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Feb. 10/19/93

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SCHAEFER
SYSTEM 2000 FURLER

Thank you for purchasing the Schaefer System 2000 Furler. We appreciate your business and hope that our products exceed your expectations.

We at Schaefer have gone to great lengths to produce the finest furler available. Our first goal was to build a rugged, durable furling system that will make your sailing safer and more enjoyable.

Another of our goals was to create a furler that is simple and logical in its construction and assembly.

Wherever possible all pieces are pre-cut and pre-drilled in our factory, thus assuring tighter quality and less work for you when you install the system.

We suggest that you read the enclosed instructions several times, prior to assembly, to familiarize yourself with the name of the components and each procedure. We would also suggest a "Dry-Run" practice assembly prior to the final riveting and locking of the product.

Please be honest about your limitations. If you need professional help, get it. Sailing is supposed to be fun, not an additional form of aggravation.

SCHAEFER SYSTEM 2000

GENERAL SPECIFICATIONS

1. Boat Size - 28' (9M) - 40' (12M)

2. Luff Tape - #6. (7/32 or 6MM)

3. Ball Bearing Material - Amoco Torlon

4. Wire Size - up to 1/4" (6MM), 9/32" (7MM) and 5/16" (8MM)

5. Rod Headstay size up to - 8 (5.72MM), - 10 (6.35MM) or -12 (7.14MM)

6. Clevis Pin Dia. 1/2" (13MM) or 5/8" (16MM)

7. Material and Coating, 6061-T6 Clear Anodized Aluminum Housing and Extrusions.
   6061-T6 Hardcoat Anodized Aluminum Joints and Torque Links.

8. Drum Capacity, 75' (23M), 5/16 (8MM) Line.

9. Headstay Extrusion Length (single section) 6'(2M).

10. Standard System Measurement 46'(14M) Maximum.

11. Shipping weight for System 2000. Furler Box -27 lbs.
    Extrusion Tube - 38 lbs.

Note: All System 2000 Boxes Meet United Parcel Service Requirements.

STEP ONE

PRE-ASSEMBLY BOAT INSPECTION

Inspect the boat prior to installation and look for the following potential problems:

1. Is the headstay wire the right size for the parts you have ordered?

   Is it of 1 x 19 construction? Wire of other construction, dyform wire, and rod headstays will require special wire/rod terminals or special handling. Call us for information or ask a professional rigger.

   Are the pin sizes 1/2" or 5/8"? Is the system you selected compatible?

2. Is the headstay in good condition, without broken strands or corrosion pitting? If not, then the headstay wire should be replaced.

3. Are the swage studs and turnbuckles in good condition without gauled threads, cracks and bends? If not, then these fittings or the entire headstay, must be replaced. If you have been considering replacing rigging, do it now.

4. Look to see that the furling drum will have adequate clearance from the bow pulpit rails, running lights, anchor rollers, windlass and other deck gear. Make sure there is clearance for the anchor stock and chain as they are lowered and retrieved over the bow roller.

   6" link tangs (#2000-13 for 1/2" pins & 2000-14 for 5/8" pins) are available to raise the drum in the event of clearance problems.

PRE-ASSEMBLY BOAT INSPECTION - continued

5. The headstay attachment point at the masthead must have a toggle to allow the headstay to articulate in a universal manner.

   Failure to provide a fully toggled masthead attachment will result in failure of the headstay and loss of the mast. Don't assume! Inspect!

   Isomat Spars with the Ball/Socket type masthead fitting must be retrofitted with a fitting which provides articulation below the masthead.

6. Inspect all halyards for wear, condition of the line and splices, as well as condition of the shackles. Replace marginal gear.

SCHAEFER ASSEMBLY INSTRUCTIONS
SYSTEM 2000 FURLER

WEATHER CONDITIONS: DO NOT attempt to install this furling unit during adverse weather conditions involving rain, snow, ice, high winds, or during unstable electrical storm conditions. These conditions can affect your footing, grip, or result in electrocution that could end your life or the life of someone helping you. Slow Down....Wait for good weather conditions.

WARNINGS: Wires

Many docks, marina's, and yacht clubs utilize overhead wires and lighting on their docks and shore facilities.

These power lines and other high-tension lines should be avoided. Do not allow any part of the furler to come close to, or in contact with any power line.

The furler, being made of aluminum, is highly conductive and represents a severe shock hazard.

PERSONNEL AND HELP:

While it is possible for one experienced individual to install the furler over the existing headstay, it has been our experience that with two or more people, the job can be done more efficiently and safely.

This is particularly true when removing the existing headstay from the masthead of a rigged boat or when transporting the assembled furler and headstay back to the boat from the work area and hoisting them into position on the boat.

We recommend you solicit three persons experienced in hauling someone aloft to help you with these tasks.

ON GOING ALOFT:

Do not treat the job of going up the mast of your boat lightly. It is extremely dangerous and should not be attempted by inexperienced persons.

For your safety, we suggest the following commonly known and common sense safety precautions:

ON GOING ALOFT - continued

1. Use a heavy duty bosun chair in good condition which provides full side and back support and has a proper crotch and waist strap system that prevents you from accidentally sliding out of the chair, large pockets or a separate tool bucket are essential.

2. DO NOT USE HALYARD SHACKLES OR SNAP SHACKLES TIED TO THE TOP OF THE BOSUN'S CHAIR: Snap shackles are designed to open under load, when the pin is pulled. This can and will happen accidentally if the pin is rubbed on or is caught by rigging while you are aloft. BYPASS THESE SHACKLES AND TIE THE BOSUN'S CHAIR DIRECTLY TO THE WIRE OR ROPE EYE OF THE HALYARD.

3. ATTACH A SAFETY LINE to the chair and tie it off when in a working position.

4. USE A SECOND HALYARD tied to the chair to provide an extra margin of safety. This is very important - as an example: the winch could develop an override, or your crew accidentally overhauls the primary halyard into the masthead which could cause a rigging failure.

   Have a helper take this halyard tail thru a block and take up slack around the cockpit winches.

5. NEVER ALLOW ANYONE TO STAND DIRECTLY UNDER SOMEONE WORKING ALOFT. A rigging pin or a screw driver dropped from 50 feet can be a lethal weapon. Stay clear of the individual aloft.

   If you and your helpers are not experienced in hauling aloft, do not attempt it! Seek the advise and help of a yacht rigger or professional service yard.

DOCK AND WORKSPACE REQUIREMENTS

If your boat is in the water with the mast, up you will need to remove the headstay and take it to a work area nearby to assemble the furler.

Try to find a dock which is sheltered from waves and has good ramp access to your work area from the float.

While it is possible to assemble the furler and make the required modifications on the dock, it is very likely that you will lose furler parts, rivets, screws or tools overboard.

Should you choose not to follow our advice, a small package of spare parts is included in the furler kit.

We suggest that you look for a large carpeted room, meeting room, sail loft or rigging shop where all the parts can be laid out full length and no parts can be lost.

If you assemble the furler on a lawn or field, place all small parts in buckets.

