



CHAIN & WIRE STEERING SYSTEMS

Planning, Installation
& Maintenance Guide

Planning & Sizing Pedestal Steering Systems

The typical installation may vary in wheel size, sheave size, chain length, and quadrant size depending on the length and displacement of the boat and the type of sailing being done. For cruising and offshore work, a larger quadrant with more power output and more turns of the wheel hard over to hard over is preferred. For racing, a smaller quadrant with fewer number of turns and a larger wheel will provide faster action especially useful for downwind sailing.

For recommended sizes, see the table below. Edson will also supply, upon request, Data Sheets and recommendations covering the best system for your boat. For boats being able to use more than one system, recommendations will be given in order of preference. For specific information for converting or planning your boat, send us your construction drawings and/or sales literature along with the type of steering system you wish to install.

TYPICAL PEDESTAL STEERER SYSTEM

A complete Pedestal Steering system will consist of the following items:

1. Pedestal
2. Steering Wheel
3. Chain and Wire Rope Assembly
4. One Pedestal Idler or Conduit Bracket
- *5. Two Sheaves or Sheave Bracket
6. Quadrant or Drive Wheel (using Radial Drive Steering System eliminates #5)
7. Two Wire Take-Up Eyes
8. Four Pedestal Mounting Bolts
9. Four Wire Rope Clamps
10. Stuffing Box (if required)

Note: For Pull-Pull Systems eliminate item #5 and substitute the appropriate length of Part No. 797 conduit.

*The number of sheaves will vary for mid-ship cockpits, or particularly complicated aft cockpit arrangements.

For complete warranty information, see inside front cover.

WHEEL TURNS LOCK TO LOCK OUTPUT FORMULA

To determine the number of turns of the steering wheel from hard over to hard over, divide the chain travel of the sprocket into the quadrant arc. Our experience indicates most boats are set up for 70° to 80° of rudder travel. Taking the standard 3/8"-11 tooth sprocket with a travel of 6.9" per turn and divide it into the selected (10") quadrant with 80° of travel (14.0") and the steering system will have 2.03 turns of the wheel.

The larger pitch diameter sprockets with a given quadrant will result in fewer turns of the wheel.

The output figures below are based on the following formulae:

$$\text{Mechanical advantage} = \frac{Rw \times Rq}{1.1 \times Rq}$$

where Rw = wheel radius (inches) and Rq = quadrant radius (inches)

- *1.1 for 5/8" - 11 Tooth Sprocket
- 1.3 for 3/4" - 13 Tooth Sprocket
- 1.5 for 5/8" - 15 Tooth Sprocket
- 1.2 for 3/4" - 10 Tooth Sprocket
- 1.6 for 3/4" - 13 Tooth Sprocket

CHAIN SPROCKET DATA

| Pedestal Steerer 334-335-400 | Chain Pitch | | No. of Teeth | Sprocket Pitch Dia. | | Chain Travel per turn of wheel | |
|---------------------------------|-------------|------|--------------|---------------------|-----|--------------------------------|------|
| | In. | Cm. | | In. | Cm. | In. | Cm. |
| Standard | 3/8" | 15.8 | 11 | 2.2 | 5.6 | 6.9 | 17.5 |
| SPECIAL ALSO | 3/8" | 15.8 | 13 | 2.6 | 6.6 | 8.2 | 21.0 |
| AVAILABLE | 3/8" | 15.8 | 15 | 3.0 | 7.6 | 9.4 | 24.0 |
| FROM STOCK | 3/8" | 19 | 10 | 2.4 | 6.1 | 7.6 | 19.4 |

The chart below is composed of information gathered from our many years of leadership in marine steering. Due to the many variations of yacht design in areas of hull shape, engine horsepower and sail

| Length of Required Wire (L.W.L.) | Quadrant or Drive Wheel Size | Steering Wheel Size | Pedestal & Compass Size | | *Turns of Wheel, Lock to Lock | | Length of Roller Chain | | Output (40 # Input) | Equivalent Tiller Length | | Required Idler & Sheave Size | | Rope Size | |
|----------------------------------|------------------------------|---------------------|-------------------------|------|-------------------------------|-----|------------------------|------|---------------------|--------------------------|-------|------------------------------|------|-------------|------|
| | | | In. | Cm. | 70° | 90° | Ft. | Cm. | | Ft. | Cm. | In. | Cm. | In. | Mm. |
| | | | In. | Cm. | In. | Cm. | In. | Cm. | | In. | Cm. | In. | Cm. | In. | Mm. |
| (17-23) | 6.5 | 18-22 | 334-4 | 10.2 | 1.0 | 1.2 | 1 1/2 | 46. | 181 | 4 1/2 | 137. | 4 | 10.2 | 3/16 | 4.76 |
| (17-25) | 8 | 18-22 | 334-4 | 10.2 | 1.4 | 1.8 | 1 1/2 | 46. | 264 | 6 | 182. | 4 | 10.2 | 3/16 | 4.76 |
| (26-29) | 10 | 24-28 | 335-5 | 12.8 | 1.7 | 2.3 | 2 | 61. | 368 | 9 | 274. | 4 | 10.2 | 3/16 | 4.76 |
| (30-34) | 12 | 26-30 | 335-5 | 12.8 | 2.1 | 2.8 | 2 | 61. | 503 | 12 | 365. | 4 or 6 | | 3/16 or 1/4 | |
| (33-34) | 14 | 26-30 | 335-5 | 12.8 | 2.4 | 3.0 | 2 1/2 | 76. | 596 | 15 | 457. | 4 or 6 | | 3/16 or 1/4 | |
| (34-35) | 16 | 32-36 | 400-6 | 15.4 | 2.8 | 3.5 | 2 1/2 | 76. | 720 | 18 | 548. | 6 | 15.4 | 1/4 | 6.35 |
| (37-40) | 18 | 32-36 | 400-6 | 15.4 | 3.1 | 4.0 | 3 | 91. | 820 | 20 | 609. | 6 | 15.4 | 1/4 | 6.35 |
| (46-55) | 20 | 36-40 | 400-6 | 15.4 | 3.5 | 4.5 | 3 | 91. | 1080 | 25 | 762. | 8 | | 1/4 | 6.35 |
| (56-70) | 24 | 36-40 | 400-6 | 15.4 | 4.2 | 5.4 | 3 1/2 | 106. | 1540 | 38 | 1158. | 10-12 | 20.5 | 1/4 | 6.35 |
| (60-75) | 30 | 40-48 | 400-6 | 15.4 | 5.3 | 6.8 | 4 1/2 | 140. | 1727 | 43 | 1310. | 10-12 | 25.4 | 3/16 | 7.94 |

*NOTE: Turns of wheel output are based on using 3/8"-11 tooth sprocket.

STEERER OUTPUT CHART

The value of this chart is twofold. First, to get steerer output; second to get a working relationship between steerer output and equivalent tiller length. To obtain the equivalent tiller length, divide the output figure by 40. For example: a boat with a 24" wheel and a 12" quadrant has an output of 432 ft. lbs. Divided by 40, this equals the leverage of an 11 foot tiller.

It is interesting to note that a 30" wheel with an 8" quadrant has the identical output of a 20" wheel with a 12" quadrant the difference being the number of turns. The first with 1.8 turns has fast action and a large wheel (the preference of most racing skippers). The second with 2.7 turns has a slower action and a smaller wheel (for the boat used primarily for cruising). Which do you prefer? We can fit the steering action to your boat.

