

# Rudder Bearing Systems

Durable, water-tight and abrasion-resistant bearing products that eliminate metal-on-metal contact.



**TIDEMARINE**

**PRODUCT CATALOG 2014**

# TIDESMARINE

*Specialists in innovative, high-quality marine systems for propeller shafts, rudder assemblies and mainsail handling.*

## **Mission Statement**

Tides Marine is committed to designing and manufacturing marine system components which improve vessel performance and reliability, solve unique marine system issues, reduce the need for scheduled maintenance and provide worry-free, long-term boating enjoyment.

## **Boat Builders**

- Each time you introduce a new vessel model (or change an old one), a Tides Marine technical specialist will be available to discuss installation techniques and guidelines with production personnel.
- A Tides Marine technical specialist will be available to conduct on-site training sessions as requested by your production team.
- If required, a Tides representative will visit any dealer in your organization to train their personnel.
- The Tides Marine design and product development staff are available to discuss production techniques, performance criteria and any special circumstances which may arise when using Tides' products.

## **Dealers, Yards and Repair Facilities**

- Tides Marine will explain repair / replacement procedures via phone or fax. If necessary, a Tides technical specialist will travel to your facility to provide on-site technical assistance.
- If your service personnel make a mistake during the installation / repair of a Tides product, simply call Tides and standard replacement parts will be shipped within 48 hours.

## **Boat Owners**

- Each Tides Marine product is covered by a 2-year / 2500 engine hour (whichever comes first) warranty, unless otherwise noted.

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Standard



Low Profile

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# Upper Rudder Bearing-Standard

## PRODUCT OVERVIEW



The TidesMarine Upper Rudder Bearing-Standard (URB-STD) is designed to be mounted directly on top of the rudder shelf. It is an ABS- and Lloyds-approved, self-aligning design which accommodates up to 10 degrees of off-axis alignment between the mounting surface (rudder shelf) and the rudder stock. As a result, it requires no shimming during installation and won't load the rudder shaft during vessel operation.

The URB-STD is lighter than conventional bronze units. It consists of a UHMW ball-type bearing captured within a UHMW housing. The ball-type bearing is designed with shoulder at the top to accept a rudder collar, allowing the unit to effectively carry rudder "download" during vessel operation.

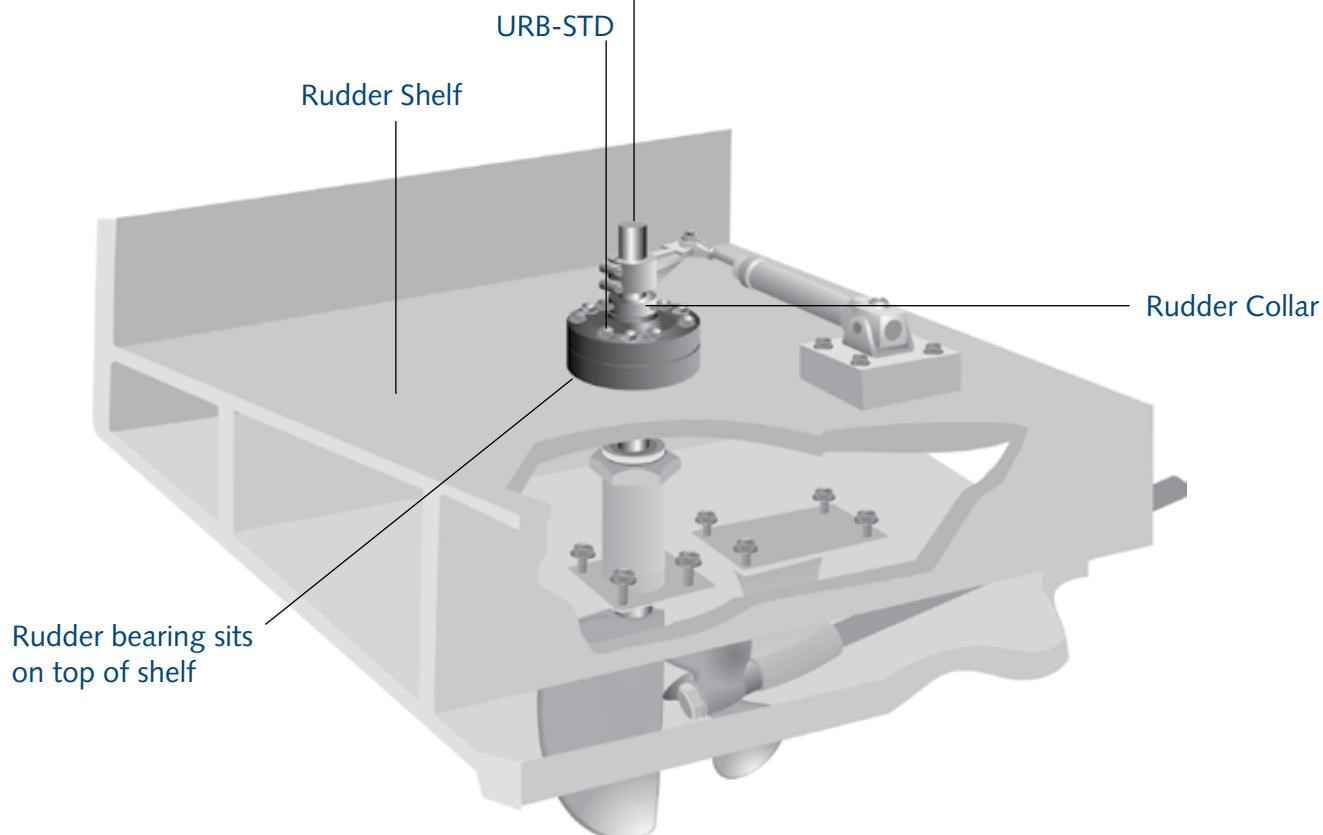
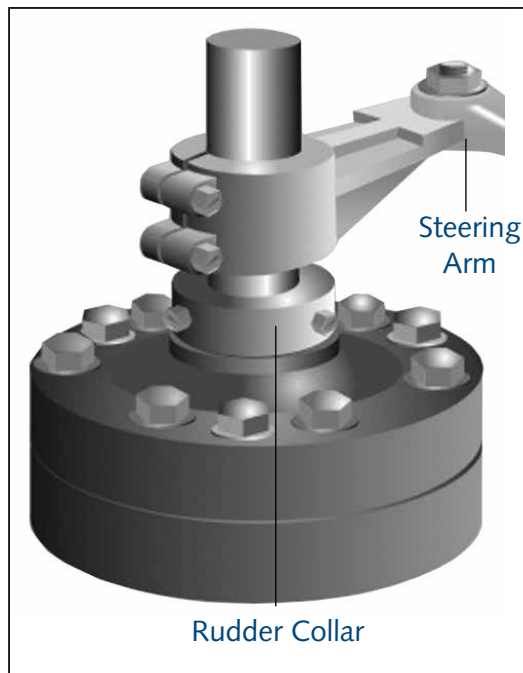
The Tides design eliminates metal-to-metal contact and the associated problems of abrasion, electrolysis and corrosion. The URB-STD is self-lubricating and maintenance free. Steering is smoother and quieter. Minor mounting adjustments to the rudder system's steering components may be necessary if the height of the unit is different than the metal pillow-block style bearing it is replacing.

# Upper Rudder Bearing-Standard

## PRODUCT OVERVIEW

### **Bronze Rudder Stock Note:**

*Bronze rudder stock diameters may run slightly under nominal. If necessary, Tides will machine the bore of the ball-type bearing to match your installation accordingly.*



# Upper Rudder Bearing-Standard

## BEFORE ORDERING

Before placing your order, there are several measurements you need to take/confirm.

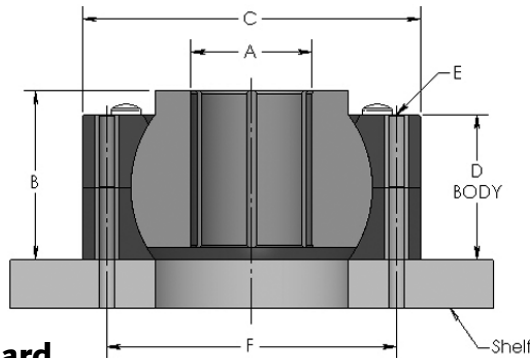
Find the exact outside diameter of your rudder stock to three decimals (.000").

Locate this rudder stock size in Column A of the table below.

Then, note the corresponding assembly height in Column "B" of the table. Verify there is enough room between the rudder shelf and the deck (or any miscellaneous structures) above to install the unit (generally 2 x the overall height of the URB-STD). If height restrictions exist, the URB-LP (page 6 in this catalog) may be a better choice.

Next, confirm there is sufficient clear space around the rudder stock on the rudder shelf for the URB-STD that fits your boat. Measurement C in the diagram and the table should be used for this purpose.

Finally, check the position and mounted height of the other steering components to determine if any adjustment will be necessary once the URB-STD is in place.



## Upper Rudder Bearing-Standard Specifications (dimensions in inches)

| RUDDER STOCK OD | ASSEMBLY HEIGHT | ASSEMBLY DIAMETER | BODY HEIGHT | # OF BOLTS IN FLANGE | BOLT HEIGHT | PART NUMBER  |
|-----------------|-----------------|-------------------|-------------|----------------------|-------------|--------------|
| A               | B               | C                 | D           | E                    | F           |              |
| 1               | 2 3/8           | 5                 | 1 3/4       | 6                    | 4           | URB-STD-1000 |
| 1 1/4           | 2 3/8           | 5                 | 1 3/4       | 6                    | 4           | URB-STD-1250 |
| 1 3/8           | 2 3/8           | 5                 | 1 3/4       | 6                    | 4           | URB-STD-1375 |
| 1 1/2           | 2 3/8           | 5                 | 1 3/4       | 6                    | 4           | URB-STD-1500 |
| 1 3/4           | 2 3/8           | 5                 | 1 3/4       | 6                    | 4           | URB-STD-1750 |
| 1 7/8           | 3 1/4           | 6                 | 2 1/2       | 6                    | 5           | URB-STD-1875 |
| 2               | 3 1/4           | 6                 | 2 1/2       | 6                    | 5           | URB-STD-2000 |
| 2 1/4           | 3 1/4           | 6                 | 2 1/2       | 6                    | 5           | URB-STD-2250 |
| 2 1/2           | 3 1/2           | 7                 | 3           | 6                    | 6           | URB-STD-2500 |
| 2 3/4           | 4 3/4           | 8                 | 3 1/2       | 8                    | 7           | URB-STD-2750 |
| 3               | 4 3/4           | 8                 | 3 1/2       | 8                    | 7           | URB-STD-3000 |
| 3 1/4           | 4 3/4           | 8                 | 3 1/2       | 8                    | 7           | URB-STD-3250 |
| 3 1/2           | 4 3/4           | 8                 | 3 1/2       | 8                    | 7           | URB-STD-3500 |
| 4               | 4 3/4           | 9                 | 4           | 6                    | 7 1/2       | URB-STD-4000 |
| 4 1/2           | 5 1/2           | 10                | 4 1/4       | 6                    | 8 3/4       | URB-STD-4500 |
| 5               | 5 1/2           | 10                | 4 1/4       | 6                    | 8 3/4       | URB-STD-5000 |
| 5 1/2           | 5 1/2           | 11                | 4 1/4       | 6                    | 9 1/2       | URB-STD-5500 |

*If you are replacing a standard part (ex: URB-STD-1000), please specify its size/configurations when ordering because there are numerous variations for the same shaft size. You may not have the standard model.*

# Upper Rudder Bearing-Low Profile

## PRODUCT OVERVIEW



The Tides Marine Upper Rudder Bearing-Low Profile (URB-LP) is designed to be installed on vessels where the steering system components need to be located as close to the rudder shelf as possible. Mounted “through” the rudder shelf, this design maintains a clean, low-profile appearance. Like the URB-STD, the URB-LP is an ABS- and Lloyds-approved, self-aligning design which accommodates up to 10 degrees of off-axis alignment between the mounting surface (rudder shelf) and the rudder stock. As a result, it requires no shimming during installation and won’t load up the rudder shaft during vessel operation.

The URB-LP is lighter than conventional bronze units. It consists of a UHMW ball-type bearing captured within a UHMW housing. The ball-type bearing is designed with a “flat surface” at the top to accept a rudder collar, allowing the unit to effectively carry rudder “download” during vessel operation.

The Tides design eliminates metal-to-metal contact and the associated problems of abrasion, electrolysis and corrosion. The URB-LP is self-lubricating and maintenance free. Steering is smoother and quieter. Minor mounting adjustments to the rudder system’s steering components may be necessary if the height of the unit is different than the metal pillow-block style bearing it is replacing.

