

Assembly and operating instructions for the  
**VARI PROP GP-128**  
3 & 4 - blade model



**Dear VARIPROP customer,**

Thank you for the trust you have placed in us by purchasing a VARIPROP feathering propeller.

You receive your VARIPROP factory assembled and ready for installation, balanced, greased and with your custom set pitch.

**Please do not disassemble the VARIPROP, this will void the warranty.**

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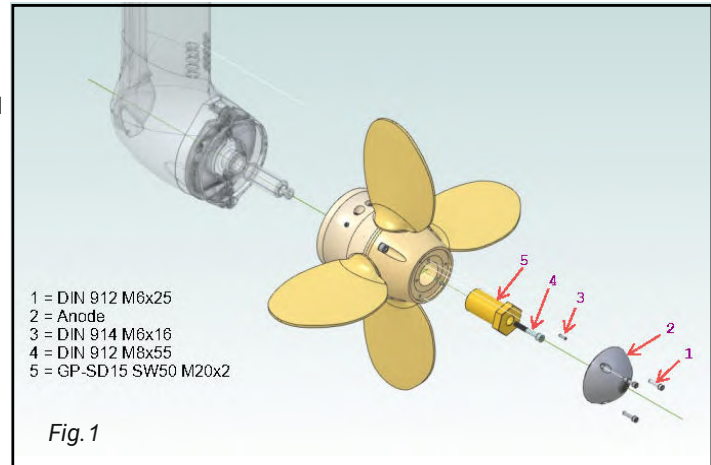
# INSTALLATION on the Saildrive

The VARIPROP is supplied ready for installation and greased at the factory.

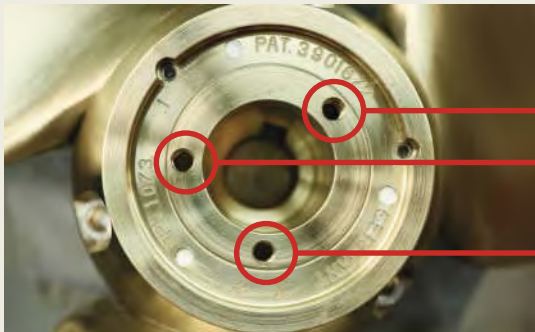
**"The VARIPROP must not be dismantled, otherwise the warranty claim will expire!"**

Before mounting the VARIPROP properly onto the saildrive spline, please check if the propeller hub gears mate precisely with the saildrive spline grooves. Tolerances are very tight to avoid on-axis movement. Some careful "wiggling" may be required to find the exact position where the hub slides onto the spline. After removal the zinc anode (2) and the propeller nut (5) the propeller hub will slide completely unto the spline. Tighten nut (5) strongly (SD ZF15 100 Nm / 75ft/lb) and use loctite low (pink).

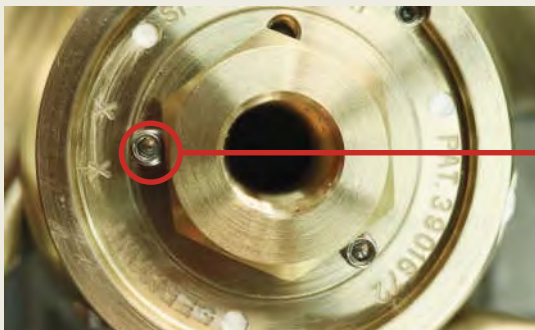
**Observe the recommended torque settings of the Saildrive manufacturer before tighten the prop nut (5).**



After installation, check that there is only a little end clearance for the prop on the saildrive shaft. If it is too high, fit one or more of the different spacer disc between the forward end of the prop and the saildrive to reduce it. The spacer discs are delivered with the prop. Secure the propeller nut (5) with the hexagonal socket cap screw (4 - M8x55 / 8Nm / 5,9 ft/lb) and two lock pins (3). Hand tighten only, and then mount the zinc cone (see beside). Make sure that the propeller is always protected from electrolytic corrosion by changing the zinc anode (2) latest every year, less often in fresh water. After the VARIPROP has been fitted properly check that the blades rotate freely from the forward stop to the reverse stop. The shock absorber function can be felt! See servicing page 11.



Only two of the three lock-pin holes can be used, depending on the final position of the shaft-nut flange. At least one of the three tapped holes must be used.



Carefully align the lock-pins (3) straight. They must go in easily. If not, try first to tighten the propnut a little further until they do. If impossible, back off the nut a little. The lock-pins should be hand tightened only. If over tightened they may strip.

Finally screw the zinc cap onto the propeller by using the three screws (1).

**Done!**

## WARNING!

### ENGINE DRY TEST:

Please consider that the dry test of the engine **MUST NOT** be done while the VARIPROP is fitted onto the saildriveunit. The VARIPROP needs water pressure on the blades, otherwise the prop could be damaged!!!

# INSTALLATION on the shaft

The VARIPROP is supplied ready for installation and greased at the factory.

**"The VARIPROP must not be dismantled, otherwise the warranty claim will expire!"**

Before fitting the VARIPROP onto the shaft, check key and keyway in the propeller hub. Take care that the key is the proper dimension and that the hub slides completely onto the shaft (see below). Remove the zinc anode (2) and the nut (4). Fit the propeller onto the shaft strongly. Tighten the nut (4) with LOCTITE low (pink) onto the shaft (torque-setting see page 12) and secure it with the lock pins (3). Fit the anode (2).

