

MAX PROP

AUTOMATIC FEATHERING PROPELLERS

BY

PYI
INC.

Instruction Manual

3 AND 4 BLADE V.P. FAST



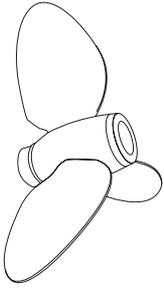
Scan the QR code with a mobile device to view the installation video.

1) **INTRODUCTION:**

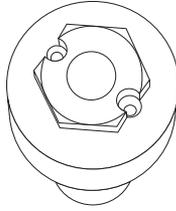
Thank you for having chosen a MAX PROP® automatic feathering propeller for your vessel. This instruction booklet is designed to answer all your questions on installation and use of the MAX PROP®. Please read it carefully and verify the correct working of the propeller before installing it on your boat.

2) **INSTALLATION:**

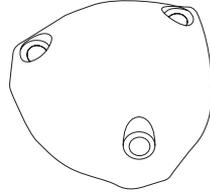
The propeller is supplied already assembled for right or left rotation, according to the information received at order and with the pitch required if discussed at the time of the order, and is therefore ready to be fitted on the shaft. **MAX PROP® parts are NOT interchangeable. Make sure, if you receive more than one propeller, that you do not interchange parts.** Please use Fig. 1.



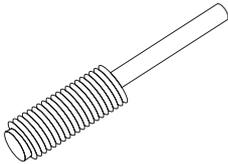
x1



x1



x1



x2



x3



x1



x1

For Sail Drives

- A) Fit the MAX PROP® onto the propeller shaft, like a fixed propeller, and be sure that the key is proper dimension: A properly fit key has almost no clearance side to side but a very small clearance on its upper surface. This clearance is to avoid the propeller being pushed off center by a key which is too tall.

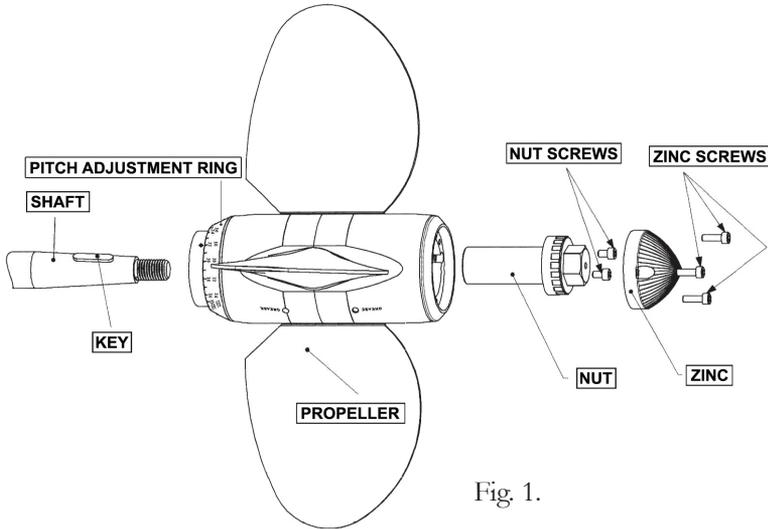
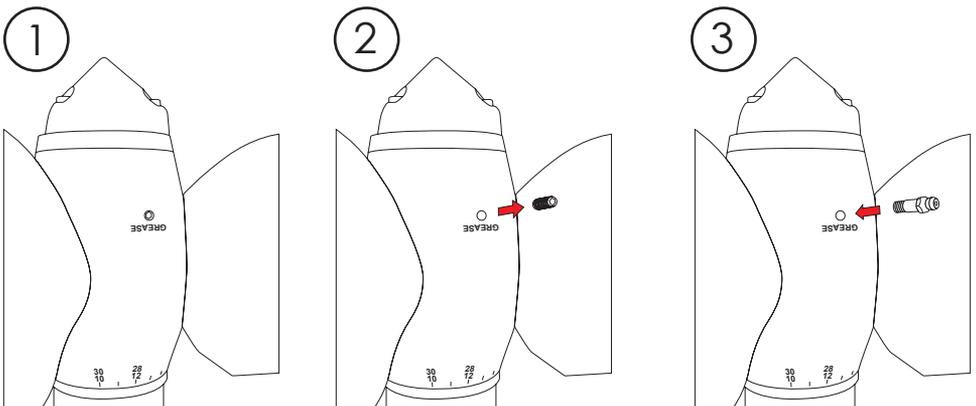
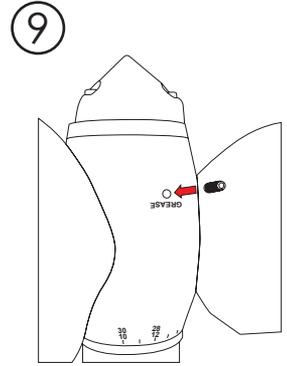
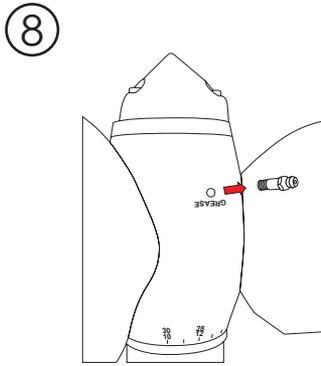
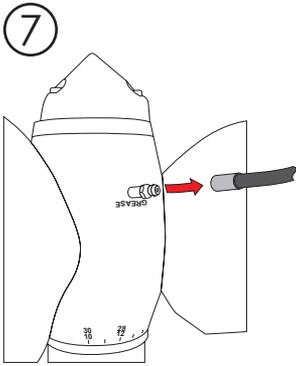
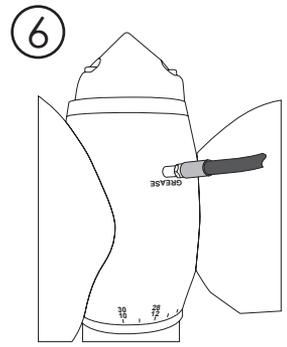
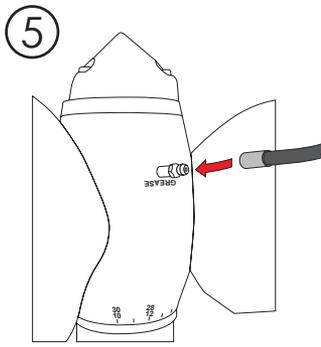
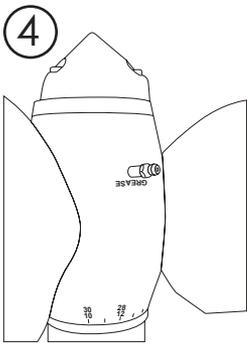


