



MAX PROP® EASY
PATENTED PROPELLER

installation instructions

INTRODUCTION

Thank you for choosing a feathering propeller MAX PROP® EASY. This instruction manual will be used to answer all your questions about installation and use of the propeller. It is very important to read it carefully and verify the correct operation of the propeller before installing it on your boat.

INSTALLATION

Please carry out the various operations referring to fig. 1. The propeller is supplied already assembled for right or left rotation, according to information received when the order was made, and with a specific required pitch, so that it can be directly installed on the propeller shaft as a common fixed-pitch propeller. We remind you that MAX PROP® EASY parts are not interchangeable. If you receive more than one propeller at the same time (for example if two propellers have to be installed on a boat), and for any reason the received propellers are opened, you must therefore be very careful not to mix the disassembled pieces.

- a. Fit the already assembled propeller on the drive shaft, like a fixed-pitch propeller, verify that the key has the appropriate size: it should have clearance on the upper surface in order to prevent the propeller from being brought off center, but between the side surfaces there should be no clearance.
- b. Tighten the nut and lock it by using the two locking-nut screws which should be inserted and tighten into the proper seats.

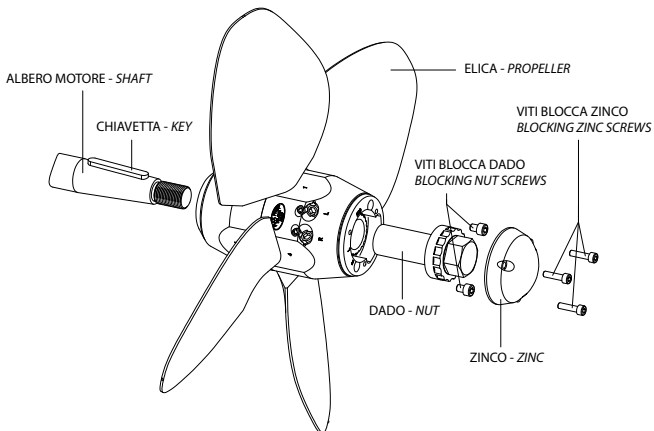


Fig. 1

- c. Fill the propeller with marine grease through the appropriate holes by using a lubrication tool. The MAX PROP® EASY propeller works properly only if completely filled with fluid grease. Verify that the grease seeps from the joints through the rotating parts (the hub and the blades) and the propeller body, so as to be sure that all of the rotating surfaces are perfectly greased. The grease must be fluid to ensure that it will continue to seep from said joints even after years of use.
- d. Orient the blades in the feathered position (i.e. perfectly in line with the axis of the propeller body), making sure that their profile is as shown in fig. 2.
- e. Before launching the boat, it is absolutely necessary to operate as follows:
- Lock the propeller shaft.
 - Verify that the propeller blades rotate freely from the forward motion position to the backwards motion position simply by hand pushing; at the end of the stroke, they must have a blade angle preset by the user and the same direction of rotation of the engine.
 - In the feathered position the blades must be perfectly aligned and oriented as in fig. 2.
 - Verify that the propeller is full of fluid marine grease.
 - Make sure that the propeller is protected from galvanic corrosion by applying the proper zinc anodes on the propeller and drive shaft.

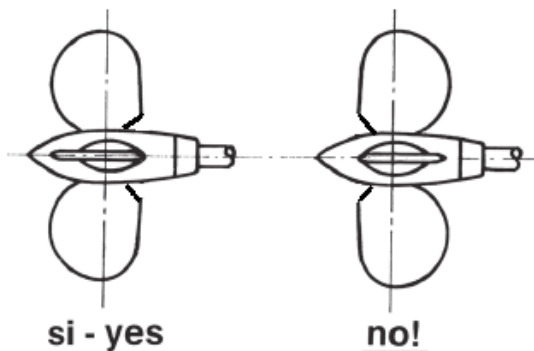


Fig. 2

PITCH ADJUSTMENT

The pitch of MAX PROP®EASY depends on the propeller diameter and the blade angle α . Table in figure 3 shows, for some diameters, the pitches in millimeters corresponding to different blade angles.

