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Installatieaanbevelingen voor boegschroeven

Installation recommendations for bow thrusters

Einbauhinweise für Bugschrauben

Recommandations pour l'installation d'hélices d'étrave

Recomendaciones de instalación para hélices de proa

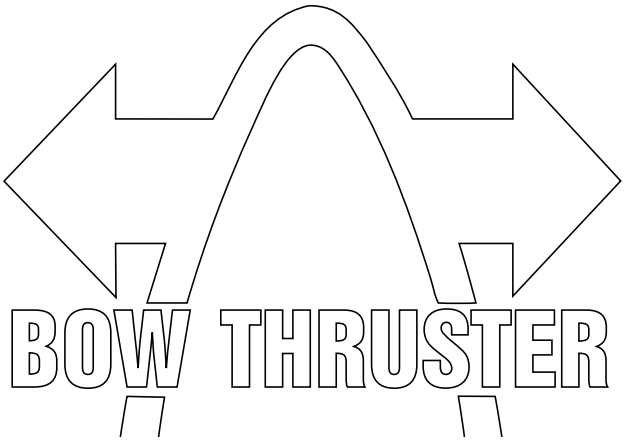
Suggerimenti per l'installazione delle eliche di prua

Anbefalinger til montering af bovskruer

Rekommendationer för montering av bogpropeller

Anbefalinger for installasjon av baugpropeller

Keulapotkurien sijoitussuosituksia



BOW25 . . .
BOW35 . . .
BOW45 . . .
BOW55 . . .
BOW60 . . .
BOW75 . . .
BOW95 . . .
BOW125 . . . **BOW230 . . .**
BOW160 . . . **BOW310 . . .**
BOW220 . . . **BOW410 . . .**
BOW285 . . . **BOW550 . . .**

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020571.03

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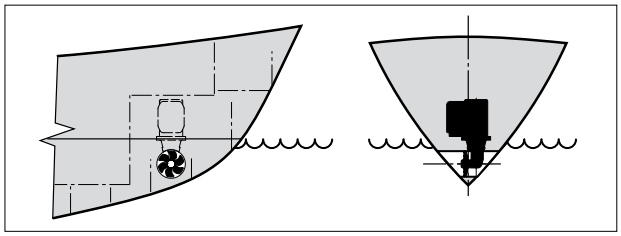
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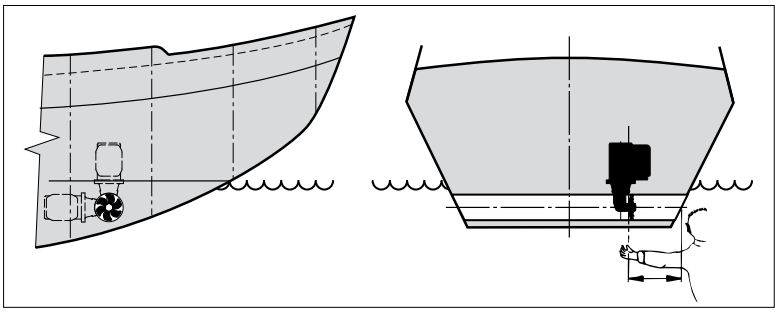
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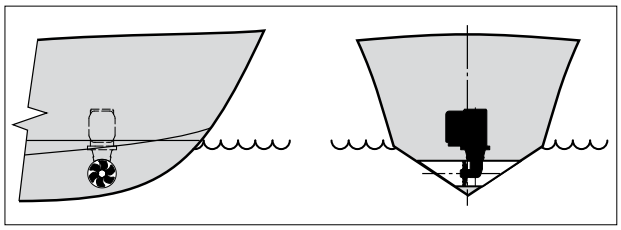
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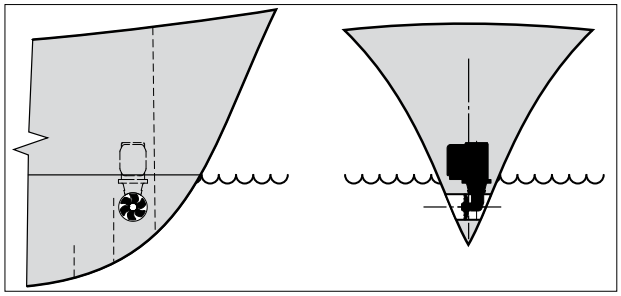
1 Positioning of thrust tunnel

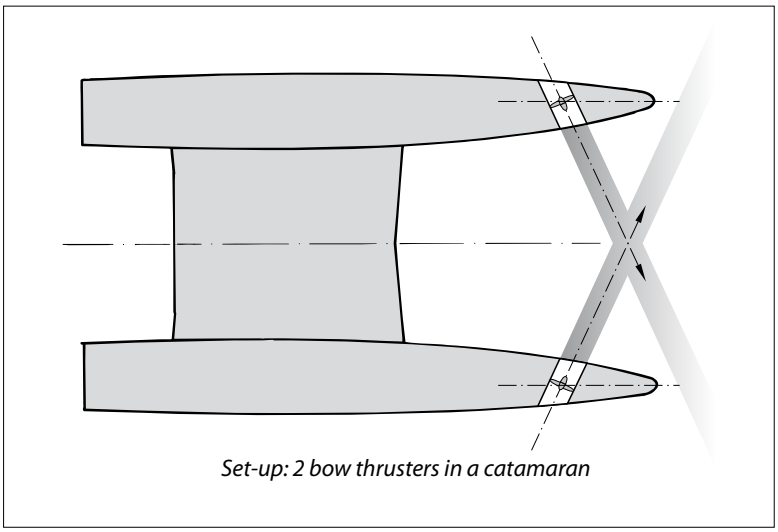
Several installation examples.