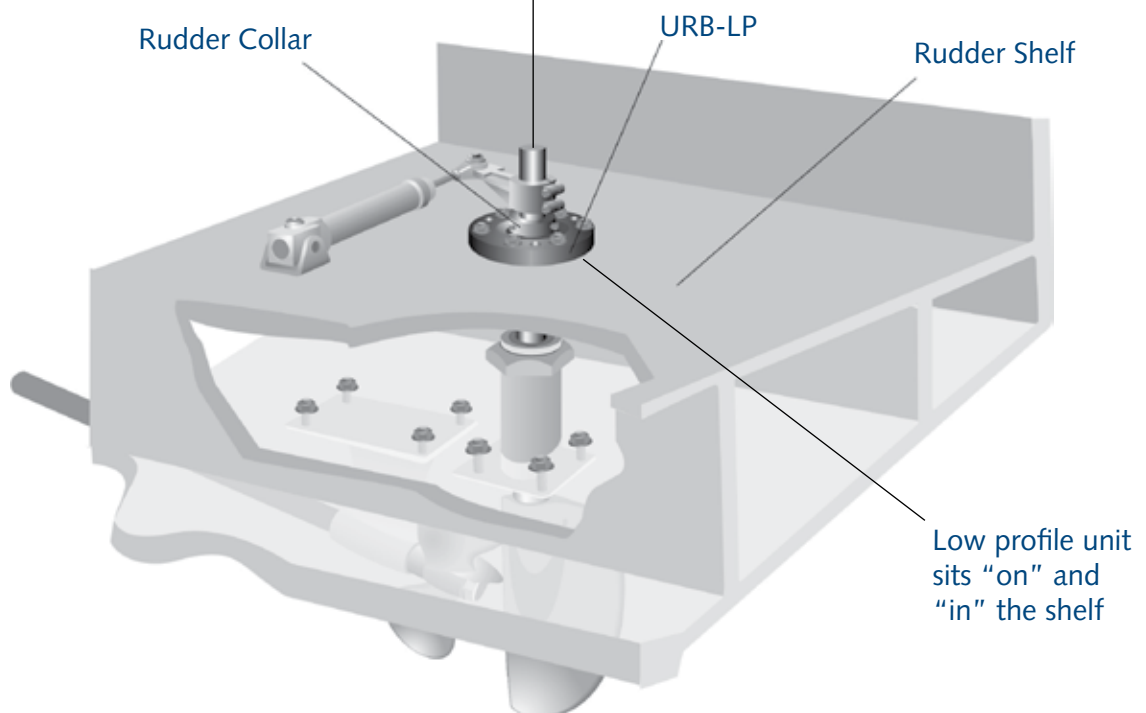
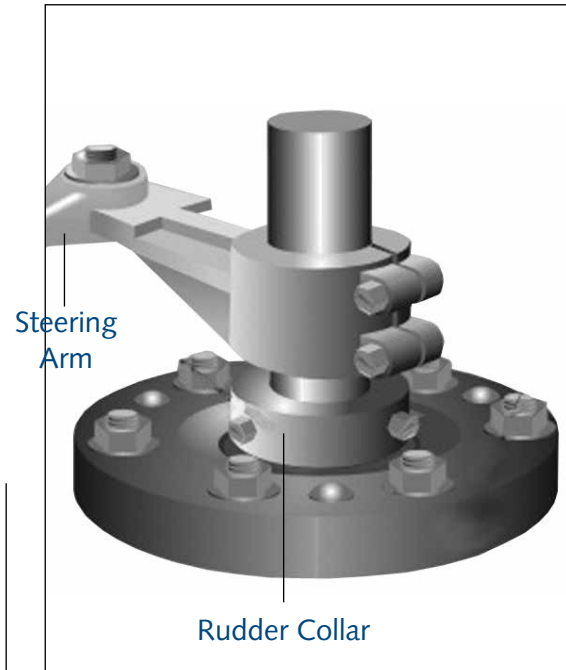


# Upper Rudder Bearing-Low Profile

## PRODUCT OVERVIEW

### **Bronze Rudder Stock Note:**

*Bronze rudder stock diameters may run slightly under nominal. If necessary, Tides will machine the bore of the ball-type bearing to match your installation accordingly.*



# Upper Rudder Bearing-Low Profile

## BEFORE ORDERING

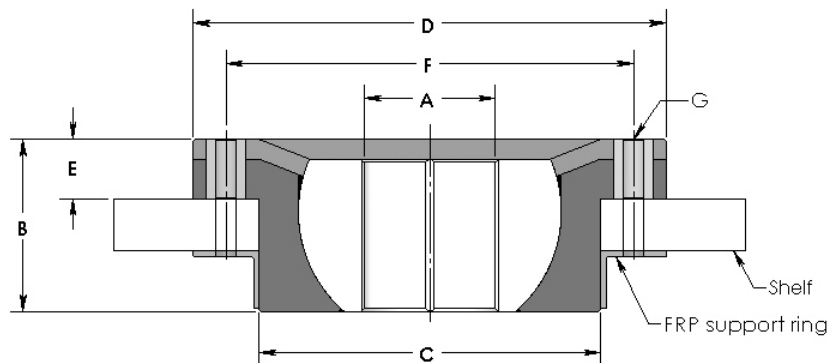
Before placing your order, there are several measurements you need to take/confirm.

Measure the exact diameter of your rudder stock (.000"). Locate this measurement in the table below.

Next, note the flange height of your part (measurement E) in the table. Verify there is enough room between the rudder shelf and the deck / miscellaneous construction above to install the unit (generally, 1 ½ x the overall height of the unit (Measurement B)).

Then, using the barrel diameter measurement in Column C, confirm there is sufficient clear space on the shelf around the rudder stock to locate the URB-LP.

Finally, check the position and mounted height of other steering components to determine if any adjustment will be necessary once the URB-LP is in place.



## Upper Rudder Bearing-Low Profile

### Specifications (dimensions in inches)

| RUDDER STOCK OD | ASSEMBLY HEIGHT | BARREL OD | FLANGE DIAMETER | FLANGE HEIGHT | BOLT CENTER | # OF BOLTS IN FLANGE | PART NUMBER |
|-----------------|-----------------|-----------|-----------------|---------------|-------------|----------------------|-------------|
| A               | B               | C         | D               | E             | F           | G                    |             |
| 1               | 2               | 4 1/2     | 6 1/2           | 3/4           | 5 1/2       | 6                    | URB-LP-1000 |
| 1 1/4           | 2               | 4 1/2     | 6 1/2           | 3/4           | 5 1/2       | 6                    | URB-LP-1250 |
| 1 3/8           | 2               | 4 1/2     | 6 1/2           | 3/4           | 5 1/2       | 6                    | URB-LP-1375 |
| 1 1/2           | 2               | 4 1/2     | 6 1/2           | 3/4           | 5 1/2       | 6                    | URB-LP-1500 |
| 1 3/4           | 2               | 4 1/2     | 6 1/2           | 3/4           | 5 1/2       | 6                    | URB-LP-1750 |
| 2               | 2 9/16          | 5 1/2     | 7 1/2           | 5/8           | 6 1/2       | 6                    | URB-LP-2000 |
| 2 1/4           | 2 9/16          | 5 1/2     | 7 1/2           | 5/8           | 6 1/2       | 6                    | URB-LP-2250 |
| 2 1/2           | 2 15/16         | 6 1/2     | 9               | 3/4           | 7 3/4       | 8                    | URB-LP-2500 |
| 2 3/4           | 2 15/16         | 6 1/2     | 9               | 3/4           | 7 3/4       | 8                    | URB-LP-2750 |
| 3               | 2 15/16         | 6 1/2     | 9               | 3/4           | 7 3/4       | 8                    | URB-LP-3000 |
| 3 1/2           | 4               | 8         | 11              | 1 1/2         | 9 1/2       | 8                    | URB-LP-3500 |
| 4               | 4 1/8           | 8 1/2     | 11 1/2          | 1 1/2         | 9 1/2       | 8                    | URB-LP-4000 |
| 4 1/2           | 4 1/8           | 8 1/2     | 12              | 1 1/2         | 10 1/4      | 8                    | URB-LP-4500 |
| 5               | 4 1/4           | 9         | 12 1/2          | 1 1/2         | 10 3/4      | 10                   | URB-LP-5000 |

*If you are replacing a standard part (ex: URB-LP-1000), please specify its size/configurations when ordering because there are numerous variations for the same shaft size. You may not have the standard model.*

# Rudder Tube Systems

## PRODUCT OVERVIEW



Based upon the Tides Marine patented Type D system, the Tube System (TS) is another rudder system approach, which can be used effectively by FRP boat builders, or used for retrofits by boat yards.

Using the supplied tooling, these Tube Systems can be installed during primary lay-up in the mold. This system provides an economical way to accurately position the rudder time after time.

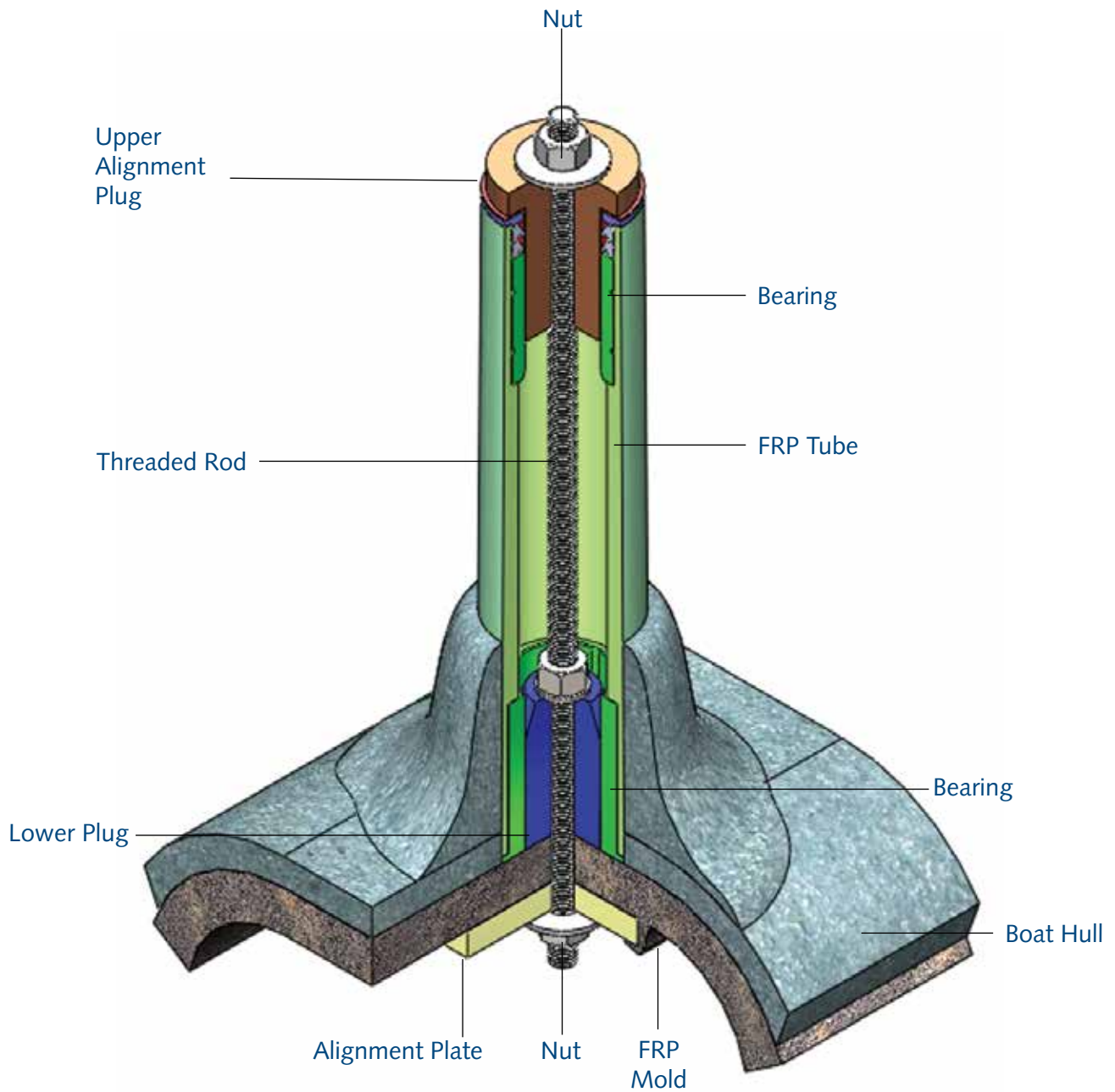
As a retrofit, it eliminates the expense of replacing both the upper and lower rudder bearings.

The system comes fully assembled with UHMW upper and lower bearings installed in an FRP tube with two lip seal at the top. A UHMW thrust washer is included.

All that is necessary for ordering is the shaft size and the overall length of tube you need. Tides Marine offers these rudder tubes using a variety of bearing materials to include UHMW, CIP Composite Material, Vesconite, etc.

# Rudder Tube Systems

## PRODUCT OVERVIEW

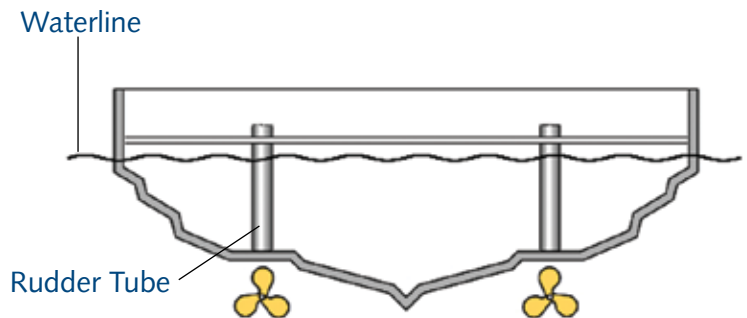


# Rudder Tube Systems

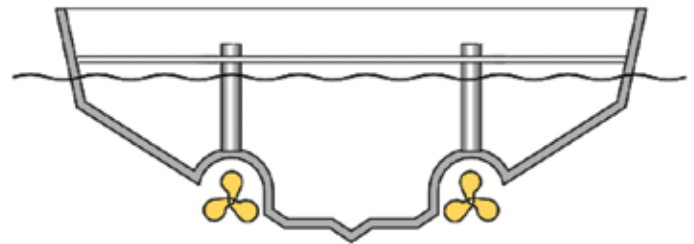
## MOLD INSTALLATION TYPES

The procedure for modifying the mold and installing the Tube System before lay-up begins will differ slightly depending upon the type of hull being produced. The following represent the three most common variations.

