



Quality Marine
Equipment Since 1981

LEADING THE WAY

PYI PRODUCT CATALOG

www.pyiinc.com

Mission Statement

Established in 1981, and still under the same ownership today, PYI Inc. is a leading manufacturer and distributor of high quality marine, boat, yacht, and ship equipment. Every year PYI has seen advancements in each of its products. Whether it is a new or established product line, be assured that you will experience the product performance and customer service that you expect and deserve.

At PYI, we quickly respond to our customer's ideas and needs. We have never forgotten that our company cannot exist without our customers. Our goal is to provide quality, innovative marine equipment with an unsurpassed level of customer service and satisfaction and we will not stray from this goal.



- 1981**
PYI founded by Frederic Laffitte
- 1983**
Kevin Woody joins PYI
- 1984**
PYI moves to a building at Shilshole Marina in Seattle
- 1986**
PSS Shaft Seal is developed and introduced to the marine world
- 1991**
Now to 7 employees, PYI outgrows its location, moves to a larger space and becomes the Whitlock Steering US distributor
- 1999**
PYI purchases its current 10,000 sqft building in Lynnwood, WA. The Seaview line of electronic mounting solutions is developed and manufacturing begins
- 2002**
PYI launches US distribution for Jefa Steering and Rudder after the Whitlock brand is sold to Lewmar
- 2016**
With the acquisition of SnoLynn Machine, PYI finally realizes a longterm goal and builds a full in-house machine shop
- 2018**
The Seaview line is spun off to 3 employees and moves to Spokane, WA
- 2019**
PYI introduces Fendertex inflatable textile fenders to the US marketplace

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PSS SHAFT SEAL



Mechanical Dripless Shaft Seal

The PSS Shaft Seal is the #1 selling marine mechanical seal worldwide and is installed as standard equipment by many of the world's most reputable boat builders and boat yards. The PSS Shaft Seal is also recognized as the premiere retrofit (aftermarket) seal on the world market. Boat builders and boat yards recognize the advantages and value of installing the PSS as it eliminates the maintenance, constant adjustment and cost associated with traditional packing type glands. In addition to these benefits, the PSS Shaft Seal helps to eliminate water in the bilge (100% water tight) and wear to the propeller shaft. The PSS Shaft Seal can be easily retrofitted and is available for shafts ranging from 3/4" to 6" (20mm to 150mm).



CERTIFICATIONS



The PSS Shaft Seal is Bureau Veritas, ABS & RINA certified.

HOW IT WORKS

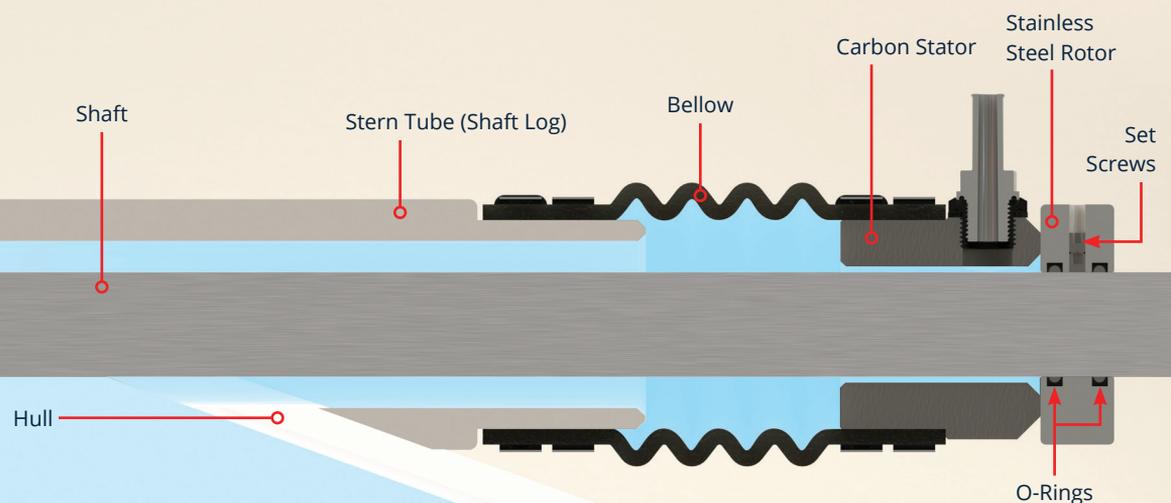
The Packless Sealing System (PSS) Shaft Seal is a mechanical face seal created between a rotating stainless steel rotor (N50 for Type B and Type C models) and a stationary carbon stator. The carbon stator is attached to a convoluted rubber bellow (silicone for Type B and Type C models) and the back of the bellow is attached to the shaft log (stern-tube) of the boat with hose clamps.

During installation, the stainless steel rotor is used to compress the convoluted bellow. The rotor is then secured to the shaft. The compression of the bellow allows the seal faces to remain in constant contact while compensating for the fore-and-aft movement of the shaft caused by the propellers thrust pushing on the engine mounts.

The carbon stator is bored slightly larger than the shaft diameter, allowing it to "float" around the shaft and compensate for minor misalignment / vibration problems.

The stainless steel rotor is sealed to the shaft with o-rings. These o-rings rotate with the shaft and rotor and do not experience any wear during operation. This static o-ring seal enables the PSS Shaft Seal to be fit on shafts that have some wear or pitting, unlike lip seal designs which require a clean area for the lip seal to ride on.

This type of carbon face seal is less sensitive to the interruption of water flow or operation in silty water, when compared to other sealing options.



PSS TYPE A



For Shaft Diameters 3/4" - 3 3/4" (20mm - 95mm)

The Type A Seal is our most common product, with over 200,000 units in operation globally. This seal will satisfy most applications for pleasure boats and smaller commercial boats.



* A Hose Barb is recommended for vessels exceeding 10 knots.

For maintenance schedule refer to the PSS Maintenance Kits on page 10.

COMPONENTS

STAINLESS STEEL ROTOR

The rotor is manufactured out of 316L stainless steel. It is secured on the shaft using 2 pairs of set screws positioned at 90 degrees for maximum holding power. This rotor does not need replacement or maintenance under normal operating conditions.

CARBON STATOR (SINGLE INJECTED)

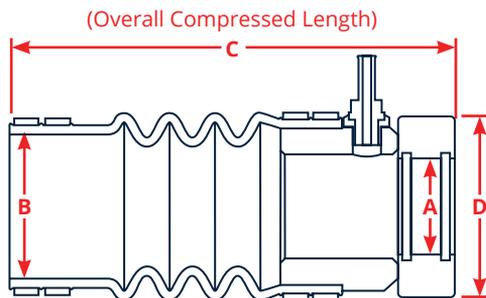
The grade of carbon composite used in the PSS Shaft Seal has a maximum operating temperature of 500° F (+260° C) and will not melt if the seal runs dry for a short period of time unlike a lip seal or a plastic face seal. The high density of the carbon greatly increases the longevity and wear resistance. The carbon should not need to be replaced under normal operating conditions.

BELLOW

The bellow on the Type A seal is molded out of a Nitrile compound. Nitrile is known for its resistance to petroleum products. It provides the best combination of durability, strength and elasticity necessary in this application.



TECHNICAL SPECIFICATIONS



Temperature Limits	5°F to 225°F (-15°C to 107°C)
Pressure Limits	15 PSI (1 BAR)
Shaft RPM Limits	10,000 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316 SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Molded Nitrile - PVC

IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
3/4", 7/8", 1", 1 1/8"	1 1/4", 1 1/2", 1 3/4", 2", 2 1/4"	6.00" - 6.125"	2.375"
	2 1/2"	6.625"	2.375"
1 1/4", 1 3/8"	1 3/4", 2", 2 1/4", 2 1/2"	6.625" - 6.75"	2.875"
	2 3/4", 3", 3 1/4", 3 1/2"	8.125" - 8.313"	2.875"
1 1/2", 1 5/8", 1 3/4", 2"	2", 2 1/4", 2 1/2", 2 3/4", 3", 3 1/4", 3 1/2"	8.00" - 8.218"	3.75"
	3 3/4", 4"	8.405"	3.75"
2 1/4", 2 1/2"	3 1/4", 3 1/2", 3 3/4", 4"	8.625"	4.20"
	4 1/4", 4 1/2", 4 3/4", 5"	9.25"	4.20"
2 3/4", 3"	4", 4 1/4", 4 1/2", 4 3/4", 5"	9.125" - 9.313"	5.00"
	5 1/4", 5 1/2", 5 3/4", 6"	9.25" - 9.438"	5.00"
3 1/4", 3 1/2", 3 3/8", 3 3/4"	4 1/2", 4 3/4", 5", 5 1/4", 5 1/2", 5 3/4", 6"	9.675" - 9.863"	6.00"

METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
20, 22, 25, 28, 30	30, 40, 45, 50, 60	152 - 156	61
	65	168	61
32, 35	45, 50, 60, 65	168 - 172	73
	70, 80, 85, 90	206 - 211	73
38, 40, 45, 50, 55	50, 60, 65, 70, 75, 80, 85, 90	203 - 209	96
	95, 100	213	96
60, 65	85, 90, 95, 100	219 - 224	107
	110, 115, 120, 125	235	107
70, 75, 80	100, 110, 115, 120, 125	231 - 237	127
	135, 140, 145, 150	235 - 240	127
85, 90, 95	115, 120, 125, 130, 135, 140, 145, 150	245 - 250	153

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PSS PRO



For Shaft Diameters 1¼" - 3¾" (32mm - 95mm)

The PSS "PRO" model is manufactured with commercial applications in mind.



* Steel hoops come standard on 2¼" shaft diameters and up.

For maintenance schedule refer to the PSS Maintenance Kits on page 10.

COMPONENTS

STAINLESS STEEL ROTOR

The rotor is manufactured out of 316L stainless steel. It is secured on the shaft using 2 pairs of set screws positioned at 90 degrees for maximum holding power. A locking collar is placed in front of the rotor and further retains the propeller or rudder shaft in case of catastrophic failure of the coupling or if the shaft comes free from the coupling. This rotor does not need replacement or maintenance under normal operating conditions.

CARBON STATOR (SINGLE INJECTED)

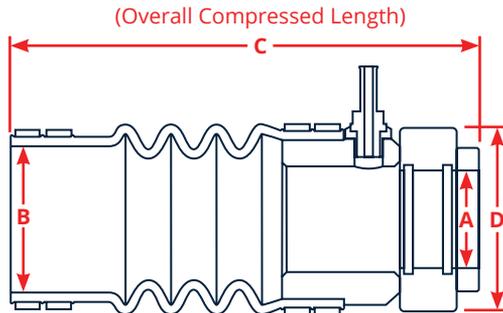
The grade of carbon composite used in the PSS PRO Shaft Seal has a maximum operating temperature of 500° F (+260° C) and will not melt if the seal runs dry for a short period of time unlike a lip seal or a plastic face seal. The high density of the carbon greatly increases the longevity and wear resistance. The carbon should not need to be replaced under normal operating conditions.

BELLOW

The PRO bellow is constructed out of high temp silicone laminated with either 4 or 5 plies of polyester fabric (aramid in larger sizes) and covered with a layer of fluorosilicone. On the larger models, the strength is greatly increased by the use of stainless steel hoops laid into the convolutions of the bellow.



TECHNICAL SPECIFICATIONS



Temperature Limits	-13°F to 425°F (-25°C to 220°C)
Pressure Limits	15 PSI (1 BAR)
Shaft RPM Limits	10,000 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316 SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Mandrel formed silicone / fabric

IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
1¼", 1¾"	1¾", 2", 2¼", 2½"	8.055" - 8.180"	2.875"
	2¾", 3", 3¼", 3½"	9.555" - 9.743"	2.875"
1½", 1⅝", 1¾", 2"	2", 2¼", 2½", 2¾", 3", 3¼", 3½"	7.842" - 8.3305"	3.75"
	3¾", 4"	7.842" - 8.3305"	3.75"
2¼", 2½"	3¼", 3½", 3¾", 4"	8.675"	4.20"
	4¼", 4½", 4¾", 5"	8.800" - 9.670"	4.20"
2¾", 3"	4", 4¼", 4½", 4¾", 5"	8.800" - 9.988"	5.00"
	5¼", 5½", 5¾", 6"	8.800" - 9.988"	5.00"
3¼", 3½", 3¾", 3¾"	4½", 4¾", 5", 5¼", 5½", 5¾", 6"	9.350" - 11.300"	6.00"

METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
32, 35	45, 50, 60, 65	8.055" - 8.180"	73
	70, 80, 85, 90	9.555" - 9.743"	73
38, 40, 45, 50, 55	50, 60, 65, 70, 75, 80, 85, 90	7.842" - 8.3305"	96
	95, 100	7.842" - 8.3305"	96
60, 65	85, 90, 95, 100	8.675"	107
	110, 115, 120, 125	8.800" - 9.670"	107
70, 75, 80	100, 110, 115, 120, 125	8.800" - 9.988"	127
	135, 140, 145, 150	8.800" - 9.988"	127
85, 90, 95	115, 120, 125, 130, 135, 140, 145, 150	9.350" - 11.300"	153

PSS TYPE B



For Shaft Diameters 4" - 6½" (100mm - 165mm)

For over 20 years, the type B seal has proven to be a workhorse for the commercial boat industry.



For maintenance schedule refer to the PSS Maintenance Kits on page 10.



COMPONENTS

STAINLESS STEEL ROTOR

The rotor on the Type B seal is manufactured out of Nitronic 50 stainless alloy. It is secured on the shaft with a large locking collar placed in front of the rotor. This collar (clamp) has a dual purpose: it secures the rotor in place on the shaft and is used as a tool during installation. The Nitronic 50 material is a very high grade of stainless steel which is almost totally corrosion resistant. This rotor does not need replacement under normal operating conditions.

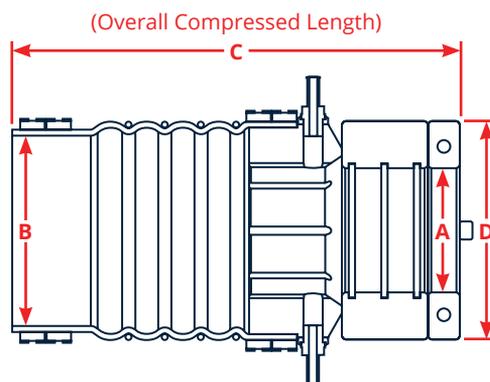
CARBON STATOR (DUAL INJECTED)

The grade of carbon composite used in the PSS Shaft Seal has a maximum operating temperature of 500° F (+260° C) and will not melt if the seal runs dry for a short period of time unlike a lip seal or a plastic face seal. The high density of the carbon greatly increases the longevity and wear resistance. The carbon should not need to be replaced under normal operating conditions.

BELLOW

The Type B bellow is constructed out of high temp silicone laminated with either 4 or 5 plies of polyester fabric (aramid in larger sizes). On the larger models, the strength is greatly increased by the use of stainless steel hoops laid into the convolutions of the bellow.

TECHNICAL SPECIFICATIONS



Temperature Limits	-13°F to 425°F (-25°C to 220°C)
Pressure Limits	15 PSI (1 BAR)
Shaft RPM Limits	7,000 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316 SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Mandrel formed silicone / fabric

IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
4", 4¼"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7"
4½"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7.875"
4¾", 5", 5½"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8½"	12.742" - 12.920"	7.875"
6"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8½"	12.920" - 13.250"	8.875"
6½"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8½"	12.920" - 13.250"	8.875"

METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
100, 105, 110	140, 145, 150, 160, 165, 170, 180	310	178
115	140, 145, 150, 160, 165, 170, 180	310	201
120, 130, 140	165, 170, 180, 185, 190, 195, 205, 220	315 - 324	201
150	165, 170, 180, 185, 190, 195, 205, 220	328 - 337	226
165	165, 170, 180, 185, 190, 195, 205, 220	328 - 337	226

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PSS TYPE C

For Shaft Diameters 6½" - 8" (165mm - 203mm)



Unlike other PSS Shaft Seals, the Type C has an integrated support for the carbon stator, so that it does not rely on the bellow for weight support. The PSS Type C Shaft Seal is available in three installation configurations:

- Weld on Stern Tube
- Flange Mounted
- Flange Mounted with Integrated Bladder System

As with all PSS seals, the PSS Type C model is a mechanical face seal using the flat surfaces of the rotating rotor and the stationary carbon flange / ring to create a water tight, dripless system. Commercial oriented by design, the Type C system uses a N50 rotor fitted on the shaft in front of the carbon flange and is secured in compression with a 316L split collar. The stationary acetal/carbon stator is attached to a heavy duty silicone bellow clamped to the vessel using the appropriate mounting option.

TYPE C MODELS



WELD ON STERN TUBE

Ideal for new construction installations, this system includes the standard Type C Seal and is designed as a weld on application. The internal tube will support the weight of the acetal/carbon stator so it stays centered to the shaft. Available in aluminum, mild steel or 316L, this mounting system ensures minimal installation time, integrates with many vessel configurations and eliminates the need for an additional adapter/bolt on system.

1. This clamp assembly maintains the PSS Type C preload/compression.
2. Nitronic 50 SS rotor surfaced to 9 Ra finish.
3. Machined acetal hub with carbon stator insert, lapped to 4 HLB.
4. Water is plumbed into the PSS Shaft Seal for cooling/lubricating the seal faces on high speed vessels.
5. Reinforced Silicone bellow houses the stationary acetal/carbon stator and is secured to the provided stern tube.
6. T-Bolt style hose clamps secure the bellow to the stern tube and the acetal/carbon stator in the bellow.
7. Stern Tube made from your choice of aluminum, mild steel or 316L stainless steel, will be welded directly onto the vessel.



FLANGE MOUNTED

Ideal for retrofit or new construction installations, this system includes the standard Type C Seal and is designed as a bolt on application. The internal tube will support the weight of the acetal/carbon stator so it stays centered to the shaft. Available in aluminum, mild steel or 316L, this mounting system is machined to match your specific application/ existing flange pattern and is offered "pre-drilled" to your bolt pattern, size and spacing or supplied "blank" for simplicity and drilling at the time of installation.

1. This clamp assembly maintains the PSS Type C preload/compression.
2. Nitronic 50 SS rotor surfaced to 9 Ra finish.
3. Machined acetal hub with carbon stator insert, lapped to 4 HLB.
4. Water is plumbed into the PSS Shaft Seal for cooling/lubricating the seal faces on high speed vessels.
5. Reinforced Silicone bellow houses the stationary acetal/carbon stator and is secured to the provided stern tube.
6. T-Bolt style hose clamps secure the bellow to the stern tube and the acetal/carbon stator in the bellow.
7. Flange manufactured from your choice of aluminum, mild steel or 316L stainless steel.

TECHNICAL SPECIFICATIONS

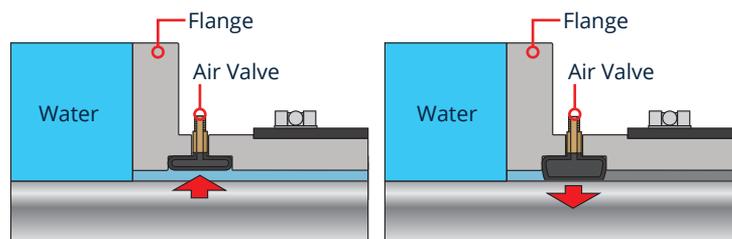
Temperature Limits	-13°F to 425°F (-25°C to 220°C)
Working Pressure	Up to 25 PSI (1.75 BAR)
Max Pressure	50 PSI (3.5 BAR)
Shaft RPM Limits	1,500 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Mandrel formed silicone / fabric



FLANGE & BLADDER MOUNTED

Ideal for retrofit or new construction installations, this system includes the standard Type C Seal and is designed as a bolt on application. The internal tube will support the weight of the acetal/carbon stator so it stays centered to the shaft. Available in aluminum, mild steel or 316L, this mounting system is machined to match your specific application/ existing flange pattern and is offered "pre-drilled" to your bolt pattern, size and spacing, or supplied "blank" for simplicity and drilling at the time of installation.

1. This clamp assembly maintains the PSS Type C preload/compression.
2. Nitronic 50 SS rotor surfaced to 9 Ra finish.
3. Machined acetal hub with carbon stator insert, lapped to 4 HLB.
4. Water is plumbed into the PSS Shaft Seal for cooling/lubricating the seal faces on high speed vessels.
5. Reinforced Silicone bellow houses the stationary acetal/carbon stator and is secured to the provided stern tube.
6. T-Bolt style hose clamps secure the bellow to the stern tube and the acetal/carbon stator in the bellow.
7. Flange manufactured from your choice of aluminum, mild steel or 316L stainless steel. The inflatable bladder allows the operator to seal the stern tube, while the shaft is not rotating, in order to inspect, clean, or work forward of the seal. In addition, if the decoupling of the shaft is needed, this operation can be done in the water as the shaft can be moved aft with bladder inflated with minimal water intrusion occurring.



BLADDER DEFLATED
Allowing water flow.

BLADDER INFLATED
Closing off water flow.

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PSS RUDDER SEAL



For Shaft Diameters 1¼" - 6" (32mm - 150mm)



COMPONENTS

STAINLESS STEEL ROTOR

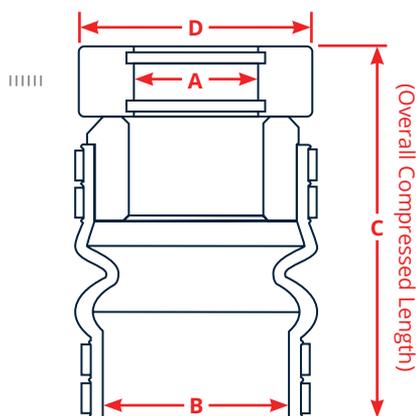
The rotor is manufactured out of 316L stainless steel. It is secured on the shaft using 2 pairs of set screws positioned at 90 degree angle for maximum holding power. This rotor does not need replacement or maintenance under normal operating conditions.

CARBON STATOR

The grade of carbon composite used in the PSS Shaft Seal has a maximum operating temperature of 500° F (+260° C) and will not melt if the seal runs dry for a short period of time unlike a lip seal or a plastic face seal. The high density of the carbon greatly increases the longevity and wear resistance. The carbon should not need to be replaced under normal operating conditions.

BELLOW

The bellow is molded out of a Nitrile compound. Nitrile is known for its resistance to petroleum products. It provides the best combination of durability, strength and elasticity necessary in this application.



TECHNICAL SPECIFICATIONS

Temperature Limits	5°F to 225°F (-15°C to 107°C)
Pressure Limits	15 PSI (1 BAR)
Shaft RPM Limits	10,000 RPM
Carbon Graphite	Lapped to 4 HLB (0.000044" tolerance)
316 SS / Nitronic 50	Faced to 9 Ra
Bellow Material	Molded Nitrile - PVC

IMPERIAL SIZES

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
1¼", 1¾"	1¾", 2", 2¼", 2½"	6.625" - 6.75"	2.875"
	2¾", 3", 3¼", 3½"	8.125" - 8.313"	2.875"
1½", 1¾", 1¾", 2"	2", 2¼", 2½", 2¾", 3", 3¼", 3½"	8.00" - 8.218"	3.75"
	3¾", 4"	8.405"	3.75"
2¼", 2½"	3¼", 3½", 3¾", 4"	8.625"	4.20"
	4¼", 4½", 4¾", 5"	9.25"	4.20"
2¾", 3"	4", 4¼", 4½", 4¾", 5"	9.125" - 9.313"	5.00"
	5¼", 5½", 5¾", 6"	9.25" - 9.438"	5.00"
3¼", 3½", 3¾", 3¾"	4½", 4¾", 5", 5¼", 5½", 5¾", 6"	9.675" - 9.863"	6.00"
4", 4¼"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7"
4½"	5½", 5¾", 6", 6¼", 6½", 6¾", 7"	12.189"	7.875"
4¾", 5", 5½"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8½"	12.920" - 12.742"	7.875"
6"	6½", 6¾", 7", 7¼", 7½", 7¾", 8", 8½"	12.920" - 13.250"	8.875"

METRIC SIZES (mm)

SHAFT DIAMETER (A)	STERN TUBE DIAMETER (B)	APPROXIMATE COMPRESSED LENGTH (C)	Rotor Diameter (D)
32, 35	45, 50, 60, 65	168 - 172	73
	70, 80, 85, 90	206 - 211	73
38, 40, 45, 50, 55	50, 60, 65, 70, 75, 80, 85, 90	203 - 209	96
	95, 100	213	96
60, 65	85, 90, 95, 100	219 - 224	107
	110, 115, 120, 125	235	107
70, 75, 80	100, 110, 115, 120, 125	231 - 237	127
	135, 140, 145, 150	235 - 240	127
85, 90, 95	115, 120, 125, 130, 135, 140, 145, 150	245 - 250	153
100, 105, 110	140, 145, 150, 160, 165, 170, 180	310	178
115	140, 145, 150, 160, 165, 170, 180	310	201
120, 130, 140	165, 170, 180, 185, 190, 195, 205, 220	315 - 324	201
150	165, 170, 180, 185, 190, 195, 205, 220	328 - 337	226

PSS ACCESSORIES



For All PSS Shaft Seal Models

MAINTENANCE KIT

To ensure longevity and proper function of the PSS Shaft Seal, PYI provides a PSS Maintenance Kit to follow PYI's recommended maintenance schedule. As with any rubber/silicone hose below the waterline, the PSS bellow must be inspected on a regular basis for any sign of wear, aging or chemical deterioration. PYI recommends that the bellow be replaced once every 6 years (for Type A Seals) and 8-10 years (for Type B or PRO Seals). It is also recommended that the hose clamps, as well as the O-Rings and set screws in the stainless steel rotor, be changed out during the bellow replacement. PYI includes all of the necessary replacement parts in the PSS Maintenance Kit.

TYPE A SEAL MAINTENANCE KIT



Includes

- Bellow
- Set screws - 5 qty.
- O-rings - 2 qty.
- 316L hose clamps - 4 qty.
- Clamp Jackets (Hose clamp tail covers)
- Medium strength thread lock
- Wrench
- Instructions

TYPE B & PRO SEAL MAINTENANCE KIT



Bellow Rings

Standard on PRO seal shaft sizes 2 1/4" to 3 3/4", and optional for smaller sizes.

Includes

- Silicone bellow
- Set screws - 5 qty.
- O-rings - 2 qty.
- Bellow rings (Standard on sizes 2 1/4" (60mm) to 3 3/4" (95mm) and optional for smaller sizes)
- 316L hose clamps - 4 qty.
- Clamp Jackets (Hose clamp tail covers)
- Medium strength thread lock
- Wrench
- Instructions

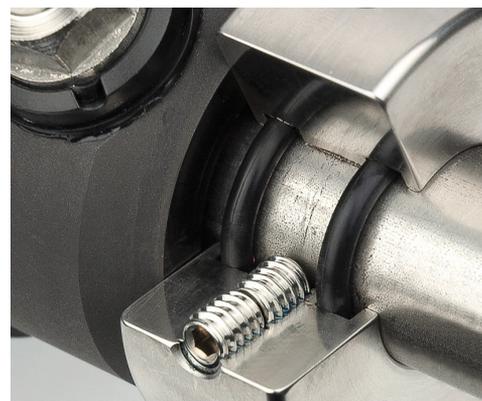
O-RING KIT

If the PSS Shaft Seal needs to be removed and re-installed, PYI suggests that you replace the o-rings, and more importantly, change the set screws as they are designed for one time use. This is a replacement kit for the o-rings and set screws.



Includes

- Set screws - 5 qty.
- O-rings - 2 qty.
- Allen wrench
- Medium strength thread lock
- Clamp Jackets - 4 qty.



Section view depicting the o-rings and set screws inside the stainless steel rotor of a PSS Shaft Seal.

SHAFT RETENTION COLLAR

The Shaft Retention Collar (SRC) is designed to protect propeller and rudder shafts. It assists in keeping the shaft and rudder in the boat in the event of a coupling failure. Due to its simple design the SRC is very easy to install with the shaft or rudder in place. Available in sizes to fit shafts from 3/4" to 3 3/4" or 25mm to 95mm.

More SRC product info on page 16.



PYI HOSE CLAMPS

Entirely 316L stainless steel with a non-perforated, rolled edge, embossed band with a one-piece double locked screw cage.

More PYI Hose Clamp product info on page 77.



TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669

PSS ACCESSORIES



For All PSS Shaft Seal Models

T-KIT

PYI offers T-Kits to help facilitate the installation of the PSS Shaft Seal. These T-Kits enable the installer to tee into the raw water discharge hose and plumb water to the hose barb fitting of the PSS Shaft Seal. Some examples of water pick-up points are: between the heat exchanger and riser, between oil cooler and heat exchanger and between the water pump and oil cooler.

Includes

- T-Fitting
- 6' of 3/8" hose
- Hose clamps



INSIDE HOSE DIAMETER	PART #
1/2"	07-KIT-012
3/4"	07-KIT-034
1"	07-KIT-100
1 1/4"	07-KIT-114
1 1/2"	07-KIT-112

REMINDER
Measure the inside diameter of the cooling hose which you intend to tee off from before ordering.



Correct T-Kit installation

FLOW INDICATOR

PYI offers an Inline Flow Indicator. This paddle wheel/sight flow indicator will allow the boat owner to quickly confirm positive water flow running to the seal/through the line. When installed in-line, the paddle will spin if positive water flow is present and will ensure the seal is getting the necessary water to keep it lubricated. The flow indicator is fitted with 3/8" hose barbs.

Includes

- Flow indicator
- 3/8" hose barbs - 2 qty.
- 316L hose clamps - 4 qty.
- Clamp Jackets (Hose clamp tail covers)



Correct Flow Indicator installation.

HY-VENT

PYI is now offering the Taco Hy-vent for sailboats and other low speed watercrafts. This nickel plated brass vent is to be installed at the end of the vent line. It is a float style vent/valve that will allow air out while restricting water flow in that direction. If any water or backflow is to come up the line from the seal, the vent will close off, keeping the water from entering the engine room. Once the water flow subsides, the float will open allowing air to freely vent. This product is a great option to maintain an air free system and ensure the engine room stays dry in the event of back flow; from prop wash, unusual external pressure, backing down, etc.

Includes

- Hy-Vent
- 3/8" hose barb - 1 qty.
- 316L hose clamps - 2 qty.
- Clamp Jackets (Hose clamp tail covers)

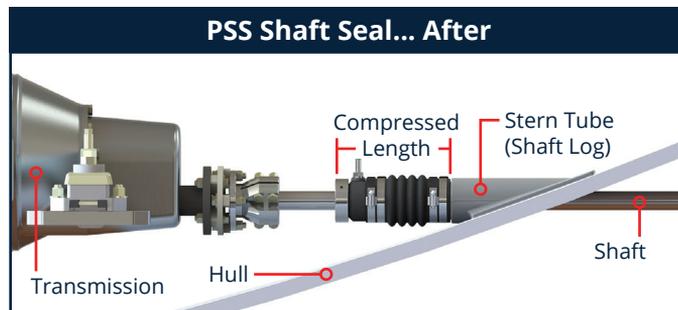
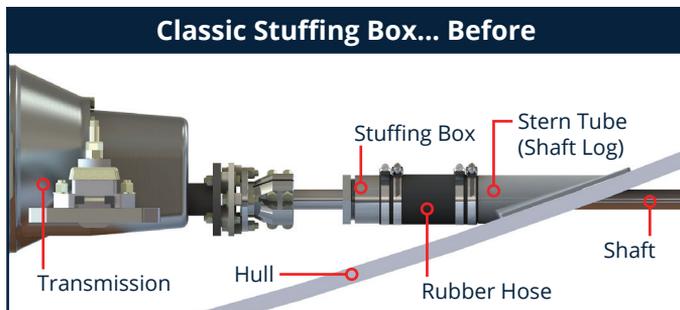


Correct Hy-Vent installation.

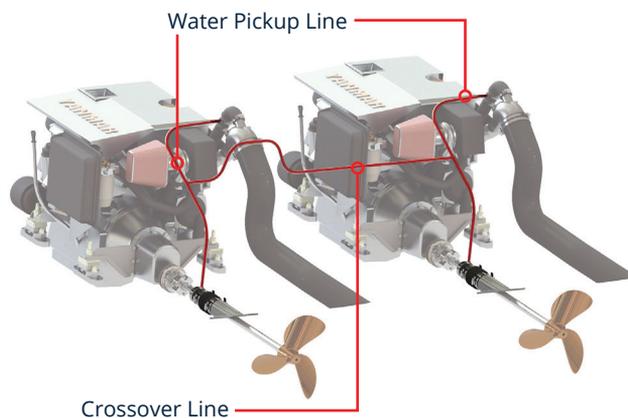
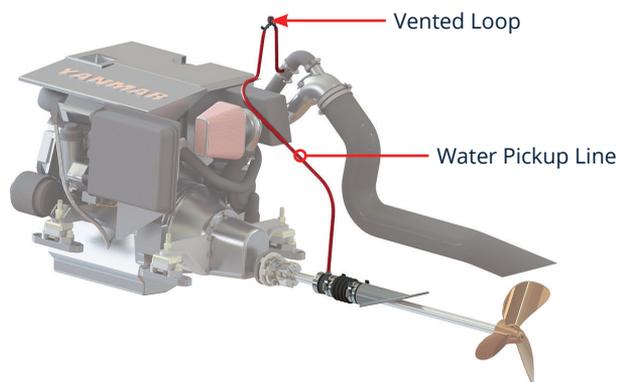
INSTALLATION EXAMPLES



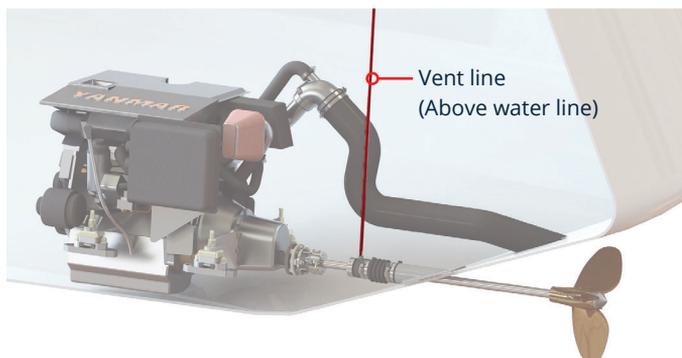
REPLACEMENT OF CLASSIC STUFFING BOX



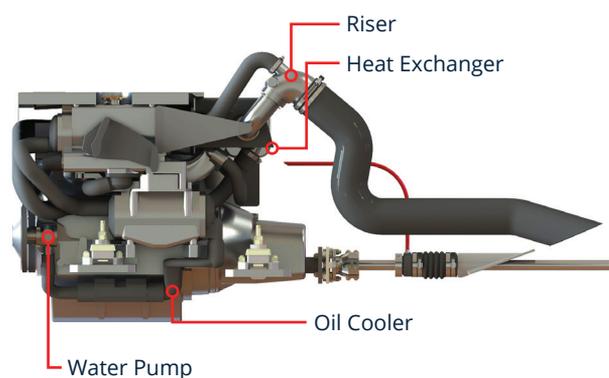
EXAMPLE OF POWERBOAT INSTALLATION



SAILBOAT INSTALLATION



POWERBOAT INSTALLATION



REMINDER

When the pick up point is located below the waterline an anti-siphon might be required to prevent back flooding of water through the exhaust system and into the engine. Standard boat plumbing practices should be followed.

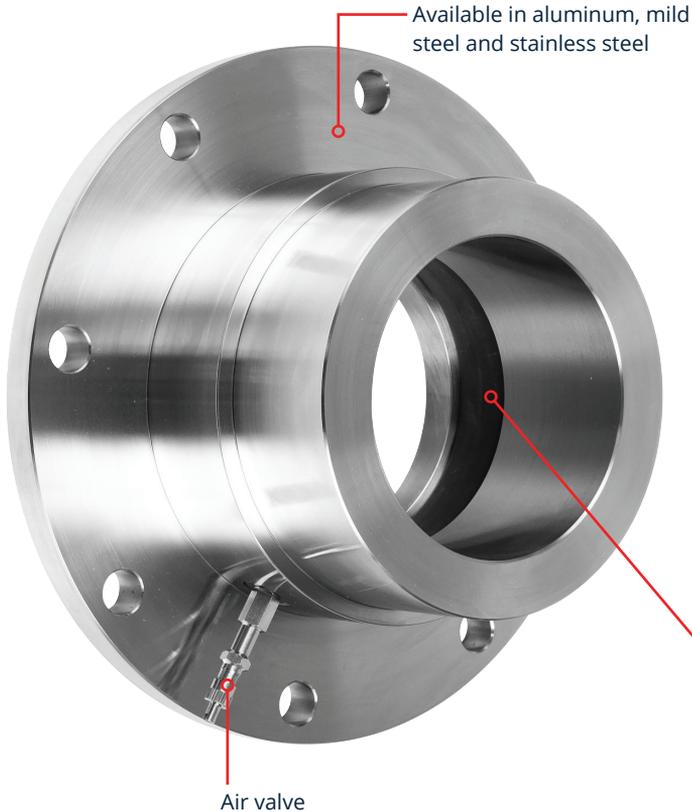
1. Tee into line after heat exchanger.
2. Tee into line after oil cooler.
3. Tee into line after water pump.
4. Hose barb into heat exchanger or oil cooler.

**TO ORDER VISIT WWW.PYIINC.COM OR
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PSS FLANGE & BLADDER SYSTEM



For Shaft Diameters 4" - 6" (100mm - 150mm)



Available in aluminum, mild steel and stainless steel

Air valve

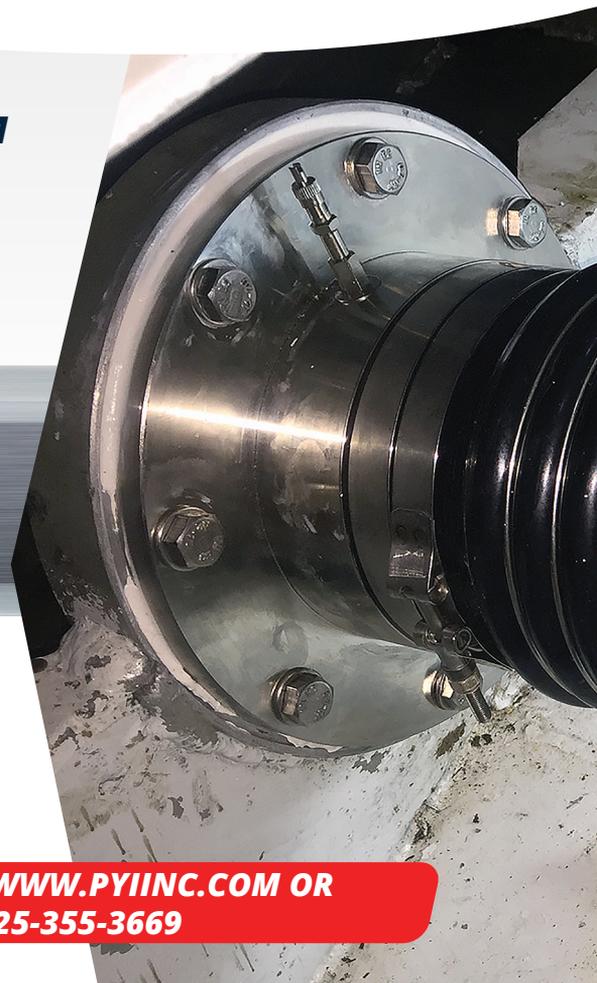
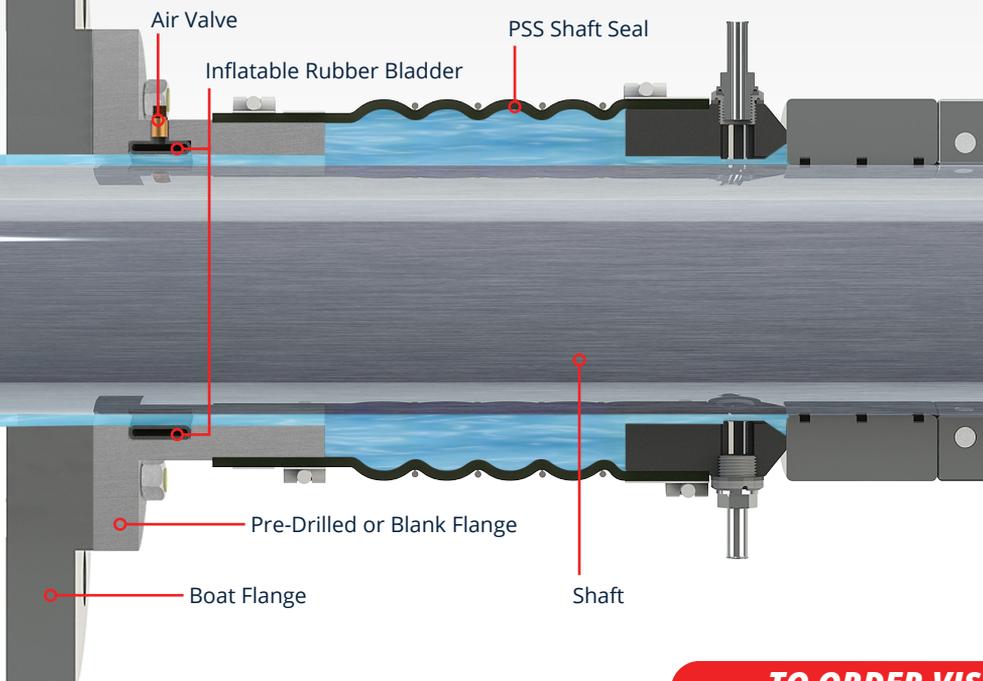
A large number of commercial vessels are manufactured with a multi-bolt flange in lieu of a stern tube. PYI offers fully customizable flange options to match the existing standard bolt pattern on the vessel (or blank to be drilled at installation) and facilitate the installation of the PSS Shaft Seal (or other shaft log mounted seals). These adapters can be ordered in any configuration as a "standard unit" or as an "inflatable bladder unit".

