Kiwi Feather Props Ltd – LIMITED WARRANTY

Kiwiprops

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Auckland 1740 New Zealand

Factory: 12 C Homestead Drive
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kiwiprops@xtra.co.nz

LIMITED WARRANTY: **VER: 2020.10**

Kiwi Feather Props Ltd. (KFP) and its agents offer the following limited warranties with the purchase of every Kiwiprop unit:

1. If in the first 30 days following the initial launching of the unit, the purchaser is for any reason not satisfied with the performance of the unit, then the unit may be returned in undamaged condition to the point of purchase for a full refund of the purchase price in New Zealand dollars net of actual freight charges.

2. KFP and its agents warrant that the Kiwiprop™ unit is free from defects in workmanship and material for a period of 12 months from the date of purchase.

What we will do to correct problems arising from a valid claim under the limited warranty:

To avoid unnecessary costs and delays please first contact KFP quoting the serial # of the unit stamped on the face for warranty assessment. KFP will then advise an appropriate shipment address. All costs of transport of the unit to KFP or their designated agent, including insurance, will be at the cost of the purchaser. This includes any spare parts purchased subsequently.

KFP may elect at their discretion to replace the entire unit or replace the faulty components to return the unit to it's normal function. There will be no charge to the purchaser for this service.

***What is not covered under the limited warranty*:**

While KFP believe the units meet all current operating criteria of the various manufacturers it is the customers responsibility to ensure the units are acceptable to the engine manufacturer.

Neither KFP nor it's agents shall be liable for incidental, consequential or special losses or damages, resulting from the use or inability to use the Kiwiprop™ unit, whether resulting from breach of warranty or any legal theory.

The warranty does not cover propellers that have been improperly installed, misused, neglected or improperly maintained or damage caused by collision or impact with foreign objects, including fishing lines and ropes. Post Jan 1st 2012 (ie Units with a Serial # > 12000) the loss of the entire propeller is not covered under this limited warranty as it is invariably caused by non standard mountings, corroded keys or a failure to following the mounting instructions correctly. Vessel insurance may cover this.

Wear and corrosion are not valid warranty claims. The cost of haul outs, antifouling and other propeller components eg seals, zinc's and cutters are not covered under the warranty.

***Acceptance of the terms and conditions of this limited warranty*:**

By installing the Kiwiprop™ unit you are accepting the terms and conditions of the limited warranty.

If you do not wish to accept these terms and conditions you must not install or use the product but return it to it's original point of purchase. The limited warranty and remedy provided is exclusive and in lieu of all other expressed warranties and unless stated herein, any statements or representations made by other person or business are void. The duration of any implied warranty of merchantability or fitness for a particular purpose shall be limited to the duration of the express limited warranty.

Unit Serial #:	Signed:

Kiwiprops™

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K4 - CUSTOMER MANUAL

This manual is also available at: www.kiwiprops.co.nz

A KEYWORD SEARCH FUNCTION IS AVAILABLE OFF THE WEB SITE

VERSION: 11.01.2021

Kiwiprops™

CONTENTS OF THIS K4 OPERATING MANUAL

Continued 1 ……..

Refer first to exploded diagram on page 9 below and to the picture of the boss on page 2 ….

You are now the proud owner of an original *Kiwiprop*™ which has been carefully designed and engineered to deliver many years of carefree service on your vessel. There are some very simple recommendations you should be aware of to ensure your *Kiwiprop*™ will continue to deliver trouble free performance in the years ahead.

SHAFTS: ***….REFER TO SHAFT FITTING VIDEO ON OUR WEB SITE ……***

Before fitting your new *Kiwiprop*™ to a shaft first check that the shaft is free to rotate and can be spun easily by hand to ensure correct feathering.

Remove the nut from the Boss of the propeller by releasing the M10 locking screws.
Note that 7 are simply a blind M10 to provide mass balance and does not lock the nut.
One will have a 5 mm spigot that goes into a matching hole in the nut once tightened.
Remove the key from the keyway on the shaft to enable correct mounting checks.

To ensure the key is sized correctly, mount the unit without the key, to ensure the taper is tight, and then again with the key to ensure it is not binding on the keyway which can then be ground down if required. Mark the front face of the propeller on the taper in each case.
All 1.500″ units mount 1.000″ down from the start of the taper to preserve a common boss.
All ISO 40 units mount 20 mm down from the start of the taper to preserve a common boss.

Wipe all mating surfaces clean and lightly smear with a marine grease including both keyways. Check that the taper length will allow the nut to pull the propeller tight on to the shaft. In all cases the boss should protrude ~ ¼″ or 6 mm aft of the small end of the taper, which is the SAE / ISO standard, to ensure the nut pulls up on the boss correctly and doesn't first bind on the thread giving only the appearance of correct mounting.