Make sure that the propeller is always protected from electrolytic corrosion by changing the anode (2) at least every year, this may not be necessary in freshwater.

After the VARIPROP has been fitted properly check that the blades rotate freely from the forward stop to the reverse stop. The shock absorber function can be felt! See servicing page 11.

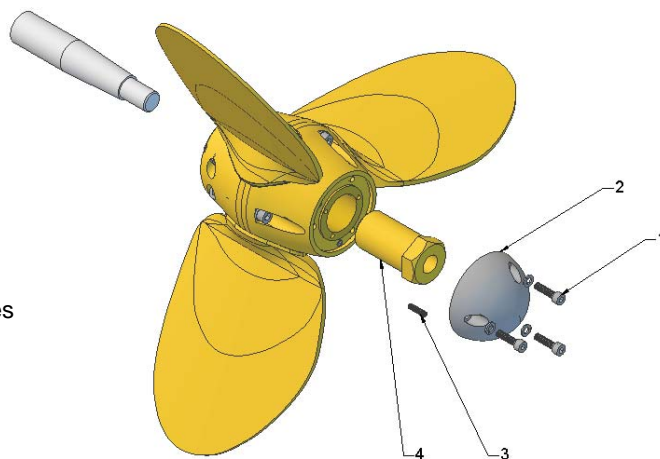


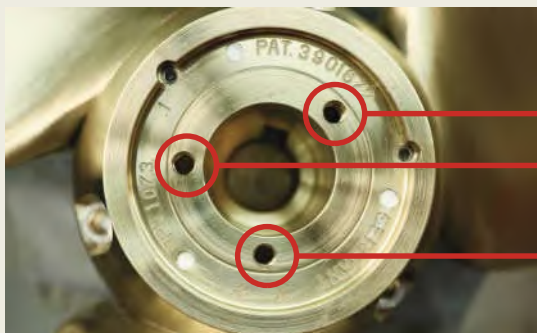
Fig. 1a

## MOUNTING:

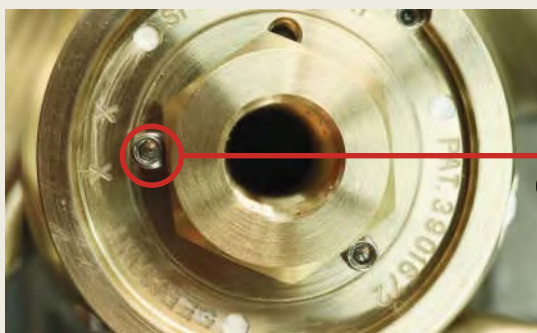
First slide the prop on the shaft without key. Mark the shaft with a grease-pen at the prop end.

After re-fitting the propeller with the key in the keyway on the shaft taper and correctly tightening the fastening nut very strongly (torque-setting see page 12) the mark must no longer be visible. If not, the key is binding and the top or the sides of the key must be filed or grind slightly down in width or height to avoid problems such as vibrations!

Light must be shining through on the top of the key when looking into the hub from astern. You may have to move your eye vertically to see it.



Only two of the three lock-pin holes can be used, depending on the final position of the shaft-nut flange. At least one of the three tapped holes must be used.



Carefully align the lock-pins (3) straight. They must go in easily. If not, try first to tighten the propnut a little further until they do. If impossible, back off the nut a little. The lock-pins should be hand tightened only. If over tightened they may strip.

Finally screw the zinc cap onto the propeller by using the three screws (1).

**Done!**

## WARNING!

### ENGINE DRY TEST:

Please consider that the dry test of the engine **MUST NOT** be done while the VARIPROP is fitted onto the shaft! The VARIPROP needs water pressure on the blades, otherwise the prop could be damaged!!!

# INSTALLATION on the shaft

## **ATTACHING THE ZINC-CONE:**

First, insert all three zinc-cone screws **(1)** loosely, then tighten securely in succession. Use LOCTITE low (pink) and observe the little washers. They prevent the grease from squeezing out of the hub during operation. Be sure to clean the screws and screw-holes from any grease before applying the loctite.



The VARIPROP feathers automatically when the shaft rotation is stopped. After engine start-up and shifting into gear the blades will engage in either forward or reverse.

## THE BEST WAY TO FEATHER THE PROPELLER INTO THE SAILPOSITION IS:

### **VARIPROP** *sailposition* *with mechanical gear-box:*

- » • Power at 3 to 4 knots in forward.
- » • Stop the engine and engage the transmission in reverse to stop the freewheeling of the shaft.

### **VARIPROP** *sailposition* *with hydraulic transmission:*

- » • Power at 3 to 4 knots in forward.
- » • Stop the engine while still engaged in forward. The remaining oil pressure of the transmission will stop spinning the shaft to feather the blades in the sail-position.

If the propeller is not feathered in the sailposition the shaft will freewheel like with a fixed propeller.

In that case start the engine again and repeat the steps above.

Once the prop is feathered, it is better to shift the transmission to neutral.

### **DO NOT stop**

the engine while it turns in reverse. In this case the blades will stay in the reverse position and will not feather.

You can actually use this feature to drive a shaft generator.