If you are forced to assemble the furler on a rough surface or a paved parking lot, wrap all the parts with carpet or cardboard to avoid scratches.

A NOTE ON PACKAGING AND MACHINED PARTS

We take pride in the quality of our machining and parts. All parts should be a slide fit; all holes are precision fixture drilled and should align.

If your parts don't fit, don't force them. If rivet and fastener holes don't align, do not drill new holes. Call us, and we will help you discover the problem; or, we will send you new parts.

Modification of the parts could result in reducing the strength of the furler and void your warranty. Please work with us to solve any problems.

REMOVING THE HEADSTAY

1.) Be sure to tie off the mast with halyards or lines prior to removing headstay pins.

2.) Slack the backstay turnbuckle - Replace pins

3.) Slack the headstay turnbuckle and remove clevis pin at the bow.

From the bosun's chair at the masthead, tie a series of tight 1/2 hitches around the headstay wire with a line long enough to allow the headstay to be lowered on deck from the chair.

Tie this line to the spar or bosun's chair temporarily to free your hands to release the masthead pin.

After the masthead pin is released, lower the headstay to the deck.

REQUIRED TOOLS - SUPPLIED BY YOU (Photo #1)

#1

1 Pair -- Needle nose pliers - for removing existing cotter pins and bending new ones in turnbuckles and masthead pins.

Wire Cutters -- For cutting headstay wire to overall length prior to furler assembly.

Hack Saw -- For cutting the top extrusion to the final overall length -- This is the only cut necessary on the extrusion.

Pop Rivet Gun -- With tip for 1/8" rivets that join extrusions.

1 Medium Point Flat Screwdriver--
-- For removing screws in drum of furler to gain access to turnbuckle.

2 Medium (8") Crescent Wrenches--
-- For tightening Norseman or Sta-Loc terminal at the top end of the wire.

Masking Tape

Rags and Acetone -- To clean excess locktite off extrusions and fasteners.

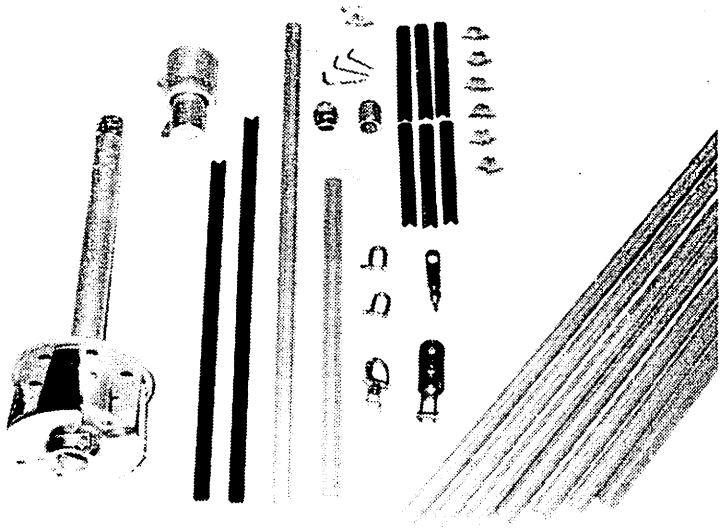
REQUIRED TOOLS (Supplied with Furler Kit)

5/32" Allen Head Wrench -- For extrusion clamp

3/16" Allen Head Wrench -- For drum housing screws.

1/8" Allen Head Wrench -- For top cap set screws

STEP ONE: Unpack the Furler and layout all parts at the work area. (Photo #2)



#2

1.) Contents of Round Shipping Tube:

7 pieces of Furler extrusions 6 feet long with 4 holes in each end.

1 piece of bottom section with 4 holes in one end only.

1 piece of 1/2 section with 4 holes on each end.

2.) Contents of Box:

A. 1 Upper swivel assembly

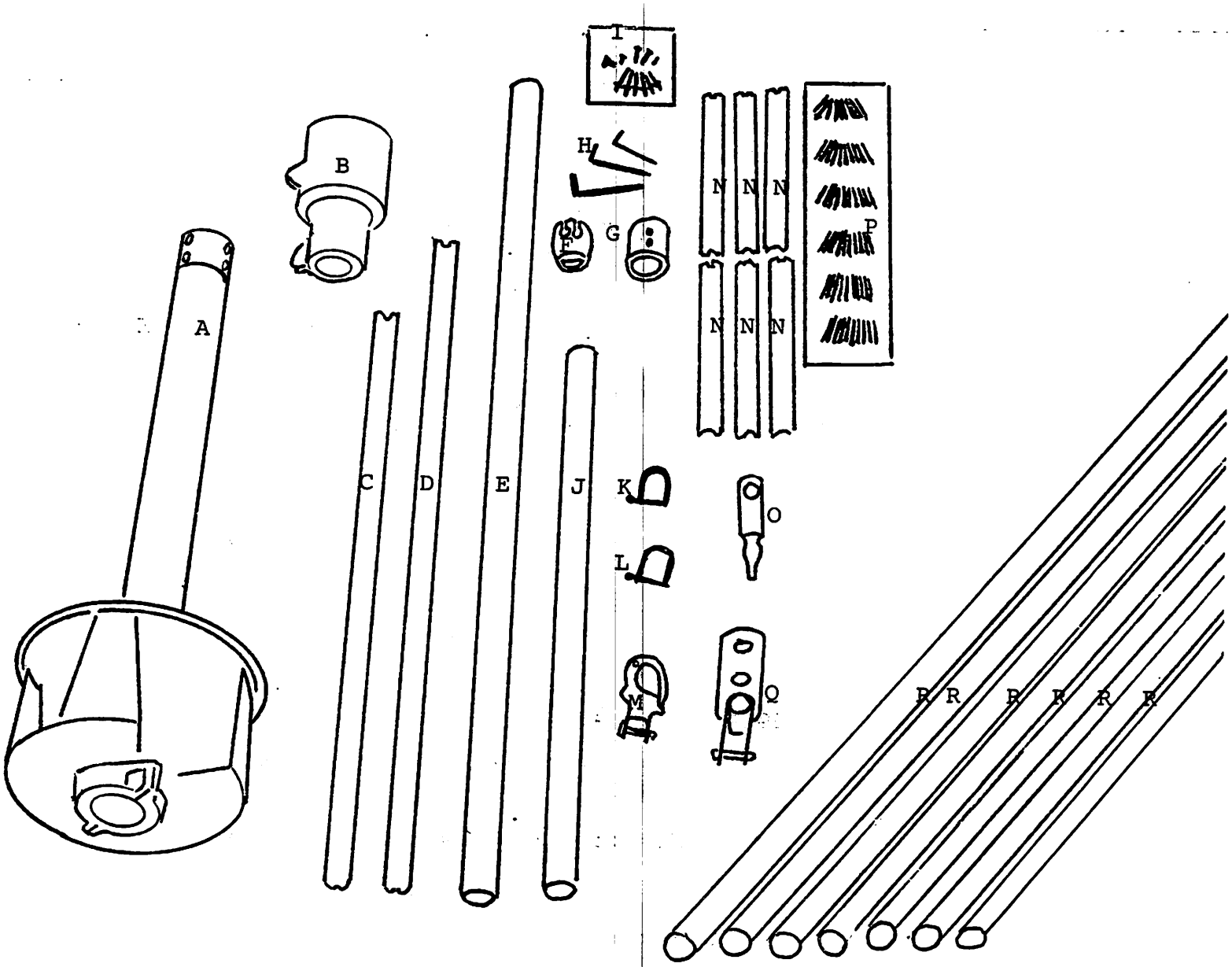
B. 1 Drum assembly with stainless steel cage.