QUADRANT SIZES (inches)

| No. of Turns | 6.5 | 8 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | 24 | 30 | 36 |
|--------------|-----|-----|------|------|------|------|------|------|------|------|------|------|
| 90° | 1.3 | 1.8 | 2.3 | 2.7 | 3.2 | 3.4 | 3.6 | 4.1 | 4.5 | 5.5 | 6.8 | 8.2 |
| 18 | 178 | 217 | 272 | 326 | 381 | 408 | 435 | 490 | 544 | 653 | 817 | 980 |
| 20 | 196 | 240 | 307 | 360 | 426 | 453 | 480 | 548 | 600 | 735 | 890 | 1096 |
| 22 | 216 | 264 | 338 | 396 | 469 | 496 | 528 | 601 | 660 | 806 | 997 | 1202 |
| 24 | 236 | 288 | 368 | 432 | 512 | 539 | 577 | 656 | 720 | 880 | 1088 | 1312 |
| 26 | | 312 | 398 | 478 | 555 | 582 | 624 | 711 | 780 | 953 | 1178 | 1422 |
| 28 | | 336 | 429 | 503 | 596 | 623 | 671 | 764 | 839 | 1025 | 1268 | 1528 |
| 30 | | 360 | 460 | 540 | 640 | 667 | 720 | 820 | 900 | 1100 | 1360 | 1640 |
| 32 | | 384 | 490 | 576 | 682 | 709 | 768 | 875 | 960 | 1174 | 1452 | 1750 |
| 34 | | 408 | 521 | 612 | 725 | 752 | 816 | 928 | 1020 | 1247 | 1542 | 1926 |
| 36 | | 432 | 552 | 648 | 768 | 795 | 864 | 984 | 1080 | 1320 | 1632 | 1968 |
| 38 | | 458 | 578 | 687 | 808 | 835 | 916 | 1038 | 1145 | 1386 | 1724 | 2076 |
| 40 | | 484 | 605 | 726 | 847 | 874 | 968 | 1089 | 1210 | 1453 | 1816 | 2178 |
| 44 | | 532 | 666 | 799 | 932 | 959 | 1065 | 1198 | 1332 | 1598 | 1998 | 2396 |
| 48 | | 581 | 726 | 871 | 1017 | 1044 | 1162 | 1307 | 1453 | 1743 | 2179 | 2614 |
| 54 | | 648 | 817 | 981 | 1144 | 1171 | 1308 | 1471 | 1635 | 1961 | 2452 | 2942 |
| 60 | | 727 | 908 | 1090 | 1271 | 1298 | 1453 | 1635 | 1816 | 2180 | 2725 | 3270 |
| 64 | | 775 | 969 | 1162 | 1356 | 1383 | 1550 | 1744 | 1937 | 2325 | 2906 | 3488 |
| 72 | | 872 | 1090 | 1308 | 1526 | 1553 | 1743 | 1962 | 2180 | 2616 | 3270 | 3924 |

Values in chart are for 3/8" - 11 tooth sprocket

CHAIN TRAVEL HARD OVER TO HARD OVER

| ARC | Quadrant or Radial Radius in Inches | | | | | | | | | | | |
|-----|-------------------------------------|------|------|------|------|------|------|------|------|------|------|--|
| | 6.5 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | |
| 90° | 10.2 | 12.6 | 15.7 | 18.9 | 21.9 | 25.1 | 28.3 | 31.4 | 37.7 | 47.1 | 56.5 | |
| 80° | 9.2 | 11.2 | 14.0 | 16.7 | 19.4 | 22.3 | 25.1 | 27.9 | 33.5 | 41.9 | 49.5 | |
| 70° | 8.2 | 9.8 | 12.2 | 14.7 | 17.1 | 19.6 | 22.0 | 24.4 | 29.3 | 36.7 | 43.4 | |

configuration, final recommendations must be approved by your naval architect.

Pedestal Steerer Installation Guide

Aft Cockpit Steering

Edson's Pedestal Installation Guide has been written to assist the boat owner, boatyard, and the designer in making the most convenient pedestal installation for any given cockpit design. Before making a final decision on the location of the steerer it is always a good idea to make a dummy steerer out of a 2 x 4, a short length of broomstick handle for the shaft and a cardboard or plywood cutout of the wheel size. At the same time the area below the cockpit floor should be checked for obstructions such as tanks and lines; also check if the builder installed cockpit floor reinforcing and its location. The location of the winches and the helmsman's visibility should also be noted.

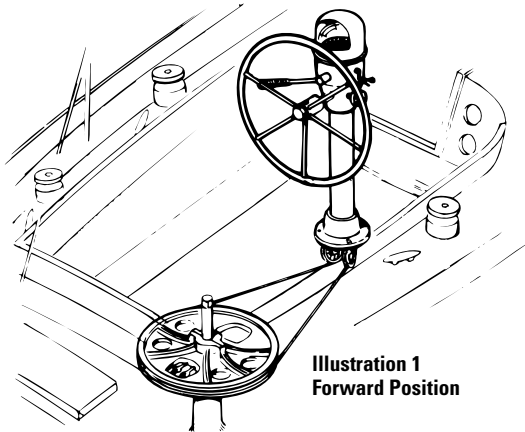


Illustration 1
Forward Position

Illustration 1 shows a steerer forward using Radial Drive. By placing the steerer at the forward end of the cockpit the helmsman has the protection of the companionway dodger and has quick and easy access to the cabin below. The forward location also keeps the cockpit activity aft of the helm and, in shorthanded situations, allows the helmsman to steer and handle the sheets with minimum difficulty. Edson suggests using a large size wheel within 2" or 3" of the cockpit seats if the boat has a bridge deck, as there will be no need for guests or crew to slide by the wheel. We also recommend the installation of a pedestal guard as a handhold for crew members going below. The larger wheel will allow the helmsman to comfortably lean against the coaming and to have excellent all-around visibility. In many conversions from tiller to wheel the forward locations make for the least cockpit layout changes as they place the helmsman in approximately the same location with the wheel as with the tiller. For a racing boat all the action is aft and, when not tacking, the crew can sit to weather and forward if it improves the balance of the boat.

Illustration 2 shows a forward steerer installation using Edson's quadrant and sheaves.

Illustration 2
Forward Position

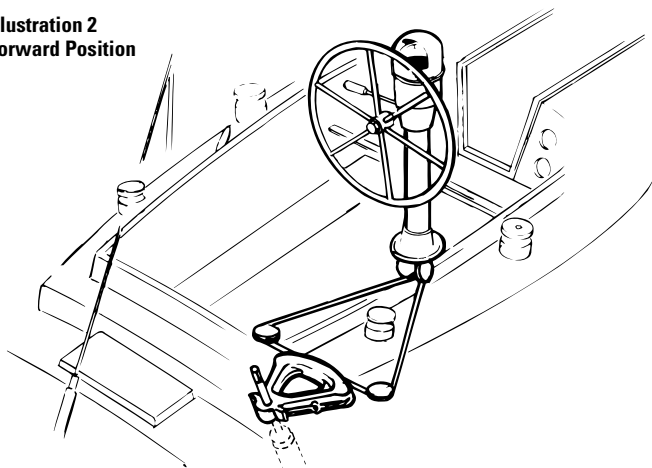
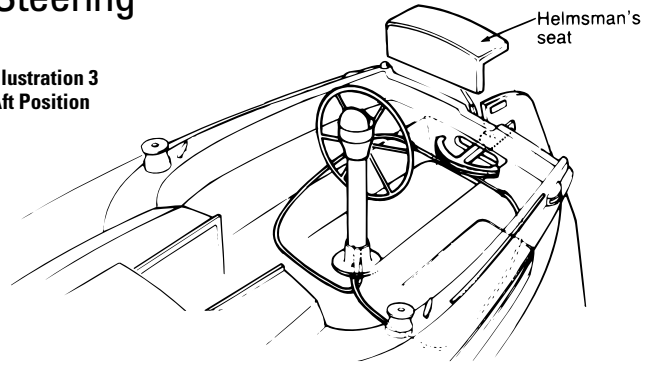


Illustration 3
Aft Position



Pull-Pull easily adapts for use with outboard rudder boats. As shown above, in Illustration 3, cables run beneath the sail locker on one side and under a quarter-berth on the other. This is an average 25 to 30 footer with transom hung rudder. The Edson Part No. 612 Quadrant series can be used on most all boats of this design.

The quadrant should be mounted fairly high on the rudder to fit within the lazarette, or so a box or helmsman's seat can be built over it as illustrated.

As a rough guide to the following Part No. 612 Quadrant sizes should be used.

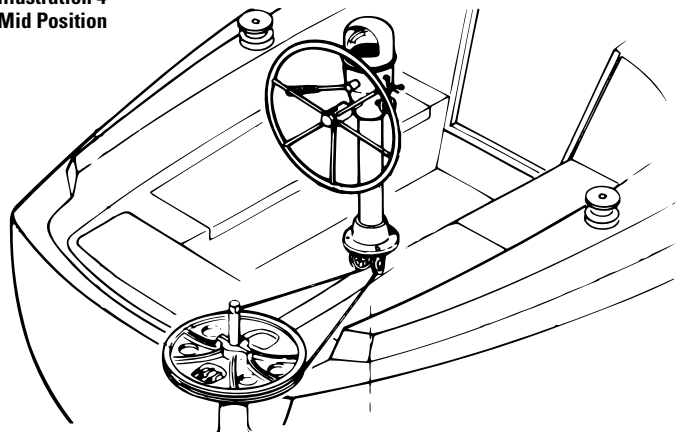
| | | | |
|--------------|--------------------|--------------|-----------------|
| Boat Length: | 20-36 ft (6-11 m) | Quadrant Sz: | 10 inch (26 cm) |
| | 37-45 ft (12-14 m) | | 14 inch (36 cm) |
| | 45-60 ft (14-18 m) | | 20 inch (50 cm) |

Use the above guide with caution. A very hard-to-steer boat must go to the next larger size quadrant than is indicated. As with all Edson Pedestals the quadrant size in inches is roughly equal to the tiller length in feet. As in any opening in the transom, it must be booted or a drain pan or area must be installed to prevent water from getting into the boat. As a further guide, the 10" quadrant requires a transom hole of about 2" (5 cm) by 6" (15 cm).

