SLEIPNER
Ocean born. Tech bred.

Installation Guide

For Vector Fin Stabiliser Systems

STABILISER 66B, 92B, 93B, 96B

VECTOR FINS VF1050, VF1350, VF1650$_{HS}$, VF1650$_{MIX}$, VF1650$_{AA}$, VF1950

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Contents

Installation Manual

Warnings and Safety

MC_0800

It is essential to follow all instructions within this document to avoid potential personal injury, death, or damage to existing products in the vessel, the vessel's hull integrity, and including this product during installation or operation. Failure to follow instructions within this document will render all warranties given by Sleipner Motor as VOID.

Warnings and situations requiring extra caution are outlined in the documentation. Take extra consideration when warnings are outlined.

WARNING
Indicate a potentially hazardous situation that, if not avoided, could result in death or severe injury.

CAUTION
Indicates a potentially hazardous situation that could result in minor or moderate injury or critical damage to vessel integrity if not avoided.

MC_0020

Responsibility of the installer

MC_0038

General:

- The installer must read this document to ensure necessary familiarity with the product before installation.
- Directions outlined in this document cannot be guaranteed to comply with all international and national regulations, including but not limited to health and safety procedures. It is the installers responsibility to adhere to all applicable international and national regulations when installing Sleipner products.
- This document contains general installation guidelines intended to support experienced installers. Contact professional installers familiar with the vessel, Sleipner products and applicable regulations if assistance is required.
- If local regulation requires any electrical work to be performed by a licensed professional, seek a licensed professional.
- When planning the installation of Sleipner products, ensure easy access to the products for future service and inspection requirements.

For stabiliser systems

MC_0203

Please follow this general guide for steps to prepare and plan your installation process:

- Find the best possible position of the actuators and fins based on the information provided in the sections about:
- Safety and General precautions Measurements.
- Fin positioning, taken other systems into consideration (water trail not affecting propulsion system, exhaust system not interfering with fins etc.).
- Hull forces
- Ensure that it is space to do the reinforcement of the hull if required
- Service access

Plan the installation of the electrical parts including the control panel and wiring runs based on the information in the manual.

Your Sleipner representative will be able to help make an educated decision for what is the best solution for your boat and your preferences. Before starting the installation, the Sleipner representative can ensure that you are not installing parts and products that will not meet your expectations. Sleipner Motor AS is a manufacturing company of marine equipment and not a Naval Architectural company & therefore take no responsibility regarding the installation of our products onto seagoing vessels.

This includes any requirement for the vessels:

- Hull reinforcement.
- Change in the vessel's stability.
- Dynamic performance.
- Weight and moment.
- Noise proofing.
- Watertight integrity after installation during normal operations or in the event of a collision.

It is the responsibility of the installer/boat builder to determine hull reinforcement requirements, ensuring that sufficient strengthening measures are in place & the vessel's hull will withstand & maintain watertight integrity in the event of a collision of our product, impacting an object when the vessel is underway.

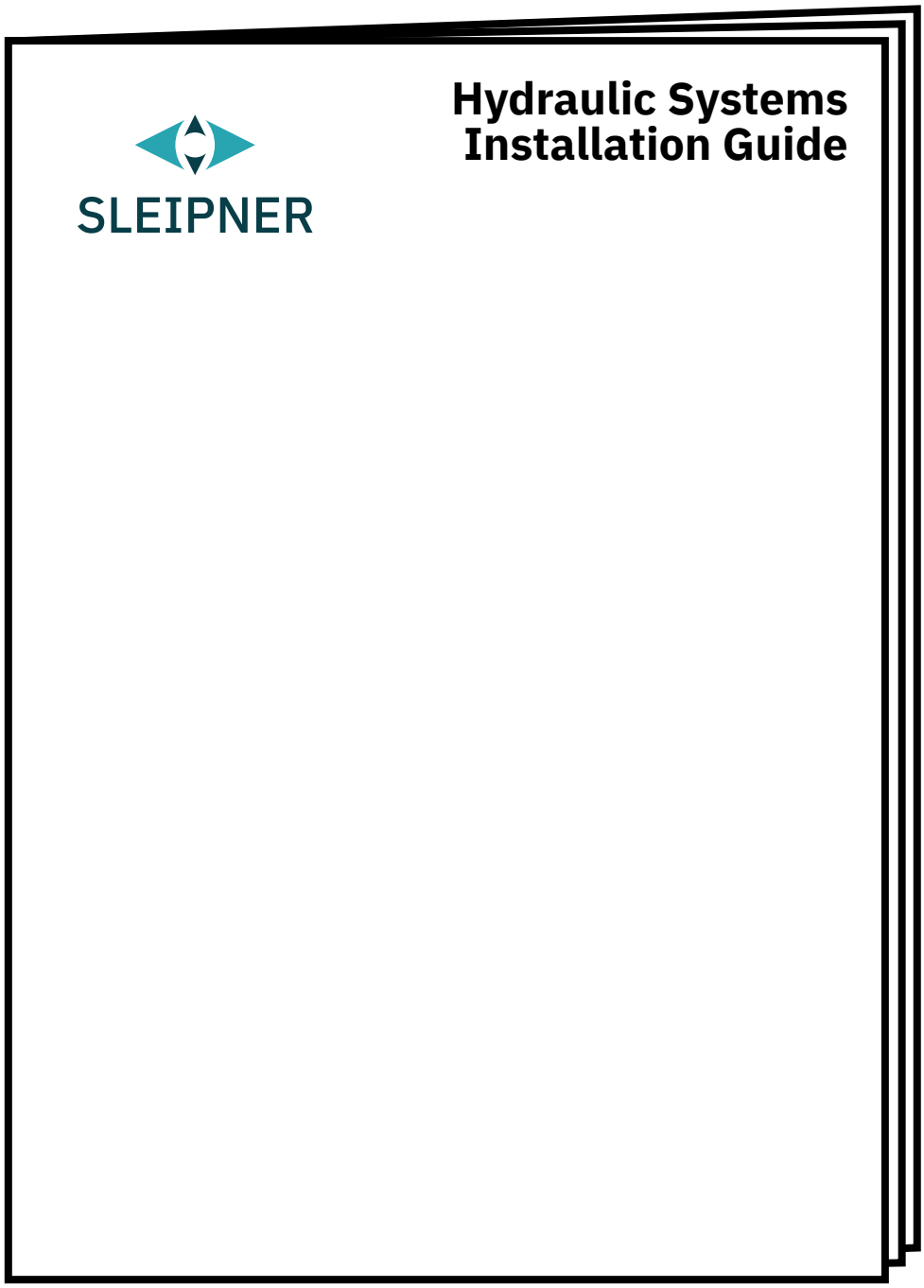
The stabilizer product includes heavy parts. Ensure suitable lifting and support equipment is available during installation & removal to prevent material damage or personnel injury.

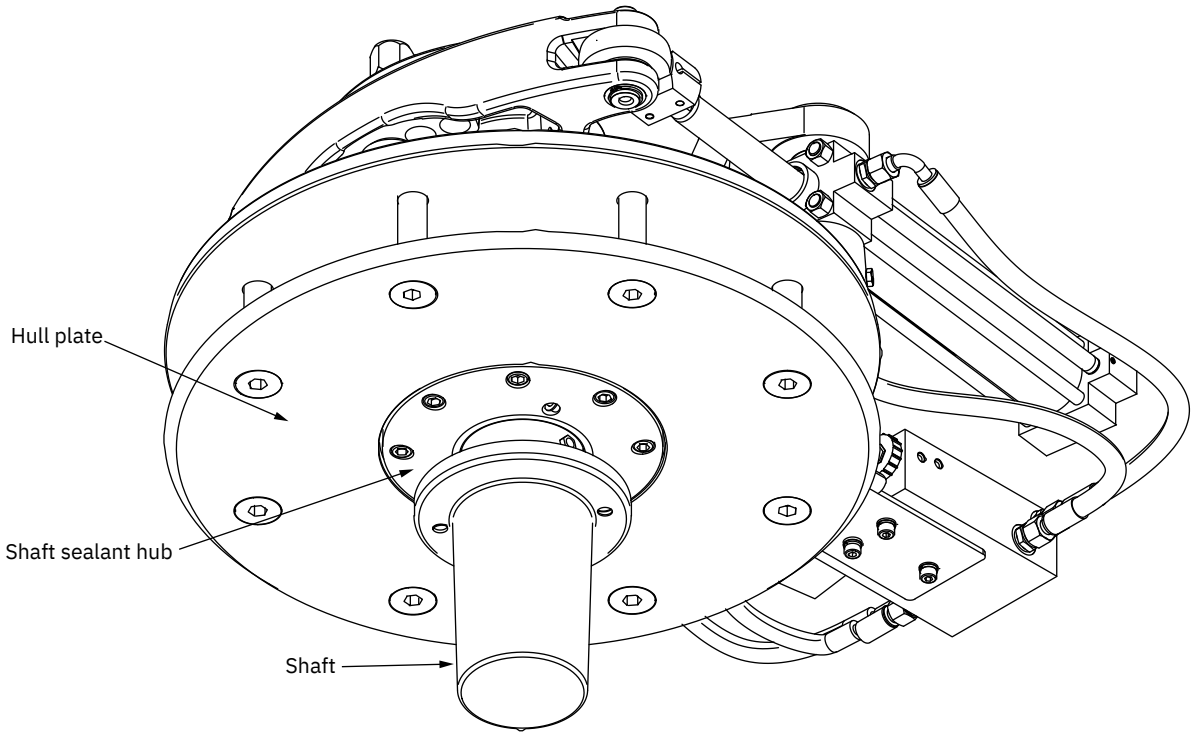
During yacht lifting operations:

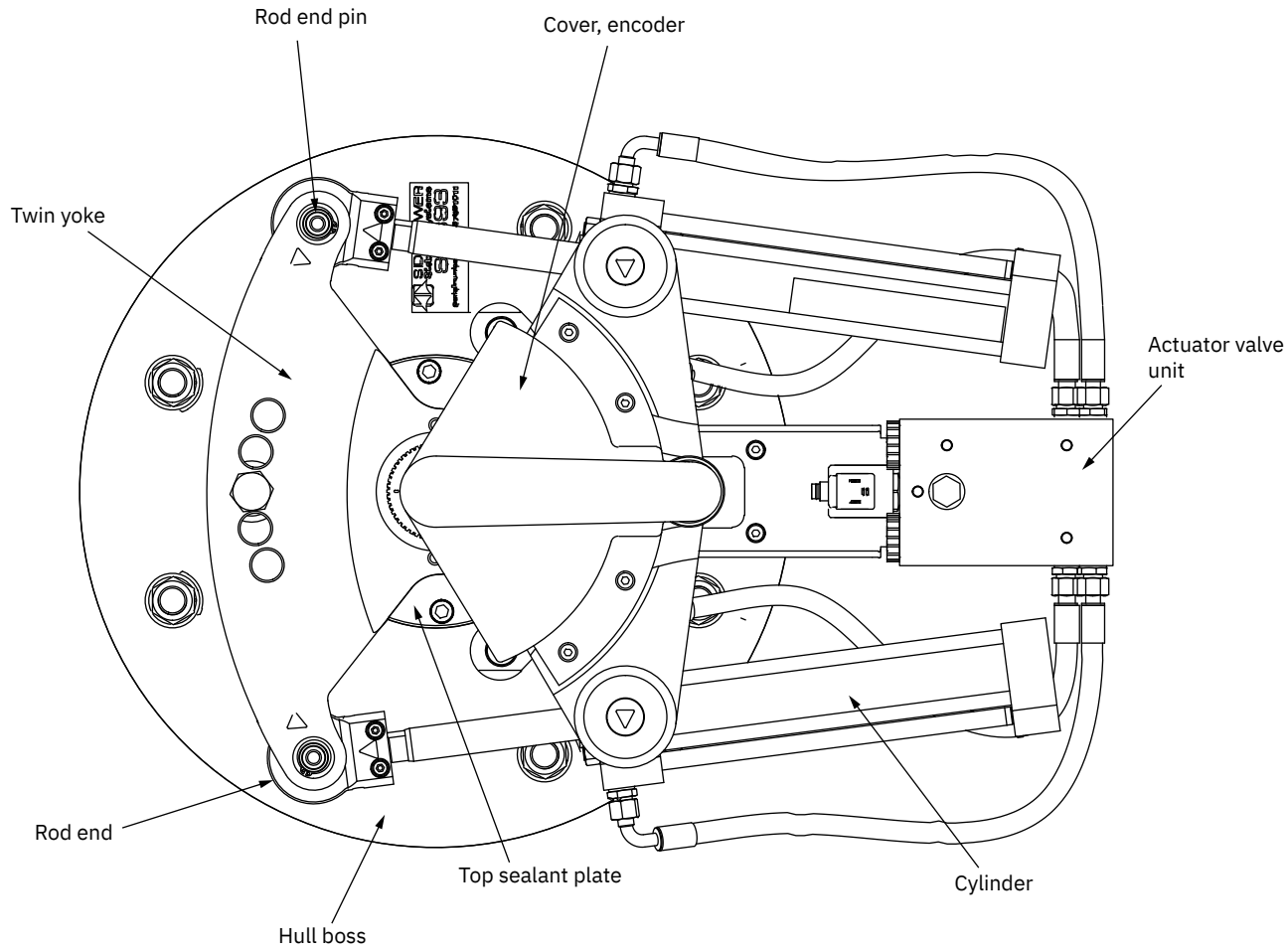
- Ensure the stabilizer fins are in the locked/neutral position.
- Lifting personnel are informed that stabilizer fins are installed preventing the danger of snagging the lifting slings & damage to the yacht, its equipment or injury to personnel.

Yacht transportation overland with road vehicles may require the removal of the stabilizer fins. Please contact Sleipner representatives for instruction procedures.

Follow the addition of supporting manuals to aid in the installation process of this product.





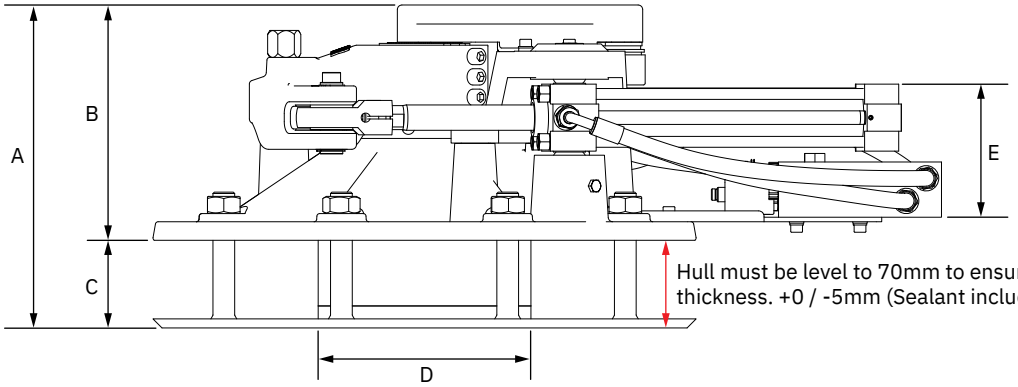


IMPORTANT
Bearings must NOT be lubricated with any kind lubrication.
This will damage the function of the bearings.

MG_0281

Actuator Measurements

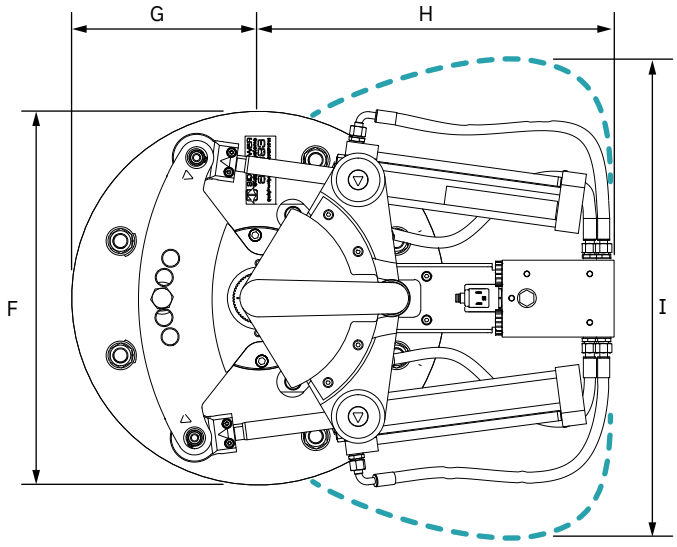
Measurement code	Measurement description	*66b		*92b		*93b		*96b	
		mm	inch	mm	inch	mm	inch	mm	inch
A	Total actuator height	260	10.2	346	13.6	346	13.6	346	13.6
B	Actuator height inside the hull	190	7.5	260	10.2	260	10.2	260	10.2
C	Hull thickness (sealant included)	70	2.8	86	3.4	86	3.4	86	3.4
D	Diameter of the actuator shaft sealant hub	175	6.9	235	9.3	235	9.3	235	9.3
E	Height of valve unit	146	5.7	172	6.8	172	6.8	172	6.8
F	Actuator Width	495	19.5	600	23.6	600	23.6	600	23.6
G	Actuator Length	247.5	9.7	300	11.8	300	11.8	300	11.8
H	Actuator Length	521	20.5	571	22.5	571	22.5	571	22.5
I	Swing Distance	650	25.6	700	27.6	700	27.6	700	27.6
	Shaft Ø	65	2.6	90	3.5	90	3.5	90	3.5
	Weight (kg / lbs)	105	231.5	185	407.9	185	407.9	185	407.9

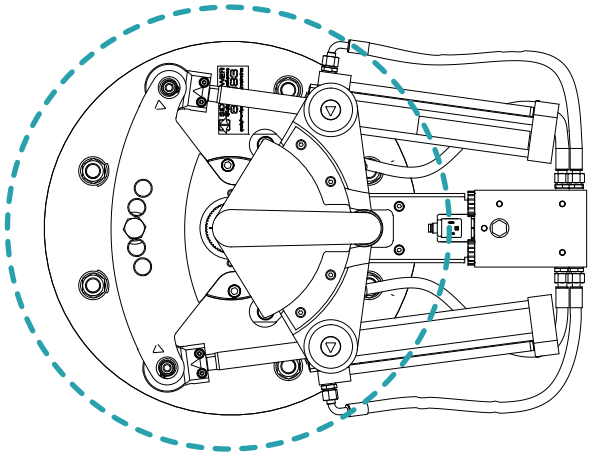


Hull must be level to 70mm to ensure the surface is correct thickness. +0 / -5mm (Sealant included)

The fin actuator assembly may be installed in any convenient radial 360° position in the hull.

IMPORTANT
Consider and plan the positioning/orientation of the actuator to achieve the full fin range of movement in both directions.
Also, ensure to achieve the correct fin alignment parallel to the keel of the yacht.





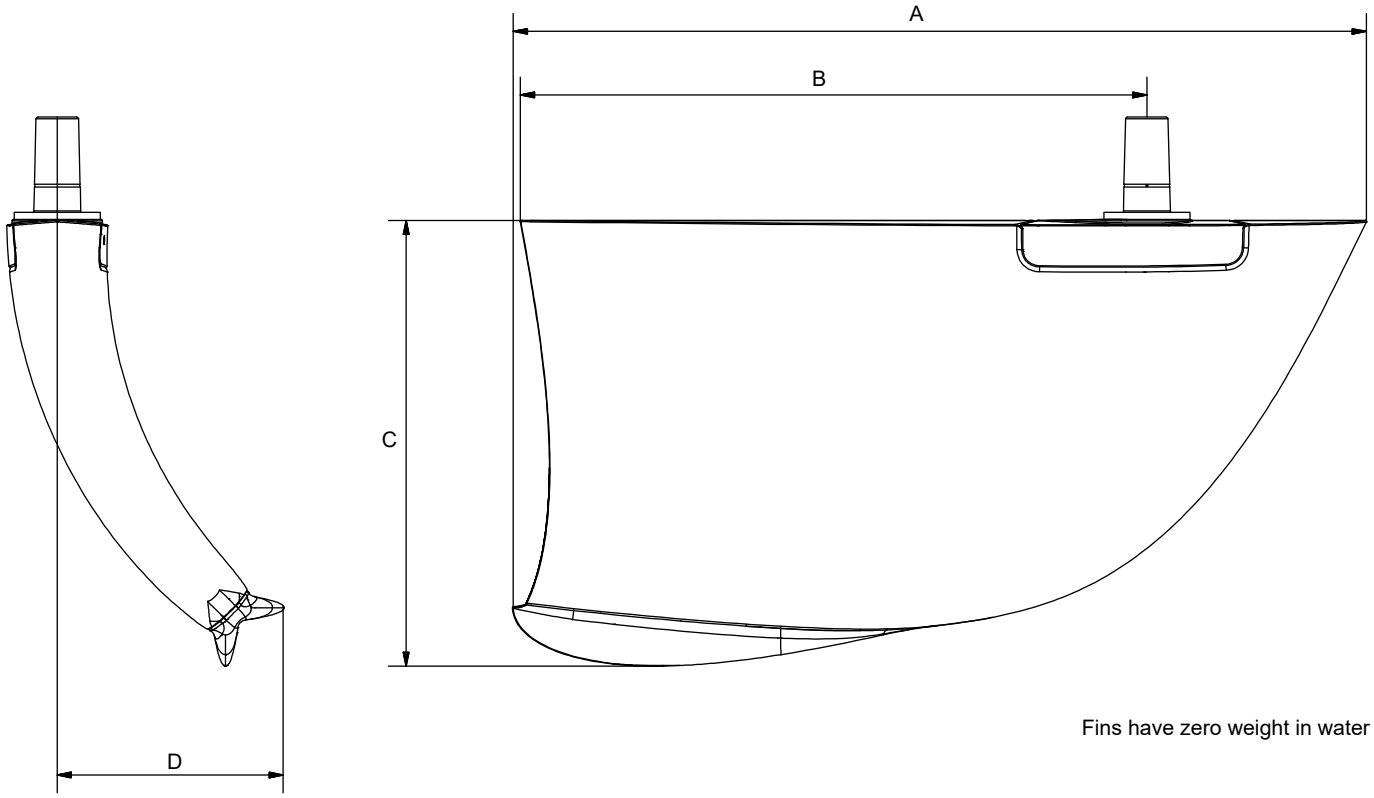
MG_0282

Vector Fin Measurements

MC_0251

Measurement code	Measurement description	*VF 1050		*VF 1350		*VF 1650		*VF 1950 HS		*VF 1950 MIX		*VF 1950 AA	
		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
A	Total Length	1618	63.7	1835	72.2	2081	81.9	2081	81.9	2081	81.9	2081	81.9
B	Length to Shaft center	1186	46.7	1345	53	1481	58.3	1371	58.3	1481	58.3	1591	58.3
C	Total Height	847	33.3	956.5	37.7	1054.1	41.5	1054.1	41.5	1054.1	41.5	1054.1	41.5
D	Width	429	16.9	485	19.1	533	21	533	21	533	21	533	21
	Size m²	1.05	10.8	1.35	14.5	1.65	17.8	1.65	17.8	1.65	17.8	1.65	17.8