C. 1 Bottom torque link 27 3/4" long with 8 holes near one end.

D. 1 Top torque link 24" long with small welded lip at one end.

Continued on Page 12...

PARTS DESCRIPTION



A. DRUM, TORQUE TUBE & CLAMP
B. UPPER SWIVEL ASSY.
C. 24" TOP TORQUE LINK
D. 27 3/4" BOTTOM TORQUE LINK
E. 36" EXTRA 1/2 SECTION
F. STAINLESS FEEDER
G. TOP CAP
H. ALLEN WRENCH (3)
I. SPARE PARTS
J. 22" BOTTOM SECTION
K. UPPER SWIVEL HALYARD SHACKLE
L. UPPER SWIVEL HEAD SHACKLE
M. SCHAEFER TACK SHACKLE
N. SIX 8" FURLER JOINTS
O. STA-LOC FITTING
P. 60 RIVETS
Q. HEAVY DUTY TOGGLE
R. SEVEN 6' EXTRUSIONS

E. 1 Shrink wrap package containing:

6 pieces of 8" Long furler joint sections pre-drilled with 8 holes each.

1 Package of 60 rivets.

1 Allen wrench 1/8".

1 Allen wrench 5/32".

1 Allen wrench 3/16".

1 Tube of .02 oz. Loctite -271 sealer.

1 Tube of Neverseez (for all stainless screws)

1 Package of "Spare Parts".

1 Top cap

1 Sail feeder

1 Tack shackle

2 "D" - shackles

For 1/4", 9/32" Wire

One 1/2" Pin Heavy duty toggle.
One Norseman or Sta-Loc fitting the same size as your wire and with the same 1/2" pin size.

For 5/16" Wire

One Heavy duty toggle with 5/8" Pin and 5/8" pin hole.

Two 5/8" Norseman or Sta-Loc fittings.

One 5/8" Pin set of link tangs to replace turnbuckle.

3.) OPTIONAL PARTS YOU MAY WISH TO ORDER FROM SCHAEFER MARINE INC.

A. Furling line 70' Marlow line (Part # 2000-11)

B. Furling line block system (Part #2000-15)

C. Extension tangs to raise drum - (Part # 2000-13 for 1/2" pin holes, Part # 2000-14 for 5/8" pin holes).

D. Cleats

E. Pre-feeder Part # 2000-17

F. 6 Foot extra headstay extrusion Part # 2000-10

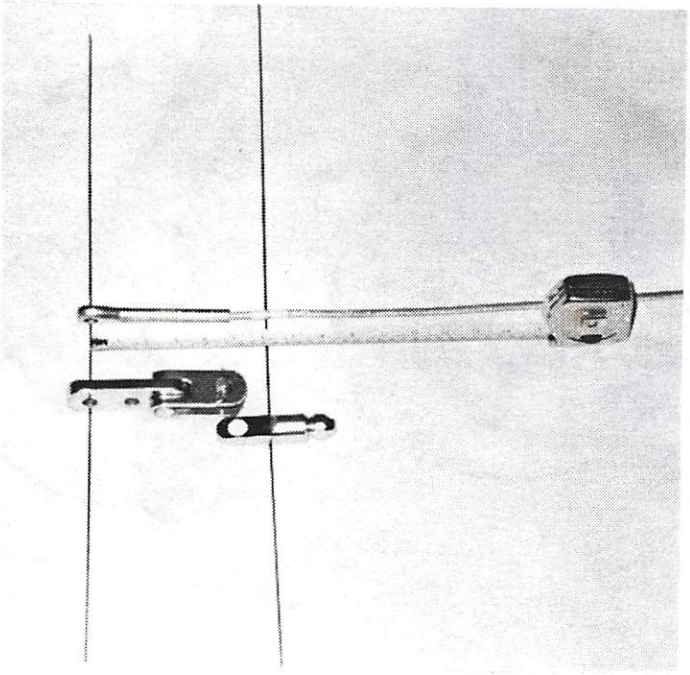
STEP 2

MODIFICATION OF EXISTING HEADSTAY AND INSTALLATION OF LINK TANG

The Schaefer 2000 System uses a new heavier duty link tang and toggle as it's base. this toggle is designed to take the additional side loads exerted on the headstay by the control line during reefing and furling. The existing turnbuckle is attached to the top of this fitting thus isolating it from side loads which could fatigue the threaded studs of the turnbuckle.

The length that is added to the overall pin to pin length of the original headstay by the new toggle is removed from the top of the headstay and a new wire terminal is installed.

In most applications, where there are no additional requirements for masthead toggles or link tangs the headstay must be cut 6" down from the center of the hole of the existing headstay fitting. With the addition of the new heavy duty toggle at the bottom and the wire terminal at the top, the headstay will again return to it's original pin to pin dimension; when the furler is installed on the boat the turnbuckle will end up being adjusted very close to the position it was in when you started. (See Photo #3 and #4)



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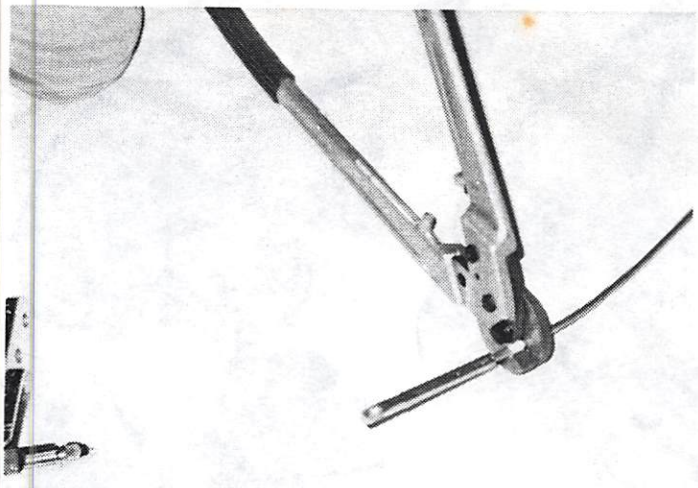
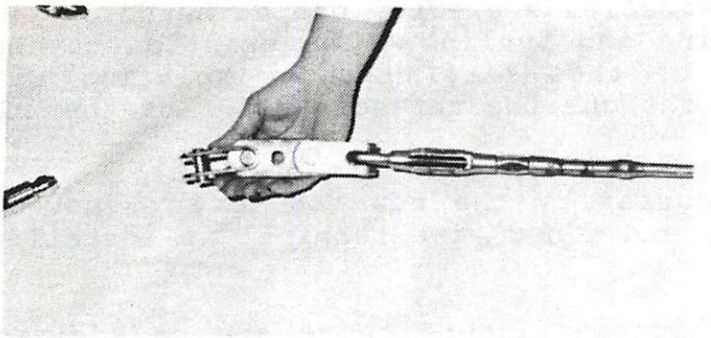


