require a sound base on the mast to adhere to, so sand the area, then clean with a solvent to remove any oils. Mask around the edges of the castings also, and grease the Spool shaft as compound may dry on this, making it difficult to remove after fitting.

Mix the seating compound with hardener at approximately 2% by weight (use less in hot weather) by volume. Mix this well until the hardener is blended with the compound. Place equal amounts of the seating compound around the castings then position in place on the mast. Working time of the seating compound will vary depending on the temperature. Take caution in hot weather as the compound can go off within a minute. In cold weather it can take 10-15 minutes or longer.

Assemble the castings and drive shaft in place on the mast. Use the plastic spacer strips or the cardboard template to centralize the spool plate around the cover. Push both the inner casting and spool cover really firmly against the mast. Install the clamping tube assembly over the drive shaft (with the clamping tube against the inner bearing). Be sure to grease all components that will come in contact with the seating compound or some parts may become stuck. Tighten the clamping assembly.

This compresses the castings against the mast profile. The seating compound will spill out from the edges. If there are areas that obviously require more compound use the excess that has spilled out to fill but if the weather is hot, be quick as you may not have a lot of time. At this stage tape both the top and bottom of the castings right around the mast to secure while the compound dries. Do not attempt to wipe the excess away.

Allow the compound to tack off then cut around the castings with a sharp blade, to remove excess compound before it fully cures. Do not leave it too long before cutting the excess away as when it goes properly hard it will be a big job to clean it up.

After the compound has cured adequately fasten the Inner bearing by machine screwing this to the mast with the screws supplied. Drill and fasten the two center screws first so as not to misalign the casting. **Use Loctite on all inner bearing fasteners.** Tighten the screws in sequence when all fitted to ensure no possibility of pulling.

Insert a winch handle into the forward face of the Spool plate, and rotate gently to either side, to free the drive shaft and furling spool. Disassemble the clamping assembly. Leave the tape securing the spool cover to the mast. Be careful not to disturb the Spool cover as it sits against the mast. The spool plate and drive shaft can be pulled away from the mast. Fasten the Spool cover by machine screwing this to the mast with the screws supplied. Drill and fasten the two center screws first so as not to misalign the casting with the drive shaft center. Tighten in sequence. Remove tape. With a round file or scraper gently remove any excess compound from inside the drive shaft hole and bearing area.

Wipe off any excess compound from around the drive shaft then refit to the mast.

Reassemble the drive assembly. When turned the spool should spin freely. If it does not, remove the spool again and file the edges further. Repeat this until the spool spins freely.

In some instances it is possible for a wiring tube to rest against the drive shaft. This should not cause a problem unless it is really forcing hard. In this instance the rivets holding the tube above and below the shaft will need to be removed, reducing tension on the tube. If possible re-rivet the tube over to one side. No damage will result if the wiring tube rubs slightly on the shaft.

INSTALLATION INSTRUCTIONS - *Fitting the boom and mandrel.*

With the furling mandrel positioned inside the boom shell lift the boom into position on the boat.

Attach the boom to the gooseneck using only the gooseneck vertical pin supplied. To fit the vertical pin, align the gooseneck spacers and knuckle with the tangs on the mast. Once fitted in position, fasten the pin in place with the washer and screw supplied. Check to ensure that the vang and mainsheet tangs are tight in position, as they may have become loose in transit.

Fit the mandrel to the drive shaft.

Slide the universal coupling onto the drive shaft (which will have to be cut to length) until it touches the Inner Bearing. If when fitted the shaft protrudes through the back face of the universal drive coupling, the shaft will need to be cut shorter by the length that it protrudes. (See Diagram 8) **This is extremely important as the universal will jam in operation and may cause considerable damage to the components or mast.** Diagram 8 shows end of the shaft (tinted blue) flush with the inside of the universal boss.

The shaft must not extend past flush.

Using the correctly sized drill bit, drill the Universal drive pin hole.

The universal has a machined hole on one side, hidden by an O-ring. Remove the O-ring and drive pin. Use a business card, or similar thickness piece spacer between the universal face and the inner bearing casting face to give a small amount of clearance, otherwise the whole unit may end up tight when the pin is installed. Through one of these holes, drill into the drive shaft approx. 3/16". Fit the Universal drive pin into the hole to avoid any misalignment and rotate the mandrel 180 degrees. Drill into the drive shaft the same depth on the other side.