The diameter and pitch must be calculated as if MAX PROP® EASY was a common fixed-pitch propeller. With respect to traditional propellers, MAX PROP® EASY gives the further advantage of allowing the pitch to be optimized if the performance is not completely satisfactory. If the engine encounters difficulties in reaching the operating number of revolutions, then the blade angle α must be decreased; if, on the contrary, the operating number of revolutions is exceeded, then the angle α must be increased. By 2 degrees variation of the angle the boat speed varies by about 14% at the same number of revolutions of the engine, or the number of revolutions of the engine varies by about 14% at the same speed of the boat.

		Diametro dell'Elica (millimetri)											
		300	350	400	450	500	550	600	650	700	750	800	
α	Angolo di inclinazione pale (gradi)	10°	100	115	130	150	170	185	200	215	230	250	265
	12°	120	140	160	180	200	220	240	260	280	300	320	
	14°	140	165	190	210	235	260	280	305	330	350	375	
	16°	160	190	215	245	270	300	325	350	380	405	430	
	18°	180	215	245	275	305	335	365	400	430	460	490	
	20°	205	240	275	310	345	375	410	445	480	515	550	
	22°	230	265	305	340	380	420	455	495	535	570	610	
	24°	250	295	335	375	420	460	505	554	585	630	670	
	26°	275	320	370	415	460	505	550	590	645	690	735	
	28°	300	350	400	450	500	550	600	650	700	750	800	
30°	325	380	435	490	545	600	655	705	760	815	870		

Fig. 3

TO VARY THE PITCH, ACT AS FOLLOWS BY REFERING TO FIG. 3 AND 4

- a. On the body of each propeller two threaded holes (housings) are obtained, marked with letters "R" and "L"; a screw/rod is inserted in each hole. The pitch of the propeller, for both forward and backwards motions, can be easily varied by changing how deeply each screw/rod penetrate the body. If the propeller is right-handed, the forward motion pitch can be changed by acting on the screw/rod housed in the

hole “R” and the backwards motion pitch by acting on the screw/rod housed in the hole “L”. On the contrary, if the propeller is left-handed the two pitches, for forward motion and for backwards motion, are changed by acting on the screws/rods housed in the holes “L” and “R”, respectively. Please note that the forward motion pitch increases by increasing the penetration depth of the screw/rod in the propeller body, and vice versa decreases by decreasing the depth. By contrast, the backwards motion pitch increases if the penetration depth of the screw/rod is reduced and vice versa.

- b. A series of equidistant grooves are carved in the head of each screw/rod. These grooves have dual capacity: locking the screw/rod in the selected position by fastening it with a threaded grub screw, and precisely defining the value of the rotation angle of the screw/rod, when switching from fastening in a groove to fastening in the next groove. All the propellers have been sized so that, by one complete turn of the screw/rod, the corresponding pitch of the propeller varies by four degrees. Therefore, since there are eight grooves in the head of each screw/rod, by shifting the locking of the screw/rod from one groove to the next (i.e. by a single groove), the propeller pitch will vary by half a degree.

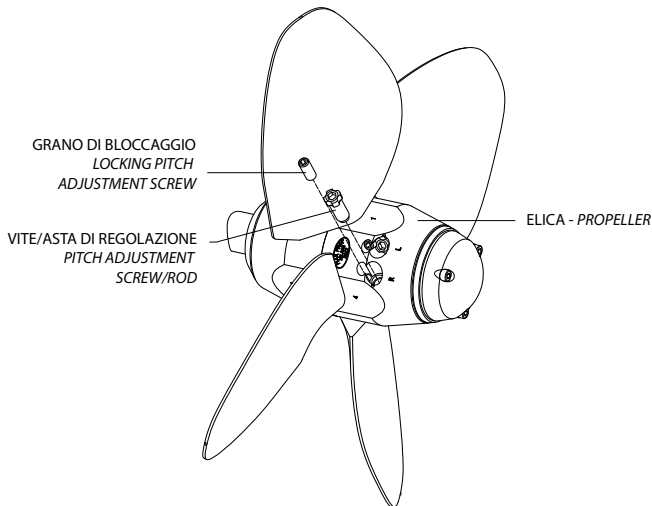


Fig. 4

- c. Each screw/rod is provided with a precise calibrated length. When the screw/rod is completely screwed into its housing until it reaches the abutment (i.e. until reaching its maximum penetration depth in the propeller body), the propeller pitch, expressed in degrees, will correspond to the one shown in Fig. 5.

d. The penetration depth of the screw/rod in the propeller body, and therefore the propeller pitch, can be easily varied by the user by choosing one of the following two procedures, at will:

