

installation & repair manual

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Thank you for your purchase of Seamech Limited's Smart Reel range of long line reels.

This manual will provide you with a simple and easy explanation of the installation , tuning and maintenance of your equipment.



hydraulic power



Seamech Limited's SMART REEL range of long line reels require 50 litres per minute at 2000 psi to be able to haul the main line at a minimum speed of 250 meters per minute. With a flow of 50 litres per minute your Smart Reel will be able to set the mainline easily at a maximum speed of 550 meters per minute. The system functions best with the use of 32 weight hydraulic oil. When heavier oil is used back pressure increases, causing problems during the line setting phase.

installation and piping

When deciding on the positioning of the reel, it is always an advantage to get the reel and line setter as close together as possible. This is because we have found that the shooting or setting phase of the long line has proven to be the most difficult. By positioning the reel and line setter together, you will reduce the number of potential problems you will have with the equipment, while shooting or setting the main line.

With the use of the new Seamech continuous belt setter (line setter), you will greatly reduce the number of problems you would otherwise have had by using other conventional line setters.

With the design of this new line setter there is a greatly reduced chance of the line coming out of the setter while setting the main line. Due to the continuous belt design, the line setter can pull harder before it starts to slip on the mainline. The line setter should be mounted on the stern of the vessel so that the mainline clears the stern while setting.

All mounting bolt holes for the reel and line setter have 12.5 mm clearance. The feet of the reel and the base of the line setter are both made from 12mm plate, this will give you an idea of the length of mounting bolts you will require.

The hydraulic lines from the pump to the directional control valve (DCV), from the DCV to the line setter manifold, and from the line setter manifold to the tank, should be no less than 19mm I.D. The lines from the

DCV to the reel manifold should be no less than 12mm I.D. The case drains from the reel motor and from the line setter motor should be no less than 6mm I.D. The boost line can be run from the line setter manifold to the reel manifold or if the reel and the line setter are far apart, and the directional valve and the reel are close together, it can be teed off from the pressure line that goes to the directional control valve. This line should be 6mm I.D. The vent line from the line setter manifold to the reel manifold needs to be as small as possible, this is so that the reel will stop as fast as possible when shooting. The larger you make this line, the slower the reel will stop when shooting. This line should be no more than 6mm O.D.

All the ports on the valve blocks have been labeled so it is easy for you to identify which pipes go where. It is very important that the line setter is piped up in the correct way. If it is not piped in the correct way, it could cause damage to the line setter motor. Once the system has been filled with oil it is always advisable to loop the hoses, together that go to the reel and to the line setter. This will help take any contaminants that are in the system back to the return line filter then to the tank. The return line filter which is fitted in the tank should then be changed before the system is run again.

It is always advisable to fit a pressure gauge in the pipe between the pump and the directional control valve. The pressure gauge will help you to adjust the system pressure and also help with fault finding.

driving the reel

Once the piping has been finished the reel will be ready to run, but before you can do this, there are a few things that you need to know. Firstly the case of the reel motor needs to be filled with hydraulic oil, the case will hold approximately 1 litre of oil. This is to ensure that all the moving parts in the case have sufficient lubrication.

Secondly there is a black valve on the side of the reel manifold; this is the free wheeling valve. To drive the reel this valve needs to be in the hauling or down position (closed).

The start stop valve on the line setter manifold must be in the up position to be able to drive the reel in the hauling direction. If it is not in the up position the reel will not be able to turn. Now that you are able to drive the reel in both directions you will be able to wind the mainline on to the spool. The

Directional control valve that was supplied with the reel is a proportional valve, meaning that the more the spool is moved the faster the reel will rotate. The pressure relief valve in the directional control valve should be set



at around 1900 psi. This particular valve has very good control.