Diagram 8

A drill press is preferred when drilling the shaft, but, if drilling through the shaft with a hand drill, make sure to drill at the proper angle so as to pass through the center of the shaft. Use a metal cutting compound to avoid work hardening the drive shaft. You may find it easier to pass through the shaft with a smaller drill first. If drilling through the shaft with a drill press, remove the shaft once center drilled. When reset up actually ream the hole with the drill until the pin is a tap in fit. It must not be a drive fit. Debur the edges of the hole then refit the spool to the mast.

Align the drive pin holes and fit the drive pin. Use a grease or similar when fitting the drive pin so as it assist with future removal. Fit the leather cover and O-ring over the inner bearing casting flange. Slide the universal onto the drive shaft. Roll the O-ring into the groove, retaining the drive pin and pull the leather cover over the universal coupling.

DECK LAYOUT

Consider the layout for leading the halyard and furling line aft. If the existing vang and topping lift lines terminate at the mast, it would be desirable for these to lead aft also.

The following diagrams offer suggestions which have worked well on previous installations.

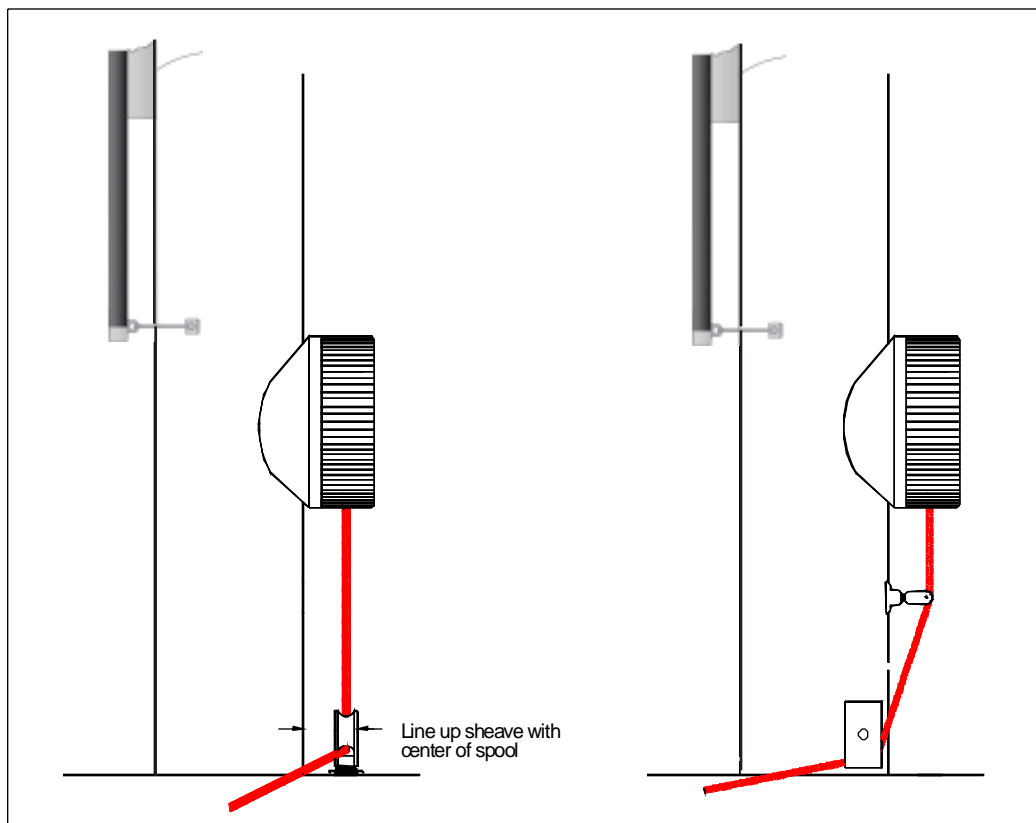
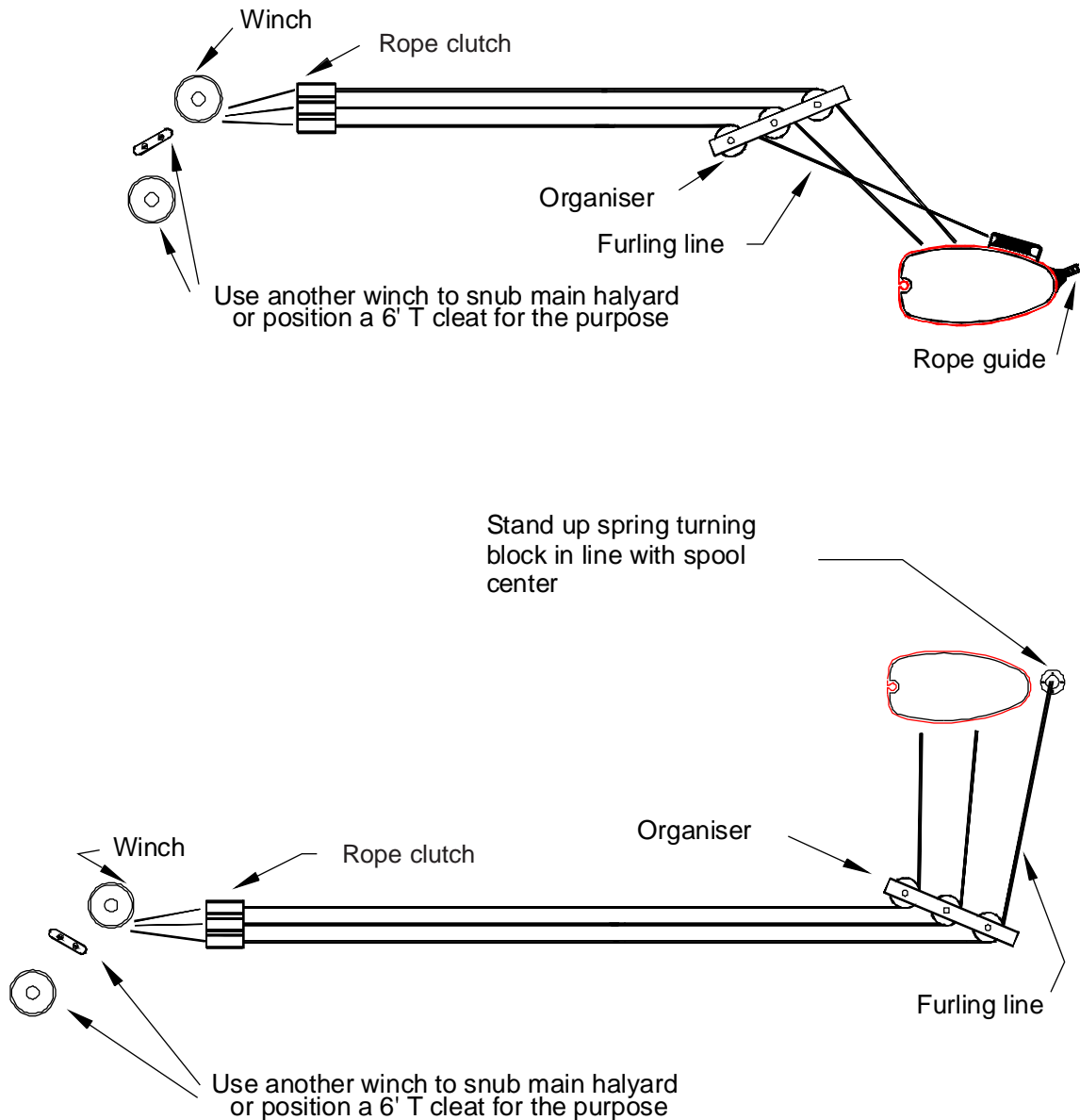


Diagram 9

Diagram 10

On new boat installations there is no need for a rope guide, providing a deck block can be located as per diagrams 9 and 12. However with existing boats, depending on the situation the need to centralize the furling line with the center of the spool arises. When used, the rope guide should lead the furling line off the spool parallel to the mast from the spool center as detailed in the diagrams 10 and 11.



It is essential that the mainsail remains visible during both hoist and furl, so position the operating switch and control lines in the cockpit in a position to allow this. Use of the existing rope clutches may determine the position for operation. The operating switch should be positioned in such a way to allow the operator the freedom to use both hands for managing the system. With an electric winch probably the best position in cockpit floor for foot operation

Leisure furl Sail fitting instructions

INITIAL CHECK

Ensure the furling mandrel rotates freely.

