

INSTALLATION INSTRUCTIONS

YACHT

SPECIALTIES COMPANY, INC.

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Shown in method 1 at right is an installation utilizing our Figure 411 sheave assembly which features a built-in quadrant stop and sheaves mounted in an adjustable manner. This method greatly reduces installation time and costs by eliminating the need of creating mounting surfaces and bonding them in place in the boat. The quadrant stop provided also saves time and costs involved in creating and installing stops.

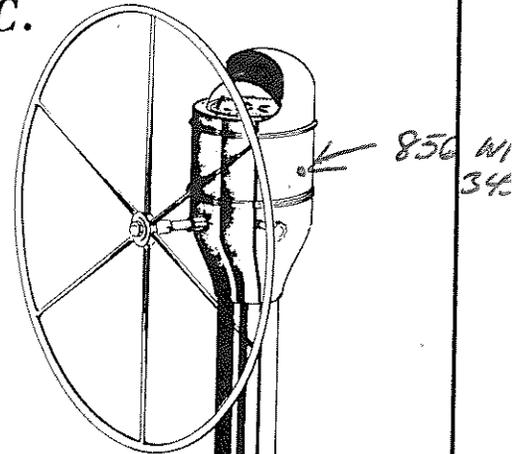
This method has certain limitations however. The pedestal must be installed forward of the rudder shaft and the center of the pedestal can be no closer than 15" to the rudder shaft using an 8" quadrant or 17" using a 10" quadrant.

It is an ideal way of making an installation where the rudder shaft is in the aft end of the cockpit.

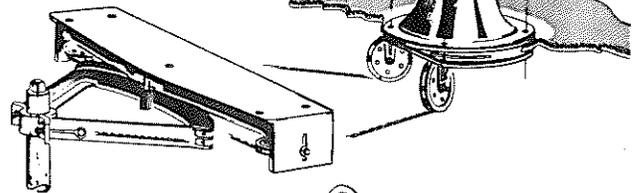
Method 2 at right shows a typical installation using separate sheaves to port and starboard of the quadrant. These sheaves must be mounted independently on existing bulkheads or surfaces. Any existing surfaces should be properly re-inforced if they are not strong enough as they are. If no bulkheads or surfaces exist, wood mounting surfaces must be installed. Details of this are shown in the back of the catalogue.

This method must be used when cockpit arrangements dictates the pedestal be installed directly forward of the rudder shaft over the quadrant or when the pedestal must be located aft of the rudder shaft.

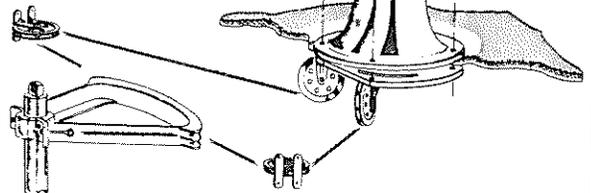
Adequate quadrant stops are a must on every system and if this method of installation is used, a quadrant stop or stops will have to be fabricated and installed. Quadrant stop suggestions are shown in the back of the catalogue.



METHOD 1



METHOD 2



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INSTALLATION INSTRUCTIONS

INSTALLING YOUR PEDESTAL STEERER

In the instructions and illustrations that follow, we have tried to cover—step by step—the best and easiest method of installing a pedestal steering system. We are often asked "How long does it take to install a system?" The answer to this question is that it can vary from a few hours to as much as two days or more.

Some boats are open and roomy and the area beneath the cockpit is accessible and free of anything in the way—such as tanks, pumps or the like. Other boats are the exact opposite—no accessibility—a tank close up to the cockpit deck or cockpit scuppers right where the quadrant wants to swing. In small diameter solid or hollow shafts we always recommend a keyway be milled in the shaft. This may mean removing the entire rudder to have the keyway milled. The rudder may also have to be dropped to install a packing gland. We cannot cure these problems. We can only say that if you want a steerer badly enough, you may have to move the tanks or re-route the scuppers or vent hose, or drop the rudder. We have, however, attempted to cover the various situations usually encountered in the average installations so your work will go easier.

LOCATING THE PEDESTAL STEERER

The proper or improper location of your pedestal steerer can make or break the functions of the cockpit as a whole and the comfort with which you steer, sometimes for hours on end.

While your architect's plans or our installation drawings might show one location, you may find a different location for the pedestal steerer that better suits the way you use your boat.

Unpack your Yacht Specialties steering equipment. Install the wheel on the steerer and place it in your cockpit as shown on plans, or where you think it should be. Move around it, reach for your winches if you are going to be single-handing it to see if they are accessible. Check to see if the mainsheet or backstay will be a problem. In other words, does the chosen location fit the way you use your cockpit and is there ample room behind the steerer to stand or sit and steer? We recommend no less than 21" to 22" from the center of the pedestal column to the aft end of the cockpit.