When setting out the blocks to direct the mainline to the reel it is advisable to have the block before the reel as far from the reel as practicable. This will put less load on the level layer, making it last longer. Once the line has been wound on to the reel you will be able to adjust the pressure relief valve in the directional control valve. This can be done by tying off the mainline to a strong point on to the boat, then you engage the directional control valve in the hauling position. The reel will turn until it has pulled up all of the loose line and then stop; at this point you will be able to read the pressure that the relief valve is set at. You may also like to set the relief pressure by engaging the directional control valve, so the reel pulls up the slack mainline to a point where the reel is almost breaking the mainline. The relief valve should be set so that if you unwind the mainline of the reel about half of a turn and then engage the reel in the hauling direction, the reel should wind up the loose line and pull tight and stop rotating without breaking the mainline.

setting up of the line setter

Now that the system has been piped up you can run the line setter to make sure it is working. To run the line setter you start and stop it with the black start stop lever on the front of the line setter manifold. If this valve is rotated clockwise and the speed control valve is opened (anticlockwise) the line setter will be able to run. The further you open the speed control valve the faster the line setter will turn.

With the spool full of line you will be able to set out the positions for blocks to guide the mainline to the line setter. When doing so it is always advisable to try to use as few blocks as possible. This will reduce the amount of friction on the mainline as the line setter pulls it. Once the blocks have been fitted in place you will be able to proceed with the first test of the setting of the mainline.

Firstly you must thread the mainline into the line setter as in the above picture. The hauling/free wheeling valve on the reel manifold must be in the hauling or down position, otherwise the reel will not stop when setting, and the directional control valve should be in the neutral position then make sure that the start stop lever in the line setter manifold is in the up position.

The next step is to open the line setter speed control valve about 2 turns; this will send enough oil to the line setter to make it turn. Then you can rotate the start stop lever to the standby position. At this point the line setter will rotate until it has pulled up all the loose line tight. Once the loose line has become tight the line setter will stop turning. If you rotate the start stop valve further clockwise to the reel setting position, the line setter and reel will start to rotate, increasing in speed until the reel and setter have reached the speed that the speed control valve is set at.

At this point it is advisable to stop the reel, when it is still only going slowly, to make sure that it can stop. To stop the reel you rotate the start stop valve counter-clockwise to the standby position. The reel and the setter will slow down and stop keeping tension between the reel and setter. If the start stop valve is rotated all the way to the setter stop position, both the reel and the line setter will stop at the same time causing the line between the reel and the setter to lose tension.

There are two adjustments that can be made to the line setter controls. The first one is the line tension. The cartridge that adjusts the tension is the one below the start stop valve and this cartridge, when screwed

clockwise, will increase the tension between the reel and the line setter. If the tension is adjusted to high, the reel and line setter will have trouble speeding up and maintaining speed during the duration of the setting phase. It is best to try to have the line tension adjusted to as low as possible as this will make the line setter belts last longer.

There is one other adjustment that can be made, adjustment of the line setter pressure. This adjusts the pulling power that the line setter has. The pressure is preset at 2000 psi that should be sufficient for most systems. Again it is advisable to set the pressure as low as possible to reduce wear to the line setter belts.

The best way to adjust the two cartridges is to install the mainline in to the line setter, then adjust the line tension cartridge to the minimum setting, then adjust the line setter pressure cartridge also to the lowest setting. Once this has been done you can turn the line setter on to the reel setting position. The setter should take up the slack mainline and hold tension on it. The next step is to wind in the setter pressure cartridge until the line setter is pulling the mainline off the reel. Be sure not to increase the setter pressure too much. Check that the tension of the mainline between the setter and the reel is not too loose. If it is you can increase the line tension by adjusting the line tension cartridge in (clockwise) direction. This adjustment should be done carefully as over adjustment could stop the reel turning because of too

much line tension. If the distance between the line setter and the reel is long, it is advisable to try to have the line setter pressure as low as possible. If the line tension is set high and the line setter pressure is high we have found that the elasticity of the mainline causes the line setter and the reel to start to hunt, causing the mainline to get loose and then tight and then loose again.

The backpressure between the line setter manifold and the hydraulic oil tank should be checked. If it is too high, over 200 psi, you will find that the line tension between the line setter and the reel will be very high even with the line tension cartridge set to the minimum (all the way out). There are two ways to fix this problem. Firstly you can increase the size of the return line to the tank reducing the line friction and secondly, you can install a two-port pressure relief in the flushing line from the reel manifold to the reel motor. To do this the stainless steel pipe from the manifold to the motor would need to be removed and the relief installed. The relief should be a maximum of 600 psi but set at around 100 psi. The relief should be installed with the tank port piped up to the case of the reel motor and the pressure port piped to the flush port. If the line tension becomes too loose after the installation of the relief, you will be able to increase the tension with the line tension cartridge in the line setter manifold.

maintenance of spool

Seamech Limited's Smart Reels are designed to give long reliable service with a minimum of repairs and maintenance in the marine environment.