Please note that 98% of our delivered VARIPROP propellers for hydraulic gear boxes feather into sailing position without a shaft lock as you turn off the engine with forward gear still clutched in . This procedure generates higher oil pressure and prevents shaft rotation. This small-scale friction is usually enough to feather the propeller instantly into sailing position. If this procedure does not work, you most likely need to fit a shaft lock. For large yachts equipped with a propeller from our VARIPROP XLS range, we highly recommend to fit a shaftlock to ensure the propeller feathers and stays in the sailing position.

**TROUBLE SHOOTING:** If the propeller does not work in forward or reverse, go through the points below systematically.

- \* Check low idle of the engine. It should be 800 to 900 rpm in idle.
- \* Check shifting movement of the transmission lever make sure that the shifting travel is not too short. The amount of lever travel, as measured at the pivot point of the actuating lever, between the neutral position and end positions for forward and reverse can be found in the owners manual of your transmission. A larger amount of lever travel is in no way detrimental.
- \* Check the clutch discs of the transmission. They could be worn out.

**WARNING:** It is important to follow the instructions below carefully to avoid excessive load and shock to the gears, shortening their life.

- \* When going from ahead to astern or the opposite, it is necessary to idle down and shift at low rpm's (max. 1200rpm) between gears to allow smooth reversing of rotation without binding. This will substantially lengthen the service life of your propeller gears.
- \* When going from ahead to astern or the opposite, you can hear the turning-noise of the feathering blades. This is normal and not a problem or a defect of your VARIPROP.
- \* The propeller body must always be completely filled with a high viscosity grease. We recommend synthetic grease type TW.2 GEL or mineral multi-purpose grease EP/SAL 8 (see servicing page 11).
- \* The propeller must be protected from electrolytic corrosion by fitting the usual zinc anodes on the shaft plus the prop anode. We recommend the replacement of the anode once a year.
- \* If you want to protect your VARIPROP with Antifouling, use only Antifouling which needs a primer first. Otherwise chemical interaction and decomposition could occur. Our recommendation is an antifouling including a primer, available from your VARIPROP distributor.

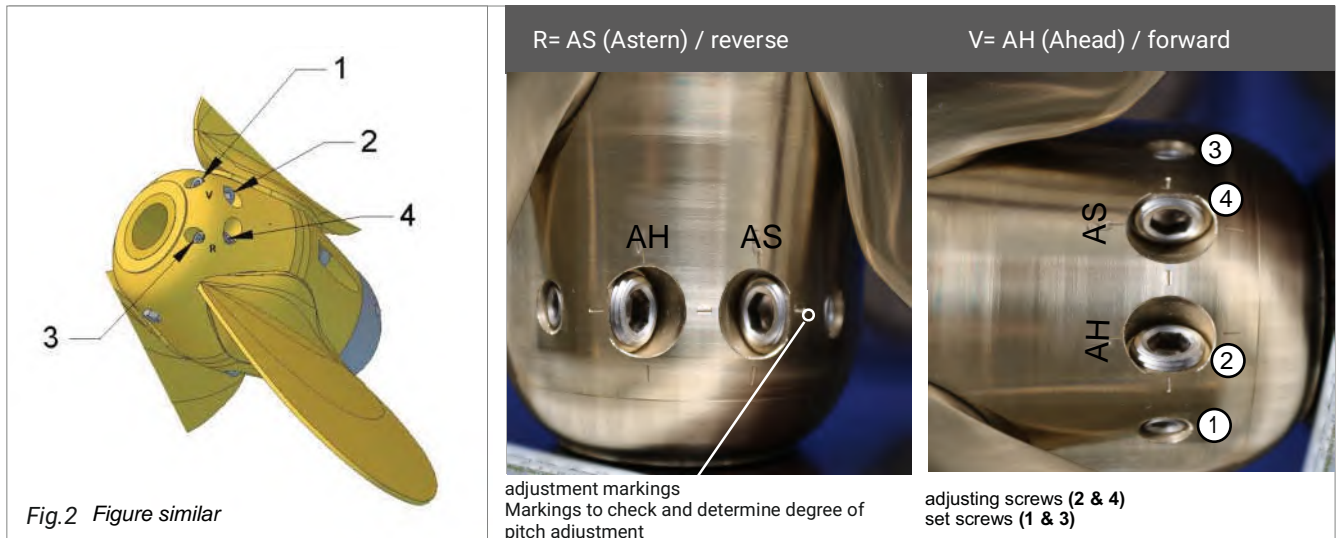
### **NEVER dismantle the VARIPROP yourselves !!**

Disassembly and reassembly require special tools and technical know-how only available at the factory or their approved service centres.

# PITCH ADJUSTMENT „LH“

**GENERAL:** The pitch adjustment is very simple on the VARIPROP, and can be done in or out of the water in matter of few minutes, if a there is enough space between propeller hub and strut to fit an allen key into the set screws (1) & (3) at Fig.2 . If not, the propeller must first be pulled. (see removing from the shaft page 9-10)

**Propeller in the drawing below (Fig.2) is for a left hand rotation VARIPROP „LH“.**



The following description refers to the view towards astern for a **left hand** VARIPROP.