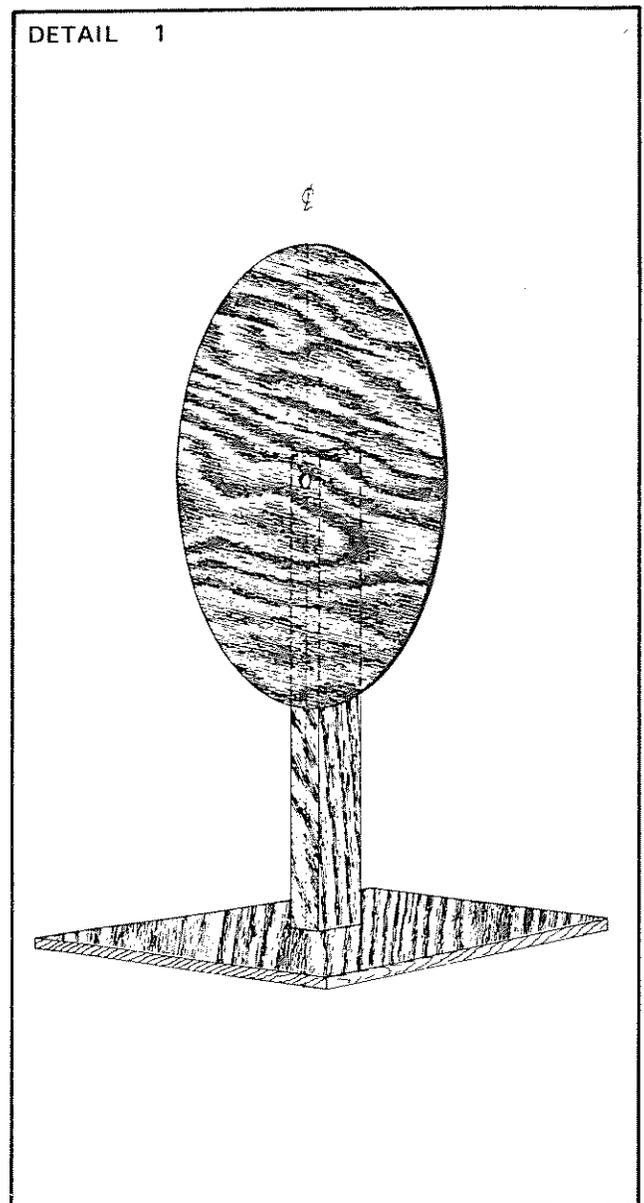
NOTE:

Before you even order your steerer you can easily determine two things. . .where you will mount your steerer and will it go there, and how large a wheel should be installed. Using a 10" x 10" square of plywood nailed to the end of a 30" length of 2" x 4" wood, you can simulate a pedestal. Out of a sheet of cardboard, cut a disc (your wheel), say 24" in diameter and nail it to the 2" x 4"—28" above the base. Using this simulated pedestal and wheel as we instructed above you can determine location and wheel size quite readily. (See Detail # 1).

With the desired location for the pedestal steerer established and the below deck components at hand, check the area below the cockpit deck to be sure there is ample freedom and room for the units to be installed.

At this time it must be determined if re-inforcement of the cockpit deck is necessary. If the cockpit deck thickness is 3/4" to 7/8" or thicker and is already re-inforced with plywood bonded to the bottom side and covered with glass cloth, it is probably sufficiently strong to mount the steerer without any addition of plywood. If the deck seems at all "springy," bond another thickness of plywood—1/2" to 3/4" thick—where the steerer and the Figure 411 sheave assembly (if used) is to be mounted and cover with glass cloth.

On boats of wood construction, seasoned blocking should be installed between the deck beams where the pedestal is to be mounted.

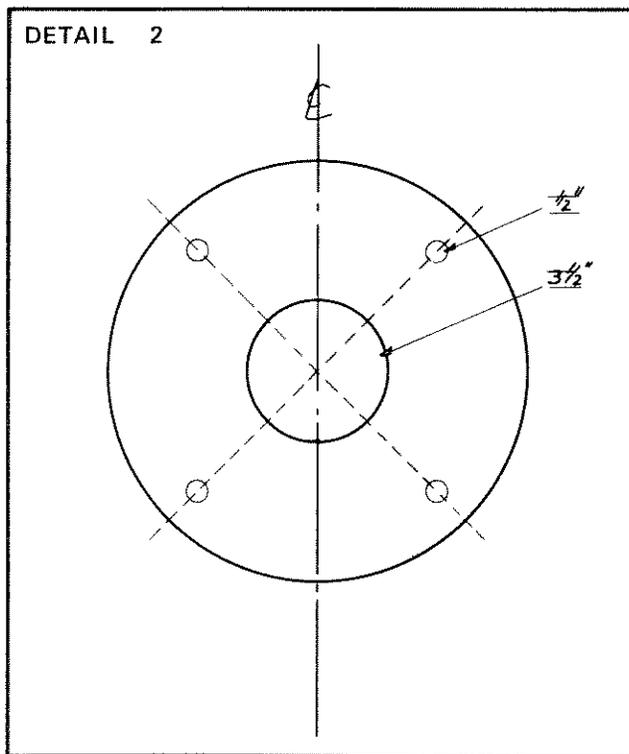


INSTALLATION INSTRUCTIONS

INSTALLATION OF PEDESTAL AND IDLER PLATE

Once the final location of the pedestal steerer is determined, center it in the cockpit and align it accurately fore and aft. Draw a line around the outside of the base and accurately indicate the four 1/2" dia. bolt holes. Remove the pedestal and with crossed lines, establish the center of the pedestal base on the cockpit deck. Drill four 1/2" dia. holes for pedestal bolts. With a sabre saw cut a hole 3 1/2" in diameter at the center of the base layout. (See Detail #2)

This 3 1/2" opening allows for the two steering cables, two engine control cables, if used, and a binnacle light wire to pass through the cockpit deck. In lieu of a large 3 1/2" diameter hole, three smaller holes may be drilled to match the openings in the Figure 410 idler plate. The Figure 410 idler plate may now be temporarily hung with the four pedestal mounting bolts but the pedestal may be set aside for later final installation.