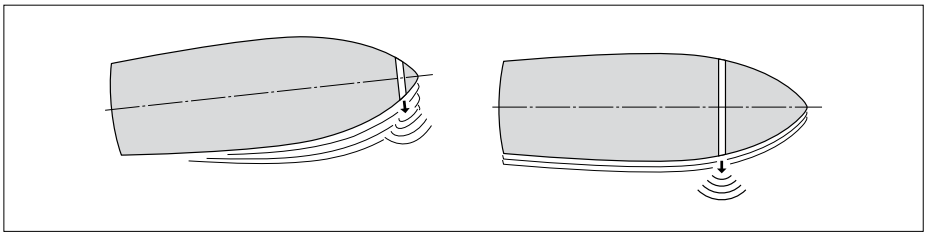




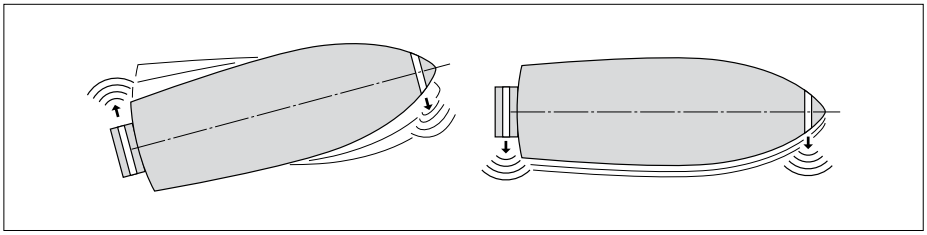


Set-up: 2 bow thrusters in a catamaran

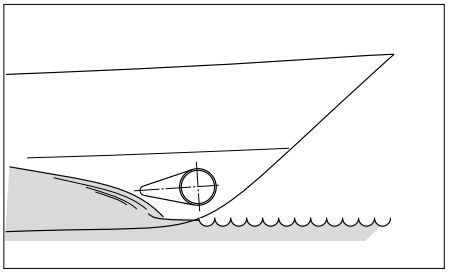
To achieve the optimum performance, position the thrust tunnel as far forward as possible.



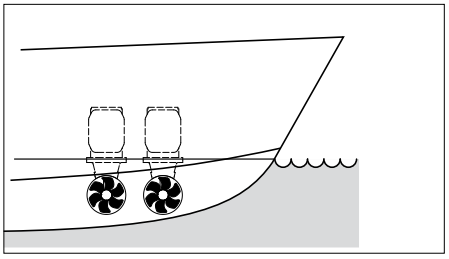
If, in addition to controlling the movement of the bow, the stern of the vessel is required to move sideways, then a second thruster may be installed at the stern.



In case of a planning vessel the tunnel should, if possible, be so situated that when the vessel is planing it is above the water level thus causing no resistance.



Installation of two bow thrusters in tandem (for larger boats). In this case, depending on weather conditions, one or both bow thrusters may be used.



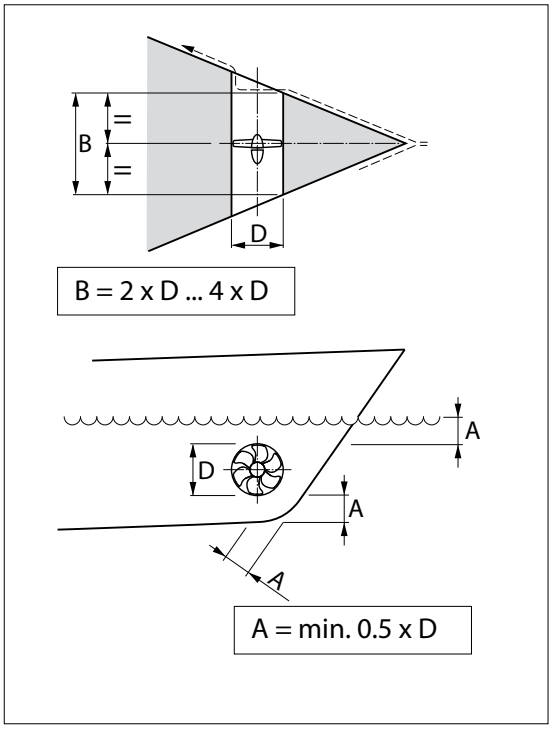
Tip:

We do not advise fitting 2 bow thrusters into one tunnel; this does not result in doubling the thrust!

When choosing the location for the thrust tunnel, take the following into account for optimum performance:

- The distance A shown in the drawing must be at least 0.5 x D (where D is the tunnel diameter).
- The length of the tunnel (distance B) should be between 2 x D and 4 x D.