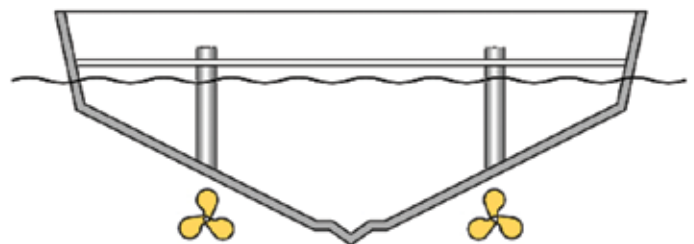
**Type 1:** Molds with an existing "flat" surface at the rudder port location, which will accept a standard FRP tube.



**Type 2:** Molds which require modification to achieve a "flat" surface or pocket to accept a standard FRP tube.

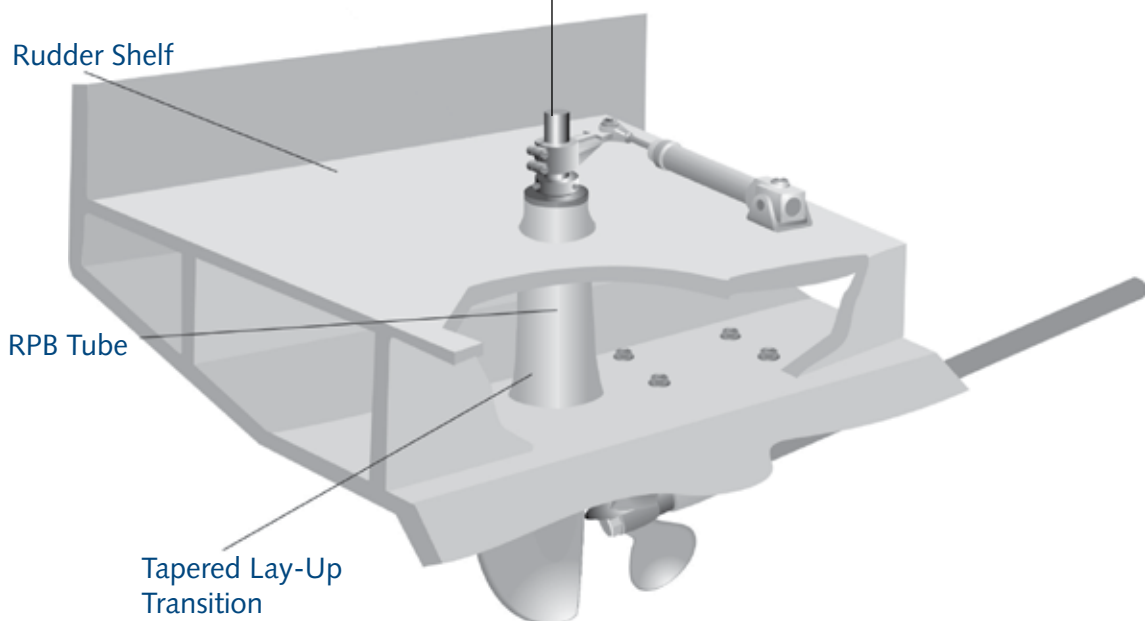
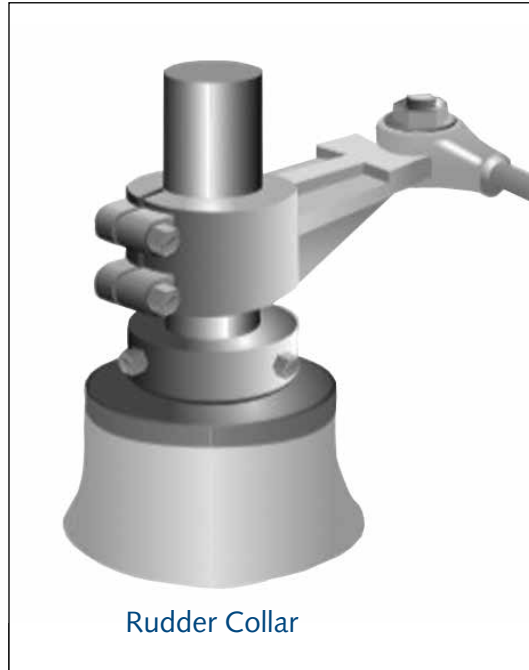


**Type 3:** Molds which require modification to accept an FRP tube with an "angled base" designed to match the dead rise and rocker angles.



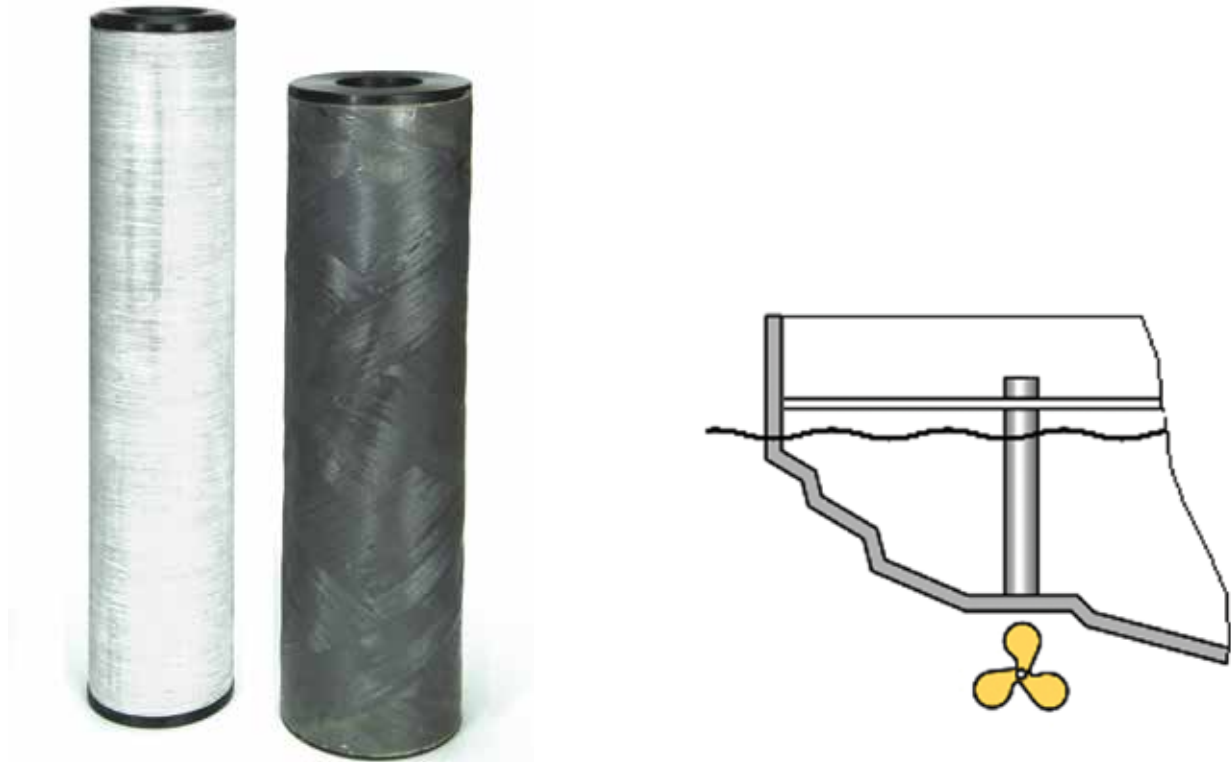
# Rudder Tube Systems

## PRODUCT OVERVIEW



# Rudder Tube Systems

## BEFORE ORDERING



Please provide Tides with the exact rudder stock diameter (.000") you have decided to use and the length of the tube you require. Tube length can be determined by calculating the distance from the bottom of the hull, through the rudder shelf to that point above the rudder shelf which you have determined is optimal for installing other steering system components (rudder collars, steering arms, etc.).

If you provide Tides with drawings of your installation, Tides will recommend one or more solutions for your installation.

# Rudder Port Bearings - With Seals

## Type C

### PRODUCT OVERVIEW

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The Tides Marine Type C rudder port is used in vessels constructed of FRP, steel or aluminum which have an integral rudder port tube and flange. Unlike the typical assemble with separate bearing and packing, the Type C unit combines both sealing and bearing functions in a cost-effective housing. It is an ABS- and Lloyds-approved design and offers a substantial "bearing surface" to "rudder stock diameter" ratio.

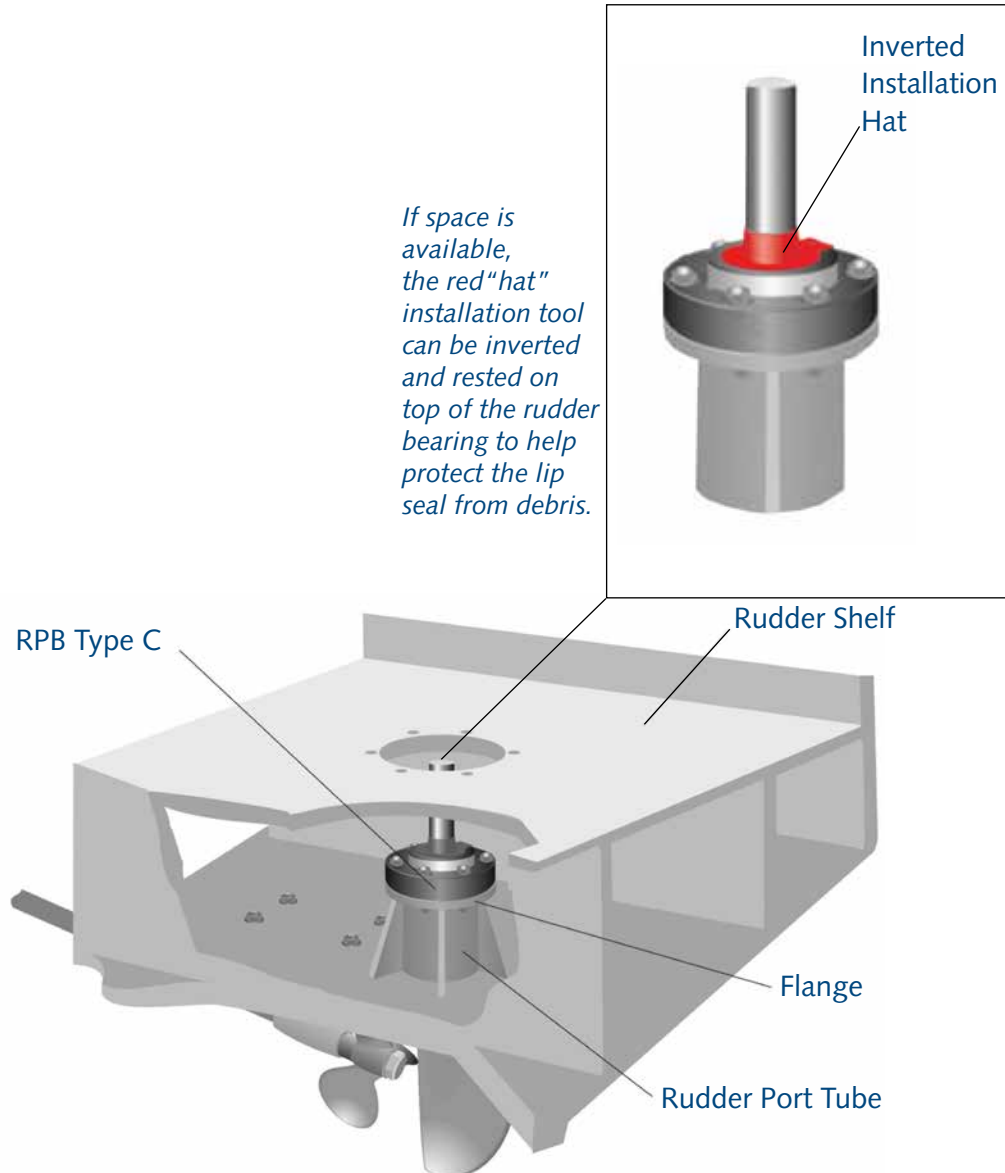
The units consist of a one-piece UHMW housing and a nitrile lip seal. The Type C is 100% watertight. It eliminates metal-to-metal contact and the associated problems of abrasion, electrolysis and corrosion. Rudder chatter and vibration are reduced, resulting in quieter, smoother performance.



# Rudder Port Bearings - With Seals

## Type C

### BEFORE ORDERING



To determine which part to order, measure the exact diameter of your rudder stock (.000") and the inside diameter of the rudder tube into which it will be mounted. Be sure that the ID of the tube is round, so that the barrel of the Type C will slide in easily (without force).