PREPARATION OF THE RUDDER TUBE FOR QUADRANT INSTALLATION

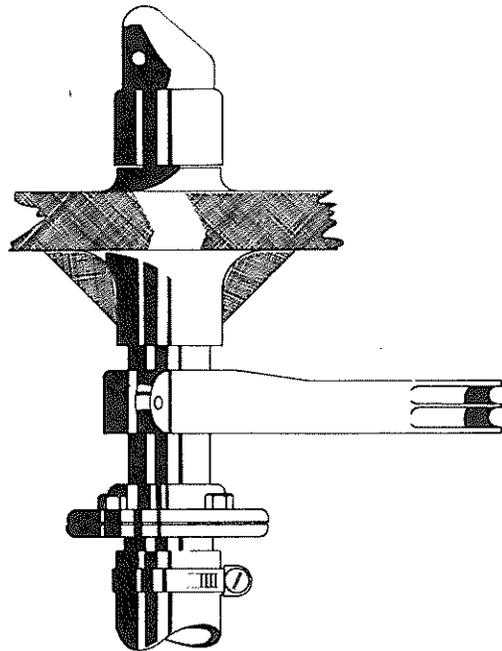
The most difficult part of a steerer installation is the preparation of the rudder tube and the proper attachment of the quadrant to the rudder shaft. If you are ordering a new boat with plans to install a steerer at a later date, have the boat builder mill a keyway in the rudder shaft and install a packing gland when the boat is in the construction stages. If these preparations are not done in the building of your boat, you will have to proceed as follows:

If your boat is equipped with a fiberglass rudder tube bonded into the hull and cockpit deck, a portion of this tube will have to be removed to expose the rudder shaft for attachment of the quadrant. If your rudder is a spade

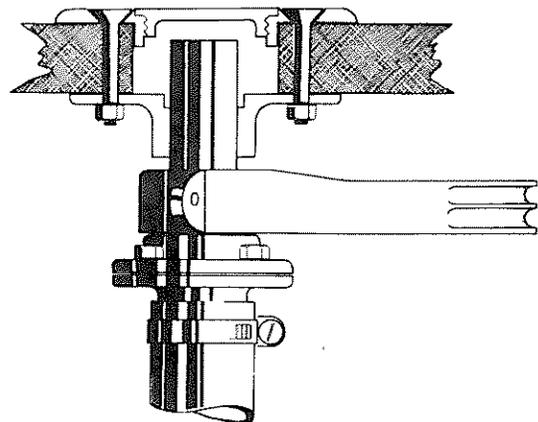
rudder or a rudder mounted behind a skeg but without pintles and gudgeons, the only thing holding it in the boat is the tiller fitting. Therefore it must be decided now, if the tiller fitting will be left as it is in the cockpit (See Detail #3) or if the rudder shaft is to be cut off and covered with a deck plate. (See Detail #4)

If the former is decided on, the upper portion of the tube will remain as a rudder bearing and carrier. It may need re-inforcing to the deck with additional glass and resin. (See Detail #3) If the latter is decided on, an adequate bearing must be well fastened to the cockpit deck and the packing gland must be installed directly below the quadrant with the quadrant bearing on the gland, thus preventing the rudder from dropping out of the boat. (See Detail #4)

DETAIL 3



DETAIL 4

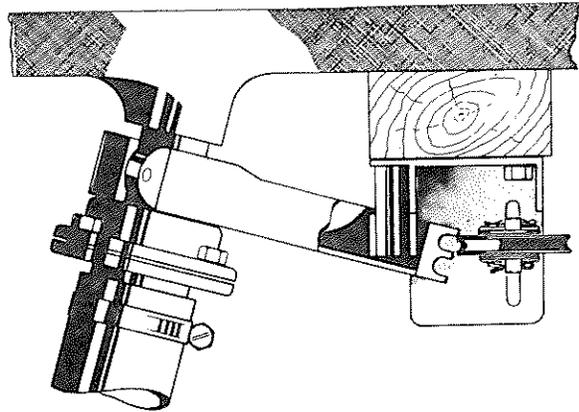


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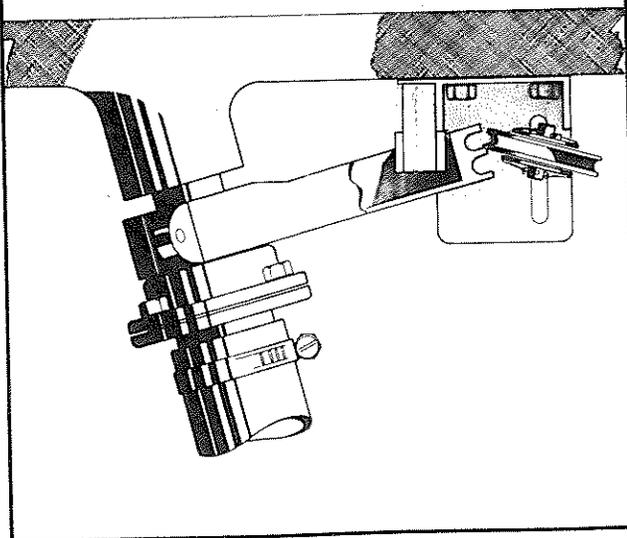
INSTALLATION INSTRUCTIONS

The quadrant should be kept as high as possible on the rudder shaft. If our Figure 411 sheave assembly is used, see details #5 and #6 for locating the rim of the quadrant relative to the cockpit deck. This dimension is approximately 2½" from underside of the cockpit deck to top of quadrant rim—or so that quadrant stop post engages vertical webs of quadrant arms but is free of horizontal webs. This will allow 40 degrees of rudder angle either side of center. In the case of a negative raked rudder shaft, a spacer block (See Detail #5) may be necessary between the cockpit deck and the Fig. 411 assembly.