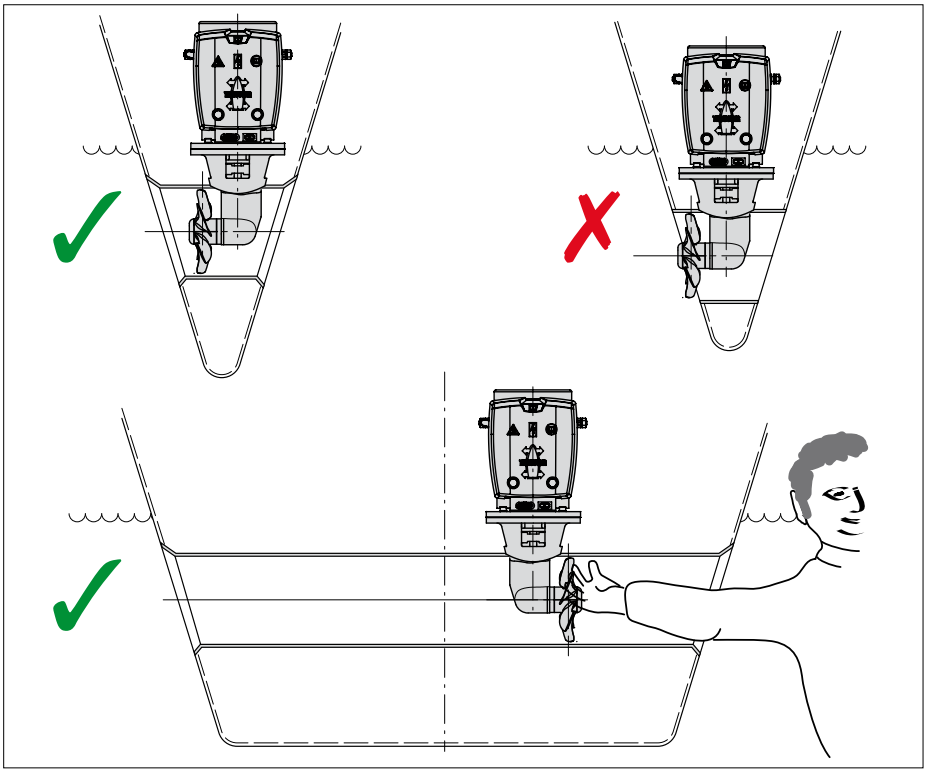
Thruster 'BOW . . . .'	D [mm] (inches)	A [mm] (inches)	B [mm] (inches)
25 . . .	110 (4 5/16")	55 (2 1/4")	220 … 440 (9 … 18")
45 . . .	125 (4 15/16")	65 (2 9/16")	250 … 500 (10 … 20")
35 . . . **55 . . .**	150 (5 7/8")	75 (3")	300 … 600 (12 … 24")
60 . . . **75 . . .** **95 . . .**	185 (7 5/16")	100 (4")	370 … 740 (15 … 30")
125 . . . **160 . . .**	250 (9 13/16")	125 (5")	500 … 1000 (20 … 40")
220 . . . **230 . . .** **285 . . .** **310 . . .**	300 (11 13/16")	150 (6")	600 … 1200 (24 … 48")
410 . . . **550 . . .**	400 (15 3/4")	200 (8")	800 … 1600 (32 … 64")



2 Positioning of the bow thruster in the thrust-tunnel

When determining the exact position of the bow thruster in the thrust tunnel, it should be taken into account that the tailpiece may NOT protrude from the tunnel end.

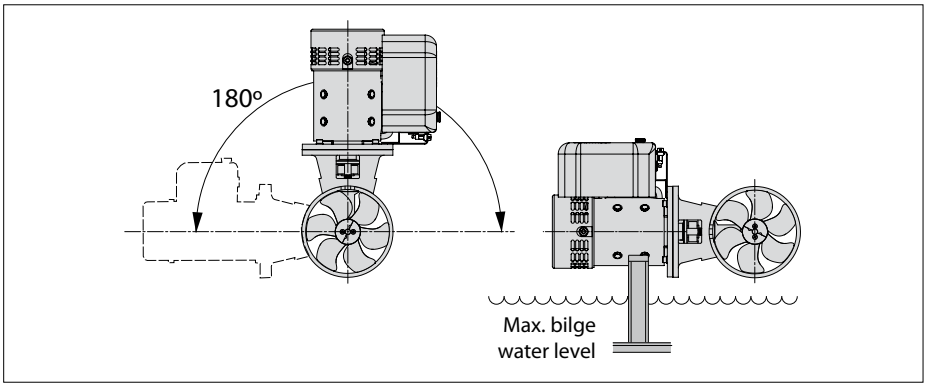
The propeller should preferably be situated on the centreline of the vessel, but it must always be accessible from the outside.



The electric motor can be installed in various positions.

If the motor is installed horizontally, a support is absolutely necessary.

The electric motor must be positioned in such a way that it is always well clear from the maximum bilge water level.

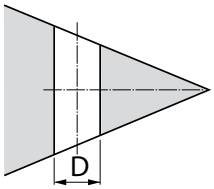


3 Connection of thrust tunnel to ship's hull

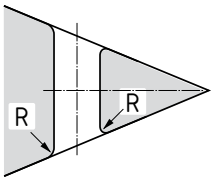
☞ **TIP:**

The manner, in which the thrust tunnel is connected to the ship's hull, is of great influence to the actual performance of the bow thruster and to the drag that the hull produces when under way.

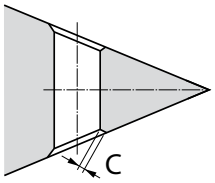
Direct connection of the tunnel to the hull, without a fairing, produces reasonable results.



The connection to the hull can be abrupt.

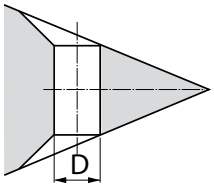


It is better to make the connection rounded with radius 'R' of about 0.1 x D.