Ensure the feeder is correctly aligned with the sail track, see diagram 4. Adjust to correct if necessary.

Ensure that boom is at correct, 87 degree angle – see owners manual page 5 and 15.

SAIL FITTING

1. With the sail laid on the port side, lift the foot up to the furling mandrel, then slide the foot bolt rope into the track, from either forward or aft.
2. Attach first the tack to the furling mandrel, leaving around 30mm between the tack web and tack ring on the universal.
3. Now lash the clew to the outhaul saddle on the mandrel. ***Do not pull the foot out tight***, leave fullness in the foot for efficient down wind sailing. The in built sail controls will generate outhaul tension – see owners manual page 8, 9, and 10.
4. ***Lash the clew with a minimum of three wraps around the furling mandrel, using a separate lashing, pulling the clew down to within 3/8” of the mandrel.***
5. Using a winch handle inserted into the spool face plate, roll the sail onto the port side of the mandrel. (We recommend two persons assist by pulling either the luff or leach, so as to ensure the bolt rope remains in the area between the boom edge and the mast, whilst the sail is being furled).
6. In some special cases, hoisting the sail from the deck may be preferred, as the spool and boom height from the deck may inhibit manual fitting. In this instance the furling line will need to be pre-wound on the spool before the sail is attached, and the boom set to the correct angle for furling, (see owners manual for hoisting the sail) before the sail is hoisted.
7. With the sail rolled on the mandrel, fasten one end of the furling line to the spool, (if not already in position as a result of note 6 above), by firstly placing five turns around the spool drum in an anti clock wise direction, looking aft. Then pass the free end through the hole in the spool. Tie a single knot as close to the end as possible, and push the knot into the counter bore of the spool drum.

The sail fitting is complete, However minor adjustments may need to be made. See owner manual for guidance.

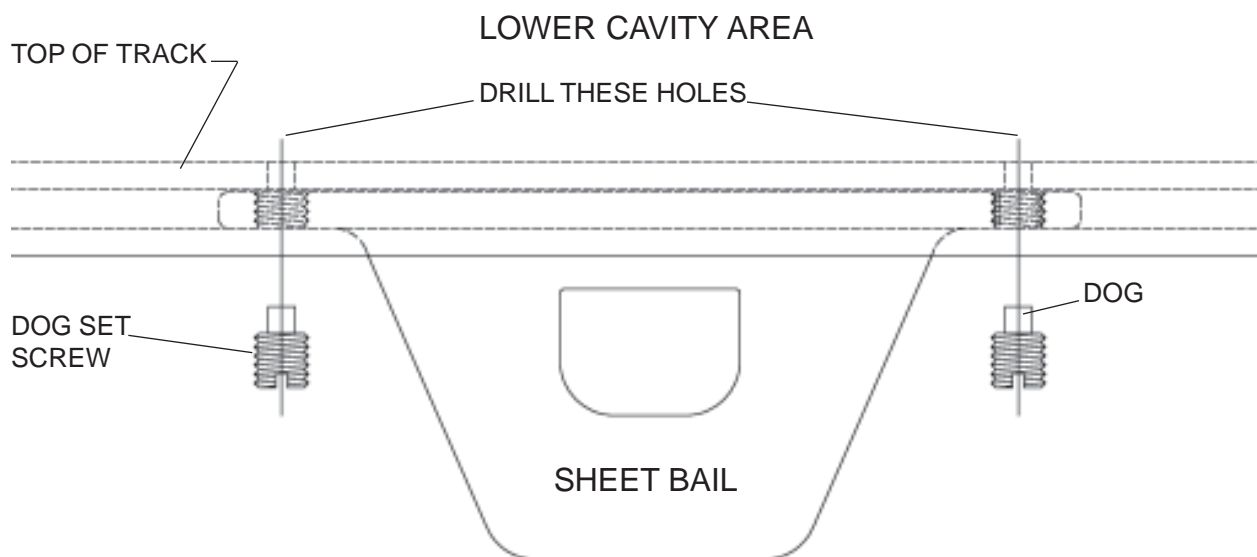
A luff lube with a PTFE or similar base should be applied to the luff tape as needed to reduce the friction in the luff foil.