DETAIL 5



DETAIL 6



If the pedestal is to be mounted just forward of the rudder shaft and over the top of the quadrant, the quadrant must be installed giving enough clearance for the Figure 410 idler plate to mount between it and the cockpit deck. In this case, individual Figure 400 sheaves must be mounted on wood sheave supports bonded to the cockpit sides and the hull.

NOTE:

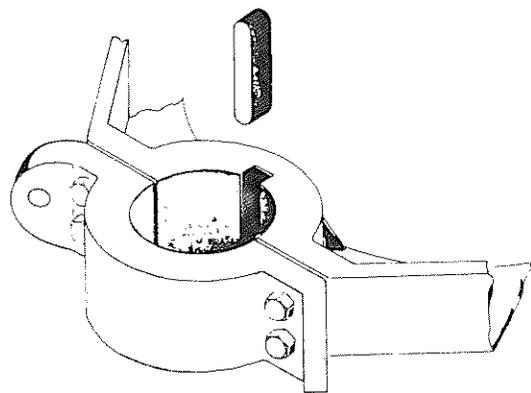
Although we recommend a packing gland, some boats have ample freeboard so as not to need one when the tube is cut. If the tube is cut at a point 12" to 15" above the waterline you can get by without a packing gland. This, in some cases, will allow the installation to be made in the water. A packing gland can always be installed later during your regular scheduled haul out. Yacht Specialties Company offers packing glands for shafts from 1¼" through 4" diameter.

INSTALLATION OF QUADRANT

With the tube prepared the quadrant may now be installed. By far the best method of securing the quadrant to the shaft is to mill a keyway in the shaft (See Detail #7). This is especially important in small diameter solid rudder shafts. Establish the quadrant location on the shaft and have a machine shop mill the keyway. We will broach the key seat in your quadrant. The accompanying table shows the usual key size used in various shaft diameters.

Dia. of Rudder Shaft	Key Size
1" - 1 1/4"	1/4"
1 3/8" - 2 1/4"	3/8"
Over 2 1/4"	1/2"

DETAIL 7

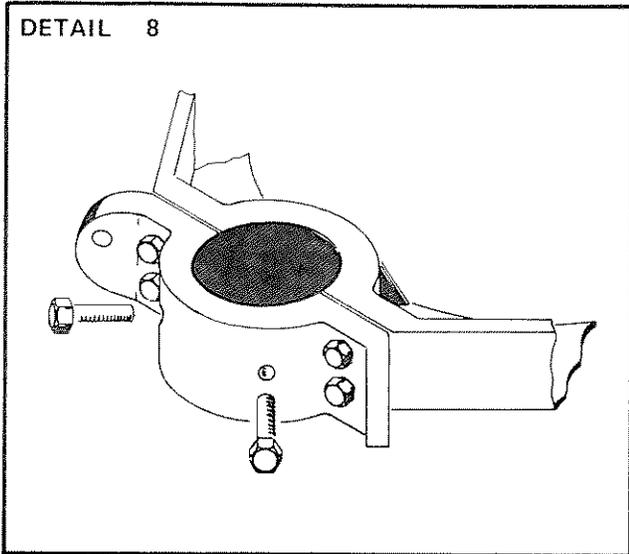


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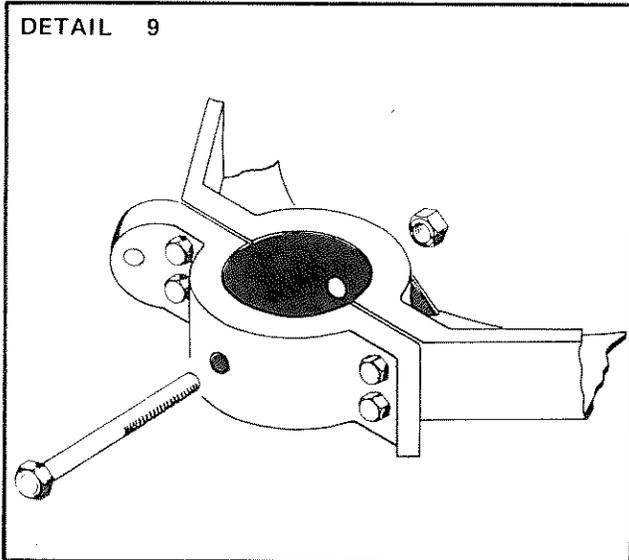
In lieu of a key, two 3/8" stainless steel cap screws may be used to attach the quadrant. Clamp the quadrant to the rudder shaft in its proper location and alignment to the rudder. Drill through the cap and well into the shaft with a tap drill. Tap holes and install cap screws, tightening them well. (See Detail #8)