- **PROCEDURE A:**

Before installing the propeller on the boat, at first insert into the two housings two screws/rods each having great length and then screw them up to abutment. In this way, the propeller will take two very precise pitches: a high pitch to travel forward and a small pitch to travel backwards. These pitches will correspond to those stamped on the two respective screws/rods. In order to change said pitches, each screw/rod must be unscrewed by rotating it counterclockwise by a specific angle (i.e., a precise number of grooves), thereby reducing the respective penetration depths in the propeller body. Therefore, the propeller forward motion pitch will decrease while the backwards motion pitch will increase. Each of the two propeller pitches (to travel forward and backwards) will vary according to the number of grooves between the new locking position of the screw/rod and the previous abutment position thereof.

If the user wants to know the value of the pitch set on his propeller, he should remember that the number stamped on the screw/rod (see fig. 5) refers to the propeller pitch in degrees reached when said screw/rod is completely screwed up to abutment. Therefore, to satisfy the mentioned curiosity of the user, the screw/rod has to be screwed while counting the number of grooves it rotates to come into abutment (and therefore how many degrees the propeller pitch has changed, remembering that the rotation between a groove and the next one corresponds to a variation of the pitch of 0.5 degrees). If the screw/rod is the one intended to adjust the forward motion pitch, the above variation must be detracted from the value of the pitch stamped on such screw/rod. On the contrary, in case in which the screw/rod is the one intended to adjust the backwards motion pitch, the variation must be added.

- **PROCEDURE B:**

Check that the screw/rod already inserted in its housing had been screwed up to the abutment. Then remove this first screw/rod (corresponding to the first pitch) from the propeller body and screw up to abutment, in the same housing, a second screw/rod having length different from the first one. The new propeller pitch will be the one stamped on the second screw/rod.

SCREW/ROD KIT SUPPLIED FOR PITCH ADJUSTMENT

SCREWS SUPPLIED FOR FORWARD	SCREWS SUPPLIED FOR REVERSE
------------------------------------	------------------------------------

PROCEDURE " A "	STAMP ON THE SCREW	RANGE OF REGULATION (PITCH IN DEGREES)	STAMP ON THE SCREW	RANGE OF REGULATION (PITCH IN DEGREES)
STANDARD SUPPLY FREE OF CHARGE IF CUSTOMER DOES NOT HAVE ANY SPECIAL REQUEST	24	24°	1	16°
		23°		17°
		22°		18°
	
		13°		27°
		12°		28°

PROCEDURE " B "	STAMP ON THE SCREW	PITCH IN DEGREES WITH THE SCREW COMPLETELY SCREWED	STAMP ON THE SCREW	PITCH IN DEGREES WITH THE SCREW COMPLETELY SCREWED
OPTIONAL SUPPLY CUSTOMER CAN ASK THE SCREWS HE PREFERS ONLY TWO SCREWS ARE FREE OF CHARGE	24	24°	1	16°
	22	22°		
	20	20°	2	20°
	18	18°		
	16	16°	3	24°

MIXED PROCEDURE " A+B "	STAMP ON THE SCREW	PITCH IN DEGREES WITH THE SCREW COMPLETELY SCREWED	STAMP ON THE SCREW	RANGE OF REGULATION (PITCH IN DEGREES)
OPTIONAL SUPPLY CUSTOMER CAN ASK THE SCREWS HE PREFERS ONLY TWO SCREWS ARE FREE OF CHARGE	24	24°	1	16°
	22	22°		17°
	20	20°		18°
	18	18°		...
	16	16°		27°
				28°

Fig. 5

- **PROCEDURE A:**

This procedure is the normally followed. Each MAX PROP® EASY propeller is supplied with two screws/rod. The first screw/rod, with the 24 degree pitch stamped, is inserted into the housing intended to adjust the forward motion. The second screw/rod, with the number 1 stamped, is inserted into the housing intended to adjust the backwards motion. Eight grooves are carved into the heads of each of the two screws/rods. By following the procedure A the user can adjust, by half-degree intervals, both the forward motion pitch and the backwards motion pitch. For convenience, in the head of each screw/rod also four equidistant holes have been made (see fig. 6). By moving the screw/rod locking from one hole to the next one (i.e., by only one hole), the propeller pitch will vary by one degree. The adjustment range is standard, that is: maximum pitch 24 degrees for the forward motion and minimum pitch 16 degrees for the backwards motion. In order to obtain pitches whose values are outside the adjustment range, Max Prop can supply longer screws, on request.