*HS - High Speed priority
*MIX - Balanced priority
*AA - At Anchor priority



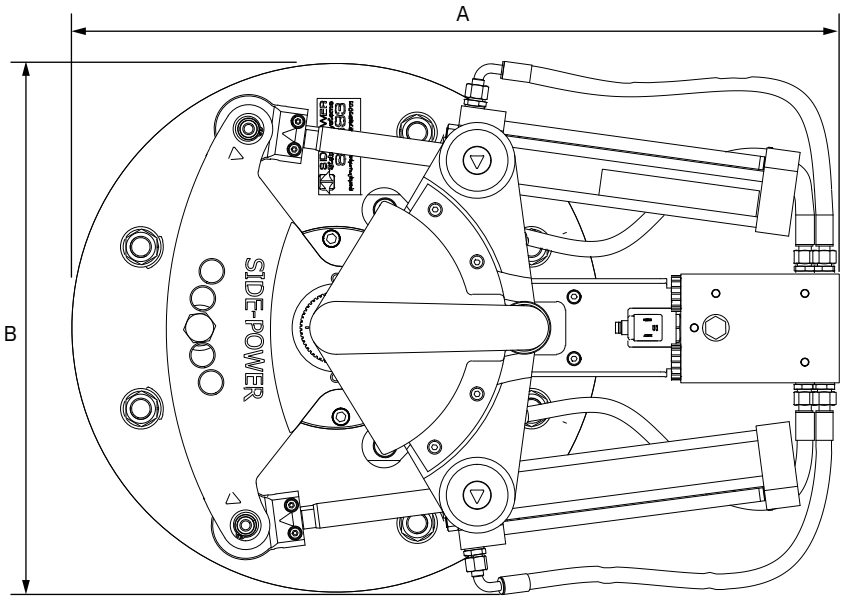
Fins have zero weight in water

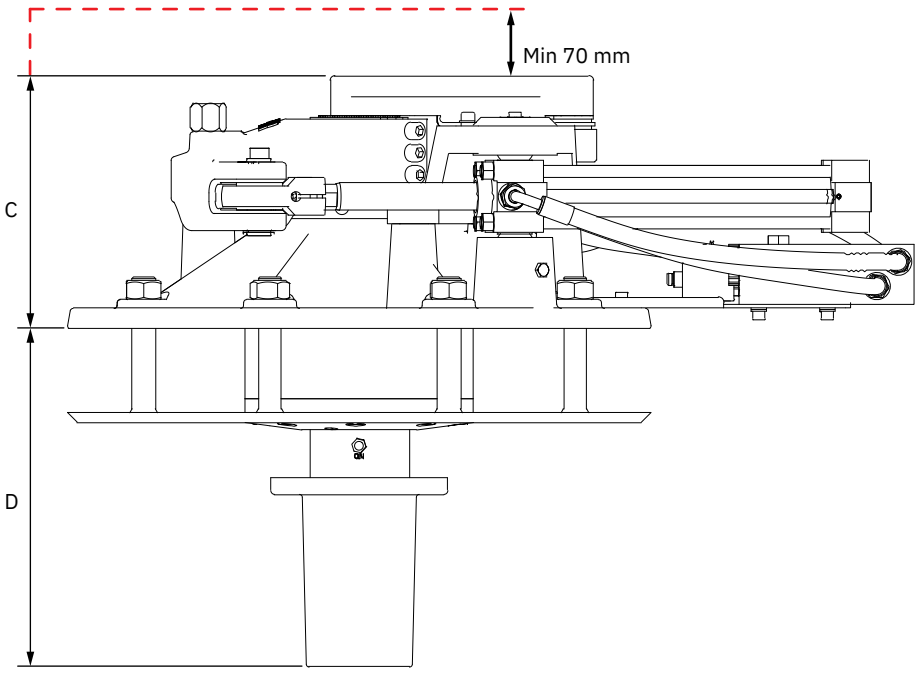
MG_0210

Measurement Clearance

Measurement code	Measurement description	*66b		*92b		*93b		*96b	
		mm	inch	mm	inch	mm	inch	mm	inch
A	Total actuator length	770	30.3	871	34.3	871	34.3	871	34.3
B	Total actuator width	650	65.6	700	27.6	700	27.6	700	27.6
C	Actuator height inside the hull	190	7.5	260	10.2	260	10.2	260	10.2
D	Length of actuator shaft from inside the hull	318	12.5	347	13.7	347	13.7	347	13.7

IMPORTANT
Ensure that all equipment with physical functions (actuators, valves, electrical & hydraulic connection points) are installed so that you allow space in the boat after reasonable dismantling of other parts or interior / furniture (fit service hatch or similar) for service access as per the following illustrations to get ample room for maintenance and any necessary service or repairs.
This is the installer/boat builders full responsibility





MG_0283

Hull Forces

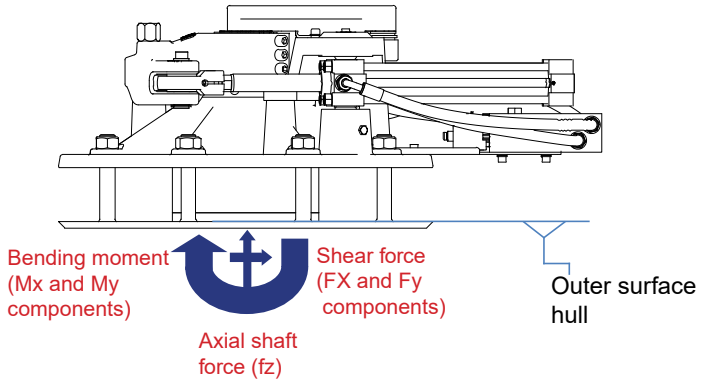
MC_0207

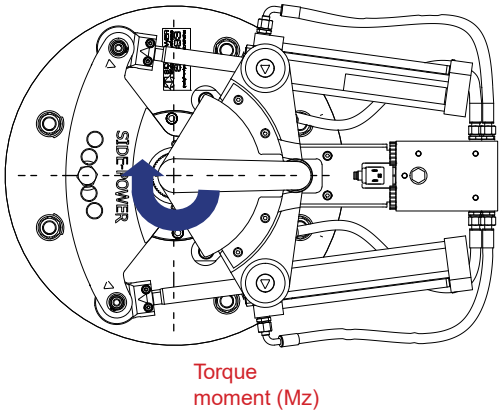
All calculated values are normalised, determined by equilibrium considerations and also that various coefficients are inaccurate as hull design etc will affect the actual fin effect.
Dynamic effects such as jumps/impacts with waves, back flow closing of valve etc could further increase the hull/shaft loads. Therefore all dimensioning should account for this by using a safety factor.

The aft top face of the fin is deliberately made weaker than the rest of the fin so it will break easier in case of an impact with the hull.

It is advised to strengthen the hull or ensure it is manufactured with materials suitable to sustaining impacts over the total length of the fin within an area of approximately 10 degrees of fin rotation in each direction from its centre.
(NB: This is a safety measure to ensure the fin will not break through the hull in a collision situation.)

Sleipner curved Vector Fin design comes with additional benefits in hull safety. Any impact with the ground will not only bend the shaft backwards and outward, allowing the fin to break away with less stress on the hull.





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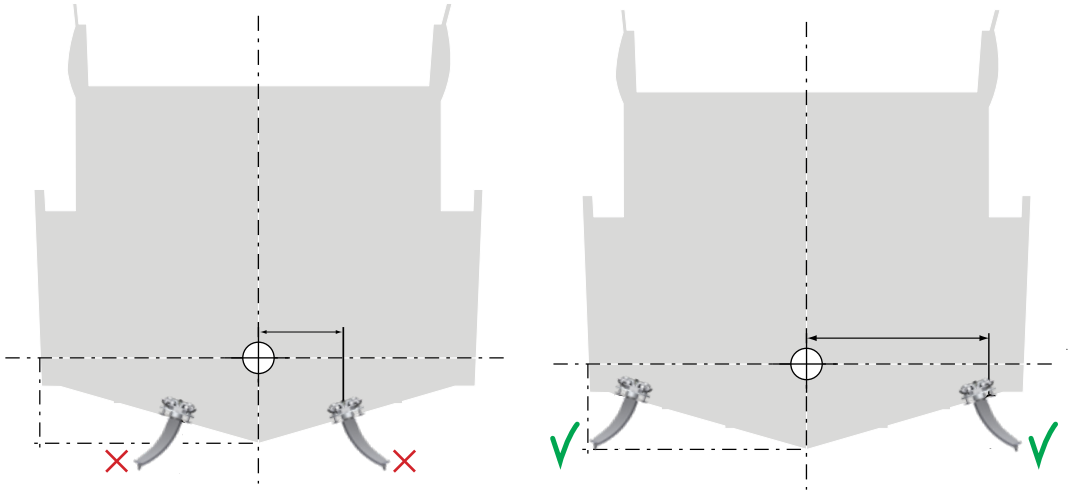
Fin Loads on Hull

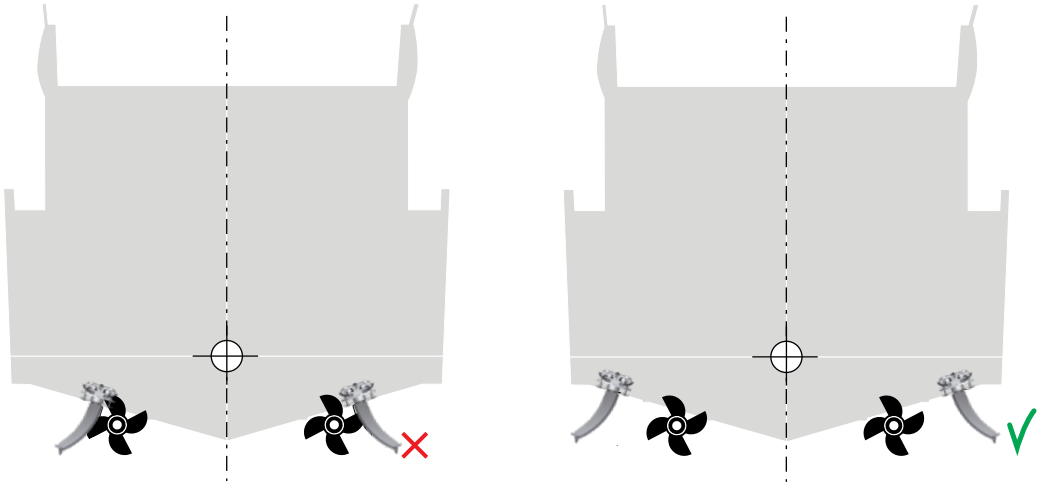
MC_0253

Fin size	Speed	Bending moment (Mx+My)	Twisting torque (Mz)	Axial shaft (Fz)	Shear force (Fx+Fy)	Shaft breakaway
SPS66/67 VF1050	10 kn	5500 Nm	3400 Nm	5000 N	10200 N	350 kN
	15 kn	6500 Nm	3400 Nm	6000 N	11200 N	350 kN
	20 kn	8200 Nm	3400 Nm	7300 N	12200 N	350 kN
	25 kn	9600 Nm	3400 Nm	8600 N	14200 N	350 kN
	30 kn	10000 Nm	3400 Nm	9000 N	15500 N	350 kN
	35 kn	10000 Nm	3400 Nm	9000 N	23300 N	350 kN
	40 kn	10000 Nm	3400 Nm	9000 N	23300 N	350 kN
SPS92 VF1350	10 kn / Min	10500 Nm	7000 Nm	6500 N	19000 N	940 kN
	15 kn	12500 Nm	7000 Nm	10000 N	20000 N	940 kN
	20 kn	15000 Nm	7000 Nm	12000 N	21000 N	940 kN
	25 kn	17500 Nm	7000 Nm	13700 N	22500 N	940 kN
	30 kn	18000 Nm	7000 Nm	14600 N	27500 N	940 kN
	35 kn	18000 Nm	7000 Nm	14600 N	35000 N	940 kN
	40 kn	18000 Nm	7000 Nm	14600 N	35000 N	940 kN
SPS93 VF1650	10 kn / Min	11500 Nm	7000 Nm	8000 N	18000 N	940 kN
	15 kn	13500 Nm	7000 Nm	10500 N	19000 N	940 kN
	20 kn	17500 Nm	7000 Nm	12500 N	21000 N	940 kN
	25 kn	20000 Nm	7000 Nm	14500 N	23000 N	940 kN
	30 kn	20500 Nm	7000 Nm	15000 N	28000 N	940 kN
	35 kn	20500 Nm	7000 Nm	15000 N	38000 N	940 kN
	40 kn	20500 Nm	7000 Nm	15000 N	38000 N	940 kN

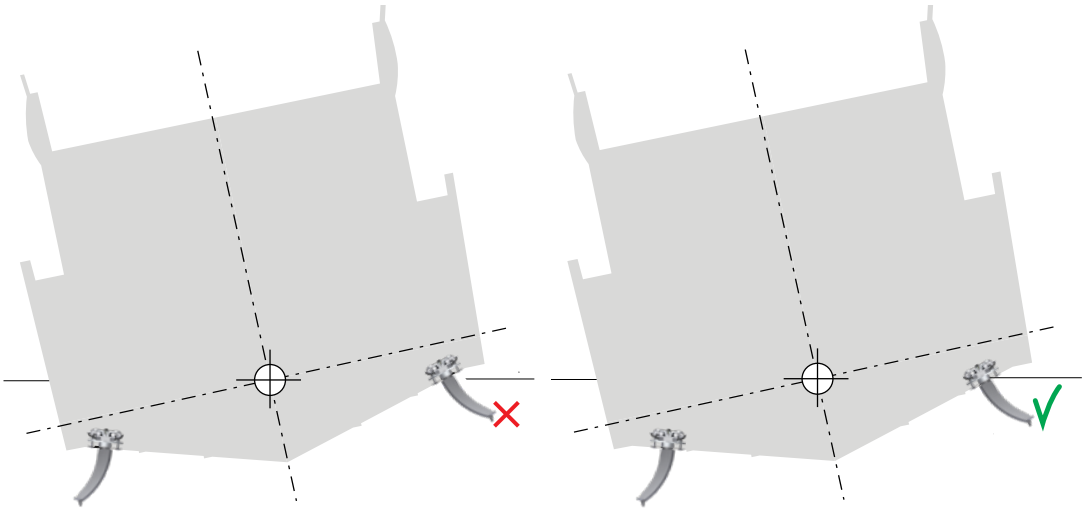
Fin size	Speed	Bending moment (Mx+My)	Twisting torque (Mz)	Axial shaft (Fz)	Shear force (Fx+Fy)	Shaft breakaway
SPS96B VFS1950 22% SHAFT POSI-TION	10 kn / Min	7800 Nm	7800 Nm	3800 N	18000 N	940 kN
	15 kn	12600 Nm	7800 Nm	8500 N	31000 N	940 kN
	20 kn	14600 Nm	7800 Nm	10600 N	34000 N	940 kN
	25 kn	15100 Nm	7800 Nm	16500 N	37000 N	940 kN
	30 kn	17000 Nm	7800 Nm	18200 N	41500 N	940 kN
	35 kn	18350 Nm	7800 Nm	24800 N	43500 N	940 kN
	40 kn	20000 Nm	7800 Nm	32000 N	47000 N	940 kN
SPS96B VFS1950 26% SHAFT POSI-TION	10 kn / Min	7600 Nm	7800 Nm	3800 N	18000 N	940 kN
	15 kn	16000 Nm	7800 Nm	8500 N	40000 N	940 kN
	20 kn	19600 Nm	7800 Nm	10600 N	49000 N	940 kN
	25 kn	20200 Nm	7800 Nm	16500 N	50488 N	940 kN
	30 kn	22700 Nm	7800 Nm	18200 N	57000 N	940 kN
	35 kn	24300 Nm	7800 Nm	24800 N	60000 N	940 kN
	40 kn	26300 Nm	7800 Nm	32000 N	64200 N	940 kN
SPS96B VFS1950 30% SHAFT POSI-TION	10 kn / Min	7500 Nm	7800 Nm	3800 N	18000 N	940 kN
	15 kn	17000 Nm	7800 Nm	8500 N	40000 N	940 kN
	20 kn	28600 Nm	7800 Nm	10600 N	64000 N	940 kN
	25 kn	31700 Nm	7800 Nm	16500 N	81000 N	940 kN
	30 kn	35900 Nm	7800 Nm	18200 N	92000 N	940 kN
	35 kn	38200 Nm	7800 Nm	24800 N	99000 N	940 kN
	40 kn	41100 Nm	7800 Nm	32000 N	105000 N	940 kN
	Maximum 30 knots top speed for SPS55 / VF1050 combination					



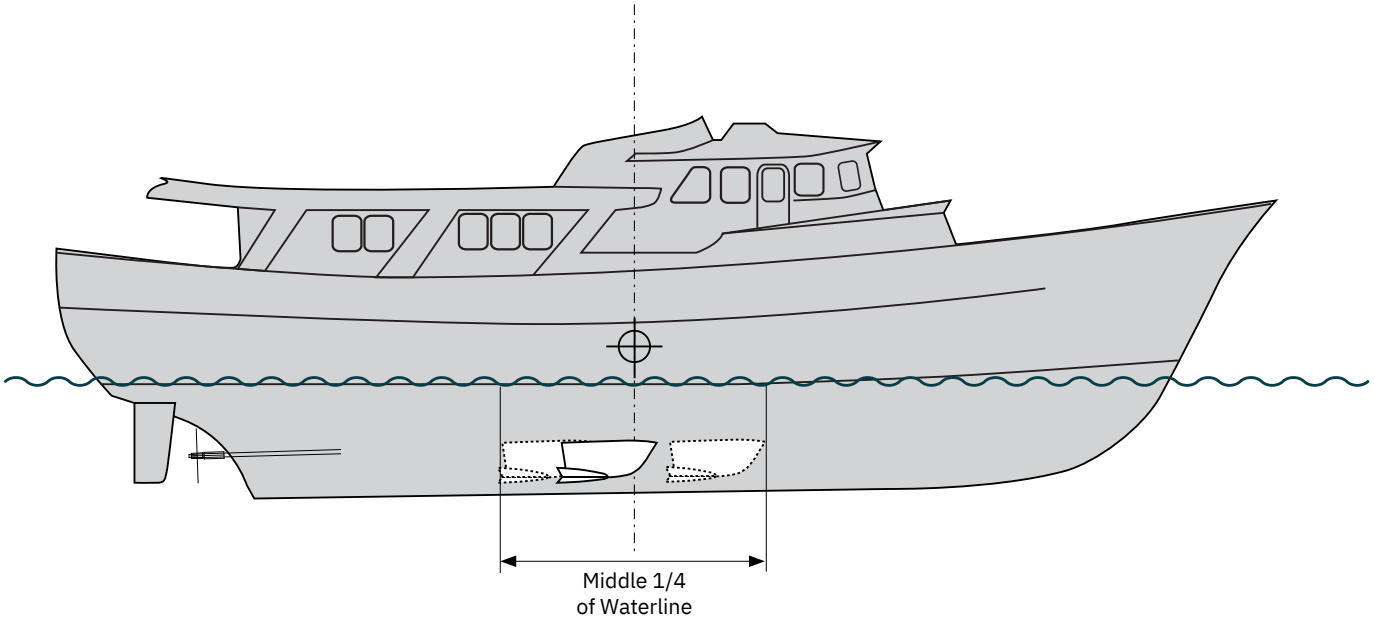
Fins should not extend outside the beam or below the keel when in neutral position.

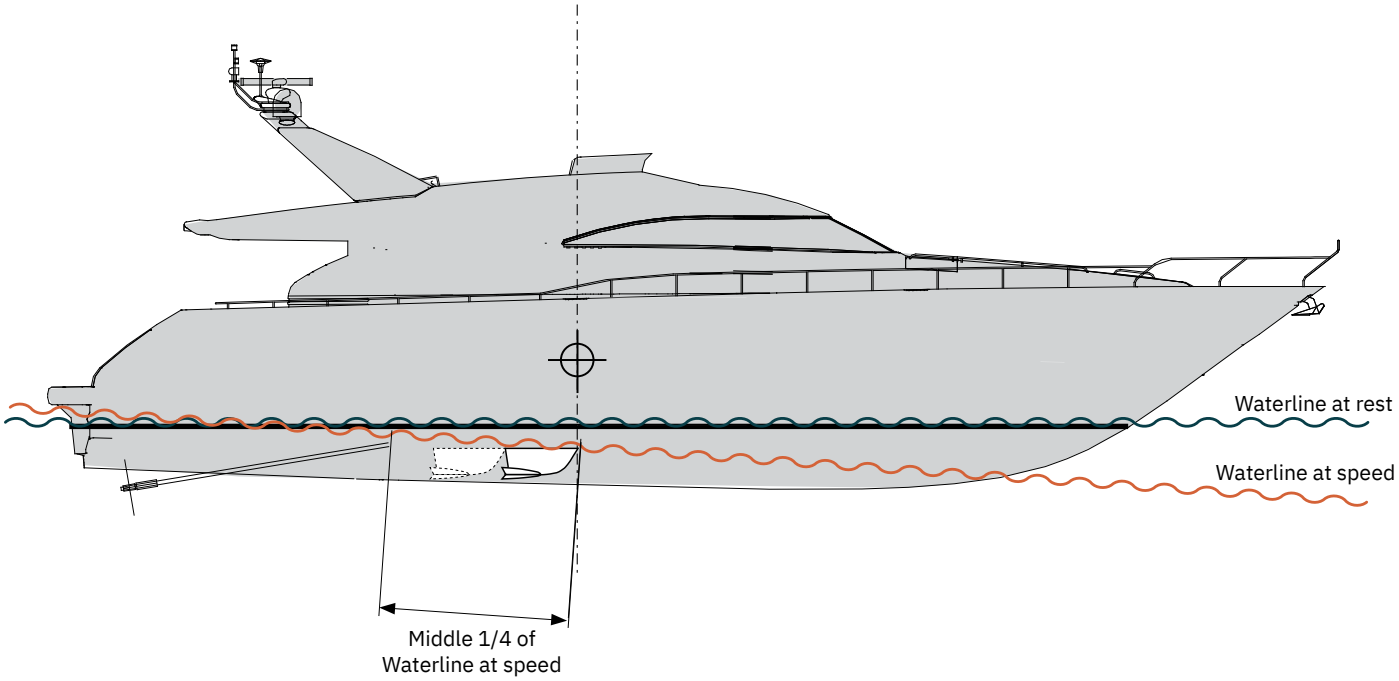


Fins should be placed as far outboard as possible, and NOT in-line with the propellers, to ensure avoiding possible disturbance of the water flow to the props which in the worst case can cause vibrations / cavitation.