#4

STEP 2 (continued)

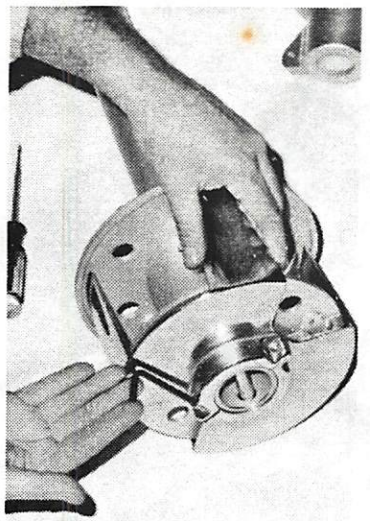
With wire shortened the required amount, now is the time to attach the heavy duty lower toggle to the turnbuckle. Close turnbuckle completely and move to step three. (See Photo # 5)



#5

STEP 3

Remove the aluminum top plate, bottom plate and stainless steel cage from the bottom furling drum and remove pin in bottom. This will make the unit easier to handle as well as providing access to fasteners required to accomplish further assembly steps and final adjustments. (See Photo #'s 6, 7, 8 and 9)



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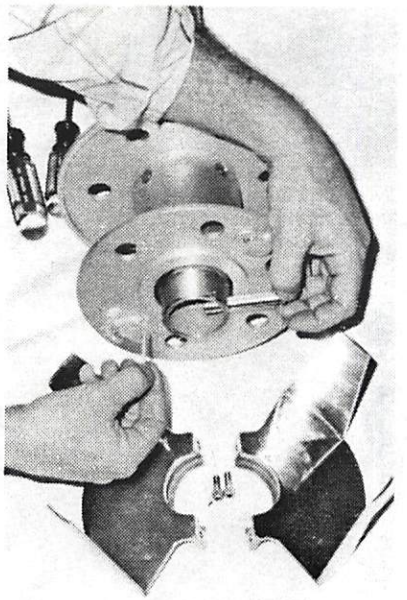

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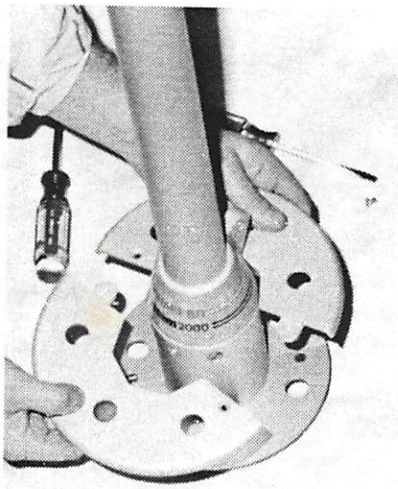

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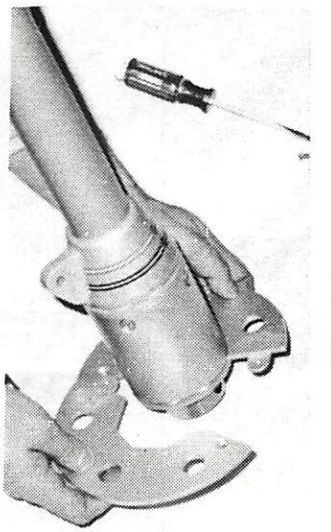
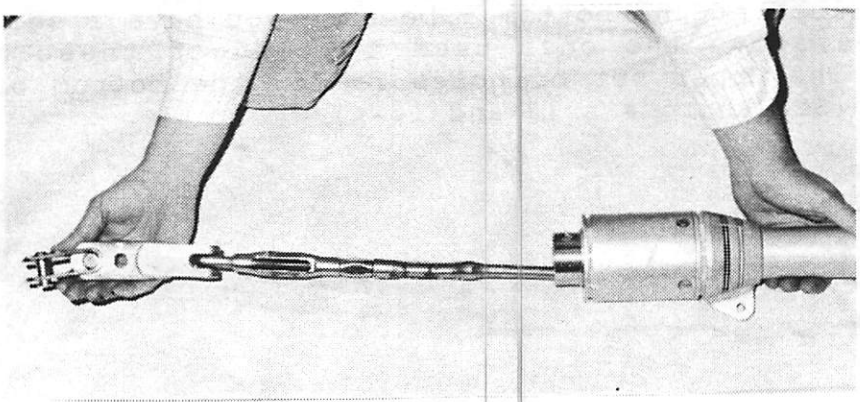


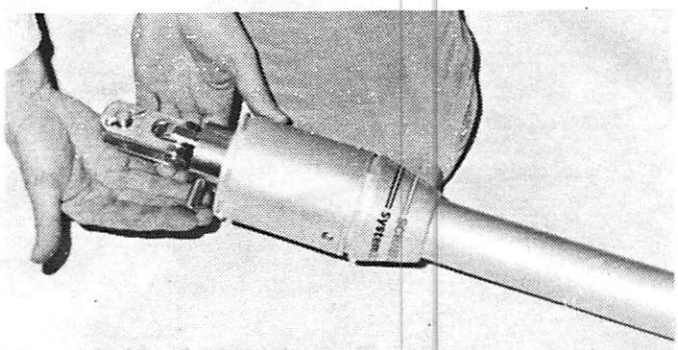
#9

Slide this disassembled unit over the cut end of the headstay wire and down to the heavy duty toggle link. (See Photo #10)



#10

Install pin thru stainless steel bottom race and thru the center hole of the heavy duty toggle. Install cotter pins in each end of pin. (See Photo #11)



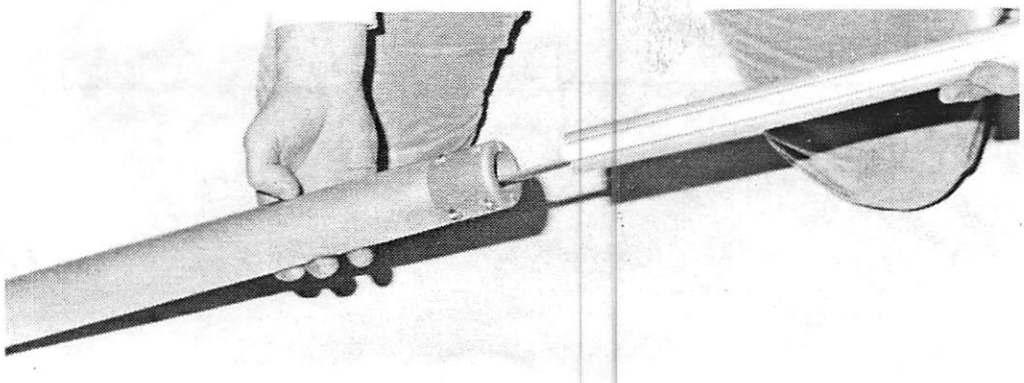
#11

STEP 4

INSTALL SPECIAL BOTTOM FOIL EXTRUSION AND SPECIAL TORQUE LINK

A special pre-cut and pre-drilled short (22" long) foil extrusion is provided to use between the top of the torque tube and the feeder.