Leisure furl Main Sheet and Vang Bail fitting instructions

BAIL FITTING

When fitting the mainsheet and vang bails in the track the bails must be secured using the special dog set screws that have been provided. **Be sure to pull the sail cover to the top of the boom to prevent damage when drilling into the lower cavity.**

1. Position the bail in the track, mark the location of the first hole then slide the bail out of the way. ***Do not attempt to drill the boom through the threaded hole in the bail as the drill could damage the threads in the bail.***
2. Drill the first hole 9/64" (14/5, 18/6 & 19/6 system bail) or 1/4" (20/7 & 25/8 system bail) hole through the top of the track.
3. Mark the location of the second hole then slide the bail out of the way, and drill the second hole through the top of the track.
4. The drill used must be sharp so as not to leave a burr extending into the lower cavity of the boom. Use a deburring tool if necessary to remove any burrs which could possibly damage the sail cover.
5. When all the holes have been drilled for the bail, use Loc-Tite on the dog and the threads of each set screw, and tighten. The dog set screws and Loc-Tite must be used at every threaded fastening point of the bail.
6. When tight, the set screws force the bail tight against the underside of the track. The dogs lock into the drilled holes which secures the bail against the thrust loads, preventing the bail from sliding in the track.
7. **All bail set screws must remain tight.** Checking these screws should be a part of the regular preventative maintenance inspections on your Leisure Furl™ boom.



Leisure furl Checklist after installation

If any of the following points are not complete, the system could be damaged. Take care to fix these any outstanding points.

1. Ensure the outer bearing clearance is correct to specifications. (See Diagram 1)
2. Ensure the outer bearing is lubricated.
3. Ensure the spool spins freely.
4. The end spacing between the universal and the inner bearing needs to be approximately 1/32" [.8mm] (the thickness of a business card).
5. Ensure all machine screws have been treated with an anti corrosive compound.
6. Ensure the sail track slugs are locked in place and tight in position. If any slugs are thought to be faulty, rivet the track in this area.
7. Ensure the track joins are aligned, and deburred.
8. Ensure the flexible feeder and limit line is set up correctly. (See Diagram 4)
9. Ensure the luff track top cap is in place and will not allow halyard chafe.
10. Ensure there are no objects or sharp edges between the feeder and gooseneck for the sail to catch on.
11. Ensure the furling line is lead aft, avoiding friction where possible, and the rope guide is set correctly for alignment from the deck to the spool See deck layout.
12. Ensure the boom angle to the mast, is not limited by the Vang or Topping lift adjustment. If a spring / fixed vang is used, ensure the vang can support the boom weight.
The 87° angle to the mast is important.
13. Ensure the drive shaft does not protrude through the back face of the Universal drive coupling. (See Diagram 8) ***Ask if in doubt, this is extremely important.***
14. Wash the boat off thoroughly as filings could be caught in deck lines or may rust on the deck.