The inflatable bladder option allows the operator to seal the stern tube, while the shaft is not rotating, in order to inspect, clean, or work forward of the seal. In addition, if decoupling of the shaft is needed, this operation can be done in the water as the shaft can be moved aft with the bladder inflated with minimal water intrusion occurring. This inflatable bladder can also be used in case of an emergency.



Inflatable bladder

CROSS SECTION OF FLANGE & BLADDER SYSTEM



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PSS STANDARD FLANGES



For Shaft Diameters 4" - 6" (100mm - 150mm)

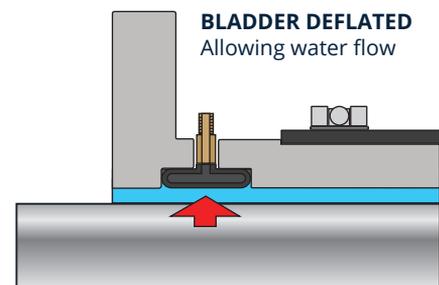
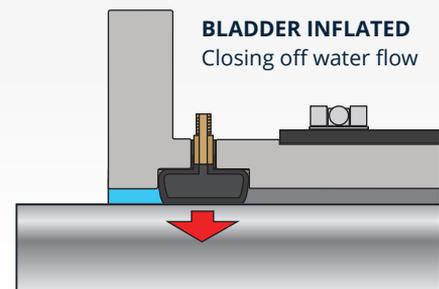


Not all vessels require a flange and bladder system, but most require a flange. To that effect PSS is offering flanges in all common materials (316 stainless steel, mild steel and aluminum). As all flanges are manufactured to order on our CNC lathes and mills, we can accommodate all patterns and shapes.



HOW DOES IT WORK?

An inflatable nitrile rubber bladder is nested in the flange. Once inflated to approximately 10 - 15 PSI, the bladder will come into contact with the shaft, creating a water tight seal. Deflate the rubber bladder to retract the bladder from the shaft allowing water back through - no damage is done to the shaft during this process. Bladder replacement is recommended every 10 years under normal use and varies dependant on water condition. The bladder can only be used with a stationary shaft.



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OTHER APPLICATIONS



WATER UTILITY, MIXING TANKS & WATER FILTRATION SYSTEMS

Specifically developed for surface water production plants, PSS Shaft Seals are installed on many horizontal mixer applications used in flocculation basins for rapid sand filtration plants and corrugated box/sheet production facilities.



PUMP & FLOW TANK INSTALLATIONS

PYI's ability to customize solutions allow PSS Shaft Seals to be integrated into space sensitive installations on specific pumps and flow tanks.



THERAPY & EXERCISE POOLS

PYI has developed and supplies mechanical seals at the OEM level for industry leading manufacturers of therapy and exercise pools used in healthcare and sport specific applications.

VERTICAL PUMPS, IRRIGATION & MINING

The ability of the PSS Shaft Seal to function in a dirty/silty environment, as well as its tolerance for radial movement makes it an ideal solution for the irrigation and mining industry. PYI's ability to customize sealing solutions has paved our way into this industry.



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SHAFT RETENTION COLLAR

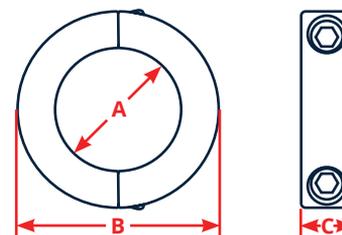


For Shaft Diameters 3/4" - 3 3/4" (25mm - 95mm)

PYI has a simple solution to assist in keeping the shaft in the boat. We have all heard horror stories of boats sinking when a coupling breaks and the shaft is ripped out of the boat.

The PYI Shaft Retention Collar (SRC) is designed to help retain the Propeller or Rudder shaft in your vessel in the event of catastrophic failure of the coupling or if the shaft comes free from the coupling.

Very simple to retrofit to existing prop and rudder shafts, the SRC is a cost-effective and quick solution that could save thousands of dollars.



DOUBLE SPLIT DESIGN

The double split design provides the maximum in axial holding power with the benefit of quick and efficient assembly with the shaft installed.

EASY INSTALLATION

Design fully engages the shaft without marring. Easily installed where major disassembly would otherwise be required. Greater axial holding power than set screw or one-piece clamping collars. Effective on hard and soft shafts. Very simple to retrofit to existing prop shafts and rudder shafts. A cost effective and quick solution that could save thousands.



ADDITIONAL SECURITY

Provides additional security for lip seals, packing gland, rudder post or PSS Shaft Seal.

A	B	C	PART #
3/4"	1 1/2"	1/2"	07-SRC-034
7/8"	1 5/8"	1/2"	07-SRC-078
1"	1 3/4"	1/2"	07-SRC-100
1 1/8"	1 7/8"	1/2"	07-SRC-118
1 1/4"	2 1/16"	1/2"	07-SRC-114
1 3/8"	2 1/4"	9/16"	07-SRC-138
1 1/2"	2 3/8"	9/16"	07-SRC-112
1 3/4"	2 3/4"	11/16"	07-SRC-134
2"	3"	11/16"	07-SRC-200
2 1/4"	3 1/4"	3/4"	07-SRC-214
2 1/2"	3 3/4"	3/4"	07-SRC-212
2 3/4"	4"	7/8"	07-SRC-234
3"	4 1/4"	7/8"	07-SRC-300
3 1/4"	4 5/8"	7/8"	07-SRC-314
3 1/2"	4 3/8"	7/8"	07-SRC-312
3 3/4"	4 7/8"	7/8"	07-SRC-334
25mm	45mm	15mm	07-SRC-25M
30mm	54mm	15mm	07-SRC-30M
35mm	57mm	15mm	07-SRC-35M
40mm	60mm	15mm	07-SRC-40M
45mm	73mm	19mm	07-SRC-45M
50mm	78mm	19mm	07-SRC-50M
55mm	82mm	19mm	07-SRC-55M
60mm	88mm	19mm	07-SRC-60M
65mm	93mm	19mm	07-SRC-65M
70mm	98mm	19mm	07-SRC-70M
75mm	103mm	19mm	07-SRC-75M
80mm	108mm	19mm	07-SRC-80M
85mm	118mm	23mm	07-SRC-85M
90mm	121mm	23mm	07-SRC-90M
95mm	137mm	23mm	07-SRC-95M

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THE STORY

Max-Prop was designed and built in the early 1970's by Maximillian Bianchi in Milan, Italy. Max, a young Italian engineer, invented a new type of propeller at the request of a sailboat racing friend in the golden days of the IOR racing rules. Little did he know at the time, this simple product would become his lifelong passion and livelihood. To this day, Max still oversees any new development of the product and follows it all the way through the manufacturing process. It is hard to believe, but Max quality checks each and every propeller that comes out of his factory. Nowadays, his son and daughter work with him, so the legacy will continue long after Max retires...if he ever does.

THE FOUNDRY

In order to keep the metal quality to a constant high standard, Max bought a foundry in the mid 70's. To this day, the majority of Max-Prop cast parts are made in that foundry near Lake Cuomo, a two hour drive from Milan.

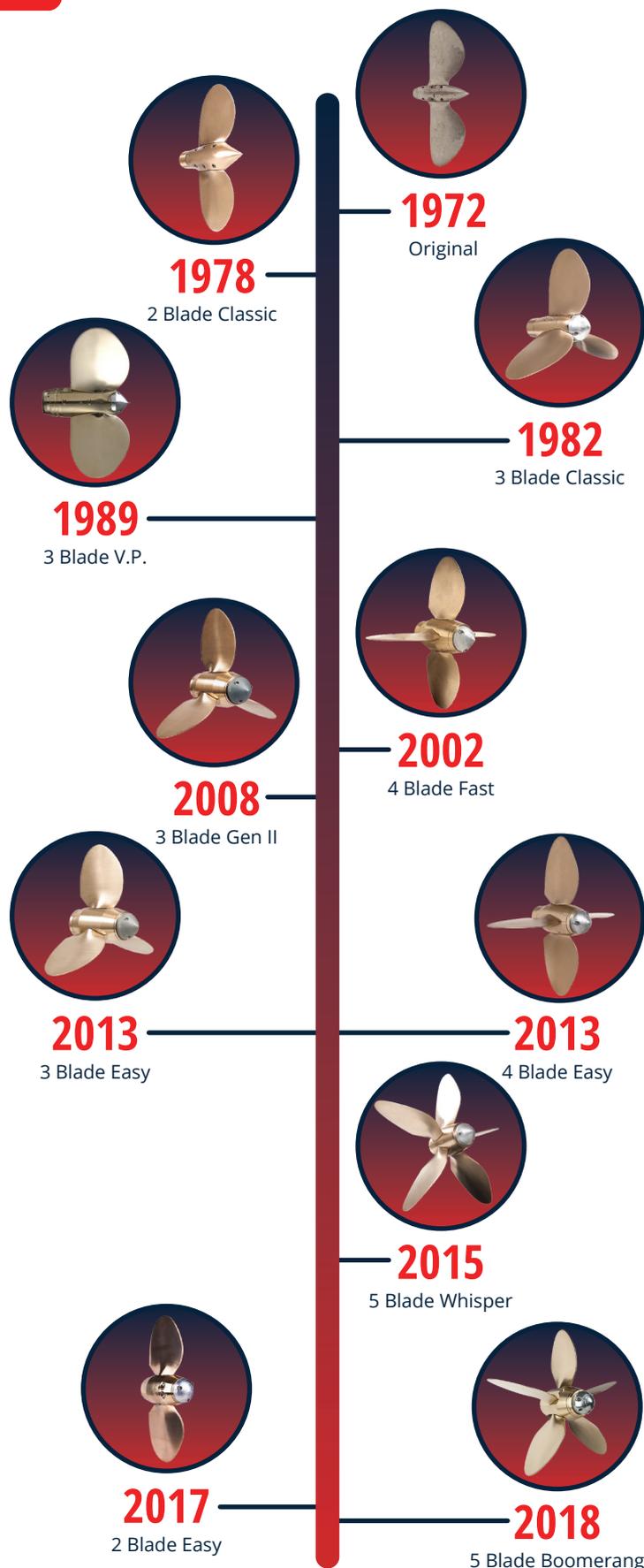
The ownership of this foundry not only resulted in high quality cast parts, but also insured that any defect in the material or the part would not be passed on to the next stage of machining. This vertical integration is one of the main reasons for the success and durability of Max-Prop.

THE MACHINE SHOP

The actual machining of the propellers has always been under the full supervision of Max, from the early days of manual lathes and mills to the ultra-modern CNC machines of today. Through the years, the machine shop has had multiple locations and currently is in Milan, in the same building as the sales offices, management and where the final assembly of the Max-Prop occurs. Once again, Max himself oversees each and every process.

SALES OFFICE

PYI is the only sales office for Max-Prop in North/South America and Asia. Since then, PYI has added products which are well known in the sailing community, some as a manufacturer and some as a distributor. Through the years, Max-Prop has been the driving force for PYI, allowing us to facilitate the manufacturing of other quality products.





*Maximilian Bianchi
Circa 1972*



*Maximilian Bianchi
Circa 2018*



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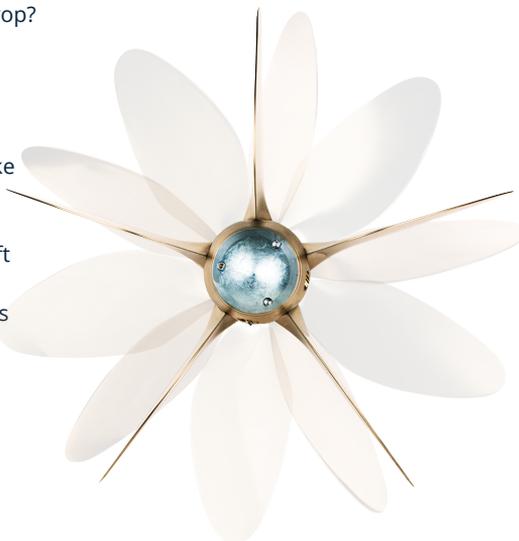
BENEFITS

Benefits of a Max-Prop Propeller

Whether purchasing, refitting, or re-powering, a boat owner is faced with a somewhat confusing choice of propellers: fixed bladed, folding, feathering, brands, material, number of blades. It becomes daunting. So why choose a Max-Prop?

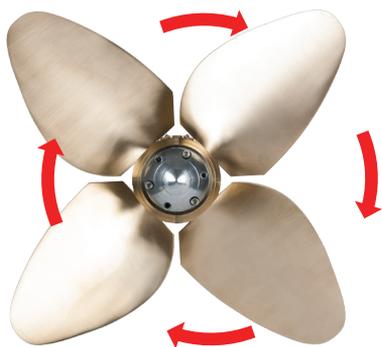
RELIABILITY IN OPERATION

Max-Props are "feathering propellers". Unlike folding propellers, Max-Props do not rely on centrifugal force to open. Instead, the Max-Prop relies on the torque from the shaft rotation acting on the "differential" type gear design in the body of the propeller. This in turn ensures an immediate opening in forward and more importantly, in reverse, unlike folding propellers which have a lag time in reverse.



RELIABILITY OVER TIME

Through the years, Max-Prop propellers have acquired a flawless reputation for reliability and longevity. It is not uncommon to see a boat built in the 70's or 80's still using its originally installed Max-Prop. A simple check on the internet would allow you to see the renowned reputation of Max-Prop. While we all wish that we could sail all the time, a propeller is a very important part of any sailboat. Sailboats end up powering a substantial amount of time and sometimes, in an emergency, we have to use our engine. In times like this it is critical to know that your propeller will open and will function as designed. Max-Prop has proven that time and again for decades.



EFFICIENT IN FORWARD

While not always as efficient as a perfectly sized fixed propeller, the right choice of Max-Prop diameter, pitch and number of blades will usually achieve 96% or better efficiency compared to a fixed blade propeller. This maximum of 4% drop in efficiency is only seen at maximum throttle, which is seldom, if ever, used. The fact that with a Max-Prop, a boat owner or a designer can choose not only the diameter and number of blades of the propeller but can also adjust the pitch easily after sea trials makes the Max-Prop an ideal tool to fine tune a boat's performance under power.



EFFICIENT IN REVERSE

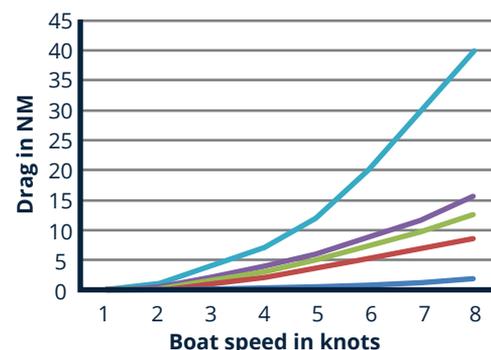
The simple fact that the Max-Prop blades use the same leading edge and pitch in reverse as in forward results in identical power in both directions. A fixed blade propeller loses almost 50% of its power in reverse. Worse yet - a folding propeller which, depending on the brand, can lose up to 80% of its power in reverse. The Max-Prop blades switch from forward to reverse instantaneously. It takes only 3/4 of the shaft rotation for the blade switch to occur.

VERY LOW DRAG UNDER SAIL

Under sail a Max-Prop will increase sailing speed between 10% to 15% compared to a fixed blade propeller, the largest difference being noticed when sailing in light air. The drag under sail varies widely between propellers, number of blades, angle of the shaft as well as location of the propeller on the boat. It is fair to say that a 2 blade Max-Prop propeller located on a horizontal shaft (sail-drive) will have the least drag while a 5 blade Max-Prop on a high angle shaft will have the most drag. However, even a 5 blade Max-Prop on a high angle shaft will have substantially less drag and provide more power when motoring than a fixed 2 blade propeller.



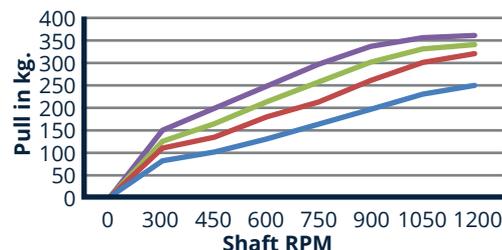
PROPELLER DRAG



- Max-Prop 2 Blade
- Max-Prop 3 Blade
- Max-Prop 4 Blade
- Max-Prop 5 Blade
- Fixed 3 Blade

BOLLARD PULL

In kg, engine 50 HP, propeller diameter 18"



MAX-PROP MODELS

The Max-Prop is available in four different models, each unique for certain applications, but all feature the legendary Max-Prop low drag and smooth running.



EASY

- 2, 3 and 4 blade designs
- Ships fully assembled for easy installation in or out of the water
- Simple pitch adjustment, no disassembly needed
- 2 Blade models offer the least drag so are ideal for racers or smaller cruising boats
- 3 and 4 Blade models offer more power and eliminate vibrations
- 3 or 4 Blade models are ideal for a local or long range cruiser
- Available from 12" to 26" diameter and for ¾" to 1¾" shafts



WHISPER

- 5 blade design offers ultra-quiet powering and extra power
- Ideal for heavy displacement cruisers or large cruising yachts
- Simple externally adjustable pitch with no need for a haul out
- Ships fully assembled for easy installation in or out of the water
- Available up to 44" diameter and 3½" shafts



BOOMERANG

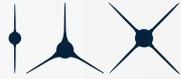
- 5 blade design offers ultra-quiet powering and extra power
- Spring assisted instantaneous feathering
- Immediate feathering with electronic shift mechanisms
- Ships fully assembled for easy installation in or out of the water
- For high speed vessels or vessels with electronic shift transmission
- Available from 18" to 44" diameter and up to 3" shafts



EASY ANTISHOCK FOR SAILDRIVE

- Antishock dampening device
- 2, 3 and 4 blade designs
- Designed to fit SailDrives from Volvo, Yanmar, TwinDisc, ZF, Sillette, or Bukh
- Ships fully assembled for easy installation in or out of the water
- Simple pitch adjustment, no disassembly needed
- 2 Blade models offer the least drag, so are ideal for racers or smaller cruising boats
- 3 and 4 Blade models offer more power and eliminate vibrations
- Available from 14" to 20" diameter

EASY



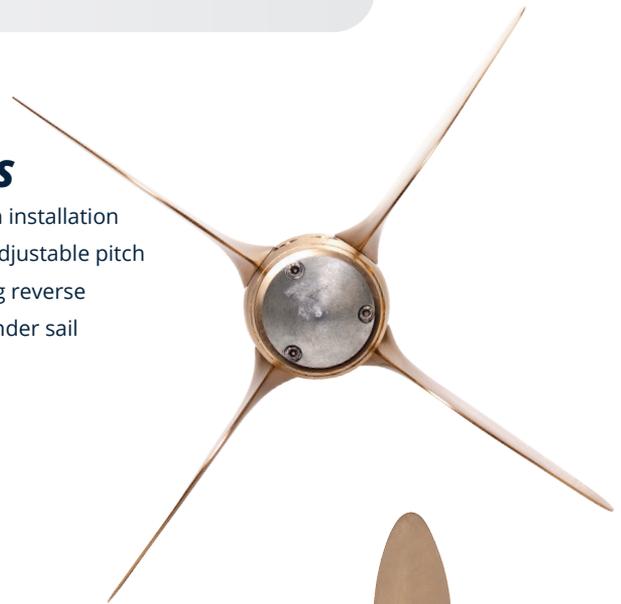
MAX PROP
AUTOMATIC FEATHERING PROPELLERS

Available From 12" - 26" Diameters, And For 3/4" - 1 3/4" Shaft Diameters.
Also Available For Saildrive.

The Max-Prop Easy is a step forward in Max-Prop design. This propeller replaces the well-known Max-Prop Classic, offering simplicity for the customer without sacrificing performance. The Easy model's main attributes over the Classic are: 1) ease of installation (simple bolt on to the shaft); and 2) flexibility of pitch adjustment without the need of a haul out.

FEATURES

- Easy bolt on installation
- Externally adjustable pitch
- Outstanding reverse
- Low drag under sail



TWO BLADE EASY FEATURES:

- Efficient forward power
- Very low drag under sail
- Available from 11" to 18" diameter
- For shafts 3/4" to 1 1/8"
- Best suited for racing boats or smaller cruisers



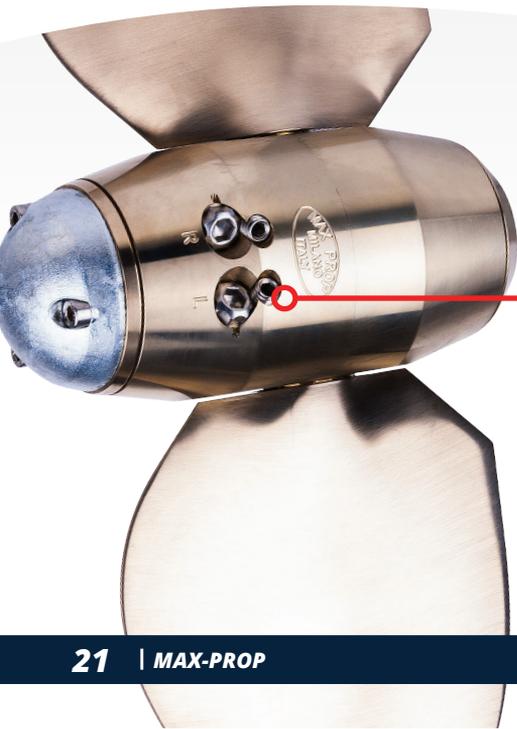
THREE BLADE EASY FEATURES:

- Added forward power
- Runs much smoother than a two blade
- Low drag under sail (slightly more than a 2 blade)
- Available from 12" to 26"
- For shafts 3/4" to 1 3/4"
- Best suited for 24' to 55' cruiser (medium displacement)



FOUR BLADE EASY FEATURES:

- Outstanding forward power
- Very smooth running (no vibrations)
- Low drag under sail
- Available from 14" to 26"
- For shafts 3/4" to 1 3/4"
- Best suited for 40' to 70' cruiser (medium to heavy displacement)

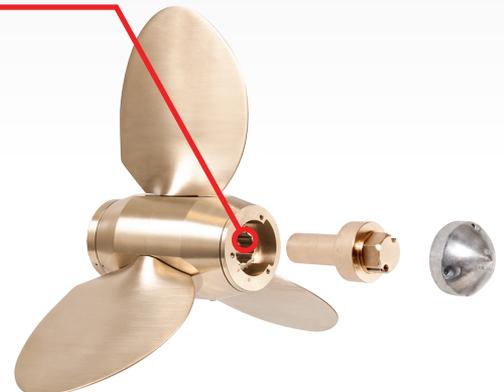


EASY TO INSTALL

Arrives pre-assembled. Unique design allows for simple bolt on installation.

ADJUSTABLE PITCH

If your engine achieves either too much or too little RPM at max throttle, adjust the pitch to a higher or lower setting to attain the correct RPM. Pitch adjustment can easily be done in or out of the water. To change the pitch just remove the pitch bolt and replace it with one of a different length.



EASY ANTISHOCK

For SailDrives



MAX-PROP
AUTOMATIC FEATHERING PROPELLERS

A large majority of modern production sailboats are equipped with a "SailDrive" leg instead of a propeller shaft. These "SailDrives" require a different type of propeller for two reasons:

- The attachment of the propeller needs a spline instead of a taper.
- The gears in the leg cannot take the shock loads of low drag propellers opening (true for both folding or feathering propellers). Therefore all propellers, including fixed propellers, must have a dampening device built in the hub which lessens the shock loads initiated by the propeller opening or closing.

The Max-Prop "Easy Antishock" for SailDrive is designed to fit on any drive leg on the market today including Volvo, Yanmar, Bukh, and Twin Disc. This propeller system greatly reduces the shock load upon engaging the transmission which remains much lower than all SailDrive manufacturers maximum load requirements.

The installation of a Max-Prop "Easy Antishock" is identical to a fixed blade propeller.

FEATURES

- Easy bolt on installation
- Externally adjustable pitch
- Outstanding reverse
- Low drag under sail



Max-Prop SailDrives Fit These Manufacturers and More!



DAMPENING DEVICE

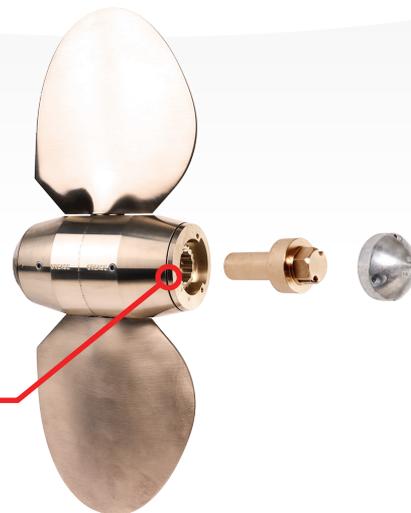
A dampening device is installed internally on all Max-Prop "Easy Antishock" propellers. This dampening device is essential for preventing shock loads while engaging the drive in forward or reverse.

ADJUSTABLE PITCH

If your engine achieves either too much or too little RPM at max throttle, adjust the pitch to a higher or lower setting to attain the correct RPM. Pitch adjustment can easily be done in or out of the water. To change the pitch just remove the pitch bolt and replace it with one of a different length.

EASY TO INSTALL

Arrives pre-assembled. Unique design allows for simple bolt on installation.



TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669

WHISPER

MAX PROP
AUTOMATIC FEATHERING PROPELLERS

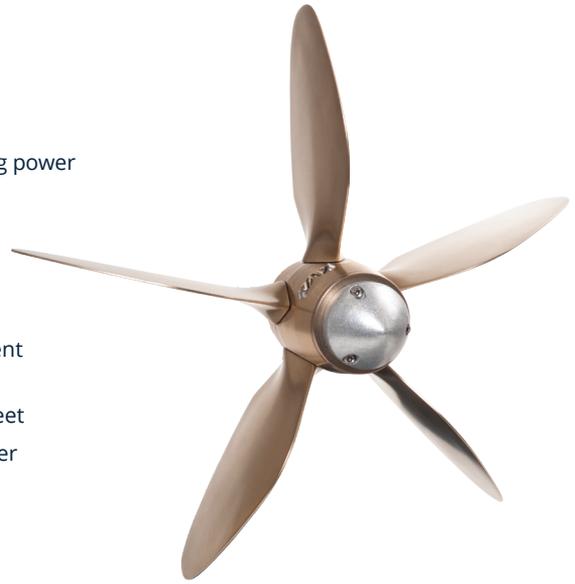
Available From 18" - 48" Diameters, And For 1¼" - 3½" Shaft Diameters

The size of sailboats has been increasing steadily over the past few years. With the larger size comes the demand for bigger engines and higher speed under power, while keeping noise and vibration down to a minimum.

To that affect, Max-Prop has designed a 5 blade propeller, combining all the necessary attributes. To address the horsepower gains, Max-Prop has added one more blade. This allows the transfer of power in the water in a more efficient way than the only other alternative - a larger diameter - while keeping noise to a minimum. In addition to the increased power, the extra blade provides a smoother run than a 4 blade propeller.

FEATURES

- Very efficient power
- Outstanding reverse and stopping power
- Ultra smooth operation
- Very low drag
- Simple bolt on installation
- Externally adjustable pitch
- Best suited for heavy displacement cruisers over 50 feet
- Ideal for large yachts 70 to 150 feet
- Available from 18" to 48" diameter
- For shafts 1¼" to 3½"



SIMPLE INSTALLATION

Due to the design of the Max-Prop Whisper, installation can be done in or out of the water with the simple bolt on installation.



LOW DRAG

A 5 blade Max-Prop Whisper on a high angle shaft will have substantially less drag than a fixed 2 blade propeller and provides more power while motoring.

EASY PITCH ADJUSTABILITY

If your engine achieves either too much or too little RPM at max throttle, adjust the pitch to a higher or lower setting to attain the correct RPM. Pitch adjustment can be done in the water as the propeller does not need to be disassembled to change the pitch.



BOOMERANG

MAX-PROP
AUTOMATIC FEATHERING PROPELLERS

Available From 18" - 44" Diameters, And For 1¼" - 3" Shaft Diameters

For decades, feathering propellers have operated as a result of the water flowing over the blades, combined with some friction of the shaft and/or transmission.

In recent years, radical changes in sailboat engine transmissions have created new issues for propeller manufacturers. These include the advent of hydraulic transmissions as well as the electronic gear shifting.

In both cases, the transmission (whether in gear or not) presents almost zero drag on the shaft when the engine is not running. Some shaft drag is always necessary for a propeller to either fold or feather. However, with these new types of transmissions, there is no drag and the helmsman does not have any mechanical way to slow the shaft down from freewheeling when the engine is stopped.

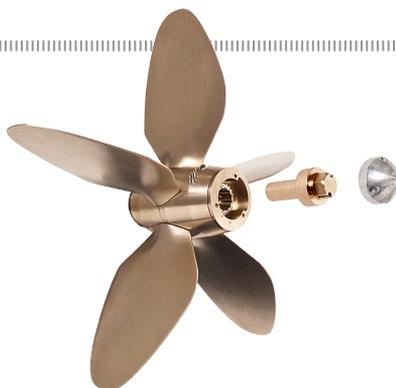
To that effect, the Max-Prop engineers have invented a patented radial spring which is incorporated inside the body of the Boomerang model. This spring solves the feathering issues by forcing the blades back into a feathered position as soon as no torque is applied to the shaft. Once the engine is either in idle or shut down, the blades will feather within seconds, regardless of the shaft rotation or the boat speed at the time.

The Boomerang model has been in testing since 2016 and has already been adopted by many European boat builders.



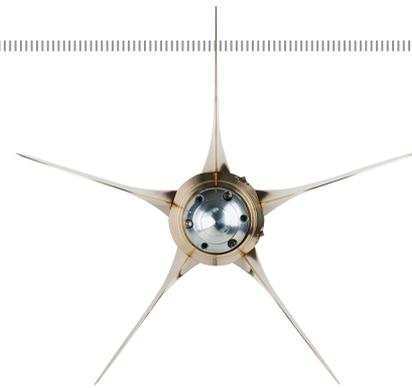
FEATURES

- Assisted feathering
- Very efficient power
- Outstanding reverse and stopping power
- Ultra smooth operation
- Very low drag
- Simple "bolt on" installation
- Externally adjustable pitch
- Available from 18" to 44" diameter
- For shafts 1¼" to 3"
- Maintains feathered position in high speed, turbulent operation



SIMPLE INSTALLATION

Due to the design of the Max-Prop Boomerang, installation is a simple bolt on and can be done in or out of the water.



LOW DRAG

A 5 blade Max-Prop Boomerang on a high angle shaft will have substantially less drag than a fixed 2 blade propeller while providing much more power while motoring.

ASSISTED FEATHERING

The Boomerang does not require water flow to feather the propeller. The internal spring brings the propeller to the feathered position. Perfect for use with electronic shift mechanisms and hydraulic transmissions.

TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669

FOR CATAMARANS



MAX PROP
AUTOMATIC FEATHERING PROPELLERS

Available From 18" - 48" Diameters, And For 1¼" - 3½" Shaft Diameters

Catamarans are increasingly popular styles of cruising sailboats. Catamarans in general, present issues under power or sail which are different from monohull sailboats. The usual advantages of the Max-Prop are accentuated on a Catamaran. The reduced drag under sail not only improves boat speed but it also reduces turbulence over the rudders, providing improved boat handling. This reduction in drag also allows a boat to come through a tack quicker, and with more boat speed exiting the maneuver, making it easier to sail in light winds.

With the increased beam and freeboard of a catamaran comes the downside of high windage. The impressive reverse power of the Max-Prop adds to the control and safety of the vessel when maneuvering. Max-Prop offers the propeller in 2, 3, 4 or 5 blade versions. This allows the boat owner to pick the amount of power desired with a given engine, with very little trade off.

FEATURES

- Improves control and safety of the vessel
- Very low drag under sail
- Reduced turbulence over rudders under sail
- Improved tacking speed with reduced drag
- Overcome windage inherent to Catamarans
- 80% more power in reverse compared to a fixed propeller
- Models designed specifically for SailDrive
- Adjustable pitch to optimize powering performance
- Available in 2, 3, 4 or 5 blade



ACCESSORIES

For More Information Or To Purchase Visit www.pyiinc.com



ANODES

Keeping a quality sacrificial anode on a Max-Prop is critical to ensure a long life. Galvanic corrosion occurs in marinas; it is simply a fact of life. Protection is a necessity. PYI keeps anodes in stock for both our current propeller lines and for our older propeller models. Our anodes are cast with a strong metal ring which helps in dispersing the current loads, thus providing better propeller protection. As some EPA rules are changing and in some States zinc is prohibited, PYI also manufactures aluminum anodes which are available upon request.



GREASE KITS

A Max-Prop should be greased yearly, at a minimum. The propeller has a pair of grease ports on the hub, the grease gets pushed into the prop at these 2 locations with the use of zerc fittings and a grease gun. This operation can be done out of the water during scheduled haul out or in the water by a diver. PYI sells the grease independently or as part of a "Grease Kit" which contains: grease, a grease gun, and a few spare screws and zerc fittings.



CRUISING KITS

For the long distance cruiser who needs a complete set of spares, PYI sells a "Combo kit" which contains a year or more supply of parts (grease, zincs anodes, screws).

SERVICES

For More Information Or To Purchase Visit www.pyiinc.com

MAX-PROP RECONDITIONING

PYI Inc. has a full Max-Prop reconditioning service that is capable of repairing and reconditioning your Max-Prop. We can bring it back to life, whether from normal wear and tear, a blade bent in half, or damage from corrosion, most damage can be repaired.

If your Max-Prop is out of balance it could be due to wear or a galvanic corrosion problem, causing the blades to wear thin. Our Max-Prop reconditioning technician can either spot weld or re-sheet the entire blade to bring it back to tolerance and balance.

A worn propeller may also have fore and aft or rotational play in the blades that exceeds

factory standards. This is caused by wear to the spacer or central conegear. To solve these problems a new spacer or conegear will be machined to fit your propeller and tighten up the play.

Another point of wear is the central hub. This is typically caused from lack of maintenance or excessive use and abuse. This can also cause vibrations. If significantly worn, we can replace the hub to tighten up the propeller.

The last step in the Max-Prop reconditioning process is to balance and polish the prop. Your reconditioned propeller will look like new at a much lower cost.



TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669

THE STORY

R&D Marine was started in 1973, after several years of development work, to manufacture a flexible shaft coupling suitable for marine use, which was both easy to fit and competitively priced. The company was started with a single garage, moving to two garages after one year and then to its current location in 1976. Over the years, the factory has been completely rebuilt and now has 8,000 square feet of modern factory space with all manufacturing being carried out on CNC machines.

It was only a short while after production started, a customer suggested that if the company produced couplings, it should also manufacture a range of compatible anti-vibration engine mounts. Similarly, another customer suggested damper drive plates. Hence by 1976 the basis of the product range had been established and since then it has grown to the comprehensive range we have today of couplings, engine mounts, damper drive plates and half couplings for engines from 5 HP to 800 HP.

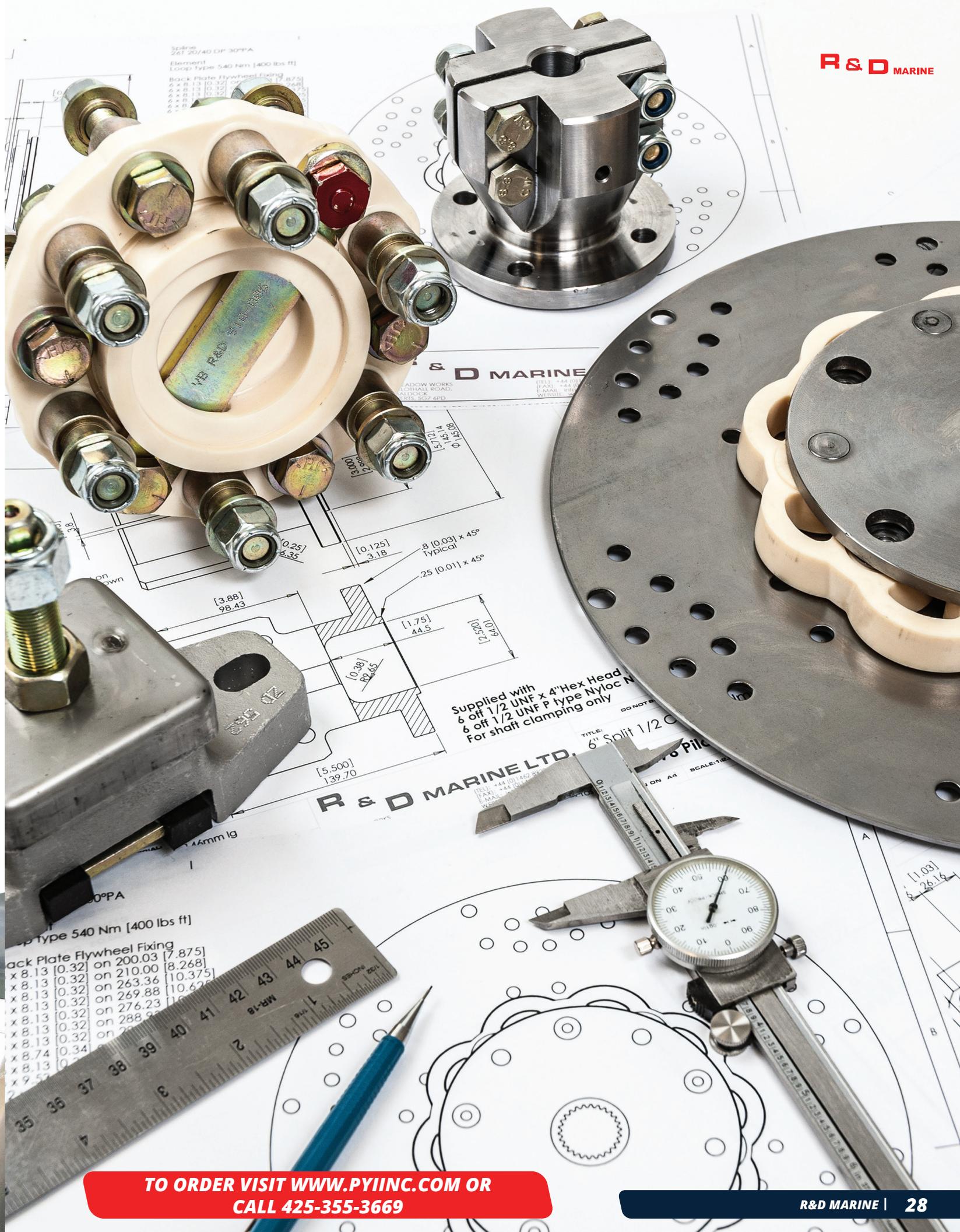
It has always been considered essential that all products should be easy to use, be fail safe and most of all be readily available at the right price. As a manufacturing company, R&D Marine prides themselves on the fact that they can supply or assemble from stock most products to cover urgent breakdowns.

Due to the service provided, the suitability of the products and recommendation of their customers it has been possible to develop the world wide distribution network which they have today.

SALES OFFICE

PYI Inc. has proudly represented R&D Marine in North America since 1995. R&D Marine's superior design, quality in-house manufacturing and technical support enable us to provide the type of products that customers have grown to expect.