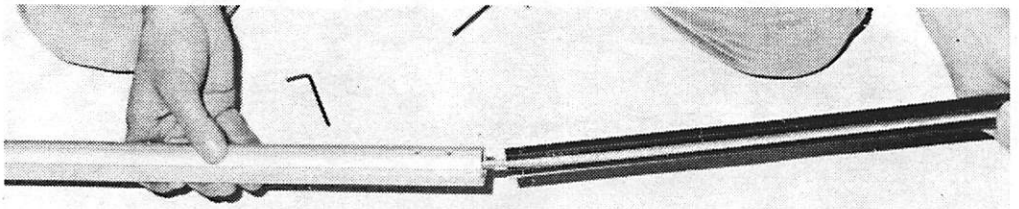
Slide this fitting down wire from the top with the pre-drilled rivet holes toward the top of the headstay. (See Photo #12)



#12

Step 4 cont.

Slide the special (27 3/4" long) torque link inside this section and check for alignment of rivet holes; the two extrusions should be nearly flush at the bottom - be sure you have a second set of rivet holes above the ones used to connect these two parts together. The upper set of holes is for the bottom of the next extrusion. (See Photo #'s 13 and 13-A)



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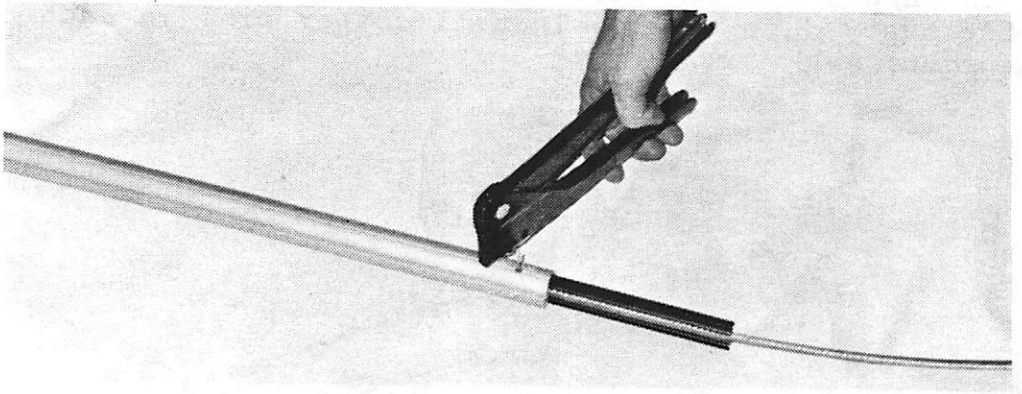
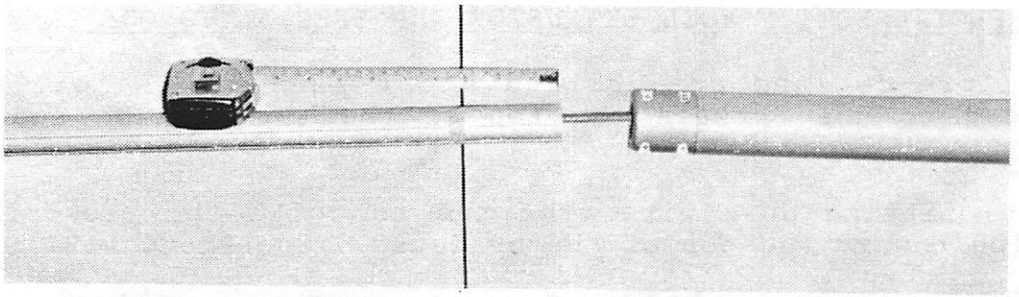


#13-A

Loosen the clamp at the top of the torque tube and slide these extrusions approximately 3 - 4" inside the clamp. Firm up the fasteners on the clamp but do not tighten at this point. (See Photo #'s 14 and 15)



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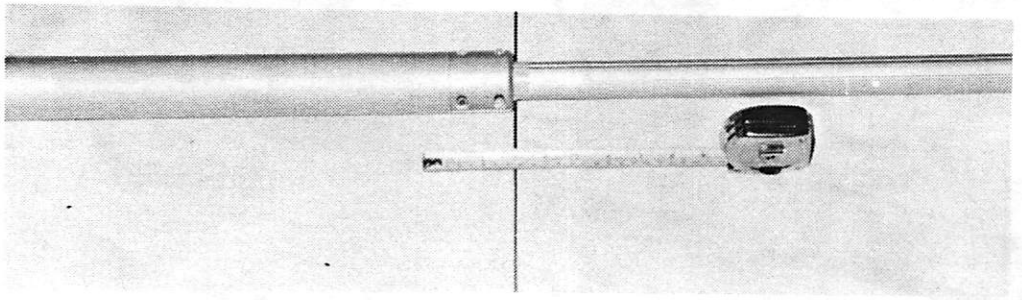
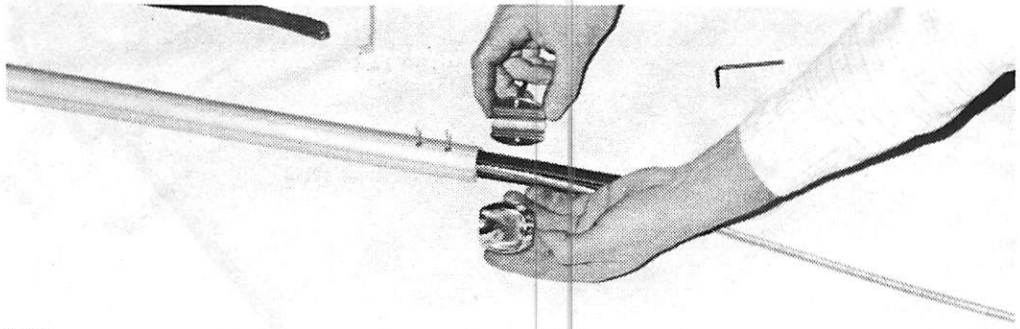


#15

STEP 5

INSTALL FEEDER

The stainless steel feeder is a 2 piece investment cast fitting designed to clamp onto a space provided at the top of the special bottom foil extrusion on the special bottom link section. (See Photo #'s 16 and 17)