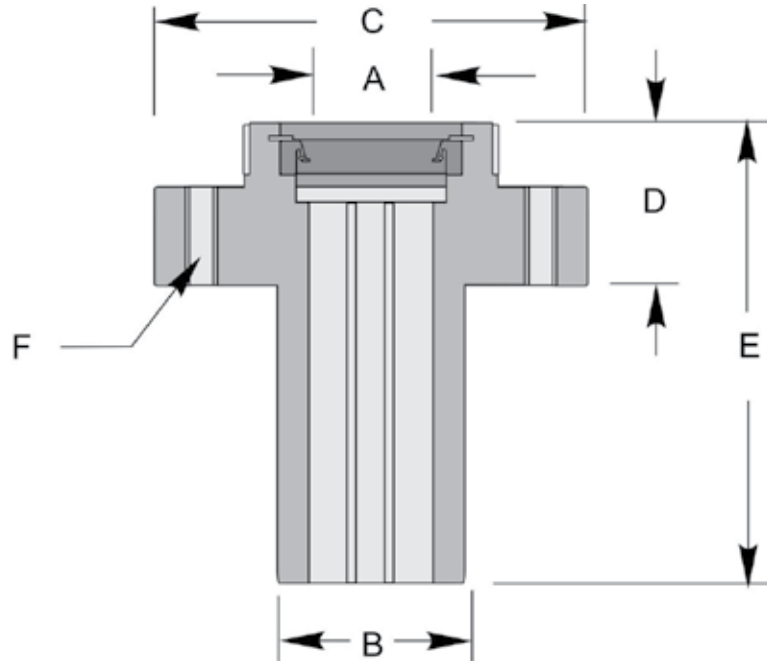
If necessary, Tides will machine the barrel of the Type C to ensure a proper fit within the tube. Using the rudder stock size and tube ID measurement, locate your part in the table on page 16. Next, confirm that the tube flange is of sufficient size to accept the bolt pattern and diameter of the flange (Column C). Make certain your existing rudder tube is long enough to encase the entire Type C within its shape.

Finally, refer to Column E in the table on page 16 to make sure there is sufficient space over the top of the existing rudder tube to install this Type C bearing.

# Rudder Port Bearings - With Seals

## Type C

### BEFORE ORDERING



## Type C

### Specifications (dimensions in inches)

| RUDDER STOCK OD | TUBE ID | DIAMETER | FLANGE HEIGHT | TOTAL HEIGHT | # OF BOLTS IN FLANGE | PART NUMBER |
|-----------------|---------|----------|---------------|--------------|----------------------|-------------|
| A               | B       | C        | D             | E            | F                    |             |
| 1               | 2 1/2   | 5        | 1 7/8         | 4 7/8        | 6                    | RPB-C-1000  |
| 1 1/4           | 2 1/2   | 5        | 1 7/8         | 4 7/8        | 6                    | RPB-C-1250  |
| 1 1/2           | 3       | 6        | 1 7/8         | 5 7/8        | 6                    | RPB-C-1500  |
| 1 3/4           | 3       | 6        | 1 7/8         | 5 7/8        | 6                    | RPB-C-1750  |
| 2               | 3 1/2   | 6 1/2    | 2 1/8         | 7 1/8        | 6                    | RPB-C-2000  |
| 2 1/4           | 3 1/2   | 6 1/2    | 2 1/8         | 7 1/8        | 6                    | RPB-C-2250  |
| 2 1/2           | 4       | 6 1/2    | 2 1/8         | 7 1/8        | 6                    | RPB-C-2500  |
| 2 3/4           | 4       | 7        | 2 1/8         | 7 1/8        | 6                    | RPB-C-2750  |
| 3               | 4 1/2   | 7        | 2 1/8         | 7 1/8        | 6                    | RPB-C-3000  |
| 3 1/2           | 5       | 8        | 2 1/4         | 8            | 8                    | RPB-C-3500  |
| 4               | 5 1/2   | 8 1/2    | 2 1/4         | 8 3/4        | 8                    | RPB-C-4000  |
| 4 1/2           | 6       | 9        | 2 3/8         | 9 7/8        | 8                    | RPB-C-4500  |
| 5               | 6 1/2   | 9 1/2    | 2 3/8         | 10 3/8       | 8                    | RPB-C-5000  |
| 5 1/2           | 7       | 10 1/2   | 2 3/8         | 11 3/8       | 8                    | RPB-C-5500  |
| 6               | 7 1/2   | 11       | 2 3/8         | 12 3/8       | 8                    | RPB-C-6000  |

*If you are replacing a standard part (ex: RPB-C-1000), please specify its size/configurations when ordering because there are numerous variations for the same shaft size. You may not have the standard model.*

# Rudder Port Bearings - With Seals

## Type D

### PRODUCT OVERVIEW



The Tides Marine Type D rudder port is an integrated approach to rudder port installation. It was developed for both the FRP boat builder and for retrofits.

Unlike conventional post layup rudder port installations, the FRP receiver (Liner) for the Type D rudder port can be incorporated into the primary hull lamination, resulting in an assembly stronger than any bronze rudder port. Tides Marine can supply mold tooling for this purpose.

The Type D system is also easy to use as a retrofit for replacing other types of conventional rudder ports. No tooling is required.

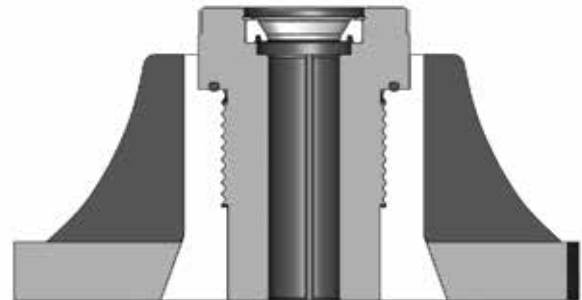
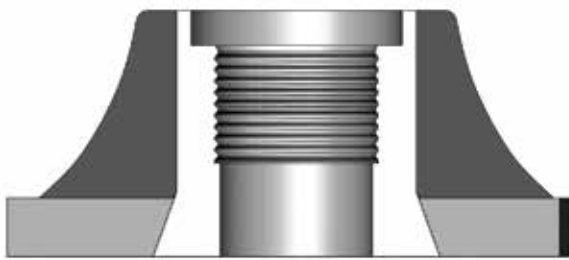
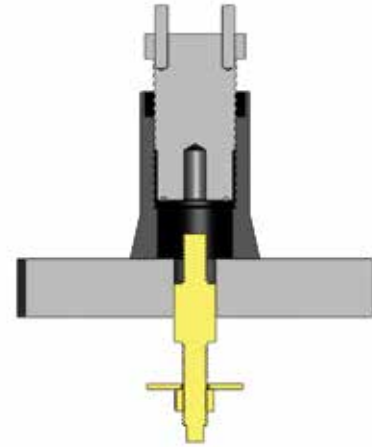
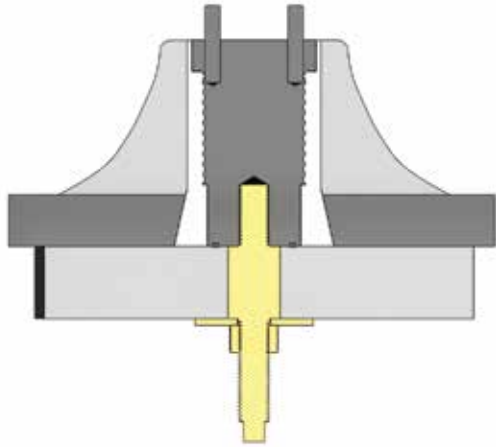
One reason many boat builders are changing to the Type D system is the significant labor savings associated with this approach. To accommodate various conventional rudder ports currently available, builders have to perform a variety of post-lay-up operations on each hull being produced. These include: building up / leveling mounting blocks, locating the correct position and axis for the rudder stock hole, aligning and drilling pilot holes and subsequent thru-holes, checking and adjusting for misalignment which may have occurred along the way and, finally, locating and drilling the mounting holes for the conventional port unit. These operations require special jigs and fixtures, several skilled workers, numerous tools and significant man hours to complete.

With the Type D product, post lay-up operations that once required hours of skilled labor are eliminated.

# Rudder Port Bearings - With Seals

Type D

## PRODUCT OVERVIEW



# Rudder Port Bearings - With Seals

## Type D

### NEW CONSTRUCTION – COMPONENT OVERVIEW

The Tides Marine Type D system components include a FRP liner, a re-useable alignment plug and fastener assembly and the Type D bearing and seal.

Molded from FRP and compatible with polyester, vinylester and epoxy systems, each Type D liner has an internal thread to accept its corresponding rudder bearing and seal.

The plug and fastener assembly consists of a machined UHMW body with either a threaded rod or bolt (depending upon the application) for attaching it to the hull mold.

The Type D rudder bearing and seal assembly consists of a one-piece UHMW housing with a nitrile lip seal. The UHMW bearing eliminates metal-to-metal contact and associated problems of abrasion, electrolysis and corrosion. They are 100% watertight. Their performance characteristics match those of other Tides Marine rudder ports in that they are quiet, smooth and vibration free.

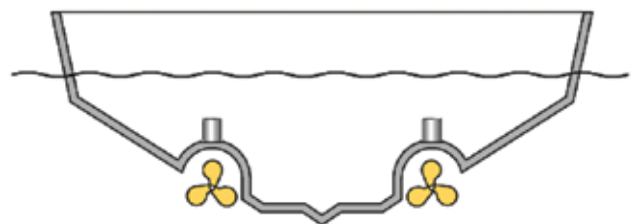
### MOLD INSTALLATION TYPES

The procedure for modifying the mold and installing the liner prior to lay-up differs according to the type of hull being produced. The following are three of the most common variations.

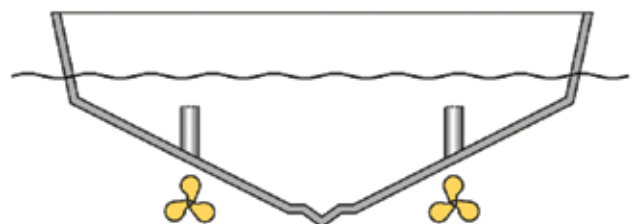
**Type 1:** Molds with an existing “flat” at the rudder port location. This installation will use the standard flange-type liner.



**Type 2:** Molds which require modification to achieve a “flat” surface or pocket for mounting a standard flange-type liner.



**Type 3:** Molds which require modification to accept an angled liner to match dead rise and rocker angles.

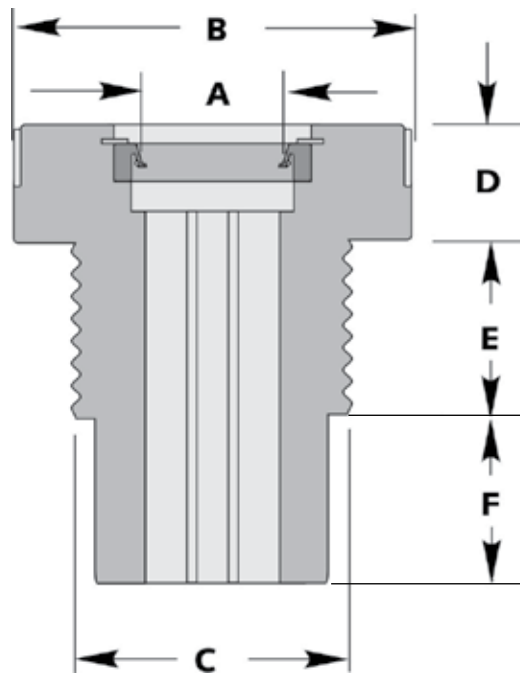


# Rudder Port Bearings - With Seals

## Type D

### BEFORE ORDERING

To determine which Type D to order, all you need is the exact diameter of your rudder stock (.000"). Assembly specifications are detailed in the table below. Confirm clearances and determine what, if any, mold modifications will be necessary. Please contact Tides Marine to discuss your installation parameters before placing your order.



## Type D

### Specifications (dimensions in inches)

| RUDDER STOCK OD | FLANGE DIAMETER | THREAD DIAMETER | FLANGE EIGHTH | THREAD LENGTH | BASE LENGTH | PART NUMBER |
|-----------------|-----------------|-----------------|---------------|---------------|-------------|-------------|
| A               | B               | C               | D             | E             | F           |             |
| 1               | 3               | 2 1/2           | 1 1/2         | 2 11/16       | 1 9/16      | RPB-D-1000  |
| 1 1/4           | 3               | 2 1/2           | 1 1/2         | 2 11/16       | 1 9/16      | RPB-D-1250  |
| 1 3/8           | 3               | 2 1/2           | 1 1/2         | 2 11/16       | 1 9/16      | RPB-D-1375  |
| 1 1/2           | 4               | 3 1/4           | 1 1/2         | 2 15/32       | 1 13/16     | RPB-D-1500  |
| 1 3/4           | 4               | 3 1/4           | 1 1/2         | 2 15/32       | 1 13/16     | RPB-D-1750  |
| 2               | 4 1/2           | 3 1/2           | 1 3/4         | 2 15/32       | 2 1/16      | RPB-D-2000  |
| 2 1/4           | 4 1/2           | 3 1/2           | 1 3/4         | 2 15/32       | 2 1/16      | RPB-D-2250  |
| 2 1/2           | 5               | 4 1/4           | 1 3/4         | 2 15/32       | 2 9/16      | RPB-D-2500  |
| 2 3/4           | 5               | 4 1/4           | 1 3/4         | 2 15/32       | 2 9/16      | RPB-D-2750  |
| 3               | 6               | 5 1/4           | 1 1/2         | 2 15/16       | 2 13/16     | RPB-D-3000  |
| 3 1/2           | 6               | 5 1/4           | 1 1/2         | 2 15/16       | 2 13/16     | RPB-D-3500  |

*If you are replacing a standard part (ex: RPB-D-1000), please specify its size/configurations when ordering because there are numerous variations for the same shaft size. You may not have the standard model.*

# Rudder Port Bearings - With Seals

## Type E

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### PRODUCT OVERVIEW



The Tides Marine RPB Type E unit is designed to be installed in rudder tubes which have been laminated or welded into a vessel's hull.