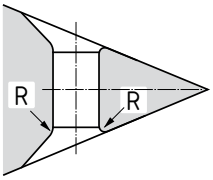


It is even better to use sloping sides 'C' with dimensions 0.1 to 0.15 x D.

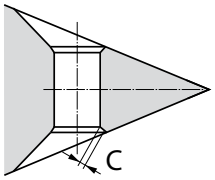
Connection of the thrust tunnel to the ship's hull with a fairing results in lower hull-resistance during normal sailing.



The connection with a fairing can be abrupt.



It is better to make the connection with a fairing rounded with radius 'R' of about 0.1 x D.

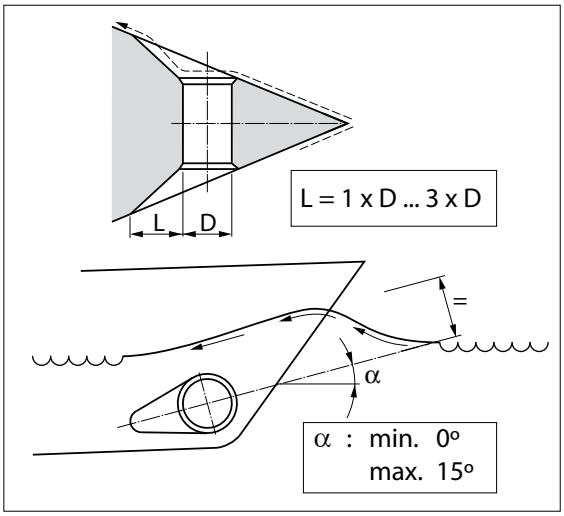


The best connection is with a fairing using sloping side 'C' with dimensions 0.1 to 0.15 x D.

Thruster 'BOW . . . . .'	D		R		C	
	[mm]	(inches)	[mm]	(inches)	[mm]	(inches)
25 . . .	110	(4 5/16″)	11	(7/16″)	11 … 17	(7/16 … 11/16″)
45 . . .	125	(4 15/16″)	13	(1/2″)	13 … 19	(1/2 … 3/4″)
35 . . . **55 . . .**	150	(5 7/8″)	15	(5/8″)	15 … 22	(5/8 … 7/8″)
60 . . . **75 . . .** **95 . . .**	185	(7 5/16″)	20	(3/4″)	20 … 30	(3/4 … 1 3/16″)
125 . . . **160 . . .**	250	(9 13/16″)	25	(1″)	25 … 38	(1 … 1 1/2″)
220 . . . **230 . . .** **285 . . .** **310 . . .**	300	(11 13/16″)	30	1 3/16″)	30 … 45	(1 3/16 … 1 3/4″)
410 . . . **550 . . .**	400	(15 3/4″)	40	1 1/2″)	40 … 60	(1 1/2 … 2 3/8″)

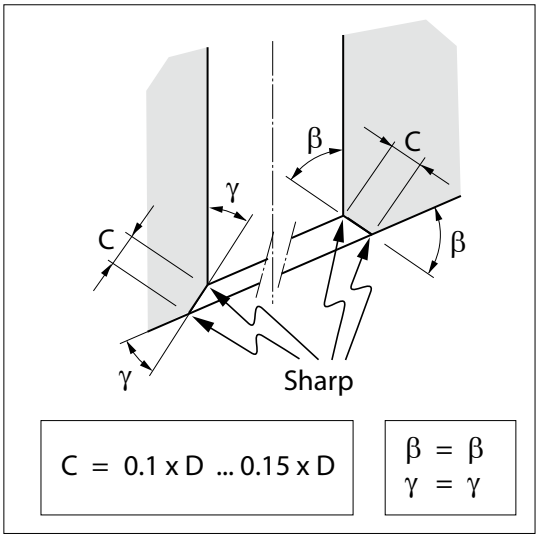
Length 'L' of the fairing should be between 1 x D and 3 x D.
This fairing should be embodied in the ship's hull in such a way that the centreline of the fairing will correspond with the anticipated shape of the bow-wave.

Thruster 'BOW . . . . .'	D		L	
	[mm]	(inches)	[mm]	(inches)
25 . . .	110	(4 5/16″)	110 ... 330	(4 1/2 ... 13″)
45 . . .	125	(4 15/16″)	125 ... 375	(5 ... 15″)
35 . . . **55 . . .**	150	(5 7/8″)	150 ... 450	(6 ... 18″)
60 . . . **75 . . .** **95 . . .**	185	(7 5/16″)	200 ... 600	(8 ... 24″)
125 . . . **160 . . .**	250	(9 13/16″)	250 ... 750	(10 ... 30″)
220 . . . **230 . . .** **285 . . .** **310 . . .**	300	(11 13/16″)	300 ... 900	(12 ... 36″)
410 . . . **550 . . .**	400	(15 3/4″)	400 ... 1200	(16 ... 48″)



If the connection of the thrust tunnel and the ship's hull is to be made with a sloped side, it should be executed in accordance with the drawing.

Make the sloped side (C) with a length of 0.1 to 0.15 x D and make sure that the angle between the tunnel and the sloped side will be identical to the angle between the sloped side and the ship's hull.