## A. Adjusting the forward pitch:

1. Remove the set screw (1) (behind the blades)  
Use the 4mm allen key supplied with the prop.
2. Turn the adjusting screw (2), which is marked as "AH" or "V" with the 6mm allen-key as follows:

2a. Increasing of pitch approx. 3" max.: »

Turn the adjusting screw (2) clockwise.

( see "NOTE" and page 8)

- » Secure set screw (1) with LOCTITE-Low (pink).  
Lock set screw strongly.

2b. Reducing of pitch approx. 2" max.

- » Turn the adjusting screw (2) anti-clockwise.  
( see "NOTE" and page 8)

- » Secure set screw (1) with LOCTITE-Low (pink).  
Lock set screw strongly.

## B. Adjusting the reverse pitch:

1. Remove the set screw (3) (behind the blades)  
Use the 4mm allen key supplied with the prop.
2. Turn the adjusting screw (4), which is marked as "AS" or "R" with the 6mm allen-key as follows:

2a. Increasing of pitch approx. 2" max.:

- » Turn the adjusting screw (4) anti-clockwise.  
( see "NOTE" and page 8)

- » Secure set screw (3) with LOCTITE-Low (pink)  
Lock set screw strongly.

2b. Reducing of pitch approx. 3" max.

- » Turn the adjusting screw (4) clockwise.  
( see "NOTE" and page 8)

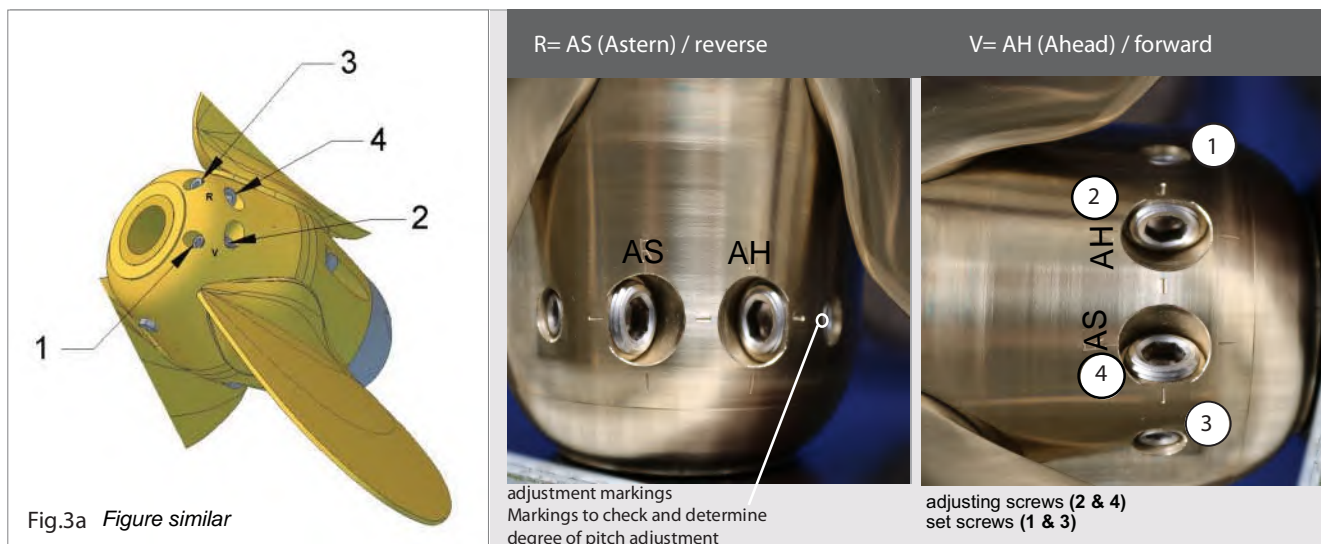
- » Secure set screw (3) with LOCTITE-Low (pink).  
Lock set screw strongly.

**Required tool for pitch adjustment see page 13 (Tightening torques)**

**NOTE:** It is quite possible to set the pitch continuously variable and independently for forward and reverse. Turning of the adjusting screws (2) and (4) by quarter a revolution ( 90° ) changes the pitch approx. 1". This will change the engine revolution by approx. 200 rpm.

**GENERAL:** The pitch adjustment is very simple on the VARIPROP, and can be done in or out of the water in a matter of few minutes, if there is enough space between propeller hub and strut to fit an Allen key into the set screws (1) & (3) at Fig. 3a. If not, the propeller must first be pulled. (see removing from the shaft page 9-10)

**Propeller in the drawing below (Fig. 3a) is for a right hand rotation VARIPROP „RH“.**





The following description refers to the view towards astern for a **right hand** VARIPROP



#### A. Adjusting the forward pitch :

1. Remove the set screw **(1)** (behind the blades).  
Use the 4mm allen key supplied with the prop.
2. Turn the adjusting screw **(2)** which is marked as "AH" or "V" with the 6mm allen-key as follows:

##### 2a. Increasing of pitch approx. 3" max.:

- » Turn the adjusting screw **(2)** clockwise.  
- » Secure set screw **(1)** with LOCTITE-Low (pink)  
Lock set screw strongly.



##### 2b. Reducing of pitch approx. 2" max.

- » Turn the adjusting screw **(2)** anti-clockwise.  
- » Secure set screw **(1)** with LOCTITE-Low (pink).  
Lock set screw strongly.