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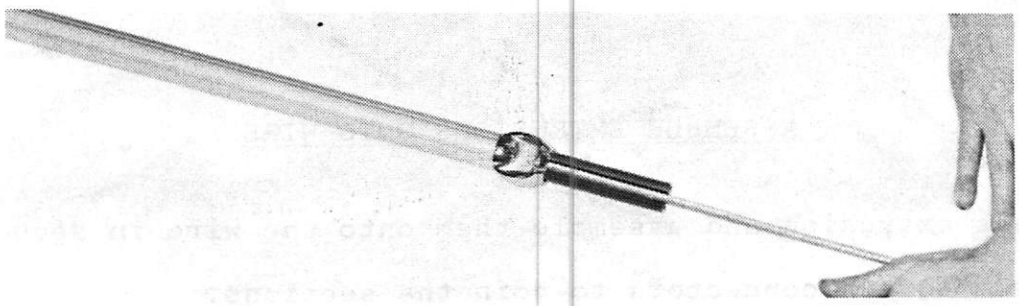


#17

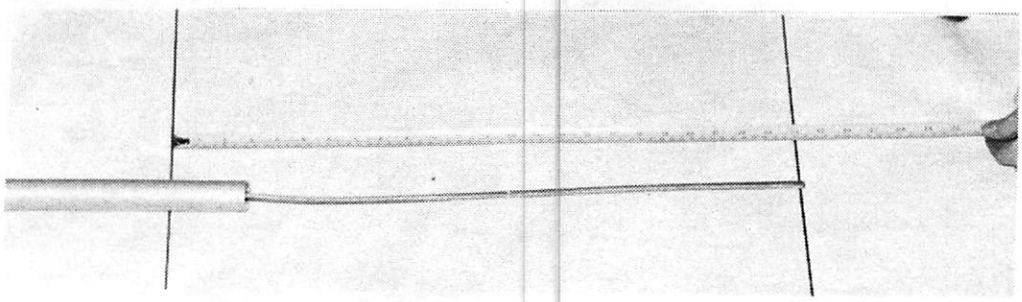
STEP 6

LAYING OUT THE EXTRUSIONS AND CUTTING TOP EXTRUSION

At this point it is advisable to lay out the extrusions and determine which extrusion will be cut and where.

Lay the extrusions end to end along side the wire from the top of the feeder to the end of the wire.

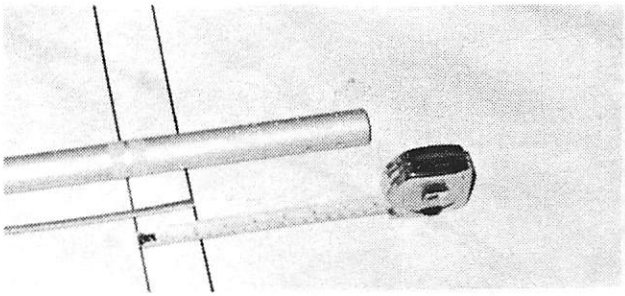
If the last joint is less than 2 feet down from the end of wire, substitute the second section down from the top with the pre-drilled 1/2 section. (See Photo #18)



#18

This will move the last joint further down the headstay, thus allowing room for the long top (24") bearing/joint to be inserted in the top section.

Next, mark the top section at a point 2" below the end of the wire, cut this off at this point with a sharp hack-saw. (See Photo #'s 19 and 20)



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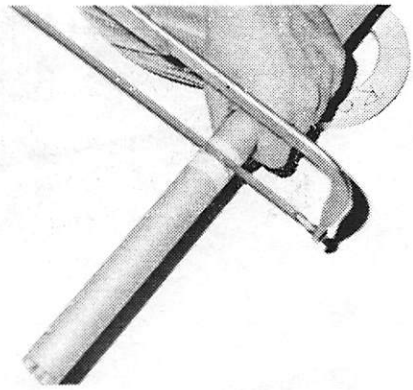


#20

STEP 7

ASSEMBLE EXTRUSIONS ONTO WIRE

Take each extrusion and assemble them onto the wire in sequence.

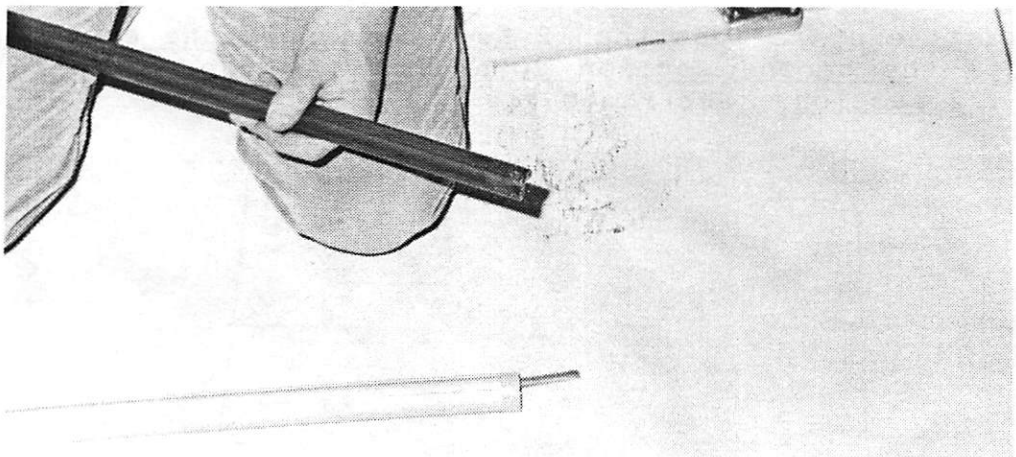
Use the 7" green connectors to join the sections.

All joints and extrusion ends are pre-drilled to ensure tight tolerances at each joint.

Make sure all rivets are flush with foil surface.

Continue to assemble all the way to the top.

Insert 24" long top bearing joint into top section. (See Photo #20A)



#20-A

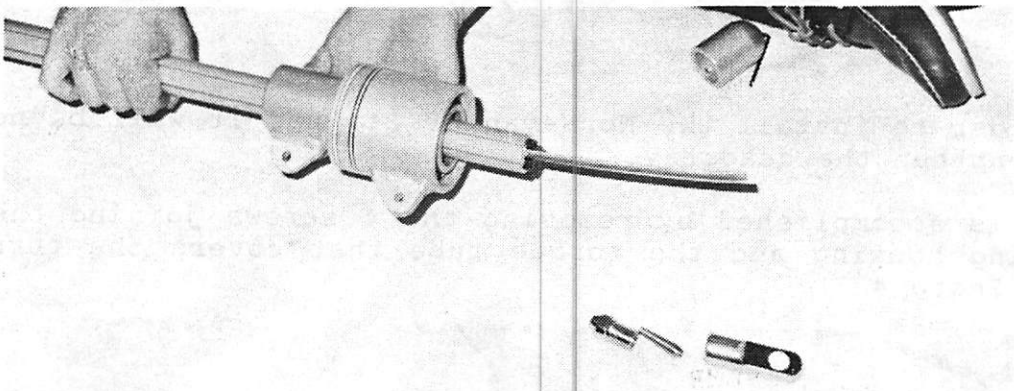
STEP 8

UPPER SWIVEL

Prior to installing top cap and Norseman Sta-Loc fitting be sure to slide the upper swivel assembly over the top and slide down to the feeder as shown. (See Photo #21)

Large diameter housing represents top of swivel.