Illustration 4 shows a mid-position steerer installation using a radial drive. Placing the steerer in the middle of the cockpit or within two feet of either end can give a good balance. The crew can be forward or aft, whichever makes the boat go best. With the steerer in the relative center of the cockpit the spinnaker winches can be aft and the genoa winches forward; when racing this keeps the spinnaker action behind the helmsman and yet allows the helmsman to assist with the jib winches, if needed. When cruising the mid-cockpit arrangement enables the guests to relax aft and not get involved in sailing the boat while the skipper can steer and tack the boat with ease.

When placing the pedestal at mid-cockpit position keep at least 15" (38 cm) clearance from the bridge deck or companionway. This will prevent a crew member from having to stand with one foot on the bridge deck, a dangerous off-balance situation. The helmsman normally will sit to one side of the wheel or stand behind the wheel. Edson's Helmsman's Seat can fit neatly between the seat risers and its arched center section raises the helmsman for better visibility.

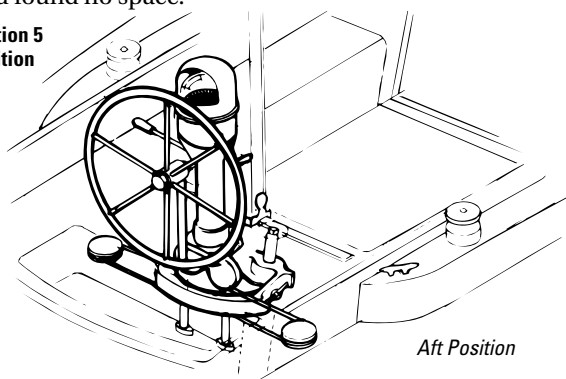
Illustration 4
Mid Position



Pedestal Steerer Installation Guide (con't.)

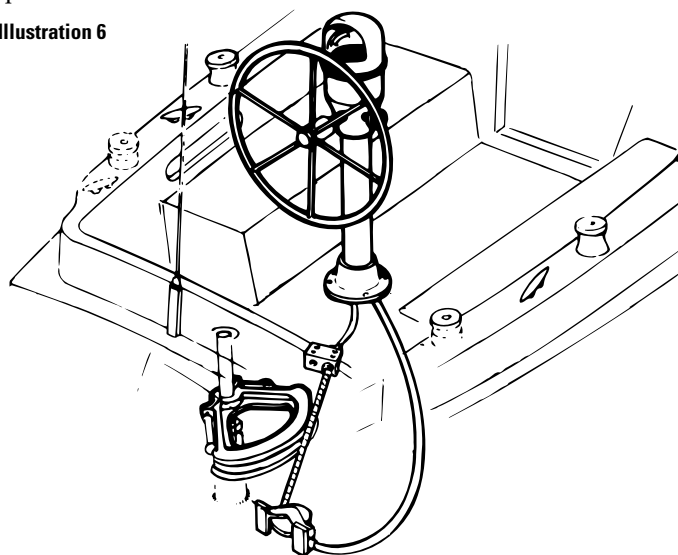
The aft location of the wheel in a long narrow cockpit is the traditional location of a pedestal. The helmsman can see all of the action and, if a line jams or some other problem develops, can take the best corrective action. If the steerer is well aft it is a good idea to put on the narrow pedestal guard and to place the engine controls on the steerer. When planning this installation beware of such potential problems as a tall helmsman hitting his head on the backstay or the main sheet catching the pedestal. Also be certain you have enough clearance (at least 16" [41 cm]) behind the wheel to allow foot room at the helm. At Edson we can tell when a pedestal is too far aft: there are heel marks on the end of the cockpit where the helmsman has tried to move his feet aft and found no space.

Illustration 5
Aft Position



In illustration 6 the rudderpost is vertical and there is a quarter berth on the port side aft. The solution was to mount the quadrant angled to one side and to lead one Pull-Pull conduit directly to the quadrant and lead the other conduit aft to a Part No. 881 Conduit Idler which directs the wire back into the quadrant.

Illustration 6



Midship Cockpit Steering

Edson offers two types of wire rope systems for the midship cockpit boat (the conventional wire system and the new Pull-Pull Conduit Steering System) which are ideal for boats up to 60' in length. Regardless of the type and size of midship cockpit boat, the steering system should be thought out at the time the boat is designed or before the interior is in place. Any boat can be outfitted with a wire or pull-pull system.

Whichever system is used, the advantages are many and important. The system is simple; this makes it excellent for boats going off-shore or to remote areas. A roller chain pulls the rudder to one side or the other. If the wire or conduit fails you can rig a new one. Try that with other types of steerers. It is, in effect, a screw, nut and bolt philosophy of design.

GENERAL

As in all installations, Edson tries to reduce the number of sheaves. They must be bought, installed, and each one adds its friction effect. A good "needle bearing" pedestal with as few sheaves as possible with well-oiled bushings and a well hung rudder will give a very sensitive system and one that is free of problems.

Please remember that fiberglass by nature is a flexible material and the steering system must be set up so it is strong yet can stand a certain amount of movement. The smoothest installations are those with the best reinforcing.

PLANNING FOR THE WIRE ROPE SYSTEM

When using wire rope and sheaves, we are dealing with a series of straight lines or, for the sake of visualization, straight connecting rods.

Illustrations 1 and 2 show the most commonly used method of running the wire in a midship cockpit boat.

The wire is run to either the port or starboard side by using the Edson Part No. 607 Adjustable Idler. This directs the wire aft a small amount, down a small amount to double sheaves that are mounted on the aft engine room bulkhead. Care must be taken to make sure that the wire is clear of the appropriate sail lockers.

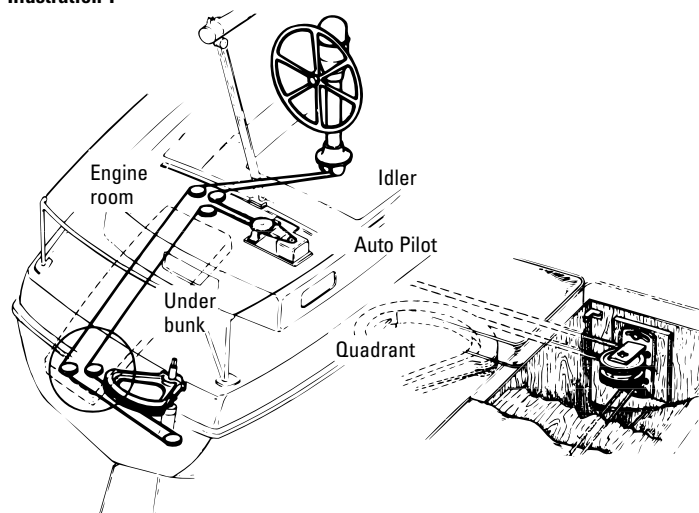
Aft the two sheaves are mounted on a stiffening bulkhead; one sheave leads the wire directly to the quadrant, the other sheave

across the boat to a sheave and then back to the quadrant. Care must be taken to ensure that the wires are led correctly to give the boat directional rather than reverse steering. This installation points out the importance of using existing or planned bulkheads and stiffening for mounting of the sheaves, easier, stronger, and simpler.

In Illustration 1 the Auto Pilot steering cables have been diverted so the pilot can be mounted on a shelf in the aft end of the engine room in an otherwise unused but generally crowded area.

The wire is then directed aft at a level just under the bunk top and on the outside of the backs of the drawers in an area generally considered to be unusable. In many cases, the wire is run along the exhaust line trunk.

Illustration 1



Pedestal Steerer Installation Guide (con't.)

Illustration 2

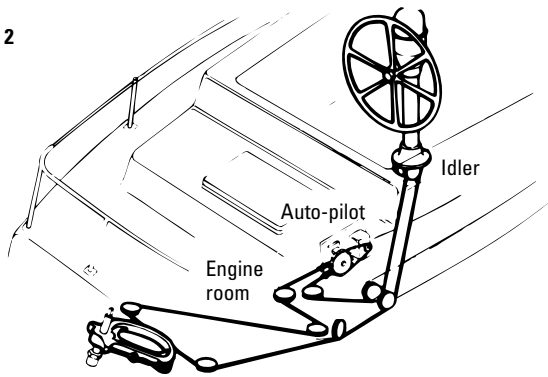


Illustration 2 shows another form of placing the Pedestal in the midship cockpit boat. The wire is basically led down and run beneath the aft cabin sole.