Check the fitting of the nut prior to finally mounting the propeller with key by ensuring the nut will freely go right down the thread. This will ensure the thread is clean and does not bind on the end of the shaft to ensure that the nut will subsequently push the rear face of the boss tightly onto the taper when mounted. Remove any burrs or impediments to the smooth operation of the nut. Smear the thread with a marine grease.

Failure to tighten the boss onto the taper and key with the nut will result in a loose mounting with subsequent shearing the key and loss of the entire propeller.

The existing key will be required for installation. *Always replace any key that is old or shows any signs of corrosion.* Keys are usually only a brass and will corrode rapidly in salt water. The shearing of a corroded key will result in the automatic loss of your new propeller.
NB: The key must not protrude aft past the small end of the taper and bind on the nut.

SAILDRIVES: ***….REFER TO SAILDRIVE FITTING VIDEO ON OUR WEB SITE ……***

Ensure that both internal and external splines are scrupulously clean.
While every effort is made to remove any burrs or hairs from machining these can cause jamming when mounting. The unit has been prefitted and should slide easily onto the spline.

Check the ~10 mm thick guard collar with seal shield is on the shaft. *(Yanmar #196420-09250 – Volvo 851984)* Check the GF PP nose cone is not binding on the zinc. Some units such as Lombardini come with collars and washers which must be mounted. All Saildrives require that the distance from the end of the spline to the face taking the thrust is exactly 3.000″. All Saildrive propellers then have bosses which are ~ 3.125″ or 79.4 mm long to ensure they pull up tight on the thrust face before the M16 (M20 for Yanmar SD40 or SD50 Saildrives) nut starts to bind at the end of the thread.

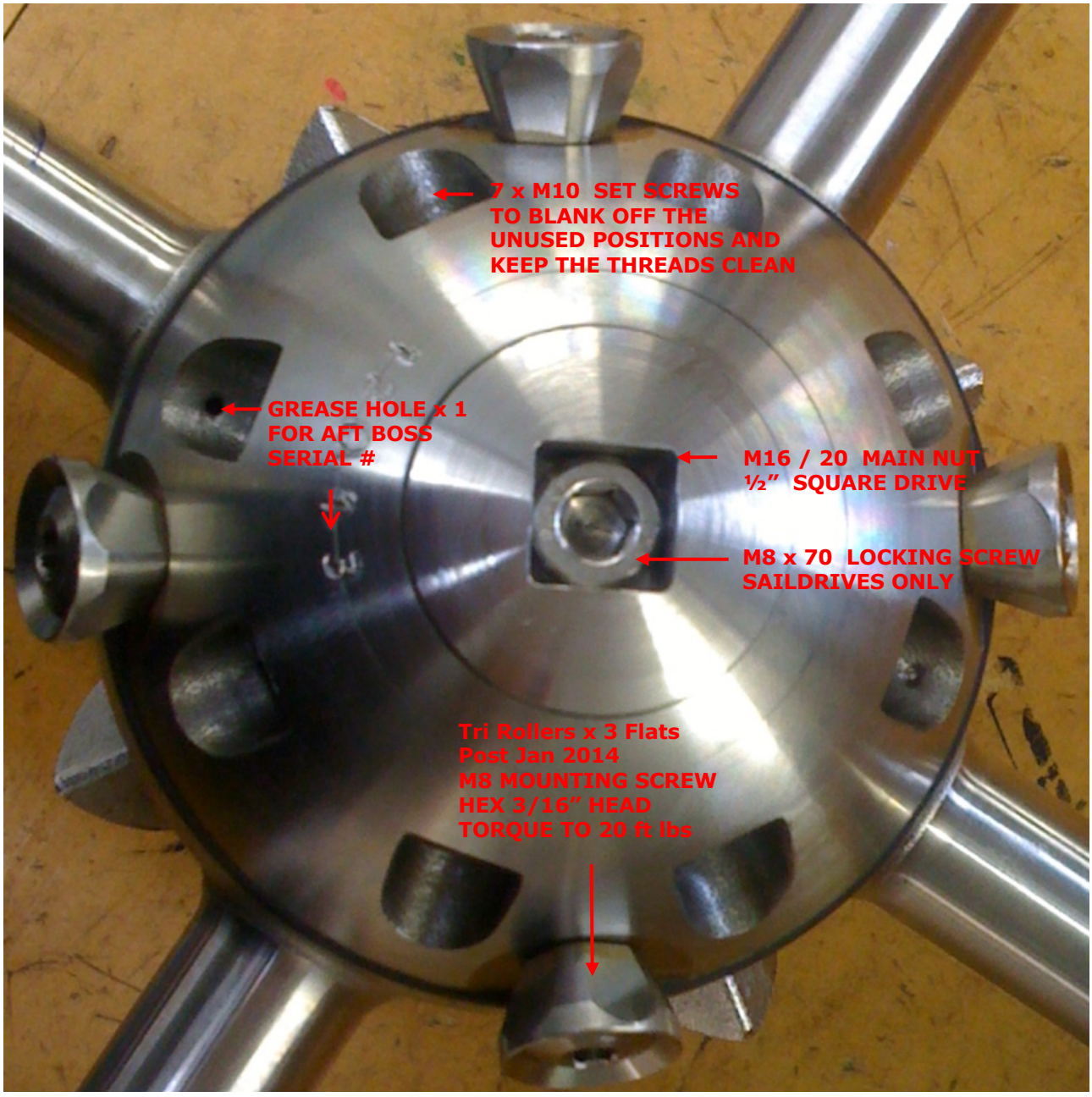
The photograph below shows a boss without the blades attached and clearly identifies the nut with it's ½″ square drive recess and the eight M10 locking screws that must first be removed to allow for removal of the nut from the unit. NB: Only one M10 screw has an extended spigot.