The unit consists of a one-piece UHMW housing with a nitrile lip seal. It eliminates metal-to-metal contact and the associated problems of abrasion, electrolysis and corrosion. It is 100% watertight and eliminates chatter and vibration, resulting in a quieter, smoother operation.

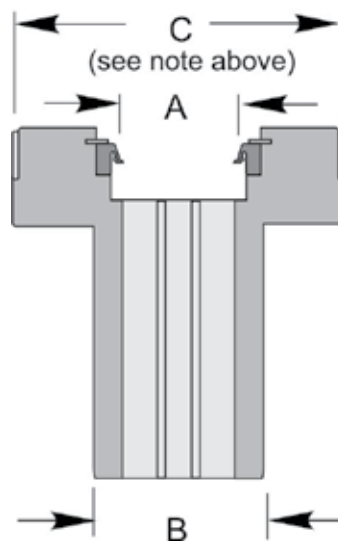
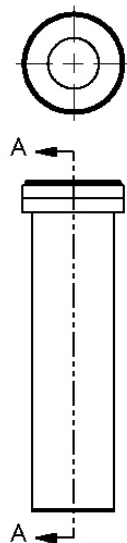
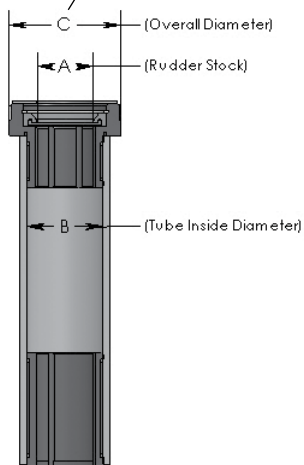
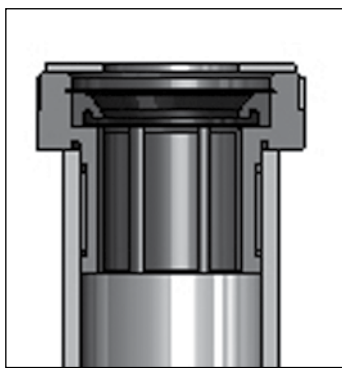
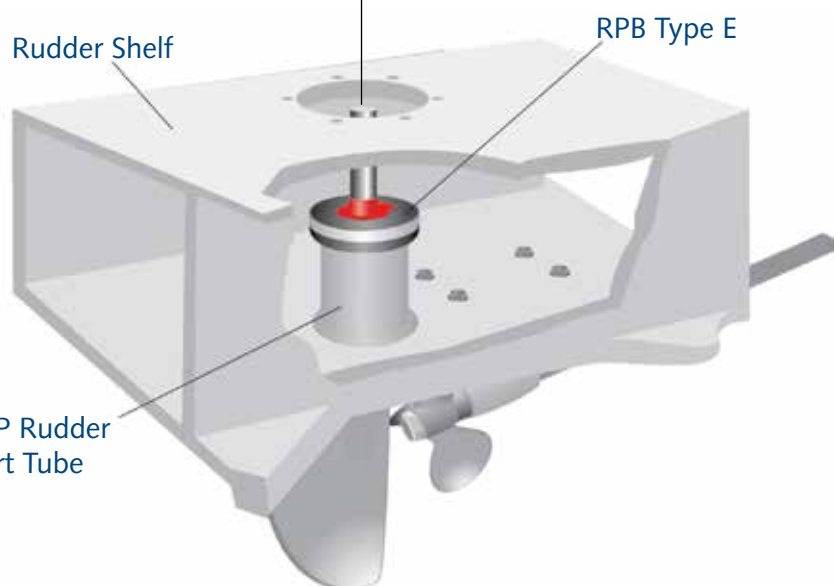
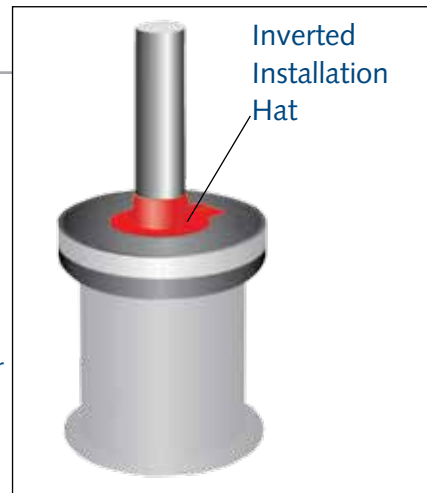
# Rudder Port Bearings - With Seals

## Type E

### BEFORE ORDERING

Tides Marine makes Type E assemblies based upon a combination of rudder stock diameter (.000") and the rudder tube I.D. When placing your order, please provide both of these dimensions.

*If space is available, the red "hat" installation tool can be inverted and rested on top of the rudder bearing to help protect the lip seal from debris.*



**Design Note:**  
 Diameter "C" must be at least equal to the rudder stock diameter plus 1 1/2".  
 Diameter "B" must be at least equal to the rudder stock diameter plus 3/4".



# Rudder Port Bearings - With Seals

## Type F

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### PRODUCT OVERVIEW



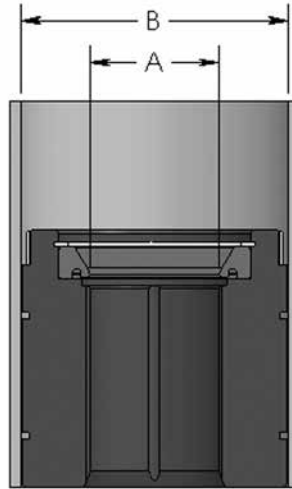
The Tides Marine RPB Type F unit is designed to be installed in rudder tubes which have been laminated or welded into a vessel's hull.

The unit consists of a one-piece UHMW housing with a nitrile lip seal. It eliminates metal-to-metal contact and the associated problems of abrasion, electrolysis and corrosion. It is 100% watertight and eliminates chatter and vibration, resulting in a quieter, smoother operation.

# Rudder Port Bearings - With Seals

## Type F

### BEFORE ORDERING



**Design Note:**

*Type F Units – Diameter "B" must be at least equal to the rudder stock diameter plus 1 ½".*

Tides Marine makes Type F assemblies based upon a combination of rudder stock diameter (.000") and the rudder tube I.D. When placing your order, please provide both of these dimensions.

# Rudder Port Bearings - No Seals

Types G/H

## PRODUCT OVERVIEW



Type G



Type H

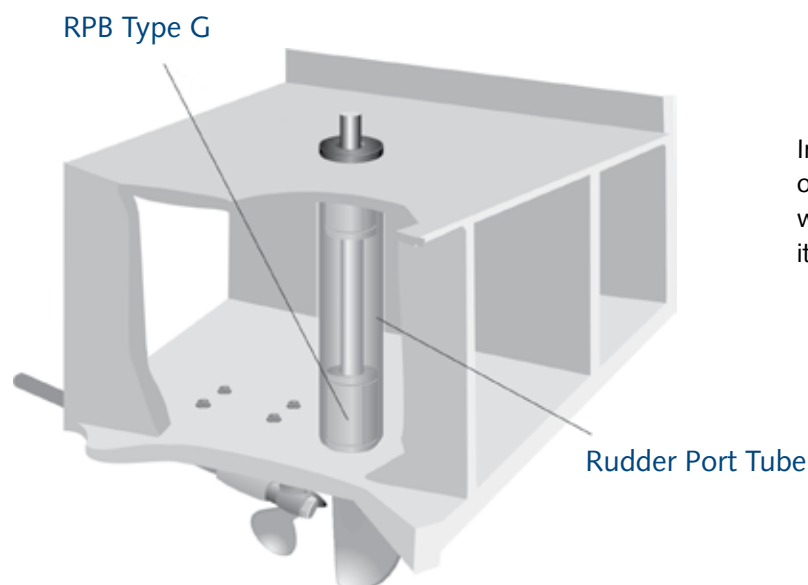
Tides Marine RPB Type G and RPB Type H units are designed to be installed in rudder tubes which have been laminated or welded into a vessel's hull. These units are simple bearings and do not provide a sealing function. Type G units have a flange and Type H units do not. They may be used on power boats and sailboats. To improve the strength of the bond between these units and the rudder tube, external bonding grooves are machined into the OD of each part.

The units consist of a one-piece UHMW housing which has fluted, self-cleaning grooves running axially along the ID of each part. They eliminate metal-to-metal contact and the associated problems of abrasion, electrolysis and corrosion. They eliminate chatter and vibration resulting in quieter, smoother operation.

# Rudder Port Bearings - No Seals

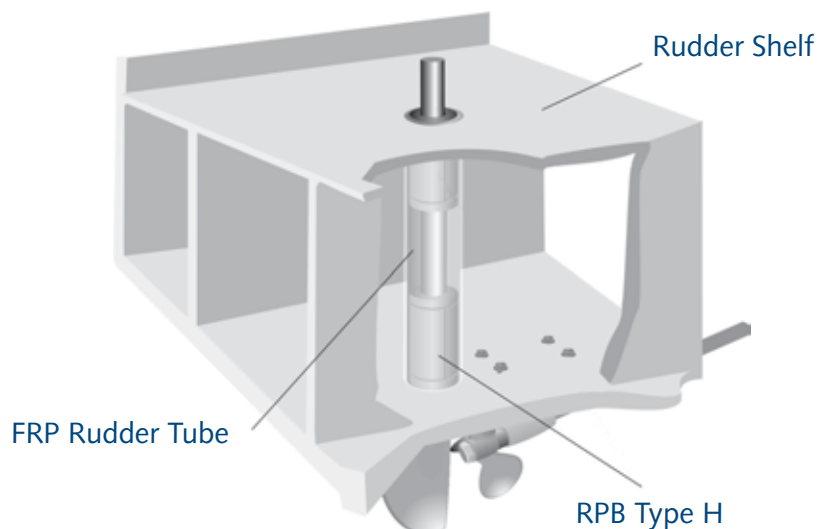
## Types G/H

### PRODUCT OVERVIEW



Inserting a Type G bearing into the bottom of a rudder tube also provides an impact/wear surface for the top of the rudder, should it ever rise to abut the bottom of the boat.

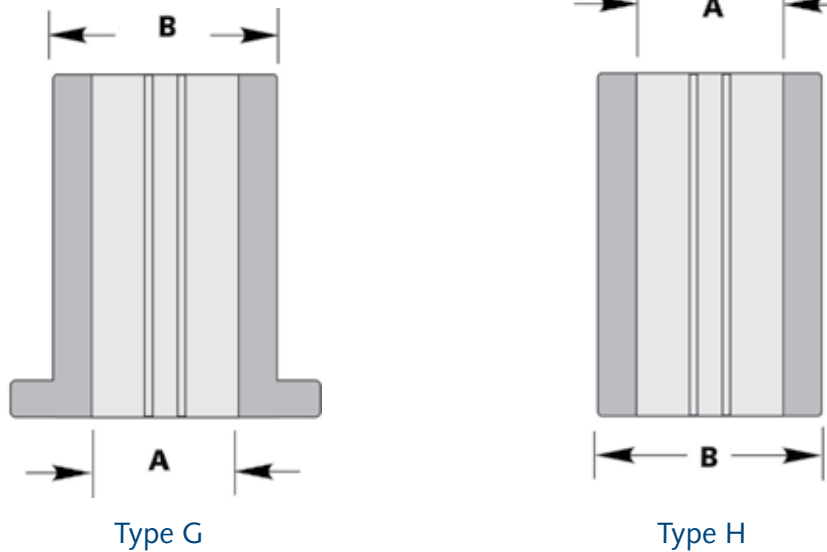
The Type H bearings slide neatly into the rudder tube and remain flush with the bottom of the rudder tube.



# Rudder Port Bearings - No Seals

## Types G/H

### BEFORE ORDERING



Tides Marine makes Type G and Type H assemblies based upon a combination of the rudder stock diameter (.000") and the rudder tube I.D. When placing your order, please provide both of these dimensions and specify the model (G – with flange or H – no flange). Tides will assign your part number based upon this information.