The pedestal can be placed aft in the cockpit with the possibility of placing the helmsman on a raised seat for better visibility over the house.

PLANNING FOR THE PULL-PULL SYSTEM

Edson's Pull-Pull Steering System is ideal for midship cockpit boats up to about 60' in length. Pull-pull conduit is an alternative to the standard wire/rope and sheave installation. However, on larger boats, conduit idlers must be used at high load points. The following illustrations show a few of the many uses of Pull-Pull Steering.

Illustration 3

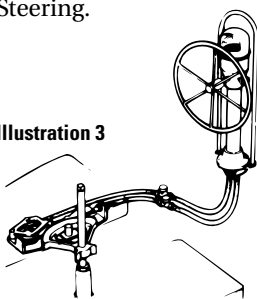


Illustration 4

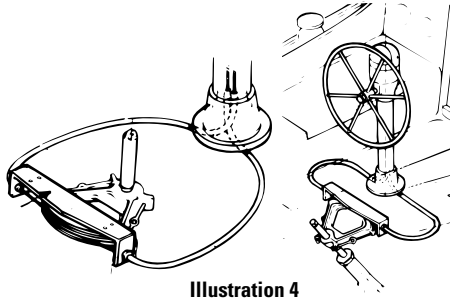


Illustration 3 shows Edson Part No. 908 Reversible Sheave Bracket with rudderstop for use where boat conduits are run together along one side of the boat or down the other. In Illustration 4, these two sketches show additional methods of running conduit to a quadrant. Using Edson Part No. 824 bracket with its built-in rudderstop.

COMBINATION PULL-PULL CABLE AND SHEAVE

This type of system is versatile and sensitive as it combines the best features of both sheaves and conduit. The sheaves are used to take the steering cable around sharp bends, reducing friction. The conduit is used to snake the steering cable through tight areas where it is difficult to install, align, and maintain sheaves.

Illustration 5

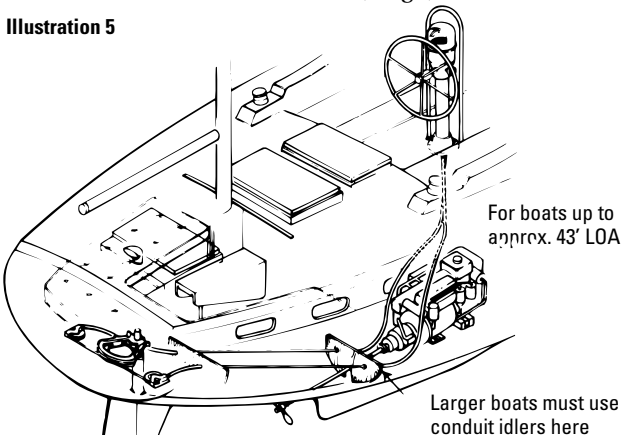


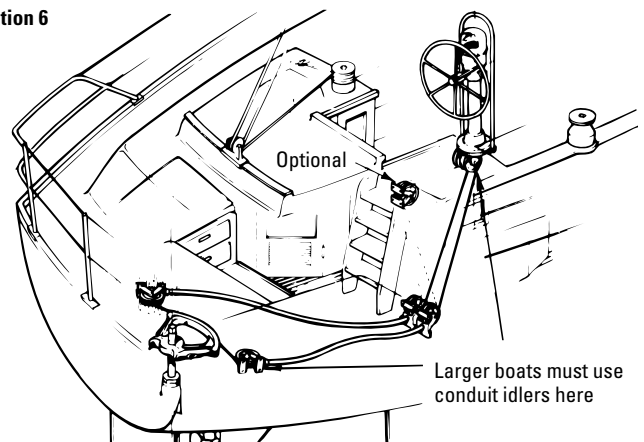
Illustration 5 shows the Pull-Pull Conduit running from beneath the pedestal, over the engine (keeping the conduit away from the exhaust manifold), and then aft to two conduit idlers on either side of the quadrant. For proper steering direction, the conduits are crossed as the quadrant is mounted on the aft side of the rudderpost.

NOTE: For additional information, pull-pull component, and maintenance instructions, see the Pull-Pull Section in this catalog.

The pedestal can be placed at the point up against the bridge deck or in the normal aft position in the cockpit. If placed forward it does allow the helmsman protection in poor weather by the dodger. In addition, the engine controls and instrumentation can be mounted on the aft end of the house. This can then place all wiring in an easily accessible trunk within the main cabin.

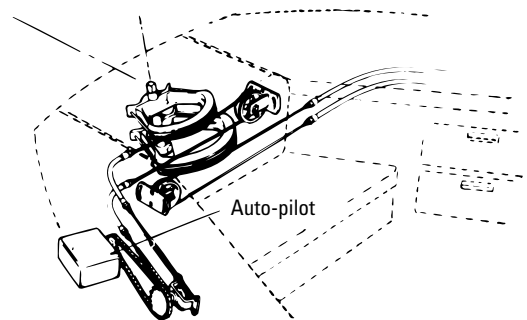
NOTE: Emergency steering can be placed on top of the rudder post by simply removing the aft cushion and placing a tiller at this point. Some owners prefer an extension that goes through the aft deck to allow placing the tiller over the aft deck house. This is a personal preference, but by all means have an emergency method of steering.

Illustration 6



An alternative method, as shown in Illustration 6, is to run the wire from a Part No. 607 Parallel Idler beneath the pedestal to a pair of Part No. 881 Conduit Idlers on the aft engine room bulkhead. The conduit then runs beneath the aft cabin floor and terminates at two Part No. 881 Conduit Idlers on either side of the quadrant.

Illustration 7



Edson's Pull-Pull Systems in midship cockpit boats easily adapt to include automatic steering. Illustration 7 shows the auto pilot placed under a berth and connected to a separate quadrant with two short lengths of conduit.

NOTE: Rapid Drive and Linear Drive Auto Pilots are also compatible. Measure carefully to assure proper fit. For further information refer to the Auto Pilot planning section of this catalog.

Pedestal Steerer Installation

INTRODUCTION

This section has been prepared for both amateurs and professionals to assist in the installation of the Edson pedestal steering systems. We have tried to take the installation step by step in hopes the job will not only go faster but easier. You will find many suggestions along with simple illustrations to guide you – but in the marine trade there is always an experience factor which cannot be covered on paper. If you require assistance or additional information write or call The Edson Corporation. We offer complete engineering services at no charge or obligation.

LOCATION OF PEDESTAL STEERER

After carefully unpacking the Edson equipment, lay out all the components and familiarize yourself with the system by arranging the parts as closely as possible to the order of assembly.

From the architect's drawing or the boat's data sheet find the ideal location for the installation of the pedestal steerer.

Set your pedestal, with the wheel attached, at this position and check the cockpit layout. Will you be able to crank your winches? Sit and stand comfortably? Will the main sheet clear the wheel? Adjust your steerer until you are satisfied you have the best location possible. We suggest at least 21" (53.3 cm) from the pedestal base (dead center aft to the rear of the cockpit for standing room). Now check the area under the cockpit floor to make certain the pedestal location chosen will allow freedom of installation for all the components.

With the pedestal carefully aligned fore, aft and centered, use Edson's Template EB237 furnished with each order to mark the location of the four bolt holes. At the center drill a through hole $\frac{1}{16}$ " (1.6 mm) dia. This tiny hole will mark the pedestal location when working under the cockpit floor. Do not drill any other holes at this time. (The small hole can easily be filled should you decide to relocate the steerer.)

PREPARATION OF THE RUDDERPOST

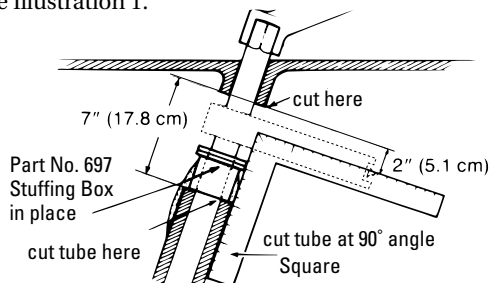
If you are ordering a new boat with a tiller but plan to add a pedestal steerer at a future date, have your boat builder install a stuffing box and key the rudderpost. This can be done by the builder at a nominal cost and will make the steerer installation far easier for you when the time comes.

If your boat's rudder is equipped with a stuffing box the Edson Pedestal Steerer may be installed with the boat in the water.