Install the 2 5/16" forged "D" shackles on upper swivel.



#21

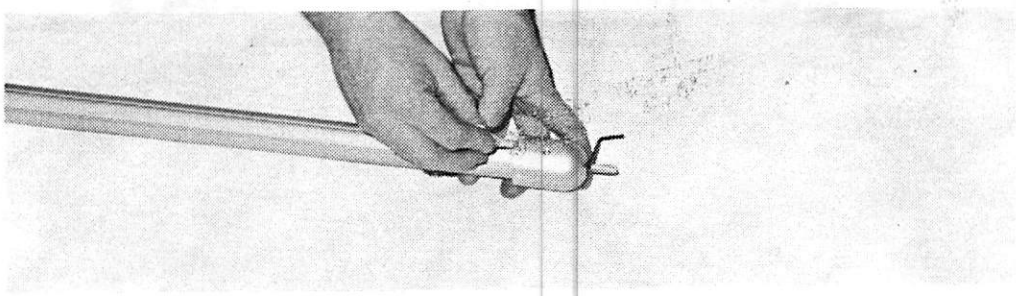
STEP 9

INSTALL TOP CAP

Slide top cap over cut end of extrusion and tighten set screws into one of the sail slots.

Use locktite to secure these set screws.

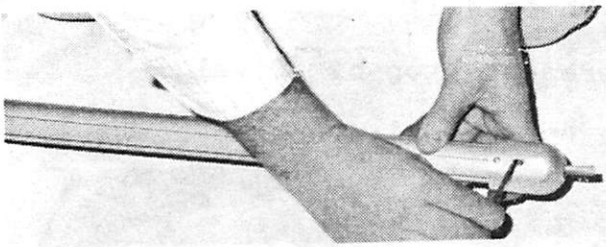
The top cap is an important detail for it prevents the halyard swivel from being overhauled off the end of the extrusion and hanging up.



STEP 10

INSTALLATION OF NORSEMAN OR STA-LOC FITTING

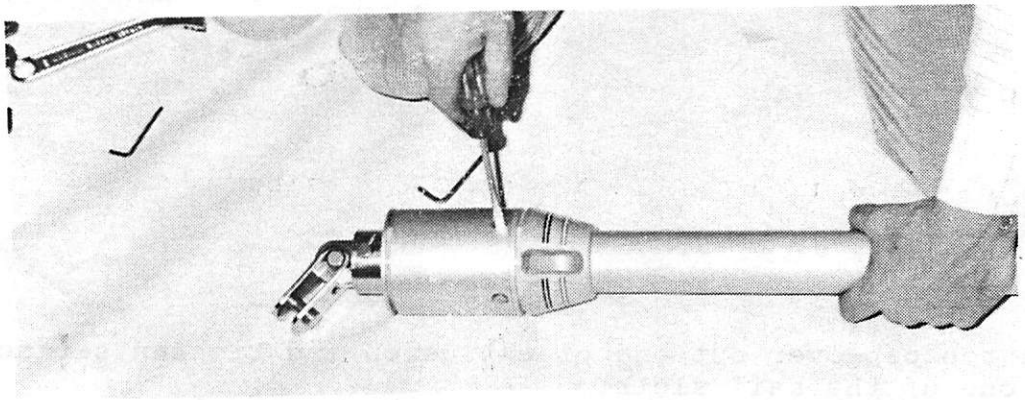
The assembled furler is now complete and only 1 1/2" of wire is showing at the top cap. (See Photo #22)



#22

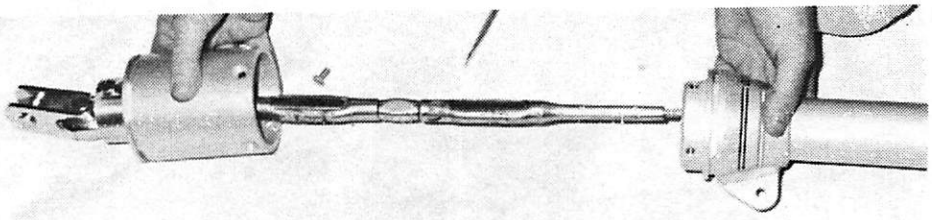
In order to install the Norseman or Sta-Loc it will be necessary to lengthen the headstay.

This is accomplished by removing the 4 screws joining the bottom bearing housing and the torque tube that covers the turnbuckle. (See Photo #23)



#23

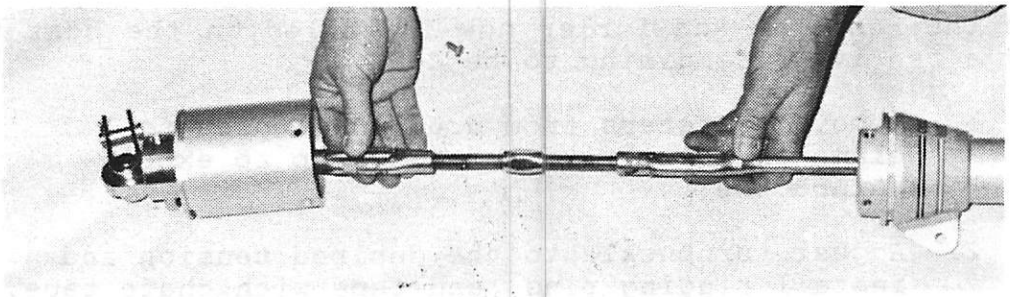
With these fasteners removed, loosen the clamp at the top of the extrusion and slide the torque tube up the foil to expose the turnbuckle. (See Photo #24)



#24

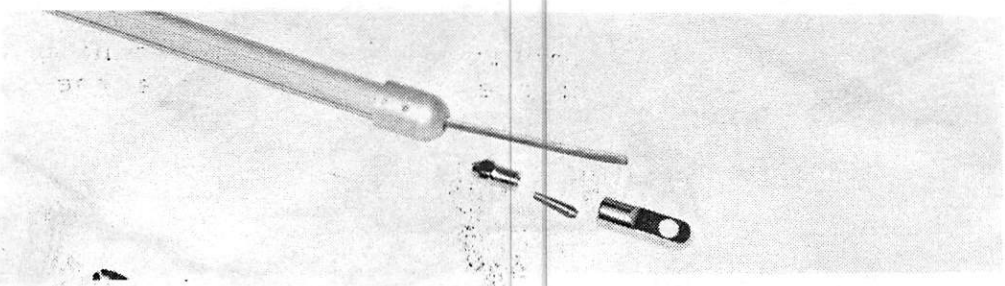
Step 10 cont.