No part of the fin should be above water level during normal roll motion/under normal sea conditions.





To avoid unwanted influences on the steering characteristics, the fins should be placed close to the vessel longitudinal centre of gravity (LCG)
- If unknown, this is usually a little aft of 50% of the waterline length.

For high speed vessels, the fins should be placed with trailing/leading edge within middle 1/4 of waterline length at speed and not in front of the LCG.

For vessels with top speed under 15 knots, fin may be placed within the middle 1/4 of waterline length.

(NB: These are general guidelines and some hull types might allow for an installation position outside of this recommendation.)

Transversal fin positioning of Vector Fins™

With Vector finsTM it is a priority to push the fins as far outboard as possible to achieve the most leverage for the fins forces unlike standard fins.

With Sleipner stabilizers enable installation of the fins to have different stroke angles inboard and outboard as the locked centre and cruising centre is flexible because they are locked hydraulically.

Avoid cutting off any of the back top section of the fin (normal on most fins on hard-chine boats) as this will cause added resistance/ drag by the fin. ***(NB: Common on fins on hard-chine boats)***. This will create a recess area that will allow water at higher speeds and anchor stabilization to lose force also as part of the water will pass easier between the hull and the fin. Additional due to the outward ”bend” of the fins keeping the lower part inside the boats ”envelope” it will result in the upper part of the fins being further inboard that creates less of an outboard stroke in the upper part of the fin (along the hull).

Finding the best position for the fin and actuator positioning often is related to the inside configuration and space that is required for proper installation.

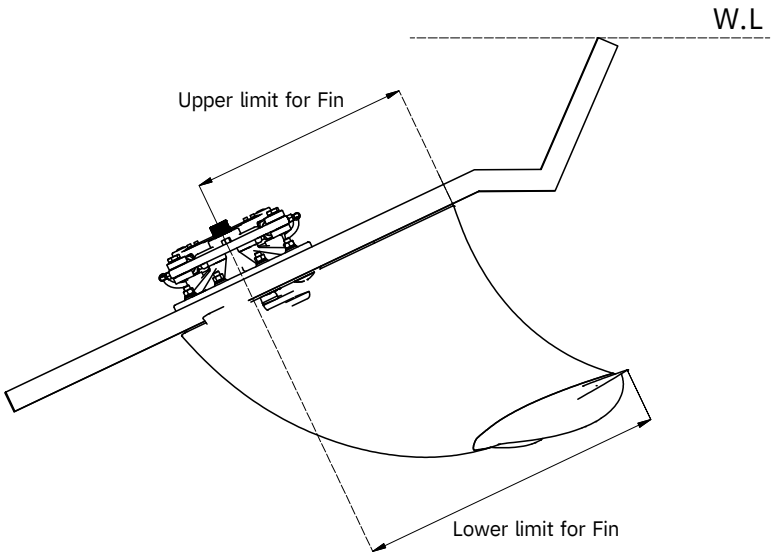
General Rules:
–Push the actuators as far as possible outboard, keeping at least 22 degrees of outboard stroke as a minimum ***(NB: if less, and the lower part is within boat envelope, a small cut-away of the back upper part can be done as a compromise).***
It is also acceptable installing the fins further inboard If inside configuration/ access to inside parts of actuators is required. ***(NB: Performance will be reduced slightly due to less leverage arm for the stabilizing force applied by the fins.)***

Measurements along hull bottom outwards to chine(upper) and outside boat ”envelope” (lower) in mm,

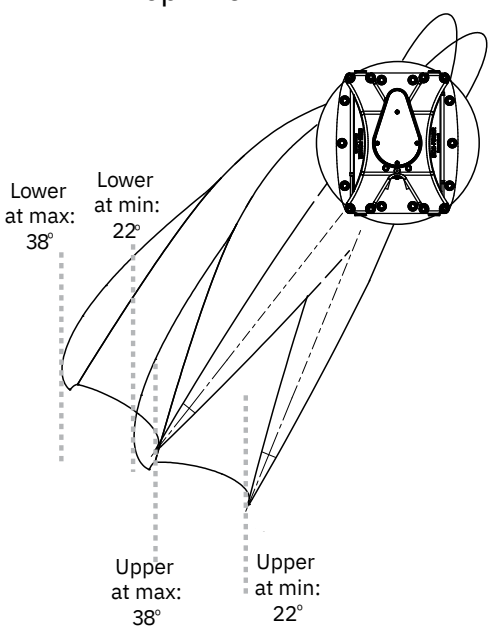
center shaft to chine start / outside envelope:

	At maximum: 38°	At minimum : 22°
Fin size	Upper / lower	Upper / Lower
VF650	575 / 810	350 / 625
VF800	642 / 900	390 / 695
VF1050	731 / 1016	444 / 791
VF1350	828 / 1150	504 / 897
VF1650	914 / 1305	557 / 1001
*VF1950	*991 / *1386	674 / 1112

“Boat” view

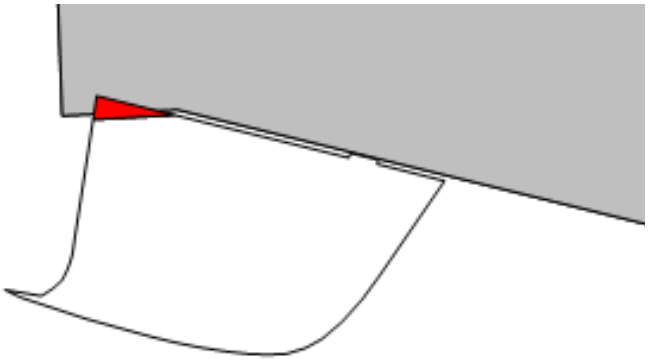


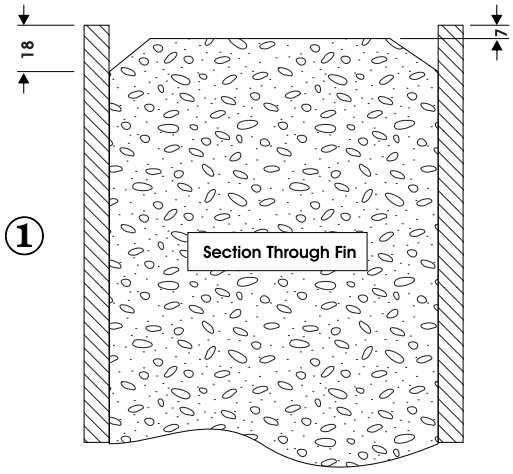
“Top” view



MG_0214

In case of the fin positioning being so that you need to cut down some of the top aft end of the fin to avoid it hitting the hull (very typical on planning boats with hard chines), please do so as per the instructions below.

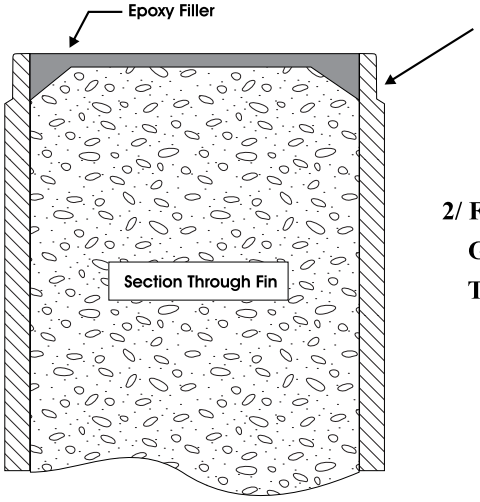




①

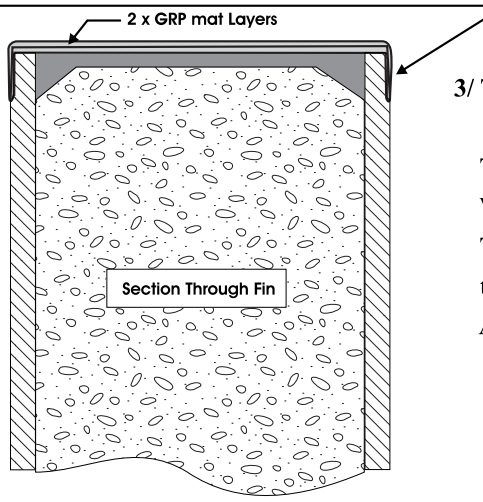
The fins are made with a pre-molded foam core with a vacuum injected Vinylester skin.

1/Cut away the desired area – "dig" / cut out the foam core 7mm all the way along the cut area – but approx. 18mm at the edges.



②

2/ Fill this with epoxy filler, level with the fin outer skin. Grind the GRP back on the fin top edges to allow mat To be applied flush later on.



③

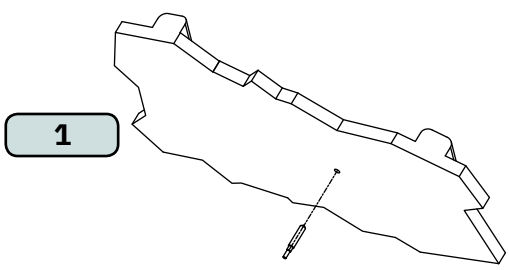
3/ Then apply a couple of layers of GRP mat and epoxy over the top and onto the external skin. The GRP should then be sanded/ground flush With the original surface. The repaired surface should be primed with the customers choice of Anti-foul paint prior to the Application of the final coats of Anti-foul.

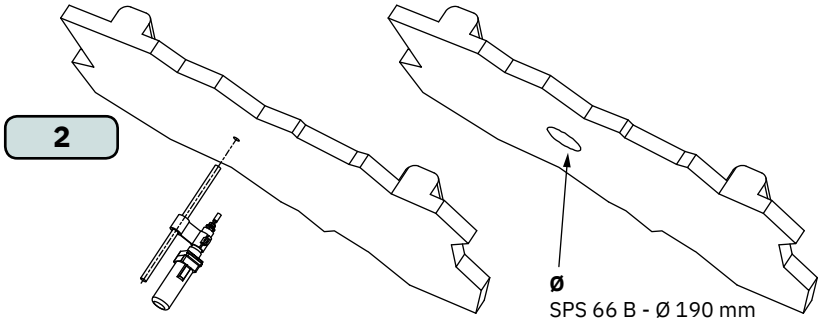
! Please refer to the graphic for special considerations relating to your model !

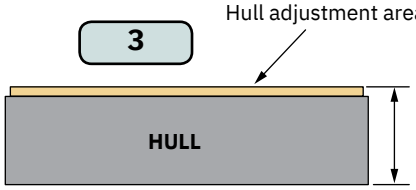
IMPORTANT
Reinforce the hull for the stabilizer installation in accordance with a naval ships architects recommendations.

Define the optimal position of the stabilizer fins.

1. Drill a 21mm pilot hole at the fin shaft centre line position externally through the yachts hull.
2. Using the pilot hole as centre line mark and cut hole from inside the boat using a suitable cutting Jig & tool.
3. Adjust the surrounding hull to the above thickness (Sealant included) and ensure that the internal and external surfaces are parallel and flat.

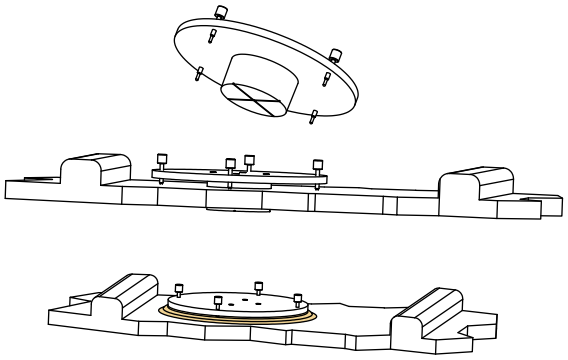






SPS 66 B
Hull Thickness
SPS 66 B - 70 mm
SPS 92 B - 86 mm
SPS 93 B - 86 mm
SPS 96 B - 86 mm

IMPORTANT
Tolerances for the hull thickness is:
SPS 66 B: +0/-5mm - the thickness of the hull must NOT be larger than 70mm.
SPS 92 B: +0/-5mm - the thickness of the hull must NOT be larger than 86mm.
SPS 93 B: +0/-5mm - the thickness of the hull must NOT be larger than 86mm.
SPS 96 B: +0/-5mm - the thickness of the hull must NOT be larger than 86mm.

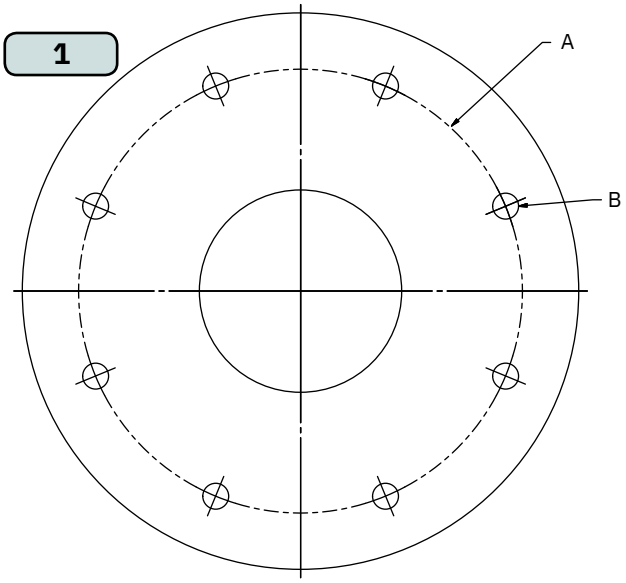


MG_0285

! *Please refer to the graphic for special considerations relating to your model* !

1. Mark the positions of the holes for the securing bolts. ***(NB: Use the external securing plate as a template.)***
2. Cut & drill the holes using appropriate cutting and drilling equipment.
3. Apply a moderate coating of watertight sealant to the mating surface. ***(NB: Sealant must be compatible with hull material. A naval architect/ Boat builder must confirm this.)***

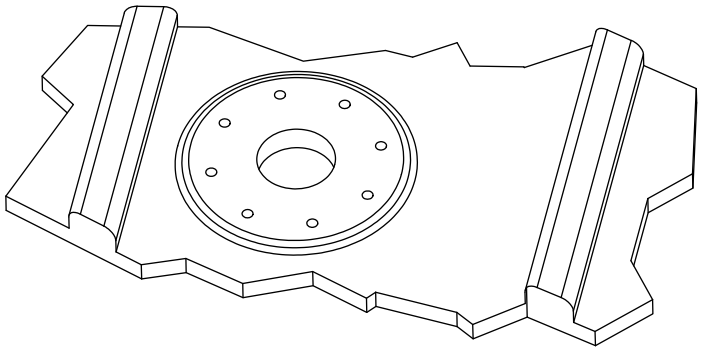
1



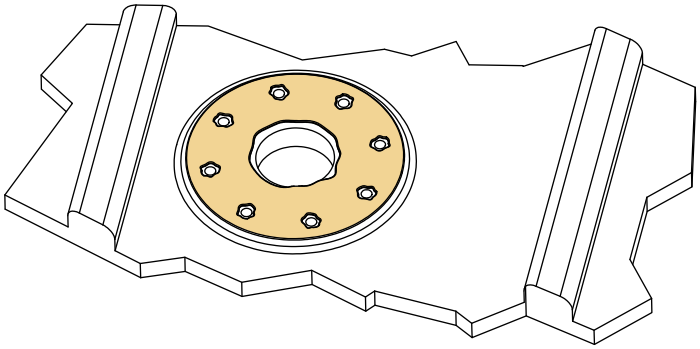
MODEL	Ø A	Ø B
SPS 66 B	395 mm 15.6”	25 mm 1”
SPS 92 B	480 mm 18.9”	25 mm 1”
SPS 93 B	480 mm 18.9”	25 mm 1”
SPS 96 B	480 mm 18.9”	25 mm 1”

IMPORTANT
Sealant must be compatible with hull material. Naval architect/ Boat builder must confirm this.

2



3

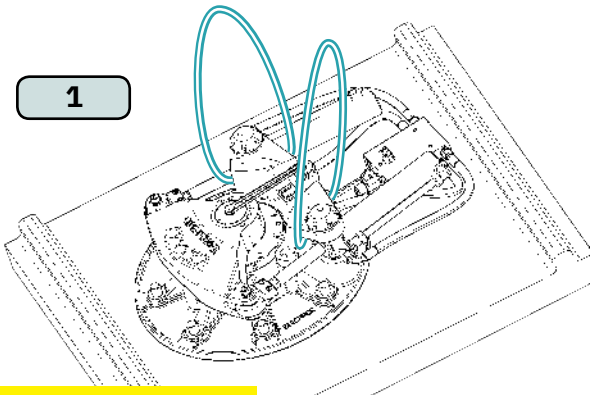


MG_0286

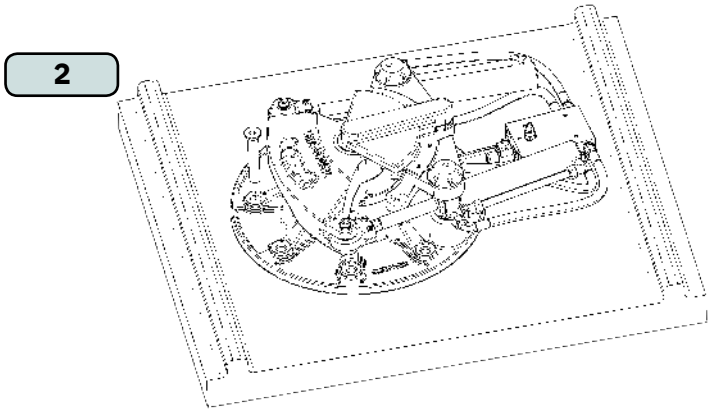
! *Please refer to the graphic for special considerations relating to your model* !

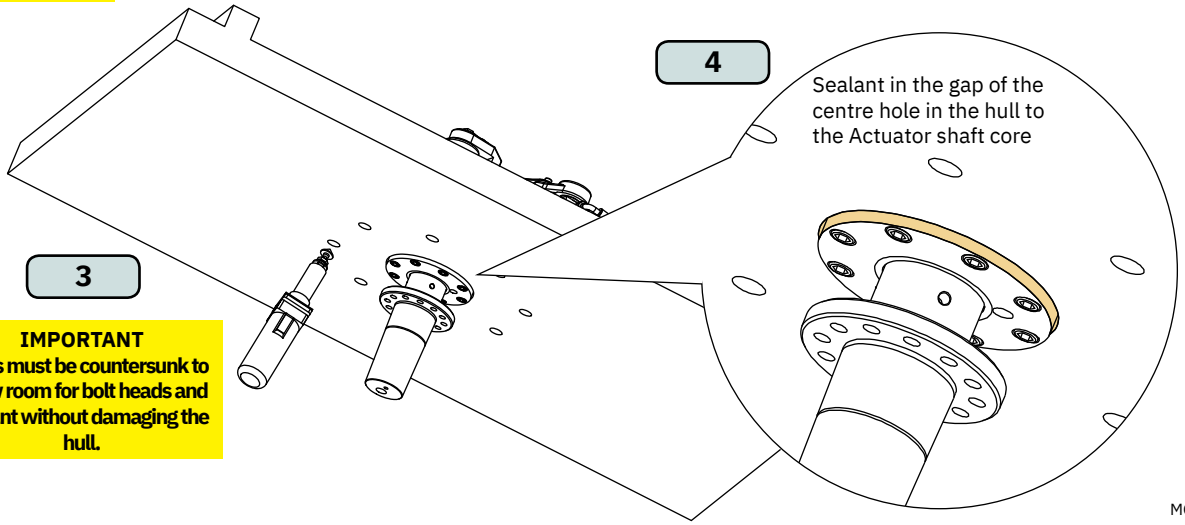
MOUNTING OF THE STABILIZER ACTUATOR ASSEMBLY

1. Carefully lower the Stabilizer Actuator Assembly into the hulls actuator hole in the correct orientation to the sealant mounting surface.
2. Use two of the securing bolts to temporally lock the Actuator Assembly into position.
3. Countersunk all holes to allow space for bolt heads and sealant without damaging the hull.
4. Apply sealant in the gap of the centre hole in the hull to the Actuator shaft core.



IMPORTANT
Do not lift or attach lifting equipment to the actuating cylinders or their rams.





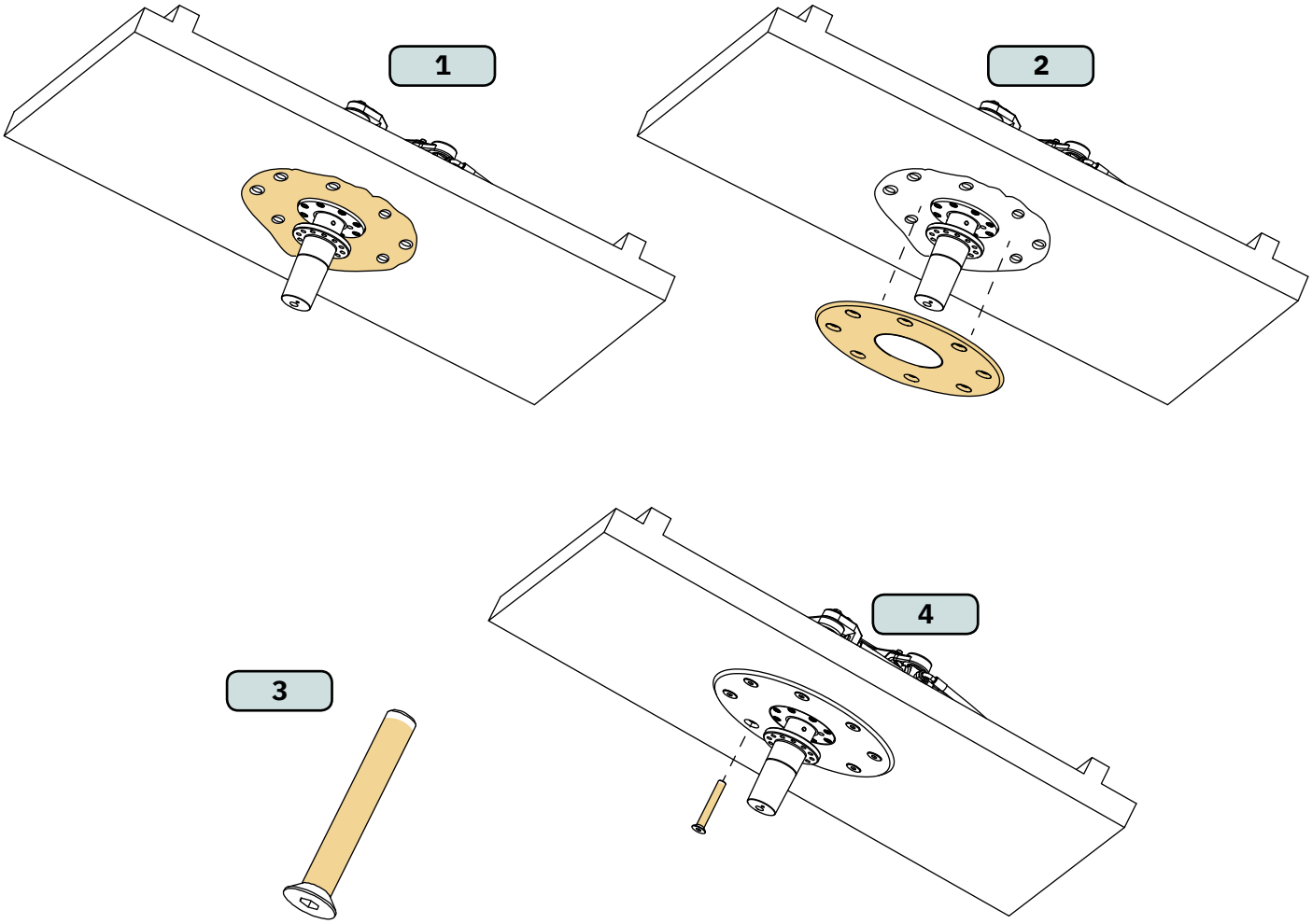
IMPORTANT
Holes must be countersunk to allow room for bolt heads and sealant without damaging the hull.