Fig. 1.

- B) Tighten the nut and secure it in place using the two allen head screws.
- C) Fill the prop with marine grease (supplied) using a grease fitting (supplied) inserted into the grease holes on the side of the propeller marked "GREASE". The MAX PROP® 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.





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.

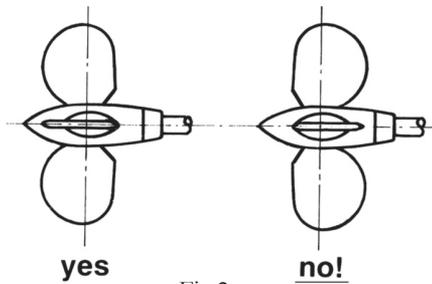


Fig.2

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. 1.
- 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.

3) **PITCH ADJUSTMENT:**

This is a critical step; make sure that you know what pitch to set the propeller at, either from your old propeller or by the engine and reduction ratio in the vessel. The pitch is adjustable from 10°-30° degrees of blade angle in one degree increments. Figure 3 shows the conversion from inches of pitch to degrees of blade angle. To properly convert from inches to degrees follow steps A through C.

- A) Determine the diameter of your propeller.
- B) Go down the column that corresponds to your propeller diameter until you find the desired amount of pitch.
- C) Cross reference this pitch in inches to the blade setting angle directly across the chart and you will have the desired blade angle.