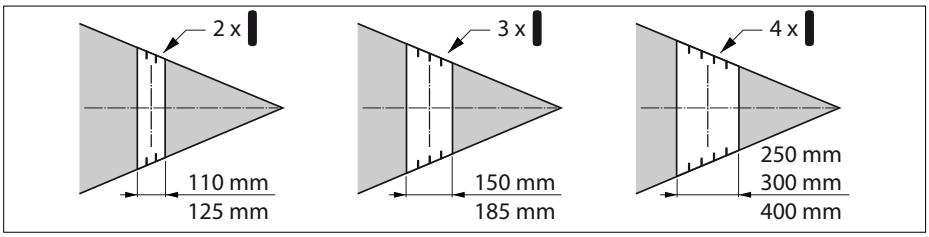
Thruster 'BOW . . . .'	D		C	
	[mm]	(inches)	[mm]	(inches)
25 . . .	110	(4 5/16")	11 … 17	(7/16 … 11/16")
45 . . .	125	(4 15/16")	13 … 19	(1/2 … 3/4")
35 . . . **55 . . .**	150	(5 7/8")	15 … 22	(5/8 … 7/8")
60 . . . **75 . . .** **95 . . .**	185	(7 5/16")	20 … 30	(3/4 … 1 3/16")
125 . . . **160 . . .**	250	(9 13/16")	25 … 38	(1 … 1 1/2")
220 . . . **230 . . .** **285 . . .** **310 . . .**	300	(11 13/16")	30 … 45	(1 3/16 … 1 3/4")
410 . . . **550 . . .**	400	(15 3/4")	40 … 60	(1 1/2 … 2 3/8")

4 Grid bars in the tunnel openings

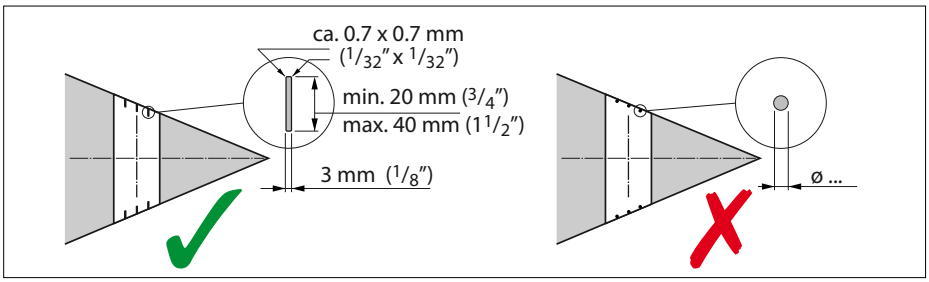
Although the thrust force will be adversely affected, grid bars may be placed into the tunnel openings, for protection of the thruster.

In order to limit the negative effect of this on the thrust and on hull resistance during normal operation as much as possible, the following must be taken into account:

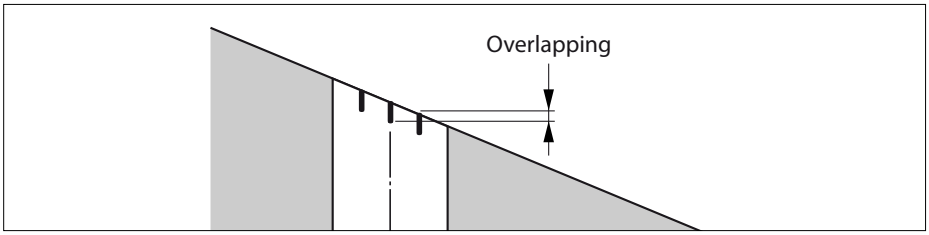
Do not fit more bars per opening than is indicated in the drawing.



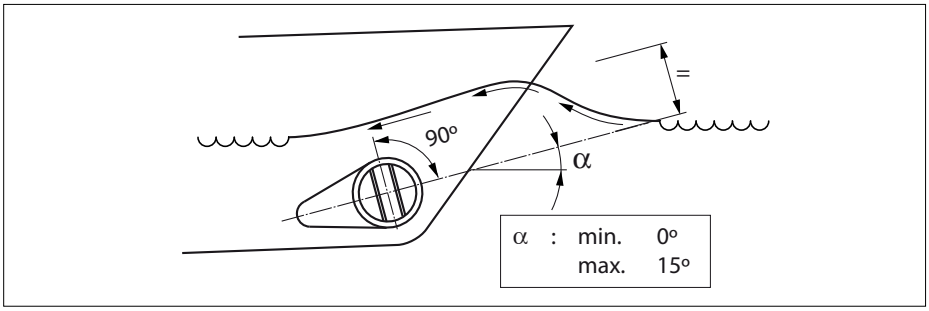
The bars must have a rectangular cross-section.
Do not fit round bars.



The bars must overlap a certain amount.

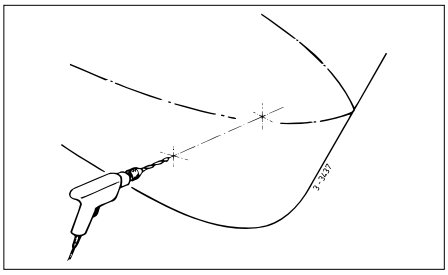


The bars must be installed so that they stand perpendicular to the expected wave form.