# Rudder Seals

## Type I – SEAL ONLY (NO BEARING)

### PRODUCT OVERVIEW



**Note:**

*This product is a seal only. It provides no bearing support for the rudder. It is generally more economical to eliminate the dual cost of a rudder port and this seal by using one of our other sealed bearing systems, such as a Type C, Type D or Tube System.*

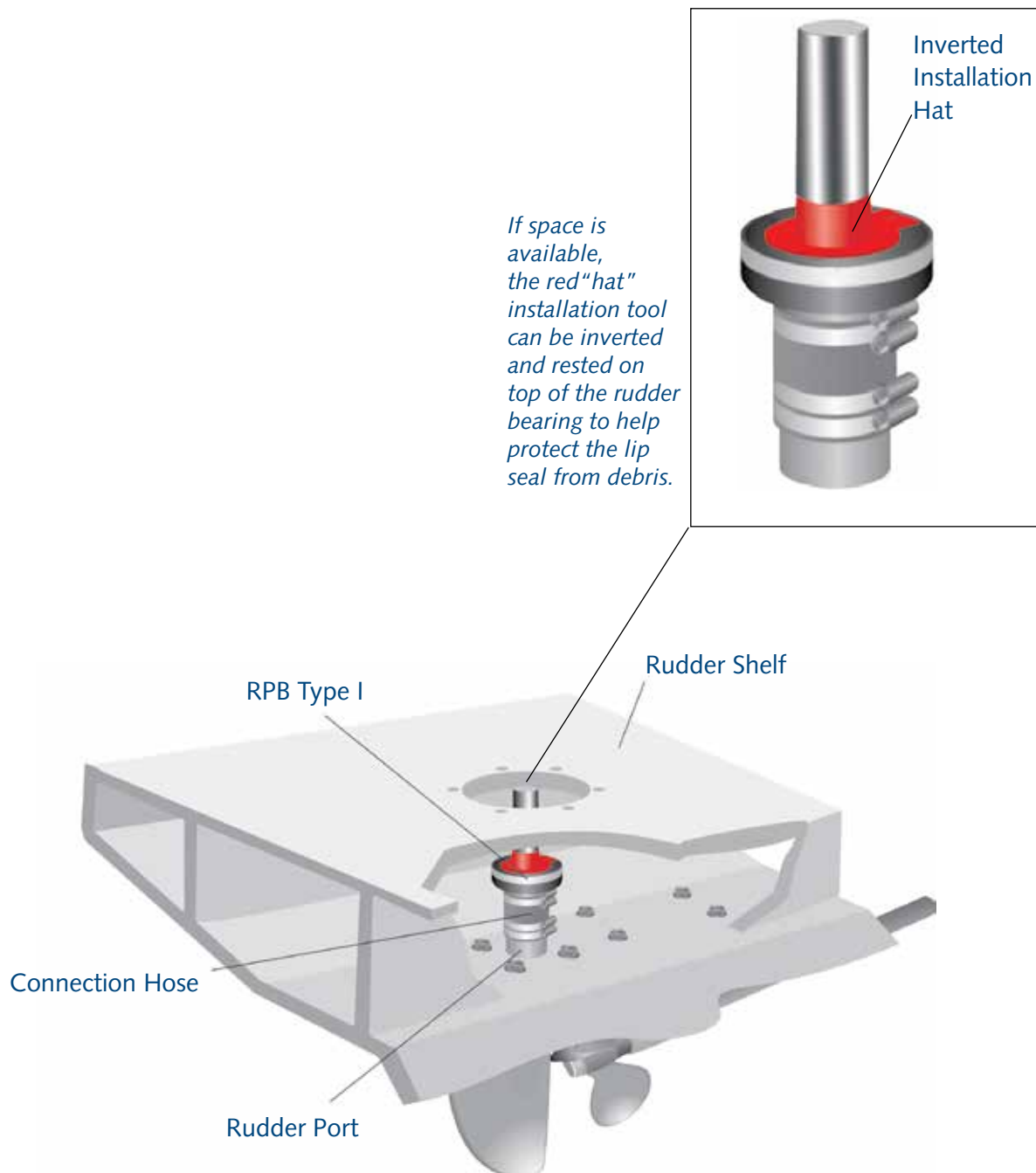
Tides Marine Type I Rudder Seals are retrofit units which are designed to replace hose mounted rudder stuffing boxes. They are connected to the existing bronze rudder port with a flexible hose which aligns the unit with the rudder stock. The assembly consists of a one-piece UHMW housing and a nitrile lip seal. The Type I will slightly increase the overall height of the rudder port assembly.

These 100% watertight units provide quieter, smoother operation. A pre-cut length of soft-wall hose (purchased separately) must be used with each Type I Rudder Seal for warranty coverage to apply.

# Rudder Seals

## Type I – SEAL ONLY (NO BEARING)

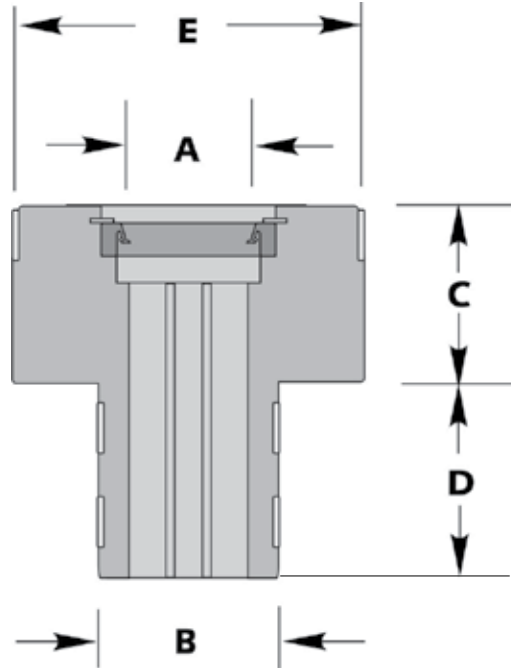
### PRODUCT OVERVIEW



# Rudder Seals

## Type I – SEAL ONLY (NO BEARING)

### BEFORE ORDERING



To determine which part to order, measure the exact diameter of the rudder stock (.000") and the O.D. of the bronze rudder port to which the unit will be connected. Note your combination of rudder stock diameter and rudder port O.D. in the table below. Confirm that there is sufficient space to accommodate the flange height and the barrel height plus 1" of space between the Type I unit and the rudder port. Finally, confirm that there is clearance for the O.D. of the Type I assembly.

If your installation does not fit within the parameters noted below, please call Tides Marine to request a custom Type I.

### Type I

#### Specifications (dimensions in inches)

| RUDDER STOCK OD | MINIMUM HOSE ID | FLANGE HEIGHT | BARREL LENGTH | FLANGE DIAMETER | PART NUMBER          |
|-----------------|-----------------|---------------|---------------|-----------------|----------------------|
| A               | B               | C             | D             | E               |                      |
| 1               | 1 3/4           | 1 1/2         | 1 1/2         | 2 1/2           | RPB-I-1000-(Hose ID) |
| 1 1/4           | 2               | 1 1/2         | 2             | 3               | RPB-I-1250-(Hose ID) |
| 1 1/2           | 2 1/4           | 1 1/2         | 2             | 4               | RPB-I-1500-(Hose ID) |
| 1 3/4           | 2 1/2           | 2             | 2             | 4               | RPB-I-1750-(Hose ID) |
| 2               | 3               | 2             | 2             | 4               | RPB-I-2000-(Hose ID) |
| 2 1/4           | 3               | 2             | 2             | 4 1/2           | RPB-I-2250-(Hose ID) |
| 2 1/2           | 3 1/4           | 2             | 2             | 4 1/2           | RPB-I-2500-(Hose ID) |
| 2 3/4           | 3 1/2           | 2 1/2         | 2             | 5               | RPB-I-2750-(Hose ID) |
| 3               | 4               | 2 1/2         | 2 1/2         | 5               | RPB-I-3000-(Hose ID) |



# Rudder Seals

## Type J

### PRODUCT OVERVIEW

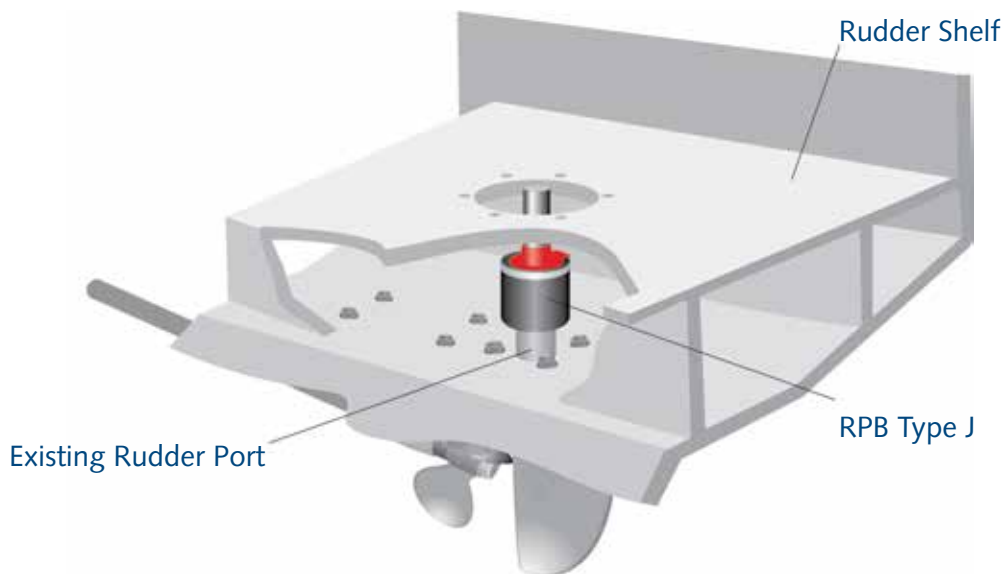
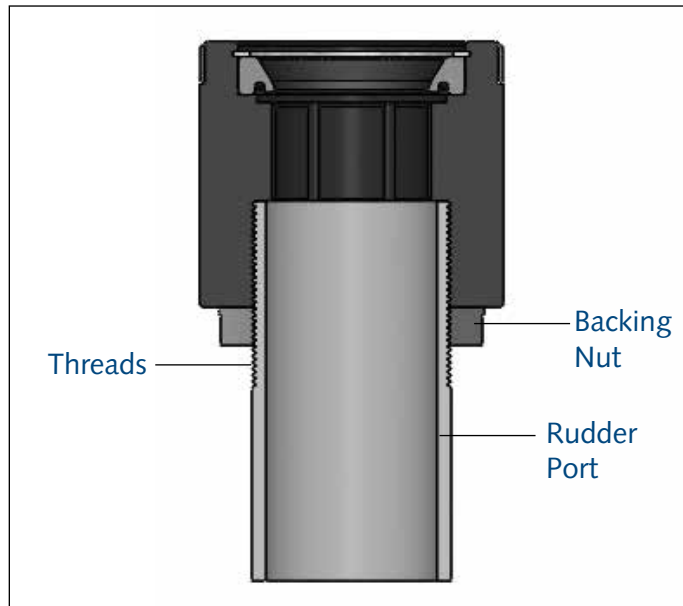


Tides Marine RPB Type J Rudder Seals are designed to replace the flax packing and compression nut of existing bronze rudder ports. Consisting of a one-piece UHMW housing with a nitrile lip seal, the Type J is 100% watertight. It is not subject to corrosion or electrolysis and provides quieter, smoother rudder system operation than the bronze stuffing box alternative.

# Rudder Seals

## Type J

### PRODUCT OVERVIEW



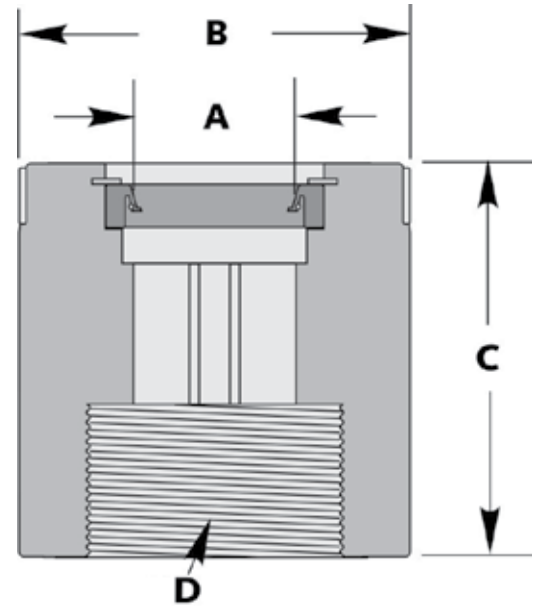
# Rudder Seals

## Type J

### BEFORE ORDERING

To determine the part number for your installation, measure the exact diameter of your rudder stock (.000") and the diameter and thread size of the rudder port. Match these three measurements to a line in the chart below. Next, confirm that there is sufficient space to accommodate both the assembly's diameter (Column "B" in the table) and height (Column "C" in the table).

If you are unable to match your installation measurements with those in Column "A" and "C" in the table below, simply call Tides Marine and we will machine a Type J to your specifications.