Spine
24T 30/40 DP 30°PA
Element
Loop Type 540 Nm [400 lbs ft]
Back Plate Flywheel Fixing
x 8.13 [0.32] on 200.03 [7.875]
x 8.13 [0.32] on 210.00 [8.268]
x 8.13 [0.32] on 263.36 [10.375]
x 8.13 [0.32] on 269.88 [10.625]
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x 8.13 [0.32] on 2094.11 [81.125]
x 8.13 [0.32] on 2100.58 [81.375]
x 8.13 [0.32] on 2107.05 [81.625]
x 8.13 [0.32] on 2113.52 [81.875]
x 8.13 [0.32] on 2120.00 [82.125]
x 8.13 [0.32] on 2126.47 [82.375]
x 8.13 [0.32] on 2132.94 [82.625]
x 8.13 [0.32] on 2139.41 [82.875]
x 8.13 [0.32] on 2145.88 [83.125]
x 8.13 [0.32] on 2152.35 [83.375]
x 8.13 [0.32] on 2158.82 [83.625]
x 8.13 [0.32] on 2165.29 [83.875]
x 8.13 [0.32] on 2171.76 [84.125]
x 8.13 [0.32] on 2178.23 [84.375]
x 8.13 [0.32] on 2184.70 [84.625]
x 8.13 [0.32] on 2191.17 [84.875]
x 8.13 [0.32] on 2197.64 [85.125]
x 8.13 [0.32] on 2204.11 [85.375]
x 8.13 [0.32] on 2210.58 [85.625]
x 8.13 [0.32] on 2217.05 [85.875]
x 8.13 [0.32] on 2223.52 [86.125]
x 8.13 [0.32] on 2230.00 [86.375]
x 8.13 [0.32] on 2236.47 [86.625]
x 8.13 [0.32] on 2242.94 [86.875]
x 8.13 [0.32] on 2249.41 [87.125]
x 8.13 [0.32] on 2255.88 [87.375]
x 8.13 [0.32] on 2262.35 [87.625]
x 8.13 [0.32] on 2268.82 [87.875]
x 8.13 [0.32] on 2275.29 [88.125]
x 8.13 [0.32] on 2281.76 [88.375]
x 8.13 [0.32] on 2288.23 [88.625]
x 8.13 [0.32] on 2294.70 [88.875]
x 8.13 [0.32] on 2301.17 [89.125]
x 8.13 [0.32] on 2307.64 [89.375]
x 8.13 [0.32] on 2314.11 [89.625]
x 8.13 [0.32] on 2320.58 [89.875]
x 8.13 [0.32] on 2327.05 [90.125]
x 8.13 [0.32] on 2333.52 [90.375]
x 8.13 [0.32] on 2340.00 [90.625]
x 8.13 [0.32] on 2346.47 [90.875]
x 8.13 [0.32] on 2352.94 [91.125]
x 8.13 [0.32] on 2359.41 [91.375]
x 8.13 [0.32] on 2365.88 [91.625]
x 8.13 [0.32] on 2372.35 [91.875]
x 8.13 [0.32] on 2378.82 [92.125]
x 8.13 [0.32] on 2385.29 [92.375]
x 8.13 [0.32] on 2391.76 [92.625]
x 8.13 [0.32] on 2398.23 [92.875]
x 8.13 [0.32] on 2404.70 [93.125]
x 8.13 [0.32] on 2411.17 [93.375]
x 8.13 [0.32] on 2417.64 [93.625]
x 8.13 [0.32] on 2424.11 [93.875]
x 8.13 [0.32] on 2430.58 [94.125]
x 8.13 [0.32] on 2437.05 [94.375]
x 8.13 [0.32] on 2443.52 [94.625]
x 8.13 [0.32] on 2450.00 [94.875]
x 8.13 [0.32] on 2456.47 [95.125]
x 8.13 [0.32] on 2462.94 [95.375]
x 8.13 [0.32] on 2469.41 [95.625]
x 8.13 [0.32] on 2475.88 [95.875]
x 8.13 [0.32] on 2482.35 [96.125]
x 8.13 [0.32] on 2488.82 [96.375]
x 8.13 [0.32] on 2495.29 [96.625]
x 8.13 [0.32] on 2501.76 [96.875]
x 8.13 [0.32] on 2508.23 [97.125]
x 8.13 [0.32] on 2514.70 [97.375]
x 8.13 [0.32] on 2521.17 [97.625]
x 8.13 [0.32] on 2527.64 [97.875]
x 8.13 [0.32] on 2534.11 [98.125]
x 8.13 [0.32] on 2540.58 [98.375]
x 8.13 [0.32] on 2547.05 [98.625]
x 8.13 [0.32] on 2553.52 [98.875]
x 8.13 [0.32] on 2560.00 [99.125]
x 8.13 [0.32] on 2566.47 [99.375]
x 8.13 [0.32] on 2572.94 [99.625]
x 8.13 [0.32] on 2579.41 [99.875]
x 8.13 [0.32] on 2585.88 [100.125]
x 8.13 [0.32] on 2592.35 [100.375]
x 8.13 [0.32] on 2598.82 [100.625]
x 8.13 [0.32] on 2605.29 [100.875]
x 8.13 [0.32] on 2611.76 [101.125]
x 8.13 [0.32] on 2618.23 [101.375]
x 8.13 [0.32] on 2624.70 [101.625]
x 8.13 [0.32] on 2631.17 [101.875]
x 8.13 [0.32] on 2637.64 [102.125]
x 8.13 [0.32] on 2644.11 [102.375]
x 8.13 [0.32] on 2650.58 [102.625]
x 8.13 [0.32] on 2657.05 [102.875]
x 8.13 [0.32] on 2663.52 [103.125]
x 8.13 [0.32] on 2670.00 [103.375]
x 8.13 [0.32] on 2676.47 [103.625]
x 8.13 [0.32] on 2682.94 [103.875]
x 8.13 [0.32] on 2689.41 [104.125]
x 8.13 [0.32] on 2695.88 [104.375]
x 8.13 [0.32] on 2702.35 [104.625]
x 8.13 [0.32] on 2708.82 [104.875]
x 8.13 [0.32] on 2715.29 [105.125]
x 8.13 [0.32] on 2721.76 [105.375]
x 8.13 [0.32] on 2728.23 [105.625]
x 8.13 [0.32] on 2734.70 [105.875]
x 8.13 [0.32] on 2741.17 [106.125]
x 8.13 [0.32] on 2747.64 [106.375]
x 8.13 [0.32] on 2754.11 [106.625]
x 8.13 [0.32] on 2760.58 [106.875]
x 8.13 [0.32] on 2767.05 [107.125]
x 8.13 [0.32] on 2773.52 [107.375]
x 8.13 [0.32] on 2780.00 [107.625]
x 8.13 [0.32] on 2786.47 [107.875]
x 8.13 [0.32] on 2792.94 [108.125]
x

FLEXIBLE SHAFT COUPLING

R & D MARINE

Reduce Vibration & Costly Transmission Repairs

R&D Flexible Couplings consist of a flexible disc machined from polyester elastomer. The disc gives clearance for bolt heads, and is able to flex freely to take up any temporary misalignment of the engine and shaft due to flexing of the boat structure or the engine moving on its mounts. Forward thrust is taken in compression on the disc between the two half couplings and reverse thrust is taken again in compression on the disc between the two fail safe straps. In the unlikely event of a severe impact, the steel straps make the coupling fail safe and ensure drive is maintained both forward and reverse.

FEATURES

- Reduce engine noise and transmission vibration
- Reduce costly transmission repairs
- Fits most major transmission makes & models
- Under compression load in both forward & reverse
- Quick & easy installation
- Periodically check alignment easily
- Impervious to salt water, diesel and lubrication oils



SIMPLE MAINTENANCE

Checking alignment on installation and during service checks is quick and easy without disassembly by using the red bolt as a reference and checking the gap while manually rotating the shaft.

DURABLE

The couplings are made from a polyester elastomer which is not affected by salt water, diesel and lubrication fluids.

EASY INSTALLATION

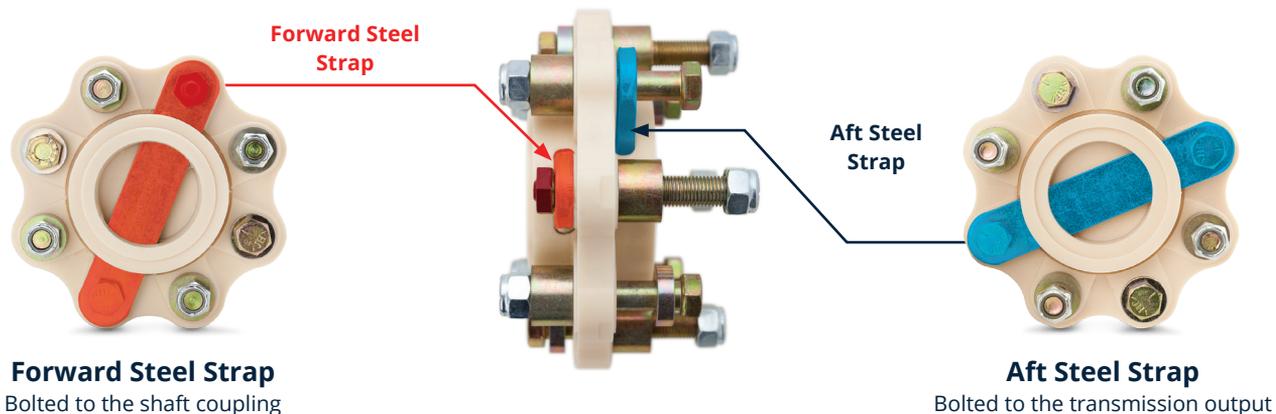
The R&D Marine Flexible Shaft Coupling requires no machining and comes supplied with bolts to connect between the two existing shaft flanges.

FITS MANY APPLICATIONS

For engines 5 to 1,500 hp.

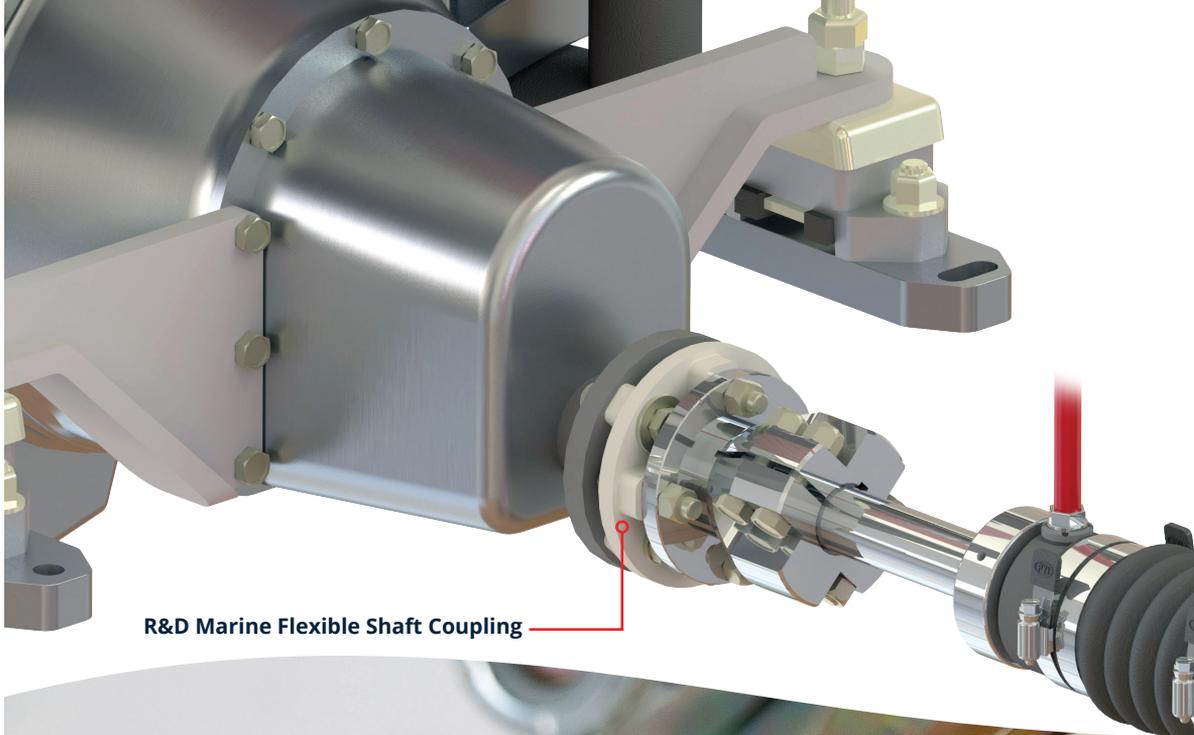
FAIL-SAFE DESIGN

The polyester elastomer disc is backed up by two metal compression straps, one on either side of the flexible coupling. These metal straps hold the system in constant compression whether the drivetrain is in forward or reverse. This feature dramatically extends the life of the system. The aft steel strap bolted to the transmission acts as a backing plate to prevent reverse thrust from pulling the element apart.



Forward Steel Strap
Bolted to the shaft coupling

Aft Steel Strap
Bolted to the transmission output



R&D Marine Flexible Shaft Coupling



Flexible Shaft Couplings available for V-Drive applications

REDUCE NOISE & VIBRATION

Staggered bolts enable the element to isolate vibrations and compensate for some misalignment. This results in reduced engine noise and transmission vibration.

The flexible disc is machined from a resilient and durable polyester elastomer. It allows the unit to flex, absorbing vibrations and temporary misalignment of the shaft and engine due to movement of the engine or flexing in the vessel's structure.

EARTHING CONNECTORS

R&D Marine Earthing Connector consists of a silver impregnated rubber strip, which when fitted through the axis of the coupling between the two fail safe straps, gives electrical continuity. R&D Marine have sizes to fit most of our couplings.



PART NUMBERS

Part #	Size (mm)	To Suit Coupling
103-036	9 x 57	910-021
103-037	11 x 57	910-001, 910-002, 910-007, 910-013, 910-014, 910-019, 910-020, 910-028, 910-043
103-038	15 x 57	910-004, 910-005
103-039	17 x 57	910-003, 910-006, 910-009, 910-012, 910-036, 910-037, 910-044, 910-052
103-040	19 x 57	910-017, 910-018, 910-025, 910-026
103-041	23 x 57	910-029, 910-038, 910-039, 910-040
103-042	25 x 57	910-032, 910-033
103-043	15 x 75	910-015, 910-016, 910-022, 910-024, 910-046, 910-048, 910-053
103-044	17 x 75	910-030, 910-041, 910-042, 910-047, 910-051
103-047	9 x 30	910-035, 910-045, 910-049, 910-050
103-053	19 x 75	910-062

REFERENCE GUIDE

STEP 1

Find your transmission make and model in the Flexible Coupling reference guide below and locate the corresponding part number(s).

Example:

ZF Hurth 45A with 5" output flange

ALLISON				PARAGON				TWIN DISC Continued...														
Model #	Flange Size	R&D Part #	Max HP/100 RPM	Model #	Flange Size	R&D Part #	Max HP/100 RPM	Model #	Flange Size	R&D Part #	Max HP/100 RPM											
M25	9"	910-046	65	All Models	4"	910-005	7	SC=Shallow Case / DC=Deep Case														
BORG WARNER				SELF CHANGE GEARS				MG5010DC	6"	910-006 910-026 910-033	20 28 37											
Model #	Flange Size	R&D Part #	Max HP/100 RPM	Model #	Flange Size	R&D Part #	Max HP/100 RPM	MG5050														
70C	4"	910-001 910-004 910-014	5	350HD	8.75"	910-015	43	MG5050-V														
71C			8	700	10.75"	910-016	65	MG5050-A														
500			3	TAIPEOUNGYANG				MG50615C														
1000			Model #				Flange Size	R&D Part #				Max HP/100 RPM	MG5061-A									
1500	TK250				178mm	910-038	55	MG5061V														
71C	5"	910-009 910-029 910-044 910-057	13	TECHNODRIVE				MG5062V				7.25"	910-017 910-039	40 55								
72C			20	Model #	Flange Size	R&D Part #	Max HP/100 RPM	MG506-1														
5000			8	4"	910-001 910-004 910-014	5 8 3	TMC30	13 20 8							MG506A-1							
73C			25				MG507-1															
7000	6"	910-003 910-025 910-032	20				MG507A-1															
			28				MG5075IV															
37	5	TM260	MG5075-A																			
BUKH				TM93	5"	910-009 910-029 910-044	MG5075SC	7.25"	910-017 910-039	40 55												
Model #	Flange Size	R&D Part #	Max HP/100 RPM	TM93A																		
All models	4"	910-013 910-028	3 5	TM170																		
ENFIELD AND SONIC DRIVES				TM170A			6"				910-006 910-026 910-033	MG506DC	7.25"	910-017 910-039	40 55							
Model #	Flange Size	R&D Part #	Max HP/100 RPM	TM345																		
2 Bolt		910-021	2.5	TM345A																		
LISTER				TM485A								7.25"				910-018 910-025 910-044	MG507-1	7.25"	910-017 910-039	40 55		
Model #	Flange Size	R&D Part #	Max HP/100 RPM	TM545A																		
All Models	4.5"	910-052	10	TM880A																		
NEWAGE PRM				TM130B													7.25"				910-018	MG5075A (1)
S=Shallow Case / D=Deep Case				TM200B (Up to 1.28:1)	40	910-018		MG5075SC														
Model #	Flange Size	R&D Part #	Max HP/100 RPM	TM265																		
Delta	4"	910-001 910-004 910-014	5	TM265A																		
80			8	TMC200B (Up to 4.48:1)			40	910-018	MG5081SC													
120			3	TM1200A					MG5081A (1)													
150			13	TWIN DISC					MG5082A													
101	5"	910-009 910-029 910-044	20	SC=Shallow Case / DC=Deep Case					MG5082SC (1)													
140			8	Model #			Flange Size	R&D Part #	Max HP/100 RPM	MG5085A (1)												
160			8	MG 340			4"	910-001 910-004 910-014	5 8 3	MG5090A												
260			20	MG5010SC						7.25"	910-017 910-039	40 55	MG509SC									
175	37	MG5011SC	4.75"	910-003 910-025 910-032	20 28 37	MG509U																
265	6"	910-003 910-025 910-032				20							5"	910-036	10	MG5091SC						
301						28	MG502-V (2)	4.25" PCD	910-009 910-029 910-044 910-057							13 20 8 25	MG5095A					
302						37	MG502-I (2)										9"	910-022 910-050	65 85	MGX5095A		
310			7.25"	910-018 910-040	10	MG5010A																
401	910-003 910-025 910-032	910-036			10	MG5011A																
402						910-003 910-025 910-032	910-036	10	MG5005A													
500									10.5"				910-024	85	MG5012SC							
750			910-024	85											MG5015A							
601 3:1	910-024	85			MG5020SC																	
1000 3:1					910-024	85	MG5055A															
601 4:1							910-024	85	MG5055A													
1000 4:1			910-024	85					MG5055A													
1200S	910-024	85							MG5055A													
1500S					910-024	85			MG5055A													
1750S							910-024	85	MG5055A													
1200D			910-024	85					MG5055A													
1500D	910-024	85							MG5055A													
1750D					910-024	85			MG5055A													

If gearbox requires an adapter (refer to the KEY at the bottom of this page), please contact PYI Inc. at:

425-355-3669 or info@pyiinc.com

TWIN DISC Continued...				ZF-HURTH Continued...				ZF-HURTH Continued...													
Model #	Flange Size	R&D Part #	Max HP/100 RPM	Model #	Flange Size	R&D Part #	Max HP/100 RPM	Model #	Flange Size	R&D Part #	Max HP/100 RPM										
MG5091DC	10.5	910-024	85	45A 1.25:1	4"	910-001 910-004 910-014	5 8 3	300-1TS	6" (0.625" bolt holes)	910-006 910-026 910-033	20 28 37										
MG509DC				45C				300ATS													
MG510DC				35 HBW				300-1ATS													
MG5111DC				40HBW				301C													
MG5114DC				50HBW				301A													
MG5113				100 HBW				300IVTS													
MG514				125H HSW				110ATS													
VOLVO				125HBW				4.75"				910-003 910-025 910-032	20 28 37	110IVTS	8"	910-049	75				
Model #	Flange Size	R&D Part #	Max HP/100 RPM	150HBW										220A (3)				311 IRM	7.25"	910-017	40
MS	4"	910-007 910-019 910-020 910-059	3 3 5 8	150A HBW										225A (3)				ZF	5"	910-009 910-029 910-044 910-057	13 20 8 25
RB				450D HSW										ZF (3)				311			
MS 2				ZF										325-1A Volvo							
MS 10				45A										350							
MS 15				45C										350A							
MS 25				63										350TS							
MS 3				63A	350ATS																
MS 4	63C	350V																			
MS 5	63A	350IV																			
HS25A	63C	311PL IRM																			
HS45A	88C	350PL-2 IRM																			
HS63A	90TS	350A-2 IRM																			
MS 4	90ATS	350PL-1 IRM																			
MS 5	110TS	350A-1 IRM																			
HS25A	360 HBW	350 IRM																			
HS45A	450H2 HSW	350V-LD IRM																			
HS63A	450AW HSW	ZF																			
YANMAR (KANZAKI)				450D HSW	6" (0.5" bolt holes)	910-003 910-025 910-032	20 28 37	W320	8.75"	910-049	75										
Model #	Flange Size	R&D Part #	Max HP/100 RPM	630H1 HSW				ZF (4)				15MIV (4)	4"	910-034 910-055 910-061	12 7 19						
KBW10	4"	910-002 910-043	3 5	630A1 HSW				150V HSW (4)				90IVTS	5"	910-034 910-055 910-061	12 7 19						
KM2				78mm PCD				450D HSW				630D HSW				63IV					
KM3				5"				910-012				10				630H1 HSW	ZF-HURTH V DRIVE (OPEN CENTER)				
KM35	100mm PCD	ZF	Model #										Flange Size	R&D Part #	Max HP/100 RPM						
KBW10		630A1 HSW	ZF (4)										4"	910-034 910-055 910-061	12 7 19						
KBW21		630A1 HSW	15MIV (4)										4"	910-034 910-055 910-061	12 7 19						
KM4		100mm PCD	150V HSW (4)										5"	910-034 910-055 910-061	12 7 19						
KM4A		5"	910-009 910-029 910-037 910-057										13 20 13 25	ZF	KEY						
KM4A														4.25 PCD	45	(1) - Needs adapter 202-356					
KM5				4.25 PCD				45-1				(2) - Needs adapter 202-148									
ZF-HURTH				80A				6" (0.625" bolt holes)				910-006 910-026 910-033	20 28 37	(3) - Needs adapter 202-384							
Model #	Flange Size	R&D Part #	Max HP/100 RPM	80-1A										(4) - Needs adapter 202-351							
ZF	4"	910-001 910-004 910-014	5 8 3	85A																	
35				800A2 HSW																	
4M				800A3 HSW																	
5M				220																	
10M				280A																	
12				280-1A																	
M12M				280-1A																	
15M				280IV																	
15MA				285A																	
25M				285IV																	
25				286																	
25A				286A																	
25MA				286IV																	
30M				300TS																	

TO ORDER VISIT WWW.PYIINC.COM OR CALL 425-355-3669

QUICK GUIDE

Use this guide to quickly choose the correct coupling based off the flange diameter and coupling capacity.

STEP 2

Calculate power of coupling required.

To calculate power of coupling required use the formula below:

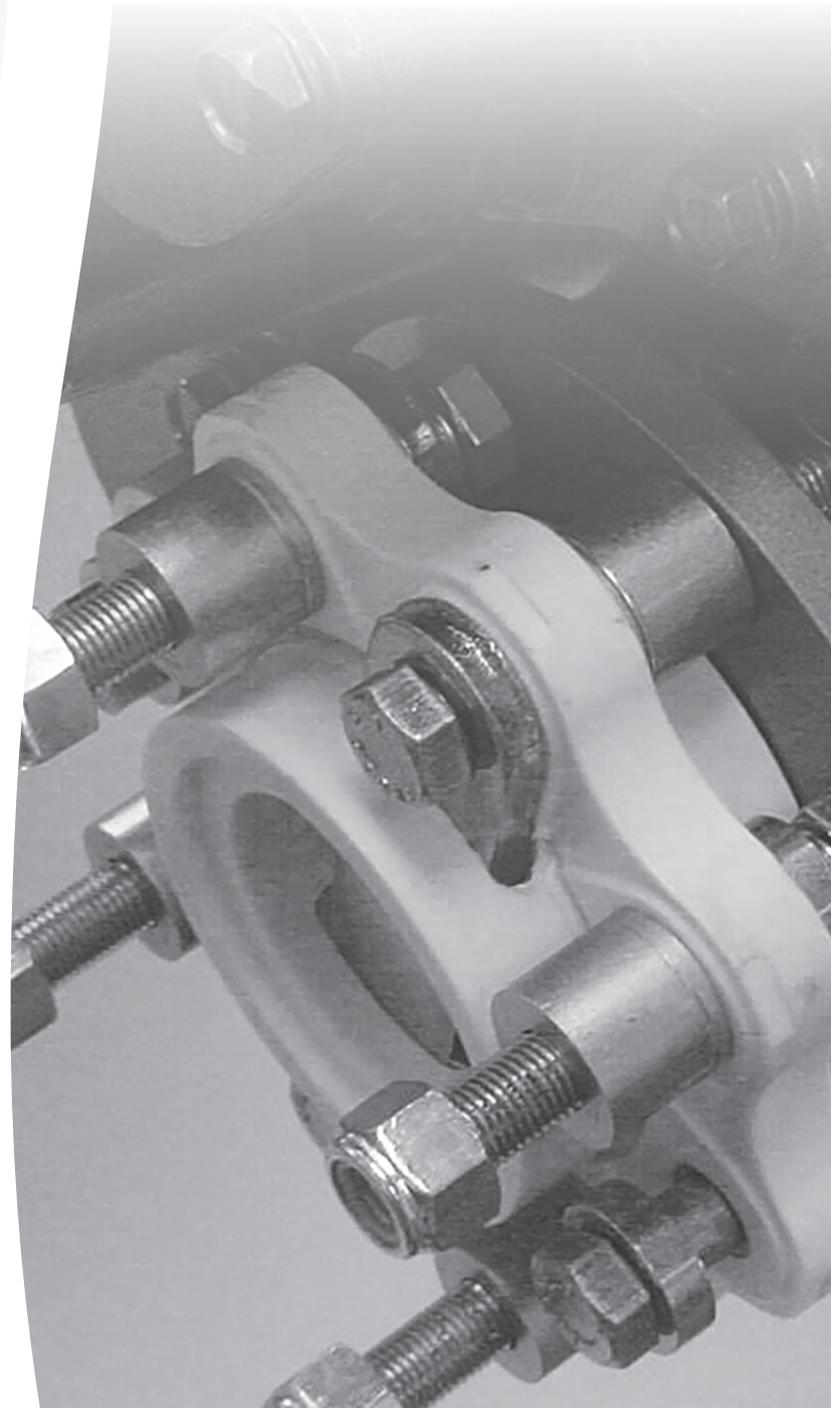
Formula:

$$\left[\frac{\text{Horsepower of Engine}}{\text{Engine Speed (Max RPM)}} \times \text{Reduction Ratio} \times 100 = \text{HP/100 RPM} \right]$$

Example:

$$\frac{150}{2,500} \times 2 \times 100 = 12 \text{ HP/100 RPM}$$

Flange Size	Gearbox Manufacturer and Compatible Couplings	Horsepower / 100 RPM
4"	Borg Warner, Twin Disc, ZF-Hurth, Newage, Technodrive	
	910-001	5
	910-004	8
	910-014	3
	Yanmar (Kanzaki)	
	910-002	3
	910-043	5
	Volvo	
	910-007 (3)	3
	910-019	3
	910-020	5
	910-059	8
	Bukh	
	910-013	3
	910-028	5
	Paragon	
	910-005	7
	ZF-Hurth V-Drive - Open Center - Adapter Required	
	910-034	12
	910-055	7
910-061	19	
5"	Borg Warner, Twin Disc - 4.25" PCD, ZF-Hurth, Yanmar - 4.25" PCD, Newage, Technodrive, Volvo	
	910-009	13
	910-029	20
	910-044	8
	910-057	25
	Yanmar (Kanzaki) - 100mm PCD	
	910-012	10
	Twin Disc - 4.125" PCD	
	910-036	10
	ZF-Hurth V-Drive - Open Center - Adapter Required	
	910-034	12
	910-055	7
910-061	19	
6"	Twin Disc, ZF-Hurth - 0.625" Holes	
	910-006	20
	910-026	28
	910-033	37
	ZF-Hurth - 0.5" Holes	
	910-003	20
	910-025	28
910-032	37	



STEP 3

Select part number that closest matches your HP / 100 RPM dictated in Step 2. * HP / 100 RPM cannot exceed max.

Example:

Using the example, there are four options for a ZF Hurth 45A with a 5" flange, the 910-009, 910-029, 910-044 or 910-057. Based on our 12 HP/100 RPM the best option would be 910-009 that is rated for 13 HP/100 RPM.

- - These couplings are fitted with a shouldered bush to locate in the gearbox flange.
- - These flexible couplings have been approved by Bureau Veritas.
- X - These flexible couplings have been approved by Lloyds Register of Shipping.
- # - For the Hurth HBW 150 V Gearbox an adapter 202-351 is required (0.875" long).
- - Open center flexible couplings

Part #	Manufacturer	Gearbox Flange Dimensions						Flexible Coupling Details						Ref				
		Diameter inches / mm		# of Bolts	Ø of holes inches / mm		Bolt Pitch Circle inches / mm		Register inches / mm		Diameter inches / mm		Length inches / mm		Bolt Ø	Max / 100 rpm hp / kW		
910-001	B/W, PRM, ZF-Hurth, Technodrive	4	101.6	4	0.39	10	3.25	82.55	2.5	63.5	4.5	114.3	1.28	32.5	M10	5	3.73	
910-002	Yanmar	4	101.6	4	0.39	10	3.07	78	1.97	50	4.5	114.3	1.28	32.5	M10	3	2.24	
910-003	B/W, PRM, ZF-Hurth, Twin Disc	5.75	146	6	0.5	12.7	4.75	120.6	3	76.2	6	152.4	1.87	47.5	1/2 UNF	20	14.92	X O
910-004	B/W, PRM, ZF-Hurth	4	101.6	4	0.39	10	3.25	82.55	2.5	63.5	4.5	114.3	1.4	35.6	M10	8	5.97	
910-005	Paragon	4	101.6	4	0.38	9.7	3.25	82.55	2.63	66.7	4.5	114.3	1.35	34.5	3/8 UNF	7	5.22	
910-006	Twin Disc, ZF-Hurth	5.75	146	6	0.63	16	4.75	120.6	3	76.2	6	152.4	1.87	47.5	1/2 UNF	20	14.92	O X O
910-007	Volvo	4	101.6	4	0.39	10	3.15	80	2.36	60	4.5	114.3	1.72	43.7	M10	3	2.24	
910-009	B/W, PRM, ZF-Hurth, Volvo	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	5.63	143	1.77	45	7/16 UNF	13	9.69	X O
910-012	Yanmar	5	127	4	0.39	10	3.93	100	2.56	65	5.31	135	1.77	45	M10	10	7.46	
910-013	Bukh	3.54	90	4	0.32	8.1	2.93	74.5	1.85	47	4.5	114.3	1.28	32.5	M8	3	2.24	
910-014	B/W, PRM, ZF-Hurth, Technodrive	4	101.6	4	0.39	10	3.25	82.55	2.5	63.5	4.5	114.3	1.28	32.5	M10	3	2.24	
910-015	Self Change 350HD	8.75	222.2	6	0.44	11.2	7.5	190.5	6	152.4	8.75	222.2	1.75	44.5	7/16 UNF	43	32.1	O
910-016	Self Change 700HD	10.25	260.4	6	0.63	16	9	228.6	6	152.4	10.88	276.4	2.28	58	5/8 UNF	65	48.47	X O
910-017	Twin Disc	7.25	184.2	6	0.75	19	6	152.4	3.75	190.5	7.5	190.5	2.39	60.7	5/8 UNF	40	29.84	O X O
910-018	PRM	7.25	184.2	6	0.63	16	6	152.4	3.75	190.5	7.5	190.5	2.39	60.7	5/8 UNF	40	29.84	X O
910-019	Volvo	4	101.6	4	0.39	10	3.15	80	2.36	60	4.5	114.3	1.28	32.5	M10	3	2.24	
910-020	Volvo	4	101.6	4	0.39	10	3.15	80	2.36	60	4.5	114.3	1.28	32.5	M10	5	3.73	
910-021	Enfield, Sonic	4	101.6	2	0.44	11.2	3	76	-	-	4.25	108	1.64	41.7	7/16 UNF	2.5	1.87	
910-022	Twin Disc	9	228.6	8	0.89	22.6	7.5	190.5	6	152.4	8.75	222.2	1.75	44.5	1/2 UNF	65	48.47	O X O
910-024	Twin Disc	10.5	266.7	8	1	25.4	8.75	222.2	5	127	10.88	276.4	2.23	56.7	5/8 UNF	85	63.38	O X O
910-025	B/W, PRM, ZF-Hurth, Twin Disc	5.75	146	6	0.5	12.7	4.75	120.6	3	76.2	6	152.4	1.96	49.8	1/2 UNF	28	20.88	X O
910-026	Twin Disc, ZF-Hurth	5.75	146	6	0.63	16	4.75	120.6	3	76.2	6	152.4	1.96	49.8	1/2 UNF	28	20.88	O X O
910-027	ZF W320 320A	8.86	225	8	0.67	17	7.72	196	5.51	140	9	228.6	1.75	44.5	1/2 UNF	65	48.47	O
910-028	Bukh	3.54	90	4	0.32	8.1	2.93	74.5	1.85	47	4.5	114.3	1.28	32.5	M8	5	3.73	
910-029	B/W, ZF-Hurth, Volvo	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	5.63	143	2.06	52.4	7/16 UNF	20	14.92	O
910-030		11.5	292.1	8	1	25.4	9.75	247.6	6	152.4	11.5	292.1	2.3	58.4	5/8 UNF	120	89.48	O X O
910-032	B/W, PMR, ZF-Hurth, Twin Disc	5.75	146	6	0.5	12.7	4.75	120.6	3	76.2	6	152.4	2.18	55.4	1/2 UNF	37	27.6	
910-033	Twin Disc, ZF-Hurth	5.75	146	6	0.63	16	4.75	120.6	3	76.2	6	152.4	2.18	55.4	1/2 UNF	37	27.6	O
910-034	Open Center V Drive 52mm Bore	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	6.38	162	1.77	45	7/16 UNF	12	8.95	#
910-035		13.38	340	8	1	25.4	11.63	295.3	6	152.4	13.7	348	4.25	108	5/8 UNF	160	119.3	O
910-036	Twin Disc	5	127	4	0.39	10	4.13	104.8	2.5	63.5	5.63	143	1.77	45	M10	10	7.46	
910-037	Yanmar	5.12	130	4	0.48	12.3	4.25	107.9	2.5	63.5	5.63	143	2.01	51.1	7/16 UNF	13	9.69	
910-038	Taipeoungyang TK 250	7	178	6	0.56	14.3	5.98	152	3.94	100	7.5	190.5	2.49	63.3	M14	55	41	
910-039	Twin Disc	7.25	184.2	6	0.75	19	6	152.4	3.75	190.5	7.5	190.5	2.49	63.3	5/8 UNF	55	41	O
910-040	PRM	7.25	184.2	6	0.63	16	6	152.4	3.75	190.5	7.5	190.5	2.49	63.3	5/8 UNF	55	41	
910-041		11.5	292.1	8	1	25.4	9.75	247.6	6	152.4	11.5	292.1	2.3	58.4	5/8 UNF	140	104.4	O
910-043	Yanmar	4	101.6	4	0.39	10	3.07	78	1.97	50	4.5	114.3	1.28	32.5	M10	5	3.73	
910-044	B/W, PRM, ZF-Hurth, Volvo	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	5.6	143	1.77	45	7/16 UNF	8	5.97	
910-045		13.38	340	8	1	25.4	11.63	295.3	6	152.4	13.7	348	4.25	108	3/4 UNF	230	171.5	O
910-046	Allison M25	9	228.6	8	0.75	19	7.5	190.5	6	152.4	8.75	222.2	1.75	44.5	1/2 UNF	65	48.47	O
910-048	Twin Disc MG 5111 SC	9	228.6	6 (8)	0.89	22.6	7.5	190.5	6	152.4	8.75	222.2	2.47	62.7	1/2 UNF	65	48.47	O X O
910-049	ZF 325-1A	8.07	205	10	0.71	18	6.69	170	5.51	140	8.78	223	4.88	124	M18	75	56	
910-050	Twin Disc 510A/5114A	9	228.6	8	0.89	22.6	7.5	190.5	6	152.4	9	228.6	4	101.6	1/2 UNF	85	63.38	O
910-051	Twin Disc MG 521	11	279.4	8	0.75	19	9.5	241.3	6	152.4	11.25	260.4	2.3	58.4	5/8 UNF	120	89.48	O
910-052	2F, 220A, Lister, Twin Disc 502	4.75	120.7	6	0.44	11.2	3.88	98.5	2.5	63.5	5.94	150.9	2.75	69.9	7/16 UNF	10	7.46	
910-054	Open Center V Drive 58mm Bore	5.75	146	6	0.5	12.7	4.75	120.6	3	76.2	6.77	172	1.87	47.5	1/2 UNF	24	17.9	
910-055	Open Center V Drive 52mm Bore	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	6.38	162	1.77	45	7/16 UNF	7	5.2	#
910-057	B/W, Hurth, Volvo	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	5.63	143	2.06	52.4	7/16 UNF	25	18.64	
910-059	Volvo	4	101.6	4	0.39	10	3.15	80	2.36	60	4.5	114.3	1.4	35.6	M10	8	5.96	
910-060	TMP	4.44	112.8	2	0.44	11.2	3.19	81	-	-	4.44	112.8	1.5	38.1	7/16 UNF	3.25	2.42	
910-061	Open Center V Drive 52mm Bore	5	127	4	0.44	11.2	4.25	107.9	2.5	63.5	6.38	162	2.07	52.6	7/16 UNF	19	14.16	
910-063	Open Center V Drive 58mm Bore	5.75	146	6	0.5	12.7	4.75	120.6	3	76.2	6.77	172	2.185	55.5	1/2 UNF	32	23.8	
910-064	Open Center V Drive 67mm Bore	7.25	184.2	6	0.63	16	6	152.4	3.75	190.5	9.06	230	2.51	63.8	5/8 UNF	50	37.3	

SHAFT COUPLING

Reduce Vibration & Costly Transmission Repairs

R&D Marine has developed a comprehensive range of Split Shaft Couplings with flange sizes from 4" to 7-1/4" diameter. Split Shaft Couplings can accommodate the variations that occur with normal shaft tolerances, are easy to install, and can be adjusted to the required position on the shaft.

FEATURES

- Easy installation
- Easy removal
- Better fit and face than solid coupling
- Machined from solid steel

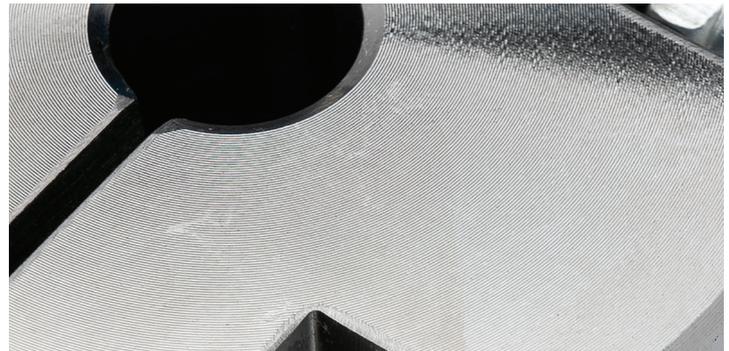


BEST FIT POSSIBLE

By clamping onto the shaft, the R&D Marine Split Shaft Coupling can overcome normal shaft tolerances. Easy to remove shaft, even after years of use. Provides a better fit and face than a solid slip-on coupling.

INCREASED STRENGTH

Unlike other shaft couplings on the market that are cast steel, the R&D Marine Split Shaft Couplings are machined from solid steel. This gives increased strength and durability.



ACCESSORIES



FLANGE ADAPTERS

R&D Marine can provide an adapter for most gearboxes to allow the fitting of a flexible coupling from their extensive range. Please contact PYI Inc. for sizes and pricing.



BOBBINS

R&D Marine can provide a Bobbin to extend the shaft. Please contact PYI Inc. for sizes and pricing.

IMPERIAL

Part #	Type of Gearbox	Bore Diameters (Inches)										
		0.75"	0.875"	1"	1.125"	1.25"	1.5"	1.75"	2"	2.25"	2.5"	2.75"
202-153	4" BW, PRM, ZF Hurth Max Bore: 1.5"	B		B	B	B	B					
202-254	4" Yanmar Max Bore" 1.5"	B		B	B	B						
202-255	4" Volvo Max Bore: 1.5"	B										
202-489	4" Bukh Max Bore: 1.5"	B										
202-168	5" BW, PRM, ZF Hurth, Volvo Max Bore: 2"		P	B	B	BK	BK	BK	BK			
202-313	5" IRM 220, MG 502, Lister Max Bore 2"		P									
202-316	5" Yanmar Max Bore: 2"		P			BK						
202-176	6" PRM Max Bore: 2.5"		P			BK	BK	BK	BK	BK	BK	
202-188	6" Twin Disc Max Bore: 2.5"		P									
202-381	7.25" PRM 601, 1000 4:1 Max Bore: 2.75"						P					
202-468	7.25" PRM 1500 Max Bore: 2.75"						P					
202-469	7.25" Twin Disc Max Bore: 2.75"						P					
202-470	7.25" ZF 311A Max Bore: 2.75"						P					

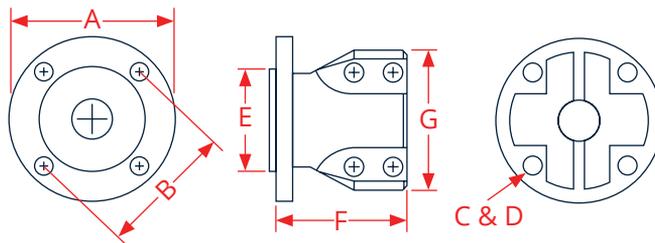
- P** - Pilot drilled open tolerance
- B** - Bored Only / Can be keyed
- BK** - Bored and must be keyed

Shaded area designates range of bores covered.

Note: Please contact PYI if shaft size is not listed.