#### B. Adjusting the reverse pitch:

1. Remove the set screw **(3)** (behind the blades).  
Use the 4mm allen key supplied with the prop.
2. Turn the adjusting screw **(4)** which is marked as "AS" or "R" with the 6mm allen-key as follows:

##### 2a. Increasing of pitch approx. 2" max.:

- » Turn the adjusting screw **(4)** anti-clockwise.  
- » Secure set screw **(3)** with LOCTITE-Low (pink)  
Lock set screw strongly.

##### 2b. Reducing of pitch approx. 3" max.

- » Turn the adjusting screw **(4)** clockwise.  
- » Secure set screw **(3)** with LOCTITE-Low (pink).  
Lock set screw strongly.

**Required tool for pitch adjustment see page 13 (Tightening torques)**

**NOTE:** It is quite possible to set the pitch continuously variable and independently for forward and reverse. Turning of the adjusting screws (2) and (4) by quarter a revolution ( 90° ) changes the pitch approx. 1". This will change the engine revolution by approx. 200 rpm .



# Defining and checking pitch adjustments

It is quite possible to set the pitch continuously variable and independently for forward and reverse. The turning of the adjusting screws [(2) & (4) Figure 2 & 3a ( see pages 6&7 )] by quarter a revolution changes the pitch approx. 1". That means a half turn ( 180° ) changes the pitch by 2" etc.. For a check of pitch adjustments there are markings on the hub face under the zinc anode. To return to original factory pitch settings, line up "AH" or "V" resp. "AS" or "R"

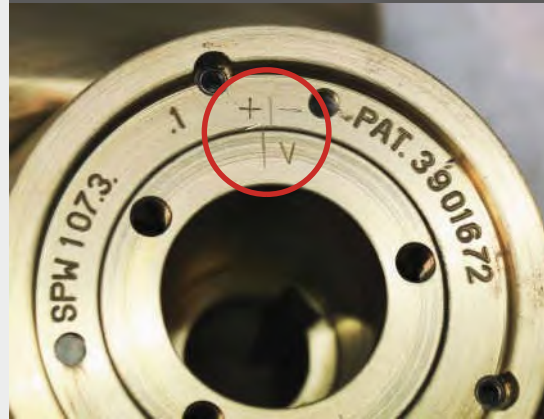
## Example for ahead:

Check adjustments ahead!  
Marked with „ V “ !



original factory pitch setting :  
markings line up

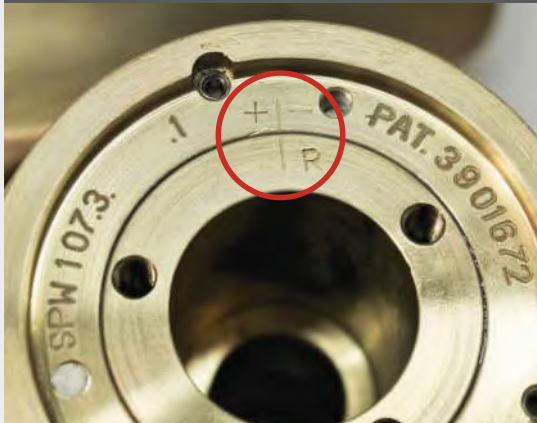
The example shows adjustment of +1"



pitch has been increased ahead

## Example for astern:

Check adjustments astern!  
Marked with „ R “ !



original factory pitch setting :  
markings line up

The example shows adjustment of -1"



pitch has been decreased astern

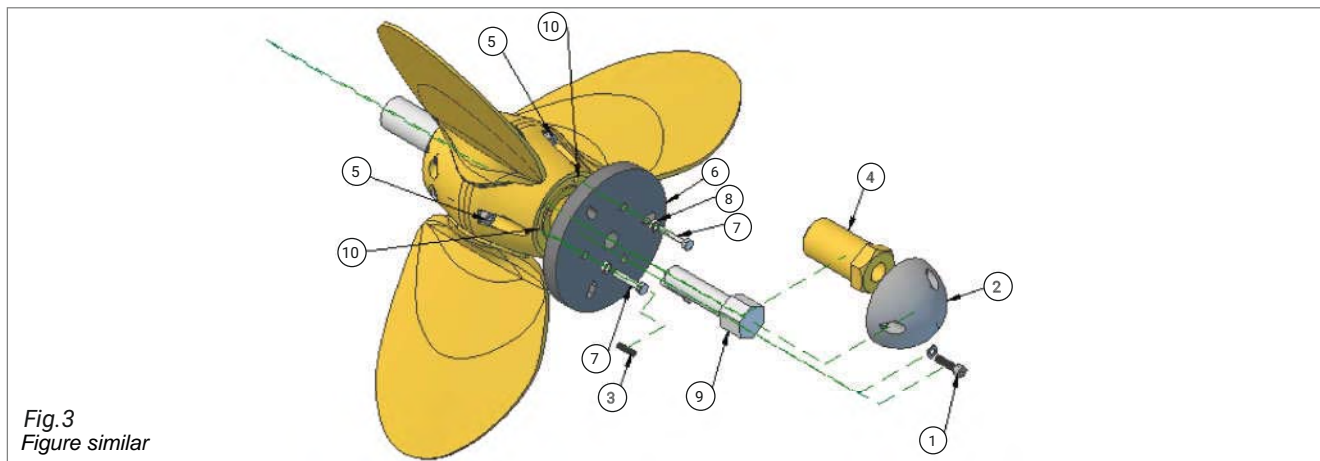
## Note:

- » If the engine does not reach the desired RPM, reduce the pitch.
- » If the engine exceeds the desired RPM, increase the pitch.
- » 1" of pitch reduction / increase results in approx. 200 rpm engine revolutions increase / reduction .