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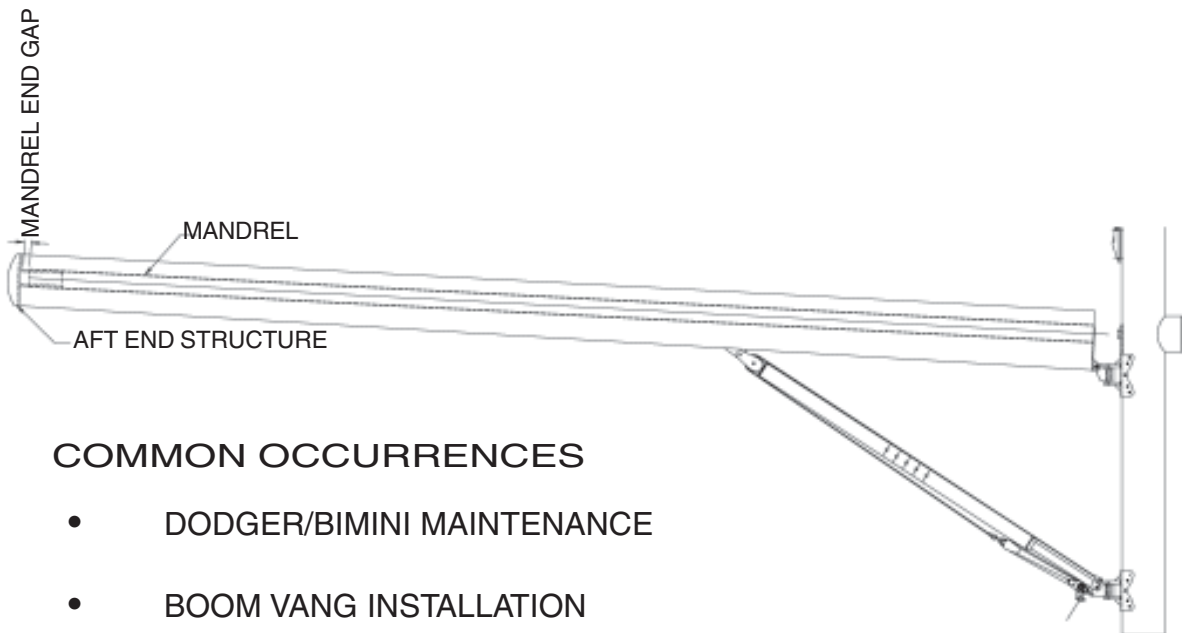
IMPORTANT NOTICE TO OWNERS AND INSTALLERS

Use caution when topping the aft end of the Leisure Furl™ boom.

As the aft end of the boom is raised, the MANDREL END GAP lessens.

Damage, including failure to the MANDREL or the AFT END STRUCTURE can result by compressing the aft end of the MANDREL into the AFT END STRUCTURE. The higher the boom is raised, the closer the aft end of the MANDREL comes to the AFT END STRUCTURE.

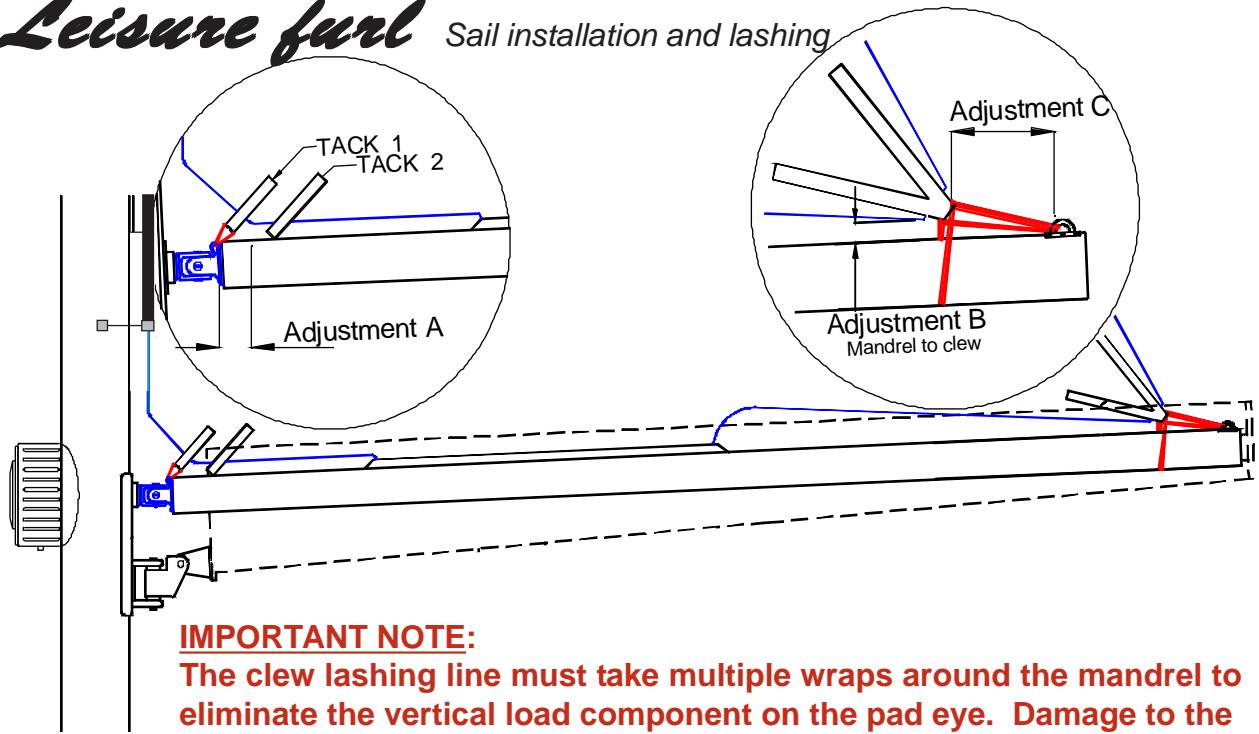
Monitor the MANDREL END GAP during the entire process of topping the boom above the 87° operational angle. Always prevent the mandrel from compressing into the AFT END STRUCTURE.