Continued 2 ……..

Remove all the 8 x M10 locking screws. Coat all thread surfaces in Loctite™ or similar product. Select a hole that is aligned internally and insert the screw with spigot into boss. Insert the other screws without spigots in the seven unused blank positions to keep these threads clean.

There are 8 external holes and 9 internal using the Vernier principle so there is an alignment every = 360 / (8 x 9) or 5 º - You may need to make very small adjustments to the nut to ensure the spigot on the M10 locking screw aligns with a hole in the nut.

NB: A FAILURE TO TIGHTEN THESE LOCKING SCREWS AND SECURE ALL THREADS WITH LOCTITE™ CAN LEAD TO THE LOSS OF THE ENTIRE PROPELLER UNIT OVER TIME ON A SAILDRIVE UNIT. THIS IS NOT SO CRITICAL ON A TAPERED SHAFT MOUNTING. SAILDRIVES HAVE AN ADDITIONAL M8 x 75 FAILSAFE RIGHT HAND LOCKING SCREW THAT PASSES THRU THE CENTER OF THE NUT INTO THE SPLINE.



Continued 3 ……..

APPLY Loctite™ to the M16 or M20 NUT & M8 x 75 Locking Capscrew on Saildrives.

DO NOT overtighten the nut which attaches to any standard ½ inch socket driver. This is particularly important on tapered shafts when you need to remove the propeller. Just nip it up using no more than an ~20 foot lbs of torque or 27 Newton meter. This is equivalent to the weight of a two gallon or ten liter can of water suspended on your socket driver one foot or 300 mm from the nut.

SAILDRIVE nuts should be tightened to twice this torque – 40 ft-lbs or ~ 54 Nm.
On Saildrives - Loctite™ fit & torque the M8 Failsafe Screw inside the square drive to 10 Nm.

NB: Saildrive nuts and their locking screws should be checked and re-tightened at each haul out as Splines by their nature may fret slightly in use and could loosen the locking screws.

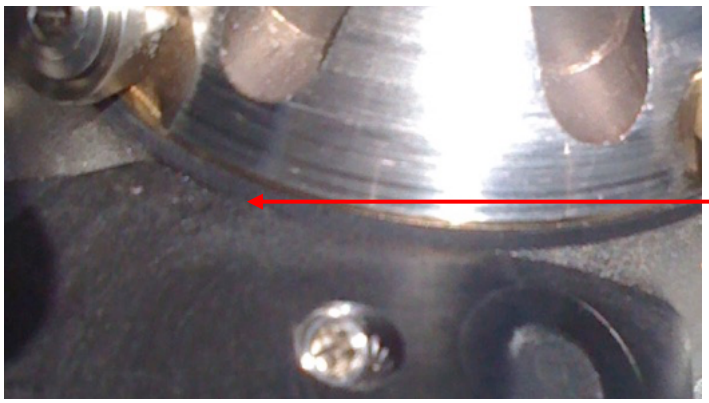
To ensure the propeller feathers correctly, first throttle down to an idle, and then place the gearbox in neutral before stopping the engine. The shaft will then slow down as the blades align themselves with the water flow and slowly come to a stop. The shaft will then begin to rotate slowly in a reverse direction. Only engage forward gear to prevent higher rates of wear.

Keep the gearbox engaged in forward only when sailing – unless you have a hydraulic box. Allowing the shaft to rotate continuously – even slowly - will generate high wear over time.

You are now ready to enjoy the ongoing benefits from your new *Kiwiprop* unit.

PITCH SETTINGS: **NB: SPARE BLADES ARE SUPPLIED WITH NO PITCH SET**

The *Kiwiprop*™ will have been set at the recommended pitch for your installation based on the engine model number, the reduction gear fitted and the particular characteristics you supplied of your vessel. You may however wish to take advantage of the simple pitch adjustment feature to accommodate the many variations between individual vessels and operating preferences to obtain the optimal motoring performance for your particular requirements.
***One turn of the 8 mm pitch screw in a clockwise direction to each blade in turn will equate to 3 degrees of pitch* [not inches of pitch] and substantially increase the power required from the engine and drive train. This will translate to lower engine revs. We would recommend adjustments be made in no more than exact half turn increments to each blade, which has the effect of varying engine revs by some 200 ~ 300 rpm. Each installation is unique and only experience can deliver the appropriate settings and optimal cruising revs for your vessel. A pitch setting of 21 degrees on a 17" unit typically equates to a normal pitch of ~ 11 to 12 inches. [The required Allen key is 5/32" or 4 mm]**



This photo shows the rear of the blade aligned with the front of the aft seal which will equate to ~ 20 º of pitch.