Reliability of all hydraulic systems is dependant on oil quality and cleanliness. Almost all hydraulic failures are caused by excessive wear from oil contamination. It is very important to change oil filters regularly. Most hydraulic equipment manufacturers recommend that filters have a minimum 10-micron filtration and are changed every 300 hrs. The hydraulic oil should be periodically checked for water contamination. Water contamination will make the oil change to a milky white colour and make the oil get thicker. If contamination of any type occurs, the hydraulic oil must be changed and the system flushed.

Throughout Seamech's range of Smart Reel's we have used standard off the shelf bearings, couplings and motors. The main reel bearings are 22215 EK double row spherical roller self aligning bearings. These should have at least one pump of a grease gun once a day. The reel level layer is fitted with two polycarbonate cased bearings that support the main level layer shaft. These bearings should be greased once a week. The level layer shaft scroll and guide rods should be greased once a day. Once a month the scroll shaft should have all the old grease removed and replaced with new grease. The level layer roller guide box has four grease nipples that lubricate the roller pins which need to be greased daily.

Once you have run your reel for more than 24 hrs you will need to tighten the drive coupling clamping bolts. This is done with a 17 mm set spanner. If these bolts are not tightened you might find that the coupling makes a squeaking sound.

If you need to change the main spool bearings, first you need to remove the Fennaflex Coupling and the Level Layer vee pulley. To remove the Fennaflex Coupling you need to unbolt the flanges that hold the rubber coupling using a 17mm set spanner and then remove the rubber tyre that joins the two coupling halves. Once this is done, you can unbolt the reel motor using a 19mm set spanner. To remove the coupling from the shaft, you need to take out the two grub screws using a 6mm allen key. Between the two grub screws that were removed, there is a third threaded hole where you must insert one of the removed grub screws. This then acts as a pusher screw that when tightened will push the coupling off the centre bush, making it easier to remove.

To remove the bearing you first have to remove the bearing cap and then lift up the core of the reel so you can remove the bottom of the bearing housing. You then can remove the lock washer tab from the bearing sleeve nut and undo the nut. Once the nut has been undone, you will be able to fit a three-legged puller onto the bearing to remove it from the tapered sleeve.

The level layer roller box is moved back and forward by a stainless steel finger. This finger needs to be checked once a month. To remove the finger you first need to wind the level layer roller box to the end of the scroll . Then the finger is removed by undoing the two 10mm bolts in the centre of the back of the level layer guide plate. To remove these bolts you will need to use a 17 mm set spanner then remove the finger holder and the finger will come out.

All Smart Reel reels and line setter's use Sai Spa hydraulic motors. The reel motors are fitted with stainless steel sleeves to the shafts, this helps to make the shaft seal last longer as the seal is running on stainless steel instead of a rusty shaft. To remove the shaft seal you first need to remove the circlip that retains the seal . You can then remove the seal by pressurising the case of the motor, which will blow the seal out of the motor.

line setter maintenance

The line setter has nine grease nipples that should be greased once a week. Throughout the construction of the line setter we have used off the shelf bearings for ease of maintenance . These bearings are 6201 or 6204 bearings. There are two belts that help to pull the mainline off the reel . Through constant use a groove becomes worn into the centre of the belts. If this groove wears too deep the line setter will start to slip on the mainline and cause it to burn. Also if a groove wears too deep the line setter will tend to hunt as it slips.

To change the shaft seal the motor has to be completely disassembled. To do this, the distributor has to be first unbolted , then the back case of the motor can be unbolted and the pistons removed. Once the pistons have been removed you will be able to remove the crankshaft and then the shaft seal. Reassembling of the motor is carried out in the exact opposite order of disassembly. It is very important to make sure that the steel sealing ring is placed in the rotary distributor correctly . Incorrect placement of the sealing ring back case of the motor to crack.