DETAIL 8



On rudder shafts made of pipe, a stainless bolt is often used. The quadrant should be properly located and clamped on the rudder shaft. A hole of close tolerance to the bolt size to be used can now be drilled through the quadrant hub and rudder shaft. (See Detail #9)

DETAIL 9

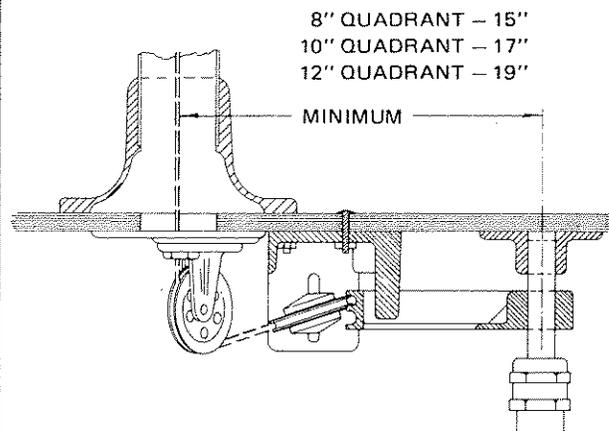


We will drill a starter hole through the cap but we definitely do not recommend continuing the hole through the quadrant body before installing the quadrant on the shaft. If this is done, there is no way of accurately meeting the hole in the body when the pipe shaft is drilled and it is extremely important that the bolt fits all holes tightly.

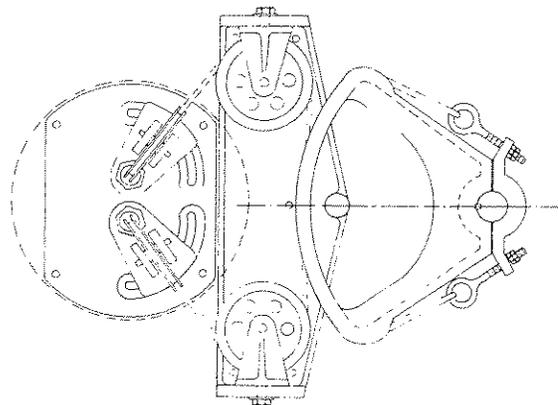
INSTALLATION OF OUTBOARD SHEAVES

Exclusive with Yacht Specialties Company is our Figure 411 sheave assembly with quadrant stop. The unit was developed to make the average installation easier, more economical, lighter and at the same time better. We can only say it has been an unqualified success. It does, however, have certain limitations. It must be installed in the sequence shown in details #10 and #11 and the pedestal must go forward of the rudder shaft a minimum distance as shown in detail #10. If balsa core is used as a stiffener on the cockpit deck it should be removed and replaced with plywood in the area where the Figure 411 assembly is to be bolted. With the quadrant installed in the proper location, the assembly may now be bolted to the cockpit deck—making sure the quadrant stop is in the proper relationship to the quadrant. Ample bedding compound or mastic should be used between the assembly and the cockpit deck. Use mastic or sealant under the bolt heads as well.

DETAIL 10



DETAIL 11

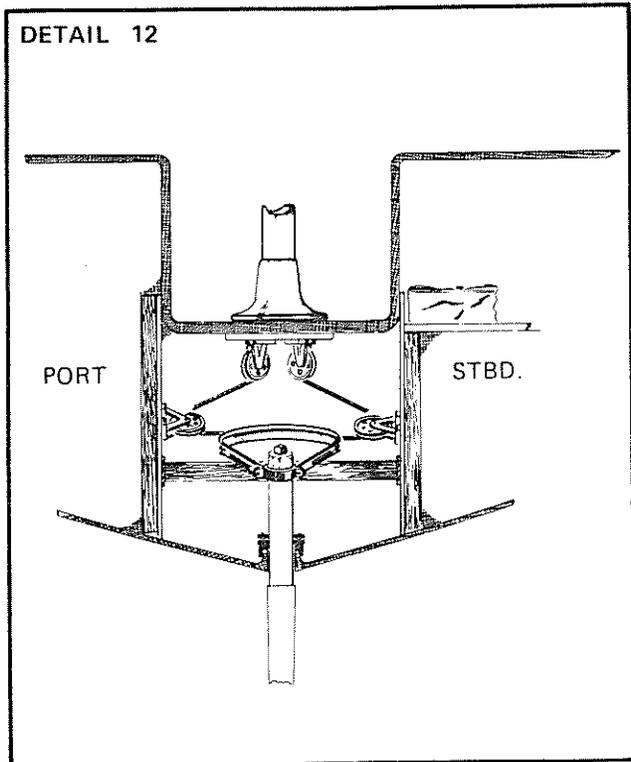


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INSTALLATION INSTRUCTIONS

If the Figure 411 sheave assembly is not to be used, suitable mounting surfaces for separate Figure 400 sheaves must be provided. If there is an existing bulkhead such as the inboard side of a quarter berth, this makes a good surface for the installation of the Figure 400 sheaves. In all probability it will have to be re-inforced as shown in detail #12, stbd. side. If no bulkhead exist, supports of well seasoned wood—about 2" x 8" and long enough to lap the cockpit sides and go down to the hull—must be installed. These should be bonded in place according to good fiberglass practices. (See Detail #12—port side) The Figure 400 sheaves are now ready for alignment and installation. Using "C" clamps, clamp the outboard sheaves to the sheave supports. (See Detail #13)