Increasing the pitch by screwing the pitch screw IN to align the blade surface with the rear edge of the seal will equate to ~ 23 º

IMPORTANT: To avoid damaging the blade roots in reverse by exceeding the designed pitch settings, first lock the propeller by engaging ahead with the engine stopped. Rotate the propeller by hand into the reverse position against the spring, and then only increase the pitch until the blade comes up against the widest section of the reversing rollers. *The flat sections will allow for higher pitch – but we must accommodate both sections of the triangular rollers which can impact the blade root. The rollers must then always be free to rotate 360º.*

NB: YOU WILL NOT BE ABLE TO EXCEED ~ 23.5 º - DO NOT EXCEED THIS SETTING ……

Continued 4 ……..

NB: DO NOT REMOVE BLADES JUST TO GREASE THEM …..

LUBRICATION:

Greasing of K3 & K4 units is similar …

The *Kiwiprop*™ contains lubricants sufficient until your next maintenance haulout. Each blade must then be greased via a lubrication point accessed by removing the small Pozidrive stainless screw on the blade face. In addition, there are two small grease holes, one very close to the GF PP nose cone in the SS casting that takes the thrust of the pitch screws and one near the outer perimeter of the sphere at the rear of the unit inside one of the locking screw recess.

These have been chamfered to accept a standard needle nosed grease point that we provide with every unit.

Each of these five grease points should then be filled with a high quality marine grease: Grade - NLGI No 2 CALTEX Delo ESI has performed well and is readily available.

Check the reversing rollers are free to turn and free up if necessary with CRC

WEB PAGE ON BLADE MOUNTING COVERS LATER PIN VERSIONS WITH THREADED CAPS IN DETAIL ……..

ANTIFOULING:

To maintain the performance of any propeller it is essential to keep both faces, and in particular the tips clean. Barnacles and weed growth will have a serious impact on motoring performance. We recommend painting the whole propeller with a modern ablative antifouling which can be applied directly to the unit. The Zytel™ and GF PP require no special undercoats. While the paint will slowly erode from the tips of the blades over time this approach will still provide the best overall solution to fouling of the propeller. If not using a soft ablative paint that will wear away quickly with any contact from a moving blade, then care must be taken to ensure that the bottom root surface of the blade does not start to bind on the boss from a buildup of antifouling over time. *All Saildrives require non copper based antifouling. Always use the same antifouling on the propeller as the Saildrive.*

NB: Ensure there are no paint runs on the blade that can cause serious vibration problems.

NB: DO NOT PAINT THE REVERSE ROLLERS – THEY MUST BE FREE TO ROTATE AT ALL TIMES …

REMOVAL OF BLADES: REFER WEB PAGE

Remove the small Pozidrive screws halfway out the face of each blade which are used to grease the unit. Gently tap out with a pin punch of less than ¼" diameter each retaining pin that holds the blades. The blades can now be removed simply by sliding off the pin on the boss. Check for wear and corrosion on these pins which can be replaced if required.

Clean the pins and the interior of each blade carefully with a petroleum based cleaner eg Mineral Turps to ensure any old lubricant which will contain dirt and abrasives is all removed. Any areas where the blades may be binding should now become obvious from any wear patterns. These should be filed or sanded down. This is most likely to occur on the boss where the root of the blades can get caught with antifouling and or barnacles over time.

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When both the mounting pin and the blade interiors are clean and dry you are now in a position to remount the blades on their correct pin and check for smooth rotation. Grease each pin hole. Smear a tablespoon of a good marine grease, Shell Nautilus Marine Grease, or similar lithium based, into the bore of each blade and also around the groove on the pin to ensure the assembly is full of grease when complete. Push the blade down fully and surplus grease will squirt from the grease hole, which must be open otherwise the blade will act like a hydraulic ram and become impossible to push back on.

Check the blade has been remounted on it's old pin. Now mount the retaining pin back into the reverse face of the blade from the side it came out of with a new wear face on the pin facing outwards. By tapping gently - reinsert the pin so that it is equidistant from each outer face of the blade. Refer photograph above for illustration.

Be careful to use a gentle striking motion with a small hammer slightly biased towards the leading edge of the blade, which will force the leading edge of the pin towards the trailing edge, to ensure it enters the hole on the opposite face cleanly. [The pin in effect pivots around the leading edge of the hole] Do not force with heavy striking. If aligned correctly it will require no more force to go in than required to take out. This should not be a problem, just a little care and common sense.