| | | Propeller Diameter | | | | | | | | | | | | | | |
|-------------|-----|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 12" | 13" | 14" | 15" | 16" | 17" | 18" | 19" | 20" | 21" | 22" | 23" | 24" | 25" | 26" |
| Blade Angle | 10° | 4 | 4.3 | 4.6 | 4.9 | 5.2 | 5.5 | 6 | 6.3 | 6.7 | 7.1 | 7.4 | 7.7 | 8 | 8.3 | 8.6 |
| | 12° | 4.8 | 5.2 | 5.6 | 6 | 6.4 | 6.8 | 7.2 | 7.6 | 8 | 8.4 | 8.8 | 9.2 | 9.6 | 10 | 10.4 |
| | 14° | 5.6 | 6 | 6.6 | 7.1 | 7.6 | 8 | 8.4 | 8.8 | 9.4 | 9.8 | 10.4 | 10.8 | 11.2 | 11.6 | 12.2 |
| | 16° | 6.4 | 6.9 | 7.6 | 8.1 | 8.6 | 9.1 | 9.8 | 10.3 | 10.8 | 11.3 | 12 | 12.5 | 13 | 13.5 | 14 |
| | 18° | 7.2 | 7.8 | 8.6 | 9.2 | 9.8 | 10.4 | 11 | 11.5 | 12.1 | 12.8 | 13.4 | 14 | 14.6 | 15.2 | 16 |
| | 20° | 8.2 | 8.9 | 9.6 | 10.3 | 11 | 11.6 | 12.4 | 13 | 13.7 | 14.5 | 15 | 15.6 | 16.4 | 17 | 17.8 |
| | 22° | 9.2 | 10 | 10.7 | 11.4 | 12.2 | 12.9 | 13.6 | 14.3 | 15.1 | 16 | 16.8 | 17.5 | 18.2 | 18.9 | 19.8 |
| | 24° | 10 | 10.9 | 11.8 | 12.5 | 13.4 | 14.2 | 15 | 15.8 | 16.8 | 17.6 | 18.4 | 19.2 | 20.2 | 21 | 21.8 |
| | 26° | 11 | 12 | 12.8 | 13.8 | 14.7 | 15.7 | 16.6 | 17.4 | 18.4 | 19.3 | 20.2 | 21 | 22 | 22.9 | 23.8 |
| | 28° | 12 | 13 | 13.9 | 15 | 16 | 17 | 18 | 18.9 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 30° | 13 | 14 | 15.1 | 16.2 | 17.3 | 18.5 | 19.6 | 20.6 | 21.7 | 22.8 | 24 | 25 | 26.1 | 27.3 | 28.2 |

Fig.3

Inches of Pitch

Diameter and pitch must be calculated as if MAX PROP® were a normal fixed propeller. MAX PROP® then offers the great advantage of pitch adjustability in order to optimize the performance of the propeller. If the engine does not reach the desired RPM, reduce the blade angle; on the contrary, if the engine exceeds the desired RPM, increase the blade angle.

The MAX PROP® FAST allows an angle variation of 1 degree increment, this corresponds to a variation in the engine RPM by 6% - 7% at the same boat speed. It's possible to change either the pitch to optimize the engine performance, (for ex. if you change the engine, or if there were a mistake when ordering the prop). If you have doubts about the rotation: shaft rotation is determined from the stern of the boat looking forward. With the engine in forward position clockwise rotation of the propeller means it is right hand "R", and a counterclockwise rotation is a left hand "L".

Pitch and rotation of the MAX PROP® FAST can be changed as follows, referring to Fig.4 on next page:

- Remove the set screw from the hub reference hole.
- Pull the regulation ring towards the bow of the vessel and turn it to increase or decrease the blade angle for your specific rotation.
- Set the regulation ring so that the hub reference hole matches with the number on the ring corresponding to the chosen angle for your rotation.
- In order to make this operation easier we suggest screwing two screws into the threaded holes on the regulation ring and using these screws for leverage.
- Once you have aligned the reference to the selected angle, make sure that you reset the ring so it snaps back in place.
- For security you should lock the regulation ring by placing a set screw into its hub reference hole in the propeller hub.

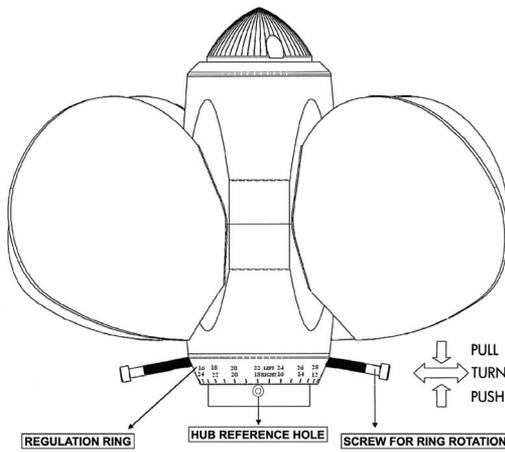


Fig. 4

4) **INSTRUCTIONS TO CHANGE PROPELLER ROTATION:**

With MAX PROP® FAST it is also possible to change the propeller rotation, if for example if you change the engine or transmission. If you are not sure about shaft rotation, it is determined from the stern of the boat looking forward. With the engine in forward position a clockwise propeller rotation means it is right hand “R”, and a counterclockwise rotation is a left hand “L”.