METRIC

Part #	Type of Gearbox	Bore Diameters (mm)										
		22mm	25mm	30mm	35mm	40mm	45mm	50mm	55mm	60mm	70mm	
202-153	4" BW, PRM, ZF Hurth Max Bore: 40mm	B	B	B	B							
202-254	4" Yanmar Max Bore" 40mm	B	B	B								
202-255	4" Volvo Max Bore: 40mm	B	B	B								
202-489	4" Bukh Max Bore: 40mm											
202-168	5" BW, PRM, ZF Hurth, Volvo Max Bore: 50mm			BK	BK	BK	BK	BK				
202-313	5" IRM 220, MG 502, Lister Max Bore 50mm											
202-316	5" Yanmar Max Bore: 50mm			BK	BK							
202-176	6" PRM Max Bore: 60mm					BK	BK	BK	BK	BK		
202-188	6" Twin Disc Max Bore: 60mm							BK		BK		
202-381	7.25" PRM 601, 1000 4:1 Max Bore: 70mm											
202-468	7.25" PRM 1500 Max Bore: 70mm											
202-469	7.25" Twin Disc Max Bore: 70mm											
202-470	7.25" ZF 311A Max Bore: 70mm											



* Male register shown

Part #	Coupling Dimensions														
	Flange Ø (A)		Hole Pitch Circle (B)		# of Holes (C)	Hole Size (D)		Register Ø (E)		Length (F)	Boss Ø (G)		Clamp Bolt Size		
inches / mm	inches / mm	inches / mm	inches / mm	inches / mm		inches / mm	M = Male* F = Female	inches / mm	inches / mm		inches / mm	inches / mm			
202-153	4	102	3.25	82.55	4	0.394	10	2.5	63.5	M	3.19	81	3.38	85.9	M10
202-254	4	102	3.07	78	4	0.394	10	1.97	50	M	3.19	81	3.38	85.9	M10
202-255	4	102	3.15	80	4	0.394	10	2.36	60	F	3.28	85.8	3.38	85.9	M10
202-489	3.54	90	2.93	74.5	4	0.32	8.1	1.85	47	F	3.28	85.8	3.38	85.9	5/16" UNF
202-168	5	127	4.25	107.94	4	0.44	11.2	2.5	63.5	M	3.75	95.3	4.06	103.2	7/16" UNF
202-316	4.72	119.9	3.94	100	4	0.394	10	2.56	65	M	3.75	95.3	4.06	103.2	M10
202-176	5.75	146	4.75	120.6	6	0.5	12.7	3	76.2	M	5.5	139.7	5.38	136.7	1/2" UNF
202-188	5.75	146	4.75	120.6	6	0.63	16	3	76.2	F	5.5	139.7	5.38	136.7	5/8" UNF
202-313	5	127	3.88	98.6	6	0.47	12	2.5	63.5	F	5.63	143	4.06	103.2	M12
202-381	7.45	189.2	6	152.4	6	0.63	16	3.75	95.25	M	7.5	190.5	6.63	168.4	5/8" UNF
202-468	7.45	189.2	6	152.4	6	0.63	16	3.75	95.25	F	7.5	190.5	6.63	168.4	5/8" UNF
202-469	7.45	189.2	6	152.4	6	0.75	19	3.75	95.25	F	7.5	190.5	6.63	168.4	3/4" UNF
202-470	7.45	189.2	6	152.4	8	0.63	16	3.75	95.25	F	7.5	190.5	6.63	168.4	5/8" UNF

Supplied with clamp bolts and nuts:

- Imperial Sizes: Keyways to BS46: Part 1 Square
- Metric Sizes: Keyways to BS4235: Part 1 Rectangular

Recommended torque specs:

- M10 - 45ft. lbs.
- 7/16" UNF - 60 ft. lbs.
- 1/2" UNF - 75 ft. lbs.
- 5/8" UNF - 155 ft. lbs.

ENGINE MOUNTS

Weight Capacity Ranging From 30 To 2,000 Pounds Per Mount

The R&D Engine Mounts are specifically designed for the rigors of marine, industrial, commercial, and heavy equipment applications.

These engine mounts are pre-loaded to provide a dampening effect when encountering upward or downward pressure. Most R&D mounts are shear loaded to absorb forward and reverse thrust, yet soft enough to isolate engine vibrations from the surface where they are mounted. To assist in the ease of installation, the mounts have nuts to adjust the height. The slotted holes in the base of the mount assist in alignment and installation.

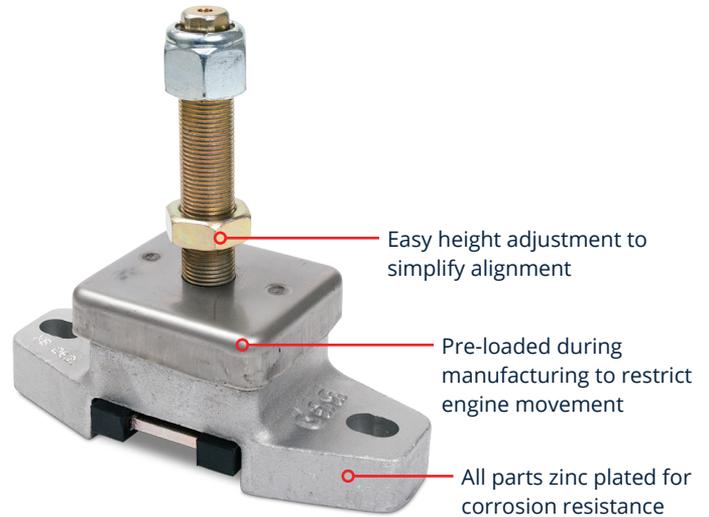
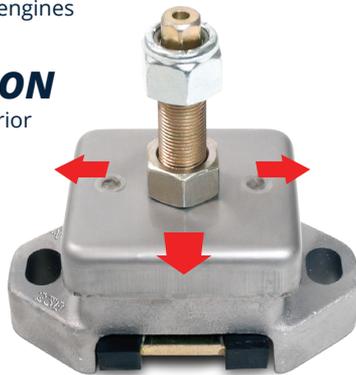
To help increase the longevity of the mounts, all steel parts are zinc plated and passivated to limit corrosion. The threads of the stud are rolled and reduce the possibility of shearing the stud. This technology produces a significantly stronger thread than possible when the material is cut away in conventional cut-thread die methods. More specifically, the thread rolling (cold forming) process strengthens the thread in three ways: tension, shear, and fatigue resistance. The rubber component is covered by an oil shield to protect the rubber from petroleum based products.

FEATURES

- Slotted holes & height adjustment to simplify alignment
- Designed for a wide variety of engines

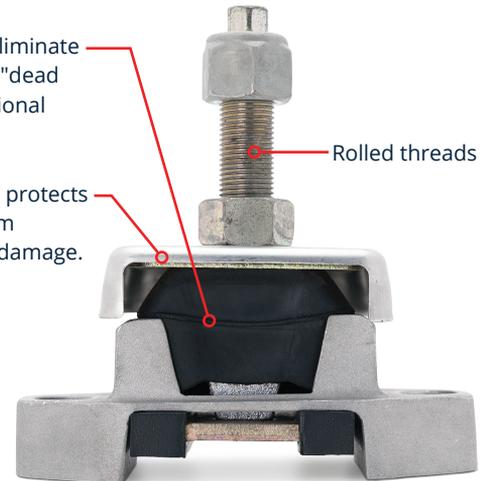
VIBRATION ISOLATION

Shear loaded mounts provide superior isolation and restrict fore and aft movement to maintain alignment.



Preloaded and soft to eliminate the vertical dampening "dead zone" found in conventional engine mounts.

Stainless steel oil shield protects the rubber element from petroleum or chemical damage.



* Cutaway

SELECTING THE RIGHT ENGINE MOUNT

Below are the formulas to use to determine the required pounds per engine mount.

FORMULAS

Front Engine Mount

$$W \times 0.4 = _ \times 0.5 = _ \text{ lbs per mount}$$

Back Engine Mount

$$W \times 0.6 = _ \times 0.5 = _ \text{ lbs per mount}$$

W = weight of engine and gearbox

Example:

Total weight of engine & gearbox = 1,200 lbs

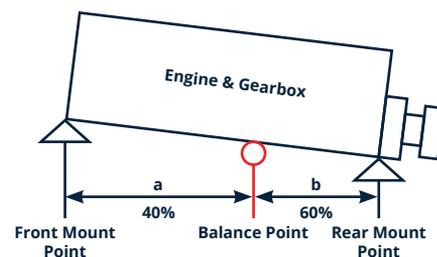
Front Engine Mount

$$1,200 \times 0.4 = 480 \times 0.5 = \underline{240 \text{ lbs per mount}}$$

Back Engine Mount

$$1,200 \times 0.6 = 720 \times 0.5 = \underline{360 \text{ lbs per mount}}$$

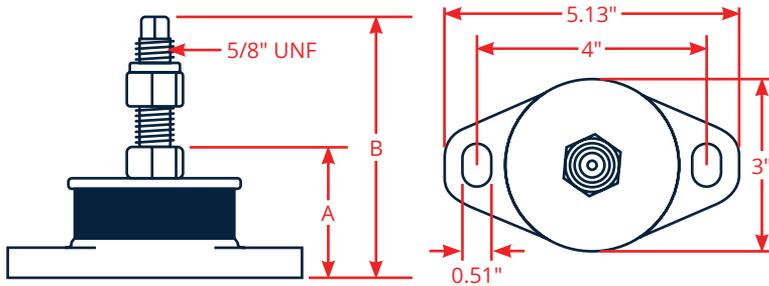
GENERAL WEIGHT DISTRIBUTION



1. Find the center of gravity by balancing on a roller (if possible).
2. If the center of gravity cannot be found, assume weight distribution of 60% on rear engine mounts, with 40% on the front engine mounts (if rear mount is in line with flywheel).

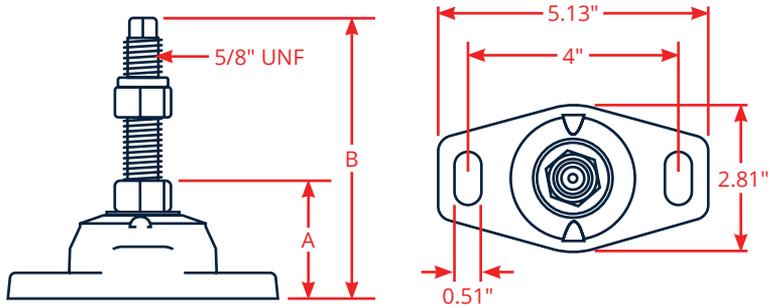
COMPRESSION MOUNTS

R&D Compression Mounts provide a competitive low height mount with basic deflection and vibration control.



5/8" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-003	100 - 180 lbs	0.06"	0.09"	2.3"	4.58"
800-004	160 - 370 lbs	0.06"	0.09"	2.3"	4.58"
800-005	320 - 500 lbs	0.06"	0.09"	2.3"	4.58"

This is a low height mount with minimum deflection.

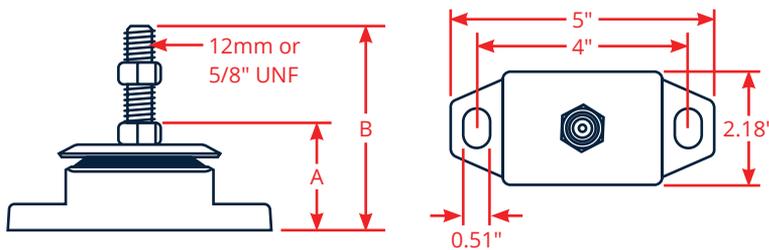


5/8" Stud				
Part #	Capacity / Mount	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-033	190 lbs	0.065"	2.3"	5.37"
800-036	300 lbs	0.065"	2.3"	5.37"

This mounting is a competitive, low height medium capacity mount giving good engine control.

RECTANGULAR SHEAR MOUNTS

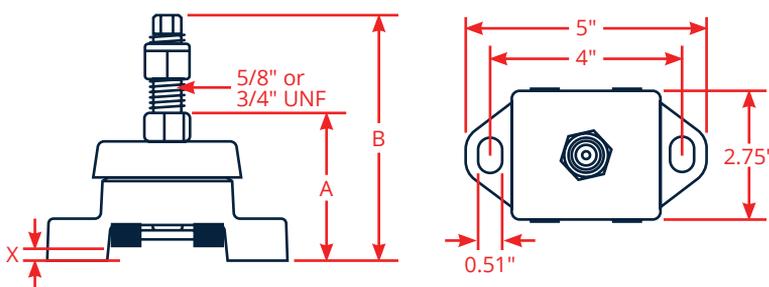
R&D Marine Rectangular Shear Mountings offer low height with the best combination of stiffness. Soft vertically and at right angles to the crankshaft to isolate vibration, stiff fore and aft to take the propeller thrust.



12mm Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-038	30 - 90 lbs	0.07"	0.07" - 0.14"	2.03"	3.9"
800-039	70 - 170 lbs	0.07"	0.07" - 0.14"	2.03"	3.9"
5/8" Stud					
800-040	30 - 91 lbs	0.07"	0.07" - 0.14"	2.19"	4.57"
800-041	70 - 171 lbs	0.07"	0.07" - 0.14"	2.19"	4.57"

SHEAR LOADED SUPER MOUNTS

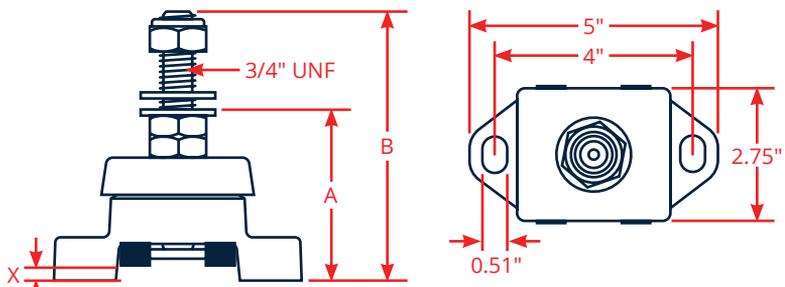
The R&D Shear Loaded Super Mounts accommodate a wide range of applications in a marine or industrial environment. Each mount has an oil shield to protect the rubber and has exceptional dampening in all directions.



"X" Dimensions on initial installation should not be less than 3.8mm (0.15").

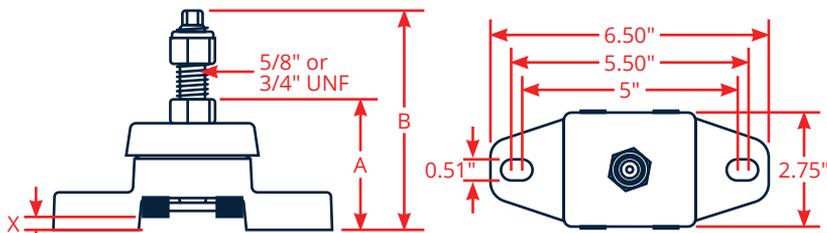
5/8" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-037	50 - 175 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-010	80 - 230 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-011	120 - 410 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-012	250 - 560 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-014	300 - 680 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
3/4" Stud					
800-020	80 - 231 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"
800-021	120 - 411 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"
800-022	250 - 561 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"
800-023	300 - 681 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"

SHEAR LOADED SUPER MOUNTS CONT'D...



"X" Dimensions on initial installation should not be less than 3.8mm (0.15").

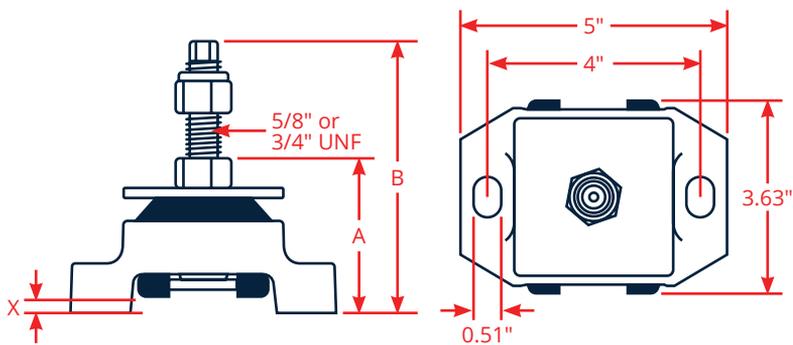
3/4" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-051	80 - 235 lbs	0.09"	0.09" - 0.21"	3.47"	5.45"
800-052	120 - 415 lbs	0.09"	0.09" - 0.21"	3.47"	5.45"
800-053	250 - 565 lbs	0.09"	0.09" - 0.21"	3.47"	5.45"
800-054	300 - 685 lbs	0.09"	0.09" - 0.21"	3.47"	5.45"



"X" Dimensions on initial installation should not be less than 3.8mm (0.15").

5/8" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-062	50 - 176 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-024	80 - 232 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-025	120 - 412 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-026	250 - 562 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"
800-027	300 - 682 lbs	0.09"	0.09" - 0.21"	3.05"	5.38"

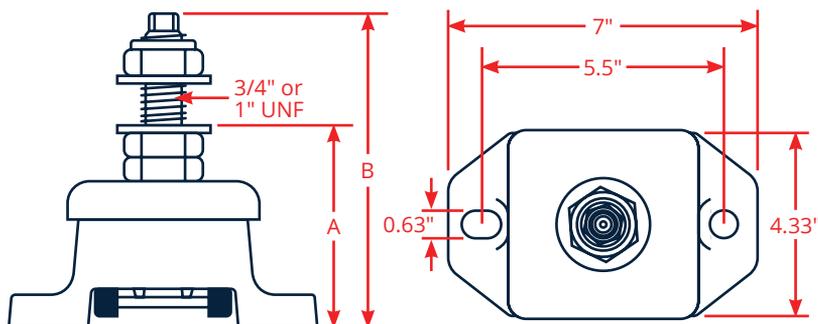
3/4" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-028	80 - 233 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"
800-029	120 - 413 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"
800-030	250 - 563 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"
800-031	300 - 683 lbs	0.09"	0.09" - 0.21"	2.93"	6.5"



"X" Dimensions on initial installation should not be less than 3.8mm (0.15").

5/8" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-013	340 - 760 lbs	0.09"	0.09" - 0.19"	2.93"	5.38"

3/4" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-035	340 - 761 lbs	0.09"	0.09" - 0.19"	2.81"	6"

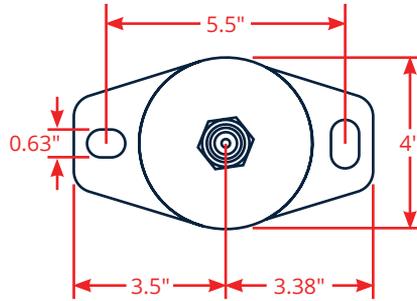
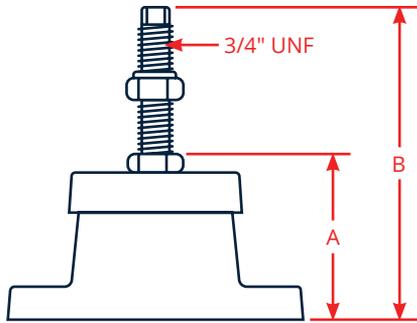


3/4" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-063	500 - 1,300 lbs	0.12"	0.12" - 0.25"	3.97"	7.16"
800-064	650 - 1,700 lbs	0.12"	0.12" - 0.25"	3.97"	7.16"
800-065	1,100 - 2,100 lbs	0.12"	0.12" - 0.25"	3.97"	7.16"

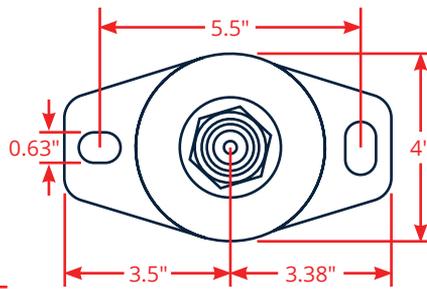
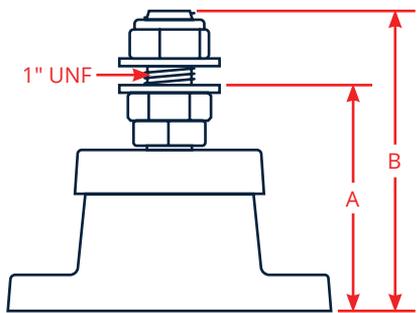
1" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-066	500 - 1,301 lbs	0.12"	0.12" - 0.25"	4.59"	7.16"
800-067	650 - 1,701 lbs	0.12"	0.12" - 0.25"	4.59"	7.16"
800-068	1,100 - 2,101 lbs	0.12"	0.12" - 0.25"	4.59"	7.16"

CIRCULAR SHEAR MOUNTS

The Circular Shear Mount is designed to provide excellent vibration isolation and is fitted with an oil shield to protect the rubber.



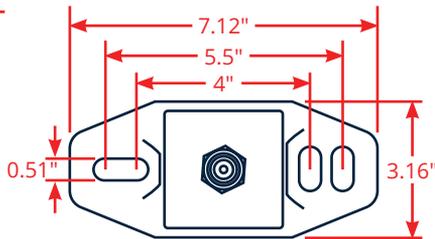
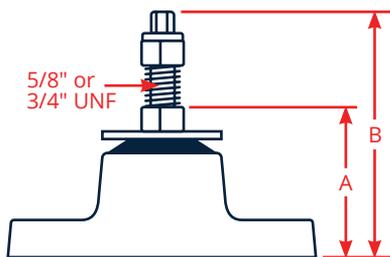
3/4" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-015	500 - 1,200 lbs	0.12"	0.12" - 0.25"	4.04"	7.22"
800-016	650 - 1,500 lbs	0.12"	0.12" - 0.25"	4.04"	7.22"
800-017	880 - 2,000 lbs	0.12"	0.12" - 0.25"	4.04"	7.22"



1" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-055	500 - 1,201 lbs	0.12"	0.12" - 0.25"	4.66"	6.34"
800-056	650 - 1,501 lbs	0.12"	0.12" - 0.25"	4.66"	6.34"
800-057	880 - 2,001 lbs	0.12"	0.12" - 0.25"	4.66"	6.34"

DOUBLE ACTING MOUNT

The Double Acting Shear Mount is a unique mount incorporating 2 rubber elements which are pre-loaded against each other, giving excellent isolation together with good control on problem installations.

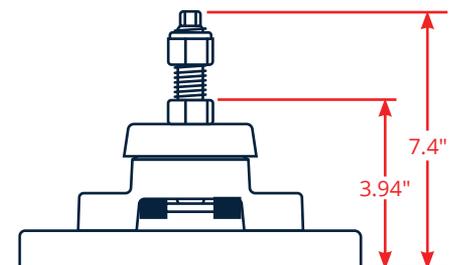
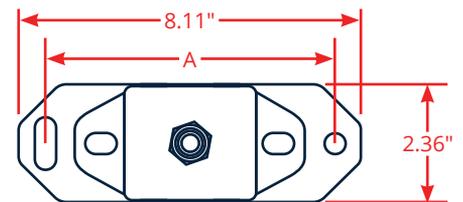


5/8" Stud					
Part #	Capacity / Mount	Mount Pre-Loaded	Deflection	Min. Height With Adjustment Nut (A)	Height (B)
800-032	100 - 420 lbs	0.19"	0.19" - 0.30"	3.51"	6"
800-034	160 - 670 lbs	0.19"	0.19" - 0.30"	3.51"	6"
3/4" Stud					
800-042	160 - 671 lbs	0.19"	0.19" - 0.30"	3.39"	6"

YANMOUNT ENGINE MOUNTS

PYI offers a range of direct replacement engine mounts for Yanmar installations. Using the proven engineered features of the R&D Marine Shear Loaded Engine Mounts and combining it with a simple, reliable lifting block to duplicate the height and bolt spacing of the Yanmar mounts.

PYI Part #	Yanmar Engine	Yanmar Ref.	Capacity Per Mount	Stud Size	(A)
Both 800-037Y	1GM	Front 128170-08350 / Rear 128170-08340	50 - 175 lbs.	5/8"	6.85"
Both 800-037Y	2GM / 3GM	Front 124772-08341 / Rear 12810-08340	50 - 175 lbs.	5/8"	6.85"
Both 800-037Y	3YM	Both 124772-08341	50 - 175 lbs.	5/8"	6.85"
Both 800-037Y	3HM	Both 124772-08341	50 - 175 lbs.	5/8"	6.85"
Both 800-037Y	2QM20	Both 124772-08341	50 - 175 lbs.	5/8"	6.85"
Both 800-037Y	3QM30	Front 121370-08530 / Rear 124772-08341	50 - 175 lbs.	5/8"	6.85"
Both 800-037Y	3JH's	Oil filter side 124772-08341 Starter side 121370-08530	50 - 175 lbs.	5/8"	6.85"
Oil filter side 800-010Y Starter side 800-011Y	4JH's	Oil filter side 121370-08351 Starter side 129470-08350	800-010Y: 80 - 230 lbs. 800-011Y: 120 - 410 lbs.	5/8"	6.85"
800-021YX	4LH	Both 119173-08440	120 - 410 lbs.	3/4"	7.25"



DAMPER PLATES

Reduces Gear Noise And Allows The Engine To Run At Lower Speeds

R&D Marine Damper Drive Plates are designed to prevent gearbox rattle at low engine speeds, which allows an engine to operate through its entire RPM range. Today's marine diesels are designed with lightweight flywheels which do not create the inertia of an older heavy flywheel. The lighter flywheels result in gear chatter or rattle at low RPM's. This rattle translates into gear wear and damage to the drivetrain. R&D Marine Damper Plates eliminate this problem.

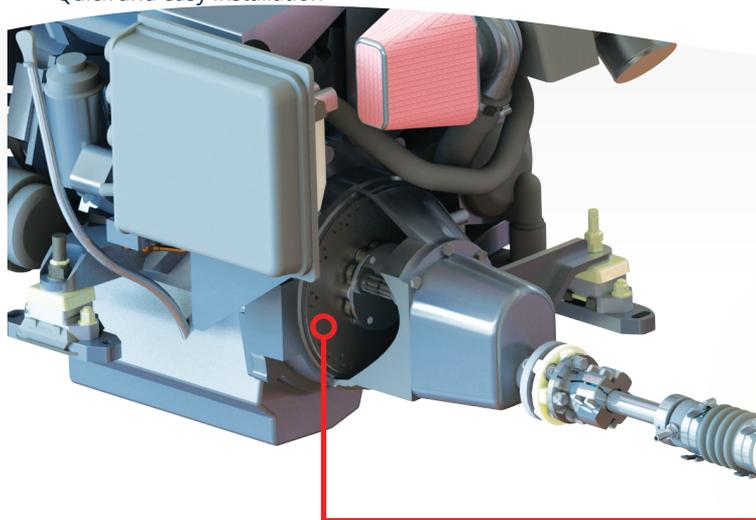
Three types of damper plates are available for different applications:

1. A "Loop" damper plate is designed for general applications. This damper provides a linear dampening of the torque with 3 degrees of deflection of the element.
2. A "Hammer Head" damper plate is designed for general use where motoring at low RPM's is common. This damper provides a two stage dampening of the torque with 9 degrees deflection of the element.
3. A "High Deflection" damper plate is designed for use in vessels where low RPM engine use is the norm as in work boats or where gear noise is being experienced. The "HD" damper gives three distinct stages of dampening with 30 degrees deflection of the element, virtually eliminating gearbox rattle for extended use even at idle speeds.

All R&D Damper Plates use a molded polyurethane element to absorb the engine torque. The fail safe design of the plate ensures that even in the unlikely event of a flexible element failure (from severe shock load), the drivetrain system would remain functional. The back plates for the R&D Marine damper plates are punched and ready to install. They can be installed within the existing space of a metal spring damper.

FEATURES

- Reduces gear noise
- Fail safe design
- Quick and easy installation



VIBRATION ISOLATION

R&D Marine Damper Drive Plates reduce gear noise by preventing transmission rattle at low engine speed and allow the engine to run at lower speeds.

DURABLE

No springs to rust or fret. The flexible element is designed to withstand increased temperatures and is not affected by salt water, diesel or lubrication oils.

WIDE RANGE OF STOCK

Damper Plates to fit most engine and gearbox combinations for engines up to 800 horsepower and torque range from 60 - 1,400 ft/lbs.

EASY INSTALLATION

The R&D Marine Damper Drive Plate requires no machining and is ready to bolt to the flywheel.

Many marine engines are fitted with a spring type damper plate. Most spring plates only provide 3 degrees of deflection. Also, steel springs will tend to corrode in a marine environment.

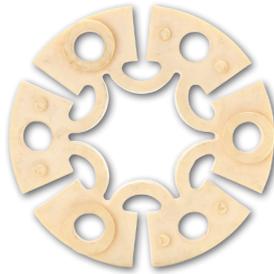
The drive, or damper plate, as it is often called, bolts to the engine flywheel and connects the engine to the transmission/gearbox's splined shaft.

The R&D Marine Damper Plates use a special element and are designed to load at lower RPM's and prevent the input spline from backlash to reduce spline gear wear.

ELEMENT TYPES



Loop Type
Linear stiffness up to 3 degrees of deflection. General purpose robust element which can be mounted either way round on the flywheel and can rotate in either direction.



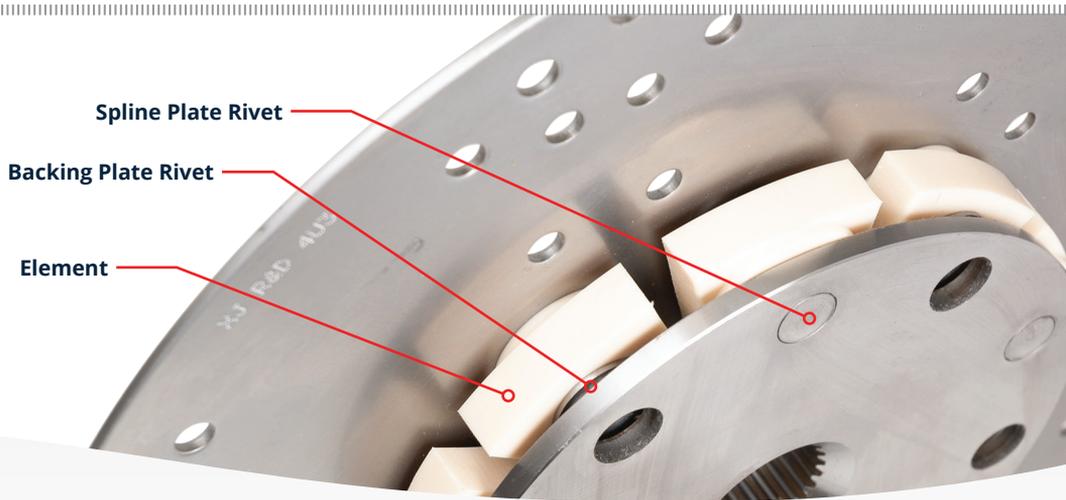
Hammer Head
Two stage with up to 9 degrees of deflection. More torsionally flexible than the loop type, usually has smaller diameter element than our other designs but still retains the ability to be mounted either way round on the flywheel and rotate in either direction.



High Deflection (H/D)
A maximum deflection up to 30 degrees, slightly larger diameter element than other designs and can easily be fitted to rotate in the standard direction of rotation (counter-clockwise looking at the flywheel). With the element facing the gearbox. Suitable for work boats with slow speed work and pleasure boats.

FAIL SAFE DESIGN

If the flexible element fails, the rivets on the spline plate will engage the rivets on the backing plate. This will allow the drive to be maintained in the unlikely event of an element failure.



DAMPER PLATE SELECTION PROCEDURE

The R&D Marine Damper Plate is comprised of 3 main components, Spline Plate, Element, and Back Plate. These 3 components are given a code which make up the finished part number. The following procedure will lead you through the selection process.

1. SELECT ELEMENT

Select the correct power and style of element for the application. Use the manufacturer's maximum torque figure for the engine or calculate from the known data of maximum horsepower rating and RPM. Using the example installation we get 61.25 ft. lbs. of torque.

Example

1. Westerbeke 42B with 42HP at 3,600 RPM
2. ZF HBW35 transmission with 10 tooth spline
3. Back plate diameter 6.12", fixing holes 5" x 0.25" on 5.593"

To calculate output torque of engine:

Formula:

$$\left[\frac{\text{Max Horsepower of Engine}}{\text{Engine Speed (Max RPM)}} \times 5,250 = \text{Torque lbft} \right]$$

Example:

$$\frac{42}{3,600} \times 5,250 = 61.25 \text{ ft. lbs.}$$

From the Element Selection Chart (**List #1**) we see the most suitable element has a code of AM and a fixing of 3 x 3/8 (4.00).

2. SELECT SPLINE / SPLINE CODE

Select the correct spline/ spline code (**List #2**) to suit the gearbox input shaft. Using the example, go to the gearbox details to find the ZF-Hurth HBW 35 has a 10 Tooth DIN 5464 input spline. Next, use **List #3** to choose the spline code that corresponds with the chosen element ("AM"). In this case we choose spline code "22" because it is compatible with the "AM" element.

3. SELECT BACKING PLATE

Select the correct back plate to suit the flywheel. Using the example, go to **List #4** to find the matching bolt pattern to fit the flywheel fixing, in this case back plate code "4". **Damper required for this example: Spline Plate: 22 | Element: AM | Back Plate: 4 | Part number: RD-22-AM-4**

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DAMPER PLATE SELECTION

STEP 1 - SELECT ELEMENT

- Calculate ft/lbs. of torque.
- Select type of element.
- Match ft/lbs of torque to find element code.
- Find your element code in the table below.

STEP 2 - SELECT SPLINE

- Find your gearbox in table to determine spline type.
- Using the location of element code (table below), find matching spline description and note what the spline code is.

STEP 3 - SELECT BACKING PLATE

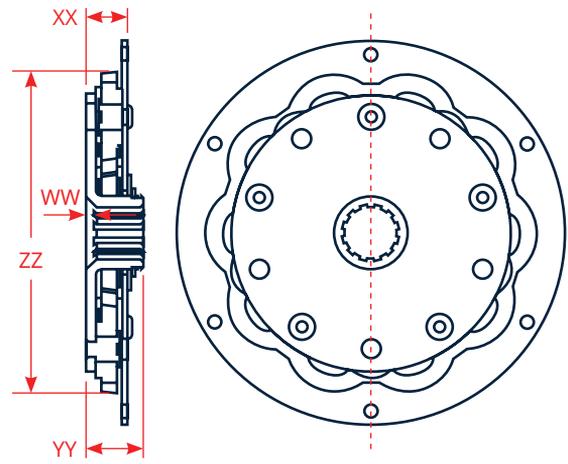
Part # Example:

RD- _____ - _____ - _____

Step 2 1 3
Spline Element Backing
Code Code Plate
Code

RD-22-AM-4

WW = Start of
spline from
front face



LIST #3														
Spline	STEP 2 Spline Plate Code	STEP 1 Element Code		Element Fixing	Damper Dimensions						STEP 3 Back Plate Ref			
		Group 1 (ZZ1)	Group 2 (ZZ2)		WW (mm / inch)	XX (mm / inch)	YY (mm / inch)	Group 1 ZZ1 (mm / inch)	Group 2 ZZ2 (mm / inch)	Group 2 ZZ2 (mm / inch)				
22T PA 30	1				0	0	25.4	1.00	32	1.25	127	5.00		
26T 20/40 DP	2				2.3	0.09	25.4	1.00	32	1.25	127	5.00		
17T 24/48 DP	12	AM, W, A, B	3 x 3/8 (4.00)		0	0	25.4	1.00	32	1.25	127	5.00		
1" x 10 SAE	13				0	0	25.4	1.00	32	1.25	127	5.00		
10T DIN 5464	22				0	0	25.4	1.00	32	1.25	127	5.00		
20T 30PA 24/48 DP	66				0	0	25.4	1.00	32	1.25	127	5.00		
26T 20/40 DP	42				5	0.20	25.4	1.00	35	1.38	182	7.13	214	8.43
10T DIN 5464	43	AN	4 x 3/8 (6.00)		0	0	25.4	1.00	35	1.38	182	7.13	214	8.43
17T 24/48 DP	44				0	0	25.4	1.00	35	1.38	182	7.13	214	8.43
17T 16/32 DP	46				1.8	0.07	25.4	1.00	35	1.38	182	7.13	214	8.43
1" 10 SAE	45				2.3	0.09	25.4	1.00	35	1.38	182	7.13	214	8.43
20T 30PA 24/48 DP	65				0	0	25.4	1.00	35	1.38	182	7.13	214	8.43
26T 20/40 DP	71	AL	4 x 3/8 (6.50)		12.5	0.49	26.4	1.04	34	1.34	194	7.64		
26T 20/40 DP	76				5	0.20	26.4	1.04	34	1.34	194	7.64		
10T DIN 5464	72				0	0	26.4	1.04	34	1.34	194	7.64		
17T 16/32 DP	73				2.4	0.09	26.4	1.04	34	1.34	194	7.64		
1" x 10 SAE	74				2.6	0.10	26.4	1.04	34	1.34	194	7.64		
20T 30PA 24/48 DP	75		1	0.04	26.4	1.04	34	1.34	194	7.64				
26T 20/40 DP	3	D, L	5 x 3/8 (5.593)		5	0.20	25.4	1.00	35	1.38	175	6.90	207	8.13
26T 20/40 DP	5				5	0.20	25.4	1.00	35	1.38	175	6.90	207	8.13
1" x 10 SAE	14				2.3	0.09	25.4	1.00	35	1.38	175	6.90	207	8.13
1-1/8" x 10 SAE	16				2.3	0.09	25.4	1.00	35	1.38	175	6.90	207	8.13
17T 16/32 DP	18				1.8	0.07	25.4	1.00	35	1.38	175	6.90	207	8.13
10T DIN 5464	23	Y, U, R	5 x 1/2 (5.593)		0	0	25.4	1.00	35	1.38	175	6.90	207	8.13
17T 24/48 DP	32				0	0	25.4	1.00	35	1.38	175	6.90	207	8.13
26T 20/40 DP	4				5	0.20	28.7	1.13	35	1.38	182	7.13	207	8.13
26T 20/40 DP Long	9				0	0	28.7	1.13	43	1.69	182	7.13	207	8.13
18T 12/24 DP	21				0	0	28.7	1.13	38.1	1.50	182	7.13	207	8.13
17T 16/32 DP	31	S	5 x 1/2 (5.593)		1.8	0.07	28.7	1.13	35	1.38	182	7.13	207	8.13
32T 16/32 DP	26				0	0	38.5	1.52	57.2	2.25			207	8.13
1-5/8" x 10	27				0	0	28.7	1.13	38.1	1.50			207	8.13
1-5/8" x 10	27				0	0	28.7	1.13	38.1	1.50			207	8.13
1-1/2" x 10	11				0	0	28.7	1.13	38.1	1.50	182	7.13	207	8.13
PR 1500	54		0	0	63.2	2.49	79.3	3.12			207	8.13		
26T 20/40 DP	4	H, N	4 x 1/2 (4.50)		5	0.20	31.8	1.25	35	1.38	207	8.13		
26T 20/40 DP Long	9				0	0	31.8	1.25	43	1.69	207	8.13		
18T 12/24 DP	21				0	0	31.8	1.25	38.1	1.50	207	8.13		
32T 16/32 DP	26				0	0	41.7	1.64	57.2	2.25	207	8.13		
1-5/8" x 10	27				0	0	31.8	1.25	38.1	1.50	207	8.13		
1-1/2" x 10	11		0	0	31.8	1.25	38.1	1.50	207	8.13				
PR 1500	54		0	0	66.3	2.61	79.3	3.12	207	8.13				
26T 20/40 DP	6	AJ, F, J	3 x 1/2 (4.50)		5	0.20	29.5	1.16	36	1.41	183	7.19		
26T 20/40 DP HT	8				5	0.20	29.5	1.16	36	1.41	183	7.19		
1-1/2" x 10	10				0	0	29.5	1.16	36	1.41	183	7.19		
1-1/8" x 10 SAE	17				2.3	0.09	29.5	1.16	36	1.41	183	7.19		
17T 16/32 DP	19				1.8	0.07	29.5	1.16	36	1.41	183	7.19		
1-5/8" x 10	28		0	0	29.5	1.16	38.1	1.50	183	7.19				
26T 20/40 DP	7	AD	4 x 1/2 (8.00)		8.1	0.32	29.5	1.16	36	1.41	158	6.19		
1" x 10 SAE	15				2.3	0.09	29.5	1.16	36	1.41	158	6.19		
17T 16/32 DP	20				1.8	0.07	29.5	1.16	36	1.41	158	6.19		
17T 24/48 DP	41				1.8	0.07	29.5	1.16	36	1.41	158	6.19		
26T 20/40 DP	48				6	0.24	29	1.14	36	1.41	235	9.25		
17T 16/32 DP	49	Z, AF	6 x 5/8 (8.00)		1.8	0.07	29	1.14	36	1.41	235	9.25		
26T 20/40 DP	57				0	0	29	1.14	36	1.41	235	9.25		
32T 16/32 DP	40				0	0	44.2	1.74	57.2	2.25	330	13.00		
PR 1500	55				0	0	68.6	2.70	79.3	3.12	330	13.00		
26T 20/40 DP	56			AH	6 x 5/8 (8.00)		0	0	44.2	1.74	51.6	2.03	330	13.00
32T 16/32 DP	40		0			0	47.3	1.86	57.2	2.25	330	13.00		
PR1500	55		0			0	71.9	2.83	79.3	3.12	330	13.00		
26T 20/40 DP	56		0			0	47.3	1.86	51.6	2.03	330	13.00		
26T 20/40 DP	50	AE	4 x 1/2 (10.25)				0	0	31.8	1.25	39	1.53	302	11.88
18T 12/24 DP	51				0	0	31.8	1.25	39	1.53	302	11.88		
17T 16/32 DP	52				0	0	31.8	1.25	39	1.53	302	11.88		