It is important to make sure that the excess grease is removed from the line setter belts and rollers as the grease tends to make the mainline slide on the line setter belts.

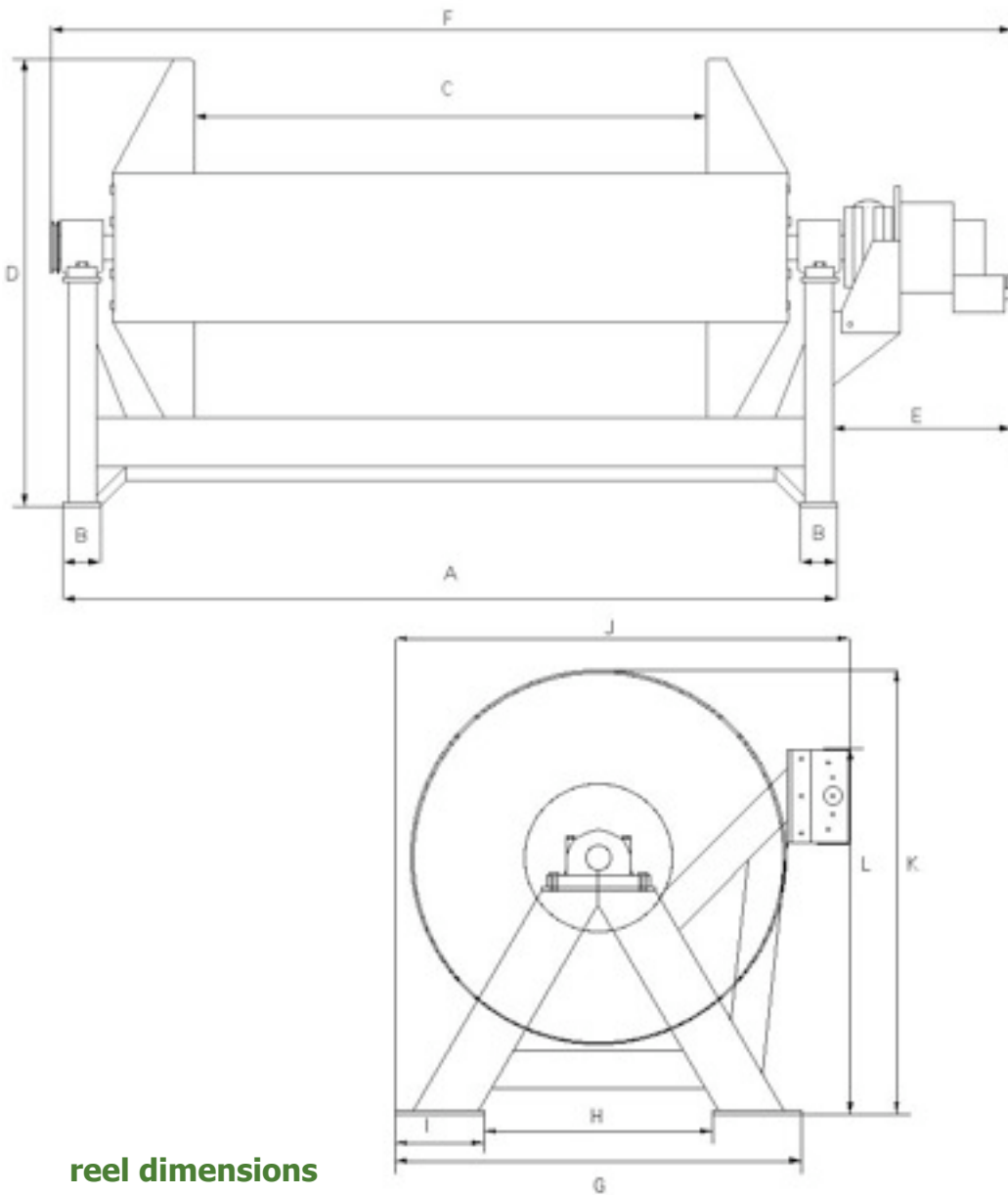
problem solving

There are a number of problems that you sometimes come across that have very simple solutions. Detailed below are a number of common problems and possible solutions that will enable you overcome these difficulties.