### Type J

#### Specifications (dimensions in inches)

| RUDDER STOCK | DIAMETER | HEIGHT | THREAD SIZE       | PART NUMBER   |
|--------------|----------|--------|-------------------|---------------|
| A            | B        | C      | D                 | E             |
| 1            | 2 1/2    | 3 1/2  | 1 9/16 x 14       | RPB-J-1000-01 |
| 1 1/4        | 3        | 3 1/2  | 1 3/4 x 12        | RPB-J-1250-01 |
| 1 1/4        | 3        | 3 1/2  | 1 1/2 x 11-1/2NPT | RPB-J-1250-02 |
| 1 1/4        | 3        | 3 1/2  | 1 7/8 x 12        | RPB-J-1250-03 |
| 1 1/4        | 3        | 3 1/2  | 1 13/16 x 14      | RPB-J-1250-05 |
| 1 1/4        | 3        | 3 1/2  | 2 x 12            | RPB-J-1250-06 |
| 1 1/4        | 3        | 3 1/2  | 1 3/4 x 14        | RPB-J-1250-07 |
| 1 1/4        | 3        | 3 1/2  | 2 1/4 x 12        | RPB-J-1250-08 |
| 1 1/4        | 3        | 3 1/2  | 1 13/16 x 16      | RPB-J-1250-09 |
| 1 1/4        | 3        | 3 1/2  | 1 3/4 x 16        | RPB-J-1250-11 |
| 1 1/4        | 3        | 3 1/2  | 1 5/8 x 12        | RPB-J-1250-20 |
| 1 3/8        | 3        | 3 1/2  | 1 13/16 x 14      | RPB-J-1375-01 |
| 1 3/8        | 3        | 3 1/2  | 2 1/8 x 14        | RPB-J-1375-02 |
| 1 3/8        | 3        | 3 1/2  | 2 x 16            | RPB-J-1375-03 |
| 1 3/8        | 3        | 3 1/2  | 1 3/4 x 14        | RPB-J-1375-04 |
| 1 1/2        | 4        | 3 1/2  | 2 1/2 x 12        | RPB-J-1500-09 |
| 1 1/2        | 4        | 3 1/2  | 2 7/8 x 12        | RPB-J-1500-10 |
| 1 1/2        | 4        | 3 1/2  | 2 7/8 x 8         | RPB-J-1500-11 |
| 1 1/2        | 4        | 3 1/2  | 2 1/8 x 11-1/2    | RPB-J-1500-13 |
| 1 1/2        | 4        | 3 1/2  | 2 x 16            | RPB-J-1500-14 |
| 1 1/2        | 4        | 3 1/2  | 2 1/8 x 12        | RPB-J-1500-15 |
| 1 1/2        | 4        | 3 1/2  | 2 13/16 x 12      | RPB-J-1500-16 |
| 1 1/2        | 4        | 3 1/2  | 1 1/2NPS x 11-1/2 | RPB-J-1500-17 |

#### Note:

To ensure correct thread size, please send Tides either the backing nut or the packing nut from your bronze rudder port assembly. We will measure the threads, machine the part and then return the backing nut with your order.

# Rudder Seals

## Type J

### BEFORE ORDERING

#### Type J

#### Specifications (dimensions in inches)

| RUDDER STOCK | DIAMETER | HEIGHT | THREAD SIZE     | PART NUMBER   |
|--------------|----------|--------|-----------------|---------------|
| A            | B        | C      | D               | E             |
| 1 1/2        | 4        | 3 1/2  | 1 3/4 x 16      | RPB-J-1500-01 |
| 1 1/2        | 4        | 3 1/2  | 2 x 11-1/2NPT   | RPB-J-1500-02 |
| 1 1/2        | 4        | 3 1/2  | 2-1/8 x 14      | RPB-J-1500-03 |
| 1 1/2        | 4        | 3 1/2  | 2 1/4 x 12      | RPB-J-1500-04 |
| 1 1/2        | 4        | 3 1/2  | 2 3/8 x 11      | RPB-J-1500-05 |
| 1 1/2        | 4        | 3 1/2  | 2 3/16 x 11-1/2 | RPB-J-1500-06 |
| 1 1/2        | 4        | 3 1/2  | 2 3/4 x 12      | RPB-J-1500-07 |
| 1 1/2        | 4        | 3 1/2  | 2 x 12          | RPB-J-1500-08 |
| 1 3/4        | 4        | 4      | 2 x 11-1/2      | RPB-J-1750-01 |
| 1 3/4        | 4        | 4      | 2 1/2 x 12      | RPB-J-1750-02 |
| 1 3/4        | 4        | 4      | 2 1/2 x 14      | RPB-J-1750-03 |
| 1 3/4        | 4        | 4      | 2 3/4 x 12      | RPB-J-1750-04 |
| 1 3/4        | 4        | 4      | 2 1/2 x 8       | RPB-J-1750-05 |
| 1 3/4        | 4        | 4      | 2 7/8 x 8       | RPB-J-1750-06 |
| 1 3/4        | 4        | 4      | 2 13/16 x 12    | RPB-J-1750-07 |
| 2            | 4        | 4      | 2 1/2 x 8       | RPB-J-2000-01 |
| 2            | 4        | 4      | 2 7/8 x 12      | RPB-J-2000-02 |
| 2            | 4        | 4      | 2 5/8 x 12      | RPB-J-2000-03 |
| 2            | 4        | 4      | 2 7/8 x 16      | RPB-J-2000-04 |
| 2            | 4        | 4      | 2 13/16 x 12    | RPB-J-2000-05 |
| 2            | 4        | 4      | 3 x 8           | RPB-J-2000-06 |
| 2            | 4        | 4      | 2 7/8 x 8       | RPB-J-2000-07 |
| 2            | 4        | 4      | 2 3/4 x 12      | RPB-J-2000-09 |
| 2            | 4        | 4      | 4 x 8           | RPB-J-2000-12 |
| 2            | 4        | 4      | 2 1/2 x 12      | RPB-J-2000-13 |
| 2 1/4        | 4 1/2    | 4      | 3 1/4 x 12      | RPB-J-2250-01 |
| 2 1/4        | 4 1/2    | 4      | 2 7/8 x 12      | RPB-J-2250-02 |
| 2 1/4        | 4 1/2    | 4      | 3 x 12          | RPB-J-2250-03 |
| 2 1/2        | 4 1/2    | 4      | 3 1/4 x 12      | RPB-J-2500-01 |
| 2 1/2        | 4 1/2    | 4      | 3 1/2 x 8       | RPB-J-2500-02 |
| 2 1/2        | 4 1/2    | 4      | 3 5/8 x 12      | RPB-J-2500-03 |
| 2 3/4        | 5        | 4 1/2  | 4 1/4 x 12      | RPB-J-2750-01 |
| 3            | 5        | 4 1/2  | 4 1/4 x 12      | RPB-J-3000-02 |
| 3            | 5        | 4 1/2  | 3 3/4 x 12      | RPB-J-3000-03 |
| 3            | 5        | 4 1/2  | 4 x 4-1/2       | RPB-J-3000-04 |

# Rudder Port Bearings - With Seals

## Type K

### PRODUCT OVERVIEW

Packing Nut Replacement



Cutlass Bearing Replacement



Available separately or as a kit

The Tides Marine RPB Type K was designed to be used with certain flanged, bronze rudder ports with two mounting studs to accept/adjust the flax packing collar. These units mount directly over the existing studs and are available with or without a lower bearing insert. This insert installs from outside the hull and usually replaces a conventional marine cutless bearing.

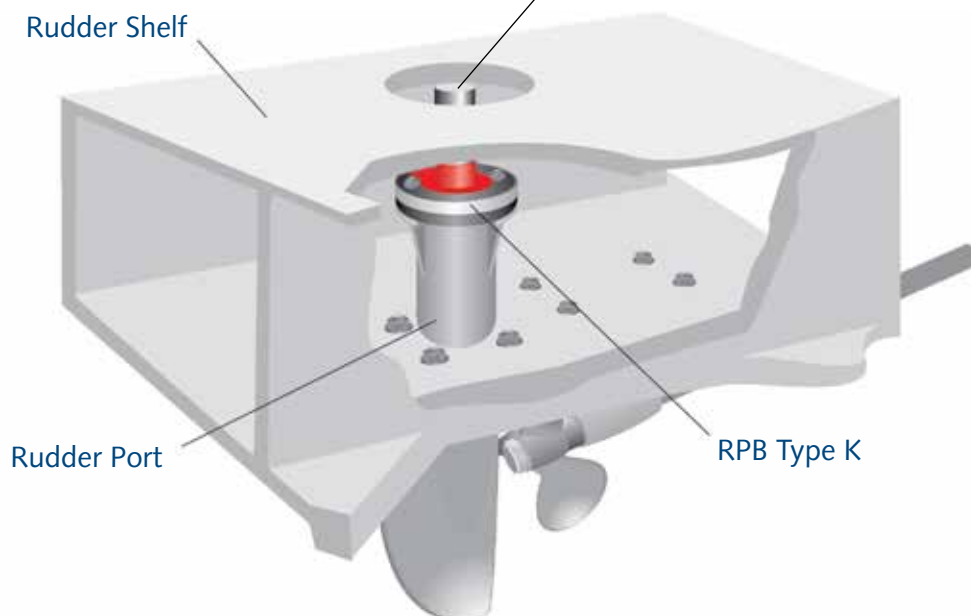
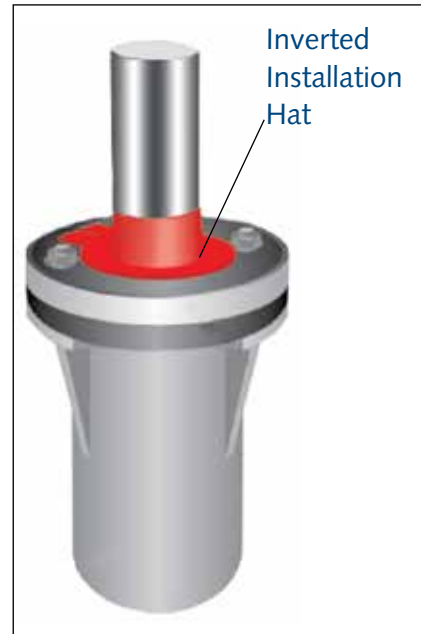
The Type K unit consists of a one-piece UHMW housing with a nitrile lip seal. The unit eliminates metal-on-metal contact and the associated problems of abrasion, electrolysis and corrosion. They are 100% watertight and reduce rudder chatter and vibration resulting in quieter, smoother rudder system performance.

# Rudder Port Bearings - With Seals

## Type K

### PRODUCT OVERVIEW

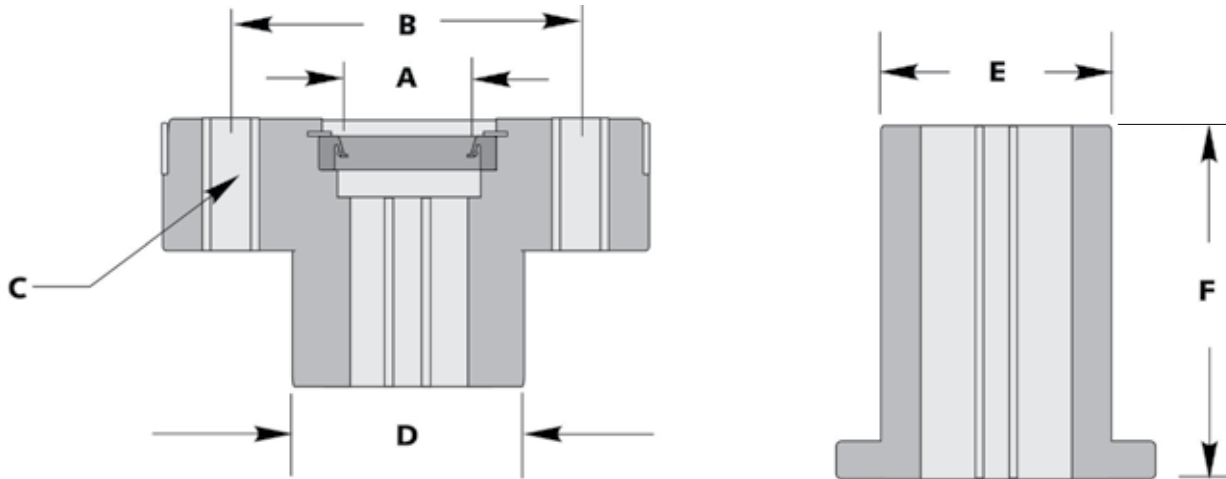
*If space is available, the red "hat" installation tool can be inverted and rested on top of the rudder bearing to help protect the lip seal from debris.*



# Rudder Port Bearings - With Seals

## Type K

### BEFORE ORDERING



Tides Marine makes RPB Type K units to builder specifications. When placing an order, please specify the exact diameter of your rudder stock (.000"), the distance between the centers of the mounting studs, the stud size and the I.D. of the rudder port into which the unit will be mounted. Match this combination to one of the line items in the table below. If your installation is not in this table, please contact Tides Marine for assistance.

If you are replacing a marine bearing, please provide the O.D. of the bearing and its length.