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STEP 1: SELECT ELEMENT

LIST #1				
Torque (ft lb)	Design	Code	Element Fixing	Rotation
High Deflection				
100	H/D	AM	3 x 3/8 (4.00)	Anti-Clockwise
200	H/D	AN	4 x 3/8 (6.00)	Anti-Clockwise
300	H/D	AL	4 x 3/8 (6.50)	Anti-Clockwise
500	H/D	AD	4 x 1/2 (8.00)	Anti-Clockwise
700	H/D	AE	4 x 1/2 (8.00)	Anti-Clockwise
Hammer Head				
100	Hammer	W	3 x 3/8 (4.00)	Either
160	Hammer	D	5 x 3/8 (5.59)	Either
250	Hammer	Y	5 x 1/2 (5.59)	Either
300	Hammer	AJ	3 x 1/2 (4.50)	Either
310	Hammer	L	5 x 3/8 (5.59)	Either
350	Hammer	U	5 x 1/2 (5.59)	Either
550	Hammer	R	5 x 1/2 (5.59)	Either
Loop Type				
60	Loop	A	3 x 3/8 (4.0)	Either
100	Loop	B	3 x 3/8 (4.0)	Either
180	Loop	E	5 x 3/8 (5.59)	Either
200	Loop	F	3 x 1/2 (4.50)	Either
250	Loop	G	5 x 3/8 (5.59)	Either
270	Loop	H	4 x 1/2 (4.50)	Either
300	Loop	J	3 x 1/2 (4.50)	Either
330	Loop	K	5 x 1/2 (5.59)	Either
400	Loop	M	5 x 3/8 (5.59)	Either
450	Loop	N	4 x 1/2 (4.50)	Either
450	Loop	V	5 x 1/2 (5.59)	Either
550	Loop	P	5 x 1/2 (5.59)	Either
750	Loop	S	5 x 1/2 (5.59)	Either
1200	Loop	Z	6 x 5/8 (10.2)	Anti-Clockwise
1200	Loop	AF	6 x 5/8 (10.2)	Clockwise
1200	Loop	AH	6 x 5/8 (10.2)	Anti-Clockwise

STEP 2: SELECT SPLINE

LIST #2			
Gearbox	Description	Spline Ø	
		mm	inch
Borg Warner			
71, 72, 73, 5000	26T 20/40 DP	35.4	1.394
1000, 1500	22T PA 30	18.5	0.729
500	10T B10 x 23 x 29 DIN 5464	29	1.142
7000	SAE 1.5" x 10T	38.1	1.5
Newage PRM			
Delta	17T 24/48 DP	19.7	0.776
80, 120, 150	10T B10 x 23 x 29 DIN 5464	29	1.142
100, 101, 140, 160, 260	SAE 1" x 10T	25.4	1
175, 250, 265, 310	SAE 1.125" x 10T	28.6	1.125
301, 302, 401, 402, 500, 750	17T 16/32 DP	28.84	1.135
In-Line 301, 302, 401, 402, 500, 750	26T 20/40 DP	35.4	1.394
601, 1000	18T 12/24 DP	40.5	1.595
1200, 1500	20T 12/24 DP	44.8	1.761
Paragon			
P Series	26T 20/40 DP	35.4	1.394
Self Change Gear			
MRF 350HD	32T 16/32 DP	52.3	2.060
MRF 350	SAE 1.625" x 10T	41.3	1.625
Technodrive			
TMC 30, 40, 50, 60	10T B10 x 23 x 29 DIN 5464	29	1.142
TM 93, 170, 260, 345, 485, 545, 880	26T 20/40 DP	35.4	1.394
TMP			
1200, 1500	26T 20/40 DP	35.4	1.394
Twinn Disc			
501, 502	26T 20/40 DP	35.4	1.394
Volvo			
140 Leg Old 270-280 Leg	SAE 1" x 10T	25.4	1
MS3, 4, 5 HS1 Sail Drive 110 New 270-280 Leg	26T 20/40 DP	35.4	1.394
120 Leg, MS	20T 30PA 24/48 DP	22.6	0.89
Yanmar			
Kanzaki	20T 30PA 24/48 DP	22.6	0.89
ZF-Hurth			
HBW 35, 40, 50, 100, 125, 150	10T B10 x 23 x 29 DIN 5464	29	1.142
HSW 125, HBW 250, 360, 25M	26T 20/40 DP	35.4	1.394
HSW 450, 630, 800, IRM 220A	26T 20/40 DP	35.4	1.394

STEP 3: SELECT BACKING PLATE

LIST #4					
Code	O/D mm	O/D inch	Flywheel Fixing mm	Flywheel Fixing inch	Remarks
1	298.5	11.75	6 x 8.1 on 200	6 x 0.32 on 7.875	
			6 x 8.1 on 250	6 x 0.32 on 9.843	
			6 x 8.1 on 269.9	6 x 0.32 on 10.625	
			6 x 8.1 on 273	6 x 0.32 on 10.75	
2	362	14.25	6 x 8.1 on 200	6 x 0.32 on 7.875	
			6 x 8.1 on 210	6 x 0.32 on 8.268	
			6 x 8.1 on 263	6 x 0.32 on 10.375	
			6 x 8.1 on 269.9	6 x 0.32 on 10.625	
			6 x 8.1 on 276.3	6 x 0.32 on 10.875	
			6 x 8.1 on 289	6 x 0.32 on 11.375	
			6 x 8.1 on 295.3	6 x 0.32 on 11.625	
			6 x 8.8 on 304.8	6 x 0.32 on 12.00	
			6 x 8.1 on 314.4	6 x 0.32 on 12.375	
			6 x 8.1 on 320.7	6 x 0.32 on 12.625	
			12 x 9.5 on 343	6 x 0.375 on 13.5	
3	336.5	13.24	6 x 8.1 on 200	6 x 0.32 on 7.875	
			6 x 8.1 on 210	6 x 0.32 on 8.268	
			6 x 8.1 on 263	6 x 0.32 on 10.375	
			6 x 8.1 on 269.9	6 x 0.32 on 10.625	
			6 x 8.1 on 276.3	6 x 0.32 on 10.875	
			6 x 8.1 on 289	6 x 0.32 on 11.375	
			6 x 8.1 on 295.3	6 x 0.32 on 11.625	
			6 x 8.8 on 304.8	6 x 0.344 on 12.00	
			6 x 8.1 on 314.4	6 x 0.32 on 12.375	
			6 x 9.5 on 320.7	6 x 0.375 on 12.625	
4	155.45	6.12	5 x 6.35 on 142	5 x 0.25 on 5.593	
5	352.5	13.875	8 x 10.6 on 142	8 x 0.416 on 13.125	SAE 11-1/2
6	202.6	7.978	8 x 8.1 on 181	8 x 0.32 on 7.125	
7	180.8	7.12	9 x 6.35 on 167.4	9 x 0.25 on 6.589	
8	298.5	11.75	6 x 8.1 on 200	6 x 0.32 on 7.875	
			6 x 8.1 on 250	6 x 0.32 on 8.843	
			6 x 8.1 on 269.9	6 x 0.32 on 10.625	
			6 x 8.1 on 273	6 x 0.32 on 10.75	
13	234	9.212	6 x 13.1 on 210	6 x 0.515 on 8.267	
14	352.5	13.875	8 x 10.6 on 333.4	8 x 0.416 on 13.125	SAE 11-1/2
15	362	14.25	12 x 9.5 on 342.9	12 x 0.375 on 13.50	Ford
17	314.3	12.375	6 x 8.1 on 200	6 x 0.32 on 7.875	SAE 10
			6 x 8.1 on 250	6 x 0.32 on 9.843	
			6 x 8.1 on 269.9	6 x 0.32 on 10.625	
			6 x 8.1 on 273	6 x 0.32 on 10.750	
			8 x 10.6 on 296	8 x 0.416 on 11.625	

Code	O/D mm	O/D inch	Flywheel Fixing mm	Flywheel Fixing inch	Remarks		
25	287.4	11.312	6 x 9.1 on 269.96	6 x 0.356 on 10.625	TAMD 40		
34	466.7	18.375	6 x 6.3 on 269.96	3 x 0.25 on 10.625			
35	263.5	10.375	8 x 13.5 on 438.15	8 x 0.53 on 17.250	SAE 14		
36	266.7	10.5	6 x 9.5 on 244.5	6 x 0.375 on 9.625	SAE 8		
			12 x 8.1 on 222.3	12 x 0.32 on 8.750			
			6 x 8.1 on 244.5	6 x 0.32 on 9.625			
			Spaced 3 groups of 2 apart 23°59'07"	Spaced 3 groups of 2 apart 23°59'07"			
			12 x 8.1 on 246	12 x 0.32 on 9.685			
			12 x 8.1 on 242	12 x 0.32 on 9.527			
37	266.7	10.5	12 x 8.1 on 222.3	12 x 0.32 on 8.750	Suit Ford XLD and Mitsubishi		
			6 x 8.1 on 244.5	6 x 0.32 on 9.625			
			Spaced 3 groups of 2 apart 23°59'07"	Spaced 3 groups of 2 apart 23°59'07"			
			12 x 8.1 on 246	12 x 0.32 on 9.685			
			12 x 8.1 on 242	12 x 0.32 on 9.527			
			12 x 8.1 on 242	12 x 0.32 on 9.527			
40	241.3	9.5	8 x 8.5 on 222.25	8 x 0.334 on 8.750	SAE 7-1/2		
43	263.5	10.375	6 x 9.5 on 244.5	6 x 0.375 on 9.625	SAE 7-1/2		
49	241.3	9.5	8 x 8.5 on 222.25	8 x 0.334 on 8.750	Beta		
52	-0.05	-0.002	8 x 13.5 on 438.15	8 x 0.53 on 17.250	SAE 14		
60	215.9	8.5	6 x 8.1 on 200	6 x 0.32 on 7.875	SAE 6-1/2		
78	352.5	13.875	8 x 10.6 on 333.4	8 x 0.416 on 13.125	SAE 11-1/2		
79	466.7	18.375	8 x 13.5 on 438.15	8 x 0.53 on 17.250	SAE 14		
88	189.9	7.48	6 x 8.1 on 170	6 x 0.31 on 6.693	Nanni, Yanmar		
91	314.3	12.375	6 x 8.1 on 200	6 x 0.32 on 7.875	SAE 10		
			-0.05	-0.002		6 x 8.1 on 250	6 x 0.32 on 9.843
			-0.13	-0.005		6 x 8.1 on 269.9	6 x 0.32 on 10.625
				SAE		6 x 8.1 on 273	6 x 0.32 on 10.750
		10	8 x 10.6 on 296	8 x 0.416 on 11.625			
94	287.4	11.312	6 x 9.1 on 269.96	6 x 0.356 on 10.625	Trans Auto		
			6 x 6.3 on 269.96	3 x 0.25 on 10.625	TAMD 40		
95	235	9.250	6 x 8.1 on 222.25	6 x 0.32 on 8.750	Beta		
101	352.5	13.875	8 x 10.6 on 333.4	8 x 0.416 on 13.125	SAE 11-1/2		
103	466.7	18.375	8 x 13.5 on 438.15	8 x 0.53 on 17.250	SAE 14		
117	276	10.866	6 x 8.1 on 250	6 x 0.32 on 9.843	Yanmar JH		
118	170	6.693	6 x 8.1 on 150	6 x 0.32 on 5.91	Yanmar 3GM		
145	215.9	8.5	6 x 8.1 on 200	6 x 0.32 on 7.875	SAE 6-1/2		
146	241.3	9.5	8 x 8.5 on 222.25	8 x 0.334 on 8.750	SAE 7-1/2		
147	263.5	10.375	6 x 9.5 on 244.5	6 x 0.375 on 9.625	SAE 8		
148	314.3	12.375	8 x 10.6 on 296	8 x 0.416 on 11.625	SAE 10		
149	352.5	13.875	8 x 10.6 on 333.4	8 x 0.416 on 13.125	SAE 11-1/2		

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LECOMBLE & SCHMITT

Complete Autopilot Drives & Steering Systems



In 1947, Lecomb & Schmitt (L&S) began designing and manufacturing high quality industrial hydraulic systems. In 1983, with almost 40 years of experience engineering and manufacturing hydraulic systems, L&S began producing marine steering systems for commercial and pleasure boat applications. L&S is now the leading manufacturer of hydraulic steering systems for pleasure boats, fishing, and work crafts. In 1998, L&S became part of the Artzainak Industrial Group. Artzainaks added engineering and manufacturing resources, further increasing L&S ability to deliver innovative products with unmatched quality and reliability.

L&S products are designed to withstand many years of use in a harsh marine environment with very little maintenance. The most common service needed can be completed with a seal kit or other common parts available from PYI Inc.



AUTOPILOT DRIVES

Linear Drives & Hydraulic Power Packs

L&S offers a complete range of Linear Drives and Power Packs for autopilot installation on private, commercial, power, and sailing vessels. The L&S range of Drives and Pumps is fully compatible with all major brands of autopilots.



INBOARD

STEERING SYSTEMS

Pleasure & Commercial Applications

L&S' full range of inboard steering components allows you to specify and install the highest quality hydraulic steering equipment on your vessel. Standard L&S cylinder designs are rated for up to 14,770 ft.lbs. L&S delivers Hydraulic Steering Systems for small and large recreational vessels, commercial fishing and work boats. Please use our catalog as a specification guide or contact us assistance.



OUTBOARD

STEERING SYSTEMS

L&S offers the widest range of Hydraulic Helm Pumps & Cylinders for outboard steering systems on the market. L&S offers a complete range of kits, including the Helm Pump, Hoses, Fittings, and Cylinder. Individual components are available as well allowing you to customize a system for your boat.



POWER ASSISTED STEERING SYSTEMS

L&S produces a line of Power Assist Steering Systems rated up to 2,000 KPM for vessels into the 130' range. L&S Power Assist Steering systems offer smooth operation, steering accuracy and a reduced number of wheel turns.



STEER BY WIRE SYSTEMS

Lecomb & Schmitt, Steer By Wire is the next generation of Hydraulic Marine Steering, offering multiple steering station options with Wheel, Jog Levers, and Joy Stick. This is combined with independent control of all major components in the system. The Steer By Wire system simplifies installation and maintenance by eliminating long hydraulic hose runs.

When the Vendée Globe fleet left Les Sables d'Olonne, more than 20 boats out of 30 were fitted with L&S hydraulic linear drive units. At the end of the race, no failure had been reported on a Lecomble & Schmitt pilot, proving that the worst sailing conditions are normal for L&S hydraulic cylinders. Linear drives L&S 40ST16 and L&S 50ST20 used on IMOCA 60 are the same as the 20,000 hydraulic pilots fitted on sailing boats for more than 10 years. After checking the 40ST16 linear drive used by Michel Desjoyeaux during 90% of the racing period, it was established that the drive could have done a second round the world race with no maintenance required!



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AUTOPILOT DRIVES

Hydraulic Linear Autopilot Drives



Lecoble & Schmitt Power Packs and Linear Drives for autopilots are perfectly adapted to the requirements of different applications, such as pleasure boating, workboats, fishing vessels, etc.

They are easy to install, state of the art machine finished and made to resist a marine environment.

You can easily select the best suited system for your boat within the most comprehensive range available on the market with a guarantee of efficiency, reliability and security.

These systems are CE approved and carry a 2 year warranty. They are fully compatible with all brands of autopilots on the market today.

Autopilot Drive units are specified based on your vessel's steering loads. Please contact PYI for assistance.

WORKING PRINCIPLE

When the boat moves away from the displayed course, the autopilot electronic computer sends current to the motor terminals or to the power pack electrovalve. Then, the cylinder will be supplied with oil and set in motion. As soon as the boat is back on the displayed course, the computer stops supplying the power pack and the cylinder stops moving.



FEATURES

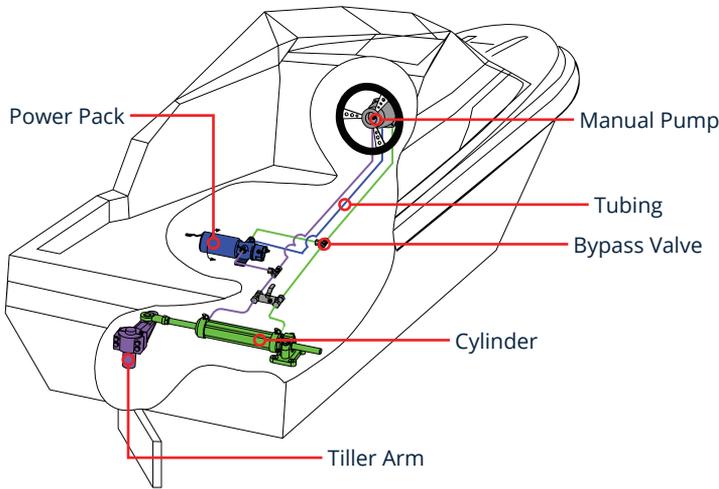
- Speed adjustment on the reversible power pack
- Separate reversible power pack for installation at your selected location
- The kit is supplied assembled and bled with 1.20 meter flexible tube. (Other lengths available upon request)
- All fittings in stainless steel
- Single rod hydraulic cylinder with integrated electrical by-pass
- Compact overall dimensions for installation on virtually all types of boats
- Direct connection to the quadrant
- Linear Feed-back "Newave" fits linear cylinder range 32 ST 16, 40 ST 16, 50 ST 20, 50 ST 203, and 63 ST 28
- Available in 12 or 24 volts

PART NUMBERS

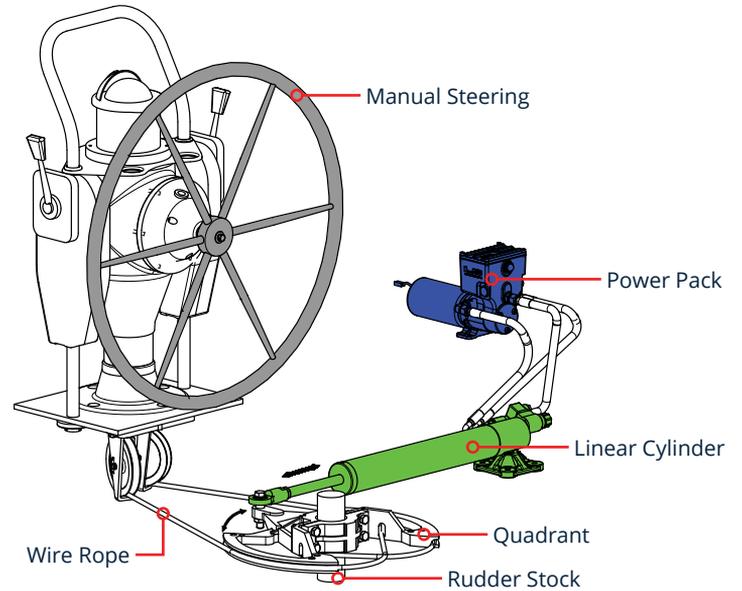
PART #	DESCRIPTION
2203063	Linear Drive 32ST16 New Wave 12v RI
2203064	Linear Drive 32ST16 New Wave 24v RI
2203066	Linear Drive 40ST16 New Wave 12v RI
2203067	Linear Drive 40ST16 New Wave 24v RI
2203603	Linear Drive 40ST16 REG DEBP 12v with adjustable flow
2203616	Linear Drive 40ST16 REG DEBP 24v with adjustable flow
2203068	Linear Drive 50ST20 New Wave 12v RI
2203069	Linear Drive 50ST20 New Wave 24v RI
2203070	Linear Drive 50ST203 New Wave 12v RI
2203071	Linear Drive 50ST203 New Wave 24v RI
2203805	Linear Drive 63ST28 New Wave 12v RI
2203802	Linear Drive 63ST28 New Wave 24v RI



POWER BOAT EQUIPPED WITH HYDRAULIC STEERING

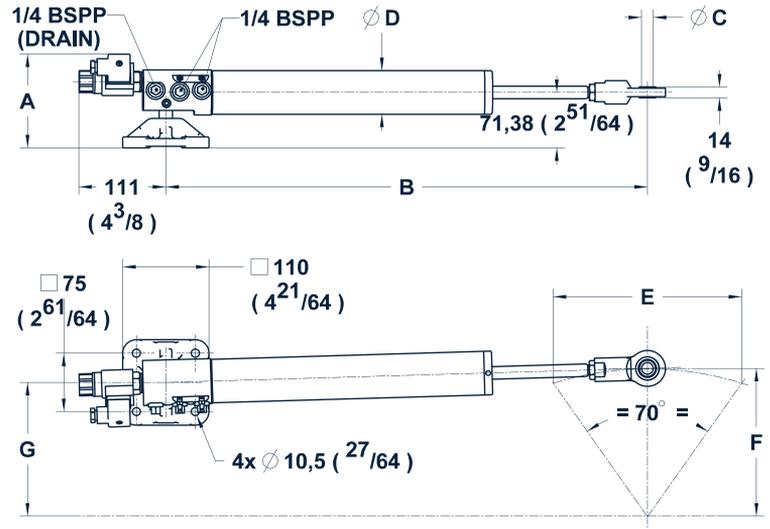


SAILBOAT EQUIPPED WITH WIRE ROPE STEERING



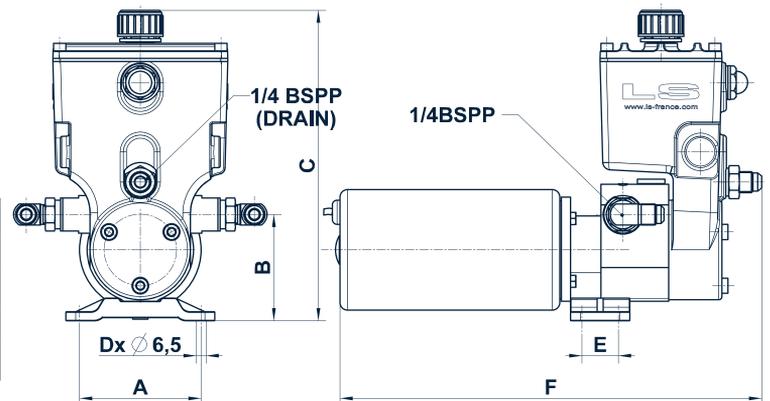
TECHNICAL SPECIFICATIONS

MODEL #	VHM 32ST16 DEBP		VHM 40ST16 DEBP		VHM 50ST20 DEBP	
PART # - 12v	2203084		2203086		2203088	
PART # - 24v	2203085		2203087		2203089	
MAXIMUM THRUST	280 kg	617 lbs	450 kg	992 lbs	700 kg	1,543 lbs
WEIGHT	3.5 kg	7.71 lbs	3.5 kg	7.71 lbs	5 kg	11 lbs
A	120 mm	4 ²³ / ₃₂ "	120 mm	4 ²³ / ₃₂ "	120 mm	4 ²³ / ₃₂ "
B	563 mm	22 ¹¹ / ₆₄ "	613 mm	24 ¹ / ₈ "	715 mm	28 ⁹ / ₆₄ "
C	15 mm	¹⁹ / ₃₂ "	15 mm	¹⁹ / ₃₂ "	17 mm	⁴³ / ₆₄ "
D	46 mm	1 ¹³ / ₁₆ "	56 mm	2 ²⁵ / ₆₄ "	70 mm	2 ³ / ₄ "
E	210 mm	8 ¹⁷ / ₆₄ "	240 mm	9 ⁷ / ₁₆ "	300 mm	11 ¹³ / ₁₆ "
F	170 mm	6 ¹¹ / ₁₆ "	190 mm	7 ³¹ / ₆₄ "	240 mm	9 ²⁹ / ₆₄ "
G	160 mm	6 ¹⁹ / ₆₄ "	172 mm	6 ⁶¹ / ₆₄ "	218 mm	8 ³⁷ / ₆₄ "



	RV1 NEW WAVE	RV2 NEW WAVE	RV3 NEW WAVE
12v PART #	2203074	2203077	2203080
24v PART #	2203075	2203078	2203081

MODEL	A	B	C	D	E	F
RV1 New Wave	80	70	186	4	24	280
RV2 New Wave	3 ⁵ / ₃₂ "	2 ³ / ₄ "	7 ² / ₆₄ "	4	¹⁵ / ₁₆ "	11 ¹ / ₆₄ "
RV3 New Wave	100	88	204	2	0	320
	3 ¹⁵ / ₁₆ "	3 ¹⁵ / ₃₂ "	8 ¹ / ₃₂ "	2	0	12 ²³ / ₃₂ "



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ACCESSORIES

For All Lecomble & Schmitt Autopilot Drives



L&S offers accessories and spares allowing you to increase efficiency and maintain your L&S Drive Unit.

ECOPILOT

The Ecopilot energy saving device was designed to meet the demand for electrical energy saving on sailboats. Power reserve on board is often very limited, however it is essential for the operation of an autopilot system. The Ecopilot acts on the electro-valve which engages the autopilot. The power consumption of this electro-valve represents a major part of the total autopilot consumption. Its action consists of letting through – during a short moment – the necessary current for the electro-valve to switch on. Then the current is significantly reduced but still sufficient to maintain the electro-valve in position.



Energy Saving! Daily consumption of the electro-valve is reduced on average from 30Ah to 5Ah. Amperage draw reduced from 2.2 amps to 0.36 amps.

PART #	DESCRIPTION
2202047	Ecopilot 12v
2202048	Ecopilot 24v

AUTOPILOT MAINTENANCE KIT

Prolong the life of your Lecomble & Schmitt Linear Autopilot Drives with these maintenance kits. The kit includes everything you need.



Autopilot Maintenance Kit Includes:

- 12v or 24v electro-hydraulic clutch
- 15mm or 17mm swivel yoke (depending on which autopilot drive this is for)
- Brush holder and brushes

PART #	DESCRIPTION
2202457	Maintenance kit for standard Linear Drives and Newave 32ST16 / 40ST16 – 12 V
2202459	Maintenance kit for standard Linear Drives and Newave 32ST16 / 40ST16 – 24 V
2202458	Maintenance kit for standard Linear Drives and Newave 40T254 / 50ST20 – 12 V
2202460	Maintenance kit for standard Linear Drives and Newave 40T254 / 50ST20 – 24 V

QUICK COUPLINGS

Stainless steel Quick Couplings from Lecomble & Schmitt. Available in 15mm and 17mm. Refer to the chart below to determine which Lecomble & Schmitt Quick Coupling is for you.

LINEAR AUTOPILOT DRIVE MODEL	LINEAR AUTOPILOT DRIVE PART #	Ø OF QUICK COUPLING	QUICK COUPLING PART #
32ST16 12v	2203063	15mm	2201557
32ST16 24v	2203064	15mm	2201557
40ST16 12v	2203066	15mm	2201557
40ST16 24v	2203067	15mm	2201557
50ST20 12v	2203068	17mm	2201558
50ST20 24v	2203069	17mm	2201558



POWER PACKS

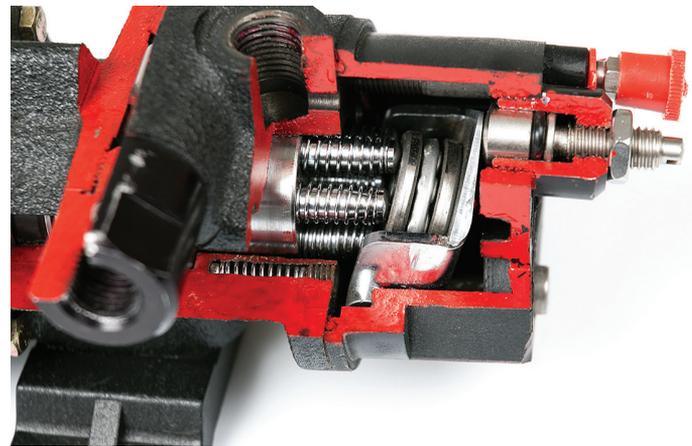
Fixed & Reversible Power Packs

REVERSIBLE POWER PACKS

Lecoble & Schmitt Hydraulic Power Packs are available in a range of reversible variable speed "on demand" units, as well as "constant running" solenoid actuated units. The reversible variable speed units are available in up to three liter per minute capacity and easily integrate into a vessel's hydraulic steering systems.

The constant running system offers hydraulic power for autopilots on vessels into the 100' range as well as power to the primary steering system.

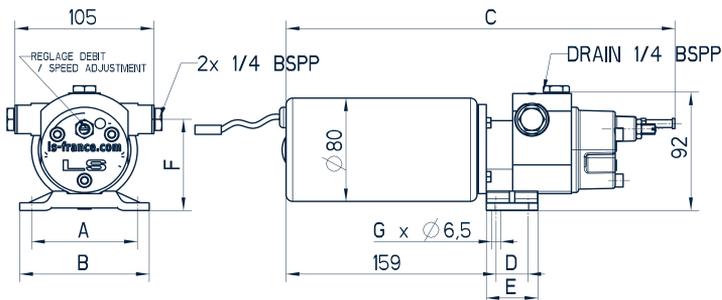
Lecoble & Schmitt Power Packs are always composed of a reversible or non reversible electrical motor in 12 or 24 volts DC, or 220/240 volts single-phased or three-phase.



The Power Pack is controlled by the electronics, and will suck or force back the oil in the circuit.

Axial piston pump or gear pump, with adjustable or fixed flow rate.

TECHNICAL SPECIFICATIONS



	RV1	RV2	RV3
Max Cylinder Capacity (CC)	216	432	650
Power Pack Flow Rate (l/mn)	0,1 à 1	0,2 à 2	0,3 à 3
Recom. Protection 12/24V	16 A / 6 A	25 A / 16 A	30 A / 16 A

MODEL	A	B	C	D	E	F	G
RV1, RV2, RV3	80 3 ¹ / ₂ "	98 3 ⁷ / ₈ "	300 11 ¹³ / ₁₆ "	24 1 ⁵ / ₁₆ "	39 1 ³⁵ / ₆₄ "	70 2 ³ / ₄ "	4



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INBOARD STEERING SYSTEMS



Hydraulic Steering Systems for Inboard Motors

Lecomble & Schmitt Hydraulic Steering Systems are perfectly adapted to inboard motor boats for pleasure, sporting and recreational fishing applications as well as to monohull and multihull sailing boats.

They are easy to install, state of the art machine finished and made to withstand the demanding marine environment.

You can easily select the best suited equipment within a wide range of pumps, cylinders and accessories which will provide the highest efficiency while maintaining reliability and smoothness.

Lecomble & Schmitt cylinders and pumps carry a 2 year warranty and are CE approved.

FEATURES

- Unparalleled smoothness
- Extremely accurate
- Reduced number of turns lock to lock



HELM PUMPS

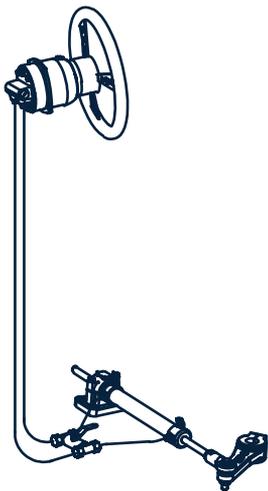
The manual pump is an axial piston pump generating hydraulic pressure to the cylinder, while managing return fluid in the hydraulic circuit when the wheel is turned.



CYLINDERS

The cylinder specification is based on the vessels steering load and is the starting point for steering systems as it delivers the steering systems power to the rudder for steering. For cylinders rated up to 14,770 ft.lbs.

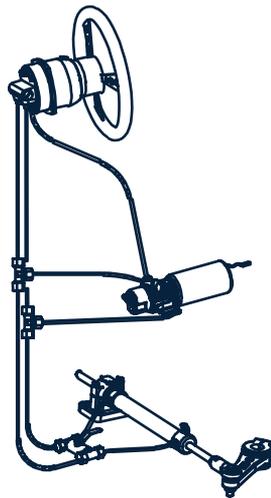
DIFFERENT TYPES OF ASSEMBLIES



- 1 Pump + LV + Fittings
- 1 Cylinder
- 2 Hoses + Fittings

OPTIONS

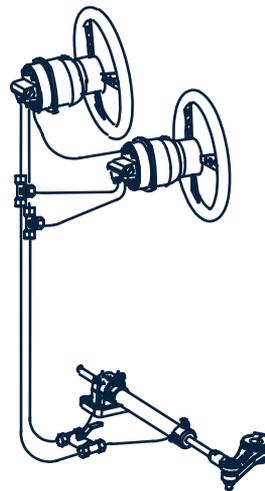
- Tiller Arm
- Bypass Valve



- 1 Pump + LV + Fittings
- 1 Cylinder
- 2 Hoses + Fittings
- Tees + Connection Fittings
- 1 Power Pack

OPTIONS

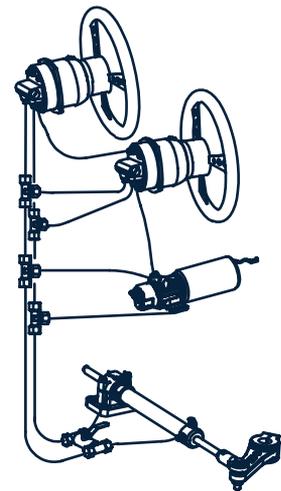
- Tiller Arm
- Bypass Valve



- 2 Pump + LV + Fittings
- 1 Cylinder
- 2 Hoses + Fittings
- Tees + Connection Fittings

OPTIONS

- Tiller Arm
- Bypass Valve



- 2 Pump + LV + Fittings
- 1 Cylinder
- 2 Hoses + Fittings
- Tees + Connection Fittings
- 1 Power Pack

OPTIONS

- Tiller Arm
- Bypass Valve

OUTBOARD STEERING SYSTEMS



Hydraulic Steering Systems for Outboard Motors

These easy-to-install and easy-to-maintain Lecoble & Schmitt Hydraulic Steering Systems for outboard motors are designed and manufactured in materials made to withstand the harsh marine environment and are perfectly adapted to all types of professional or pleasure boating requirements.

Lecoble & Schmitt range is the widest on the market, thus allowing precise selection of the best suited system while maintaining reliability, efficiency and user comfort.

All products are CE approved and carry a 2 year warranty.



PUMPS

The manual pump is an axial piston pump generating hydraulic pressure to the cylinder, while managing return fluid in the hydraulic circuit when the wheel is turned.

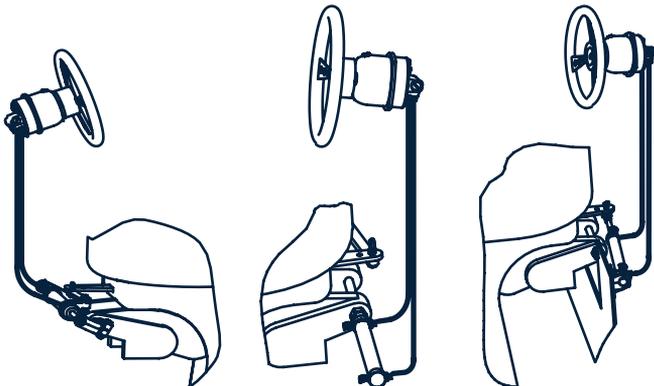


CYLINDERS

The cylinder specification is based on total horsepower or the outboard motor(s) as defined in the L&S Outboard Steering Catalog.

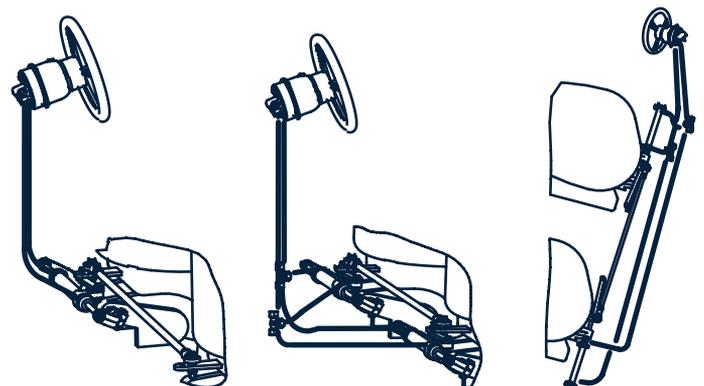
DIFFERENT TYPES OF ASSEMBLIES

SINGLE MOTOR INSTALLATIONS



- 1 Motor
- 1 Pump
- 1 Front Mount Cylinder
- 1 Motor
- 1 Pump
- 1 Side Mount Cylinder
- 1 Motor
- 1 Pump
- 1 Side Mount Cylinder on Panel

TWIN MOTOR INSTALLATIONS



- 2 Motors
- 1 Pump
- 1 Front Mount Cylinder
- 1 Tie Rod
- 2 Motors
- 1 Pump
- 2 Front Mount Cylinders
- 1 Tie Rod
- 2 Motors
- 1 Pump
- 2 Side Mount Cylinders
- 1 Tie Rod

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JEFA STEERING SYSTEMS



Complete Steering Systems

Jefa Steering is a world leader in sailboat steering with their systems on some of the most prestigious and recognized production boats in the market. With four different steering methods available, Jefa steering always has a solution for your boat.



STEERING WHEELS

Jefa offers a complete line of steering wheels to fit every sailor's need and preference. The stainless steel, flat, "Destroyer" wheel has become the modern standard sailors are used to seeing on many boats. "Destroyer" wheels are available up to 1,200mm diameter. Tandem spoke wheels are available from 900mm to 1,800mm. Stainless steel wheels are also available with leather covered rims.

Aluminum wheels are available when you want to save weight at the helm. These wheels come finished in black or white powder coating with a leather covered rim. Available in diameters from 700mm to 1800mm.

GRP and carbon wheels are the next steps in weight saving technology while adding style to the boat and reducing steering effort for competitive sailors. GRP wheels are available in white or black 900mm and 1,000mm diameters.

The Jefa wheel selection is rounded off with teak rimmed wheels with stainless steel spokes and custom hybrid wheels made with carbon fiber and wood. Teak rimmed wheels are available in 700mm to 1,200mm diameter.



CABLE STEERING

Traditional Choice For Sailboats

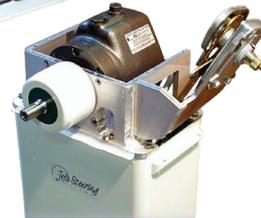
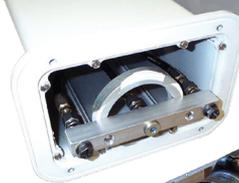
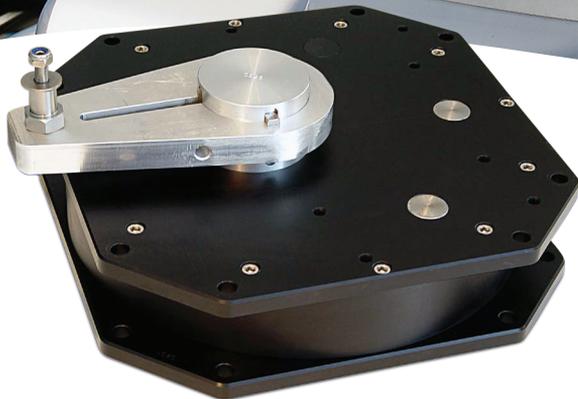
The Jefa Chain and Cable system has many advantages over competing brands in the market. Jefa's quadrants and sheaves are not made from cast-aluminum like most other quadrants available. As most quadrants will also function as rudder stop, quadrants can have very high impact loads. Cast aluminum is brittle and could easily break under these circumstances. All Jefa quadrants and sheaves are fabricated from high strength Aluminum 6082. This material is enormously strong, while retaining high ductility (Jefa Marine produces rudder shafts from the same material), resulting in an extremely strong quadrant arrangement. The quadrants always have twin high precision CNC milled tracks with deep groove depths and large guide bend radii, ensuring a reliable and long lifetime of the cable. The twin track arrangement offers flexibility while installing and adds the possibility of crossing the cable between the helm station and quadrant instead of crossing the cables inside the pedestal.



RACK & PINION STEERING

Ideal System for Aft Cockpit Sailboats

Jefa's Rack and Pinion system is a robust steering system that will provide a direct and solid connection from the helm to the rudder. With a 5:1 mechanical advantage at the wheel, along with a proportional reduction as steering loads increase, this system is an immense upgrade from a traditional open wire steering system. The Rack and Pinion system also offers the advantage of being extremely easy for a professional or skilled do-it-yourselfer to install. Made up of no casted parts, the machined seawater resistant solid Aluminum 6082 pedestal will not corrode, even when it's exposed by surface damage. The robust powder coated aluminum base has no mounting holes for pedestal bolts as these are integrated in the pedestal deck flange. This avoids multiple weak points for damage with the accompanying corrosion and possible leaking.



TRANSMISSION STEERING

Ideal System for Center Cockpit & Larger Sailboats

The Jefa Transmission Steering System (TSS) is based on the same principals as a Rack and Pinion System with a direct and solid connection to the rudder. The rotation of the wheel is transferred to a push pull movement via gearbox and levers. With the TSS system, the distance between the wheel and the rudder shaft can be much larger and the routing more complex, which makes it the ideal system for center cockpit sailboats. Via torque tubes, universal joints, and bevel gearboxes, the rotation is transmitted to the reduction gearbox next to the rudder shaft. The reduction gearbox transfers the rotating movement into a push and pull movement on the tiller lever. As all rotating parts use roller bearings, and the system can be easily back driven by the rudder, the steering system provides the same precision and feel as a tiller steered boat, but with a helm that can be placed away from the rudder.

HYDRAULIC STEERING & PEDESTALS

Jefa offers a complete line of Hydraulic Steering Systems featuring Jefa's pedestal, wheels, and other components. The hydraulic components offered by Jefa are supplied by Lecomble & Schmitt (L&S) Hydraulic Steering Systems. L&S adds over 70 years of hydraulic steering experience to Jefa's expertise; to deliver the reliability, styles, and function to boats that require Hydraulic Steering Systems. We are able to offer you single source pedestals, helm pumps, cylinders, and autopilot pumps.



ACCESSORIES

Make it "Your Boat" with Jefa's complete range of accessories. Your Jefa helm station is the focal point of on deck control and activity aboard the boat. Select the Jefa accessories to position controls and display them where you want for safe convenient operation. Jefa also offers a range of cockpit tables for on deck dining and entertainment as well.

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JEFA RUDDER BEARINGS

Complete Steering Systems



Beginning in 1980, Jefa Rudder & Steering Systems has supplied Rudder Bearings to over 40,000 boats.

Jefa Rudder Bearings offer the utmost in feel and durability. Utilizing captive roller bearings in rugged aluminum housings, there is a full range of sizes and styles, including self-aligning bearings, to suit all sizes of sailboats.