MG_0287

! *Please refer to the graphic for special considerations relating to your model* !

MOUNTING OF THE STABILIZER ACTUATOR ASSEMBLY

1. Apply a coat of watertight sealant externally to the hull surface. Ensure to fill around the bolts.
2. Place the External Securing Plate over the Stabilizer shaft & onto the external hull mounting surface.
3. Coat the securing bolts with sealant and insert to the External Securing Plate.
4. Secure each bolt with a plain washer and a nut. Tighten & torque load the securing bolt nuts diagonally to avoid misalignment.



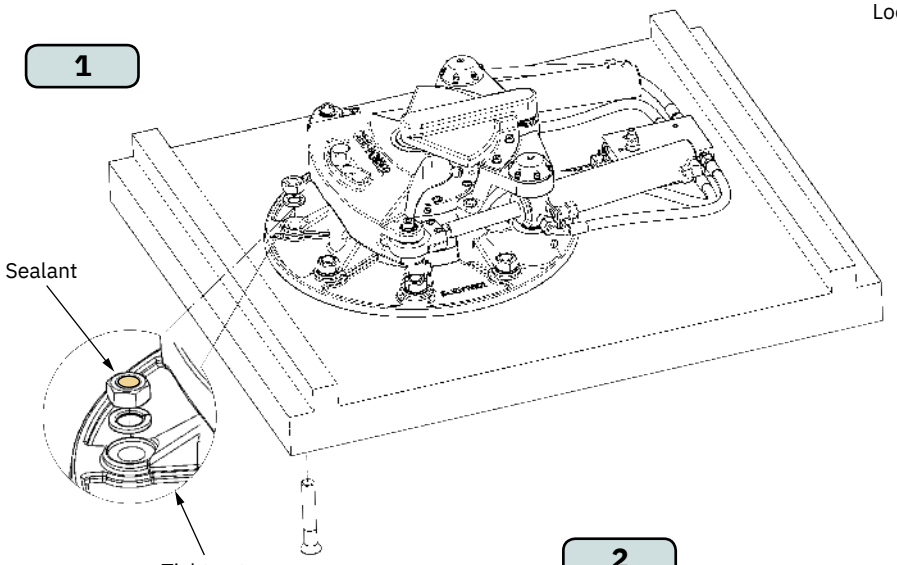
MG_0288

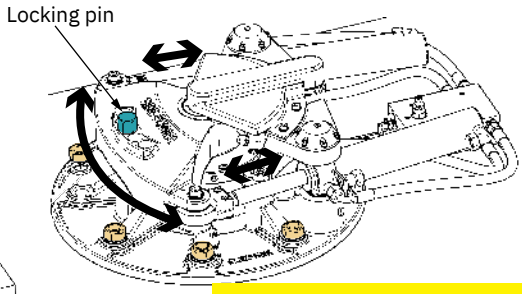
! *Please refer to the graphic for special considerations relating to your model* !

1. Coat the securing bolts with sealant and insert into the External Securing Plate, the Yachts hull and the Actuator Assembly and secure each with a locking washer and a nut. Tighten & torque load the securing bolt nuts diagonally to avoid misalignment

2. Connect a ground wire from the yachts main bonding/anode system to each actuator.

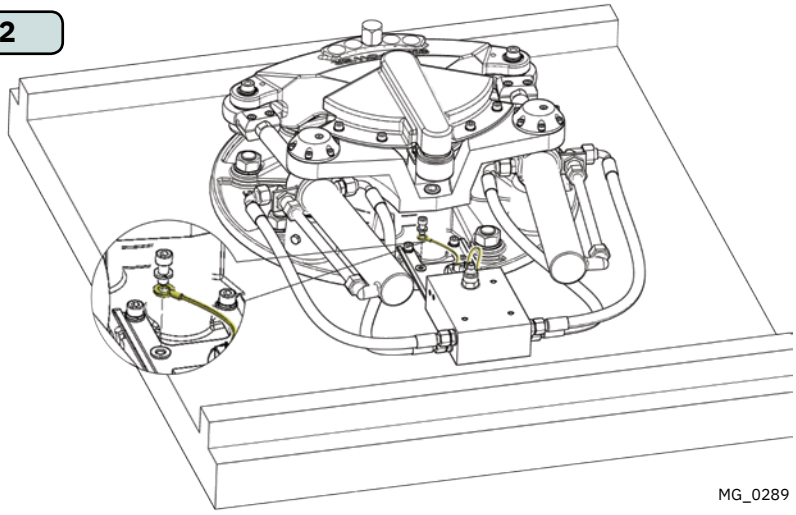
1





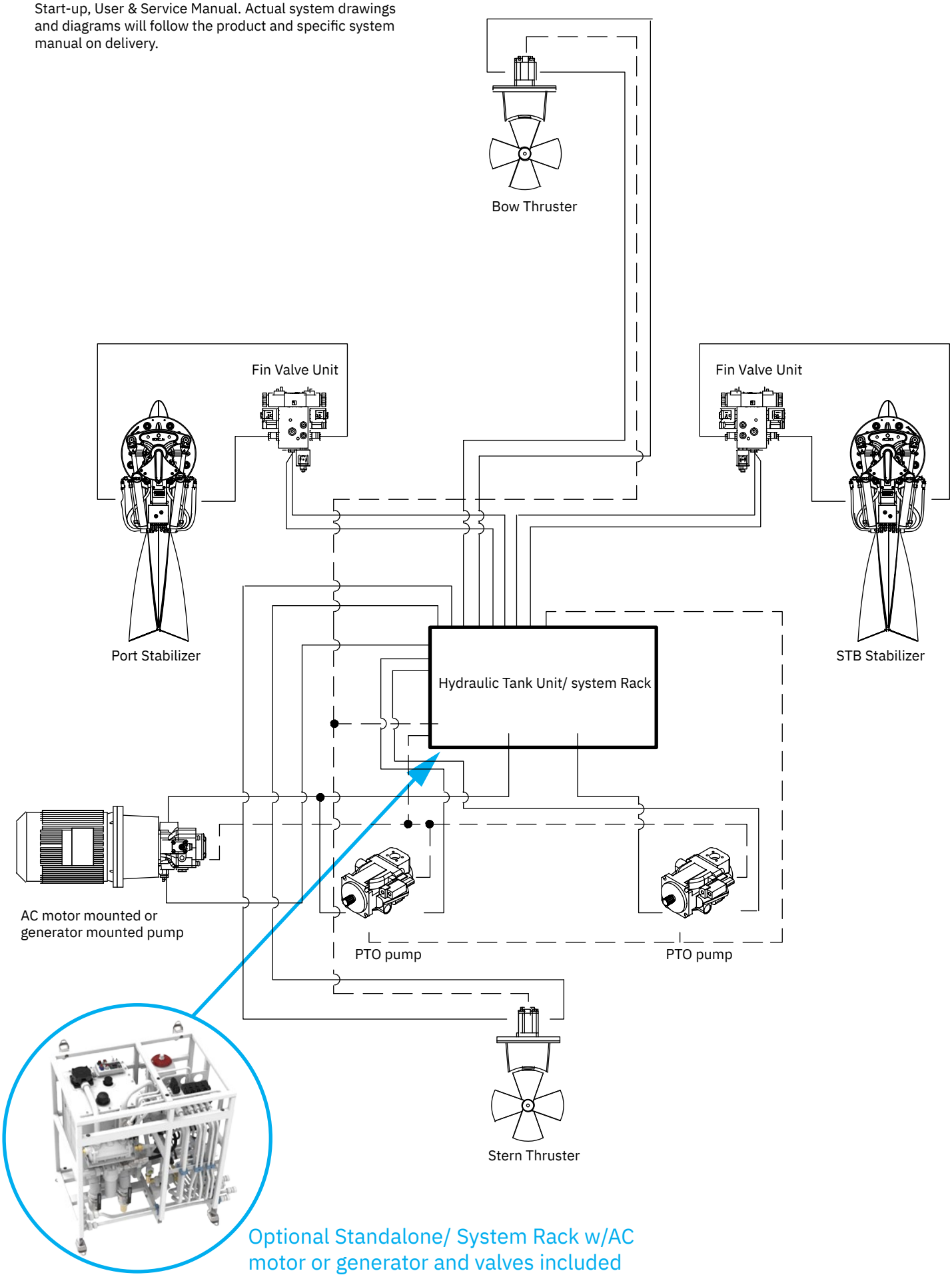
IMPORTANT
Remove locking pin to move the twin yoke for easy access to nuts. Rod ends and cylinders can be damaged when hit.

2



MG_0289

For specific details see the hydraulic system installation, Start-up, User & Service Manual. Actual system drawings and diagrams will follow the product and specific system manual on delivery.



MG_0222

IMPORTANT
For specific and complete details see Side-Power 'Hydraulic System Installation, Start-up, User & Service Manual'. Actual system drawings and diagrams will follow the product and specific system manual on delivery.

Tank Installation

- Place the tank in a position where you have access to connections and inspection points. Ensure that there is enough space to remove and replace the filters. ***(NB: Ensure room for access to the oil filling point.)***
- Place the tank high enough to get the oil level above the hydraulic pump. The system requires overpressure/gravity feed in the pump feed lines.
- Secure the tank assembly properly.
- Ground the tank electrically to the boat's bonding system.
- Ensure that the tank and other components are thoroughly clean before you start the installation of fittings and hoses. Also, make sure that the fittings and hoses are thoroughly clean (avoid ingress of dirt, water and other contamination).
- Ensure to plan and install the cooling system in accordance with the Hydraulic system manual.

Pump Installation

- Check that the power source drive direction is in accordance with pump rotation!
- Pump direction is decided as described in Hydraulic system manual, facing the pump shaft, i.e the pump direction will be the opposite of engine / PTO /generator. (NB: Please see (PTO) pump nameplate L=CCW and R=CW)
- Ensure that the power source and connection point can handle the torque and load from the hydraulic pump.
- As soon as the pump is connected to the power source, it is very important NOT to run the power source before the installation is complete and the pump is pre-filled with hydraulic oil.

Hydraulic Hoses

Each thruster system is calculated and correctly set up individually by Sleipner. Please see the unique system drawings in the provided system manual for hose/tube/fittings dimensions. Hoses and fittings must be installed by trained professionals only. Make sure to clean the hoses internally before assembly, all hoses MUST be cleaned with jet pellets or flushed before they are fitted ***(NB: Cleanliness requirement according to: Required cleanliness class ISO 4406-1999 21/19/16)***.

To ensure easy and trouble-free connection, apply a small amount of oil to threads and mating faces before connecting. Different fittings will require different tightening torque to avoid leakage. If in doubt, please contact a skilled professional to get the best results. It may be required to check and re-tighten all hose connections after start-up and sea trial.

Oil filling

Before filling the tank, prime the pump(s) through their upper drain port. Use only oil quality as specified. Fill the tank with correct hydraulic oil through the filler/breather unit. It is recommended to use a filler trolley with filter (10 micron). Use only new mineral based hydraulic oil, ISO VG46. Use ISO VG32 oil on systems without stabilizers when the vessel will operate in arctic conditions.

Oil to be according to ISO 11158 Class HV/DIN 51524 Part 3 Class HVLP. The oil level in the tank should be approximately 3/4 full, or at the middle of the upper indicator of the sight glass. Because vessels heel and the fact that we have an air breathing filter in the oil filler cap, avoid higher oil level than what the sight glass can indicate. Always check oil level and refill during start-up and air purging.

PTO pump pre-startup

IMPORTANT
Before filling the system oil tank, prime the pump(s) through their upper drain port. Stabilizer system must not be activated. Check pump feed line from the tank (Dimension/routing) for good gravity feed.

- Fill the hydraulic tank. (ISO VG 46 (by ISO 3448). Or, 32 for Arctic climate.) See detailed specifications.
- Remove the pump drain blank or hose from pump to ensure the oil has reached pump)
- Re-fit drain blank or hose in PTO pump port, or at the gauge on accumulator block.
- PTO1: Start engine1 and watch pressure gauge for standby pressure of 10-30 bar. (Monitor oil level)

(NB: Gauge at PVG valves for thruster + stabilizer system. For stabilizer only pressure reading on system status page in the stabilizer control panel.)

- PTO2: Start engine2 and watch pressure gauge for standby pressure of 10-30 bar. (Monitor oil level)

(NB: If no pressure, confirm pump rotation.)

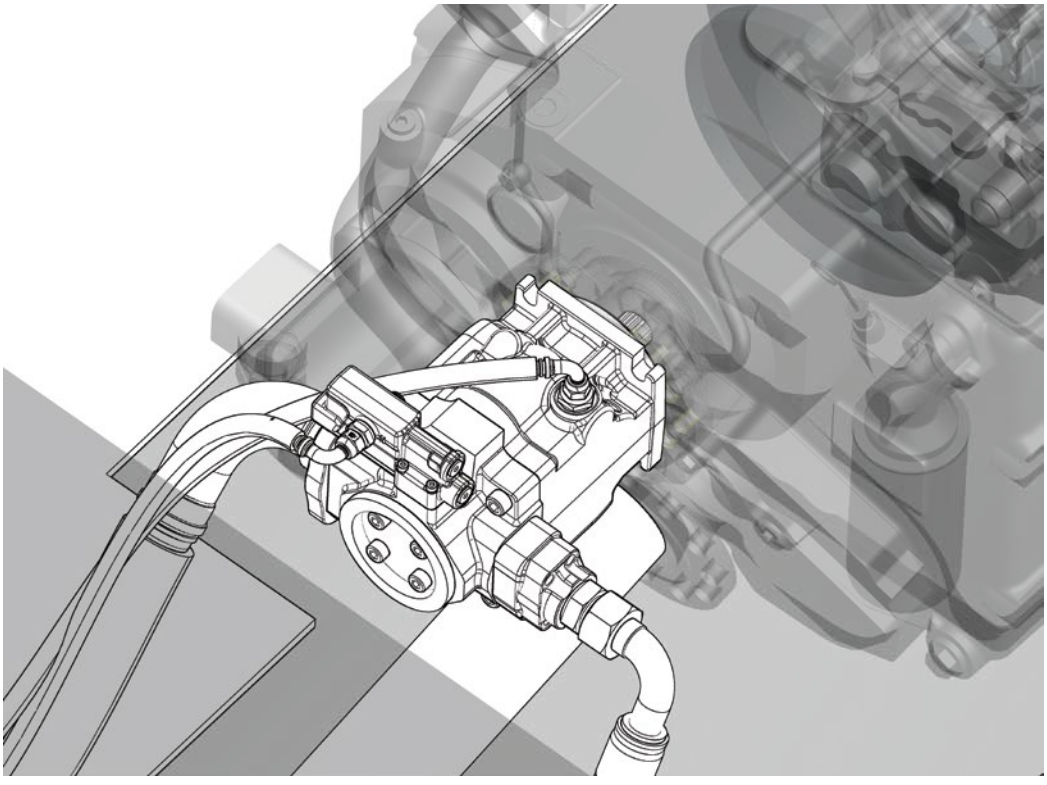
- Check for leaks between tank and pump that is running
- Shut down engine(s) and check the oil level in the tank. Refill if required. (Refill oil only after the accumulator tank is de-pressurized to avoid flooding the tank later on.)

PTO pump pressure adjustment

Most stabilizer systems come with pre-set PTO-pump(s) from Sleipner. The pump has a tag on the drive shaft telling actual pressure setting if this tag is not present, or other settings are required the pump pressure must be checked and adjusted if necessary.

(NB: System pressure will always be directly related to the actual system load at the time. Lack of system pressure is more often caused by open bleed/bypass/dump valve or other system related problems than incorrect pump setting.)

When the above issues are excluded and pump pressure is confirmed incorrect contact Side-Power for pump adjustment instructions. Please have system serial number and pump model data available for correct instructions.



MG_0223

Actuator Valve Unit.

The valve has multiple functions:

1. Combiner for the cylinder hoses
2. Electric operated decouple valve
3. Manual operated decouple valve

Manual operation:

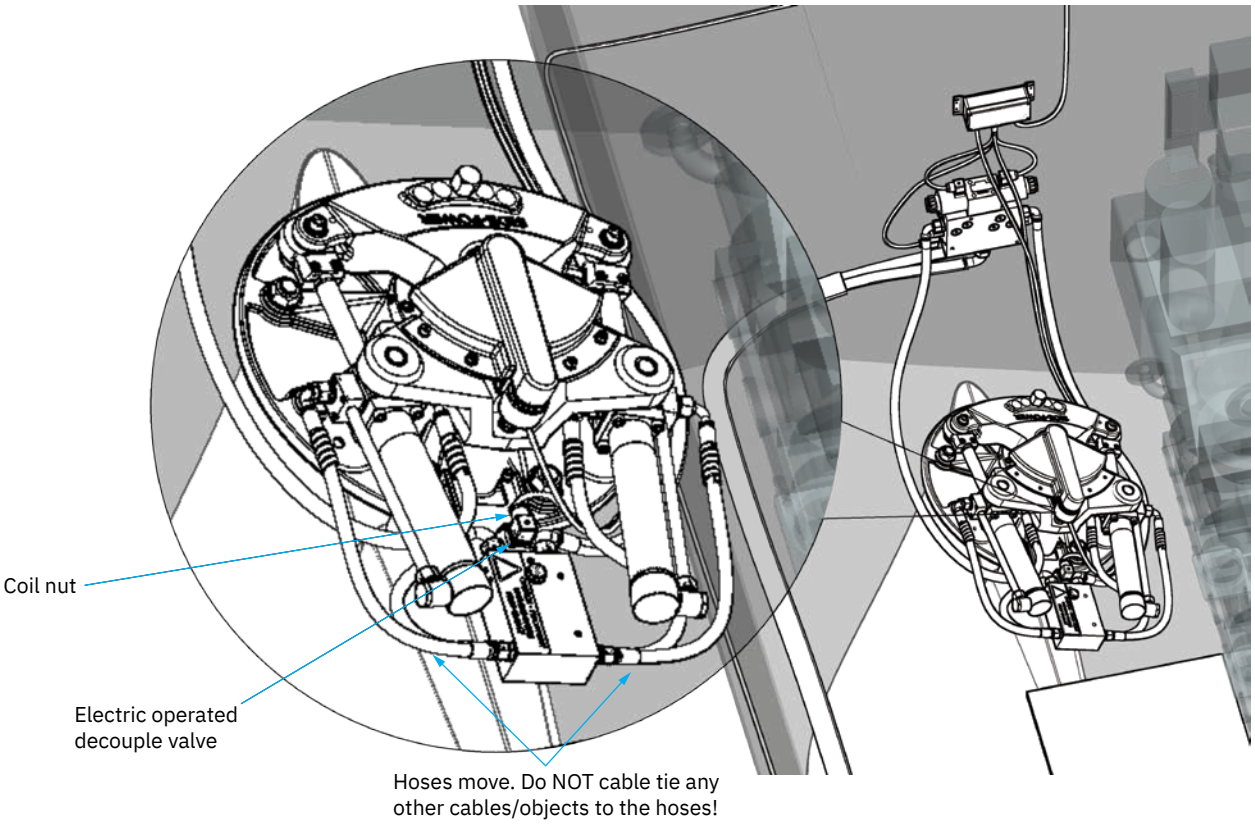
- Push the red button for manual bypass/de-coupling.

  Fins are now free and can be moved manually to the required position.

Hose Connection

Some banjo fitting brands used in combination with metric or BSP crimp fittings can cause interference between the swivel nut and the cylinder rod end. If required, the electrical operated decouple valve coil/solenoid can be removed during hose installation for better access to the hose fittings.

IMPORTANT
Electric operated decouple valve (coil nut) to be re-torqued to 6.8-9.5 Nm (5-7 Ft-lbs) Over torque of the coil nut will damage the valve function.



WARNING
If the valve is unlocked and opened be aware of unexpected movement of fins and cylinders. Especially if the boat is afloat !