Replace the small Pozidrive screws after repeating the above process on each blade.

Refer to our web page on BLADE MOUNTING:

www.kiwiprops.co.nz/cms/index.php/resources-general/blade-mounting

AUTO ROTATION:

If high speed autorotation occurs when sailing check for freedom of movement of each blade and the presence of foreign objects – typically fishing lines or pieces of rope, flotsam etc that has been picked up by the propeller.

To deal with extreme events such as broaching, falling off waves etc - each unit is biased with a small foil extension modifying the last few millimeters of the blade's trailing edge on one side so that any tendency to auto rotate will always be against the normal ahead direction and prevent the internal spring winding up and in effect engaging reverse. Normal operation will be for the prop to slow down and then stop but rotate very slowly in reverse above ~ 6-8 knots.

Place the unit in forward gear only to prevent this – but the shaft must be stopped first. The blades are still feathered. The water flows around the propeller of any yacht are very complex and turbulent. Lee way and disturbances from the shaft and strut make specific predictions very difficult. Eliminating rotation will minimise any potential blade movement and thus wear over time.

Do not engage reverse as this could leas to reverse rotation of the motor and ingestion of water to the motor if the exhaust was ever underwater and there is no exhaust break.

Further detail is available on our web site under: AUTO ROTATION

REVERSING FUNCTION:

It is important to understand some of the issues that need to be considered when reverse is engaged with this unit. Refer to our web page REVERSING ISSUES where this is covered in detail.

NB: CHECK GEARBOX OIL LEVEL IS CORRECT TO ENSURE CORRECT CLUTCH ENGAGEMENT

Your Kiwiprop™ will automatically go to the maximum available pitch which is ~ 23/24 deg irrespective of the pitch that the blades have been set to in the ahead position. This is to ensure the propeller will deliver the maximum thrust in reverse at relatively low engine rpm.

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The latest Yanmar gearboxes will go to ~ 3.2:1 reduction in reverse irrespective of the ahead ratio and will have very adequate power in reverse. Many of the older boxes have the same ratio in astern that they have in ahead, and in this case, they will be loaded by the difference in pitch between what the propeller is currently set to and the maximum of ~ 24 deg.

Some gearboxes - Lombardini for example, while having a 2.6:1 ratio in ahead only have a 2.13:1 ratio in astern, which means that the propeller shaft will turn at a proportionally higher speed in reverse. Couple this with the extra pitch and the engine will be highly loaded in reverse and unable to achieve the same rpm that it can in ahead. It is not possible to design any propeller that is optimal in ahead and reverse for quite different shaft speeds.

All Saildrives have the same reduction ratio in ahead and astern.

REMOVAL OF THE UNIT:

For both shaft and Saildrive installations remove the M10 locking screw with spigot, then the main attachment nut with square drive. You will also need to remove all 8 x M10 set screws to locate the M10 with spigot that locks the nut. The other 7 simply blank the threads to prevent fouling. Saildrives will have an additional M8 x 75 cap screw inside the square drive center of the nut that must also be removed.

NB: If the unit is to be removed from a tapered shaft this must be done with a puller.

Under no circumstances should the unit be removed with a hammer as this will damage the face of the unit and is likely to distort the GF PP nose cone.

Removal from a Saildrive spline once the M10 spigoted locking screw, M8 cap screw and square drive attachment nut has been removed simply involves sliding the unit off the spline.

DISASSEMBLY OF THE UNIT:

If disassembling the unit, which should not be necessary, ensure when pre-loading the internal torsion spring that the blades are held in the reverse position to avoid damaging the spring from over-winding when reverse is subsequently engaged. The nose cone must be sealed with 3M 5200 Fast Cure or SIKA equivalent on the joint lines and under the friction surface which assists in preventing the nose cone turning on the shaft under the torque from the spring. This includes the area under the thrust groove in the boss. Clean all the matching surfaces with Mineral Turps before applying no more than a very light smear of 3M 5200 including the area under the thrust groove to maximise the area of 3M 5200. Clean up with Mineral Turps and allow to dry.

Ensure the alignment marks are now correctly located as per the diagram on page 9.

It is critical to ensure there is no sealant flowing into the internal spring mechanism which when hardened will cause the spring to bind during the reverse function and take the reverse torque on the spring – not the drive mechanism - which will break the spring.

ANNUAL MAINTENANCE:

Whenever the boat is hauled is an opportunity to ensure the propeller receives the following checks to ensure it will continue to operate correctly into the future.

- **Do not use a high pressure wash on the blade roots that may damage the blade seals**
- **CHECK the main attachment nut and associated M10 locking screws have not moved**
- **CHECK the Blade Retaining pins are secure with threaded cap secure**
- **There should be no need to remove the blades for normal maintenance and greasing**

Continued 7 ……..