RETROFIT BEARINGS

Jefa offers replacement and retrofit bearings for many boats built using bearings that are no longer produced. We have replacement bearings for many U.S. built, and European boats. These include J-Boats, Beneteau, Express, Bavaria, Santa Cruz, Dehler, Olson, Moody, and many more.

Jefa also produces replacements for old Harken rudder bearings which precisely match the original outer dimensions. Available for 2", 2½", 3",



ROLLER BEARINGS

All Jefa Rudder Bearings are produced with precision machined rollers and close tolerances to provide smooth operation under load. The close tolerance allows Jefa to eliminate the roller cage needed with sloppy bearings and keep the design simple for long term reliability.



STANDARD & SELF-ALIGNING BEARINGS

Jefa produces Self-Aligning Bearings for rudder stocks engineered to flex. Self-aligning bearings also eliminate the need for precise alignment during installation. Standard or Non Self-aligning bearings are available at a lower cost and normally have a smaller outside diameter.



PLASTIC VS. ALUMINUM

Whenever possible, Jefa uses engineering plastic below the waterline. This offers a durable bearing while helping to eliminate electrolysis at the waterline and near antifouling paint.



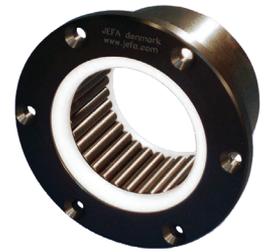
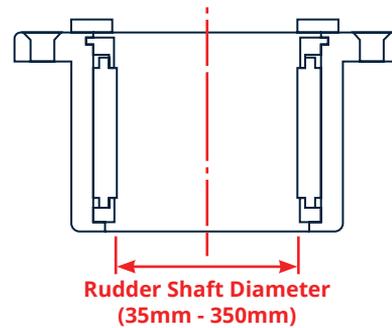
TOP RUDDER BEARINGS

Rudder Bearings with Rollers for Tiller Steered Boats

TYPE 42000

**Top Roller Bearings for
Rudder Shaft Diameters 35mm - 350mm**

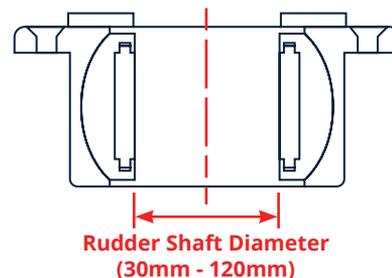
The 42000 series bearings are suitable for all types of hull material. This type of top bearing can also be used on tiller steered boats. The rudder head will rest on the delrin ring, in this way achieving vertical locking. In yachts with a steering system a locking ring on top of the bearing will take care of the vertical locking. A special type of the 42000 series bearing (42...STP) with integral stops in combination with our tiller heads is available in 35 and 40mm. On this bearing, the top of the rudder stock and locking ring stand out above deck. For a flush mount, one should choose the bearing type 42000Z.



TYPE 5T000

**Self-Aligning Top Roller Bearings for
Rudder Shaft Diameters 30mm - 120mm**

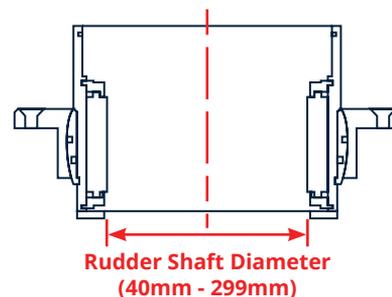
The 5T000 series bearings are low-cost self-aligning top bearings for light to medium loaded applications. As there is no aluminum inner housing between the rollers and the ball, the working load is lower than the 4SF000 type bearings. These bearings can be used in applications with relative bigger diameter rudder shafts like aluminum and carbon rudders. This type of top bearing can also be used on tiller steered boats. The rudder head will rest on the delrin ring, achieving on this way the vertical locking. A special type of the 5T000 series bearing (5T...STP) with integral stops in combination with our tiller heads is available in 35, 40 and 50mm. When the yacht has a steering system, a locking ring on top of the bearing will take care of the vertical locking. On this bearing, the top of the rudder stock and locking ring will stand out above deck. For a flush mount, one should choose the bearing type 4S000Z.



TYPE 4SF000

**Self-Aligning Top Roller Bearings for
Rudder Shaft Diameters 40mm - 299mm**

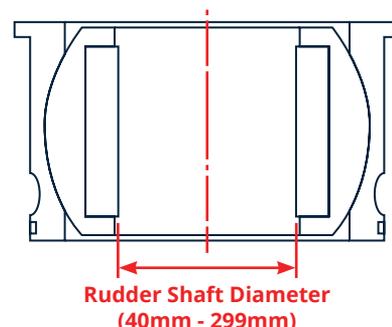
The 4SF000 series bearings are suitable for all types of hull material. This bearing type combines a very simple installation with a very smooth operation under all circumstances as the bearing will always be aligned to the rudder shaft. The bearing consists of an aluminum outer housing with an inside sphere turned out. A one piece delrin ball is located in the sphere and is sealed to the outer housing by an O-ring. The inner housing is pushed inside the delrin ball and also sealed with an O-ring. This construction creates a watertight situation between the rotating inner housing and the fixed outer housing. On this bearing, the top of the bearing, the rudder stock and locking ring stand out above deck. For a flush mount, one should choose the bearing type 4S000Z or use it under deck.



TYPE 6BF

**PETP Self-Aligning Top Roller Bearings for
Rudder Shaft Diameters 80mm - 200mm**

The 6BF PETP Self-Aligning Roller Bearings are designed to be mounted as top bearing in a GRP or metal tube like Jefa 6D bearings. The bearing is made of PETP (also known as Arnite, Ertalyte, Sustodur & Ultradur), so it doesn't contain any metals. The bearing ball can be easily dismantled out of the housing for installation safety or replacement if any future damage may happen.



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TOP RUDDER BEARINGS

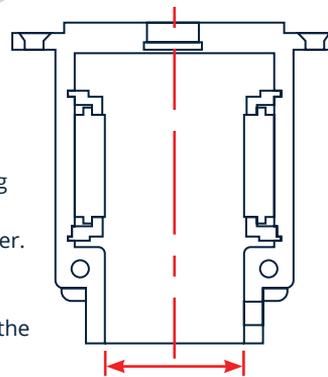


Rudder Bearings with Rollers for Wheel Steered Boats

TYPE 42000Z

Top Roller Bearings with Deck Cover for Rudder Shaft Diameters 50mm - 80mm

The 42000Z series bearings are suitable for all types of hull material. This bearing is the perfect solution as top bearing for cruising and cruising/racing yachts as it combines a horizontal roller bearing with a vertical roller bearing and a deck cover. Due to the vertical roller bearing arrangement, the rotation of the rudder shaft is extremely smooth. The bearing is ideal as a deck or cockpit floor bearing as it doesn't extend beyond the deck level, especially when the deck flange is let into the teak deck. In combination with emergency tiller arrangement type 1, a quick and safe access to the emergency steering is achieved. The bearing is available in three sizes, so take notice when designing the rudder stock.



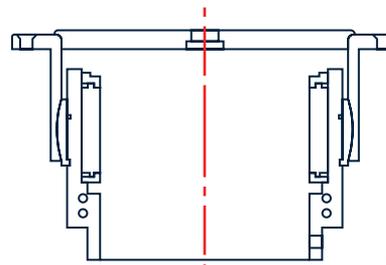
Rudder Shaft Diameter
(50mm - 80mm)



TYPE 45000Z

Top Self-Aligning Roller Bearings with Deck Cover for Rudder Shaft Diameters 30mm - 165mm

The 45000Z series bearings are suitable for all types of hull material. This bearing is the self-aligning version of the 42000 type and the perfect solution as top bearing for cruising/racing and racing yachts as it combines a horizontal self-aligning roller bearing with a vertical roller bearing and a deck cover. Due to the two way vertical roller bearing arrangement, the rotation of the rudder shaft is extremely smooth, even on racing yachts where the rudder could be lighter than the water, so generating an upwards lift. The bearing is ideal as a deck or cockpit floor bearing as it doesn't extend beyond the deck level, especially when the deck flange is let into the (teak) deck. In combination with emergency tiller arrangement type 1, a quick and safe access to the emergency steering is achieved. The bearing is available in specific sizes, so take notice when designing the rudder stock.



Rudder Shaft Diameter
(30mm - 165mm)

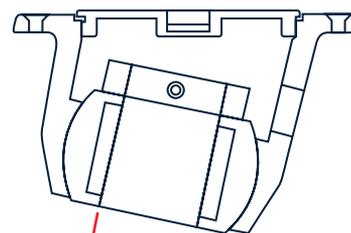


Recommended torque setting for the lock ring is 7Nm for M6 set screws and 35Nm for M10. This assumes stainless steel 304/A2 cup point set screw, made to DIN916/ISO4029, fitted to a dry, ungreased thread. It is recommended to pre-drill the stock at set screw locations to ensure a durable lock ring fit.

TYPE 5T000Z(S)

Top Roller Bearings with Deck Cover for Rudder Shaft Diameters 40mm - 140mm

The 5T000ZS bearings can be used in a rudder stock to deck angle of 0° to 25° and the 5T000Z bearings in a rudder stock to deck angle of 0° to 21°. The function of this bearing is similar to the 45000Z-20 group, but the bearing is lower priced as it isn't machined out of solid aluminum, but casted to shape. The vertical locking is achieved with an additional locking ring (46xxx) not included. The deck cover is easy removable via a bayonet connection for the 5T000Z bearings and a threaded connection for the 5T000ZS bearings.



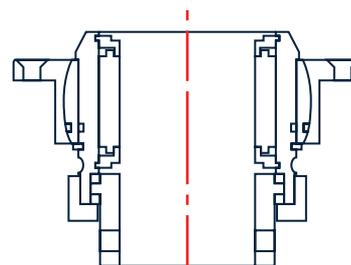
Rudder Shaft Diameter
(40mm - 140mm)



TYPE 4SF000H

Hanger Type Self-Aligning Top Roller Bearings for Rudder Shaft Diameters 40mm - 140mm

The 4SF000H series bearings are suitable for all types of hull material. This bearing type combines a very simple installation with a very smooth operation under all circumstances as the bearing will always be aligned to the rudder shaft. The 4SF000H bearing is a special version of the 45F000 completed with a double working vertical ball bearing. This bearing is also similar to the 45000Z bearing without the deck cover. The typical application for this bearing is as top bearing on a rudder stock that is not extended to the deck, but mounted on a horizontal bulkhead at cockpit level.



Rudder Shaft Diameter
(40mm - 140mm)



BOTTOM RUDDER BEARINGS



Rudder Bearings with Rollers

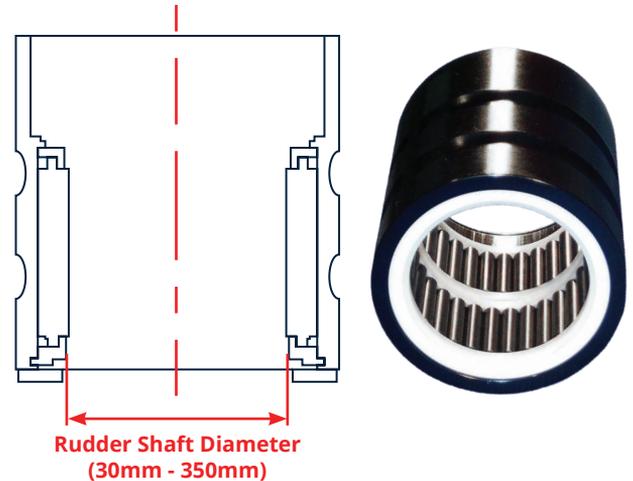
TYPE 41000

Lower Roller Bearings for Rudder Shaft Diameters 30mm - 350mm

The 41000 series Jefa Rudder Bearings are the first type of roller bearings that were produced by Jefa Marine. In the past 30 years, more than 25,000 of these bearings have been produced. This bearing is typically suitable for GRP or wood core cruising yachts where a light revolving and backlash free rudder system is required that will not be stretched to the limits as on racing yachts. The bearing is also perfect as hull bearing for skeg rudders as the skeg will prevent the shaft from bending.

Due to the high tolerances between the shaft and bearing, it has to be glassed in combination with the shaft present in the yacht. For one-off projects this is mostly not a problem. For production environments, Jefa Marine can supply a dummy shaft (a rudder shaft without the part that normally sticks out beneath the hull). This bearing should not be used in aluminum and steel hulls. It's better to use the 43000 series Self-Aligning Bearings for these types of hulls.

The bearing can be sealed by a rudder tube or double lip seal inside the top register.

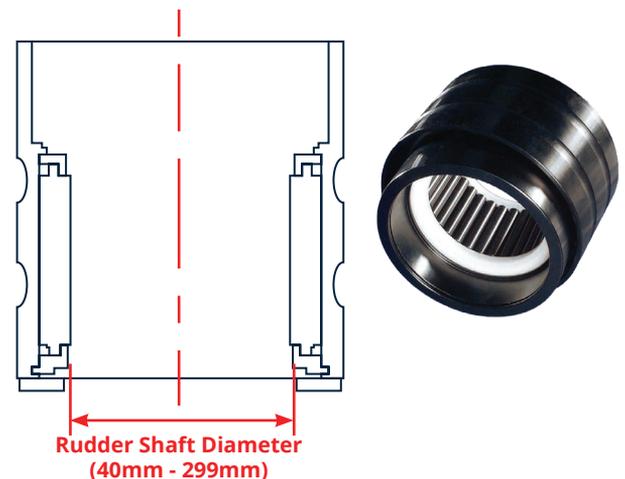


TYPE 45000 - SELF ALIGNING

Self-Aligning Lower Roller Bearings for Rudder Shaft Diameters 40mm - 299mm

The 45000 series bearings are suitable for GRP and wood core cruising and racing yachts. This bearing type combines a very simple installation with a very smooth operation under all circumstances as the bearing will always be aligned to the rudder shaft. The bearing consists of an aluminum outer housing with an inside sphere turned out. A one piece delrin ball is located in the sphere and is sealed to the outer housing by an O-ring. The inner housing is pushed inside the delrin ball and also sealed with an O-ring. This construction creates a watertight situation between the rotating inner housing and the fixed outer housing. The inner housing will always have one set of rollers. It's therefore important to check that when the bearing diameter is above 90 mm, and the maximum working load isn't exceeded. If the calculated working load is above the maximum working load, one should choose bearing type 43000.

The bearing can be sealed by a rudder tube or double lip seal inside the top register of the inner housing, or for maximum security a rudder tube in the top register in the outer housing.

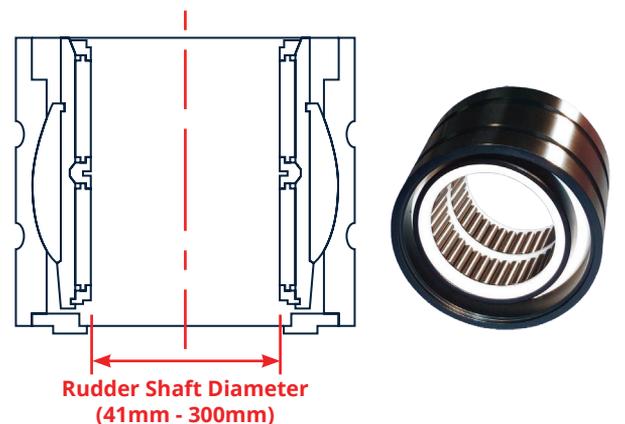


TYPE 43000

"Heavy-Duty" Self-Aligning Lower Roller Bearings for Rudder Shaft Diameters 41mm - 300mm

The 43000 series bearings are suitable for all types of hull material. This bearing type combines a very simple installation with a very smooth operation under all circumstances the bearing will always be aligned to the rudder shaft. The bearing consists of a heavy duty aluminum outer housing with an inside sphere turned out. A two-piece delrin ball is located in the sphere. The inner housing is pushed inside the delrin ball. Above 79mm, two sets of rollers are mounted to achieve a very high working load. As the delrin ball is mounted in two parts, the bearing is not watertight between the outer housing and inner housing, so a tube has to be used in the top register of the outer housing to achieve a proper sealing.

This bearing is normally used in applications where the working load of the 45000 type bearing isn't sufficient. For aluminum hulls this bearing can provide the perfect solution: the outer housing can be welded into the hull, providing a very strong and fast installation and also saving a very expensive big tube.

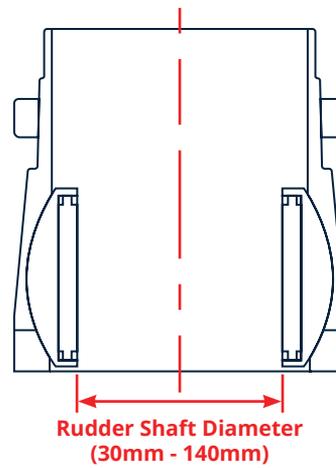


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TYPE 5BT000

Conical Self-Aligning Lower Roller Bearings for Rudder Shaft Diameters 30mm - 140mm

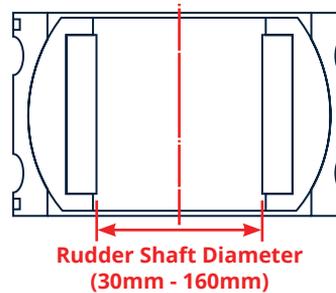
The 5BT000 series bearings are specially designed for production yachts. This bearing type combines a very simple installation with a very smooth operation under all circumstances as the bearing will always be aligned to the rudder shaft. The bearing consists of an aluminum outer housing with an inside sphere turned out. A one piece delrin ball with rollers is located in the sphere.



TYPE 6BB

PETP Self-Aligning Roller Bearings for Rudder Shaft Diameters 30mm - 160mm

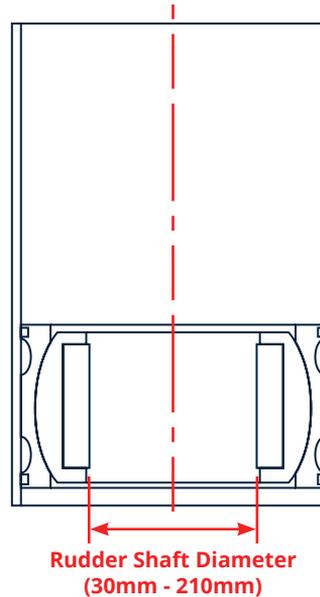
The 6BB PETP Self-Aligning Roller Bearings are designed to be mounted in a GRP or metal tube (like our 6D bearings). The bearing is made of PETP (also known as Arnite, Ertalyte, Sustodur & Ultradur), so it doesn't contain any metals. The bearing ball can be easily dismantled out of the housing for installation safety or replacement if any future damage occurs. When a bearing with a flange is preferred, please choose the 6BF series.



TYPE 6T

PETP Self-Aligning Lower Roller Bearings for Rudder Shaft Diameters 30mm - 210mm

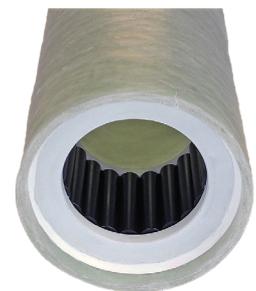
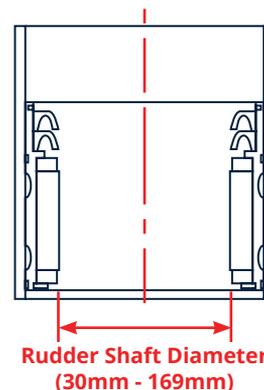
The 6T series bearings combine a very simple installation with a very smooth operation under all circumstances as the bearing will always be aligned to the rudder shaft. The bearing is made of PETP (also known as Arnite, Ertalyte, Sustodur & Ultradur) in a GRP tube, allowing it to be laminated directly into the hull. A separate rudder tube is not required as the bearing housing is designed to extend above the boat's waterline. It must be sealed to the rudder shaft with a gaiter. In the case of female molded production boats the bearings housing can be mounted into the hull mold before lamination and gel coating begins. After gel coating the hull is laminated as usual with the exception that the hull laminate runs up the side of the bearing housing. This means that the bearing is already installed in the hull upon de-molding, thus providing an integrated rudder support, and saving production time. It's advisable to add some webs around the bearing to allow the rudder forces to be spread on the hull. As the bearing is self-aligning, there will be no torque transmitted to the hull, just rudder forces and the bearing will never try to twist out of the hull. The bearing ball can be easily dismantled out of the housing for installation safety or replacement if any future damage occurs.



TYPE 61000(S)

PETP Lower Roller Bearings for Rudder Shaft Diameters 30mm - 169mm

The 61000 series bearings are developed as a more affordable alternative to the 6T self-aligning bearings. It's also an alternative to the 41000 series bearing when a metal bearing housing is not appropriate. The bearing is made of PETP (also known as Arnite, Ertalyte, Sustodur & Ultradur) in a GRP tube, allowing it to be laminated directly into the hull. As the bearing is non self-aligning, it should be laminated in the hull with the rudder shaft mounted or for production boats with a dummy shaft.



DOUBLE BEARINGS

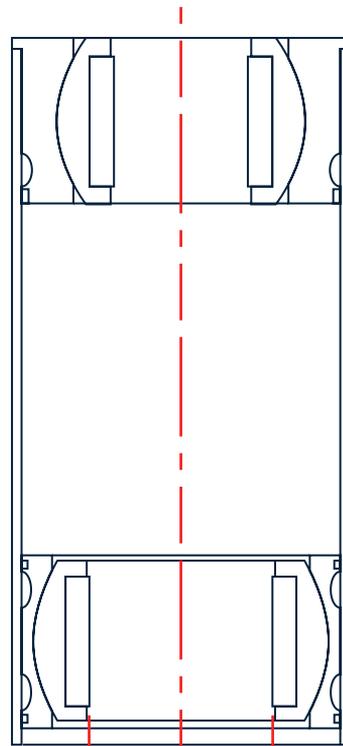
Rudder Bearings with Rollers

TYPE 6D

Twin-PETP Self-Aligning Roller Bearings for Rudder Shaft Diameters 30mm - 160mm

The 6D series bearings combine a very simple installation with a very smooth operation under all circumstances as the bearing will always be aligned to the rudder shaft. The bearing is made of PETP (also known as Arnite, Ertalyte, Sustodur & Ultradur) in a GRP tube, allowing it to be laminated directly into the hull. It's primarily meant to be used on tiller steered boats, but could be used on wheel steered boats if the tiller arm/quadrant is above the top bearing.

As the bearing is self-aligning, there will be no torque transmitted to the hull, just rudder forces and the bearing will never try to twist out of the hull. The bearing ball can be easily removed out of the housing for installation safety or replacement damage if future damage occurs.



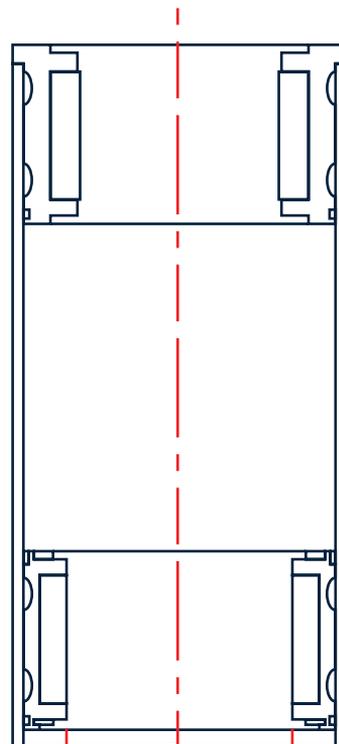
Rudder Shaft Diameter
(30mm - 160mm)



TYPE 6S

Twin-PETP Roller Bearings for Rudder Shaft Diameters 30mm - 169mm

The 6S series bearings are developed as a more affordable alternative on the 6D bearings. The bearing is made of PETP (also known as Arnite, Ertalyte, Sustodur & Ultradur) in a GRP tube, allowing it to be laminated directly into the hull. It's primarily meant to be used on tiller steered boats, but could be used on wheel steered boats if the tiller arm/quadrant is above the top bearing.



Rudder Shaft Diameter
(30mm - 169mm)



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RUDDER BLADES

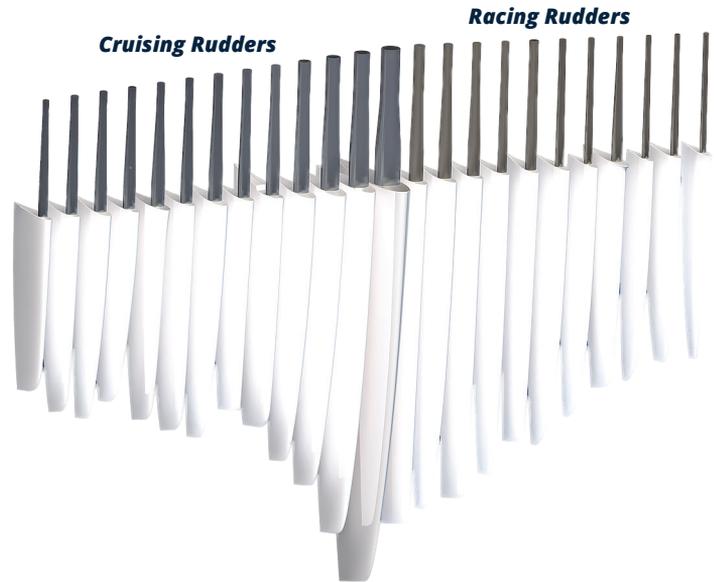


GRP Cruising and Racing Rudder Blades

Jefa produces a wide range of standard rudder blades for boats from 22 to 75 feet length. This unique product line offers the boat builder a modern rudder blade without investing in expensive molds. The rudders are made in Jefa's modern GRP factory and are available in many sizes depending on the boat size.

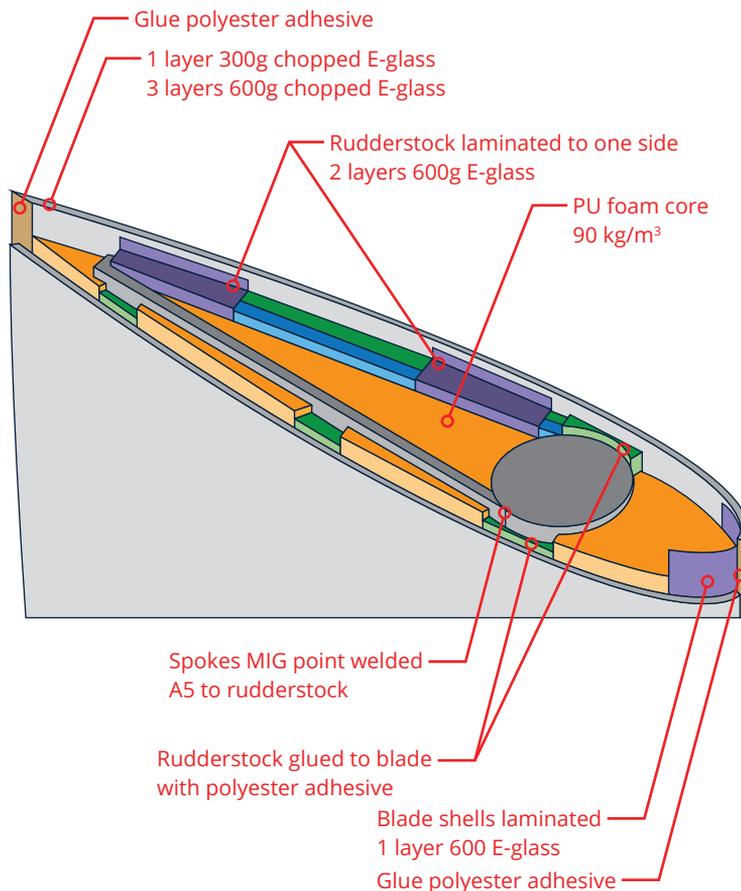
What makes Jefa Rudder Blades unique and distinct from all other rudder blade producers and yard made rudder blades is the production in solid aluminum molds. This unique production method allows very high pressures to be used in the gluing and foaming process and results in an extremely precise shape. Traditional fiberglass molds don't allow any pressure from inside the blade, so one can't be sure of a good bonding of both sides and the final shape of the rudder.

Jefa has delivered rudder stocks and complete rudders for 1,000's of boats. Rudder stocks are available machined from stainless steel, or aluminum alloy. Rudders are laminated in female molds and filled with high density foam. Complete rudders are built to OEM specification or as replacement rudders for existing boats in a purpose built production facility allowing Jefa to deliver the highest quality rudders.



CONSTRUCTION

The illustration on the right shows the way Jefa Rudder Blades are built. The blades are made of one layer of 300g chopped E-glass and 3 layers of 600g. The metal (Aluminum or Stainless Steel) rudder stock is MIG welded to the spokes which are glued to the rudder blade at each side. On top of that there is extra lamination at one side of 2 layers of 600g glass. This extra laminate is very important as any movement between the rudder stock and rudder blade is fatal for the lifetime of the rudder. All rudder blades comply to the ISO 12215-8 norm CE regulations. Please look further on the page for more detailed information on sizes, production methods and specials. All Jefa rudders are delivered in a gel coat finish and should be treated with non-water penetrable epoxy coating and anti-fouled. This will prevent water entering the gel coat and underlying GRP structure.



Due to the high pressure foam filling system, the foam is guaranteed present in all areas of the blade so no air pockets can be present. Also visible is the large overlap at the front and the huge glue contact area at the aft side of the rudder blade.



A unique feature of Jefa Rudders is the overlapping parts of the blades. This feature substantially strengthens the blade integrity, making it nearly impossible to split. Traditionally the rudder halves are glued heads on together, allowing only a very small contact area which causes the blade to split easily.

SEALING SYSTEMS

Sealing Solutions For Rudder Shafts



GAITER SEALING SYSTEM

The tube and Gaiter Sealing System is the most efficient method of providing a seal. The friction is almost zero, the sealing is 100% sure, and the gaiter will allow the shaft to rotate and bend freely. The system consists of an aluminum tube, which is bonded to the lower bearing and to which is clamped via a stainless-steel hose clamp, a neoprene gaiter. The top end of the neoprene gaiter is clamped to the rudder shaft by a second hose clamp. The gaiter is made to allow up to 90° of rudder travel ($\pm 45^\circ$), without causing inelastic extension to the gaiter. It is desirable to take the rudder tube as high as possible for water security and must be at least 100mm above the waterline.

The gaiter is in fact 100% waterproof and will show no signs of wear, even after many years of service. However it is possible for this to become mechanically damaged or torn, if materials are stored loosely in this area of the yacht. Please avoid direct sunlight on the gaiter as the UV light will damage the neoprene in time.



LIP SEALS

Lip Seals are used when the use of a tube is not possible. A typical situation is when the tiller lever or quadrant is located just above the bottom bearing. For security, we recommend always using two Lip Seals. To achieve a good seal it's important that the contact area of the rudder shaft has a very smooth surface. It is not possible to use lip seals in combination with self-aligning bearings except for our standard self-aligning bearing where the seals are mounted in the inner housing and move with the deflection of the shaft.

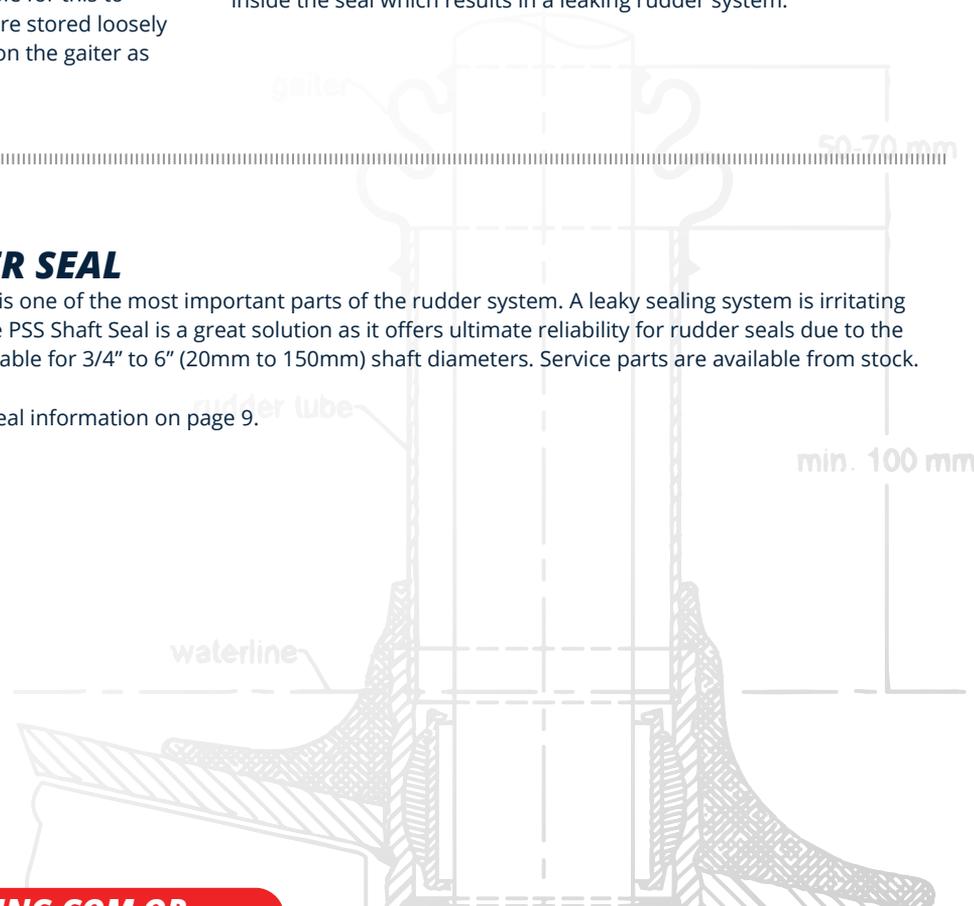
Always use Jefa special PUR Lip Seals. They are specially developed for rudder sealing purposes and contain no metals. When industry lip seals are used, they will have to be replaced every 2 years as the rubber will develop porosity and corrode the steel reinforcement ring inside the seal which results in a leaking rudder system.



PSS RUDDER SEAL

The sealing system is one of the most important parts of the rudder system. A leaky sealing system is irritating and dangerous. The PSS Shaft Seal is a great solution as it offers ultimate reliability for rudder seals due to the simple design. Available for 3/4" to 6" (20mm to 150mm) shaft diameters. Service parts are available from stock.

More PSS Rudder Seal information on page 9.



TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669

JEFA AUTOPILOT DRIVES



Complete Autopilot Drives & Steering Systems

The Jefa electro-mechanical drives are strong, compact, and much more efficient than any other electro-mechanical autopilot drive unit on the market. Suitable for sailing vessels from 20' up to 70' in length, Jefa drive units use a flat wound electric motor that is not a standard industrial motor, but specifically designed and produced for this application. This provides multiple advantages over standard industrial motors. Jefa has also developed a unique and patented engagement clutch. The solution is based on two electrically operated spring loaded clutch pins that engage and disengage when the autopilot is powered and switched off. This allows for less friction when under manual

control of the helm, a very long clutch life as it will not wear over time like traditional friction plates, and a very low current draw. Due to their use of the flat wound motor and pin clutch system, the drive units are one of the most strong and compact autopilot drive units available. Jefa's mechanical autopilot drive units are compatible with all major autopilot brands, like Raymarine, Simrad, Garmin, NKE, Furuno and B&G. Jefa Marine has been making reliable electro-mechanical autopilot drives for over ten years. Please to contact us if you have any questions about the available drive units.

Autopilot Drive units are specified based on your vessel's steering loads. Please contact PYI for assistance.

LINEAR DRIVE

The Jefa Linear Drive is a strong and compact autopilot drive, that is much more efficient than existing hydraulic and electromechanical linear drive units. With a thrust of 882 lbs. on 9.84" center it's much stronger than a human being (the maximum output torque of 723 ft/lb is equivalent to 220 lbs. force on the rim of a 40" steering tiller) and is built for 24 hours per day continuous operation with a total weight of only 14.5lbs.

PART NUMBERS

PART #	DESCRIPTION
DU-LD-100	Linear Drive 100kgm - 400kg, thrust, 12v



DU-LD-100
Linear Drive

DIRECT DRIVES

DIRECT DRIVE TYPE 1

The Jefa Direct Drive Type 1 is an extremely compact autopilot drive. The maximum output torque is 1082 ft/lbs. with a total weight of only 26.5 lbs. The combination of the flat wound (pancake) electric motor with the ultra efficient planetary and spur gearbox results in an extremely efficient drive unit. The drive can be used on boats up to 45' LOA. with a mechanical steering system that can be back driven. The direct drive drives the rudder via a draglink and the existing tiller arm or quadrant, or via an independent tiller arm.

DIRECT DRIVE TYPE 2

The Jefa Direct Drive Type 2 is a very compact autopilot drive unit for larger boats. The maximum output is 2706 ft/lbs. Total weight of only 42 lbs. This drive can be used on boats from 45 to 55 foot, equipped with a mechanical steering system that can be back driven. The direct drive drives the rudder via a draglink and the existing tiller arm or quadrant, or via an independent tiller arm.



DUD-D112
Direct Drive Type 1

DUD-D212
Direct Drive Type 2

PART NUMBERS

PART #	DESCRIPTION
DU-DD1-FB	Rudder feedback mounting bracket for DD1
DUD-D212	Direct Drive 375kgm Type 2 12v
DUD-D224	Direct Drive 375kgm Type 2 24v
DUD-D312	Direct Drive 525kgm Type 3 12v
DUD-D324	Direct Drive 525kgm Type 3 24v
DUD-D424	Direct Drive 735kgm Type 4 24v
DUD-D112	Direct Drive 150kgm Type 1 12v

SPROCKET DRIVE

The Jefa Sprocket Drive is the most compact sprocket autopilot drive available. The maximum output torque is 147 ft/lbs at 9 RPM. The combination of the specially designed electric motor with the ultra efficient 3 stage planetary gearbox results in an extremely efficient drive unit. The drive can be used on boats from 35' to 65' (or with a rudder torque up to 2887 ft/lbs) equipped with a cable or rod steering system.

PART NUMBERS

PART #	DESCRIPTION
DU-WS200-12	Sprocket autopilot drive unit 200nm 12v
DU-WS300-24	Sprocket autopilot drive unit 300nm 24v
DU-WS-BR	Bracket for Sprocket Drive



DU-WS-BR
Sprocket Drive
Mounting Bracket

DU-WS200-12
Sprocket Drive

TRANSMISSION DRIVE

The Jefa Transmission Drive is one of the most compact autopilot drives in the world, and is designed for 24 hours per day continuous operation with a total weight of only 13lbs.

PART NUMBERS

PART #	DESCRIPTION
DU-TS8-12	Transmission DU 200nm 12v - 8 rev/min
DU-TS6-12	Transmission DU 200nm 12v - 6 rev/min
DU-TS4-12	Transmission DU 200nm 12v - 3.5 rev/min
DU-TS8-24	Transmission DU 300nm 24v - 8 rev/min
DU-TS6-24	Transmission DU 300nm 24v - 6.5 rev/min
DU-TS4-24	Transmission DU 300nm 24v - 4 rev/min



DU-TS8-12
Transmission Drive

TILLER LEVERS

Jefa Tiller Levers are made from high strength aluminum. The Jefa Tiller Levers are available in four sizes depending on the rudder stock diameter. All Jefa Tiller Levers are standard equipped with an autopilot pick up hole at 250mm centers and tap holes for the rudder feedback unit. PYI can bore and key to suit your needs.



DRAGLINKS

Jefa aluminum Draglinks create a lighter and stronger solution over stainless steel draglinks (proof stress of 280 N/mm² compared to 200 N/mm² for SS). The articulated rose joints on the Draglink are specially designed from high strength aluminum with a removable Delrin ball. This provides an electrical disconnect of the rudder from the rest of the steering system and boat. The Draglinks can be adjusted 110mm in length. Standard Jefa rose joints have a 16 mm hole, and are also available in imperial sizes for replacement on other steering systems.



KIWIGRIP



Non-Skid Coating

KiwiGrip is a revolutionary, water-based non-skid coating. It is easily applied and extremely durable when fully cured. KiwiGrip provides a beautiful, customizable texture and color that can be applied over a variety of substrates. After preparing the substrate, KiwiGrip is spread with a foam brush or notched trowel over the application area. A roller is then used to provide the desired texture (no fillers or aggregates needed). As the delivery agent (water) evaporates, the plastic acrylic resin will fuse together and form a strong, durable non-skid coating. KiwiGrip is flexible after drying and effortlessly covers minor imperfections in the substrate.



FEATURES

- Water based, non-skid coating
- Low-glare, IR reflective finish
- Non-toxic, no volatile solvents
- Easy to apply

USES

Apply over wood, fiberglass, epoxy, concrete, metal or most other sealed surfaces. Originally designed for boats but also perfect for other applications like parks, sidewalks, construction projects and any other surfaces requiring non-skid.

NON-TOXIC

Non-toxic, no volatile solvents, very low VOC. Cleans up with soap and water.

DURABLE

Once properly applied and fully cured, you can expect to get 3-5 years in heavy foot traffic areas before any touch up is needed. Because there are no fillers, KiwiGrip will wear evenly throughout its life and once some touch up is needed, simply clean the surface and re-apply additional KiwiGrip to the desired texture. Along with long lasting durability, KiwiGrip has very low glare properties and extremely high UV stabilization contents. The result will be a long lasting, beautiful and safe surface year after year.