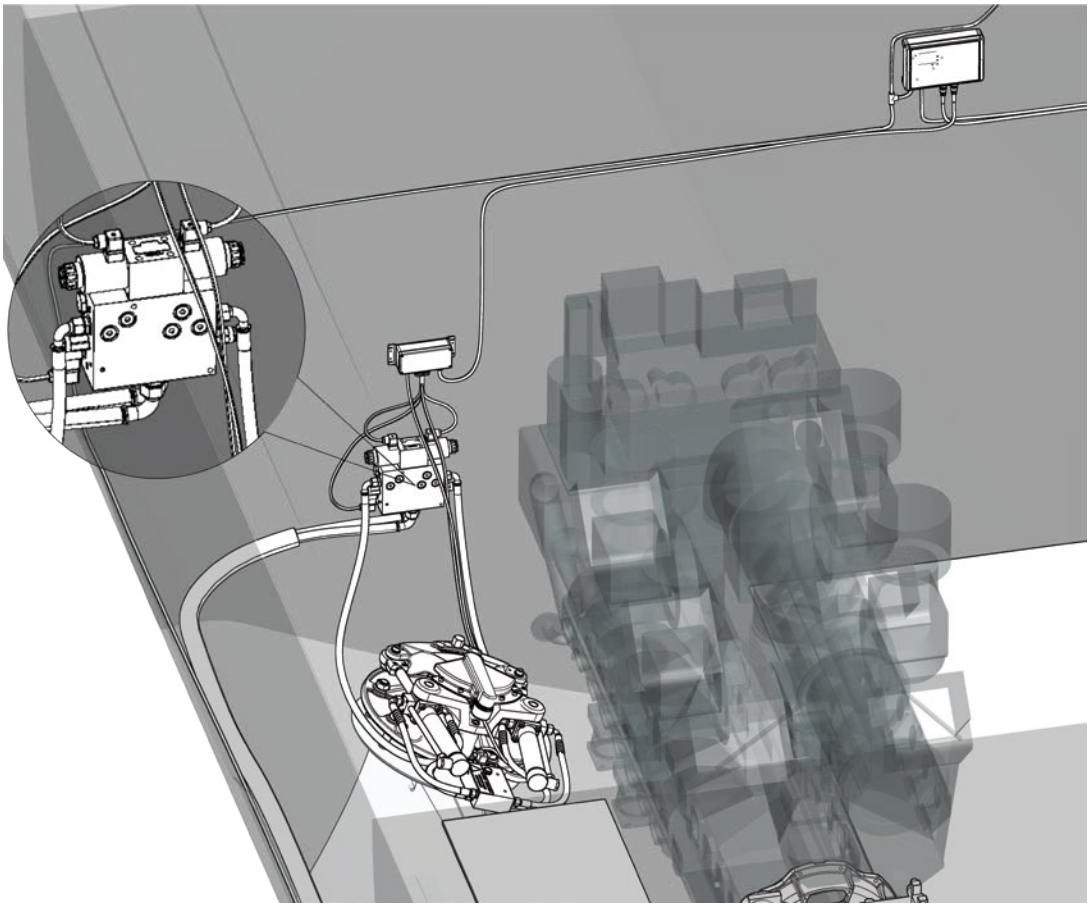
MG_0290

Fin Valve Unit

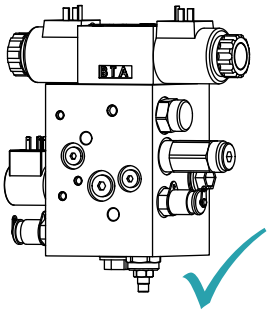
The Fin valve unit should be located as close as possible(Recommended < 2,5m (max 3,5m)), to the Actuator Valve Unit with recommended hose dimensions (System drawings). Use a minimum 2 layer steel braided hoses.

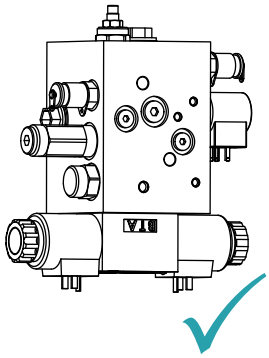
If the fin valve unit is installed more than 2,5m from the actuator, very stiff (none expanding) hoses or even better, some of the distance in rigid piping is necessary to not make the fin movement “soft” by the hoses expanding with varying pressure. Always fit hoses to the hull on soft mounts.

The unit must be mounted on a rigid flat surface - and we recommend to use a vibration dampening material behind them to avoid any high-frequency noise/vibration to go into the structure of the boat.



IMPORTANT
The unit must be mounted on a rigid flat surface





MG_0225

Fin Valve Unit manual decouple operation

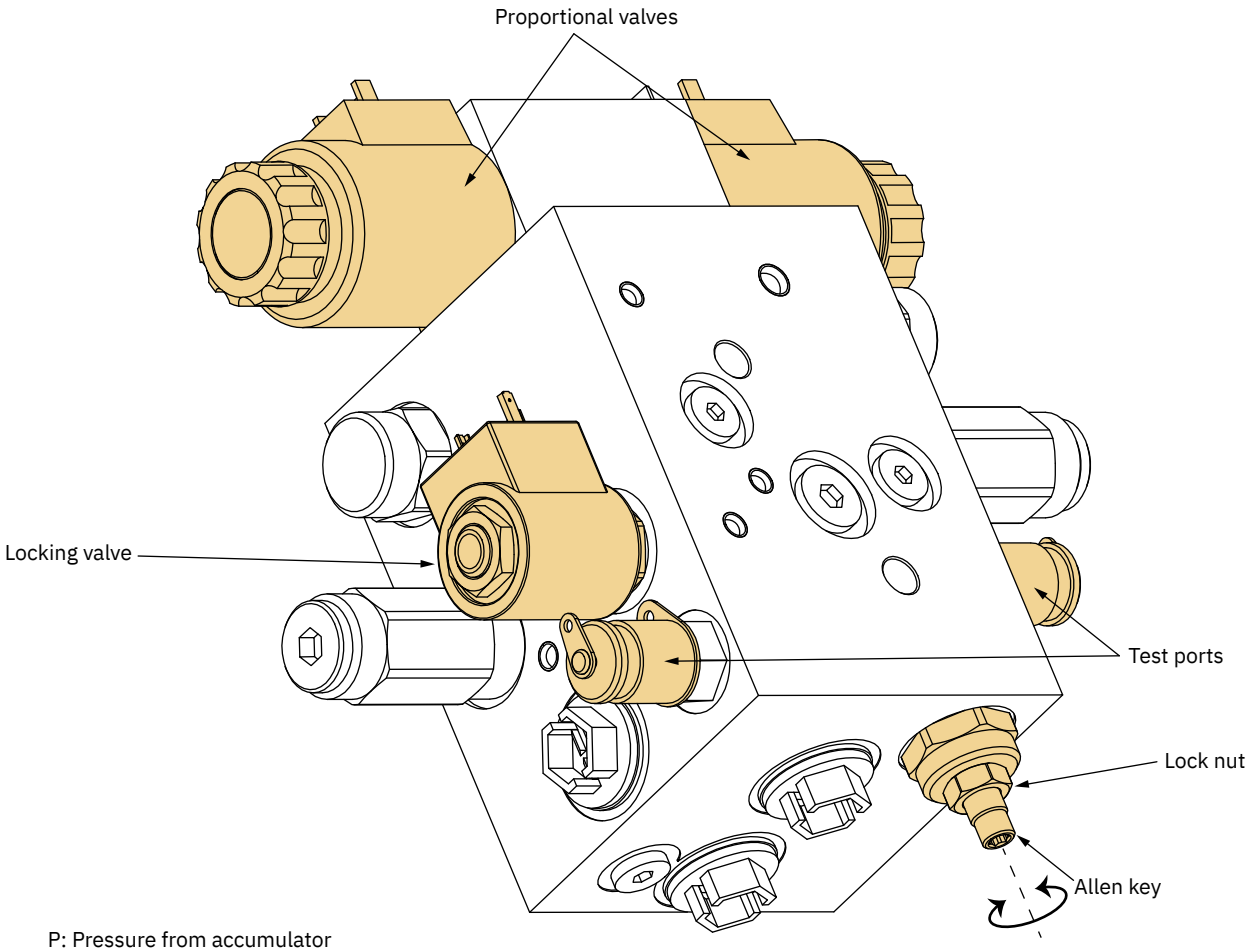
The manual operated valve can be used to allow manual movement of the Stabilizer Actuator Rams/Stabilizer fins.

- Unlock valve by turning the 9/16” lock nut anti-clockwise
- Open the valve by turning 3/16” Allen key anti-clockwise.

Fins are now free and can be moved manually to the required position.

IMPORTANT
Manual decouple valves have to be fully closed during normal operation of the stabilizer system.

WARNING
If the valve is unlocked and opened be aware of unexpected movement of fins and cylinders. Especially if the boat is afloat.



P: Pressure from accumulator
T: Tank return

MG_0226

Accumulator tank

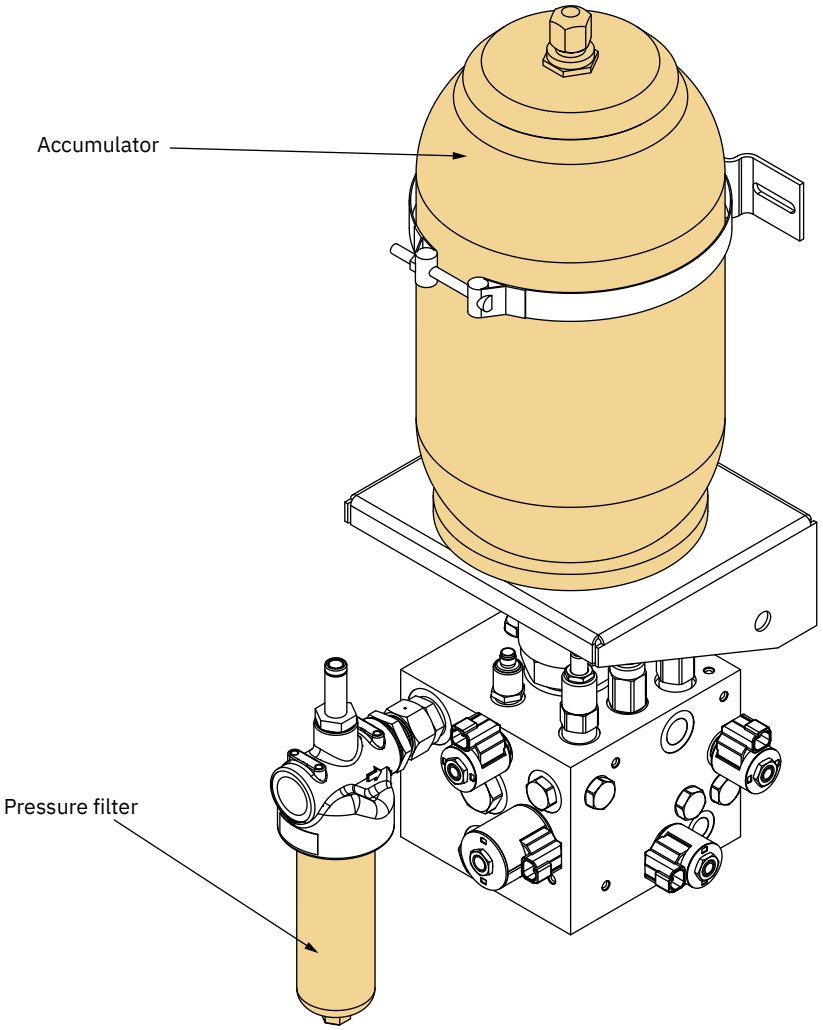
All stabilizer systems have accumulator tanks. The main purpose of the accumulator is to create additional capacity and quicker response to the stabilizing system. It also has a pulse dampening effect for the system.

For Nitrogen(N2) filling and testing procedure - see HYDAC manual. (Accumulator tank supplier) Bladder charge pressure - 45bar.

Base kit (Filling kit) - 321308 covers these countries: Austria, Belgium, Check Republic, Denmark, Finland, Germany, Netherlands, Norway, Poland, Sweden, Switzerland.

For other countries, additional adapters must be used, see HYDAC manual for the correct adapter.

IMPORTANT
Due to logistic reasons most accumulator tanks are shipped without nitrogen(N2) (if nothing else is agreed when the order was placed) in the pressure bladder in top of the accumulator tank. Therefore, make sure to fill the tank or check the pressure before startup according to the accumulator tank manual.



WARNING
Running the system without any nitrogen/pressure on the tank will damage the stabilizer system.

MG_0227

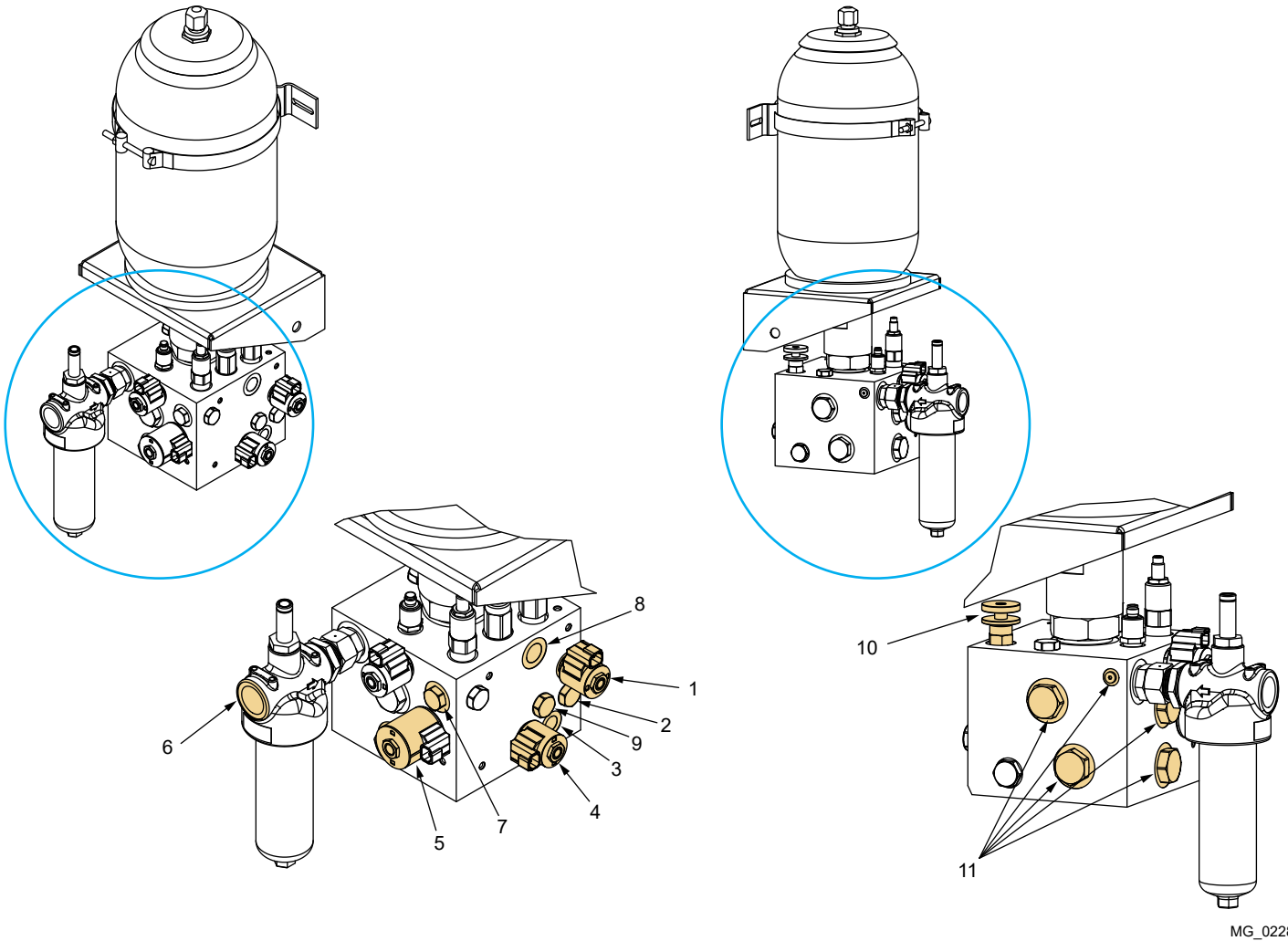
Main Valve Unit

The following functions and ports are integrated into the Main Valve unit:

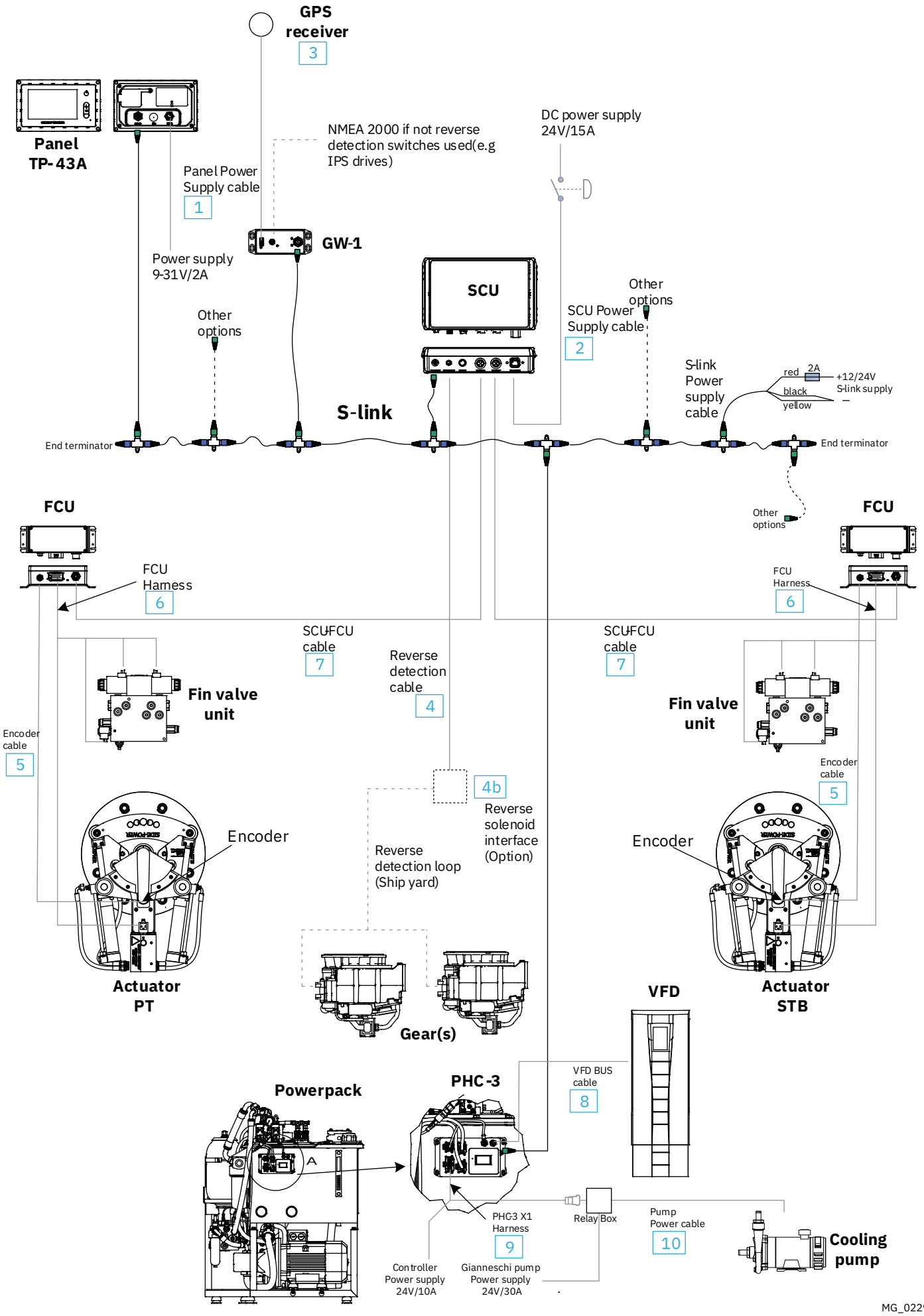
(1) - Accumulator Unloading Valve
(2) - LS-V: Load sense from Tank-mounted valve unit
(3) - PC: Pressure to Cooling Pump
(4) - Cooling Pump ON/OFF valve
(5) - Feed from Main Pump(s) ON/OFF
(6) - P-AC: Pressure from AC Pump
(7) - P-MAIN: Pressure from Main Pumps
(8) - T: Return to Return Combiner
(9) - LS-P: Load sense to Main Pumps
(10) - Manual Unloading Valve
(11) - P-STAB: Pressure to Fin Valve Units

IMPORTANT
During normal operation, the manual unloading valve has to be fully closed (tightened clockwise).

Refer to system drawings for details



MG_0228


GPS receiver
3
Panel TP-43A
Panel Power Supply cable
1
NMEA 2000 if not reverse detection switches used(e.g IPS drives)
DC power supply 24V/15A
GW-1
Power supply 9-31V/2A
SCU
Other options
SCU Power Supply cable
2
Other options
S-link Power supply cable
red 2A
+12/24V S-link supply
black
yellow
S-link
End terminator
End terminator
FCU
FCU
Other options
FCU Harness
6
FCU Harness
6
SCU-FCU cable
7
SCU-FCU cable
7
Reverse detection cable
4
Fin valve unit
Fin valve unit
Encoder cable
5
Encoder cable
5
4b
Reverse solenoid interface (Option)
Reverse detection loop (Ship yard)
Encoder
Encoder
Actuator PT
Actuator STB
Gear(s)
VFD
VFD BUS cable
8
Powerpack
PHC-3
PHC3 X1 Harness
9
Relay Box
Pump Power cable
10
Cooling pump
Controller Power supply 24V/10A
Gianneschi pump Power supply 24V/30A

MG_0229

1. Panel Power supply cable Part# 151090-020 - 2m

2. SCU Power supply cable Part# 151371-025 - 2,5m

3. GPS Receiver Part# 321714 - 10m

4. Reverse detection cable Part# 151375-100 - 10m
4b. Reverse Solenoid Interface Part# 151380
Optionally: pressure switches for ZF or TwinDisc gearboxes.

5. Encoder cable Part# 151271-015 - 1,5m
Encoder cable Part# 151271-030 - 3m
Encoder cable Part#151271-050 - 5 m

6. FCU harness Part# 151272 - 0,6m+3m
FCU harness Part# 151277 - 5m

7. SCU-FCU cable Part# 151370-040 - 4m
SCU-FCU cable Part# 151370-070 - 7m
SCU-FCU cable Part# 151370-100 - 10m
SCU-FCU cable Part# 151370-150 - 15m
SCU-FCU cable Part# 151370-200 - 20m
SCU-FCU cable Part# 151370-250 - 25m
SCU-FCU cable Part# 151370-300 - 30m

8. VFD BUS cable Part# 160311-050 - 5m

9. PHC-3 X1 Harness Part# 151470-1

10. Pump power cable Part# 10 2371 (24v) *PHC-3 controls relay inside.
Pump power cable Part# 10 2357 (hyd) * is operated via valve controlled by PHC-3.

IMPORTANT
If installing S-link products DO NOT connect any other control equipment to the S-link controlled products except Sleipner original S-link products or via a Sleipner supplied interface product made for interfacing with other controls. Any attempt to directly control or at all connect into the S-link control system without the designated and approved interface will render all warranties and responsibilities for the complete line of Sleipner products connected void and null. If you are interfacing by agreement with Sleipner and through a designated Sleipner supplied interface, you are still required to also install at least one original Sleipner control panel to enable efficient troubleshooting if necessary.