Loosen the turnbuckle the full amount, this should give you 6" to 8" of wire at the top of the system which is adequate to install the wire terminal. (See Photo #25)



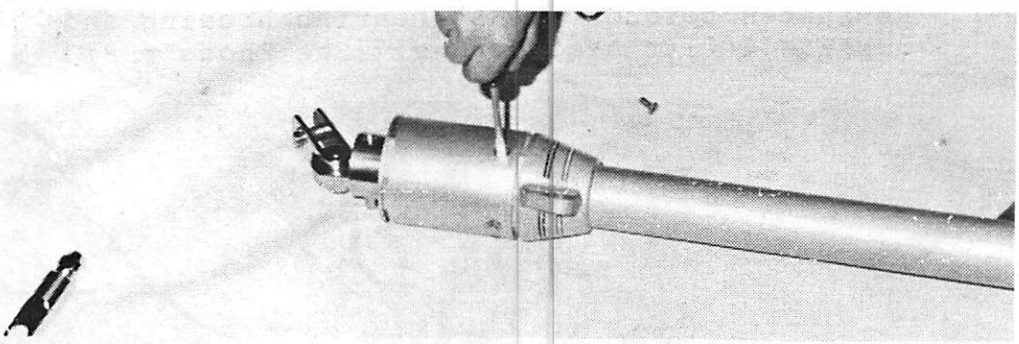
#25

Follow the instructions in the Sta-Loc or Norseman package for assembly of these fittings on the wire. (See Photo #26)



#26

Re-assemble torque tube to bearing housing and re-clamp to foil. (See Photo #27)



#27

The headstay and furler are now ready to return to their standing position on the boat.

STEP 11

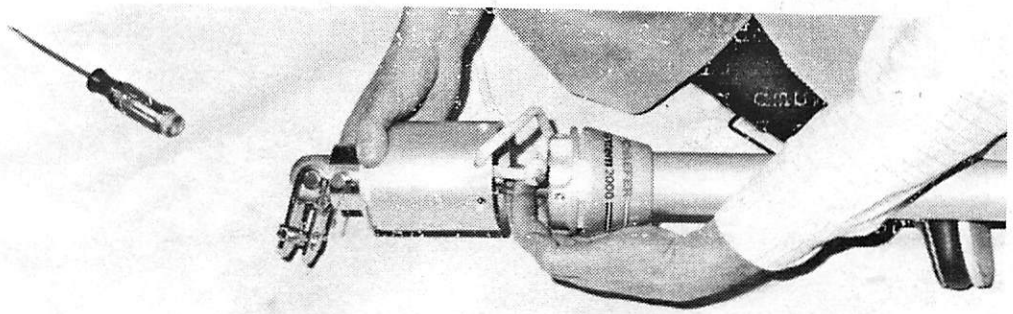
FINAL ASSEMBLY ON BOAT

With the Headstay and furler now installed on the boat there are only a few items remaining to be done.

1. Remove fasteners from drum and loosen foil clamp one more time and slide up to expose turnbuckle.

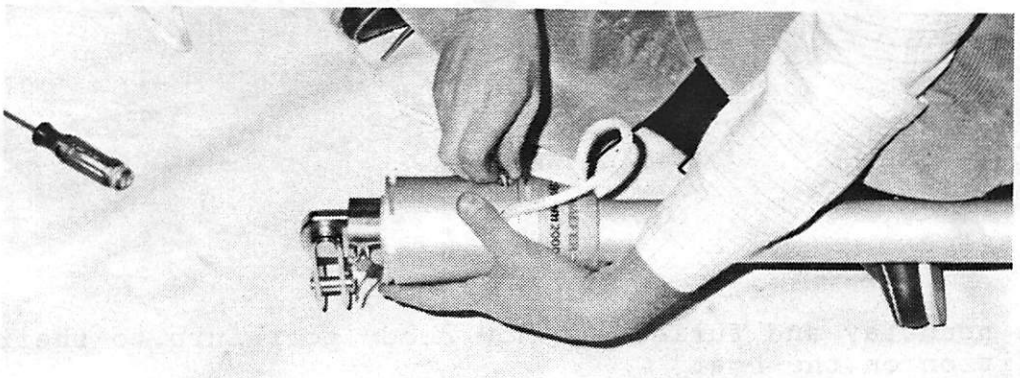
2. Adjust turnbuckle to the desired tension and install rigging pins, and tape with chafe tape.

3. Install furler control line in side of drum housing. (See Photo #28)



#28

4. Re-fasten torque tube to bearing housing and replace 4 flat head screws. (See Photo #29)



#29

5. Push extrusion up until 3 to 4" only are inside the clamp of the top of the torque tube. Fasten tightly.

STEP Eleven - Continued

6. Attach Schaefer tack shackle at base tack lug on torque tube.

7. Re-install bottom, then top drum plates first and stainless steel cage second.

STEP Twelve

FINAL TOUCHES AND RIGGING SAIL

1. Coil all the reefing line onto the drum before hoisting sail.

2. Lead the halyard line off the drum to Schaefer Part Number 300-35 lead block attached to a stanchion or pulpit, then hence aft thru Schaefer Part Number 300-34 to the cockpit. (#2000-15 Furling Block Kit.)

3. Raise the sail with the halyard swivel, feeding the luff tape into either sail slot.

SYSTEM 2000-03 FURLER
INSTRUCTIONS FOR 5/8" TURNBUCKLES ON 5/16" WIRE

Some 5/8" turnbuckle bodies will not fit inside the torque tube above the drum.

The system 2000-03 includes a set of link tangs in addition to a heavy duty bottom toggle, all of which have 5/8" pins to match the existing rigging. All are designed to fit within the torque tube.

It will be necessary to remove the turnbuckle and use the link tang system in its place.

We suggest that you perform this modification to this lower end first and then follow the same directions for assembly as apply to System 2000-01 and 2000-02.

Two Norsemen or Sta-Loc fittings are provided so that both top and bottom ends can be modified.

Should the bottom end of the wire be a swaged marine eye, attaching to a jaw and jaw turnbuckle, the swaged eye may be used without modification on the new link tang system. The top end of the wire will be the only required modification.

Once the furler is installed over the headstay and installed back on the boat, final headstay length will be determined by sliding the two link tangs together until the holes align and then inserting the clevis pin.

Final headstay tension will be obtained by tightening the backstay turnbuckle.

WARRANTY

Schaefer Marine, Inc. warrants its System 2000 Furling gear and accessories to be free from factory defects in material and workmanship for a period of three (3) years from the date of purchase.

At any time within three years of the demonstrated date of purchase, Schaefer Marine, Inc. will remedy any factory defect in material or workmanship (at no charge to the original purchaser) if the product is returned to Schaefer Marine, Inc. The buyer shall be responsible for shipping and insurance charges, if any, on the products returned for repair under the terms of this warranty. Schaefer Marine, Inc. will pay shipping for products returned to the buyer. Return of defective products must be accompanied by a letter giving name, address, date of purchase, type of boat, and description of malfunction of the gear.

This warranty extends only to factory defects in material or workmanship of products in normal use. It does not extend to damage caused by accident or abuse, or to any consequential or incidental losses or damages arising from the products or their use. There are no other warranties, including that of merchantability, expressed or implied, other than those set forth herein which extend beyond the period of this warranty.

This warranty is in lieu of all other implied, express and statutory guarantees, and in no event shall Schaefer Marine, Inc. be liable for special, incidental or consequential damages.

Some states do not allow limitations on how long an implied warranty lasts, nor the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.