PART NUMBERS

PART #	COLOR	SIZE
KG-1WP-R	White	1L
KG-4WP-R	White	4L
KG-1GP-R	Grey	1L
KG-4GP-R	Grey	4L
KG-1CP-R	Cream	1L
KG-4CP-R	Cream	4L
KG-1BL-PR	Blue	1L
KG-4BL-PR	Blue	4L
KG-1BK-PR	Black	1L
KG-4BK-PR	Black	4L



KIWIGRIP ROLLER*

The KiwiGrip roller (4" roller included with every pouch of KiwiGrip) is what gives the KiwiGrip its texture.

*Available in 4" and 9" lengths.

PERFECT TEXTURE

By varying your technique you can achieve any desired texture with KiwiGrip non-skid. Visit www.kiwigrip.com to watch our KiwiGrip videos, where we show you how to achieve fine, mild, medium and aggressive textures.

Fine



Mild



Medium



Aggressive



COLOR OPTIONS

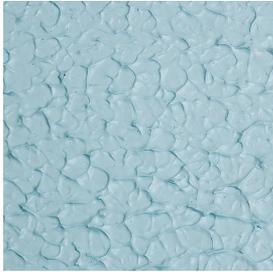
KiwiGrip is available in five stock colors: white, cream, light blue, light grey and black. Most colors (excluding black) were chosen for their low heat absorption.



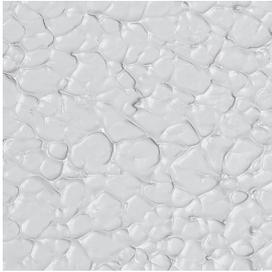
White



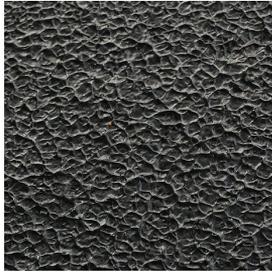
Cream



Blue



Grey



Black

CUSTOM COLORS

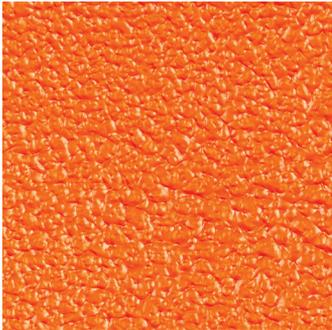
KiwiGrip comes in 5 stock colors but can be easily tinted should you be looking for something custom or when trying to match an existing topside paint or color theme.

TINTING

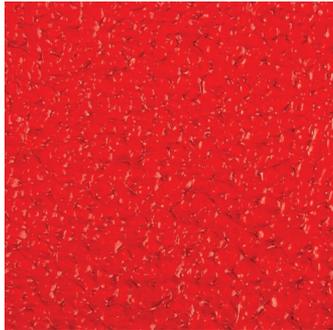
KiwiGrip can be tinted using most water-based tints found at your local paint dealer, making it easy to color match almost any project. Lighter custom colors are easily achievable. It is recommended to add no more than 2.5% tint to the white KiwiGrip base so some darker/vibrant colors can be difficult to match. If too much tint is added, the paint will become watery and lose its non-skid properties. KiwiGrip stock colors were chosen to minimize heat absorption when exposed to direct sunlight, providing a finish that will be comfortable to walk on in any weather condition. Please contact PYI, Inc. for detailed tinting instructions.



Safety Yellow



Safety Orange



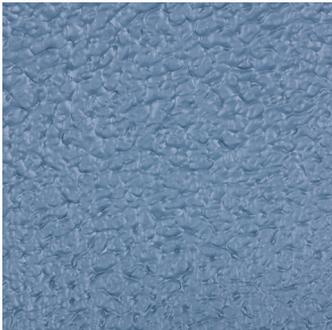
Safety Red



Sack Cloth



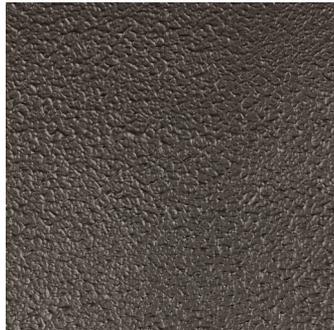
Downing Sands



Storm Cloud

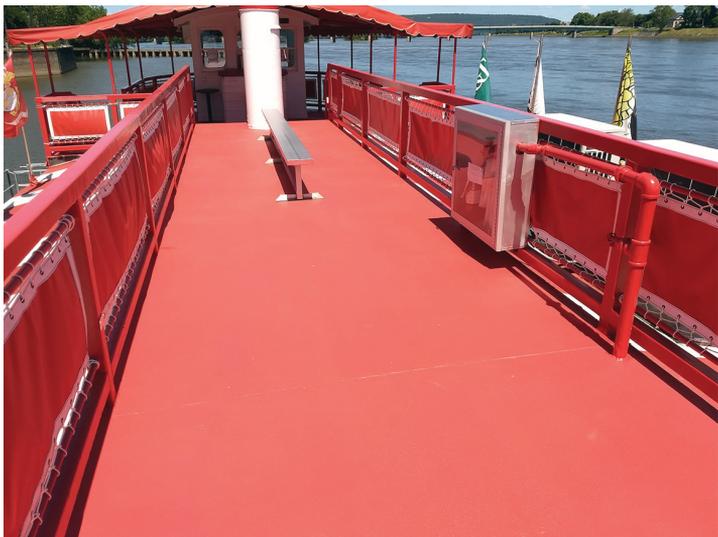
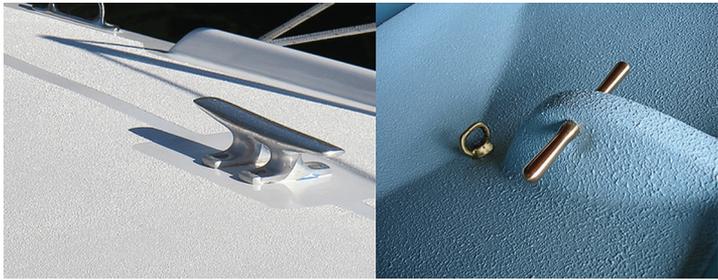


Major Blue

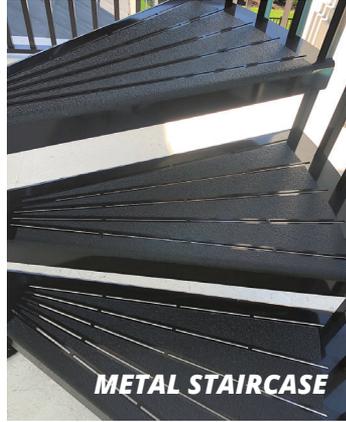


Grey Brown

MARINE APPLICATIONS



OTHER APPLICATIONS



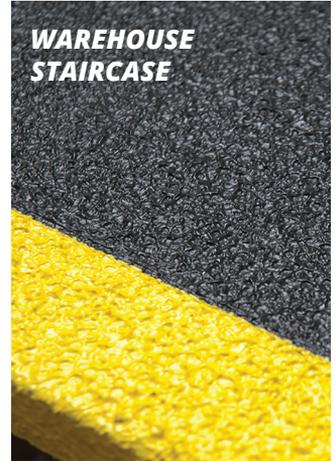
METAL STAIRCASE



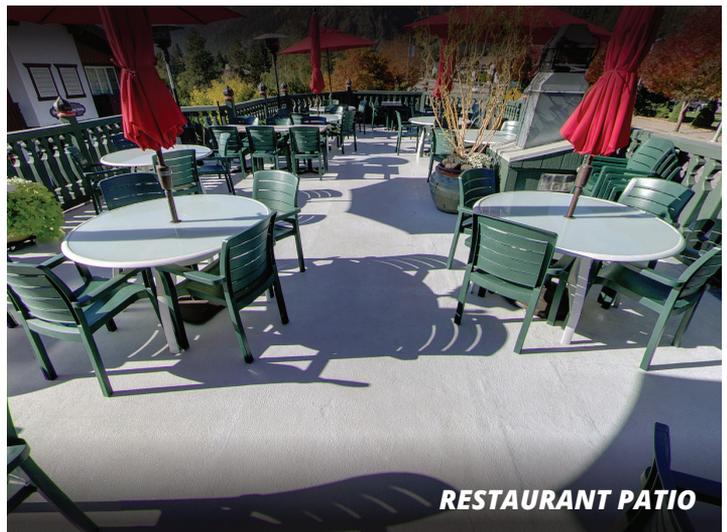
TILE ENTRANCE



PLAYGROUND WALKWAY



WAREHOUSE STAIRCASE



RESTAURANT PATIO



WALKWAY

EASY APPLICATION

KiwiGrip comes in 5 stock colors but can be easily tinted should you be looking for something custom or when trying to match an existing topside paint or color theme.



1 - PREP

Clean the surface with a degreasing soap and scrub brush. Tape off the areas where KiwiGrip will be applied. Scuff surface using 100-220 grit sand paper to remove any gloss and provide better adhesion. Wipe away any and all dust until the application area is completely clean and free of debris.



2 - APPLY

Apply and spread an even coat of KiwiGrip onto the clean surface with a foam brush or notched trowel.



3 - ROLL

Use the proprietary KiwiGrip roller to achieve the texture you desire.

HOW TO ACHIEVE TEXTURES

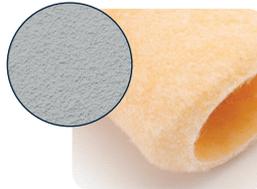
MEDIUM TO AGGRESSIVE TEXTURES

For an aggressive texture apply a thick coat/layer of KiwiGrip and roll using the provided textured roller. Should additional texture be necessary, simply backroll over the partially cured surface to achieve a more aggressive finish.



MILD TEXTURE

For a mild, sand-like texture, apply a thin coat of KiwiGrip and use a low shed 3/8" nap roller that can be found at most local hardware or paint stores. For additional tips on achieving a more mild texture please refer to our application instructions.



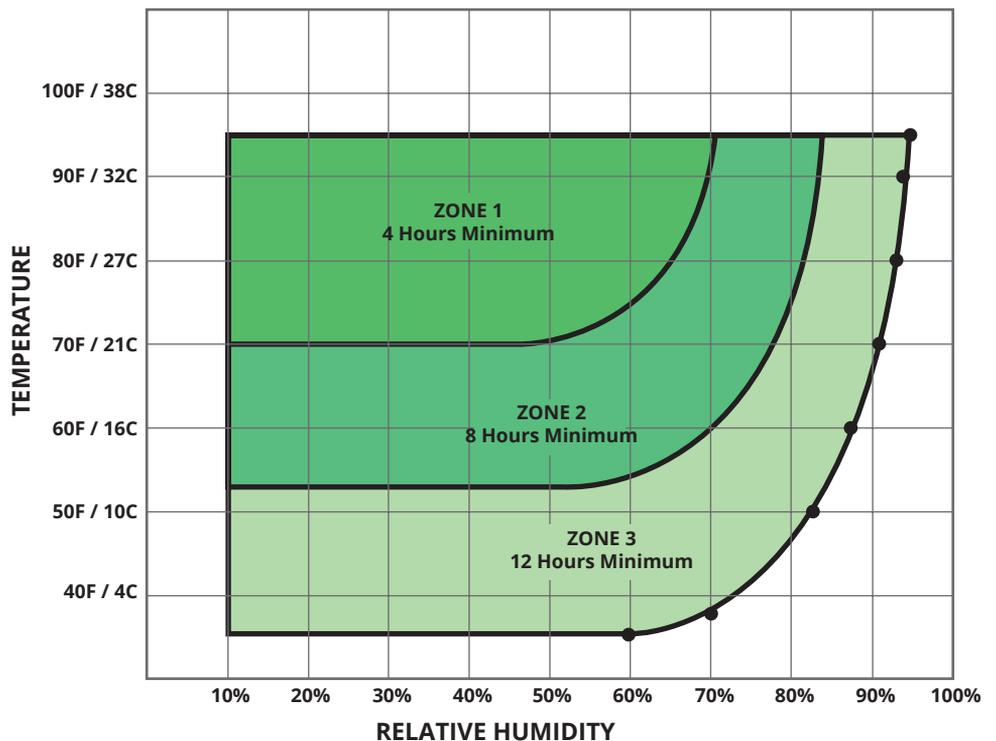
APPROXIMATE COVERAGE

KIWIGRIP	APPROX COVERAGE
1L	20 square feet
4L	80 square feet

TIPS & DRY TIMES

Maintain deck and ambient conditions as shown in each zone before allowing KiwiGrip to get wet.

1. Do not apply KiwiGrip if conditions are expected to fall outside application window before KiwiGrip is fully dry.
2. Application in direct sunlight and in hot conditions significantly reduce tack time. (Add up to 10% water to extend tack time).
3. Drying time in cold conditions is significantly extended. (Moving air from a fan or breeze will shorten drying time).



TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669

THE PROBLEM...

For hundreds of years mariners have been plagued with the same old problem of marine growth on the hull, power train and steering gear for their boats. With this comes:

- Reduced speed due to extra drag
- Increased fuel consumption, estimated to as much as 30%
- Propeller cavitation (which in turn causes extensive damage to propellers)
- Expensive annual haul outs and repainting costs

THE SOLUTION...

Sonihull is a cost effective antifouling product that works alongside a conventional antifouling paint, with additional benefits.

In addition to reducing annual haul out costs, Sonihull reduces growth on hull, stern gear, and bow thrusters. A clean hull will substantially reduce fuel costs while keeping the boat performing as it should.



THE BENEFITS

- Sonihull pays for itself by reducing operating costs!
- A clean hull and drivetrain can reduce fuel bills by 20% to 30%
- Reduced vibration and improved performance
- Suppress diesel bug and keep stored water fresher when used on tanks

HOW DOES IT WORK?

Sonihull systems produces multiple bursts of ultrasonic energy in a range of targeted pulse frequencies.

This produces a pattern of alternating positive and negative pressure, whereby the microscopic bubbles that are created during the negative pressure are imploded when positive pressure is applied. This implosion has a cleansing effect that destroys algae, the first link of the food chain, making the surface less attractive to other marine life that feed on the algae. This microscopic movement of water also prevents barnacle and mussel larvae from embedding.



ENVIRONMENTALLY FRIENDLY

Reduce your carbon footprint!

With new environmental regulations set to substantially reduce the effectiveness of traditional antifouling paints, PYI Inc. offers Sonihull Ultrasonic Antifouling Systems as a credible addition to traditional antifouling methods. Using the latest in digital electronics and transducer technology, Sonihull has made a quantum leap forward over the competition to fill the needs of the marine industry.

Tests have demonstrated that electronic antifouling products have no adverse effect to fish and marine mammals. The ultrasonic frequencies stay very close to the hull structure and it is demonstrable that the signal does not stray into open water.



BEFORE



Fouling on hull prior to being cleaned, and then having Sonihull installed.

AFTER



Boat hull after being in the water for 2 years with the Sonihull system.

The Sonihull Ultrasonic Antifouling System offers superior performance and reliability with a combination of features not offered by any competitor.

- Each transducer is powered by a dedicated signal generator, offering a continual signal to all transducers
- Transducers and their cable connections are rated for submerged operations
- Transducers have no exposed metal
- AC/DC power option, defaulting to AC
- Automatic shut off in Low Voltage DC power situation to protect batteries
- Remote system status monitor
- Total quality control throughout the manufacturing process
- Virtually undetectable to the human ear with no need for a "sleep switch"

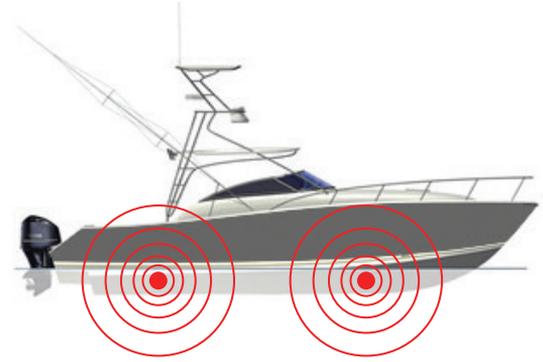
TRANSDUCERS PLACEMENT

These diagrams show you the approximate positioning for optimal performance for a Sonihull Mono and Sonihull Duo systems.

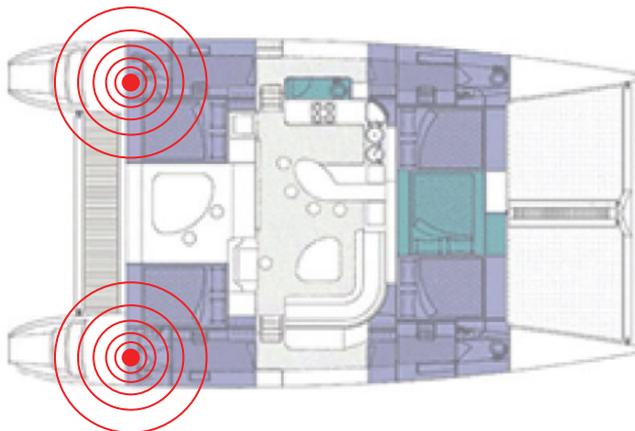
Contact PYI if your yacht is larger than 55' or BWL is greater than 16'.



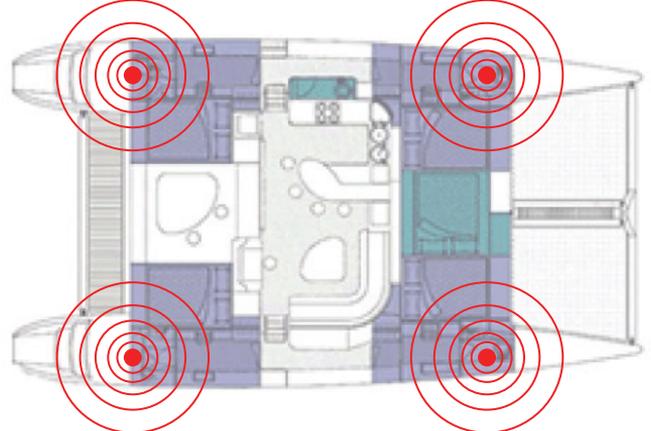
Sonihull Mono
For boats up to 32 feet



Sonihull Duo
For boats 32 - 55 feet



Sonihull Mono
For catamarans up to 32 feet



Sonihull Duo
For catamarans 32 - 55 feet

SONIHULL MODELS

SONIHULL
ULTRASONIC ANTI-FOULING SYSTEM



SONIHULL MONO



SONIHULL DUO

WHICH SONIHULL SYSTEM?

The Sonihull System is available in a single transducer “Mono”, or a two transducer “Duo”. Which Sonihull System, or the number of transducers needed is determined by the waterline length of the boat. This chart shows what combination of Mono and Duo systems are needed to protect you boat.

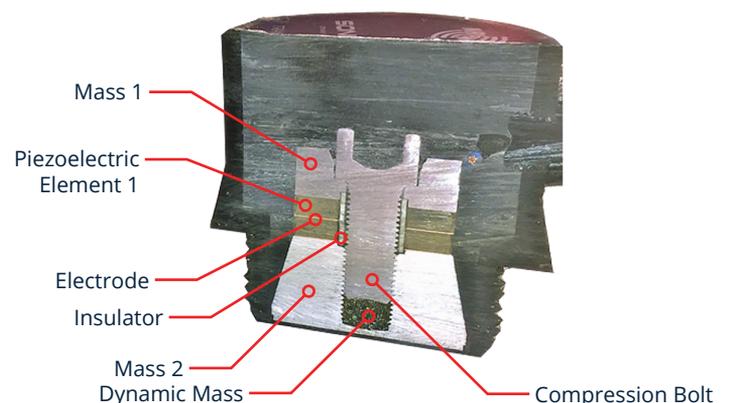
Transducers are placed near the vessel centerline and about twelve inches or more away from structures like primary bulkheads. As the beam of a boat approaches 20 feet the transducers will need to be positioned further outboard while reducing the fore & aft separation. A distance of 25 – 35 feet apart will provide effective and efficient hull protection.

	≤ 32'	32 - 55'	49 - 65'	59 - 72'
Mono	●			
Duo		●		
Mono + Duo			●	
Duo + Duo				●

Note:

1. For twin hull vessels double the requirements.
2. For cored hulls the transducer must contact the outer skin of the hull.

TRANSDUCER OVERVIEW



WHY SONIHULL IS FOR YOU

- No through hulls!
- Keeps your hull & running gear free of fouling
- Saves you money by reducing maintenance and haul outs, & improves fuel economy
- Environmentally friendly



TECHNICAL SPECIFICATIONS

Power Supply Approvals	UL and CE
Voltage	100-240v AC 50/60Hz, 12-24v DC
Power	Mono: 3.6w / Duo: 7.2w
Pulse Frequency	19.5 - 55 kHz
Control Box Rating	IP65
Transducer Rating	IP68
Transducer Cable	21 feet
Weight	9 lbs.
Dimensions	7" x 5" x 3"
Warranty	2 years

KIT INCLUDES

Sonihull Mono Includes

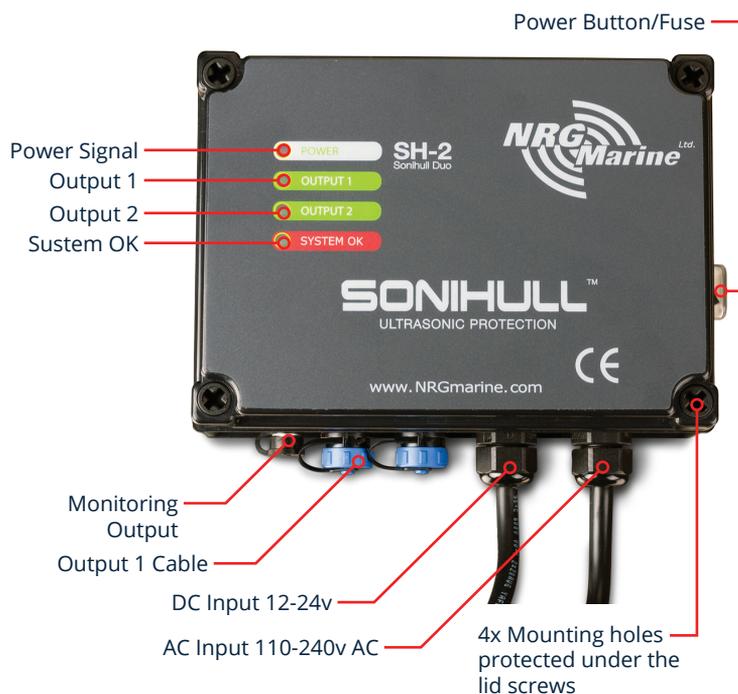
- Control Unit: x1
- Transducer: x1
- Main AC Cable: x1
- Main DC Cable: x1
- Marine Grade Epoxy: x1
- Vaseline: x1

Sonihull Duo Includes

- Control Unit: x1
- Transducer: x2
- Main AC Cable: x1
- Main DC Cable: x1
- Marine Grade Epoxy: x1
- Vaseline: x1

CONTROL BOX OVERVIEW

LED	COLOR	NORMAL STATUS	FAULT STATUS	COMMENTS
Power On	Red	ON	Flashing	Flashing is normal due to incorrectly seated transducers.
Output 1	Green	ON	OFF	OFF when not connected or in fault.
Output 2	Green	ON	OFF	OFF when not connected or in fault.
Status OK	Green	ON	OFF	Fault indication, check power and transducers.
Status output 2 core connector providing +5v DC output in normal condition, and OV in fault condition.				



**TO ORDER VISIT WWW.PYIINC.COM OR
CALL 425-355-3669**

SONIHULL8

Eight Transducer System

SONIHULL
ULTRASONIC ANTI-FOULING SYSTEM

The Sonihull8 is the latest addition to NRG Marine's Sonihull range of ultrasonic anti-fouling technology. Sonihull's fit-and-forget systems prevent marine organisms from colonizing solid surfaces that are exposed to raw seawater.

With eight independent and programmable outputs, Sonihull8 can protect every part of your vessel or structure from marine fouling with no through hulls. Unlike biocidal coatings and impressed-current systems, Sonihull8 is low cost and low maintenance, with zero poisonous environmental impacts. With one panel and eight transducers, Sonihull8 has all of your equipment covered.

- Each transducer is powered by a dedicated signal generator, offering a continual signal to all transducers
- Transducers and their cable connections are rated for submerged operations
- Transducers have no exposed metal
- AC/DC power option, defaulting to AC
- Automatic shut off in Low Voltage DC power situation to protect batteries



- Remote system status monitor
- Manufactured in-house for the best possible quality control
- Virtually undetectable to the human ear with no need for a "sleep switch"

Zero Environmental Impact

No poisonous environmental impact from biocides or metallic compounds. Zero interference with SONAR arrays or black box recovery equipment.

Low Maintenance

No expensive anodes to replace, no specialist fittings, dry docking or current isolation required.

Microbial Control

Suppresses Diesel bug in stored fuel and keeps potable water fresher for longer.

Eight Independent Transducers

Sonihull8 effectively opens the market for large installations, where multiple surfaces and equipment can now be protected by one unit.

Intelligent Multi-Material Commissioning

Operators can select different resonance algorithms for each ultrasonic transducer to suit the different materials or structures being protected.

Networks With Up To 32 Units

A potential network of 256 independently controlled and centrally managed transducers, ideal for large installations or multiple areas of protection.

Can Connect Up To 80m Away

Transducers are impedance matched, enabling cable lengths to be extended to 80 meters with no loss in performance. This makes Sonihull8 suitable for modular pre-fabricated constructions.

Fully Programmable & Integratable

Full RS232 / RS422 & SCADA communication interface for wired/ wireless remote control with critical path fault monitoring.



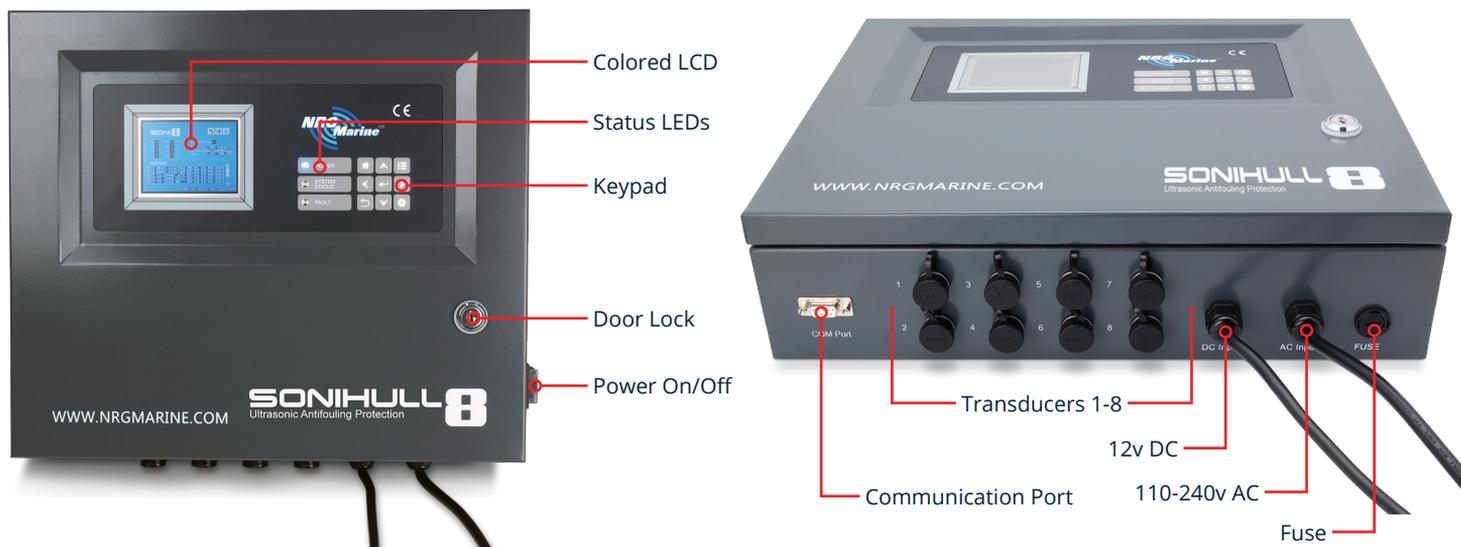
TECHNICAL SPECIFICATIONS

Power Supply Approvals	UL and CE
Voltage	110 - 240v AC, 22-30v DC
Power	<30w
Transducer Rating	IP68
Transducer Cable	24.6' (extendable up to 262.4')
Weight	10.6 lbs. (Control Box) 2.2 lbs. (Per Transducer) 28.2 lbs. (Total Weight)
Dimensions	13.3" X 17" X 4.7" (Control Box) Ø 3.7" X 3" (Transducer & Mounting Ring)
Warranty	2 years

SONIHULL8 INCLUDES

- 8 Independent ultrasonic transducers
- Industrial grade LCD full color screen
- Full critical path fault monitoring
- Runtime hour timer
- Event history
- Fully programmable transducer control
- RS422 port for repeater panel and future upgrades
- Status remote output for integration with management systems

CONTROL BOX OVERVIEW



SONIHULL8 PROTECTS

Inside

- Sea chests
- Tanks
- Keel coolers
- Box coolers
- Pipework
- Intakes
- Valves

Outside

- Hulls
- Structures
- Shafts
- Propellers
- Water jets
- Stern Drives
- Steering Gear

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CALL 425-355-3669**



STERN DRIVE & SAILDRIVE ADAPTOR

Stern drives have always been problematic in terms of fouling. Due to the many different metals they are composed of, their moving parts and soft bellows, conventional copper impregnated antifouling paints are not a valid option.

Sonihull coupled with the Stern Drive Adaptor offers great protection to this most important part of the boat that is prone to fouling. Results show an impressive average of 80% reduction in fouling.

This device enables a Sonihull transducer to be simply screwed in, so that ultrasonic signals can be directly injected into the stern drive. The Sonihull Stern Drive Adaptor mounts via the 16-18mm bolt found in the fixed end of the stern drive leg steering ram.



V16 MTU engine with Sonihull sea chest protection.

PROTECT YOUR SEA CHEST!

Proven around the world on commercial, military and private vessels as a most valuable addition to the protection of inlets and pipework.

Protection against growth and scaling, maximizing flow for intakes, filters, pipework, valves and heat exchangers.

With no expensive anodes to replace, no corrosion and completely safe for use on both steel and aluminum vessels. The Sonihull systems have proven themselves as the most credible antifouling alternative to suppressed current/cathodic protection systems.

This protection has not only been demonstrated in boats, but also in fixed installations, such as pumping stations, fire pumps, oil rigs, bunkering, desalination and more.

KEEL COOLER

Keeping the coolant system cool is extremely vital, a heavily fouled keel cooler will significantly impact this. Sonihull will keep your keel cooler free of fouling and thus keep coolant and engine at optimal temperatures.



One years growth without Sonihull Ultrasonic Antifouling.

After one year with Sonihull Ultrasonic Antifouling system.

PIPE ADAPTOR

Fouling in pipe work can be a major problem. It doesn't take long before fouling can start to restrict the flow of water, which can lead to engines and generators being destroyed as a result of overheating and water pumps wearing out due to the sharp increase in pressure.

The PA (Pipe Adaptor) for the Sonihull transducer simply bonds to the side of the pipe, allowing the ultrasonic pulses to be transmitted directly into the pipe wall, suppressing the build up of bio film and inhibiting barnacle larva and other critters from embedding. Maintenance free, with no expensive anodes to replace, and completely safe on steel and aluminum vessels.



Suitable For All Rigid Pipes!

- Steel
- Aluminum
- Stainless Steel
- Titanium
- Fiberglass
- Rigid Plastic

PART NUMBERS

PART #	FOR PIPES UP TO...
NR-GPA-25	1" (26mm) in diameter
NR-GPA-50	2" (52mm) in diameter
NR-GPA-65	2.5" (66mm) in diameter
NR-GPA-80	3" (82mm) in diameter
NR-GPA-100	4" (102mm) in diameter
NR-GPA-150	6" (152mm) in diameter
NR-GPA-200	8" (203mm) in diameter
NR-GPA-250	10" (254mm) in diameter
NR-GPA-300	12" (305mm) in diameter
NR-GPA-350	14" (356mm) in diameter
NR-GPA-400	16" (408mm) in diameter
NR-GPA-450	18" (458mm) in diameter
NR-GPA-500	20" (508mm) in diameter
NR-GPA-600	24" (610mm) in diameter
NR-GPA-700	28" (712mm) in diameter
NR-GPA-800	32" (813mm) in diameter
NR-GPA-900	36" (915mm) in diameter

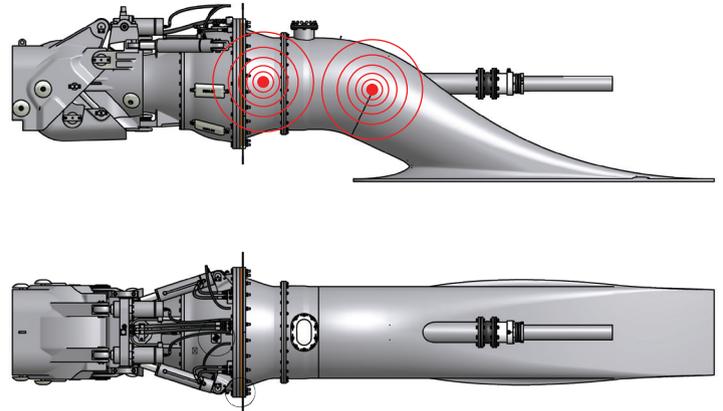
JETDRIVE PROTECTION

Following extensive tests with both jet manufacturers and military vessels, Sonihull has proven to be the most effective solution for protection from marine growth on marine water jet drives.

Sonihull now offers a proven and effective solution for water jets.

Available for:

- Rolls Royce
- Marine Jet Power (MJP)
- Hamilton's
- Alamarin-Jet
- And more!



Recommended Sonihull Transducer Locations

- One transducer located in the center of the impeller housing
- One transducer located on the intake housing in line with the impeller shaft

PYI HOSE CLAMPS

PYI
HOSE CLAMPS

For Hose Diameters 0.37" - 15" (9.5mm - 380mm)



NON-PERFORATED



ROLLED EDGE



7mm
SLOTTED HEX HEAD



500°C MAX
OPERATING TEMP



CORROSION
RESISTANT 316L

RELIABLE

PYI Hose Clamps are manufactured entirely out of 316L stainless steel, giving them excellent resistance to corrosive chemicals and acids that could limit the life of other metals. Whether used in a marine environment, industrially or around the house, the PYI Hose Clamp will keep any hose secure in some of the harshest environments.

DURABLE & STABLE CLAMPING FORCE

The PYI Hose Clamp utilizes a durable one-piece riveted screw cage design that is formed from a single piece of 316L stainless steel which is capable of withstanding high tightening torque and internal hose pressure. Our Hose Clamps can be hand tightened up to 135 in/lbs. without the screw slipping or distorting the screw cage during its installation and use; providing a reliable, strong and stable clamping force, as well as a long-lasting hold that is ideal for the most demanding applications.

FOR ALL HOSE TYPES

By rolling the edges and removing perforations and ribs on the inside portion of the embossed hose band, the PYI Hose Clamp can be used on the softest hoses without worry of damage to the underlying surface during installation and throughout its use.

ENTIRELY 316L STAINLESS STEEL

316L stainless steel is the metal of choice for a marine grade hose clamp due to its superior resistance to the corrosive action of saltwater, de-icing salts, industrial chemicals and acids. 316L utilizes a higher percentage of molybdenum, chromium and nickel than lower grade alloys. The addition of these elements not only improves the corrosion resistance of the material but also provides a greater creep resistance, a stronger stress-to-rupture and a higher tensile strength at elevated temperatures.

QUALITY AT EVERY LEVEL OF MANUFACTURING

PYI Hose Clamps are manufactured in a facility that is ISO 9001:2015 and Bureau Veritas certified and kitemarked to BS 5315:1991.

One-piece, 316L stainless steel screw cage

316L screw with hexagonal screw head and screw driver slot

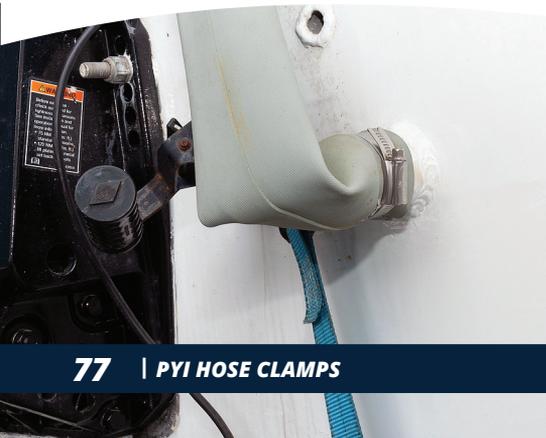
316L embossed band

Rolled edges

Non-perforated worm drive

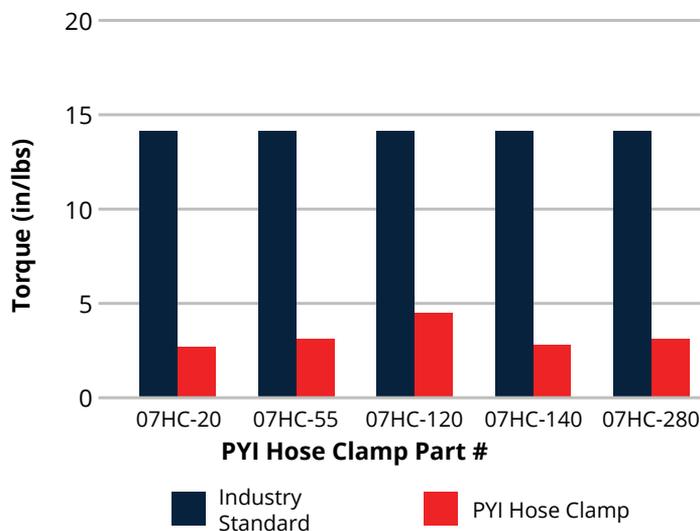
Smooth inside

- Non-perforated worm drive to increase strength and limit corrosion
- Rolled edges to protect the hose from abrasion or cuts
- 316L stainless steel construction that provides a high degree of corrosion resistance
- One-piece screw cage capable of withstanding high tightening torque
- The PYI Hose Clamp offers a durable and stable clamping force which provide a long lasting hose connection for a wide array of marine, industrial, automotive and household applications



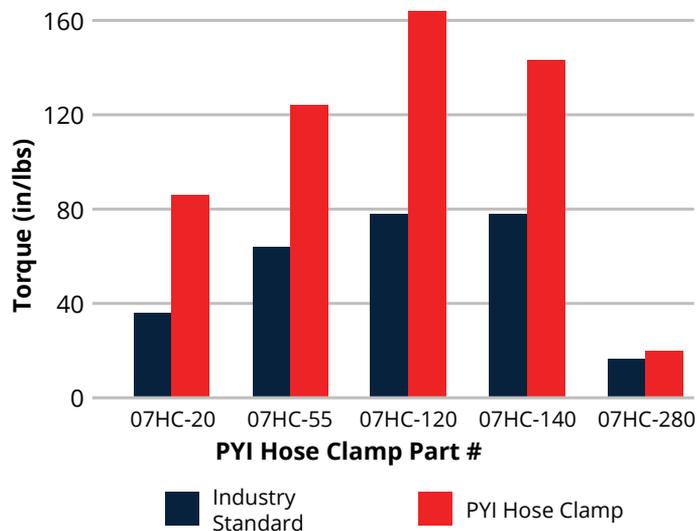
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LOWER TORQUE TEST*



* The Lower Torque Test measures the amount of torque required to twist the screw to tighten the clamp (lower is better).

DESTRUCTIVE TORQUE TEST**



** The Destructive Torque Test measures how much force is required to break the hose clamp (higher is better).

BENEFITS OF USING 316L STAINLESS STEEL

	316 STAINLESS
APPLICATIONS	
Automotive	•
Farm	•
Food	•
Garden	•
Heavy Duty	•
Home	•
Industrial	•
Marine	•
Medical	•
Plumbing	•
Forced Air	•
CHARACTERISTICS	
High Corrosion Resistance	•
PROPERTIES	
Material is Non-Magnetic	•

DURABLE DESIGN

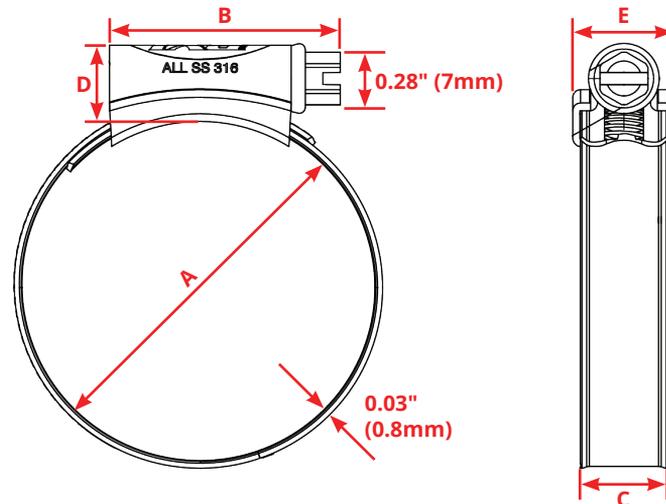
The screw cage utilizes a one-piece design capable of withstanding high tightening torque and internal hose pressure. The screw cage is pressed with a riveting machine that uses 60 tons of pressure to form the metal and the band together, resulting in an extremely durable solution. The clamp can be hand tightened to over 135 in/lbs. without the screw slipping or the cage becoming deformed.



CERTIFICATIONS

PYI Hose Clamps are manufactured in a facility that has earned the BSI Kitemark™ and is ISO 9001:2015 certified by Bureau Veritas.