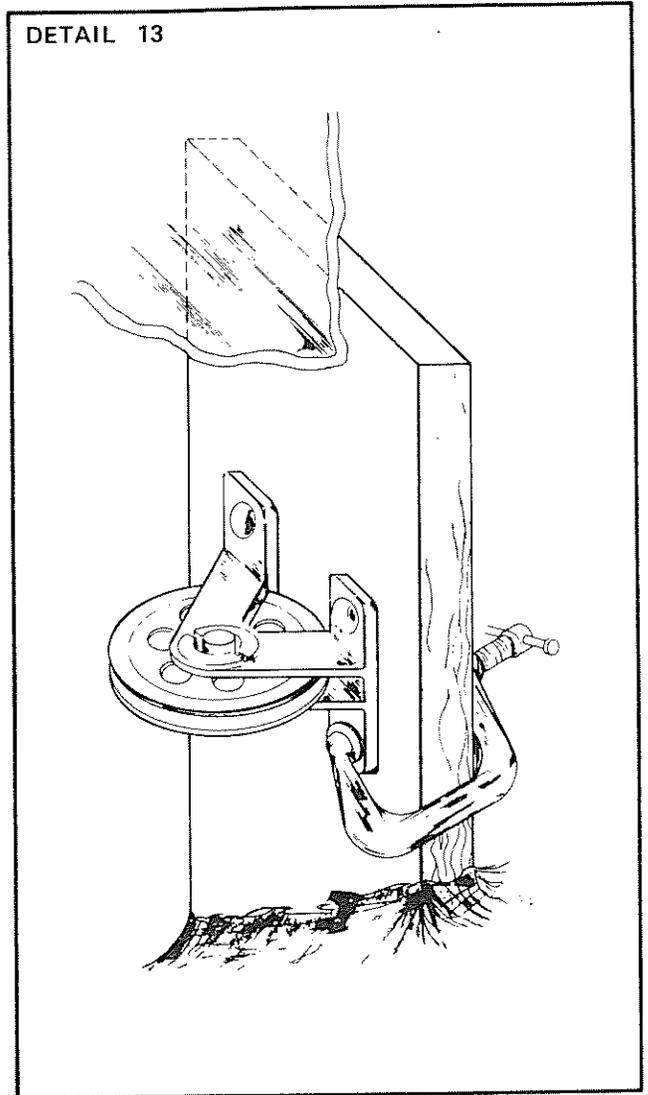
DETAIL 12



A length of chalk line or small nylon braided line may now be threaded down through the Figure 410 idler plate, around the Figure 400 sheaves and into the grooves of the quadrant and secured to the ears on the quadrant cap. Relax the "C" clamp and adjust the outboard sheaves and the idler sheaves so that the cord enters and exits the grooves in the sheaves and quadrant with no chafing on the sides of any of the grooves. Do this aligning carefully as it is essential to long sheave and cable life and to the freeness with which the system will work. When properly aligned tighten the bolts and flange nuts on the Figure 410 idler plate and drill for and install mounting bolts in the outboard sheave bases. A spreader bar between the upright mounting surfaces is a good idea. By making the spreader out of a piece of angle iron with end plates to fasten it to the uprights, you can incorporate a quadrant stop and the spreader bar into one. See Detail #17 on quadrant stop suggestions.

If the Figure 411 assembly is used, the same care in alignment must be exercised. Once aligned, tighten the stainless steel cap screws holding the sheaves on each end of the assembly.

DETAIL 13



FINAL INSTALLATION OF THE PEDESTAL

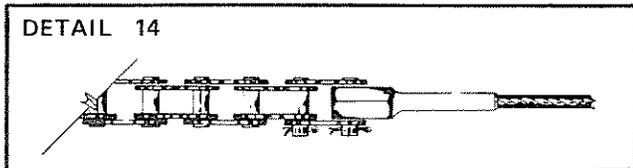
With the alignment of the sheaves completed the pedestal may now be finally installed. To facilitate the threading of the steering cables, lead a pair of cords down through the column of the pedestal—one on either side of the sprocket shaft—and through the Figure 410 idler plate making sure there is no twist in the two cords. This is also the time to install a binnacle light wire through the pedestal column. If an engine control is to be installed on the pedestal, the two control cables should also be led through the proper opening in the idler plate and up through the pedestal column—one on each side of the shaft. The binnacle light wire may be taped to one of the control cables.

Apply bedding compound to the pedestal base and under the bolt heads and firmly secure the pedestal and the Figure 410 idler plate to the cockpit deck.