# VARIPROP REMOVAL from the shaft

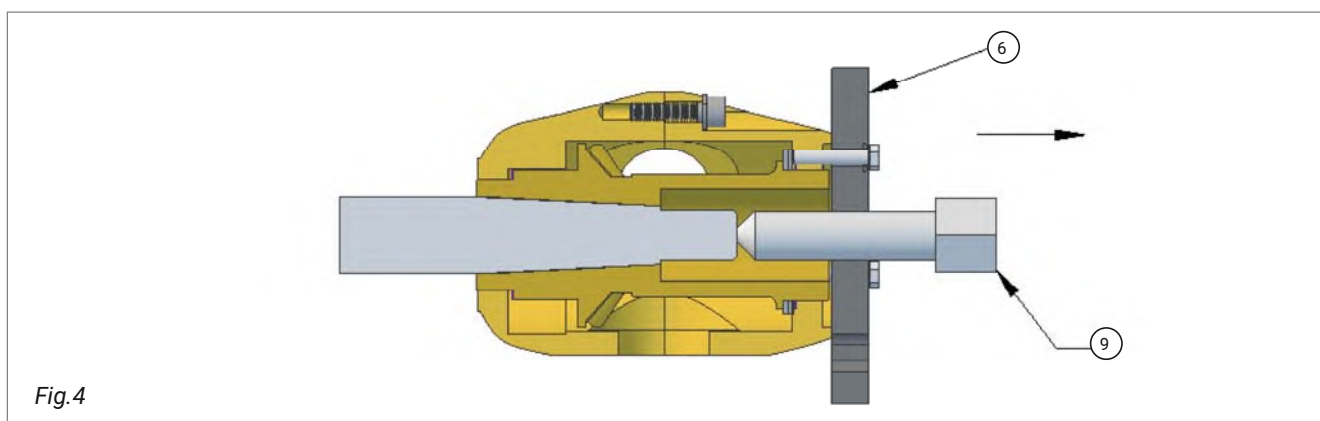
## VARIPROP removal after 1 or 2 seasons.

1. In order to remove the VARIPROP, you must first remove the zinc anode (2)
2. Remove both lock pins (3) and the prop nut (4)



- 3.) Fit the short hexagonal head screws (7) into the inner bolt circle diameter of the puller (6) . Fit the SPW puller (6) onto the aft of the rear boss and screw the short hexagonal head screws (7) completely into the zinc screw holes (10). Take care that the plate (6) will fit snugly and evenly to the aft boss.

**CAUTION!**  
**DO NOT OPEN THE HEXAGON SOCKET SCREWS (5) !**  
**It would dismantle the two separate halves of the VARIPROP hub !!!**



4. Now turn the hexagonal head bolt (9) against the end of shaft until the VARIPROP comes off the taper. Do not use excessive force to turn bolt (9). If prop does not come off, proceed to page 10 → removal after the 3rd season. Never use a hammer to remove the prop from the taper !!!

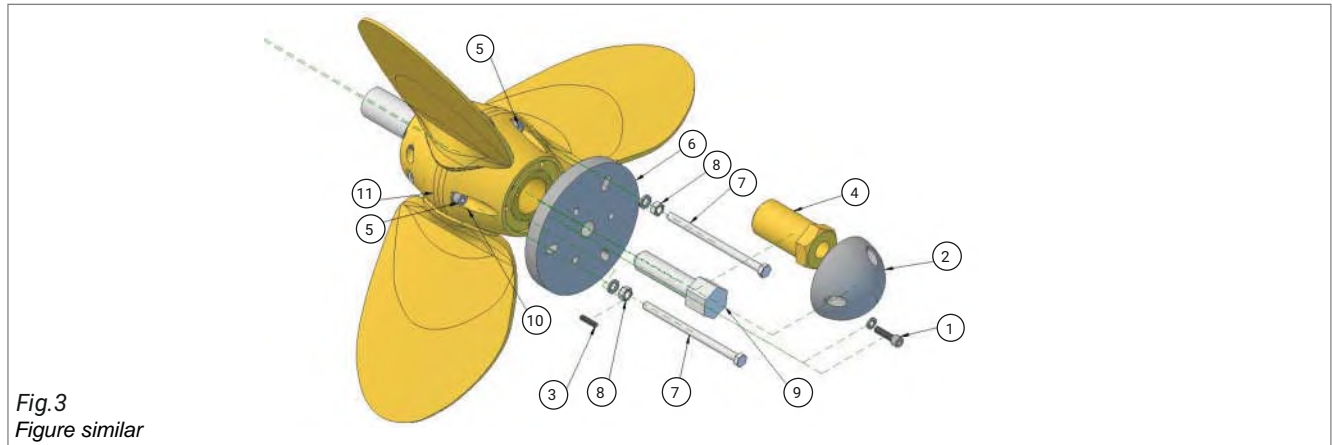
**CAUTION:** The VARIPROP should NOT be dismantled into its individual parts!  
The correct assembly requires special knowledge and special tools.