If your rudderpost enters through a fiberglass tube from the hull to the cockpit sole, a portion of this tube will have to be cut away to expose the rudderpost for the installation of the Radial Drive Wheel or the quadrant. *In order to insure that no water enters the boat through this tube, a stuffing box (see page 50) should be installed on the rudderpost.* In order to do this, the rudder will have to be dropped – the boat should be hauled for this operation. The location of the cut is determined by the location of the Radial Drive Wheel or quadrant and the size of the idler sheaves. Measure from under the cockpit sole either 5" (12.7 cm) down for 4" sheaves or 7" (17.8 cm) down for 6" sheaves. This locates the location of the wire groove in the Drive Wheel or quadrant. With a square mark its location on the tube. Start measuring from this mark.

For a quadrant installation measuring up to 2" (5.1 cm) then down 7" (17.8 cm). See Illustration 1.

Standard Quadrant Illustration 1



For Radial Drive with the hub up measure up to 4" (10.2 cm) and then down 8 $\frac{1}{4}$ " (21 cm) and then down 9" (22.9 cm). Mark the lines and cut the tube at 90°. See Illustration 2.

For Radial Drive with the hub down measure up 1 $\frac{1}{2}$ " (21 cm) and then down 9" (22.9 cm). Mark the lines and cut the tube at 90°.

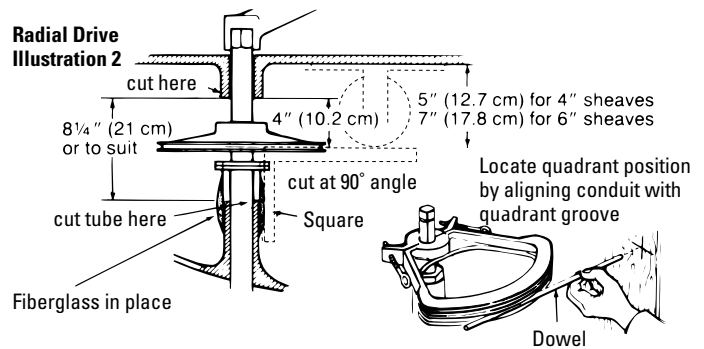


Illustration 3

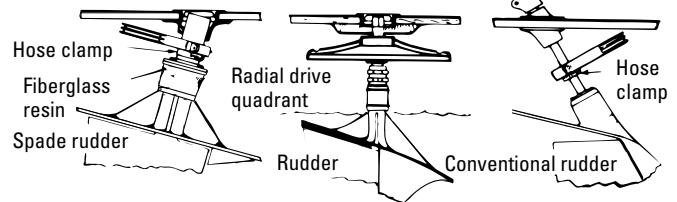
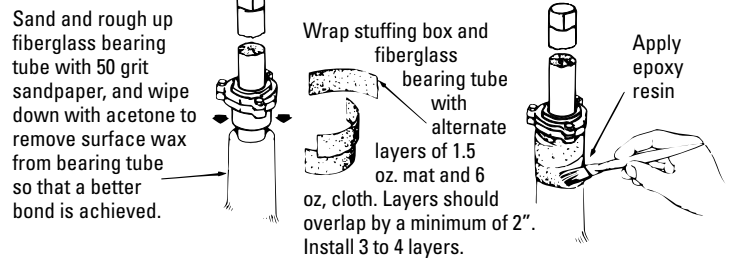


Illustration 4



PULL-PULL STEERING

When installing an Edson Pull-Pull Steering System your quadrant location is determined by the termination point of your conduit. The quadrant or radial drive wire grooves will be on the same plane as your conduit end fittings. If your conduit is to be terminated in conduit idlers your quadrant or radial drive grooves will be on the same plane as the wire groove in the sheave of the idler.

There are three methods of preparing and attaching the Radial Drive wheel or the quadrant to the rudderpost. The most secure method for solid stock is cutting or milling a keyway in the rudderpost, and the drive wheel or quadrant. Be sure and cut the keyway longer than necessary for final adjustment, and the possible addition of an autopilot.

For hollow pipe stock the Drive Wheel or quadrant must be positioned on the post by tightening the bolts. Only after all the final measurements and adjustments for the entire system have been made, drill through the hub and rudderpost for a stainless steel pin.

The third system is an alternative to cutting a keyway in solid stock or through drilling for a pin in the hollow pipestock. The same positioning method as used for the pin must be observed and only after all final adjustments for the entire system have been made, *drill and tap for two stainless steel $\frac{3}{8}$ " (9.5 mm) cap screws through the hub and well into the rudderpost.* The actual drilling operation whether for the pin or for the set screws should be the last step in the entire installation.

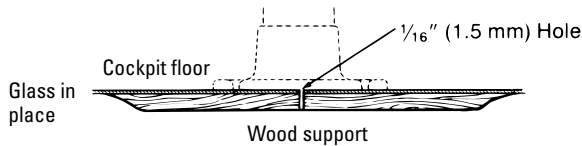
A suitable stuffing box should be used to seal the rudderpost at the tubing. Edson's Part No. 697 Stuffing Box/Bearing is preferred, as it serves as additional bearing, however, hose type stuffing boxes may be used. The stuffing box must be installed above the water line. It should be installed using alternate layers of 1.5 oz. fiberglass mat and 6 oz. cloth, which are wrapped around the stuffing box and fiberglass bearing tube (see Illustration 4). If additional support is needed, fiberglass plywood supports or knees to the fiberglass tube and hull. As on all rudders be sure and place the Part No. 697 Stuffing Box within about 1 $\frac{1}{2}$ " (3.8 cm) of the bottom of the quadrant or Drive Wheel and support it well for the rudder loads. **NOTE:** As a simple safety factor, install a stainless steel hose clamp directly under the quadrant or Drive Wheel. This will prevent slippage if the quadrant or Drive Wheel were to loosen in service.

Pedestal Steerer Installation (con't.)

PEDESTAL SUPPORT

On many boats the cockpit floor will require "beefing up" at the pedestal. One method is to install a piece of 1/2" (12.7 mm) to 3/4" (19 mm) plywood about 2 feet square under the cockpit floor.

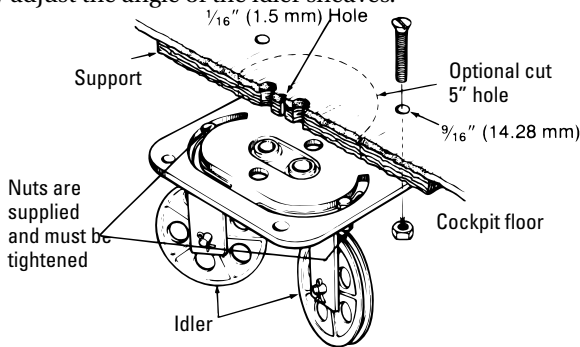
Illustration 5



POSITIONING THE IDLER

Whether installing a Part No. 776 Idler, Part No. 711 Idler, or a Part No. 841 Dropped Conduit Mounting Plate, at the previously marked location for the pedestal, drill four 3/16" holes through the cockpit floor. At this time saw or drill one 5" diameter opening. This eliminates the necessity of drilling four separate holes when using Edson Engine Controls and/or the optional instrument pods. Secure the idler in position with the pedestal bolts, and temporarily adjust the angle of the idler sheaves.

Illustration 6



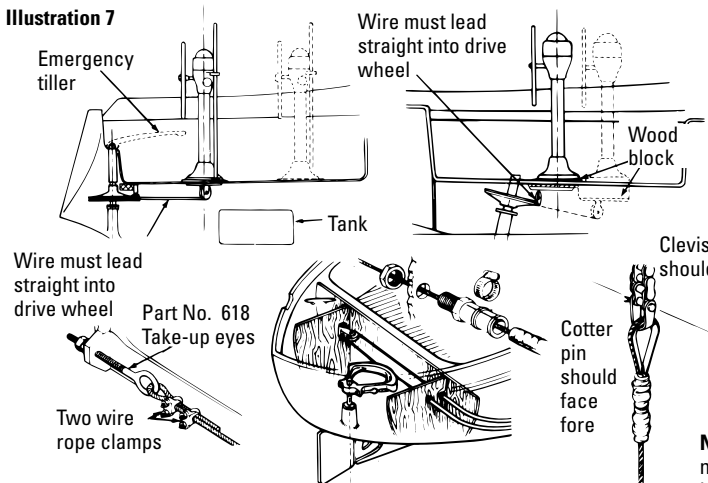
RADIAL DRIVE INSTALLATION

Alignment between the idler and the Drive Wheel is done by raising or lowering the Drive Wheel on the rudderpost. Be sure and cut the keyway longer than necessary for final adjustment. When locating the keyway decide whether you will be mounting the Drive Wheel hub up or hub down, because the wire line is not at the center of the hub. Cable tension is adjusted using two Part No. 618 Wire Rope Takeup Eyes as in the standard quadrant system.