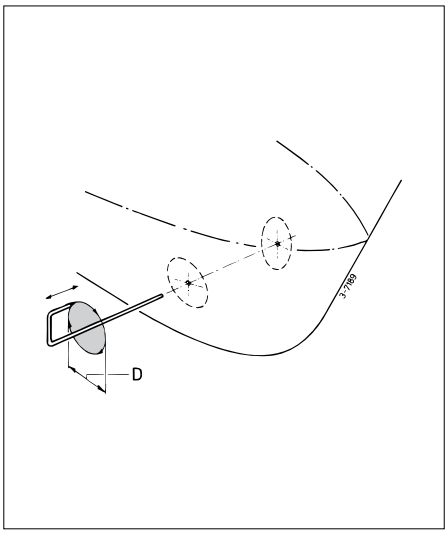
5 Installation of the thrust tunnel

Drill 2 holes into the ship's hull, where the centreline of the thrust tunnel will be, in accordance with the diameter of the marking tool.



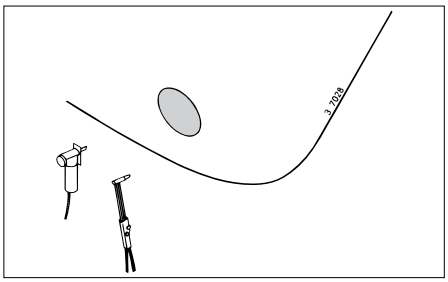
Pass the marking tool (home-made) through both pre-drilled holes and set out the outside diameter of the thrust-tunnel to the hull.

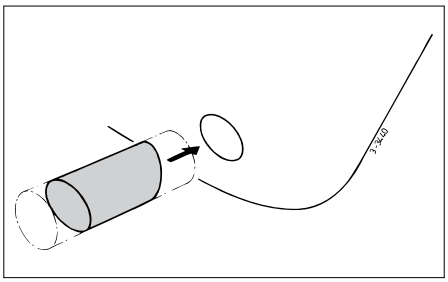
Thruster '**BOW . . . . .**'	D [mm] (inches)		
	Steel	GRP	Aluminium
25 . . .	121 (4 49/64″)	120 (4 13/32″)	120 (4 13/32″)
45 . . .	134 (5 9/32″)	136 (5 23/64″)	—
35 . . . **55 . . .**	159 (6 17/64″)	161 (6 11/32″)	160 (6 19/64″)
60 . . . **75 . . .** **95 . . .**	194 (7 41/64″)	196 (7 23/32″)	196 (7 23/32″)
125 . . . **160 . . .**	267 (10 33/64″)	265 (10 7/16″)	264 (10 25/64″)
220 . . . **230 . . .** **285 . . .** **310 . . .**	320 (12 19/32″)	320 (12 19/32″)	320 (12 19/32″)
410 . . . **550 . . .**	420 (16 17/32″)	424 (16 11/16″)	—



Dependent on the vessel's construction material, cut out the holes by means of a jigsaw or an oxy-acetylene cutter.

Install the thrust-tunnel.





Polyester thrust tunnel:

Resin: The resin used for the polyester thrust tunnel is Isophtalic polyester resin (Norpol PI 2857).

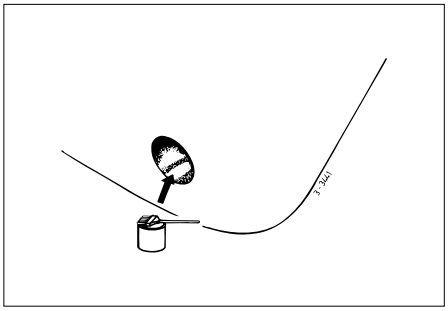
Pre-treatment: The outside of the tunnel must be roughened. Remove all of the top surface down to the glass-fibre. Use a grinding disc for this.

Important: Treat the end of the tunnel, after it has been sawn to length, treat the end of the tube with resin. This will prevent water seeping in.

Laminating: Apply a coat of resin as the first coat. Lay on a glass-fibre mat and impregnate with resin. Repeat this procedure until you have built up a sufficient number of layers.

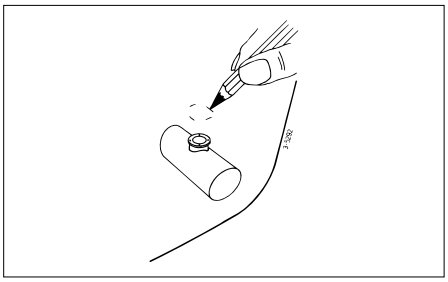
A polyester thrust tunnel should be finished as follows:

- Roughen the hardened resin/glass-fibre. Apply a top coat of resin.
- Treat the side of the tunnel which comes into contact with water with 'epoxy paint' or 2-component polyurethane paint.
- Then apply anti-fouling treatment if required.



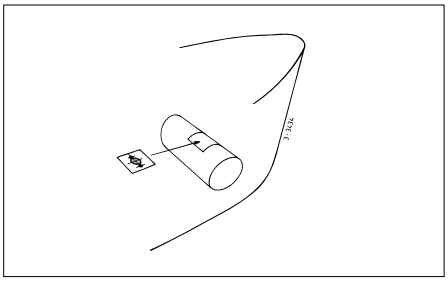
6 Drilling the holes in the thrust-tunnel

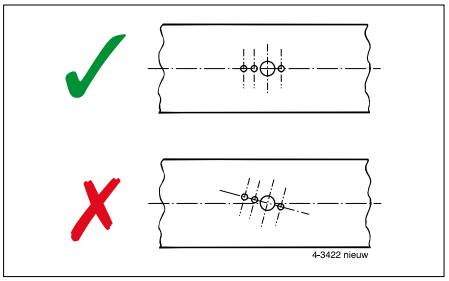
Mark the installation position of the bow thruster by means of the intermediate flange.



