MAX PROP WHISPER

INTRODUCTION

Thank you for having chosen a MAX PROP® WHISPER automatic feathering propeller for your vessel. This instruction booklet is designed to answer to all your questions on assembly and use of the propeller. Please read it carefully and verify the correct working of the propeller before installing it on your boat.

INSTALLATION

Please, do as follows with reference to fig. 1. The propeller is supplied already assembled for right or left rotation, according to the information received with the order and with the pitch required, so that it can directly fit on the shaft. MAX PROP® WHISPER parts are NOT interchangeable. Please, make sure , if you receive more than one propeller, that you do not interchange parts.

a) Fit the already assembled propeller to the shaft, as if it was a fixed propeller, and make sure that the key has proper dimension: a good key has almost no clearance side to side but a very small clearance on its upper surface. This clearance is to avoid the propeller to be pushed out of center by a key which is too tall.

b) Tighten the nut and secure it in place using the two allen head screws.

c) Fill the prop with marine grease using the grease fitting (supplied) inserted into the grease holes marked "grease". The MAX PROP® WHISPER propeller works properly only if the central body is completely filled with the correct grease. Verify that the grease is oozing from the rotating joints between the central part and the hub, so that all of the moving surfaces are perfectly oiled. The grease used must be a type of grease approved by MAX PROP® so it will remain fluid after years of use and will not get too stiff in cold water.

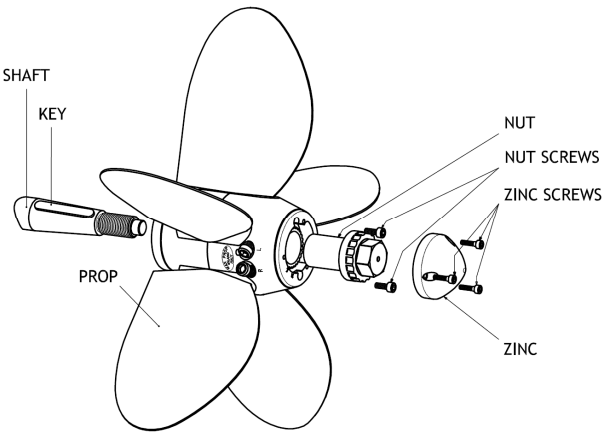

Fig. 1

d) Move the blades into the feathered position, making sure that the rounded trailing edges of the blades are aft as shown in fig. 2.

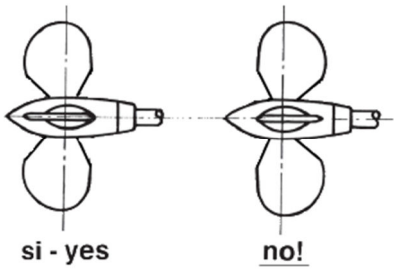

Fig. 2

e) Before launching the boat, it is absolutely necessary to operate as follows:

- Hold the propeller shaft.
- Check that the blades of the propeller rotate freely from the forward to the reverse position just by a light effort
- In the feathered position the blades must be perfectly lined up and set like fig. 2
- Check that the propeller body is full of fluid marine grease
- Make sure that the propeller is protected from galvanic corrosion by using the usual zinc anodes on the propeller and the shaft.

PITCH ADJUSTMENT

The pitch on a MAX PROP® WHISPER changes according to the diameter of the propeller and the blades rotation angle α. fig. 3 shows the pitches in millimeters corresponding to the degree of blades angle for a given propeller diameter.

		Propeller Diameter (millimeters)										
		300	**350**	**400**	**450**	**500**	**550**	**600**	**650**	**700**	**750**	**800**
α Blades inclination angle (degrees)	**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

Diameter and pitch must be calculated as if MAX PROP® WHISPER were a normal fixed propeller. MAX PROP® WHISPER then offers the great advantage of pitch adjustability in order to better optimize the performance of the propeller. If the engine does not reach the desired RPM, reduce the blade angle α ; on the contrary, if the engine exceeds the desired RPM, increase the blade angle α. With a 2 degrees variation of the blade angle, the speed of the vessel varies 14% at the same RPM or the RPM varies 14% at the same speed of the vessel

PROCEED AS FOLLOWS IN ORDER TO CHANGE THE PITCH, WITH REFERENCE TO FIG. 3 AND 4

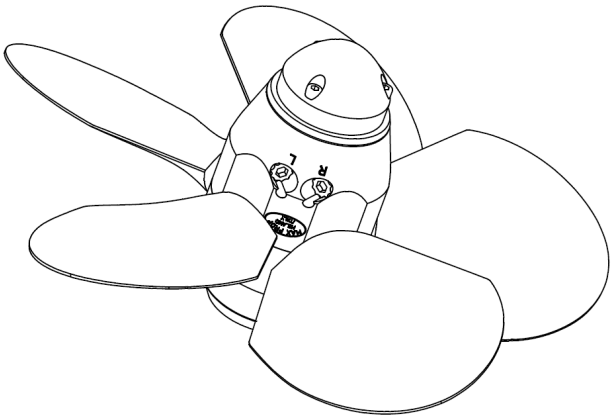

Fig. 4

a) Pitches of the propeller corresponding to blades inclination and propeller diameter are shown in millimeters in fig. 3

b) In the body of every propeller are opened two threaded bores, marked with letters “R” and “L”; within these bores are placed two poles (screws).