- **PROCEDURE B:**

If this procedure is chosen, each MAX PROP® EASY propeller is supplied with several screws of various lengths (on request), each length corresponds to a given forward motion pitch and to a given backwards motion pitch.

- **MIXED PROCEDURE A + B**

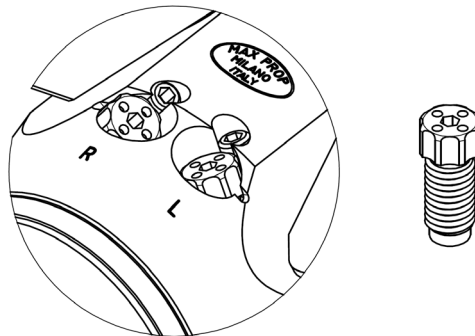


Fig. 6

INSTRUCTIONS TO CHANGE DIRECTION TO PROPELLER ROTATION

MAX PROP® EASY gives the possibility to change direction of rotation, for example if you change engine or in case of a mere error when ordering (If you have any doubts: to understand the direction of rotation of your drive shaft, put into forward gear and

look from stern to stem. If the shaft rotates clockwise, the rotation is right-handed; by contrast, if it rotates counterclockwise, the rotation is left-handed). In order to change rotation of the MAX PROP® EASY, from right-hand rotation to left-hand rotation or vice versa, operate as follows referring to fig. 7.

- Unscrew the screws locking the zinc, and remove the zinc.
- Unscrew the screws locking the nut, and remove the nut.
- At the aft edge of the hub there is a Seeger ring: remove it.
- Remove the transmission ring on which the zinc is fixed (zinc-bearing ring).
- Once the zinc-bearing ring has been pulled out, you can see there is an engraving on one tooth of the hub (aft side), and two teeth of the zinc-bearing ring are marked with “L” (left) and “R” (Right), respectively.
- If you reassemble the zinc-bearing ring, placing the tooth “R” at the tooth of the hub where the engraving is stamped, you will have a right-hand propeller, if you rather insert the ring placing the tooth “L” at the tooth of the hub where the engraving is stamped, you will have a left-hand propeller (see fig. 7).
- Insert the Seeger ring in its seat.
- Screw the nut and lock it with the nut-locking screws.
- Put back the zinc, and fasten it with the three special screws.

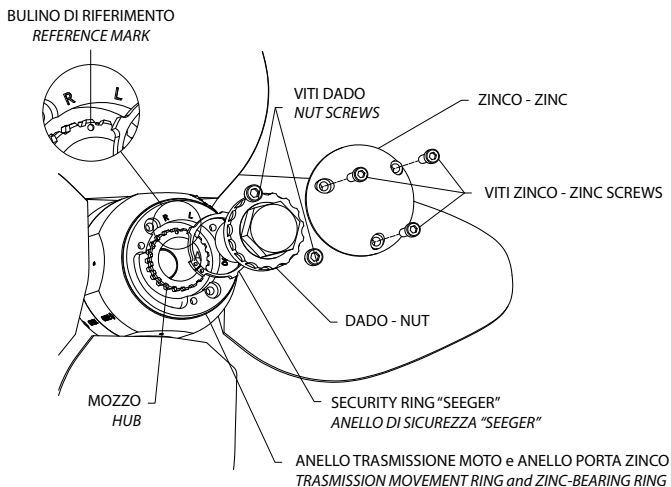


Fig. 7

PROPELLER USE

The MAX PROP® EASY propeller works completely automatically. It takes the pitch when the drive shaft is rotated to travel forward or backwards (WARNING: reversing the rotation when the number of revolutions is too high is definitely inadvisable). The propeller feathers when engine is off, starting from the position to travel forward, with the propeller shaft locked.

In order to feather the propeller, operate as follows:

- Drive the boat to travel forward.
- Turn off the engine without disengaging the forward gear, and lock the drive shaft.

DO NOT turn off the engine while traveling backwards, as in this case the blades will be in the backwards motion position and will not feather. You can actually use this method to rotate the shaft when the latter is connected to a generator.