On pedestal installations with the rudderpost raked forward or aft, you may require a block of wood between the cockpit floor and the idler to lower the idler for a good lead to the Drive Wheel. An alternative, sometimes used on racing yachts for ultimate feel, is using a 6" idler to lower the wire lead.

The Drive Wheel is supplied with a welded steel rudderstop which can be mounted above or below the Drive Wheel forward of aft.

Illustration 7



METHODS FOR INSTALLING SHEAVES AND CONDUIT IDLERS

1.) The sheaves may be mounted on wood supports that tie the cockpit to the bottom of the boat and keep the steering loads from wracking the cockpit with resultant bending of the rudderpost.

2.) Use an Edson Part No. 739 bracket that bolts to well glassed in wood blocks. This system is excellent for those boats that have an adequate transverse bulkhead to take the loads.

INSTALLING SHEAVE SUPPORTS

Illustration 8 shows the time honored "Edson Method" of glassing in wooden sheave supports. The port side shows the wood support running from the inside sail locker to the bottom of the boat. It should be glassed or bolted and made smooth so it does not catch your sails.

The starboard side indicates a modification when a quarter berth or other structure limits the use of the cockpit bulkhead. Here the sheave support butts against the cockpit floor or pedestal support. Use straight grained mahogany approximately 1 1/2" x 8"; long enough to reach between the outboard side of the cockpit seat risers and the hull. Bond in place with epoxy resin and glass cloth. For added support we recommend a wood (same stock) spreader between the two sheave supports.

Illustration 9

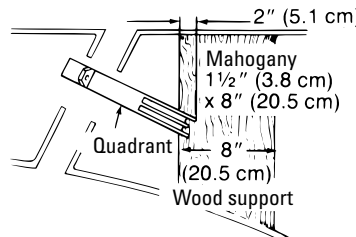
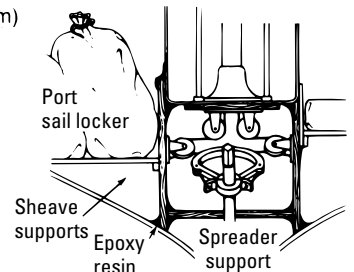


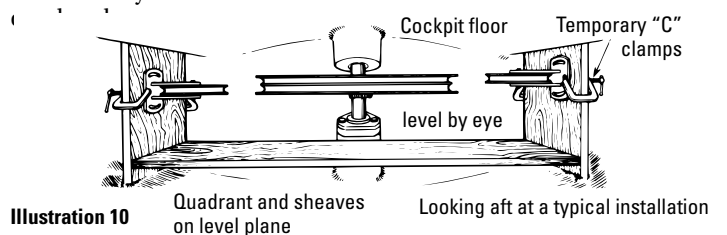
Illustration 8



POSITIONING THE SHEAVES

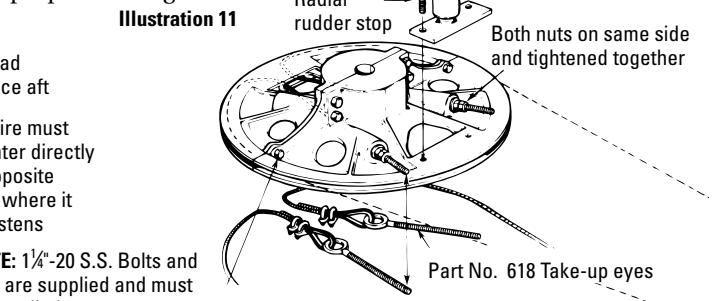
The location of the sheaves is crucial, for any misalignment will cause binding in the system. The edge of the sheave which receives the wire from the quadrant must be on the same plane as the correct groove in the quadrant.

Simply adjust the outboard sheaves (using the "C" clamp) up or down until the two sheaves and the quadrant appear to be on the same level (see Illustration 10). This can be done visually but as a check you can use a level or take measurements from the



When installing conduit end fittings outboard of quadrant, make certain that the bulkheads to which the conduit is terminated, are secure and strong enough to handle the steering loads.

NOTE: For RADIAL DRIVE cross the cables inside the pedestal for proper steering direction.



Pedestal Steerer Installation (con't.)

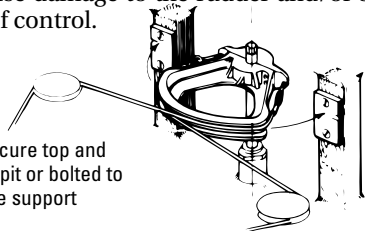
USE AND INSTALLATION OF RUDDER STOP

A steering system using either a quadrant or radial drive system must incorporate stops for the rudder that will be able to pick up all the loads that the rudder may place on the system when the rudder is in the hardover position. Shown on this page are several different methods that can be used. For offshore use it is recommended that an independent stop method such as a Tiller Arm must be used. This is especially important for those boats set up with a large steering wheel and a small quadrant or radial drive and with a large rudder.

Rudder stops *must* be installed to prevent the rudder from hitting the hull or the roller chain adapters, damaging the sprocket. The travel of the roller chain inside the pedestal is controlled by the rudder stops. The stop must be very strong and must be located so that the stop on the radial drive squarely hits the stops. If set at an angle they will try to deflect the stop and can break the radial drive. Likewise, the stop block must hit the stop as close to the radial drive as possible so it doesn't bend the stop. The reinforced rubber piece furnished with the radial drive greatly reduces the shock load and must be used.

When using the boat be sure when it is left unattended that the wheel brake be tightened or the wheel tied in place to prevent its free wheeling. Above all, do not back the boat down at speed and then let go of the wheel. The rudder will smash against the stops which can cause damage to the rudder and/or steerer and could result in loss of control.

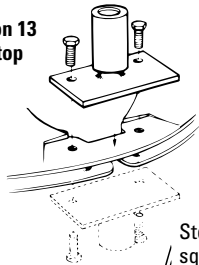
Illustration 12



2x4 Post can be secure top and bottom under cockpit or bolted to bulkhead or sheave support

Make sure the quadrant hits squarely and that there is a slight cutout for the wire. Most sailboats have the stops set to keep the total travel to between 80° and 90°.

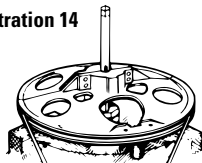
Illustration 13
Rudder Stop



Stop must hit squarely
Keep gap to a minimum

Illustration 15

Illustration 14



NOTE: Stop is independent of steering system

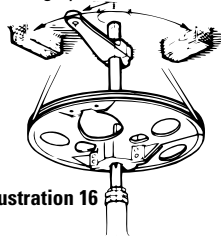


Illustration 16

SPECIAL INSTALLATION NOTES

NOTE: Do not use a magnet when checking for magnetism - use a compass or magnetometer.

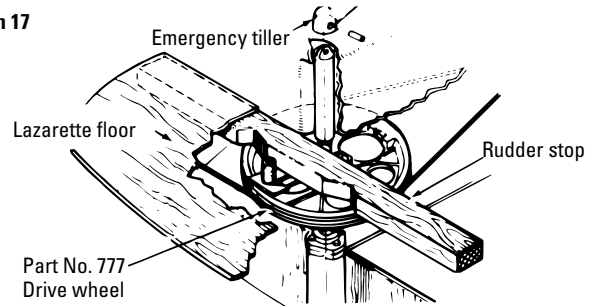
Installation procedures on some boats may require slight variations to the preceding Edson recommendations. When doing so, be sure to use good judgment and sound engineering principles. We also recommend consulting ABYC safety standards particularly with respect to compass light wiring, push-pull engine control connections, electrolytic corrosion (electrolysis), lightning bonding, and other boat building techniques. If you have any questions regarding installation please contact Edson or a qualified service representative.

NOTE: For more information on "Safety Standards for Small Craft," write to American Boat and Yacht Council, P.O. Box 806, 190 Ketcham Ave., Amityville, NY 11710.

All Radial Drive Wheels are provided with a rudder stop. The stops can be mounted fore or aft and to either the top or the bottom of the drive wheel (Illustrations 14 and 15). Blocks of wood should be fiberglassed in place for the stop to hit. Stops *must* hit squarely and as low on the stop as possible. *The best rudder stop arrangement, Illustration 16, uses a tiller arm or its equivalent as a stop. This keeps the stops independent of the steering and must be used on boats with high rudder loads or boats in the commercial, charter or offshore use. If in doubt, use an independent rudder stop.*

An alternative method for the rudder stop is to place a straight grained mahogany beam athwartship and cut out two notches for the stop to hit squarely, keeping the total travel of the Drive Wheel between 80° and 90° (illustration 17).