problem	cause	identification tip	solution
1. Mainline gets burnt	<ul style="list-style-type: none"> Line setter hunting 	<ul style="list-style-type: none"> At the wharf check to see if the line setter is able to be set to 700 rpm with the line still at an acceptable tension 	<ul style="list-style-type: none"> Change rubber belt on main drive wheel
	<ul style="list-style-type: none"> Pilot orifice in the line setter valve block is blocked 	<ul style="list-style-type: none"> With the main line fitted in the setter as if you were going to set the line, rotate the start stop lever to the stand by position and check the system pressure. It should be around 1300-2000 depending on the size of the vessel 	<ul style="list-style-type: none"> Clean out orifice
	<ul style="list-style-type: none"> Line tension between line setter and reel too high 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Adjust line tension cartridge on line setter
	<ul style="list-style-type: none"> Line setter pressure relief set too high 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Adjust line setter pressure relief valve to as low as possible (refer to page 3 - setting up of line setter)
2. Line setter will not run	<ul style="list-style-type: none"> Pressure relief in directional control valve bypassing prematurely (this problem can only eventuate with the use of our low pressure control system) 	<ul style="list-style-type: none"> With the main line fitted in the setter, as if you were going to set the line, rotate the start stop lever to the stand by position and check the system pressure. It should be around 1300-2000 depending on the size of the vessel 	<ul style="list-style-type: none"> Remove and clean relief valve components and adjust relief valve to approximately 2000 PSI
	<ul style="list-style-type: none"> Contaminants lodged in line setter relief cartridge 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Remove relief cartridge and clean or replace

problem	cause	identification tip	solution
3. Line setter cannot set a high enough speed	<ul style="list-style-type: none"> Line tension between line setter and reel too high 	<ul style="list-style-type: none"> With the main line fitted in the setter, as if you were going to set the line, rotate the start stop lever to the stand by position and check the system pressure. IT should be around 1300-200 depending on the size of the vessel 	<ul style="list-style-type: none"> Adjust the tension cartridge on line setter
	<ul style="list-style-type: none"> Line setter pressure relief valve set too low 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Adjust the line setter pressure relief valve to higher setting (refer to page 3 - setting up of line setter)
	<ul style="list-style-type: none"> Main pressure valve at the hydraulic pump malfunctioning 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Remove relief cartridge and clean or replace
4. Reel will not turn	<ul style="list-style-type: none"> Start stop lever has been rotated to set in position 	<ul style="list-style-type: none"> Attach the mainline from the reel to the vessel and engage the directional control valve to the hauling position once the mainline has pulled tight. 	<ul style="list-style-type: none"> Rotate start stop lever to reel hauling position
	<ul style="list-style-type: none"> Pressure relief valve in directional control valve malfunctioning 	<ul style="list-style-type: none"> Check the system pressure - it should be around 1800-2000 PSI, depending on mainline size 	<ul style="list-style-type: none"> Remove, clean and replace
	<ul style="list-style-type: none"> Free wheeling valve is rotated to the free wheeling position 	<ul style="list-style-type: none"> Check to see if the reel can be rotated by hand 	<ul style="list-style-type: none"> Rotate start stop lever to reel hauling position
	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Rotate free wheeling valve to the down/ hauling position
5. Reel will not stop when setting	<ul style="list-style-type: none"> Free wheeling valve is rotate to the free wheeling position 	<ul style="list-style-type: none"> Rotate free wheeling valve to the down/ hauling position 	<ul style="list-style-type: none"> Rotate free wheeling valve to the down/ hauling position
	<ul style="list-style-type: none"> Line tension cartridge is jammed with contaminants 	<ul style="list-style-type: none"> With the hydraulic system turned off, check to see if the reel can be turned by hand in the setting direction 	<ul style="list-style-type: none"> If so, remove RVGA cartridge and clean

installation dimensions



reel dimensions

dimensions	reel size	1.0	1.2	1.4	1.6	1.8	2.0
A						2457	2705
B						100	100
C						1800	2000
D						1201	1201
E						480	480
F						2951	3203
G						1100	1100
H						620	620
I						240	240
J						1230	1230
K						1201	1201
L						989	989