COMMON OCCURRENCES

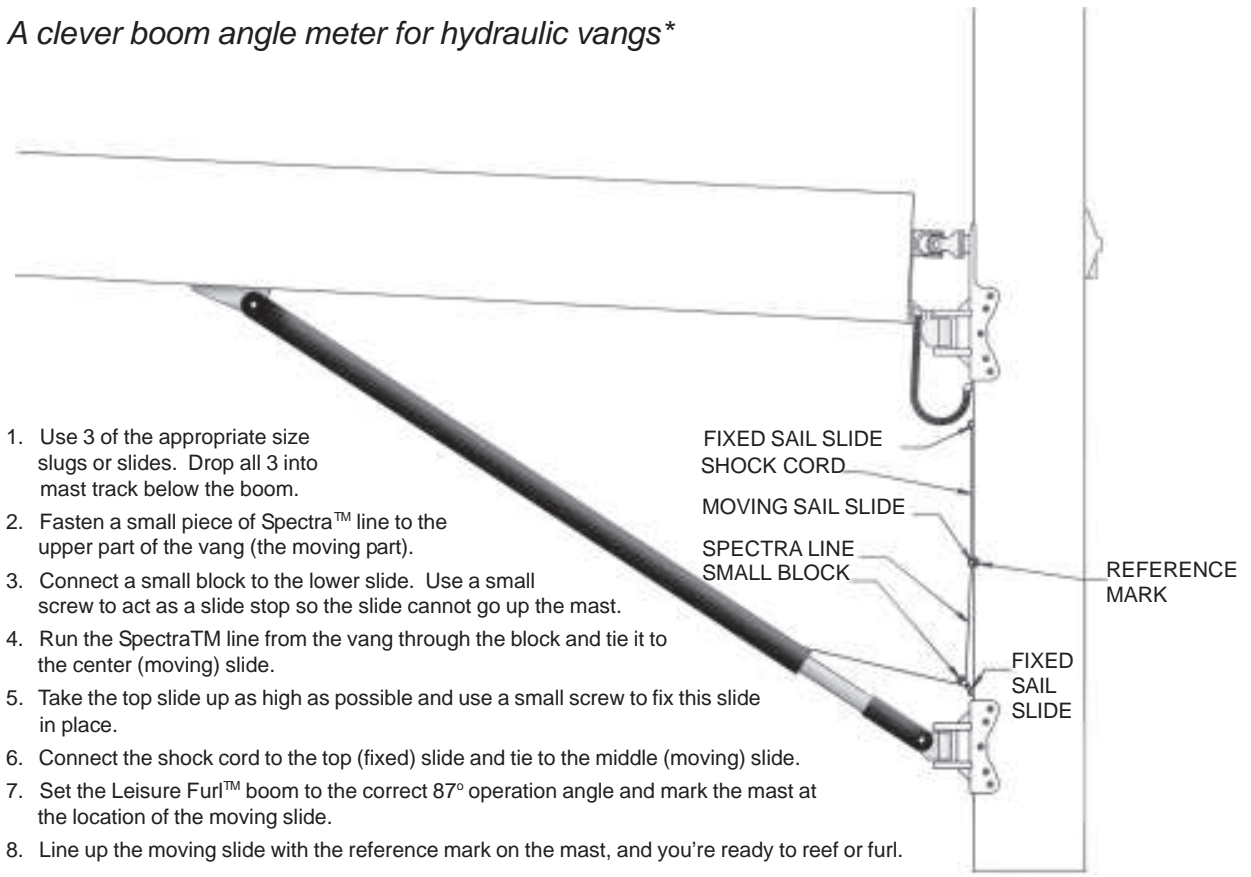
- DODGER/BIMINI MAINTENANCE
- BOOM VANG INSTALLATION

Leisure furl Sail installation and lashing



IMPORTANT NOTE:
 The clew lashing line must take multiple wraps around the mandrel to eliminate the vertical load component on the pad eye. Damage to the mandrel and the foot of the sail WILL result if this process is not followed.