c) The pitch of the propeller, both in front and reverse position, can be easily varied changing poles (screws) assembled on the body of the propeller with other poles (screws) having a different length. If the propeller is right-handed, pitch in front position varies changing the pole (screw) placed in bore “R” and, in reverse position, changing the one placed in bore “L”. If the propeller is left-handed, pitch in both position varies changing the relative poles (screws) placed in bores “L” and “R”

d) The list of the pitch regulation poles, that are supplied with every WHISPER propeller is indicated in fig. 5

e) Inserting in the threaded bores “L” or “R” opened in the body of the propeller the poles (screws) 20 and 2, the blades assume a 20 degrees inclination, both in front position and reverse position. Varying 1 millimeter the length of the poles (screws), blades inclination has a 2 degrees variation

f) In every single propeller:
– pole (screw) 20 has the same length as pole (screw) 2
– pole (screw) 16 has the same length as pole (screw) 3
– pole (screw) 24 has the same length as pole (screw) 1

LIST OF THE PITCH REGULATION POLES (SCREWS) THAT ARE SUPPLIED WITH EVERY "WHISPER" PROPELLER

BLADES INCLINATION (DEGREES)	RIGHTHAND ROTATION		LEFTHAND ROTATION	
	FORWARD POSITION BORE “R”	REVERSE POSITION BORE “L”	FORWARD POSITION BORE “L”	REVERSE POSITION BORE “R”
16	16	1	16	1
18	18		18	
20	20	2	20	2
22	22		22	
24	24	3	24	3

Fig. 5

INSTRUCTIONS TO CHANGE PROPELLER ROTATION

With the MAX PROP WHISPER® it is also possible to change the rotation, e.g. if you change the engine, or if there was a mistake when ordering the prop. If you have doubts about the engine rotation, it can be determined looking forward from the stern of the boat. With the engine in forward position a clockwise rotation of the propeller means it is right handed(R), and a counter-clockwise rotation is left handed (L).

In order to change the rotation of the MAX PROP WHISPER®, from a right hand rotation to a left hand rotation or vice versa do as follows, referring to fig. 6

- Unscrew the locking-zinc screws, and remove the zinc
- Unscrew the locking-nut screws and remove the nut

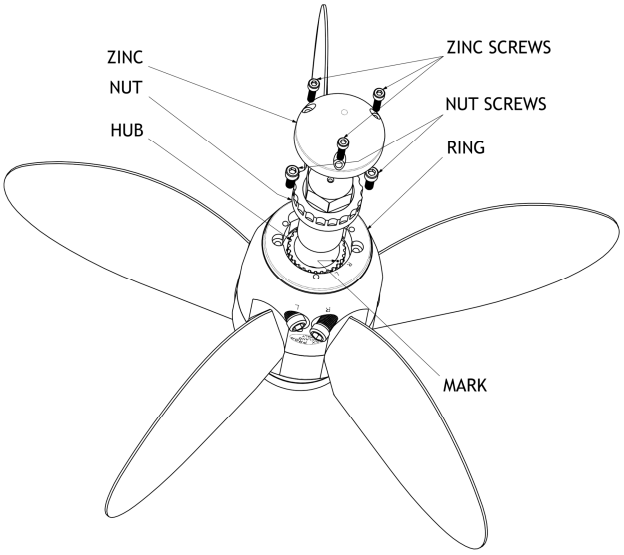

Fig. 6

- On the aft edge of the hub there is a security ring “Seeger” that must be slipped off)
- Release the zinc-bearing ring

- Once released the zinc-bearing ring, you see that on one tooth of the hub (the aft side)there is a reference mark, and two teeth of the bearing-zinc ring are marked one with “L” and the other with “R”.
- If you place the zinc bearing ring in its seat again, matching the “L” tooth with the hub reference mark, you have a left hand rotating propeller, on the contrary, with the “R” tooth you have a right rotating propeller as in fig. 6
- Place the “Seeger” ring in its seat
- Tighten the nut and secure it with the locking-nut screws
- Place the zinc again, and secure it with the 3 proper screws:

PROPELLER USE

The MAX PROP® WHISPER works automatically. By putting the engine in gear the blades will engage in either forward or reverse (WARNING: do not change from forward to reverse and vice versa when the engine is running at high RPM) and feathers from forward position when you turn of the engine and block the shaft.

The best way to feather the propeller is:

- Power at 2 to 3 knots in forward
- Turn off the engine while still engaged in forward.
- If your propeller has been greased properly it will feather in a fraction of a second as soon as you stop the shaft from freewheeling.

  DO NOT kill the engine while in reverse. In this case the blades will be in the reverse position and will not feather. You can actually use this feature to drive a shaft alternator.

  Modern engine transmission are either mechanical or hydraulic. With a mechanical transmission, the best way to stop the shaft freewheeling is to engage the transmission in reverse (WARNING: engage the reverse only after the engine has stopped completely).