Ensure the blades are free of barnacles and any marine growth. If the blades have been antifouled as recommended this will minimise growth but with the expected wear near the tips these will over time accumulate growth as the paint is ablated away. Any roughness on the blades will interfere with motoring performance. Sanding with wet and dry paper will restore the blades to their original condition. Antifoul as suggested above.

Sand fair any nicks and dings on the leading edge from collision with flotsam.

Check that post lubrication the spring within the nose of the propeller will return the blades to the feathered position when the blades are forced into the reverse position whilst holding the shaft of the unit to wind up the spring. Refer carefully to the above notes on disassembly.

Check that each of the 4 small reversing rollers are quite free to turn on the small stub shafts. Reverse action forces these through 120º so they will remain free over time.

CHECK THE 4 x M8 REVERSE ROLLER SCREWS ARE TIGHT IN THE BOSS. THESE ARE RIVETED INTERNALLY AND CANNOT BE EASILY REMOVED. (5/32" or 4.0 mm HEX KEY)

DO NOT attempt to remove these machine screws as they have been inserted with Loctite and are never intended to be removed. They can only be taken out with heat.

Check that each of the blades is free to turn on it's shaft. Any stiffness here will impact on the overall ability of the unit to feather properly in all conditions. If it feels as if this situation will not be rectified with subsequent lubrication it will be necessary to remove the blade from it's mounting following the instructions detailed above. If the blade becomes free following the removal of the attachment pin – but not the blade then the binding will be under the root of the blade.

Over greasing and forcing the seal out can cause binding on the blade root.

Careful observation of the blade and matching surfaces will indicate where the binding is occurring. It could be on the root of the blade from a buildup of marine growth and/or deposits which would need to be cleaned off. It could be foreign material in the surface between the blade and the pin. This would require that both surfaces be cleaned with a petroleum based cleaner such as mineral turps to remove all the grease and any contaminants. With only 0.003" clearance between the surfaces it takes very little to interfere with a smooth action about the pin.

If the blade is still binding on the shaft after cleaning - the internal recess will need to be sanded with a piece of sandpaper on a round mandrel such as a piece of dowel or similar to remove any high spots which are causing the interference. Ensure the blade is cleaned thoroughly to remove all traces of abrasive prior to lubrication as detailed in the above section.

As a general guide each blade should fall slowly and smoothly under it's own weight when placed in a horizontal position after it has been lubricated and reassembled following the instructions above for blade removal.

Lubricate each blade in turn plus the nose and aft section of the unit as described in the section on lubrication detailed above. The unit should now be ready for another season.

The more regular lubrication the unit receives – the longer it will last.

Continued 8 ……..

TOOLS REQUIRED:

The tools and consumables required to mount the unit are summarised below:

- **½" Square Drive Socket Head**
- **4 mm or 5/32" A/F Hex or Allen Key for M8 Socket Screw**
- **6 mm Allen Key for M10 Socket Screw**
- **Allen Key for M8 Cap Screw – Saildrives only**
- **Clean Rags with Mineral Turps or equivalent**
- **Marine grease Caltex Delo ESI or siumilar**
- **Loctite™ or similar *(Loctite™ Medium=Blue or High Strength=Red recommended)***

BOATS STORED IN VERY LOW TEMERATURES:

In some situations around the world there will be operating environments where the vessel is stored on the hard over winter – typically where temperatures are below zero for extended periods.

We have had reports that when exposed to temperatures as low as – 50 deg C the blades have stiffened up on their mountings. Blades are shipped with 0.006" or 0.15 mm of clearance on diameter over the mounting pins. Freezing water can blow the V Seals on the blade roots.

Always check the blades are free to feather if your vessel has been exposed to very long periods of extreme low temperatures and may have had retained water in the pins.

BLADE CARRIER ASSEMBLY TOLERANCES:

After initial service and bedding in of wear surfaces it may be that we have not tightened the nose sufficiently when assembling the unit - this can be caused by a piece of swarf somewhere we were unaware of or simply the bedding in of the various contact bearing surfaces.

We tighten the threaded nose until the movement of the blade carrier assembly starts to tighten then lock it with just targeted 0.002 " or 0.05 mm clearance.

Any excess tolerances here will account for both the excess movement of the Teflon washer which prevents metal on metal contact during a reverse action as SS 316 is prone to " galling " and the looseness of the blade assembly.

To tighten - first identify the 2 x M8 Cap screws on the side of the nose cone with the slot. The 2 on the opposite side are for balance only and do not tighten the nose. Leave these untouched.

Place unit in gear to lock shaft.

You will now have to loosen the single M8 Cap screw locking the collar aft of the nose holding the spring tail plus the M8 set screw on the opposite side. Before doing so mark the position of this relative to the Blade Carrier casting with a marker pen. This will allow restoration of correct spring tension.

Loosen the 2 M8 Locking Cap screws spanning the slot until just starting to free up.
You should now be able to tap the nose cone round in an anticlockwise direction viewed from Astern facing forward as the Nose is on a Right Handed M50 x 2.5 thread.
That means it moves laterally 2.50 mm every 360º of rotation.