In order to change rotation of the MAX PROP® FAST, from right hand rotation to left hand rotation or vice versa, do as follows referring to Fig. 4.

- Unscrew the zinc screws, and remove the zinc.
- Unscrew the locking-nut screws remove the nut.
- At the aft edge of the hub remove the Circlip.
- Pull the zinc bearing ring aft.
- Once the zinc bearing ring is free, rotate it to where the “R” or “L” align with the reference mark on the hub.
- Then push the zinc bearing ring in its place again, making sure the “L” tooth aligns with the hub reference mark, you have left hand rotating propeller, or the “R” tooth if you have a right rotating propeller, as in Fig. 5.
- Reinstall the Circlip ring in its place.
- Tighten the nut and secure it with the locking-nut screws.
- Place the zinc, and secure it with the 3 screws.

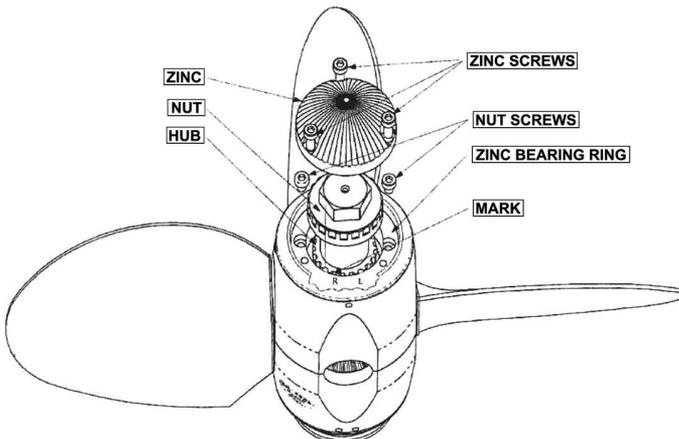


Fig. 5

5) **PROPELLER USE:**

The MAX PROP® CLASSIC GENERATION 2 works automatically. By putting the transmission 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 off the engine and lock the shaft.

The best way to feather the propeller is:

- Power at 2 to 3 knots in forward.
- Kill 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 cannot feather. You can actually use this feature to drive a shaft alternator.

Modern transmissions 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 in effect lock the shaft for a few moments, enough for the MAX PROP® to feather.

6) **MAINTINANCE:**

- The propeller must always be completely filled with recommended grease, the propeller should be greased at least once a year.
- 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 surfaces between the zinc and the propeller shaft in order to have a good electrical contact.

WARNING:

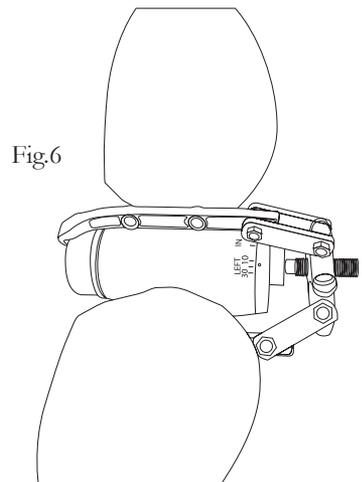
It is important to follow the instruction below carefully so as to avoid a shock load to the gears on the blades and cone gear, that could be damaging to the teeth.