We highly recommend the use of above described special puller, available from your VARIPROP dealer.  
Standard 3-prong pullers can easily slip and damage the rounded VARIPROP housing !

# VARIPROP REMOVAL from the shaft

## VARIPROP removal after 3 years or more.

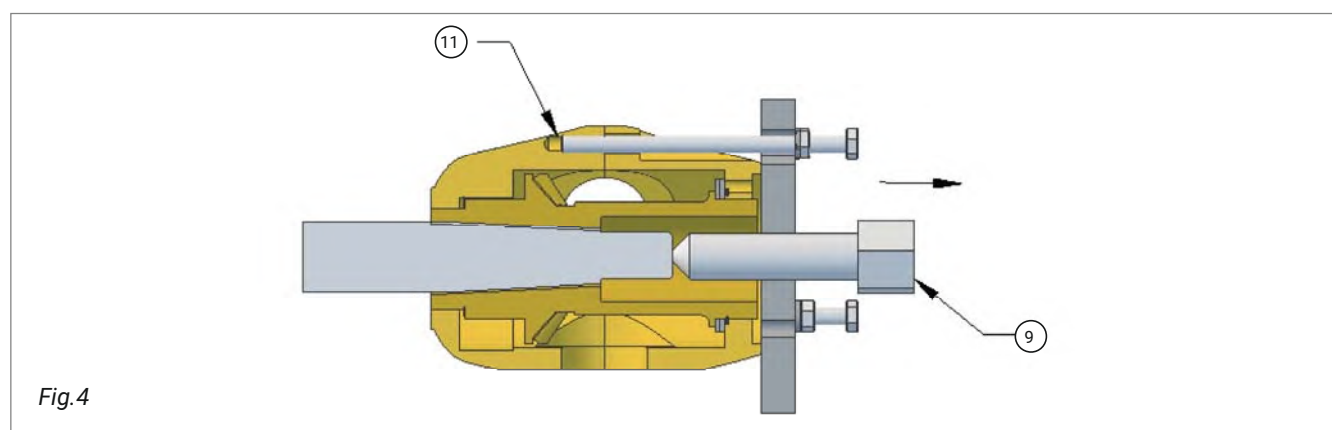
1. In order to remove the VARIPROP you must first remove the zinc anode (2).
2. Remove both lock pins (3) and the prop nut (4)



3. Then remove at first only two hexagonal socket screws (5). **DO NOT REMOVE ALL SCREWS!!**

**Do not remove all housing screws (5) at the same time, but loosen one after the other and immediately secure each housing screw with the long screw of the puller so that the VARIPROP hub-housing remains together.**

4. Fit two of the long hexagonal head screws (7) into the outer bolt circle diameter of the puller (6). Now fit the SPW puller (6) onto the aft of the rear boss and screw the long hexagonal head screws (7) completely into the screw holes (11) of the front boss half (10). Tighten the nut (8) on the head screws (7) until the plate (6) is fitted snugly and evenly to the aft boss. CAUTION: Do not dismantle the two separate halves of the VARIPROP hub !!! In this mode remove the last hexagonal socket screw (5) as well and fit the third long hexagonal head screw. Take care that plate (6) will fit snugly and evenly to the aft boss.



5. Now turn the hexagon head bolt (9) against the end of shaft until the VARIPROP comes off the taper. Never use a hammer to remove the prop from the taper !!!
6. At the end remove the puller (6) carefully and secure the boss halves (10) with the socket screws (5). Tighten strongly with LOCTITE blue ( medium ). Take care that the hub halves do not come apart when removing the hexagonal head screws (7).

**CAUTION: The VARIPROP should NOT be dismantled into its individual parts!  
The correct assembly requires special knowledge and special tools.**

We highly recommend the use of above described special puller, available from your VARIPROP dealer. Standard 3-prong pullers can easily slip and damage the rounded VARIPROP housing !

## Important note:

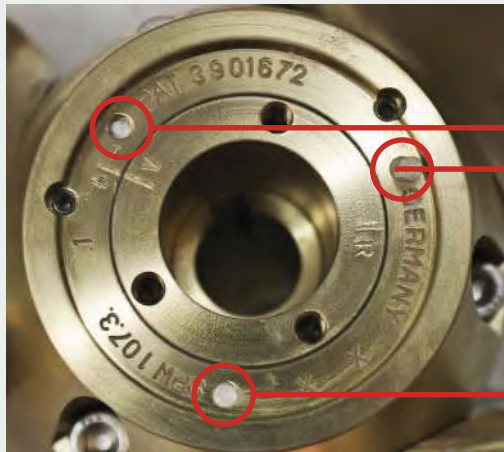
**We explicitly point out that the following spare parts may only be installed as original SPW parts:**

anodes - screws - locking screws and EP/SAL special grease

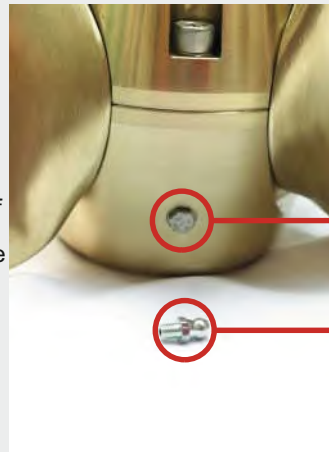
This concerns in particular the installation of the anodes. Non-original SPW anodes lead to malfunctions!