Tighten this up until the slack is all gone but the Blade Carrier assembly is not binding so when reverse is engaged to can still move freely.

Tighten the 1 x M8 Cap Screw to lock the collar after ensuring it is realigned with the mark.
Tighten the 1 x M8 Set Screw on the opposite side of the Collar

Tighten the 2 x M8 Cap screws securely as back up to lock the nose cone on the thread

Continued 9 ……..

NEW ENGINE WARRANTY ISSUES:

Engine manufacturers correctly require a new engine to reach it's rated max rpm for warranty purposes. Some engines tachometers are quite inaccurate and may also be driven off the alternator where new V belts typically can cause tachometer under reading errors of up to 350 rpm at 3600 rpm actual.

We can only respond to apparent propeller sizing issues with accurate data that has been obtained from a digital tachometer off the engine itself.

The propeller delivered will be sized to achieve rated max rpm as measured by a digital tachometer – not the tachometer supplied with the engine.

PERFORMANCE EVALUATION:

Evaluation of any propeller performance is always difficult given the problems of replicating an identical situation for any base line comparison. Sea state, wind, fuel and water load, current, bottom state, dinghy etc will all contribute to changes in motoring performance.

Typically a new propeller has been fitted over winter and previous data may not be available or other additional changes have been made to the vessel.

It is important to ensure instruments are calibrated correctly prior to making comparative readings. Many engines for example now run the tachometer off the alternator so even a worn V-belt can change engine rpm readouts by effectively reducing the driven pulley diameter.

Using time over distance calculations to obtain boat speed requires an accurate knowledge of any current present. Remember GPS measures speed over ground – not speed through water which is what we are concerned with and will be distorted by any currents present.

New boat speed indicators may not be calibrated correctly – or the transmitter may have antifouling coverage affecting readout accuracy.

The average of two consecutive runs in reciprocal directions for a reasonable distance over the same course using a GPS in calm wind and water seems to deliver the most accurate results.

While the first evaluation will always be motoring – we stress that we would expect the benefits from your new propeller to be also manifested in improved sailing performance if you have replaced a fixed bladed propeller and in reversing function if you have replaced a folding type propeller. Sailing performance comparisons are even more difficult to quantify.

Remember that all feathering type propellers have flat blades with constant angle from the tips to the blade roots. Other types have progressive blade angle where the angle varies from high at the blade root to low at the tips. The pitch at the tips of any feathering unit will thus be higher than on a fixed or folding type unit. At low engine and boat speeds you may notice a slightly different noise coming from the propeller which goes away as soon as the engine rpm are increased. This can be caused by slight cavitation off the tips of the blades. As boat speed builds the effective pitch decreases and the unit begins to operate in it's normal design range. This is exacerbated by high shaft angles and thus does not generally occur on Saildrives.

Continued 10 ……..

CUSTOMER FEEDBACK:

We would appreciate receiving feedback from each customer after using their Kiwiprop for a period. In particular data on maximum and cruising rpm with corresponding boat speeds and the relative performance of the unit with the previous propeller installation allows us to continuously refine sizing recommendations.

Comments as to how the unit performs can be e-mailed to: kiwiprops@xtra.co.nz

Always consult our web page at www.kiwiprops.co.nz for additional information if required