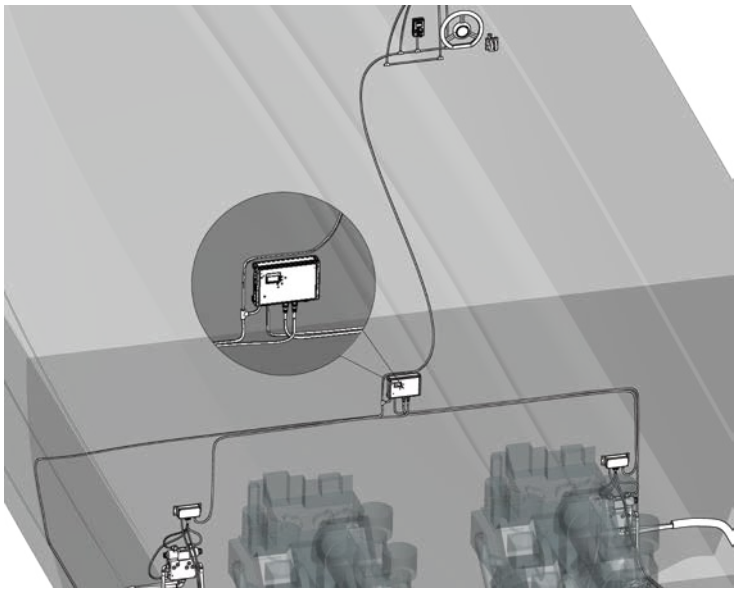
Mounting the SCU:

Mount the SCU on a bulkhead perpendicular to the keel, as central as possible in the boat (so it moves as little as possible). A typical location is the forward or aftward engine room bulkhead. It must be installed with the cable outlet facing DOWN - the direction if it is mounted facing forward or aft, a setting stating the direction is done in the control panel during setup.

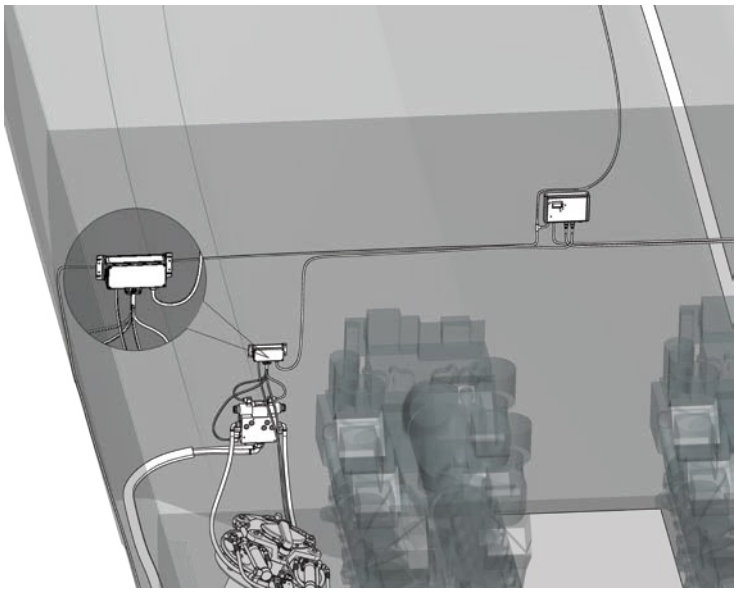
IMPORTANT
The mounting area MUST be vibration free.

Mounting the FCU:

Mount the FCU close to the actuator and fin valve unit.



Mounting the SCU



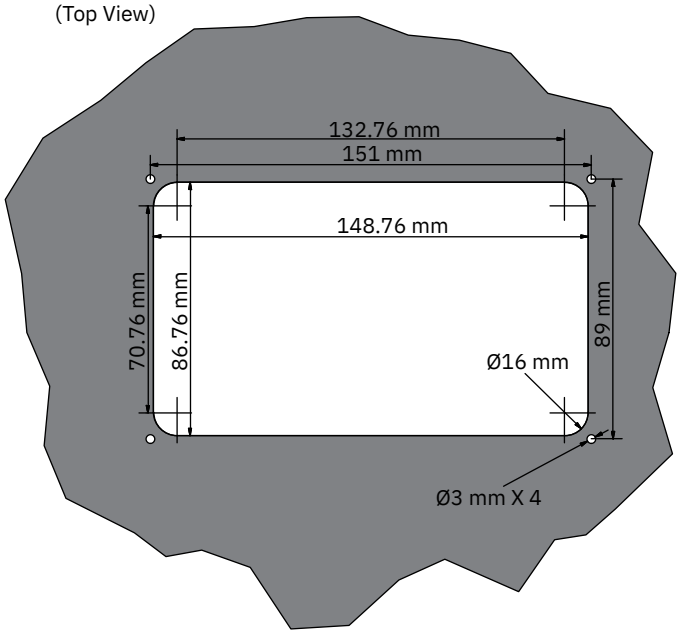
Mounting the FCU

MG_0230

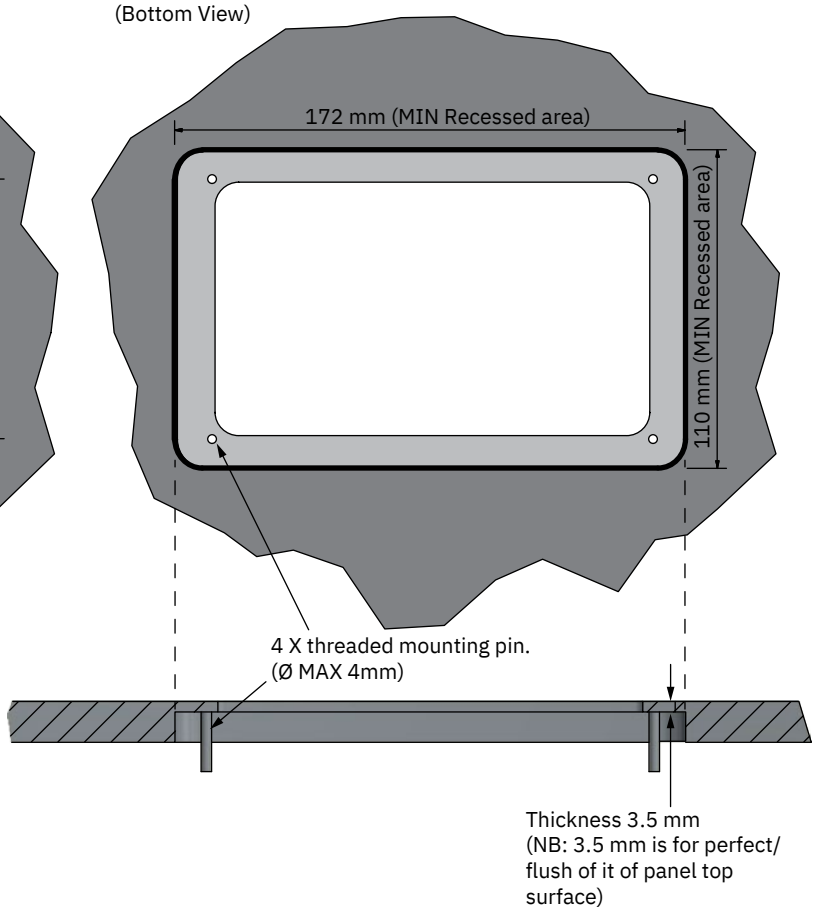
Mounting the Control Panel:

The main operating panel can be fitted on the dashboard(s) from the front using four screws with a smooth plastic cover. Or, it can be “flush mounted” by rear-fitting using studs or other solutions. The Stabilizer operating panel is a 4,3” sunlight-readable touch panel, that is used for setup and operation of the stabilizer system as well as other parts of the S-link system.

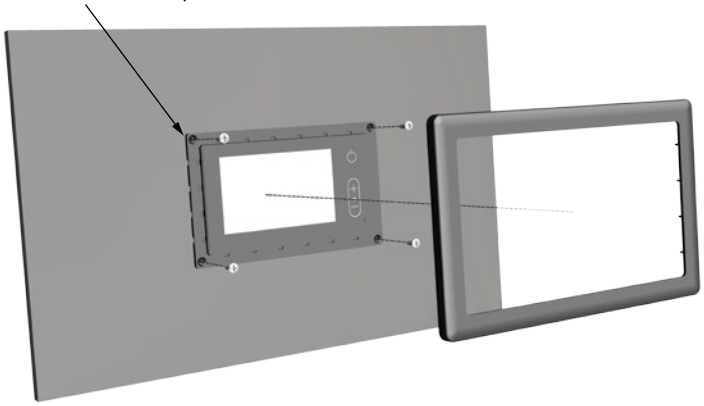
Front Mounting
(Top View)



Rear Mounting
(Bottom View)



Gasket between the dashboard and back surface of the panel.



Studs

Gasket

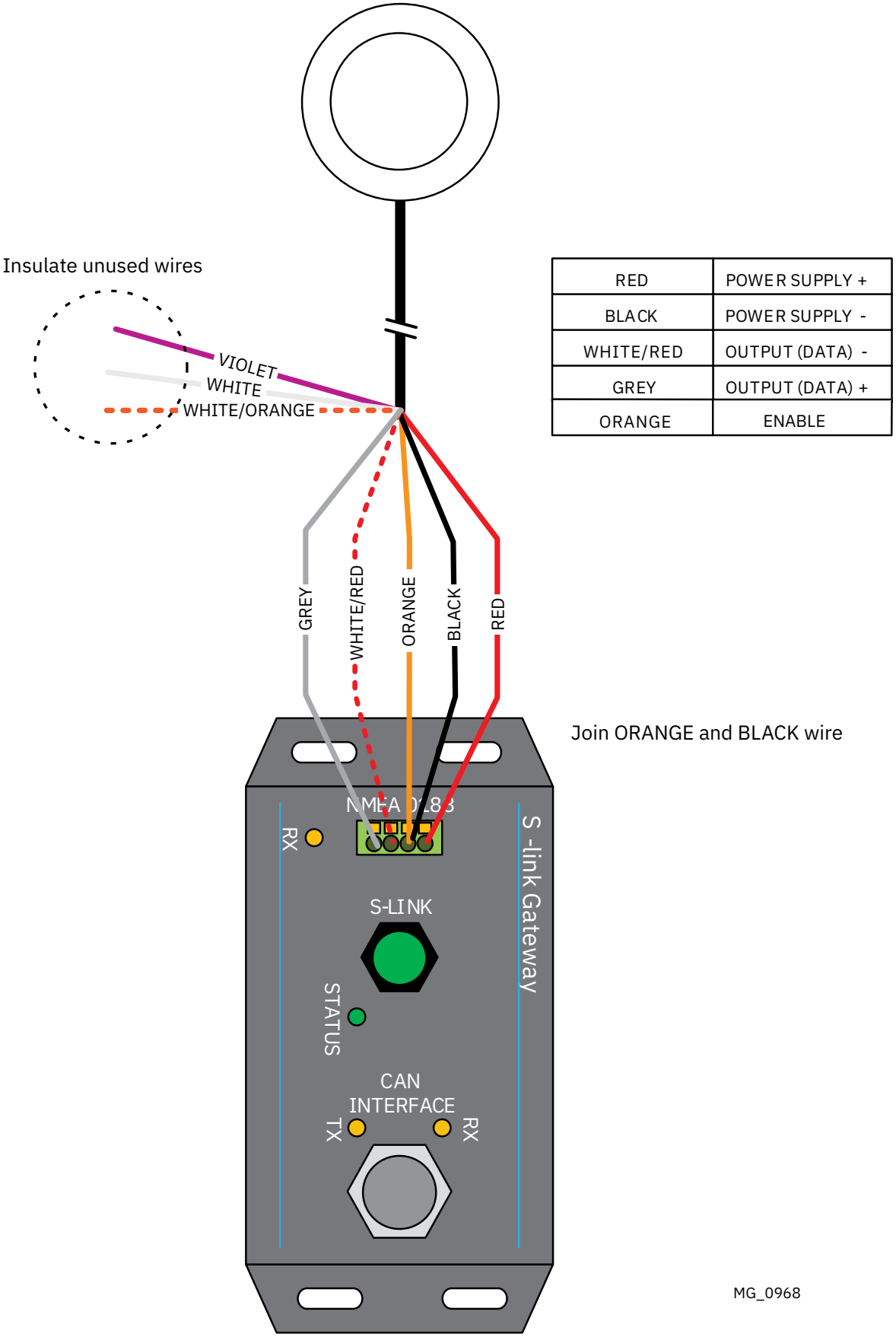
Ensure access to USB plug is available. If necessary use the included USB external plug with cable to extend the USB port.
(NB: This must only be used for upgrading the panel, not as power supply to other USB devices.)

MG_0231

Mounting the GW-1 including GPS receiver:

Mount the GW-1 within 10m from the GPS receiver, for example under the dashboard. See GW-1 manual for detailed information.

GARMIN GPS 19x HVS/GPS 24xd HVS



RED	POWER SUPPLY +
BLACK	POWER SUPPLY -
WHITE/RED	OUTPUT (DATA) -
GREY	OUTPUT (DATA) +
ORANGE	ENABLE

MG_0968

Wiring the control system:
See the electrical wiring diagram supplied with the system.

Control panel:
Connect the supplied power cable to a 9-31V, 2A fused circuit.
Connect the panel to the S-link bus with the appropriate S-link cables.

SCU:
Connect the SCU power supply cable 151371 to a 15A fused 24V DC supply. Plug the cable into connector X1. Connect the 151370-xxx cables for each Fin Control Unit (FCU) to the correct inputs X5-STBD and X6-PORT. Lock the connectors by twisting the locking ring clockwise until a click can be felt. Connect an S-link spur between input X2, and the S-link bus. Connect the 151375 Reverse detection cable into X3. Tighten the connector ring clockwise by hand. This connection should not be made in case of reverse detection over NMEA2000/S-link is implemented. All connector inputs are labelled on the SCU.

FCU:
Connect the 151370-xxx cable from the SCU into the appropriate connector. Lock the connector by twisting the locking ring clockwise until a click can be felt. Connect the wire harness 151272 into the rectangular connector. Connect each of the valve connectors to the correct solenoid valve, and secure the connector screw. Note that Proportional Valve A and Proportional Valve B connectors can be swapped. The actuator tuning performed during commissioning will detect and correct the operating direction. Wiring the actuator position encoder: Remove the yellow protective cap on the encoder connector and connect the 151271 cables between encoder and FCU. Tighten the connector rings clockwise by hand.

S-link:
Basics - The system needs a spur drop cable (green) for each S-link unit and a backbone loop through the yacht where you connect all the spur cables included a power feed spur on T-connectors. If you have upgraded to SEP thrusters you will also have
the thrusters and their power switches on the S-link. See S-link overview for cabling references.

GW-1/GPS receiver:
The GPS receiver is wired to the Gateway GW-1 NMEA0183 port, according to the diagram supplied with the GPS receiver. The GW-1 is connected to the S-link bus with the appropriate S-link cables. GW-1 and GPS are powered from the S-link bus. GPS data can also be provided from NMEA2000 GPS receivers if GW-1 is connected to an NMEA2000 network. In case GW-1 is connected both to an NMEA2000 network supplying GPS data, and a separate GPS receiver connected to the NMEA0183 port, the GW-1 will automatically switch between the signals.

Wiring the AC Power Pack:
In the case of single-phase supply systems, a Variable Frequency Drive (VFD) is delivered as part of the PowerPack. The VFD is used as an AC motor starter device, that supply 3 phase voltage for the AC motor. A separate breaker is required for the VFD supply. Recommended breaker size and the wire gauges can be found in the VFD quick start guide. Cable from VFD to the motor should be of a screened type, suited for VFD use. For further reference, see Quick Start Guide supplied with the VFD. For main circuit wiring.

Harness: #FCU-KIT-15
#FCU-KIT-30

Prop valve connectors A/B (X2/ X3)

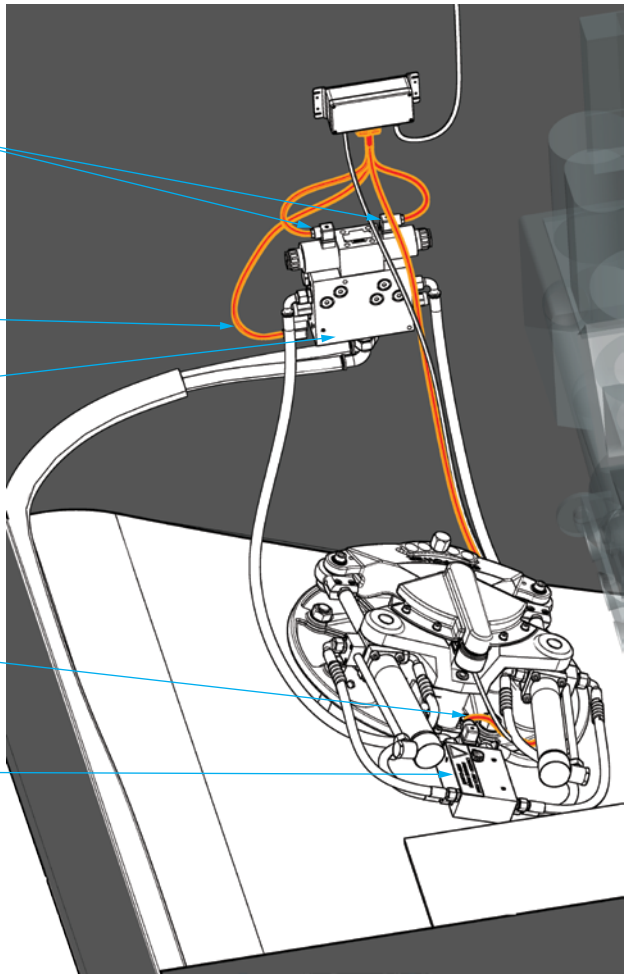
(NB: Connectors A/B can be placed either way. The valves direction will automatically be identified at startup.)

Lock valve connector (X5)

Fin Valve Unit

Float Valve connector (X4)

Actuator Valve Unit

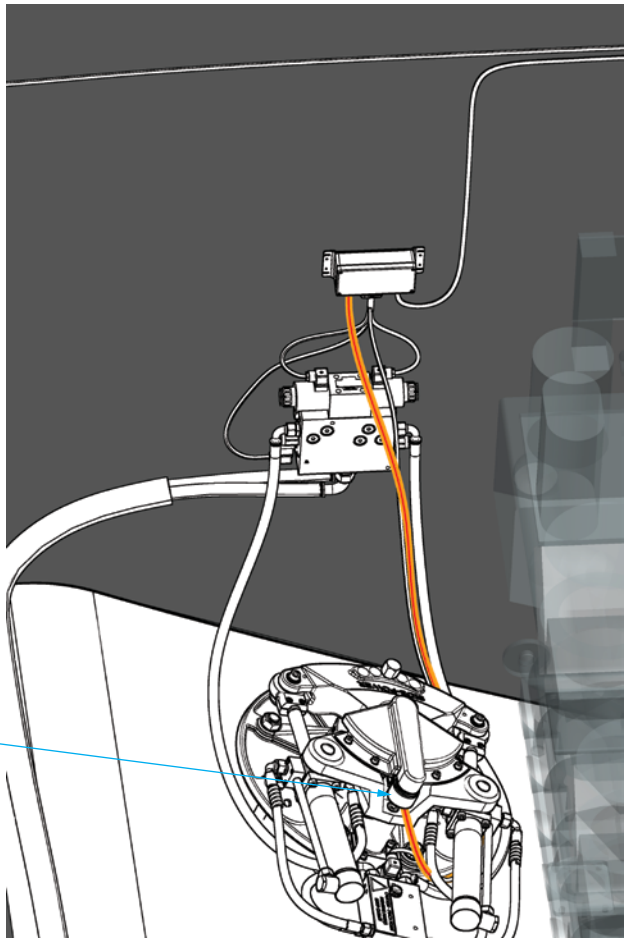


Encoder connection:

Cable: #151271-015
#151271-030

(Included in FCU-KITxx)

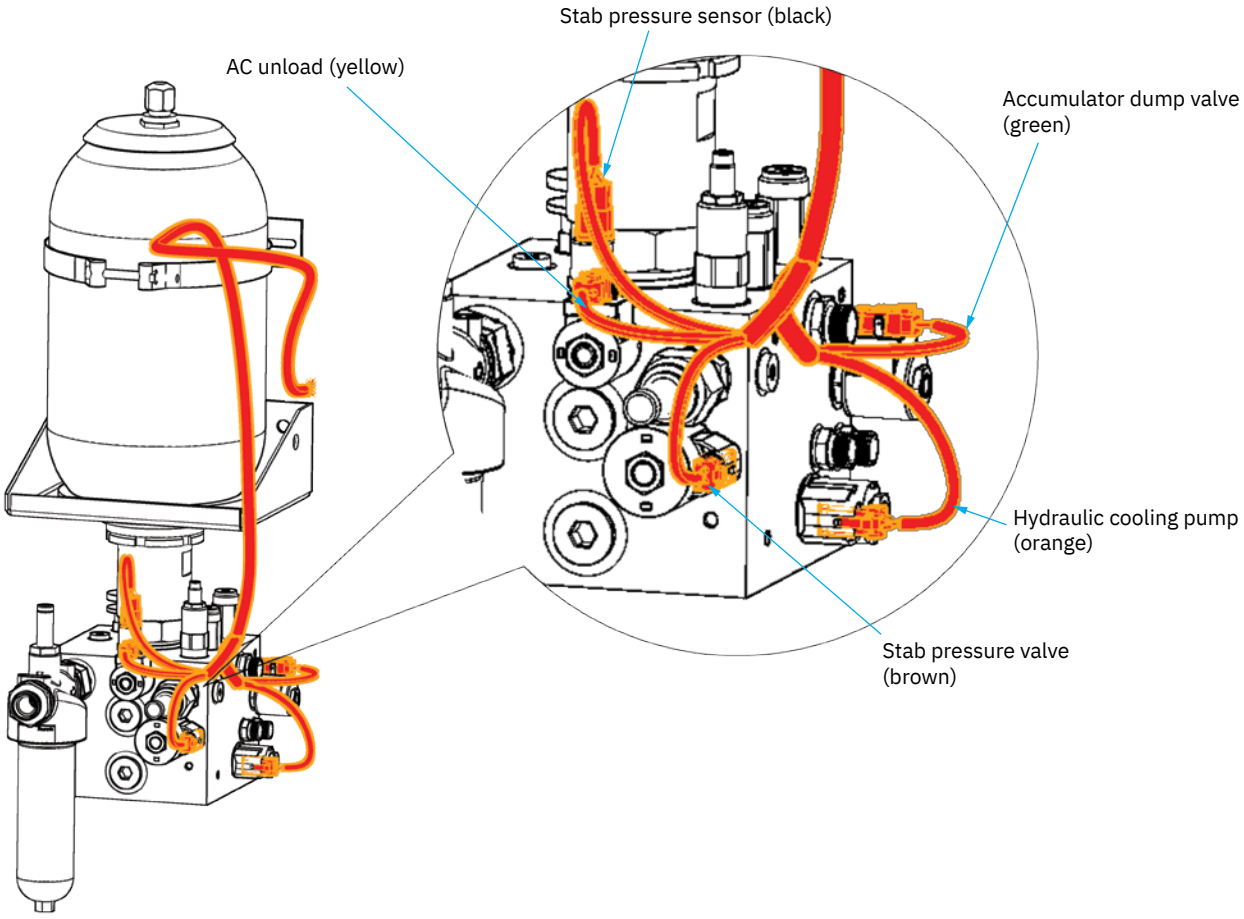
Float Valve connector (X4)



MG_0291

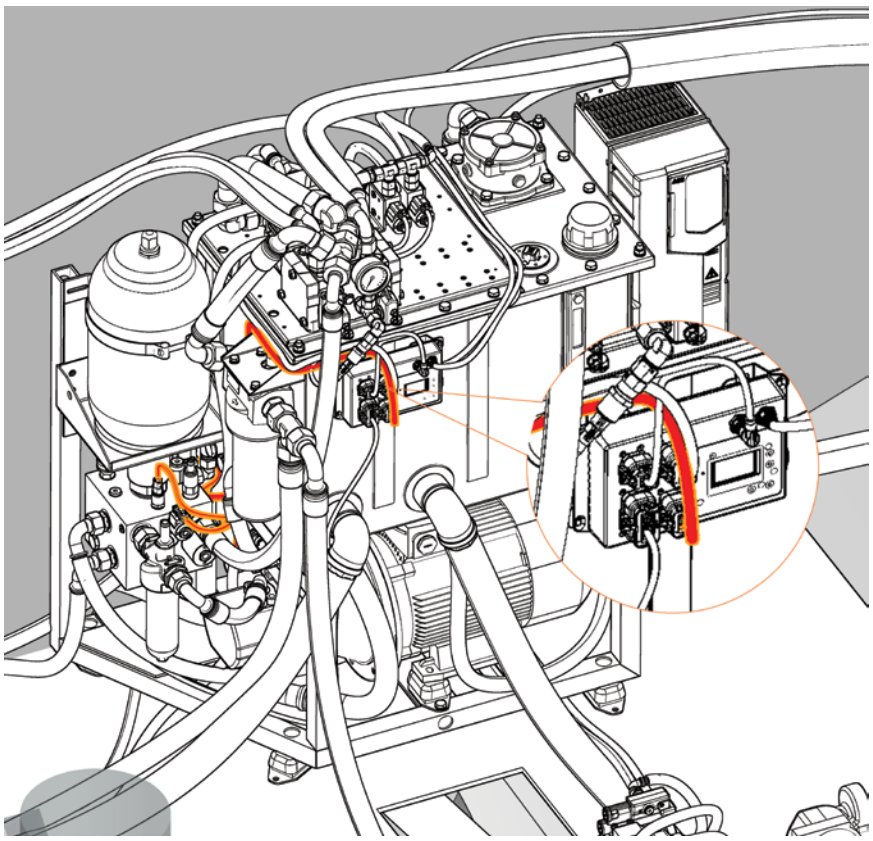
IMPORTANT
All electrical connections and wiring must be secured with cable ties appropriately and not in conflict with actuator cylinder hoses.