**TO ORDER VISIT WWW.PYIINC.COM OR
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PART #	A (Min-Max Hose Diameter)	B	C	D	E	RECOMMENDED TORQUE
07-HC1-2	0.37"-0.47" (9.5-12mm)	0.75" (19mm)	0.37" (9.5mm)	0.39" (10.0mm)	0.48" (12.3mm)	30.1 in/lbs
07-HC1-6	0.43"-0.63" (11-16mm)	0.75" (19mm)	0.37" (9.5mm)	0.39" (10.0mm)	0.48" (12.3mm)	30.1 in/lbs
07-HC2-0	0.50"-0.79" (13-20mm)	0.75" (19mm)	0.37" (9.5mm)	0.39" (10.0mm)	0.48" (12.3mm)	30.1 in/lbs
07-HC2-2	0.63"-0.87" (16-22mm)	0.94" (24mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	37.2 in/lbs
07-HC2-5	0.71"-0.98" (18-25mm)	0.94" (24mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	37.2 in/lbs
07-HC3-0	0.87"-1.18" (22-30mm)	0.94" (24mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	45.1 in/lbs
07-HC3-5	0.98"-1.38" (25-35mm)	0.94" (24mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	45.1 in/lbs
07-HC4-0	1.18"-1.57" (30-40mm)	0.94" (24mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	45.1 in/lbs
07-HC4-5	1.38"-1.78" (35-45mm)	0.94" (24mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	45.1 in/lbs
07-HC5-0	1.38"-1.97" (35-50mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC5-5	1.57"-2.16" (40-55mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC6-0	1.78"-2.36" (45-60mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC7-0	2.17"-2.76" (55-70mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC8-0	2.36"-3.15" (60-80mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC9-0	2.76"-3.54" (70-90mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC1-00	3.35"-3.94" (85-100mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC1-20	3.54"-4.72" (90-120mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC1-25	3.94"-4.92" (100-125mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC1-40	4.72"-5.51" (120-140mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC1-50	5.11"-5.91" (130-150mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	60.2 in/lbs
07-HC1-60	5.12"-6.30" (130-160mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC1-80	5.91"-7.10" (150-180mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC2-00	6.70"-7.87" (170-200mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC2-30	7.48"-9.05" (190-230mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC2-50	8.66"-9.84" (220-250mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC2-80	9.45"-11.02" (240-280mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC3-00	10.63"-11.80" (270-300mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC3-30	11.42"-13" (290-330mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC3-60	12.60"-14.17" (320-360mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs
07-HC3-80	13.78"-14.96" (350-380mm)	1.30" (33mm)	0.47" (12.0mm)	0.50" (12.5mm)	0.58" (14.65mm)	52.2 in/lbs

PYI HOSE CLAMP PART #	RANGE OF ADJUSTMENT	ABA	AWAB	MURRAY	SAE	TRIDON
07-HC1-2	0.37"-0.47" (9.5-12mm)	-	-	EBL12x012SS	-	-
07-HC1-6	0.43"-0.63" (11-16mm)	-	316017	EBL12x016SS	4	-
07-HC2-0	0.50"-0.79" (13-20mm)	0813 4003 020	316020	EBL12x022SS	8	-
07-HC2-2	0.63"-0.87" (16-22mm)	0813 4003 020	316024	EBL12x022SS	8	53415-0027
07-HC2-5	0.71"-0.98" (18-25mm)	0813 4003 024	316028	EBL12x027SS	10	53415-0027
07-HC3-0	0.87"-1.18" (22-30mm)	0813 4003 027	316032	EBL12x032SS	12	53415-0032
07-HC3-5	0.98"-1.38" (25-35mm)	0813 4003 032	316038	EBL12x040SS	16	53415-0040
07-HC4-0	1.18"-1.57" (30-40mm)	0813 4003 038	316044	EBL12x045SS	20	53415-0045
07-HC4-5	1.38"-1.78" (35-45mm)	0813 4003 038	316044	EBL12x050SS	20, 22	53415-0045
07-HC5-0	1.38"-1.97" (35-50mm)	0813 4003 044	316050	EBL12x050SS	24	53415-0050
07-HC5-5	1.57"-2.16" (40-55mm)	0813 4003 050	316057	EBL12x060SS	24, 28	53415-0060
07-HC6-0	1.78"-2.36" (45-60mm)	0813 4003 050	316064	EBL12x060SS	28, 32	53415-0060
07-HC7-0	2.17"-2.76" (55-70mm)	0813 4003 067	316070	EBL12x070SS	34, 36	53415-0075
07-HC8-0	2.36"-3.15" (60-80mm)	0813 4003 077	316083	EBL12x080SS	40, 44	53415-0080
07-HC9-0	2.76"-3.54" (70-90mm)	0813 4003 077	316095	EBL12x090SS	48	53415-0090
07-HC1-00	3.35"-3.94" (85-100mm)	0813 4003 100	316102	EBL12x100SS	52, 56	53415-0100
07-HC1-20	3.54"-4.72" (90-120mm)	0813 4003 100	316127	EBL12x110SS	60, 64	53415-0110
07-HC1-25	3.94"-4.92" (100-125mm)	0813 4003 121	316127	EBL12x120SS	64, 80	53415-0120
07-HC1-40	4.72"-5.51" (120-140mm)	0813 4003 121	316140	EBL12x140SS	72, 80	53415-0140
07-HC1-50	5.11"-5.91" (130-150mm)	0813 4003 148	316152	EBL12x150SS	88	53415-0150
07-HC1-60	5.12"-6.30" (130-160mm)	0813 4003 148	316165	EBL12x160SS	96	53415-0160
07-HC1-80	5.91"-7.10" (150-180mm)	0813 4003 165	316178	-	104	-
07-HC2-00	6.70"-7.87" (170-200mm)	0813 4003 190	316203	-	104, 122	-
07-HC2-30	7.48"-9.05" (190-230mm)	0813 4003 216	316232	-	122, 138	-
07-HC2-50	8.66"-9.84" (220-250mm)	0813 4003 241	316257	-	138, 154	-
07-HC2-80	9.45"-11.02" (240-280mm)	0813 4003 267	316283	-	154, 170	-
07-HC3-00	10.63"-11.80" (270-300mm)	0813 4003 292	316308	-	170, 186	-
07-HC3-30	11.42"-13" (290-330mm)	-	-	-	200	-
07-HC3-60	12.60"-14.17" (320-360mm)	-	-	-	224	-
07-HC3-80	13.78"-14.96" (350-380mm)	-	-	-	232	-

* Actual size ranges may vary

HOSE CLAMP ACCESSORIES



FLEXIBLE HOSE CLAMP DRIVER

The flexible shaft allows for access in tight spaces such as marine engines, plumbing repair, automotive, etc. The socket fits all PYI Hose Clamps or any hose clamp with 7mm screw heads.



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CLAMP JACKET

**CLAMP
JACKET**

Prevents Cuts & Scrapes

Put an end to exposed hose clamp tails! Clamp Jackets by PYI Inc. protect users from cuts and scrapes caused by the sharp ends of hose clamps.

Made out of durable EPDM rubber, the unique sleeve design allows the Clamp Jacket to slip over the tail of a hose clamp to provide a worker protection from cuts and abrasion from exposed clamp tails. The Clamp Jacket is ideal for a multitude of projects including marine, automotive, industrial, military and around the house.



TECHNICAL SPECIFICATIONS

Temperature Range	-65°F to +300°F
Material Durometer	70+ / -5 (Shore A)
Tensile Strength	14.3 MPa

PART NUMBERS



QUANTITY	5/16"	1/2"	1/4"
25	CJ516-25	CJ-12-25	CJ-T14-25
100	CJ-516-100	CJ-12-100	CJ-T14-100
900	CJ-516-25C	CJ-12-25C	CJ-T14-25C
1,200	CJ-516-100-C	CJ-12-100C	CJ-T14-100C
2,500	CJ-516-2-5K	CJ-12-2-5K	CJ-T14-2-5K
10,000	CJ-516-10K	CJ-12-10K	CJ-T14-10K
100,00	CJ-516-100K	CJ-12-100K	CJ-T14-100K



Non slip grips for easy installation and removal.

Self aligning lip makes for quick installation.

T-BOLT CLAMP STYLE FEATURES

Simply slides on 1/4" threads. Protects threads as well as the user.

No more hassling with fingers sliding off, indents for superior grip when installing & removing.



FENDERTEX FENDERS

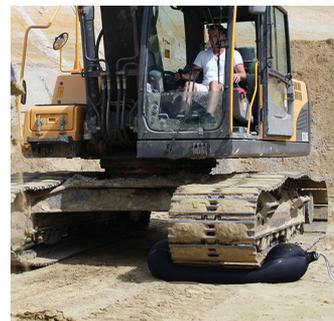


Inflatable Textile Fenders

Fendertex® is the only manufacturer of inflatable textile fenders for the yachting market. The Fendertex® standard line offers cylindrical, spherical, and tandem fenders. Fendertex® also offers a wide range of customizable textile fenders and accessories.

FEATURES

- Lightest fender in the world
- Can be deflated and rolled for easy stowage
- Built to withstand an immense amount of pressure
- Automatically adapts to pressure changes from temperature swings
- Available in three standard shapes and ten standard colors
- Customized sizes, colors, and personalization options available
- Available accessories include fender covers, covered D-rings, fender lines, and pumps



ULTRA LIGHTWEIGHT

Fendertex® Fenders are extremely light, making them easier to handle than typical PVC or other inflatable fenders.

- Up to 95% lighter compared to PVC fenders
- Up to 40% lighter than other inflatable fenders

SPACE SAVING

Storage of traditional fenders is often an issue on vessels. Fendertex® Fenders are designed to minimize the use of storage space. Once deflated and rolled up, a set of fenders can easily be placed into a small locker.

- 95% smaller when deflated compared to standard PVC fenders
- 50% smaller when deflated than other inflatable fenders
- Quickly inflates & deflates

ROBUST DESIGN

- Can withstand an immense amount of pressure
- Automatically adapts to temperature swings
- Holds shape after extended periods of pressure
- Made with solution dyed yarn for good UV protection and resistance to color fading

CUSTOMIZATION

- Custom knitted fender covers can feature boat name or logo
- Embroidery can be added to the cover, neck strap and bottom side tab
- Wide variety of colors
- Covered D-rings and custom stitching available in numerous colors



Fendertex® Fenders

FENDERTEX® FENDERS VS. OTHER INFLATABLE FENDERS

- Much lighter than comparative fenders on the market
- Can be used on a dock with no additional cover
- In case of strong winds, water can be added to the bladder to ballast the fender
- Automatically adapts to temperature swings, thanks to the elasticity of the mesh, no need to adjust the pressure once inflated
- Can be cleaned in a standard washing machine

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PRODUCT DETAILS

1. Technical textile with more elasticity at the ends to compensate for the increase in air volume caused by high temperatures maintains a constant pressure of about 5.1 psi (350 mbh).
2. Long side tab.
3. Highly elastic inner tube, water can be added to act as ballast for the fender.
4. A technical textile made from polyester with high abrasion resistance. Does not absorb salt, thus avoiding micro scratches on the hull. Easy to clean with water or in a standard washing machine.
5. Retention strap to prevent deformation of the collar during compression.
6. Inflatable suspension collar with a maximum capacity at 1.5 tons of vertical tension.
7. Suspension strap sewn into a cross for added strength.
8. 316 stainless steel D-ring.

TEMPERATURE RESISTANCE

Polyester Cover

284°F (140°C) static
320°F (160°F) dynamic

Inner Tube

293°F (145°C) static
257°F (125°C) dynamic

MAINTENANCE

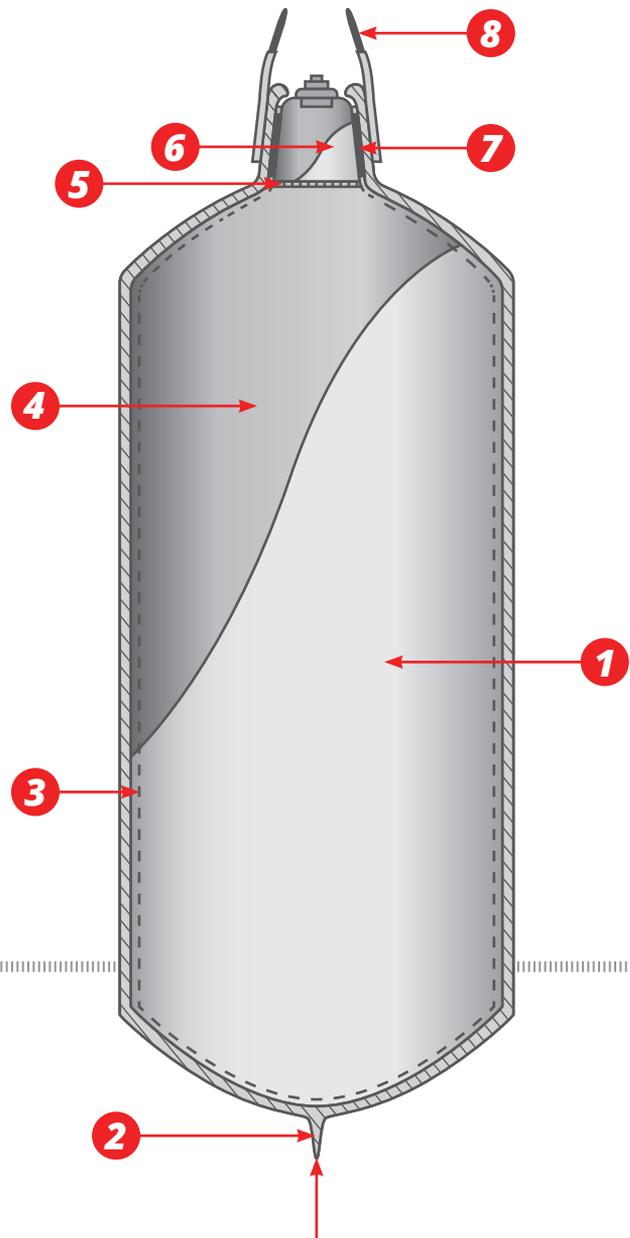
Fendertex® Fenders are machine washable up to 104°F (40°C). Can be washed with bladder intact.

TEXTILE DETAILS

- Outer shell made of one piece knitted engineered textile
- 100% polyester, yarns manufactured exclusively for Fendertex®
- Knitted textile covers the tapered extremities
- Material knitted as a single sleeve

INFLATABLE BLADDER DETAILS

- Proprietary polyurethane manufactured for Fendertex®
- Durable, with high elasticity
- Designed for the marine environment
- High frequency welding used on the seams
- Uses a secure, "fast-empty" valve



ATTACHMENT DETAILS

- Suspension straps made with 100% polyester
- Stainless steel D-rings at the top
- Polyester strap at the bottom

TEXTILE FENDER

Fendertex® is the only manufacturer of inflatable textile fenders for the yachting market. Outer shell made of one piece knitted engineered textile.

BUILD YOUR FENDERTEX FENDER

Using the steps outlined in the next few pages you can build your personalized FenderTex® Fender.



STEP 1: SELECT FENDER SIZE

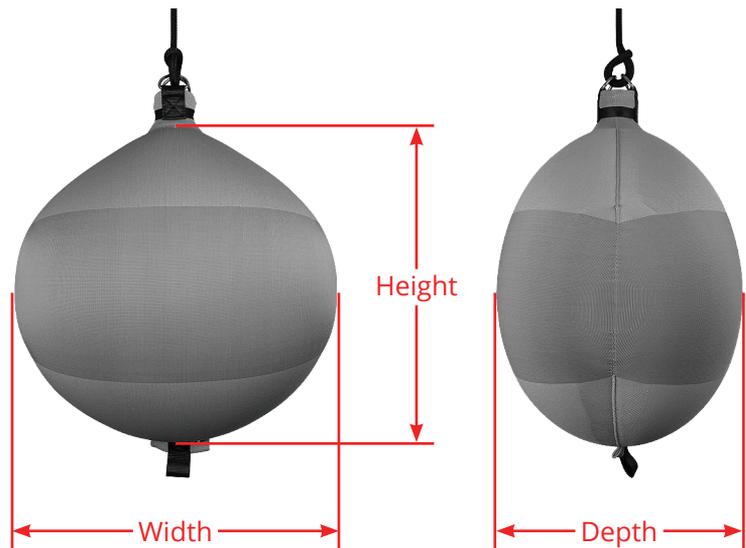


BOAT LENGTH	CYLINDRICAL FENDER PART #	DIMENSIONS	COMPRESSION STRENGTH	# OF FENDERS RECOMMENDED (For Both Sides Of The Boat)	TANDEM FENDER PART #	DIMENSIONS	COMPRESSION STRENGTH
20 - 30 feet (7 - 9 meters)	C52	Height: 19.7" (550 mm) Diameter: 8.7" (410 mm)	4,409 lbs (2,000 kg)	x6	T52	Height: 19.7" (550 mm) Width: 8.7" (520 mm) Depth: 4.3" (410 mm)	2,204 lbs (1,000 kg)
30 - 43 feet (9 - 13 meters)	C73	Height: 27.6" (550 mm) Diameter: 9.8" (410 mm)	6,613 lbs (3,000 kg)	x8	T73	Height: 27.6" (550 mm) Width: 9.9" (520 mm) Depth: 4.8" (410 mm)	3,306 lbs (3,000 kg)
43 - 52 feet (13 - 16 meters)	C84	Height: 31.5" (550 mm) Diameter: 11.8" (410 mm)	10,361 lbs (4,700 kg)	x8	T84	Height: 31.5" (550 mm) Width: 11.9" (520 mm) Depth: 5.8" (410 mm)	5,180 lbs (2,350 kg)
52 - 62 feet (16 - 19 meters)	C104	Height: 39.4" (550 mm) Diameter: 13.4" (410 mm)	13,227 lbs (6,000 kg)	x10	T104	Height: 39.4" (550 mm) Width: 13.5" (520 mm) Depth: 6.6" (410 mm)	6,613 lbs (3,000 kg)
62 - 98 feet (19 - 30 meters)	C124	Height: 47.2" (550 mm) Diameter: 14.2" (410 mm)	17,196 lbs (7,800 kg)	x12	T124	Height: 47.2" (550 mm) Width: 14.3" (520 mm) Depth: 7" (410 mm)	8,598 lbs (3,900 kg)
98 - 131 feet (30 - 40 meters)	C145	Height: 55.1" (550 mm) Diameter: 19.3" (410 mm)	19,841 lbs (9,000 kg)	x14	T145	Height: 55.1" (550 mm) Width: 19.4" (520 mm) Depth: 9.6" (410 mm)	9,920 lbs (4,500 kg)
131 - 180 feet (40 - 55 meters)	C175	Height: 66.9" (550 mm) Diameter: 22.1" (410 mm)	26,455 lbs (12,000 kg)	x16	T175	Height: 66.9" (550 mm) Width: 22.1" (520 mm) Depth: 10.9" (410 mm)	13,227 lbs (6,000 kg)
180 - 230 feet (55 - 70 meters)	C207	Height: 78.7" (550 mm) Diameter: 27.6" (410 mm)	35,273 lbs (16,000 kg)	x18	T207	Height: 78.7" (550 mm) Width: 27.6" (520 mm) Depth: 13.7" (410 mm)	17,637 lbs (8,000 kg)
230 - 328 feet (70 - 100 meters)	C248	Height: 94.5" (550 mm) Diameter: 37.4" (410 mm)	44,092 lbs (20,000 kg)	x20	T248	Height: 94.5" (550 mm) Width: 37.4" (520 mm) Depth: 18.6" (410 mm)	22,046 lbs (10,000 kg)

TANDEM FENDERS ALSO AVAILABLE



SPHERICAL FENDER PART #	DIMENSIONS	COMPRESSION STRENGTH
S60	Height: 21.7" (550 mm) Width: 20.5" (520 mm) Depth: 16.1" (410 mm)	13,227 lbs (6,000 kg)
S70	Height: 25.6" (650 mm) Width: 24.4" (620 mm) Depth: 19.7" (500 mm)	15,432 lbs (7,000 kg)
S80	Height: 29.1" (740 mm) Width: 26.4" (670 mm) Depth: 21.7" (550 mm)	17,637 lbs (8,000 kg)
S100	Height: 33.9" (860 mm) Width: 35.4" (900 mm) Depth: 27.6" (700 mm)	22,046 lbs (10,000 kg)
S120	Height: 38.6" (980 mm) Width: 48" (1,220 mm) Depth: 33.5" (850 mm)	26,455 lbs (12,000 kg)



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STEP 2: CHOOSE FENDER TYPE

The Fendertex® standard line offers cylindrical, spherical, and tandem fenders.



FENDERTEX®



CYLINDRICAL FENDER

The cylindrical fender is the most common fender shape. Built with stainless steel D-rings located at the top and a strap at the bottom, this fender can be positioned vertically or horizontally. Some sizes require the long-side option for horizontal hanging.



SPHERICAL FENDER

The spherical fender is usually used as a hand held fender during maneuvers due to its width, but it is also used as a standard fender on larger vessels.



TANDEM FENDER

The tandem fender is designed for sailboats, both monohulls and catamarans. The dual tube design prevents it from rolling on itself and protects a larger hull area than other shaped fenders.

STEP 3: PICK A COLOR

Fendertex® Fenders are available in ten different colors.

* These colors are not stocked and have a 4-6 week lead time.



BLACK



DARK GREY*



GREY



NAVY BLUE



ROYAL BLUE*



BURGUNDY*



RED*



ORANGE*



TAN*



GREEN*

STEP 4: CHOOSE AN OPTIONAL COVER

Protect your Fendertex® Fender with a Fender Cover. Choose either a Neoprene Style or Textile fender cover. Fender covers only available for Cylindrical fenders.



NEOPRENE STYLE COVER

Available in black.



TEXTILE COVER

Available in all ten factory colors.

PERSONALIZE YOUR COVER!

Neoprene Fender Covers can have your logo or boat name embroidered onto the cover.

The Textile Fender Covers can have your logo or boat name knitted into the cover.

* Textile cover shown.



STEP 5: SELECT OPTIONAL ACCESSORIES

Further enhance your Fendertex® Fender with the numerous optional accessories.



FENDERTEX®



COVERED D-RINGS

Covered D-Rings protect your boat from potential impact from exposed metal D-Rings when handling. Standard and custom color options available.



SPliced FENDER LINES

Standard 6' or 9' lengths. Custom lengths available. Available in black, grey and navy blue.



LONG SIDE COVER

The Long Side Cover option allows you to orient and mount the fender horizontally. Required for side hanging of C124 and larger models.



LONG SIDE OPTION

The Long Side D-Ring option allows you to orient and mount the fender horizontally. Available only on fender models C84 and C104.



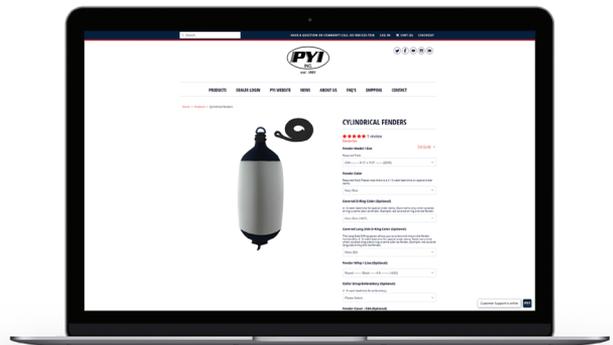
COLLAR EMBROIDERY

Personalize your Fendertex® Fender with either your boat name or logo embroidered onto the fender collar.



INFLATION PUMPS

Manual, battery powered and electric available.



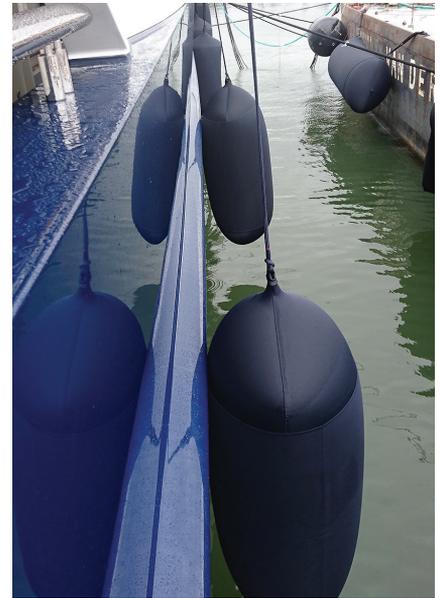
DESIGN & SEE YOUR FENDER USING OUR FENDER BUILDER

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FENDERTEX® IN ACTION



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FLOOR ANCHORS

FLOOR ANCHORS

Available For 1/2"-1 1/4" (12mm-32mm) Thick Floorboards

PYI Floor Anchors are a purpose designed fastener, engineered to secure floorboards or lock hinged panels. Available in 316L stainless steel, they will not corrode, discolor with age or damage the wood surface. PYI Floor Anchors meet ISAF requirements for offshore boats (category 2.03) and can safely hold 500 lbs (226 kg) per unit. The simple bayonet style opening mechanism, with 1/4 turn lock and release, will not loosen with age. Being that all pieces are self-contained, Floor Anchors can be repeatedly opened/closed without the risk of losing parts. Suitable for 0.5" to 1.25" (12mm - 32mm) thick floorboards.

DURABLE

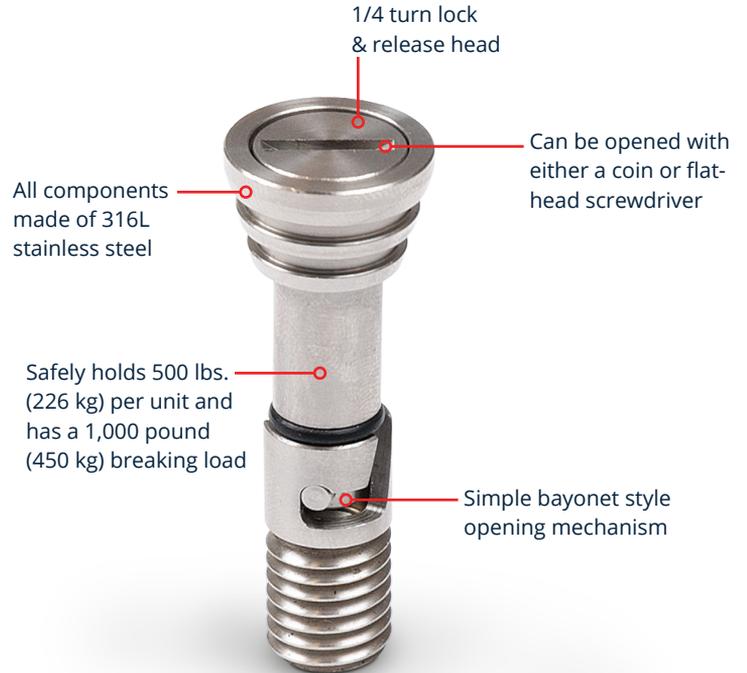
Made of 316L stainless steel. Will not corrode, discolor with age or damage the wood surface.

SIMPLE DESIGN

Opening mechanism is a simple bayonet style, with 1/4 turn lock and release that will not loosen with age. Can be opened or closed by either a coin or a flat head screwdriver. All components permanently attached, no loose pieces to drop in the bilge.

FLUSH MOUNTED

PYI Floor Anchors are flush mounted for improved aesthetics. The permanently glued tapered washer acts as protection for the floorboards.



PART NUMBERS

PART #	QUANTITY	DESCRIPTION
11-FA0-34	1	Floor Anchor for 1/2" to 3/4" floorboards
11-FA0-344	4	Floor Anchor for 1/2" to 3/4" floorboards
11-FA0-3412	12	Floor Anchor for 1/2" to 3/4" floorboards
11-FA1-00	1	Floor Anchor for 7/8" to 1 1/4" floorboards
11-FA1-004	4	Floor Anchor for 7/8" to 1 1/4" floorboards
11-FA1-0012	12	Floor Anchor for 7/8" to 1 1/4" floorboards



STARTER KIT

The PYI Floor Anchor Starter Kit comes with everything you need for installation. Includes four stainless steel Floor Anchors, countersink cutter, drill bits and a tap.

PART #	DESCRIPTION
11-FA0-34S	3/4" Floor Anchor Starter Kit
11-FA1-00	1" Floor Anchor Starter Kit



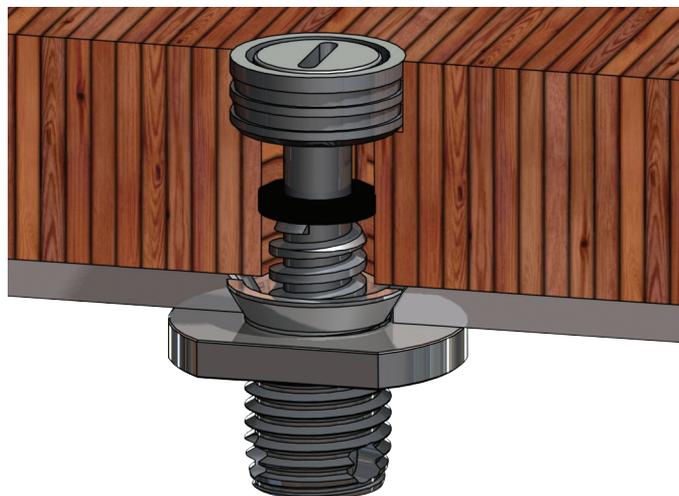
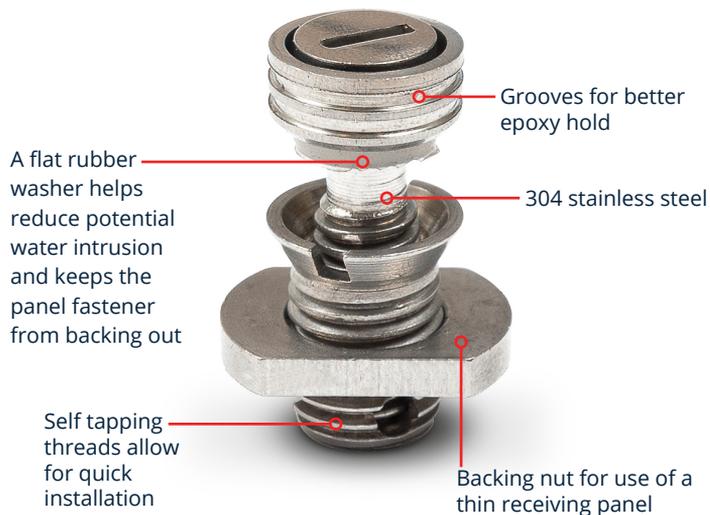
INSTALLATION KIT

The PYI Floor Anchor Installation Kit comes with everything you need for installation. Includes countersink cutter, drill bits and a tap.

PART #	DESCRIPTION
11-FAI-NST	Floor Anchor installation kit



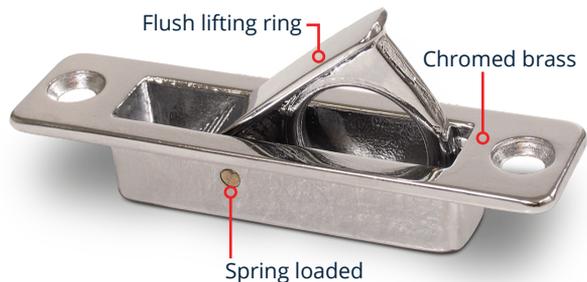
OEM FLOOR ANCHORS



PYI "OEM" Floor Anchors are designed to allow a 3/8" (9mm) to 3/4" (19mm) floor panel to be attached and detached repeatedly. PYI "OEM" Floor Anchors are a simplified form of PYI's successful Floor Anchors. Their simple design and installation allows a production boat builder to implement this type of fastener in a manufacturing environment. All components are made from 304 stainless steel.

PART #	DESCRIPTION
11-FA0-EM	Floor Anchor for 3/8" to 3/4" (9 - 19mm) floorboards

FLOOR LATCH



The PYI Floor Latch is made of chromed brass. It features a flush lifting ring, and when pressed the latch opens due to the loaded spring.

PART #	DESCRIPTION
11FAL-CH	Spring loaded Floor Latch



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PYI MACHINE SHOP



Over 35 Years of Experience

Our focus is to provide customers with quick turn around for quality machining at competitive prices. We focus on small to medium sized runs using our diverse set of CNC lathes and mills. Our highly experienced team currently machines parts for the marine, aerospace, industrial, and medical industries.

FEATURES

- Over 35 years of experience
- Quick turn around
- Small to medium sized runs
- Diverse machining capabilities.

PRODUCTION MACHINING

- Typical run sizes are between 5 to 1,000 parts
- Flexibility to accommodate rush jobs
- Our purchasing agents have access to competitively priced material if needed

PROTOTYPING

We can help you take your idea from concept to production. Our engineering staff are highly experienced at designing and developing new parts. We use Solidworks CAD design, the leading solid modeler for machining, for precision in designing and machining.

MAIN MACHINES



HAAS DS 30SSY
CNC LATHE



MAZAK QUICK TURN 15 MARK II
CNC LATHE



MORI SEIKI SV-50
CNC MILL

OTHER MACHINES

Mazak Quick Turn 20M
CNC Lathe

Mazak Quick Turn 10
CNC Lathe

Morie Seiki SV Junior
CNC Mill

Graziano SAG 210
Manual Mill

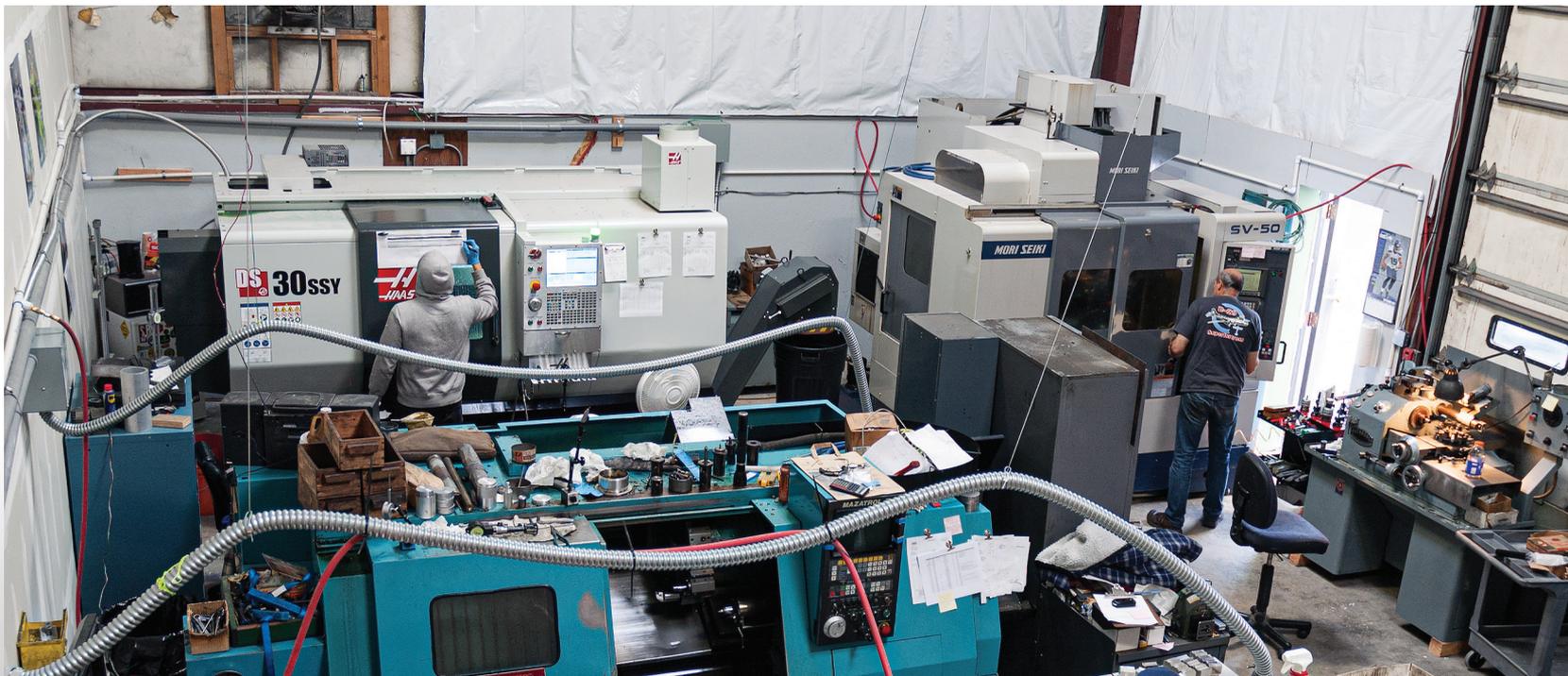
Rathbone 5C
Chucker

RAW MATERIALS

We are able to machine numerous raw materials such as aluminum, stainless steel, acrylic, plastic and delrin.



PROJECT SAMPLES



QUOTING PROCESS

To get a quote on your specific machining needs, you can contact us via email or on our website.

- Send an email to ms@pyiinc.com, attaching any necessary drawing and/or documents.
- Go to our website and fill out our contact form. www.pyiinc.com/machineshop.html

To provide you with a timely and accurate quote, we typically need the following items:

Drawings - Mechanical drawings containing the specific details of the component(s) you need manufactured.

Materials, coatings, heat treating, etc. - Drawing files should include material specifications and any heat treating, plating, coating, or other special processing required.

Quantities - Please specify the batch quantities of each part that you would like us to quote. In our business, every operation requires a setup of the associated machine and process required, this setup is allocated across the batch quantity into a per-piece price. As a result, the larger the batch size, the lower the setup costs per part. We can easily quote multiple quantities so you can easily see and evaluate the difference.

After we review the provided information, we will contact you with pricing and lead time for your project.

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THE PYI TEAM



As a company, PYI realizes that a great deal of our success is owed to our employees and their dedication to you, our customers. We pride ourselves on treating our employees with the respect they deserve, and are fortunate to have extremely high employee retention.

Many of our employees have been with us for 15 years and some for 25 years and more! By treating our employees right, they in turn, treat our customers right. We all appreciate the opportunity to earn your business.



Tracy Langlie
Accounting



Kathy O'Brien
Accounting



Laura Helliard
Purchasing



Eric Young
Graphic Designer



Fred Hutchison
Sales/Tech Support



Miles Weber
Sales/Tech Support



Kenneth Planck
Sales/Tech Support



Michael Fannin
Sales/Tech Support



Phil Quartararo
Sales/Tech Support



Justin Romesburg
Sales/Tech Support



Nic Laffitte
Sales/Tech Support



Ben Woody
Sales/Tech Support



Jerome Blakely
Max-Prop Service



Mike Butler
PSS Assembly



Jennie Panameno
PSS Assembly



Brandon Chhann
Warehouse



Mazen Mattas
Machine Shop



Julio Martinez
Machine Shop



Dave Lentz
Machine Shop



Kevin Woody
Vice President



Frederic Laffitte
President

TECHNICAL SUPPORT



At PYI we quickly respond to our customer's ideas and needs. Since 1981, we have never forgotten that our Company cannot exist without our customers. Our goal is to provide quality, innovative marine equipment with an unsurpassed level of customer service and satisfaction and we will never stray from this goal.

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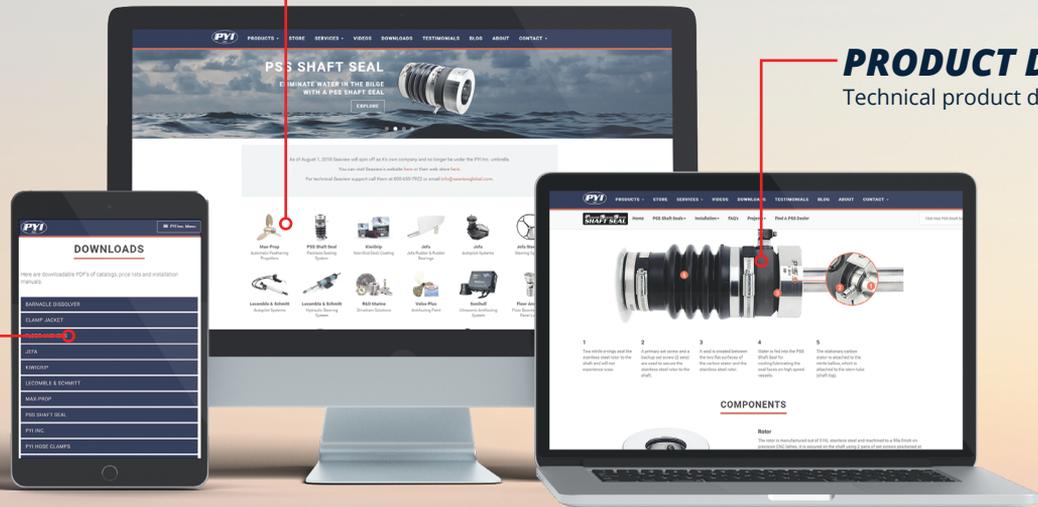
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PRODUCT DETAILS

Technical product details.

DOWNLOADS

Current catalogs, price lists, installation instructions, etc.



TECHNICAL SUPPORT

Monday - Friday
7:00 am to 4:30 pm PST
425-355-3669
Toll Free: 800-523-7558
info@pyiinc.com

Need technical support? Contact one of our friendly experts.



OFFICE LOCATION

12532 Beverly Park Road
Lynnwood, WA 98087

Stop by our office for technical support or to purchase products.



Subscribe to our YouTube channel for helpful How-To videos and product demonstrations.

Follow us on social media!



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How-To Compress a Type B Seal

Don't Re-Use the Set Screws

How-To Clean a PSS Shaft Seal

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Max-Prop Easy Disassembly

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Max-Prop Classic Disassembly

Determining the Pitch and Rotation
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How-To Install a Max-Prop Easy

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Stress Testing Fendertex Fenders

Manufacturing Process of Fendertex

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