IMPORTANT WARNINGS

Carefully follow the following instructions:

- Before reversing motion, allow the decrease of the number of revolutions of the engine, and then reverse.
- Verify that the propeller body is full of very fluid marine grease.
- The backwards motion must always be engaged starting from the forward motion position, and through the neutral position, to avoid the thrust direction of the propeller to be reversed.
- Protect the propeller against galvanic corrosion by applying a sufficient mass of zinc. Replace the zinc anodes every year even if they have not corroded and check that there is good electrical contact between the zinc, the propeller and the shaft (the contact surfaces between the zinc and the bronze must be cleaned with abrasive cloth).

PROPELLER DISASSEMBLY

In order to remove the propeller you must first remove the zinc and the nut-locking screws; then fasten a perforated washer, supplied only on request, on the zinc-holding ring by means of five threaded grub screws (fig. 8). Screw the five threaded grub screws (long enough and provided with five nuts) into the five threaded holes obtained in the zinc-holding ring, making sure that all five threaded grub screws are tightened to the bottom of their own threaded hole. Then lean all five nuts on the perforated disc which acts as extractor (see fig. 8). Start unscrewing very smoothly the propeller-locking nut, which will press against the washer (fig. 8) and check that all five extraction screws work together with the same load to extract the propeller. Slowly unscrew the nut and be careful not to overload the screws to prevent them from breaking. When, due to nut unscrewing, stress is applied to all 5 screws, it may be helpful to knock lightly on the propeller body with a plastic mallet. Said knocks will detach the propeller hub from the propeller shaft.

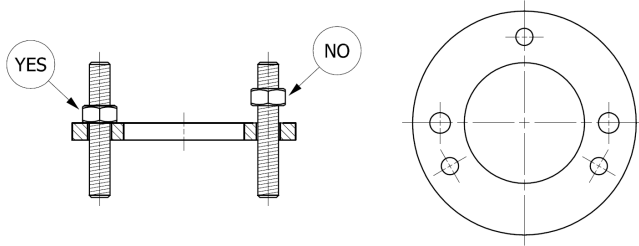


Fig. 8

Spare parts reference code _____

MAX PROP® GENERAL SALE CONDITIONS

1. All the components of each propeller must not be modified in any way or for any reason.
2. All the components of each propeller are not interchangeable between a propeller and the other.
3. The propeller must be used following the instructions of the manual enclosed with the prop, paying particular attention to the warnings.
4. The non-compliance of the conditions 1, 2 and 3 means the loss of the warranty.
5. Max Prop Srl is to repair and replace free of charge the original pieces of the propeller which may result damaged due to construction defects or due to material defects. Max Prop Srl will not pay, for any reasons, any refund whatsoever, not even partial. The warranty granted by Max Prop Srl is therefore limited exclusively to the repair or replacement of any possible defective propeller and does not include any damage compensation refund, or claim of any kind.
6. The reparations in warranty, that might be needed, will be carried on exclusively by Max Prop Srl at its own workshop in Italy - Milan - Via Bernardino Galliani, 1. The customer will, at his own charge and care, send the defective pieces to our workshop.
7. This warranty is valid 12 months starting from the date of propeller delivery.
8. Any possible controversy will fall within the jurisdiction of the Milan Courts-Italy.
9. The transport cost charged in the invoice from Max Prop doesn't include any insurance. The customer notes that the insurance (even if pre paid from Max Prop), from the order confirm and from the payment of the proforma, is not included on the transport. In case the customer wants to insure the shipment, he will have to get in touch directly with the transporter and agree an upgrade of the shipment charge with an insurance cover policy. In no way Max Prop Srl can be considered responsible for any loss, damage or delay starting from when the goods are given to the courier. The customer itself must be considered responsible for any loss, damage or delay due to the transport, in case he has chosen not to stipulate a transport insurance with the courier.
10. These conditions of sale are integral part of any purchase contract agreed with Max Prop Srl.
11. The official and binding text of these general sale conditions is the one edited in Italian, any translations in other languages are a form of courtesy. It is established that the Italian text will be the only value text.
12. The customer confirms that the purchase price of the propeller has been established considering his acceptance of the present general conditions of sale. With this acceptance the customer excludes any type of claim.



manufactured by: MAX PROP ®
via Bernardino Galliani, 1 - 20156 Milano - ITALY
tel. +39 02 33 404 325 - skype: maxprop1
www.maxprop.it - info@maxprop.it