Illustration 17



EMERGENCY STEERING

Provisions must be made for emergency steering. This can be accomplished by leaving the existing tiller head in position so that your present tiller can be used for emergency steering. Edson recommends regular emergency tiller drills. If you purchase a new boat with wheel steering installed, try your emergency tiller to see how your boat reacts, and how much force is needed to control the boat with your emergency tiller.

NOTE: If at any time you suspect any problem with your steering gear, the cause should be checked out immediately; failure to do so can result in loss of steering and loss of control of your boat. If you have any questions regarding the steering system on your boat which you have been unable to answer through this catalogue, please contact Edson or get professional boatyard assistance.

Illustrations 18 and 19 show several possible arrangements for emergency steering with existing tiller heads. Edson pedestals can be purchased with milled bases (as in Illustration 19) to provide a neat, compact arrangement.

Illustrations 20, 21, and 22 show different ways to make an emergency tiller for both solid and hollow stock rudderposts. Before modifying your rudder post be sure the tiller head fitting is not the thrust bearing holding the rudder up in the boat.

Illustration 18

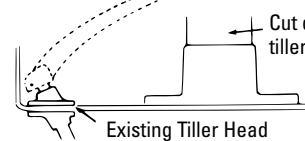


Illustration 19

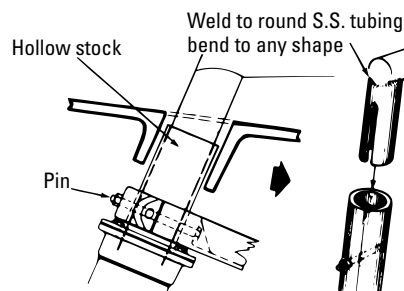
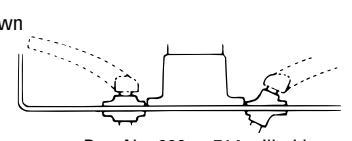


Illustration 20

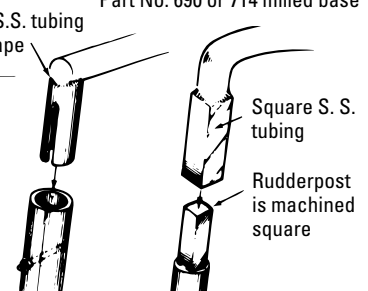


Illustration 21

Illustration 22

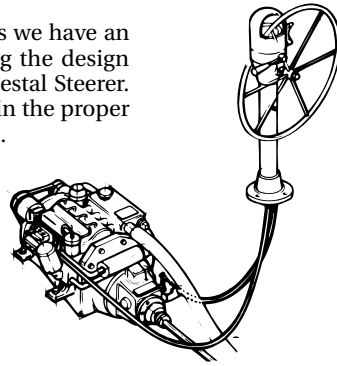
Pedestal Steering Assembly

As a further service to our customers we have an illustrated parts breakdown showing the design and construction of your Edson Pedestal Steerer. These parts drawings will assist you in the proper maintenance of your steering system.

If disassembly should become necessary, the following instructions will provide a simple but precise method of removing and replacing the steering shaft and its components.

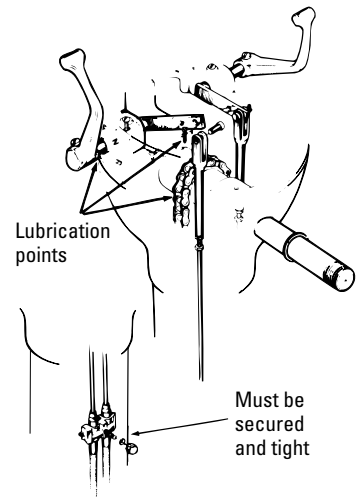
DISASSEMBLY

- 1.) With the wheel and brake assembly removed, replace the wheel nut with any standard thread $\frac{3}{4}$ " or 1" hex nut.
 - 2.) Loosen the steering cables and chain by backing off the take-up eyes at the Quadrant or Radial Driver, lift the chain off the sprocket and tie to the forward part of the bowl.
 - 3.) Put a cloth just under the sprocket so no parts drop down.
 - 4.) Align the notch in the aft nylon washer with the "V" stamped on the sprocket.
 - 5.) Carefully drive the pin out of the sprocket (drive from the round end toward the grooved end).
 - 6.) With a piece of wood against the $\frac{3}{4}$ " or 1" hex nut, gently tap the wheel shaft from the housing (see illustration); be careful not to drop the shaft components into the pedestal.
 - 7.) Remove the sprocket, two nylon washers and forward needle bearing.
 - 8.) Remove aft needle bearing and washers.
 - 9.) Wipe out any dirt or old grease before reassembly.
- To reassemble, reverse the above procedure; do not grease the bearings until reassembly is completed.
- NOTE:** Check your compass for possible readjustment.



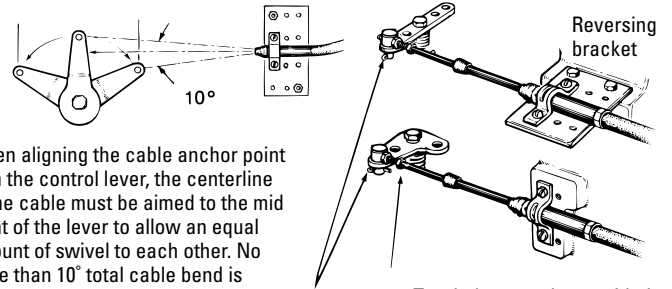
IMPORTANT! ENGINE CONTROLS INSTALLATION

Great care must be taken to assure ease and safety of engine controls operation. Components must be installed and adjusted so the engine goes into gear smoothly and completely, and the throttle operates easily. Cables must be installed straight or in broad curves. Refer to the Engine Connections illustrations (below) for installation procedures. Don't force engine controls when operating above idle. Force-shifting can result in broken cables and loss of boat control. Familiarize yourself with the operation of the engine controls. Caution and train all those on board.



ENGINE CONNECTIONS

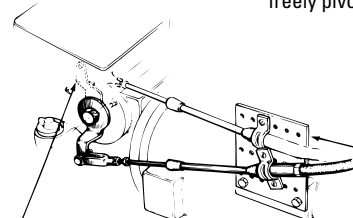
NOTE: Use the information below as a guideline. Most engine and control cable manufacturers furnish instructions for installing their products. Use their instructions if there is any variance with the instructions shown below.



When aligning the cable anchor point with the control lever, the centerline of the cable must be aimed to the mid point of the lever to allow an equal amount of swivel to each other. No more than 10° total cable bend is allowed.

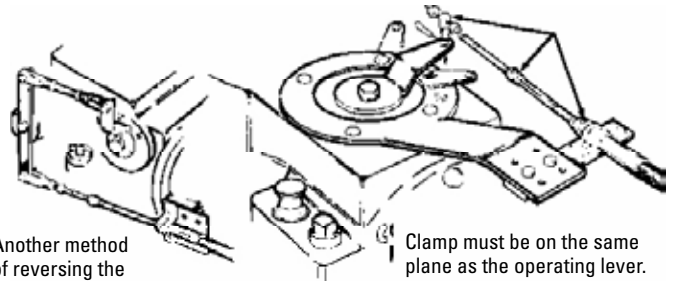
All connecting pivot pins must freely pivot.

Two holes must be provided in the engine throttle lever to optionally select the proper travel. Holes, both $1\frac{1}{4}$ " R or $2\frac{1}{4}$ " R. Inner hole will provide increased throttle travel control handle pressure.



Transmission lever "flopped" for directional shifting - Fw'd is forward, etc.

Typical working end clamping brackets with extra holes for centering and reverse if required. Straight lead is very important.

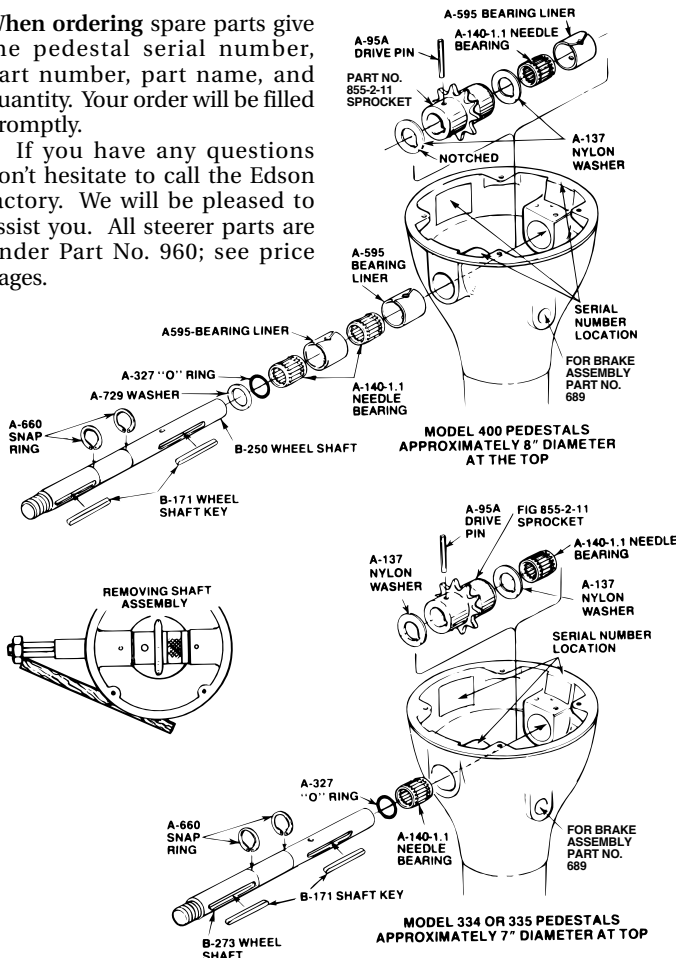


Another method of reversing the transmission

Clamp must be on the same plane as the operating lever.