  With a hydraulic transmission you must shut off the engine while still engaged in forward. The remaining hydraulic pressure will en effect lock the shaft for a few moments, enough for the MAX PROP® to feather.
- If the moving transmission kinematic is provided with an hydraulic inverter, the motor shaft can get automatically stopped assembling the brake supplied by MAX PROP® with an extra charge.

WARNINGS

In order to avoid a shock to the gears on the blades and cone gear, that could be damaging the teeth, it is important to follow the instructions below carefully:

- When going from forward to reverse and the opposite, it is necessary to idle down and shift at low RPM’s between gears
- The propeller must always be completely filled with a recommended grease.
- Make sure that you always keep the zinc anodes in good condition. They must be replaced at least once a year, even if they still look ok. The propeller must be protected by a lot of zinc, so also use a zinc on the shaft when possible. When replacing it make sure that you clean the contact point between the zinc and the propeller shaft in order to have a good electrical contact.

PROPELLER REMOVAL

In order to remove the propeller you must first remove the zinc and unscrew the nut , then pull off the prop using MAX PROP® extractor, or a similar tool with external threading, as per fig. 7. Tighten the five screws (that must be long enough and provided with 5 nuts) in the five threaded bores made in the zinc, being careful that all the five screws are well tighten until the end of their threaded bores. Make the five nuts lean against the pierced disc that serve as extractor. (see fig. 7). Start unscrewing very gently the locking nut, that in this way will push against the MAX PROP® extractor and verify whether all the five extracting screws work together with the same load while extracting the prop. Go on unscrewing the nut slowly, being careful not to load the screws too much, in order to avoid them to brake.

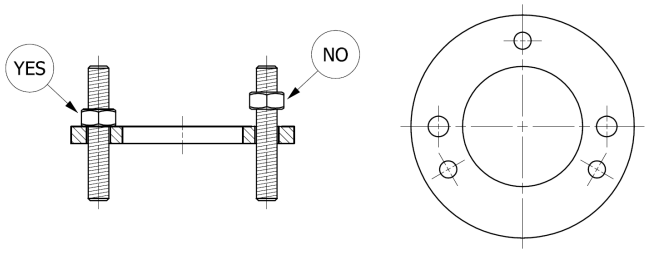

Fig. 7

INSTRUCTIONS FOR THE PROPER WORKING OF THE BLOCKING NUT OF THE PROPELLER (FIG. 8)

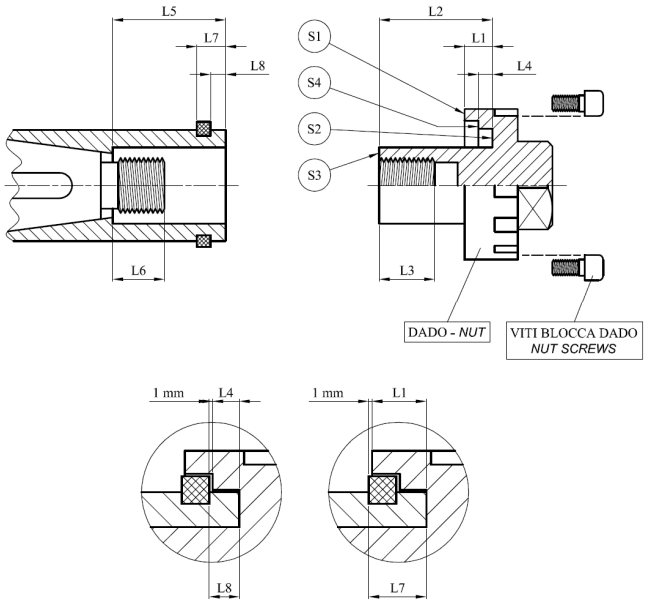

Fig. 8

When it is tightened on the motor shaft, the nut must contact only the 2 surfaces S2,S3. Therefore, when you work the nut, you must be sure that length L2 coincides precisely with the length L5, measured on the prop hub, and that length L3 is greater than the length L6 of the threaded edge of motor shaft.

Check that the following dimensions are respected:

- L2 = L5
- L3 greater than L6
- L1 = L7 - 1 mm
- L4 = L8 - 1 mm.

GENERAL SALE CONDITIONS

1) Max Prop Srl produces her own propellers to measures, expressly as the customer requires
2) Max Prop grants that every propeller produced is tested and leaves the workshop in perfect functioning conditions.
3) Max Prop Srl. is willing 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 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.
4) The reparations in warranty that might be needed will be carried on exclusively by Max Prop at its own workshop in Italy – Milan, via Bernardino Galliari 1. The customer will, at his own charge and care, send the defective pieces to Max Prop's workshop.
5) This warranty is valid 12 months starting from the date of propeller delivery.
6) 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 as advised in point n° 3.
7) Any possible controversy will fall within the jurisdiction of the Milan Courts-Italy
8) These conditions of sale are integral part of any purchase contract agreed with Max Prop Srl.

Manufactured by:

MAX PROP®

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