## Type K

### Specifications (dimensions in inches)

| RUDDER STOCK OD | STUD CENTERS | STUD SIZE | BARREL OD | BUILDER  | PART NUMBER    |
|-----------------|--------------|-----------|-----------|----------|----------------|
| A               | B            | C         | D         |          |                |
| 1 1/4           | 2 13/16      | 3/8       | No        | Bertram  | RPB-K-1250-00  |
| 1 3/4           | 3 1/16       | 3/8       | No        | Bertram  | RPB-K-1750-00  |
| 1.925           | 3 5/8        | 3/8       | No        | Bertram  | RPB-K-1925-00  |
| 2               | 4            | 1/2       | Yes       | Hatteras | RPB-KT-2000-00 |
| 2               | 4 1/8        | 1/2       | Yes       | Viking   | RPB-KT-2000-01 |
| 2               | 4 3/16       | 1/2       | Yes       | Davis    | RPB-KT-2000-02 |
| 2.49            | 4 1/8        | 3/8       | No        | Bertram  | RPB-K-2490-00  |
| 2 1/2           | 4 1/2        | 1/2       | Yes       | Hatteras | RPB-KT-2500-00 |
| 2 1/2           | 5 1/4        | 1/2       | Yes       | Viking   | RPB-KT-2500-02 |
| 3               | 5            | 1/2       | Yes       | Hatteras | RPB-KT-3000-00 |

# Spare Rudder Seal Carrier

## PRODUCT OVERVIEW



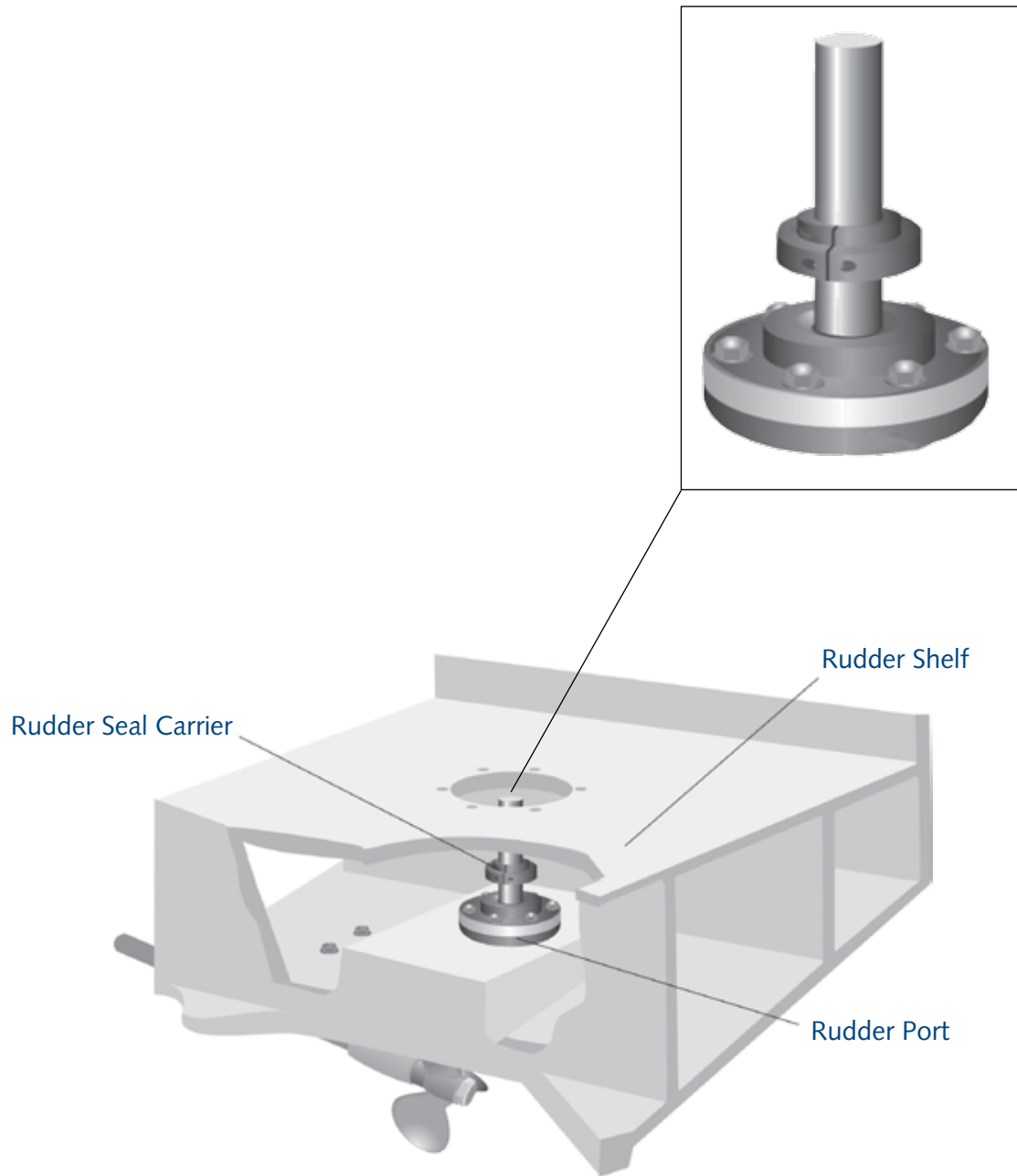
Tides Marine Spare Rudder Seal Carriers were developed as a convenient place to store spare lip seals on the rudder stock. The unit also makes the job of replacing the lip seal in a Tides Marine rudder port easier and is recommended as an accessory for all Tides Marine rudder ports. Installed at the same time as the RPB, they allow the lip seal to be replaced without uncoupling the rudder stock from the steering system or dropping the rudder.

The unit is a lightweight, two-piece, filled-nylon housing which is affixed to the rudder stock between the Tides RPB and the upper rudder bearing. Each unit comes with a lip seal and red installation hat.



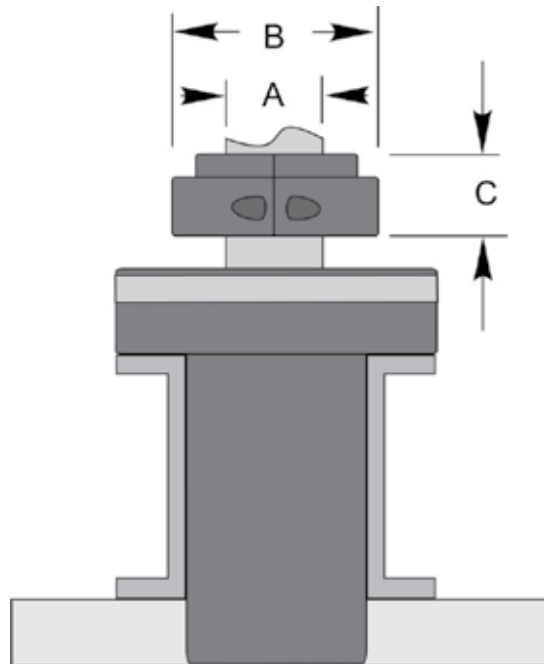
# Spare Rudder Seal Carrier

## PRODUCT OVERVIEW



# Spare Rudder Seal Carrier

## BEFORE ORDERING



Measure the exact diameter (.000) of your rudder stock. Next, confirm that there is sufficient space to accommodate both the diameter of the Carrier (Column "B" in the table below) and its the overall height (Column "C" in the table below).

### Spare Rudder Seal Carrier

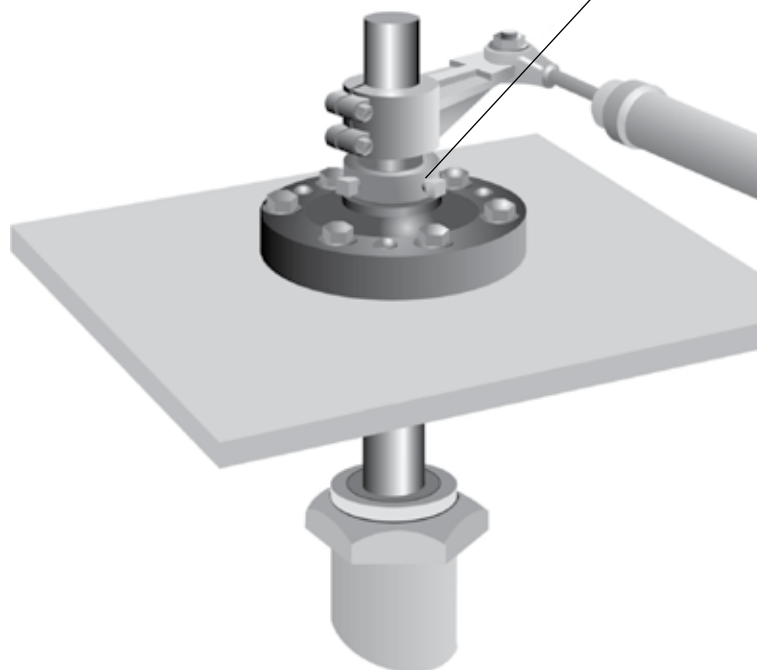
#### Specifications (dimensions in inches)

| STOCK | DIAMETER | HEIGHT | PART NUMBER |
|-------|----------|--------|-------------|
| A     | B        | C      |             |
| 1     | 2 1/2    | 1 1/8  | KR-1000     |
| 1 1/8 | 2 1/2    | 1 1/8  | KR-1125     |
| 1 1/4 | 2 1/2    | 1 1/8  | KR-1250     |
| 1 3/8 | 3        | 1 1/8  | KR-1375     |
| 1 1/2 | 3 1/2    | 1 1/8  | KR-1500     |
| 1 3/4 | 3 1/2    | 1 1/8  | KR-1750     |
| 2     | 4        | 1 1/8  | KR-2000     |
| 2 1/4 | 4 1/2    | 1 3/8  | KR-2250     |
| 2 1/2 | 5        | 1 3/8  | KR-2500     |
| 2 3/4 | 5        | 1 3/8  | KR-2750     |
| 3     | 5        | 1 3/8  | KR-3000     |
| 3 1/4 | 5        | 1 3/8  | KR-3250     |
| 3 1/2 | 5 1/2    | 1 3/8  | KR-3500     |
| 3 3/4 | 5 1/2    | 1 3/8  | KR-3750     |
| 4     | 6        | 1 3/8  | KR-4000     |
| 4 1/2 | 6        | 1 3/8  | KR-4500     |
| 5     | 7        | 1 3/8  | KR-5000     |

# Rudder Collars

## PRODUCT OVERVIEW

Rudder Collar



Tides Marine Rudder Collars are for use on power boats. Machined from 304 stainless steel, each unit comes with two threaded locking screws. A third "indexed hole" (which is not threaded) is machined into each Rudder Collar and may be used as a guide to drill "dimples" in the rudder stock. Simply measure your rudder stock diameter (.000") and select the matching part number below.

## BEFORE ORDERING

### Rudder Collars

#### Specifications (dimensions in inches)

| RUDDER STOCK OD | HEIGHT | OUTSIDE DIAMETER | PART NUMBER     |
|-----------------|--------|------------------|-----------------|
| A               | B      | C                |                 |
| 1 1/4           | 1      | 2 1/4            | RUD COLLAR-1250 |
| 1 1/2           | 1      | 2 1/2            | RUD COLLAR-1500 |
| 1 3/4           | 1      | 2 3/4            | RUD COLLAR-1750 |
| 2               | 1      | 3                | RUD COLLAR-2000 |
| 2 1/4           | 1      | 3 1/4            | RUD COLLAR-2250 |
| 2 1/2           | 1      | 3 1/2            | RUD COLLAR-2500 |
| 2 3/4           | 1      | 3 3/4            | RUD COLLAR-2750 |
| 3               | 1      | 4                | RUD COLLAR-3000 |

# Nitrile Lip Seals

## PRODUCT OVERVIEW



Tides Marine Nitrile Lip Seals are specifically designed for each type of sealing application, whether propeller shaft or rudder stock. They are the only seals which are covered by the Tides Warranty. The outer shell is made of an Aramid fiber composite which is integrally molded to a rubber hinge and a nitrile lip edge. A 316-stainless steel garter spring is incorporated to distribute loads uniformly over the propeller shaft or rudder stock.

## BEFORE ORDERING

**Note:**

When re-ordering, please supply the 4 or 5 digit number from the face of the lip seal to make certain you receive the correct replacement part.

## Nitrile Lip Seals

### Specifications (dimensions in inches)

| RUDDER STOCK DIAMETER | PART NUMBER     |
|-----------------------|-----------------|
| 3/4                   | LIP SEAL-0750   |
| 7/8                   | LIP SEAL-0875   |
| 1                     | LIP SEAL-1000   |
| 1 1/8                 | LIP SEAL-1125   |
| 1 1/4                 | LIP SEAL-1250   |
| 1 3/8                 | LIP SEAL-1375   |
| 1 1/2                 | LIP SEAL-1500   |
| 1 3/4                 | LIP SEAL-1750   |
| 2                     | LIP SEAL-R-2000 |
| 2 1/4                 | LIP SEAL-R-2250 |
| 2 1/2                 | LIP SEAL-R-2500 |
| 2 3/4                 | LIP SEAL-R-2750 |
| 3                     | LIP SEAL-R-3000 |
| 3 1/4                 | LIP SEAL-R-3250 |
| 3 1/2                 | LIP SEAL-R-3500 |
| 4                     | LIP SEAL-R-4000 |
| 4 1/4                 | LIP SEAL-R-4250 |
| 4 1/2                 | LIP SEAL-R-4500 |
| 5                     | LIP SEAL-R-5000 |

# Zero-Draft FRP Tube

## PRODUCT OVERVIEW



Tides Marine Zero-Draft FRP Tubing is used primarily for building rudder tubes and shaft logs. Made from high-strength epoxy resin and fiberglass using a proprietary Tides process, their bore is dimensionally constant from end to end. Unless otherwise requested, standard wall thickness is  $\frac{1}{4}$ ". Stock inside diameters range from 3" through 8" in  $\frac{1}{2}$ " increments.

## BEFORE ORDERING

To order, specify inside diameter and required length.

For inside diameters running from 3" up to (and including) 6  $\frac{1}{2}$ ", the maximum length is 48".

From 7" through 8", the maximum length is 20".

*Example:*

**TUBE-8.00-20**

*Tube has 8" I.D. and is 20" long.*

For custom sizes, contact Tides Marine.



# TIDESMARINE

**We have agents and offices worldwide, and will be happy to provide details upon request.**

## **Contact Information**

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