Main Valve Unit:
Harness: #151471-x



IMPORTANT
All electrical connections and wiring must be secured with cable ties appropriately and not in conflict with actuator cylinder hoses.

Main Valve Unit:
Integrated in a thruster and stabilizer rack. Harness is pre-installed from factory. Also integrated/pre-installed in a standalone stabilizer system.



MG_0234

S-Link System Description

MC_0120

S-Link is a CAN-based control system used for communication between Sleipner products installed on a vessel. The system uses BACKBONE Cables as a common power and communication bus with separate SPUR Cables to each connected unit. Only one S-Link POWER cable shall be connected to the BACKBONE Cable. Units with low power consumption are powered directly from the S-Link bus.

Main advantages of S-Link system:

- Compact and waterproof plugs.
- BACKBONE and SPUR Cables have different colour coding and keying to ensure correct and easy installation. BACKBONE Cables have blue connectors and SPUR Cables have green connectors.
- Different cable lengths and BACKBONE Extenders make the system scalable and flexible to install.

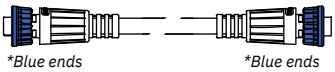
Installation of S-Link cables:

Select appropriate cables to keep the length of BACKBONE- and SPUR Cables to a minimum. In case of planned installation with total BACKBONE Cable length exceeding 100 meters please consult your local distributor. The S-Link cables should be properly fastened when installed to avoid sharp bend radius, cable chafing and undesired strain on connectors. Locking mechanism on connectors must be fully closed. To ensure long lifetime, cables, T-Connectors and Extenders should not be located so that they are permanently immersed in water or other fluids. It is recommended to install cables in such a way that water and condensation do not flow along the cables into the connectors. This can be done for example by introducing a u-shape bend before the cable enters the product connector.

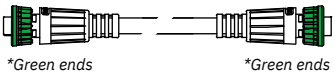
Ideally, the POWER Cable should be connected to the middle of the BACKBONE bus to ensure an equal voltage drop at both ends of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

To reduce the risk of interference, avoid routing the S-Link cables close to equipment such as radio transmitters, antennas or high voltage cables. The backbone must be terminated at each end with the END Terminator.

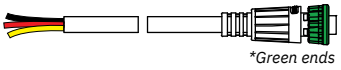
SPUR cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



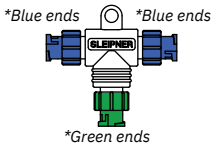
BACKBONE Cable
Forms the communication and power bus throughout a vessel. Available in different standard lengths.



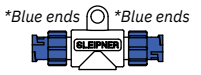
SPUR Cable
Used to connect S-Link compliant products to the backbone cable. One SPUR Cable must be used for each connected component, with no exceptions. Recommended to be as short as practically possible. Available in different standard lengths.



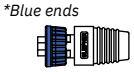
POWER Cable
Required in all installations for connection of BACKBONE Cable to a power supply and should be protected with a 2A fuse.



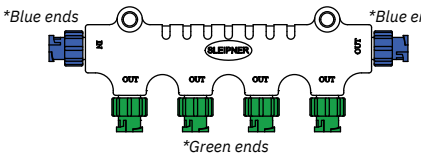
T-Connector
Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.



BACKBONE Extender
Connects two BACKBONE Cables to extend the length.

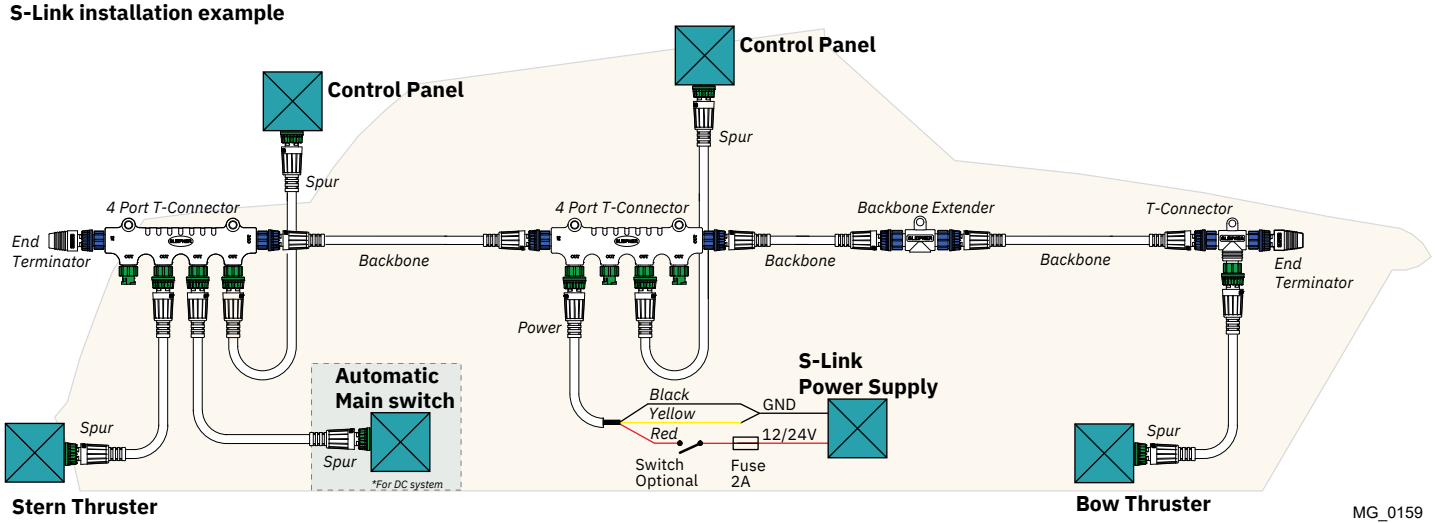


END Terminator
Must be one at each end of the BACKBONE bus.



4-Port T-Connector
The 4-PORT T-connector allows multiple SPUR Cables to be connected. The 4-PORT T-connector comes with two sealing caps to protect unused ports.

S-Link installation example

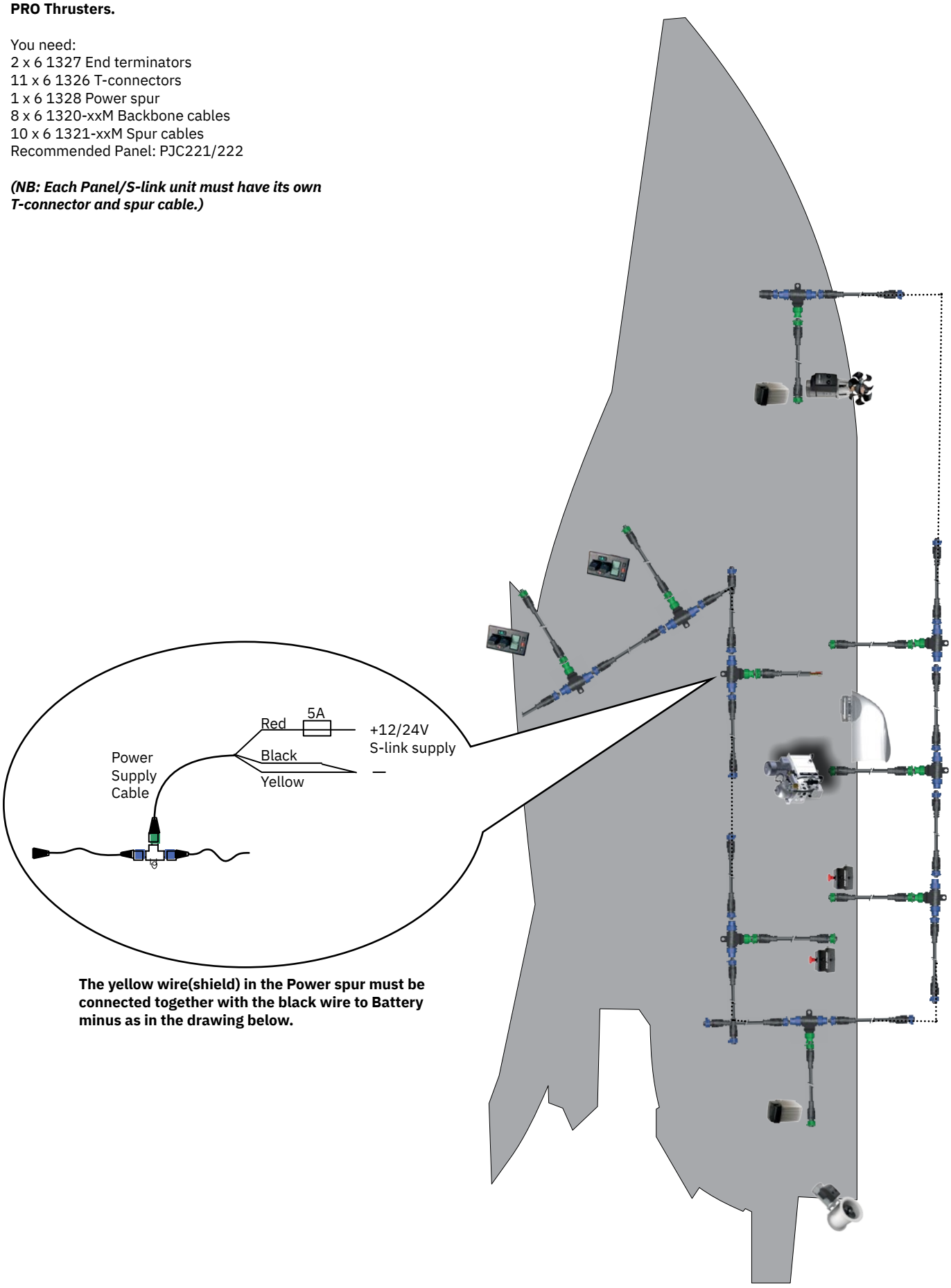


MG_0159

Example of S-Link wiring with Stabilizers and DC PRO Thrusters.

You need:
2 x 6 1327 End terminators
11 x 6 1326 T-connectors
1 x 6 1328 Power spur
8 x 6 1320-xxM Backbone cables
10 x 6 1321-xxM Spur cables
Recommended Panel: PJC221/222

(NB: Each Panel/S-link unit must have its own T-connector and spur cable.)



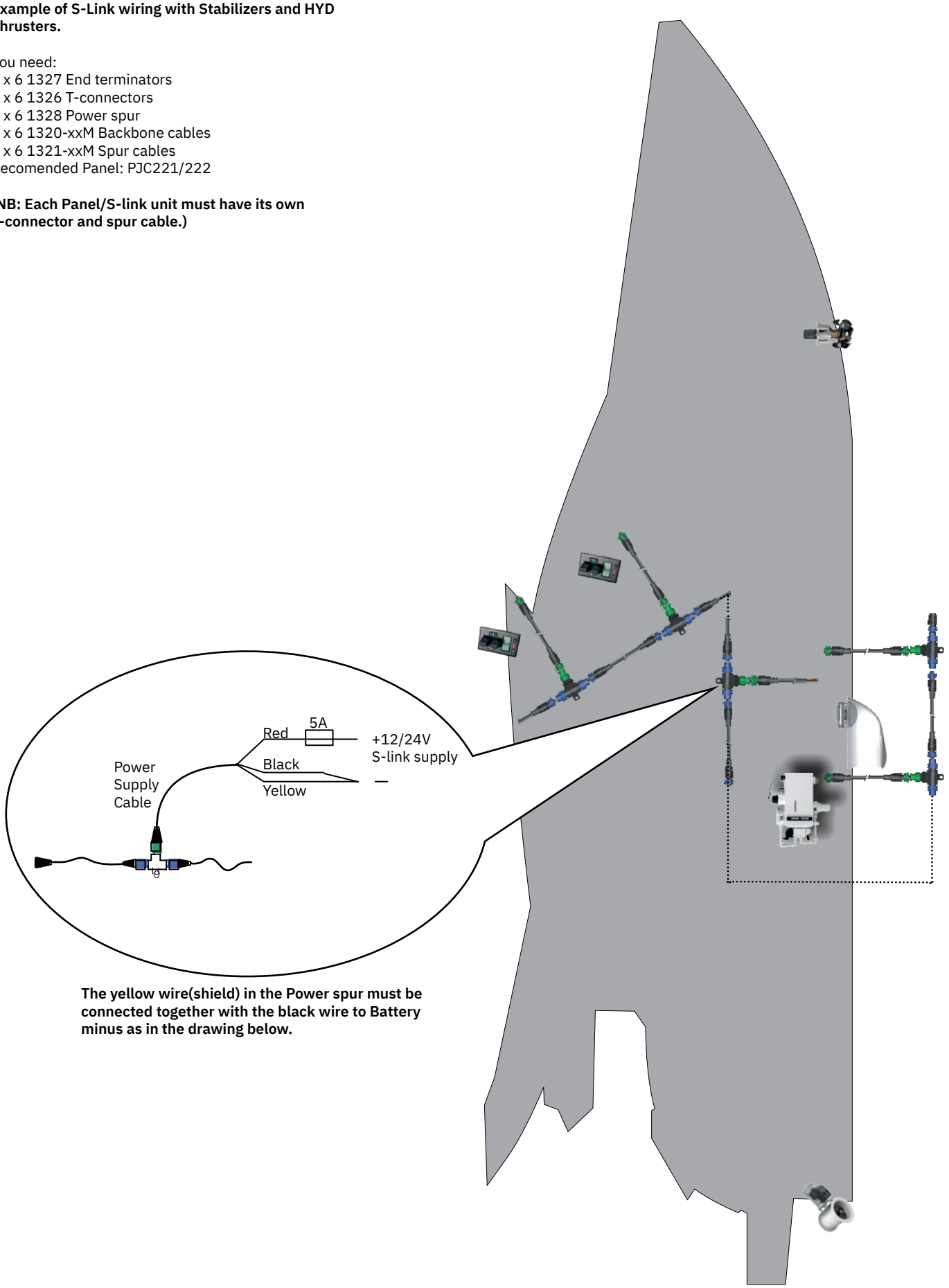
The yellow wire(shield) in the Power spur must be connected together with the black wire to Battery minus as in the drawing below.

MG_0235

Example of S-Link wiring with Stabilizers and HYD Thrusters.

You need:
2 x 6 1327 End terminators
7 x 6 1326 T-connectors
1 x 6 1328 Power spur
4 x 6 1320-xxM Backbone cables
6 x 6 1321-xxM Spur cables
Recomended Panel: PJC221/222

(NB: Each Panel/S-link unit must have its own T-connector and spur cable.)



The yellow wire(shield) in the Power spur must be connected together with the black wire to Battery minus as in the drawing below.

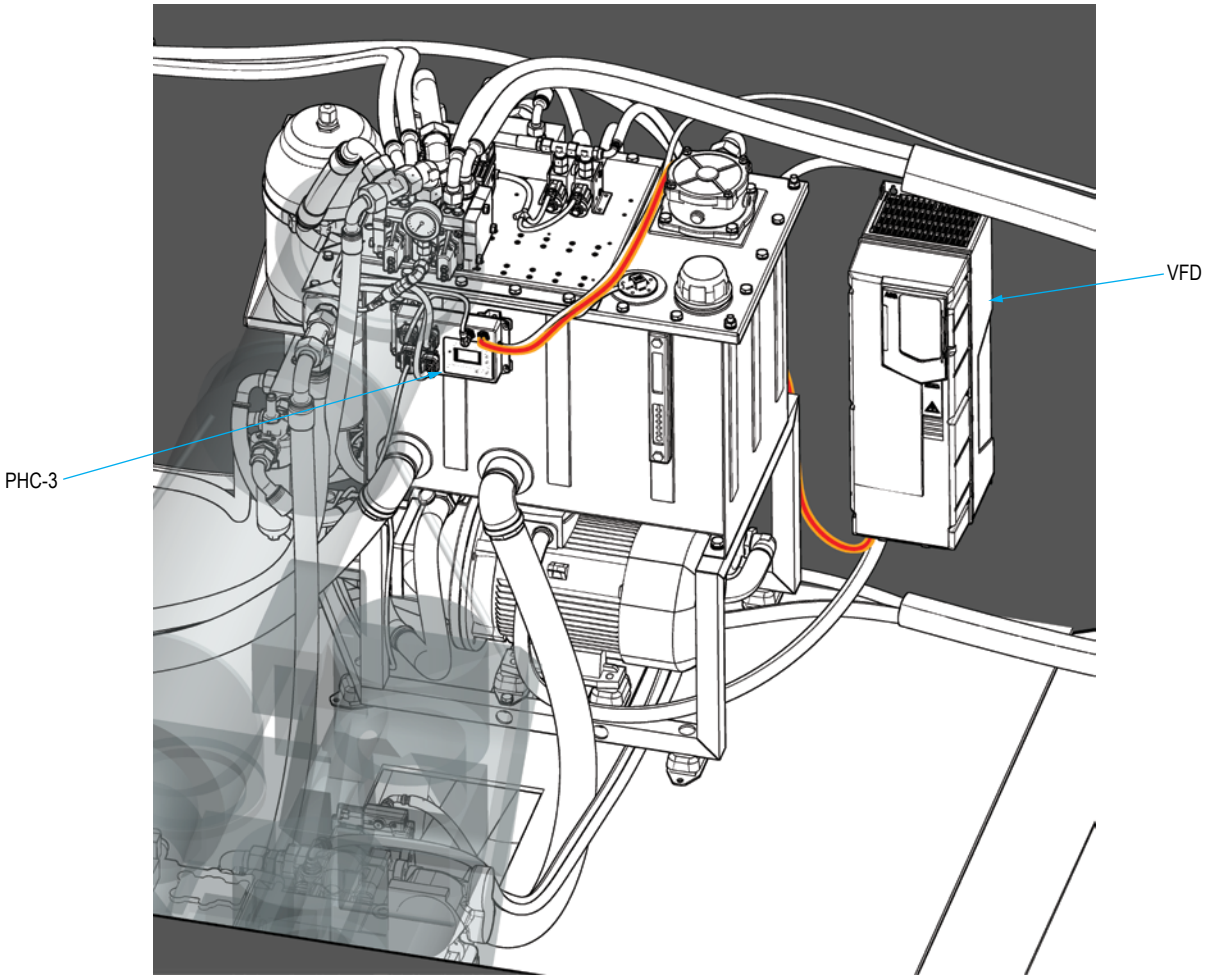
MG_0235

VFD:

Mount the VFD relatively close to the PHC-3 controller(Power pack/Rack/Tank/AC motor), within 4 meters.
Harness: #160311-050

(NB: VFD must be protected from any water spray.)

IMPORTANT
Follow the installation guidelines from the VFD manual supplied with the system.



MG_0237

VFD cable dimensions:
* Based on MAX 20 meters cable lengths.

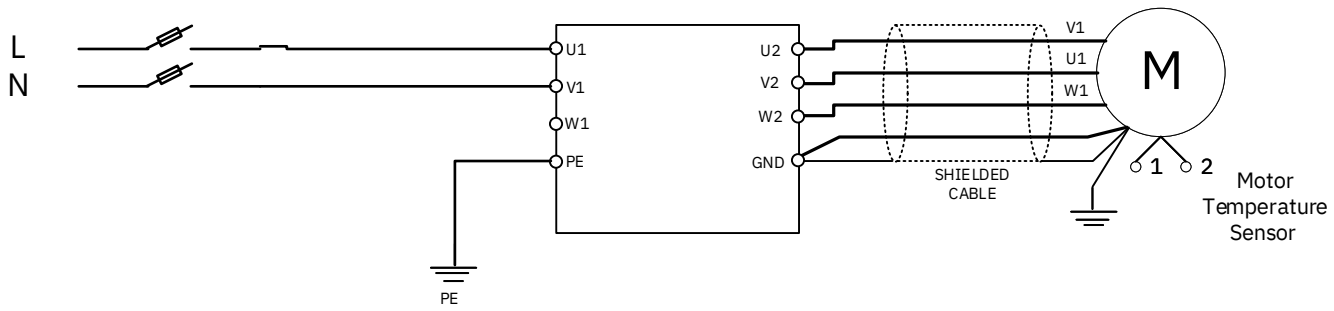
Motor power (kW)	Input Phases	Input Voltage (V)	Input Supply Current (A)	Motor Current (A)	Input Wire Size (mm²)*	Motor Wire Size (mm²)*
3,5	1	220	21,8	12,6	4	2,5
4,6	1	220	29,1	16,8	6	4
5,5	1	220	39,0	22,5	10	6
7,5	1	220	46,2	26,7	16	10
7,5	3	220	26,7	26,7	10	10
11	1	220	67,5	39,0	25	16
11	3	220	39,0	39,0	16	16
11	3	400	21,0	21,0	4	4
15	1	220	88,3	51,0	35	16
15	3	220	51,0	51,0	16	16
15	3	400	28,0	28,0	10	10

Changes or misprints might occur in information given.