A clever boom angle meter for hydraulic vang*



1. Use 3 of the appropriate size slugs or slides. Drop all 3 into mast track below the boom.
2. Fasten a small piece of Spectra™ line to the upper part of the vang (the moving part).
3. Connect a small block to the lower slide. Use a small screw to act as a slide stop so the slide cannot go up the mast.
4. Run the Spectra™ line from the vang through the block and tie it to the center (moving) slide.
5. Take the top slide up as high as possible and use a small screw to fix this slide in place.
6. Connect the shock cord to the top (fixed) slide and tie to the middle (moving) slide.
7. Set the Leisure Furl™ boom to the correct 87° operation angle and mark the mast at the location of the moving slide.
8. Line up the moving slide with the reference mark on the mast, and you're ready to reef or furl.

*Thanks to John Baxter and Chuck Omalley of Doyle Sailmakers along with the guys at Atlantic Spars & Rigging for their efforts in developing this design. **22**

Important information for both installers and owners.

- **Do not raise the boom with the topping lift or vang more than 3 feet from the normal operating angle, as the mandrel will bottom out on the boom end plate and cause damage. If it is essential to do this, the mandrel must be disconnected from the universal.**
- **If the boom is dropped down to the deck for any reason ensure that the mandrel has not dropped off the aft end spigot before raising the boom again with the vang or topping lift.**
- **If it is necessary to furl downwind pull the boom in to 45 degrees before commencement. This decreases the load in the sail, gets the sail off the shrouds and spreaders and increases the efficiency of the universal.**
- **Ensure that the end float between the universal inner face and the inner bearing casting is no more than 1/16".**
- **If a topping lift only is being used to support the boom, tie a knot in the topping lift line aft of the rope clutch or cleat to ensure that if someone accidentally releases the topping lift cleat the boom doesn't crash down and cause damage or hurt someone.**
- **Ensure all track joints are smooth and radiused. The track entrance from the sail feeder is particularly important. See diagram 5.**
- **Ensure that there is nothing on the mast in the area that the sail rolls that could possibly cause sail chafe. This could include fittings around the side of the mast and trisail tracks.**

Leisure furl Flex Feeder Leaf Spring

This UHMW “Leaf Spring” component provides increased strength and support to the flex feeder at the lower end of the luff base extrusion. The transition from supported to unsupported flex feeder has shown to be vulnerable to cracking when the feeder is allowed to flex well beyond its design parameters. Testing has proven that operator error is required for this over-flexing to occur, and is generally due to insufficient furling line tension during the hoist. This lack of furling line tension can result in the sail ‘blowing out’ of the top of the boom which results in unacceptable side loads on the flex feeder. Also, extreme vertical compression loads can be exerted on the flex feeder in this situation when a batten pocket is forced to make virtually a right-angle turn before entering the prefeeder. Therefore, it is critically important that the restrictor line and termination blocks be installed properly (see Dia. 4 page 11). An additional issue results from reefing with a batten on the flex feeder. Cyclical batten thrust forces will cause the flex feeder to fracture. **ALWAYS REEF THE SAIL SO A BATTEN IS ON THE FURLING MANDREL.** A batten in this location provides outhaul tension to the foot of the reefed sail.

The leaf spring component dramatically softens the hard-point transition at the lower end of the luff base extrusion. This addition does not negate the tailing requirement when operating the Leisure Furl boom. It is always important to keep the sail as vertical as possible between the boom and the prefeeder when hoisting or furling.



The leaf spring is secured to the luff base extrusion by two 10-24 FHMSs.

DURING SEA TRIAL

Instruct the boom operator how to tail the furling ling when hoisting and ensure the sail does not blow out of the top of the boom. Keep the sail flat and as vertical as possible between the top of the boom and the prefeeder during the hoist.