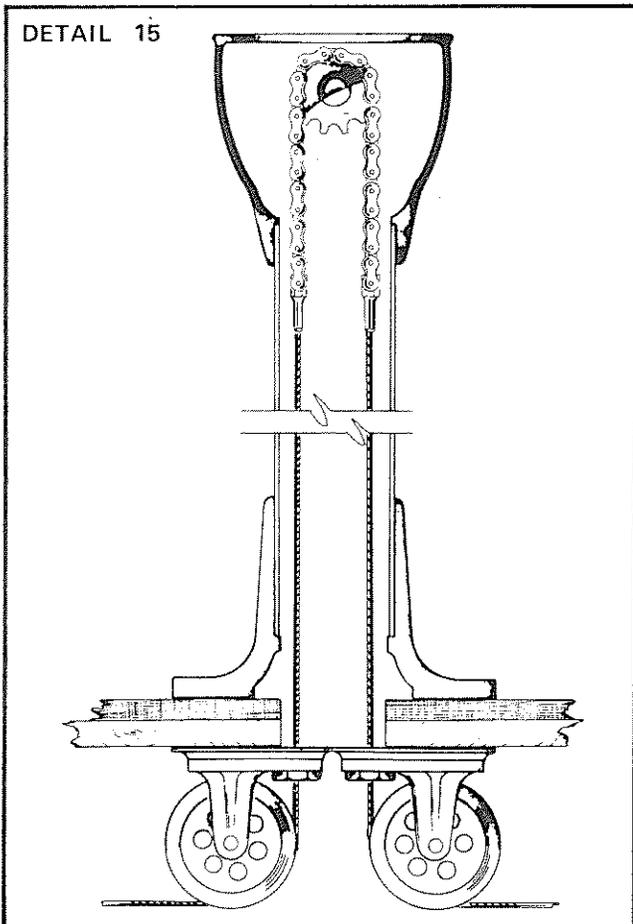
INSTALLATION INSTRUCTIONS

INSTALLATION OF STEERING CABLES

Make sure you have ample length cables for the system. We recommend 7 x 19 stainless steel cable. Use 3/16" or 7/32" diameter cable on 4" diameter sheaves and 1/4" diameter cable on 6" diameter sheaves. Using large diameter cable around small diameter sheaves will greatly shorten cable life. Proper cable to roller chain connectors must be applied to one end of each cable. We recommend our Figure 424 connectors and we will attach them to your cables when the system is ordered. Connect one cable to each end of the roller chain with a connecting link—our Figure 421 (See Detail # 14).



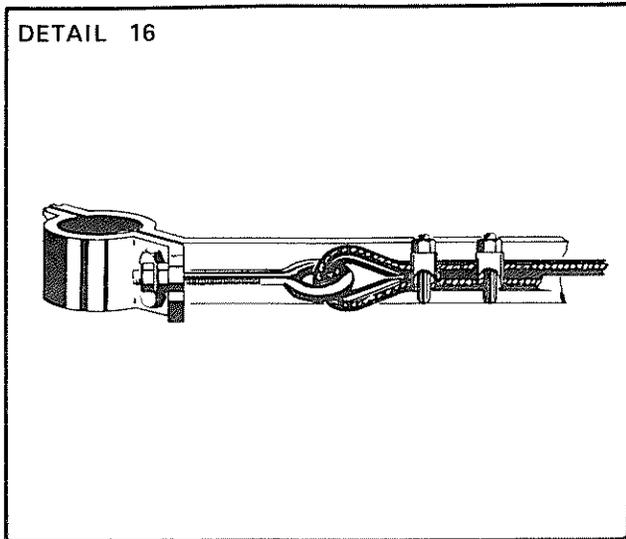
At this time tie a piece of string around the link in the very center of the chain length. This will help you in centering the chain when the final connections are made. With masking tape, tape the upper end of the cords led through the pedestal to the ends of the steering cables and carefully pull the cables down through the pedestal column and through the Figure 410 idler plate. (See Detail # 15)



Next, thread the cables around the outboard sheaves, into the grooves of the quadrant and through the eyes of the eye bolts in the ears of the quadrant. Be sure to use a thimble in each eye bolt. Making sure the chain is centered on the sprocket and the quadrant is centered fore and aft, secure the cables at the eye bolts with 2 cable clamps. (See Detail #16)

The eye bolts may now be adjusted to take all slack out of the cables. Do not set the tension of the cables too tight so as to make the steering stiff. Make sure the locknut on the eye bolt is tightened after final adjustment is made.

DETAIL 16



INSTALLATION OF QUADRANT STOPS

Quadrant stops are a very important part of your steering system. They should be installed securely so that they limit the swing or travel of the quadrant to prevent damage to the sprocket teeth in the steerer or damage to the hull or rudder fittings. The stops should be installed so that the chain stops traveling before the cable connectors contact a sprocket tooth.