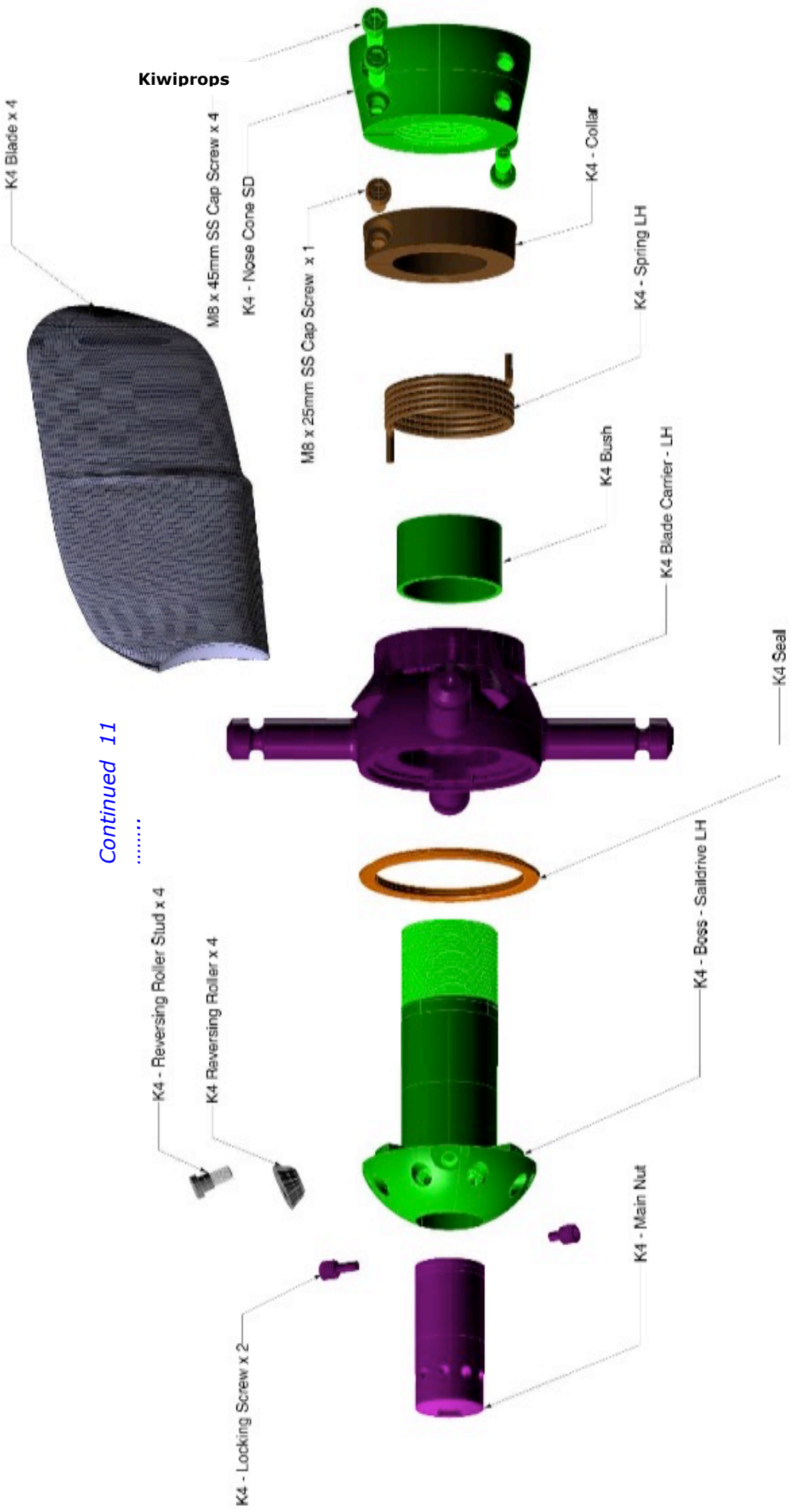
- ***Use the SEARCH function by entering a relevant keyword***

VOLVO 120S Saildrive CAUTION:

A K4 unit should not be fitted to one of these older Volvo model Saildrives which may have been retained when a new engine of higher power has been fitted.

The Saildrive units contain an internal spiral spline mounted cone clutch that utilizes the lateral thrust of the cone on the spiral spline to assist with secure clutch engagement – the downside is that with the extra load from a K4 – the unit can be very difficult to get out of reverse gear.

It is for this reason we do not recommend fitting K4 unit to an older style Volvo 120S Saildrive.



Continued 11 ……..

Continued 12 ……..

Kiwiprops™

BLADE SIZE CODES:

Blades are marked near the outer trailing edges with a code to indicate blade size:

No Mark:	**20.50" - Rounded Edges**
Small Line:	**19.50"**
No mark:	**18.00" - Rounded Edges**
One Dot:	**17.50"**
Two Dots:	**17.00"**
Three Dots:	**16.50"**
Four Dots:	**15.50" - Rounded Edges**

BLADE MOUNTING: is well covered on our web site at:

http://www.kiwiprops.co.nz/cms/index.php/resources-general/blade-mounting

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FEATHERING – MOTORING TO SAILING:

To ensure the unit feathers correctly when getting underway after hoisting sail the following series of actions should ensure the unit always feathers correctly.

Hoist the sails and get underway with the motor still running in gear

Throttle down to idle rpm whilst still in gear

Sail with the engine in gear at idle for about 20 - 30 secs – this gives time for the water flows to nearly align the blades with the stream lines – but still not fully feathered

Take the unit out of gear and leave in neutral going forward

Switch the engine off

Leave the gearbox in neutral

The unit should then remain feathered with each blade aligned to a minimum drag position.

On long passages - if the unit is rotating very slowly in reverse as designed - with the small foils that bias any motion into a reverse rotational direction – engaging gear will reduce any movement of the blades " flapping " a little up and down on their mounting pins due to shaft angle and / or leeway. Any continuous movement over time, even if lubricated and with little forces involved will involve wear – albeit at very low rates.

CAUTION: Do not engage reverse to lock the shaft as were the propeller to encounter flotsam or seaweed - there exists the remote possibility that it could engage fully and then operate like a fixed propeller.

This would then construct a scenario where the engine could be rotated in reverse.

Unless you are very confident that the vessels exhaust will never be underwater or you have a fully compliant anti-siphon water riser with air break to never allow for water to be sucked back into the motor under any circumstances with reverse rotation – Do not engage reverse to lock the shaft.