Use the drill pattern supplied, to determine the correct position of the holes to be drilled.

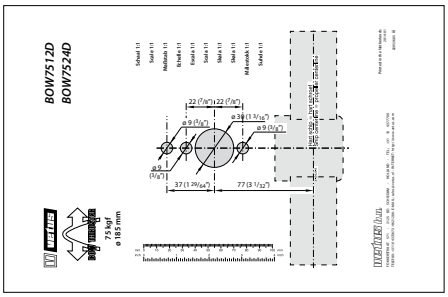
Important: The pattern of the holes must be positioned precisely on the centerline of the tunnel.

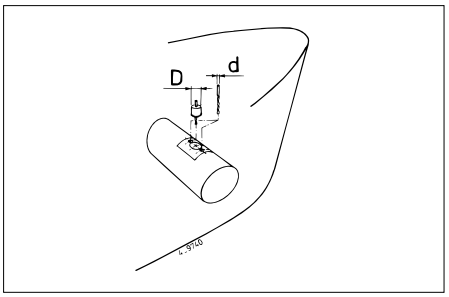




Consult the template for the dimensions of the holes to be drilled.

Drill the holes through the thrust tunnel and take care that the holes are free of burrs.



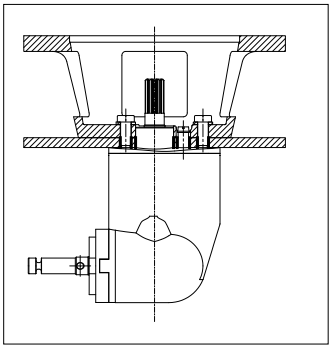


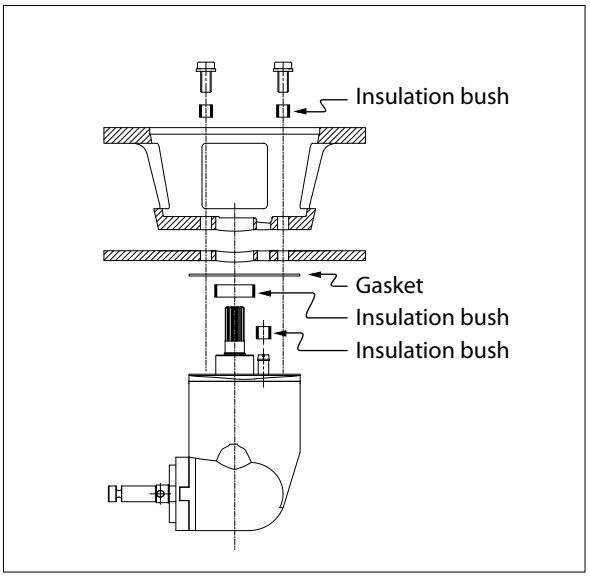
7 Protection of the bow thruster against corrosion

To prevent corrosion problems, do not use copper based anti-fouling. Cathodic protection is a 'must' for the protection of all metal parts under water.
In order to protect the bow thruster tailpiece against corrosion, the tailpiece is supplied with a zinc anode.

Corrosion of a steel or aluminium thrust tunnel can be reduced by ensuring that the tail piece is completely insulated from the thrust-tunnel.

NOTE: The gaskets supplied are already electrically insulated. However the bolts and the shaft need to be fitted with insulation material, for example nylon bushes.





8 The power supply

8.1 Choice of battery

The total battery capacity must be sufficient for the size of the bow thruster; see the table. We recommend Vetus maintenance free marine batteries; these can be supplied in the following sizes: 55 Ah, 70 Ah, 90 Ah, 108 Ah, 120 Ah, 143 Ah, 165 Ah, 200 Ah and 225 Ah.

We also recommend that each bow thruster is powered by its own separate battery or batteries. This allows the battery bank to be placed as close as possible to the bow thruster; the main power cables can then be short thus preventing voltage losses caused by long cables.

☞ **Note**

Be sure to only use 'sealed' batteries if the batteries are located in the same compartment as the bow thruster.
The Vetus 'SMF' and 'AGM' maintenance-free batteries are ideally suited to this application.
Batteries that are not 'sealed' may produce small amounts of explosive gas during the charging cycle.
Sparks generated by the carbon brushes of the bow thruster motor may ignite this explosive gas.

Always use batteries whose type and capacity are compatible for their use.

! **Caution**

In extreme cases, for example when a battery with a capacity of five times or more than suggested is used, there is the danger of causing permanent damage to one or more of the following shaft connections:

- The connection between motor shaft and the tail piece input shaft.
- The connection between the tail piece output shaft and the propeller.

8.2 Main power cables (battery cables)

The minimum diameter must be sufficient for the bow thruster in use and the voltage drop must not be more than 10% of the voltage supplied, consult the table in your bow thruster installation and operating manual.

☞ **Note**

The maximum duration of engagement and the thrust, as specified by the technical details in your bow thruster installation and operating manual, are based on the recommended storage battery capacities and storage battery connection cables.

If appreciably larger batteries in combination with very short connection cables with appreciably larger diameter than recommended are used then the thrust will increase. In such cases the maximum operating time must be reduced in order to prevent damage to the motor.

8.3 Main Switch

A main switch must be included on the 'positive cable'.
A Vetus battery switch is a very suitable choice. Consult the following table for the correct type of battery switch.