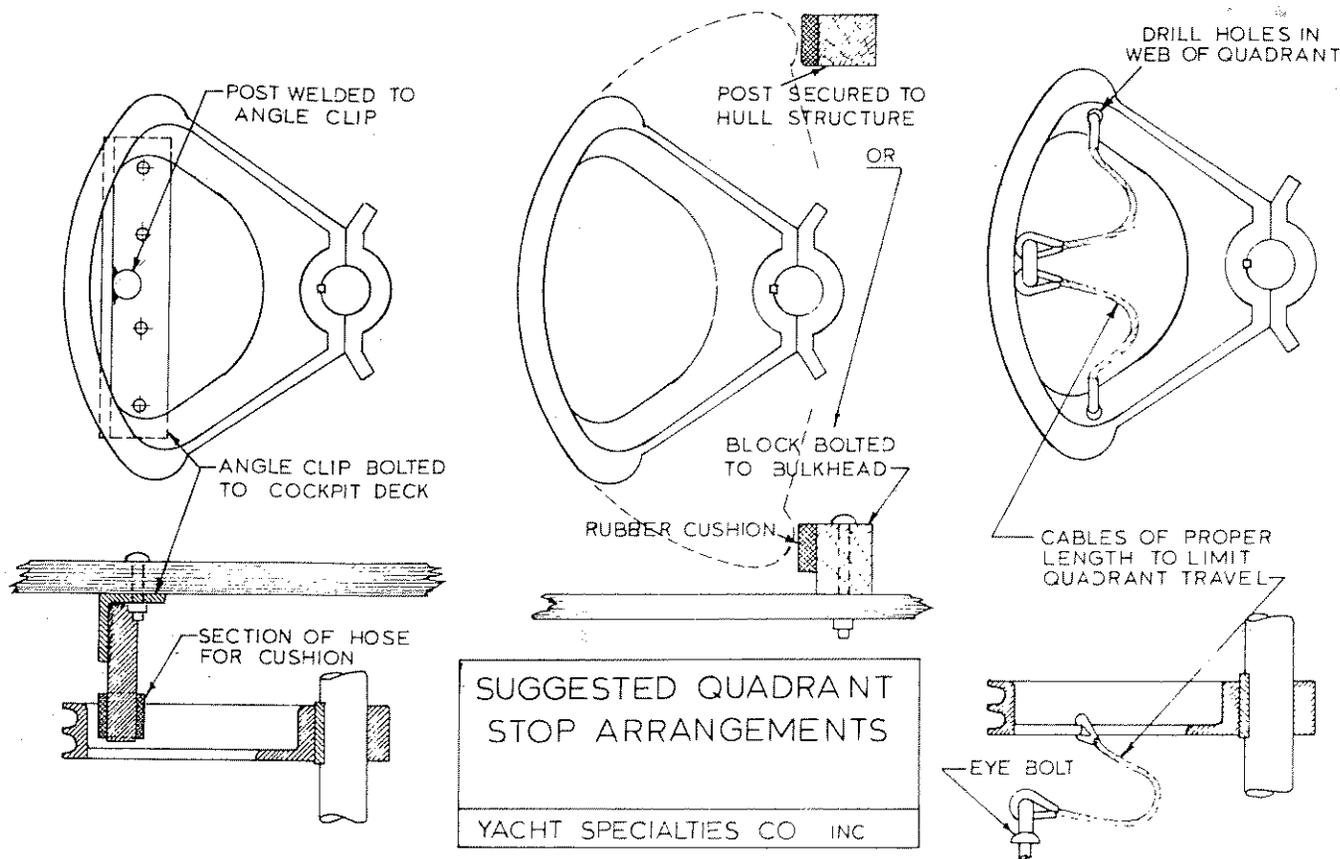
If our Figure 411 assembly is used in the system, a quadrant stop is an integral part of the assembly. If separate outboard sheaves are used, a suitable stop arrangement must be created and installed. Detail #17 shows suggested quadrant stops.

MAINTENANCE OF THE SYSTEM

After a short period of use the tension of the cables should be checked and adjusted and all nuts and fastenings should be tightened if necessary. This should be done seasonally.

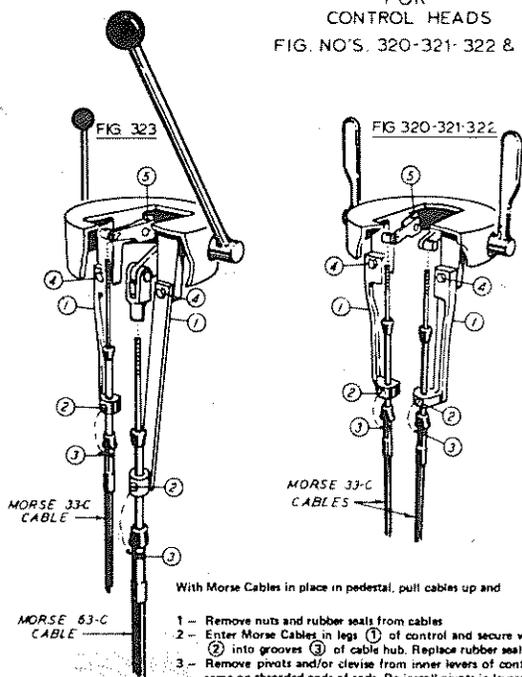
The shaft bearings in the pedestal have been lubricated at the factory. No particular damage can result from lack of lubrication but we recommend a few drops of oil at the front and rear bearings once or twice a season or as needed. This can be done by removing the compass and at the same time apply a light amount on the roller chain while turning the system from hard over to hard over. The sheave bearings are of prelubed type but should be oiled three to four times a season to prolong their life.

DETAIL 17



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INSTALLATION INSTRUCTIONS FOR CONTROL HEADS FIG. NO'S. 320-321-322 & 323



With Morse Cables in place in pedestal, pull cables up and

- 1 - Remove nuts and rubber seals from cables
- 2 - Enter Morse Cables in legs (1) of control and secure with screws (2) into grooves (3) of cable hub. Replace rubber seals and nuts.
- 3 - Remove pivots and/or clevis from inner levers of control. Screw same on threaded ends of rods. Re-install pivots in levers.
- 4 - Lower unit to approx 2" above pedestal and tighten cap screws (4)
- 5 - Lower control to pedestal top and fasten with F.H. S.S. machine screws
- 6 - Make sure cap screws (5) are tightened after adjustment of outer levers

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SUGGESTED INSTALLATION DETAILS STUFFING BOXES - RUDDER SHAFT BEARINGS - EMERGENCY TILLERS