**ANY WARRANTY IS VOID!**

The VARIPROP needs to be greased once a year minimum. The VARIPROP housing should always be completely filled with a high viscosity grease of a hydrophobic nature. Remove the cap screw (5) and screw in the lubricating nipple which is supplied with the tools. Further remove the zinc anode! With each pump of the grease gun rotate the propeller from forward stop to reverse stop to allow the grease to work through the propeller. Stop to pump when enough grease comes out of the anode drill holes on top of the prop.



Stop greasing if  
grease squeeze  
out here!



Cap-screw (5)

Lubrication  
nipple M5

Factory supplied special grease EP/SAL is recommended and available from your VARIPROP distributor. Avoid regular white grease (sterntube-grease) !

**Shock-absorber:** The integrated shock-absorber reduces unpleasant operating noises. The pitch stops are substantially protected against wear. While rotating the blades by hand, you can feel the shock-absorber function. This "heavy" turning at the absorber area is normal and necessary for the function !

Make sure that you always keep the zinc anode in good condition. The VARIPROP must be protected by a lot of zinc, so also use a zinc anode onto the shaft if possible. Use fine sandpaper to clean the aft of the end boss and the forward face of the VARIPROP-anode to give the zinc good contact with the propeller.

# TORQUE SETTINGS FOR PROP-NUT

( page 2, Fig.1, part-no. 5)  
( page 3, Fig.1a, part-no. 4)

Standard - thread	
M 14 x 2 UNC 1/2" - 13	40 Nm / 30 ft/lb
M 16 x 2 BSW 5/8" - 11 UNC 5/8" - 11	60 Nm / 45 ft/lb
M16 x 2 for Yanmar Saildrive SD-20, SD-31 for Volvo Saildrive, Technodrive, ZF and all others	60-70Nm / 45-50 ft/lb
M20x2,5	125 Nm / 95 ft/lb
UNC 7/8" - 9	160 Nm / 115 ft/lb
M24 x 3 BSW 1" - 8 UNC 1" - 8	210 Nm / 155 ft/lb
M27x3	315 Nm / 230 ft/lb
M30 x 3,5 UNC 1 1/8" - 7 BSW 1 1/8" - 7	350 Nm / 255 ft/lb
UNC 1 1/4" - 7	350 Nm / 255 ft/lb
UNC 1 1/2" - 6	390 Nm / 290 ft/lb

Fine - thread	
M 14 x 1,5 BSF 1/2" - 16	40 Nm / 30 ft/lb
M 16 x 1,5 BSF 5/8" - 14 UNC 5/8" - 18	70 Nm / 50 ft/lb
M 20 x 1,5 BSF 3/4" - 12 UnC 3/4" - 16	135 Nm / 100 ft/lb
M 20 x 2 for Yanmar Saildrive SD-40, SD-50, SD-60 ZF - SD-15	100 - 120 Nm / 74 - 88 ft/lb
M24 x 2 BSF 1" - 10 UNF 1" - 12	225 Nm / 165 ft/lb
M 30 x 2	430 Nm / 315 ft/lb
M 36 x 2	430 Nm / 315 ft/lb
M42 x 3	530 Nm / 390 ft/lb



*Werkzeug und Größen mit Valerij abgleichen, ob korrekt*

## Tools supplied with each VARIPROP

### Service Tools GP-128 (Fig.1a):

- »» 1 small plastic bottle with Loctite low (pink)
- »» 1 grease nipple 5 mm
- »» 1 allen key 3 mm
- »» 1 allen key 4 mm
- »» 1 allen key 5 mm
- »» 1 allen key 6 mm

### extra for Saildrive (GP-128 only)(Fig.1/p.5)

- »» 1 allen key 8 mm for socket cap screw (4)

### Service tool for Pitch Adjustment GP-128 (Fig. 2/3a)

- »» 1 allen key 4 mm
- »» 1 allen key 8 mm

## + necessary tools for removing the prop **after 1 or 2 seasons** (page 9)

### for GP-128 :

- »1 open-end- / box spanner 17 mm
- »1 open-end- / box spanner 30 mm
- »1 open-end- / box spanner 50 mm
- »1 allen key 3 mm
- »1 allen key 5 mm

## + necessary tools for removing the prop **after 3 years** (page 10)

### for GP-128:

- »1 open-end- / box spanner 17 mm
- »1 open-end- / box spanner 30 mm
- »1 open-end- / box spanner 50 mm
- »1 allen key 3 mm
- »1 allen key 5 mm
- »1 allen key 6 mm

## NOTES



OnlineShop

**VARIPROP**  
FEATHERING PROPELLERS

*Made in Germany*

Westkai 58 | 27572 Bremerhaven | Germany  
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Telefax +49 (0) 471 - 7 74 44  
info@spw-gmbh.de  
www.spw-gmbh.de | www.VARIPROP.de

F65 VP\_GP128 Installation Instruction Rev.std 11.pdf  
04/10/23

15

**SPW** GmbH  
SAIL PROPELLER- UND WELLENBAU