IMPORTANT INSTALLATION INSTRUCTIONS FOR **AUTOSTREAM 4000 SERIES** Sail drive propellers.

Please read and follow these instructions precisely, failure to do so may result in unsatisfactory results, additional slipping costs, and loss of propeller or voiding warranty.

Our experience has shown virtually all problems stem from faulty installation – avoid frustration and extra expense and read on.

Pre installation points

1. Before disassembling the propeller note which is the leading and trailing edge of the blades when feathered.

2. Note how freely the blades rotate.

3. Note that the propeller is the same hand in forward and reverse positions.

4. Points 1 to 3 must be the same after installation. Marking the blade positions with a felt tip pen prior to disassembly may help.

5. Check that the correct hand has been ordered. The letter R or L in the serial number denotes left or right hand rotation. Right hand rotation requires clockwise rotation of the propeller shaft (when viewed from astern) to drive the boat forward. Vies versa for left hand. If for a Volvo leg the letter 'V' should be included in the serial number.

6. Tools required for installation:-

5mm Hex key	supplied with propeller
2.5mm Hex key	supplied with propeller
Valvoline Val Plex M grease	supplied with propeller
262 loctite	supplied with propeller
242 loctite	supplied with propeller
6mm hex key	supplied with propeller –only required if changing blade bearings
Grease gun	
Flat blade screwdriver	may be required for pitch adjustment
1/2"A/F ring spanner	may be required for pitch adjustment
Suitable socket for propeller nut	
Soft-faced hammer	
6mm A/F hex key for propeller nut lock screw	

7. This may be a convenient time to replace the sail drive leg anode. **Please note:** This anode is to protect the leg and is not replaced by the propeller anode, which is to protect the propeller.

Assembly instructions

1. Undo 3 screws 'A' **ONLY** using 5mm hex key supplied. Position blades in feathered position. Grasp the main body and with a soft-faced hammer gently tap the leading edge of the blades to remove the blade assembly. **Do not** lever with a screwdriver or similar in the joint face as this may damage the faces. See fig 1.
2. Any line cutter or spacer supplied with sail drive leg should be left in place on the splined shaft. Fit washer 'B' next.
3. Ensure the rubber cushion is fitted to the propeller. This is the square rubber ring visible inside the forward end of the propeller.
4. Smear a little grease on to the splined shaft keeping the end thread clean. Apply 3 drops of the loctite supplied to the splined prop shaft thread and to the thread inside end of shaft. Slide the propeller body assembly onto the splined shaft.
5. Push the assembly firmly on and rotate back and forth checking that the propeller body is not touching the leg anode. **Note:** the gap between the propeller body and the leg anode will vary as the anode size varies as supplied by Yanmar. Do not remove washer 'B' to decrease this gap.
6. Apply 3 drops of loctite supplied inside the nut supplied and fit the nut to the splined shaft. Tighten to 50Nm(36ft/lbs) torque.
7. Apply 2 drops of loctite supplied to end of thread of locking cap screw and fit to end of shaft through propeller nut using 6mm hex key. Tighten to 15Nm(11ft/lbs) torque. Insert tie wire through lug on nut and through head of cap screw. Secure by twisting ends together. Push down to ensure wire ends do not "foul" gear teeth.
8. **Check** that the propeller body rotates freely from pitch stop to pitch stop ie: forward to reverse. If fouling occurs check that all the correct spacers are in place ie: standard line cutter or spacer and washer 'B'. Check for 'V' in serial number if a Volvo leg.
9. Align 'V' markings on main gear and main body. See fig 3.
10. Apply 1 drop of loctite to each of the 3 threaded holes and to end of screws 'A'.
11. With all blades in feathered position (as in Fig 1) carefully fit the blade assembly to the main body with No.1 blade aligned with No.1 on main body as in Fig 1. Using 5mm hex key supplied lightly tighten the 3 screws 'A'.

Check that the propeller rotates freely from forward to reverse and that the propeller is the same hand in both directions and all blades are the same pitch. See item 4 of the pre installation points. If not correct the relationship between the body and gear or blades has moved during assembly. Remove assembly, clean screws of loctite and try again. When all is satisfactory tighten screws 'A' to 9.5Nm(7ft/lbs) torque. Fit 3-5mm grub screws around the circumference of body, applying the 242 loctite supplied to both the threaded hole and the grub screws. Using 2.5mm hex key supplied, tighten grub screws.

12. Check propeller rotates freely from forward to reverse. It should be as free as the pre installation check. If not the propeller will have to be dismantled and inspected for dirt or damage to the gears, which will most likely be the problem.
13. Grease the propeller with Val Plex M or equivalent through the grease nipple at the end of the anode until grease appears at the blade bearing journals.
14. To remove the anode, undo the locknut at the grease nipple and slide the anode off. NOTE: It's not necessary to dismantle the blade assembly (fig 1) unless replacing the blade bearings. To replace blade bearings: Remove the tail cone anode and 3-12mm grub screws using 6mm hex key supplied, then remove the 3 cap screws underneath. Position blades in the feathered position as in fig 1, remove end cap leaving blades behind. When reassembling clean screws and threaded holes of old loctite and reapply loctite supplied. Tighten screws to 9.5Nm(7ft/lbs) torque. Re-fit the 3-12mm grub screws using 6mm hex key. Blade bearing bores are numbered on all parts and must correspond.

General Notes

If not using a torque wrench for tightening screws and nuts:
Yanmar sail drives:- do not over tighten the propeller nut as you may snap the thread off the end of the shaft as it is a hardened shaft. This is very expensive. About the same torque as doing up a spark plug is ok. Make sure threads are clean and use sufficient loctite. All other screws should be done up very tight. You will break the screws before you strip the threads in the bronze.

Anti fouling of the propeller.

Modern self-abating anti-fouls will not last very long if the boat is used under motor power. We suggest if the boat is moored for long periods, especially in high fouling areas, that the propeller be anti-fouled.
If the boat is mainly used in clean ocean water than anti fouling is not required.
If anti foul is used on the propeller:

1. Do not allow paint to run into the blade journals and restrict the ease of blade movement.
2. Do not paint the tail cone anode or grease nipple.

Sea trials

The propeller pitch is generally preset using the information supplied when the propeller was ordered. However fine-tuning may be required to achieve optimum performance. The correct pitch is achieved when the engine just reaches max rpm under flat-water conditions. Over revving is not enough pitch, black smoke or under revving is too much pitch. The pitch adjustment screws are marked F and R for forward and reverse adjustment. Half a turn of the screw will make about 150rpm alteration on most installations.
To increase the pitch ahead screw 'F' in.

To increase the pitch astern screw 'R' out and vies versa

Reverse rarely needs adjustment and is set at a finer pitch than forward.

NOTE Autostream propellers are much more efficient in reverse than other types of propellers, take care reversing in confined areas as you may be doing 3 to 4 times the speed for the same rpm that you were previously.