	Art. code Vetus Battery Main Switch			
BOW	**Standard Thruster**		**'Extended Runtime' Thruster**	
	12 Volt	**24 Volt**	**12 Volt**	**24 Volt**
25	**BATSW250**	—	—	—
35		—	—	—
45		—	—	—
55		**BATSW250**	—	—
60			—	—
75			—	—
95	**BATSW600**		—	**BATSW600**
125			—	
160	—	**BATSW600**	—	
220	—		—	—
285	48 Volt : **BATSW600**		—	—


BATSW250


BATSW600

The BATSW250 is also available with two poles, (Vetus art. code BATSW250T).

Main switch with remote control
Instead of a storage battery main switch, a **remotely controlled main switch annex emergency stop** can be installed.

This remotely controlled main switch is available for 12 or 24 Volt direct voltages.
Vetus art. code: BPMAIN12 respectively BPMAIN24.

NOTE:
When using a series-parallel switch, the main switch must be suitable for the voltage onboard.

Use a 12 Volt main switch if a 24 Volt bow thruster has been connected in combination with a series-parallel switch to a 12 Volt onboard network.

8.4 Fuse

In addition to the main switch, a fuse must be included in the 'positive cable'.
The fuse prevents the bow thruster from overloading, as well as protecting the onboard network from short circuiting.
Consult the table in your bow thruster installation and operating manual for the correct fuse.
We can also provide a fuse holder for all types of fuses. Vetus art. code: ZEHC100.

8.5 Series-parallel switch

Bow and stern thrusters that are only available for 24 Volts*) can be connected to a 12 Volt onboard network with the help of a series-parallel switch.
By installing a series-parallel switch:

- the 2 (12 Volt) storage batteries will be engaged in series during use, so that the 24 Volt bow thruster receives the necessary 24 Volts of power.
- the 2 (12 Volt) storage batteries will be engaged in parallel during recharging, and can be coupled to the 12 Volt charging system.

Vetus can provide a series-parallel switch that is ready to be connected to the Vetus 24 Volt bow thruster. Vetus art. code: BPSPE.

If the battery that has been installed for the bow thruster will also be powering other (12 Volt) systems, the following must be taken into account:
Both batteries will be providing power to 12 Volt systems via the charging current cables and charging current contacts of the series-parallel switch.

> ⚠ **Warning**
>
> A continuous stream of at most 100A may be carried through the charging current contacts of the series-parallel switch, and at most an intermittent current of 150A at 20% duration of engagement.
> Never use these storage batteries as starting batteries and never connect an anchor capstan to them.

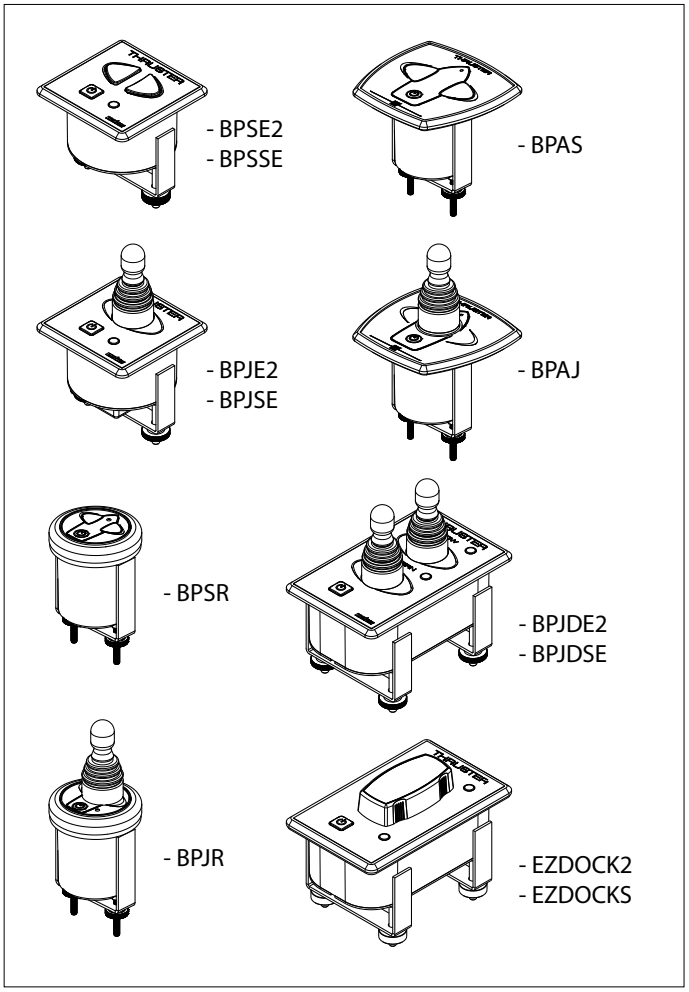
> ☞ **Tip**
>
> If an isolating switch is included in the charging current cable, the storage battery sets can be isolated, should they not be charged for a long period of time, in order to prevent excessive discharging.

The way in which the bow thruster is to be operated will remain unchanged after a series-parallel switch has been installed!

*) the Vetus bow thruster BOW28548 can be connected to a 24 Volt onboard network with the help of the series-parallel switch supplied.

9 Bow thruster operation

Consult the Vetus catalogue for the various operating panels that are available.



9.1 Delay when reversing the turn direction

If a delay is desired where one of the following operating devices is installed, a delay switch can be installed.

Operating device:

- BPJSTA, separate turn switch (Joystick),
- BPSM, operating panel for side mounting,
- FSxx, foot switch button

Delay: Vetus art. code: BPTD

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