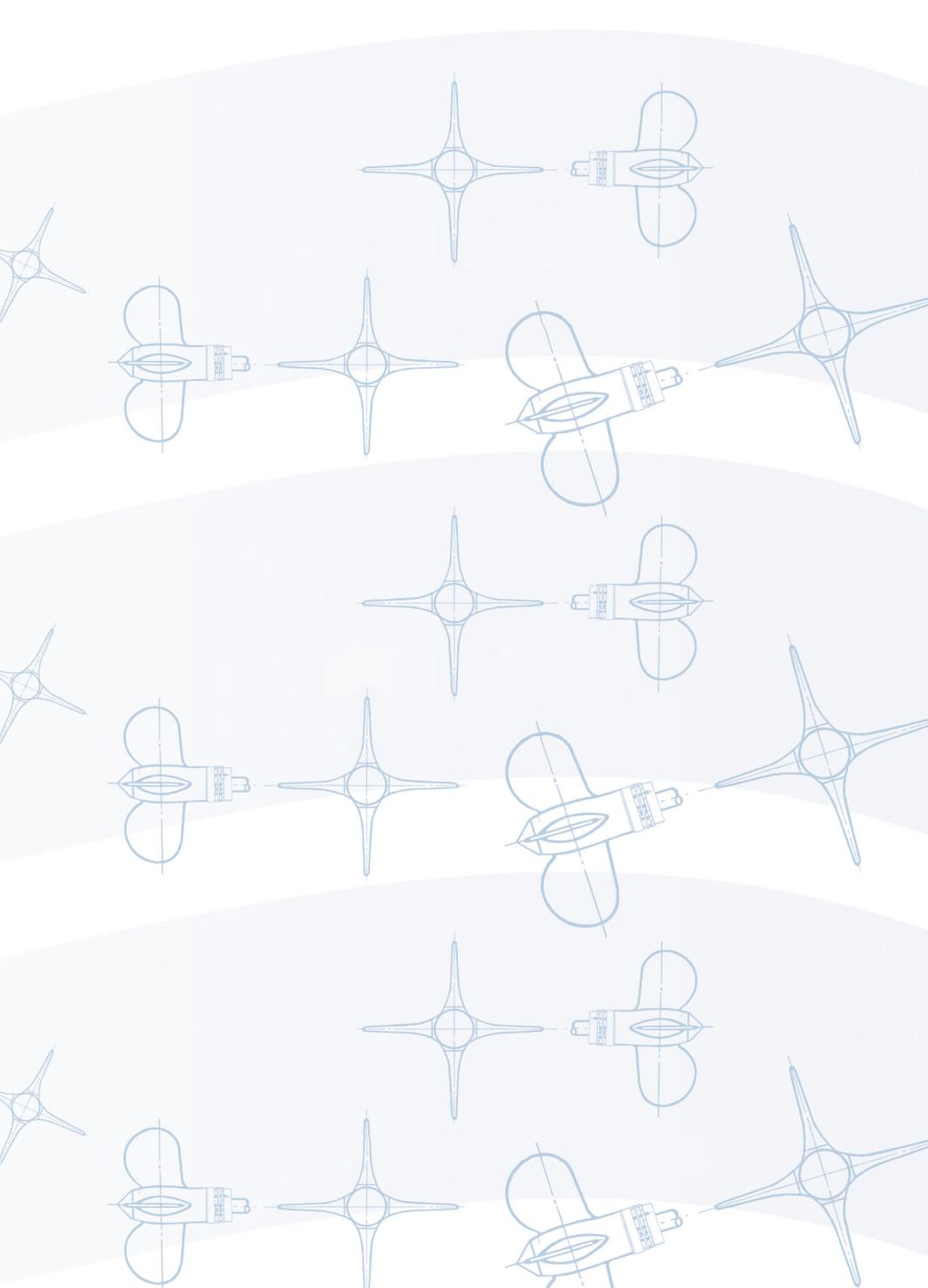
- When going from forward to reverse and the opposite, it is necessary to idle down and shift at low RPM's between gear, that could be damaging to the teeth.

7) **PROPELLER REMOVAL:**

In order to remove the propeller you must first remove the zinc and remove the nut. Next fit a long armed gear puller over the front of the propeller as show in Fig. 6. Tightening the center bolt of the gear puller will release the MAX PROP® from the propeller shaft.

If the bolt from the gear puller is not long enough to contact the end of the propeller shaft inside the MAX PROP® the MAX PROP® nut can be loosened and left in place. In this scenario the bolt from the puller will push against the back of the nut to release the propeller from the shaft.





MAX PROP PATENTED PROPELLERS

PYI Inc., 12532 Beverly Park Rd., Lynnwood, WA 98087

Tel: 425-355-3669 Fax: 425-355-3661 info@pyiinc.com www.max-prop.com