When ordering spare parts give the pedestal serial number, part number, part name, and quantity. Your order will be filled promptly.

If you have any questions don't hesitate to call the Edson factory. We will be pleased to assist you. All steerer parts are under Part No. 960; see price pages.



ENGINE CONTROLS MAINTENANCE

Oil the control handle shaft bearings with #30 motor oil. Use a good grade of Teflon spray with an extender nozzle for the pedestal end of the engine control push/pull cables.

At the engine, clean off the control cable metal ends and spray with Teflon grease. This will increase cable life and make operation easier. Engine cables are subject to high heat from the transmission, and salty bilge water, both very hard on moving parts. If stiff, replace. **Note:** Lubricate all connecting pivot pins.

Pedestal Steering Maintenance

To properly maintain the moving parts in the top of the pedestal, it is necessary to remove the compass and its cylinder. For proper alignment when re-installing the compass, we recommend placing three or four lengths of tape on the pedestal and compass as shown below. Slit the tape when removing compass, align the strips of tape when re-installing the compass for visual realignment. Your compass MUST then be checked out for accuracy. Lubrication of needle bearings should be done by squeezing Edson Part No. 827 Teflon Lubricant into the holes located on top of the bearing housings inside the pedestal bowl. Spin the wheel when squeezing the lubricant in to make sure the entire bearing is serviced. Winch grease or water pump grease can be used as an alternative, but don't let the bearings run dry. Do not over grease as it will run onto the brake pads. Oil the chain with #30 weight motor oil. Do NOT grease chain as it does not penetrate the links.

Inspect the condition of the wire, tension of the wire and lightly oil. Edson recommends placing about five layers of "Kleenex" on the palm of your hand, squirt oil on the tissues and lightly oil the wire. This will lubricate the strands but will also "flag" a broken or hooked strand by tearing off a small section of tissue. If you do have a wire break, replace the wire immediately. See Edson Part No. 775 Wire and Chain Replacement Kits. (Caution: Wire splinters can cause painful cuts.) Replace the wire after 5 years. If still good, keep the old wire on board as a spare.

STEERING WIRE TENSION

A top quality roller chain to wire steering system can be kept in "as new" sensitivity by keeping the wire at a correct tension. To check for proper wire tension, lock the wheel in position by using the pedestal brake, or by tying off the wheel. Cable tension is best when you cannot move the quadrant or drive wheel by hand with the wheel

locked in place. Over tightening will greatly reduce the sensitivity of the system.

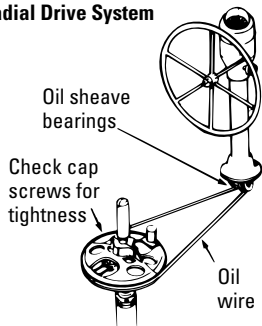
It must be emphasized that all on board must be familiar with the care and operation of the Steering System and engine controls. One person must be assigned the job of maintenance and must be thoroughly familiar with the operation and intent of all the equipment. If at any time your Steering System makes strange noises or reacts differently than it has previously, you must find the causes immediately and correct the problem.

Screws, nuts, bolts, as well as clevis and cotter pins that are part of the steering system, engine controls or pedestal accessories, must be checked regularly for tightness and wear. Failure to inspect all steering parts, engine controls and pedestal accessories may cause loss of control or failure of the engine or steering system. *All boats must have an emergency tiller or its equivalent and all on board must be familiar with its location and operation. An emergency tiller drill is just as important as a man-overboard drill and must be regularly conducted.*

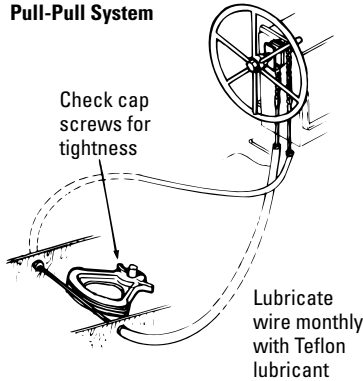
On a new boat and at least once a year, inspect the system when under a strong load. On a calm day and under power, go away from the other boats and with the person who is assigned the maintenance watching from below, put the wheel hard over at full throttle. The maintenance man should watch carefully for all parts of the system bending, distorting, creaking, or giving any indication of failing if placed under a heavy load for a period of time. If, for any reason something did fail or needs adjusting, the day is early and you will have plenty of time.

When leaving your boat at her mooring or slip, make sure that your wheel is properly tied off. **DO NOT LEAVE THE STEERING SYSTEM TO FREE WHEEL.**

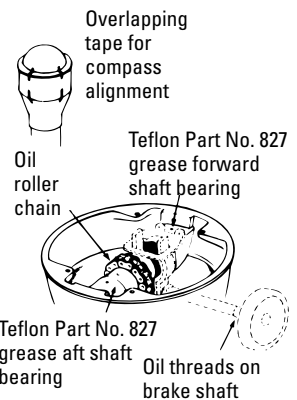
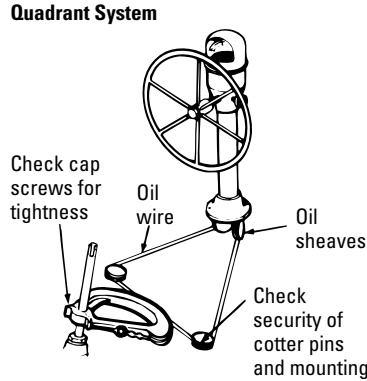
Radial Drive System



Pull-Pull System



Quadrant System



CLEANING STAINLESS STEEL

Pedestal guards, steering wheels and shafts are all made from top quality stainless steel. The implication of its name "stainless steel" does not mean it is totally rustproof. All stainless steel will rust to a certain degree due to chemical reaction to air and saltwater. This is mainly cosmetic and will require an occasional polishing with an abrasive type cleaner such as "Brasso" or equivalent.

CLEANING PEDESTAL AND ACCESSORIES

Clean them with soap and water; don't use chemicals such as MEK or acetone as they break down the super finish on your Edson pedestal system, compasses and instruments. Most manufacturers

of compasses and electronic instruments suggest that they all be removed during winter storage and kept in a warm dry area. Compasses are normally held in place by two or three slotted-head screws, placed near the top of the compass. A Part No. 672 Rubber Connector will assist in removing the compass. Instruments can be removed by the screws in the Edson faceplate. Just unplug the instrument and you are all set.

CAUTION: When the equipment is in the tropics or in charter service, the maintenance schedule must be speeded up. Or, to put it in a few words: clean it up, oil it, inspect it, cover it. The effects of sun, saltwater and inexperienced operators can be severe.

LUBRICATION RECORD

| component | lubricant | schedule | 1st year 20__ | 2nd year 20__ | 3rd year 20__ | 4th year 20__ | 5th year 20__ | 6th year 20__ | 7th year 20__ |
|-----------------------|---------------------|---------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| sheave bearings | #30 oil* | check and oil monthly | | | | | | | |
| pull-pull cables | Teflon Part No. 827 | check and grease monthly | | | | | | | |
| wire rope | #30 oil* | check and oil annually | | | | | | | |
| roller chain | #30 oil* | check and oil annually | | | | | | | |
| pedestal shaft barngs | Teflon Part No. 827 | check and grease annually | | | | | | | |

*Any light oil is suitable. We recommend #30 weight motor oil since most boat owners have it aboard.

CAUTION: 1.) on extended voyages your steering system should be inspected each day and lubricated weekly. Carefully inspect your steering system at least once a week before a vacation cruise to avoid last minute maintenance.
2.) When the boat is unattended secure the wheel with the brake or a line. In rough weather the rudder can swing violently from stop to stop causing damage.