IMPORTANT
Responsible electrical technician must consider fitting method, temperature conditions and cable lengths before doing this electrical work.
This table is just a general recommendation.

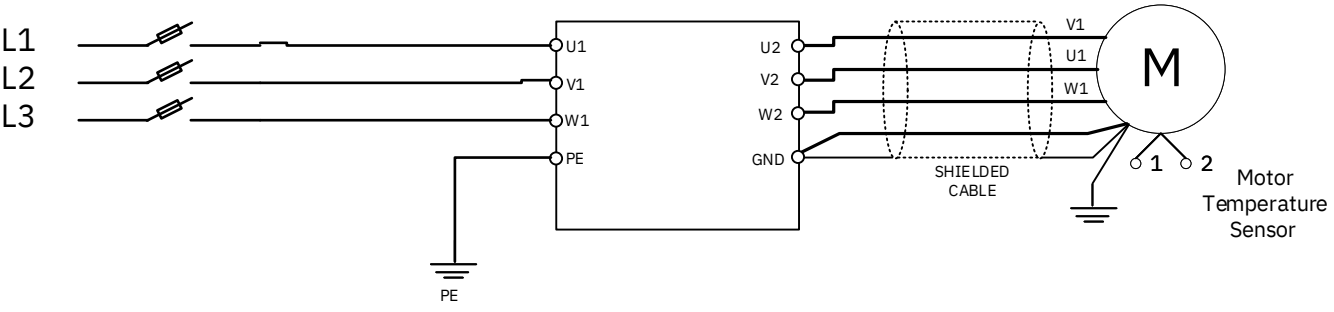
Single Phase Supply

ABB ACS580



Three Phase Supply

ABB ACS550



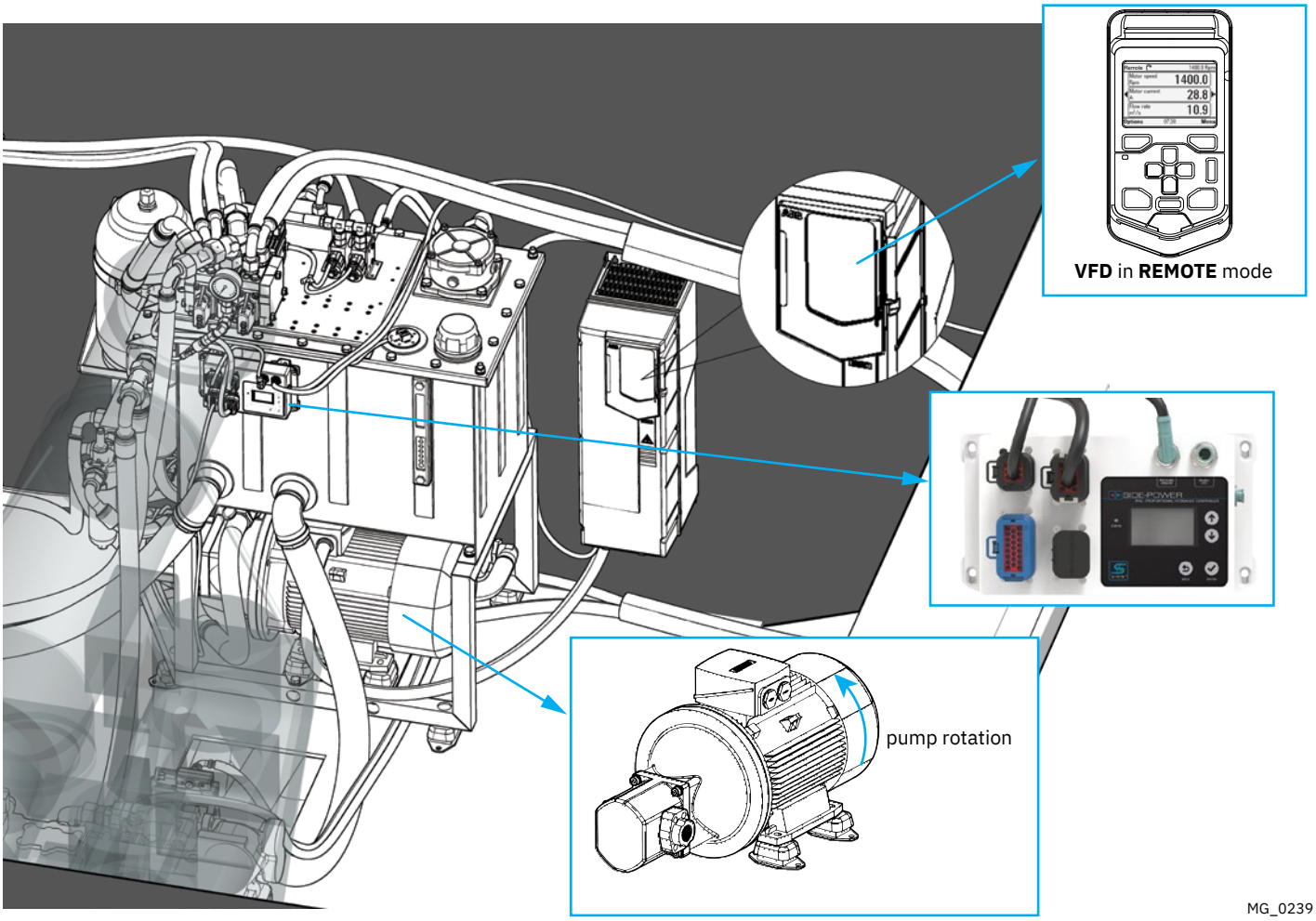
MG_0238

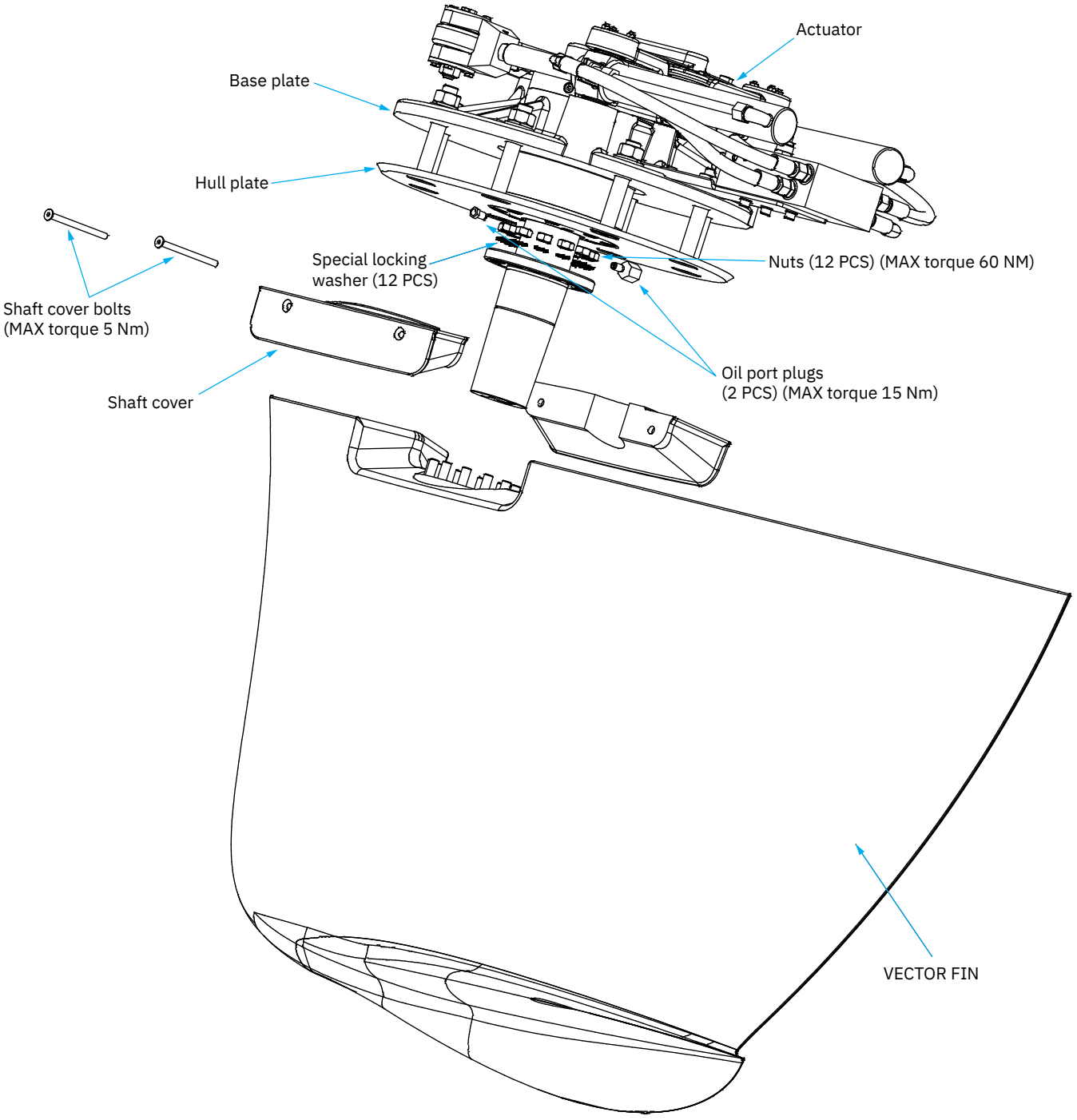
AC Motor driven Pump Unit Pre-Startup

IMPORTANT
The yachts main engine(s) must be switched off during this procedure. The first start of the AC Motor/Pump Unit must be carried out manually from the PHC-3 control panel. However, before performing pre-startup procedure from the PHC-3 ensure the VFD(variable frequency drive) is in REMOTE mode. The VFD panel is factory programmed, therefore no additional functional programming should be required.
Complete the checklist found at the back of this manual before pressurizing the system!

- Leave Stabilizer system off at control panel. (Bypass and dump valves will be open)
- Check oil level in tank and open cock valves (if present) on AC pump feed line.
- Open the Manual Unloading Valve by turning the wheel fully anti-clockwise.
- AC motor pre-startup from PHC-3: See MANUAL OPERATION – See ABB MANUAL for first start details - START VFD procedure in PHC-3 manual.
- Monitor oil level and stop the AC pump and refill oil if required.
- When pres-startup is completed, close the Manual Unloading Valve.
- Check for oil leaks and tighten if required.

IMPORTANT
Verify the drive direction in accordance with the direction arrow label on the AC Motor/Pump Unit. To better see/feel the drive




Actuator
Base plate
Hull plate
Special locking
washer (12 PCS)
Nuts (12 PCS) (MAX torque 60 NM)
Shaft cover bolts
(MAX torque 5 Nm)
Oil port plugs
(2 PCS) (MAX torque 15 Nm)
Shaft cover
VECTOR FIN

MG_0292

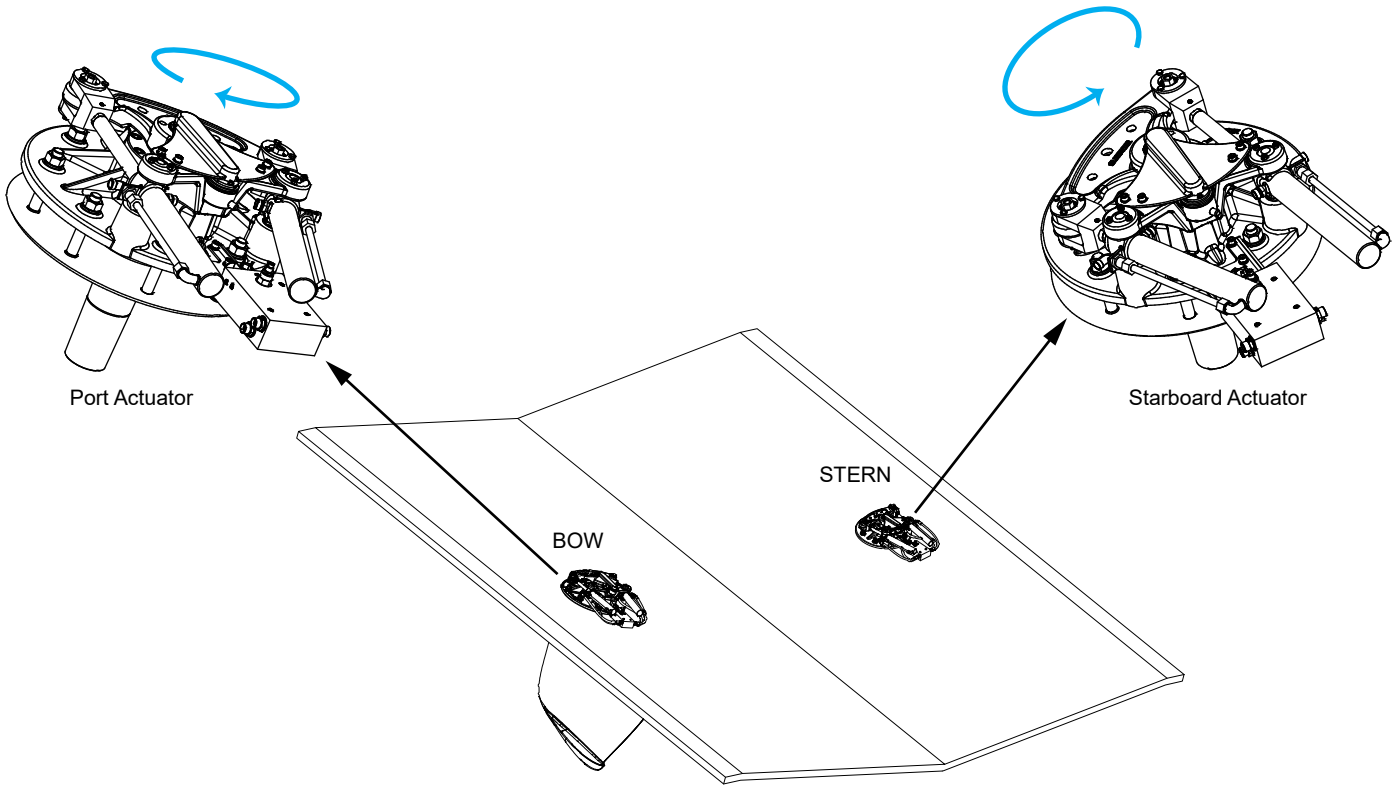
Correct actuator position for fin shaft installation

The following figures illustrate the position the stabilizer actuator assembly cylinders must be positioned in relation to the fully outboard position of the relevant fin.

When viewed and seen from inside/above the relative Stabilizer Actuator assembly:

- Rotate the Port Actuator fully to clockwise.
- Rotate the Starboard Actuator Fully counter clockwise.
- See Transversal fin positioning section.

IMPORTANT
During FIN INSTALLATION procedure, fins/actuators can/will move, ensure that health and safety measures will be taken



MG_0293

WARNING
A hand oil pump (Installation tool kit, Item nr VFT55) must be used to achieve the fin installation. The pump should only be operated by qualified personnel that follow the pump manual operating instruction and health and safety directives.

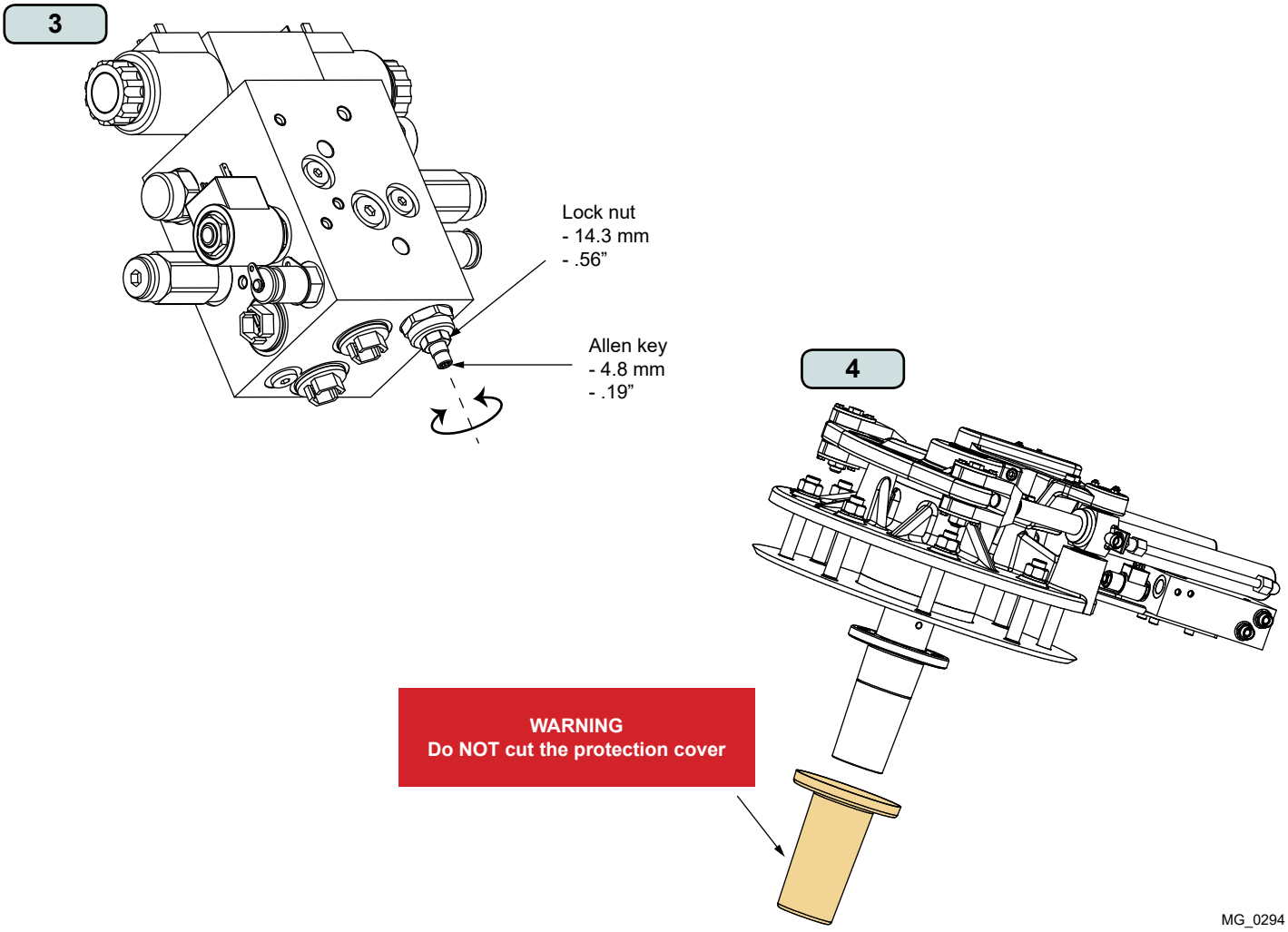
Installation of the fin assemblies

1. Place correct fin on a pallet adjacent to relevant actuator under the yacht for mounting.

2. Locate port and starboard fin valve units.

3. On the fin valve units locate the manual decouple valve. ***(Relevant only, if you do not have any electrical or hydraulic power installed yet)***
   - Unlock the valve by turning the 9/16” lock nut anti-clockwise.
   - Open the valve by turning the 3/16” Allen key anti-clockwise.

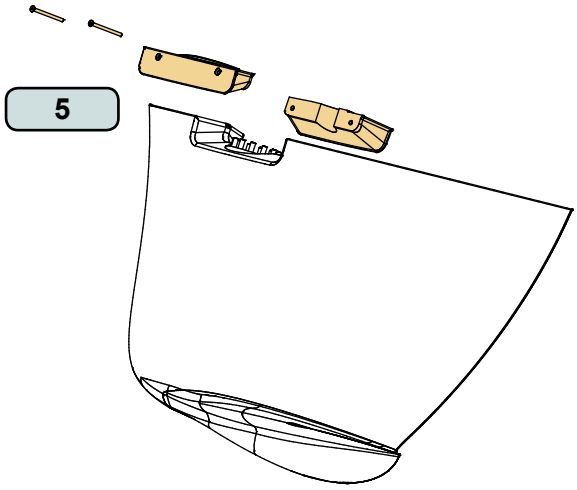
4. Remove protective covering from the actuator shaft. Clean and degrease the angled surface. ***(NB: The protective cover can easily be removed by blowing air using a air pressure gun into the bottom hole of the cover.)***

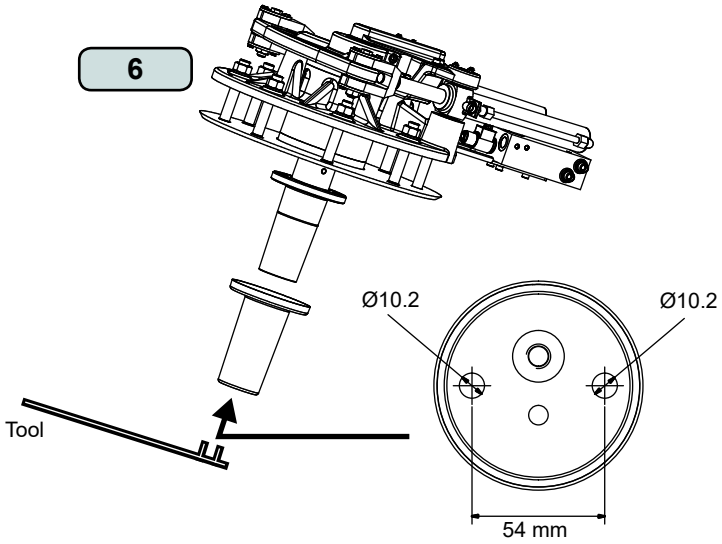


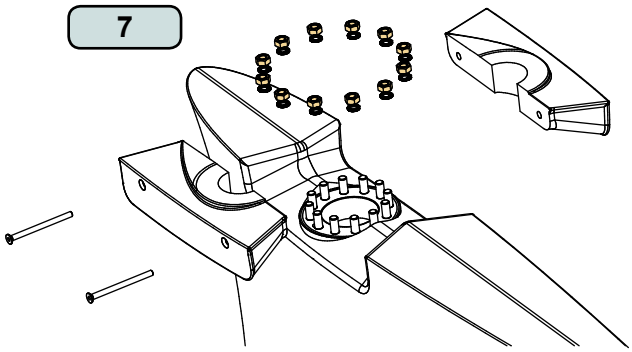
5. Remove shaft covers from fin using a 4mm Allen key.

6. Use a suitable tool to move the actuator to the most outboard position, without damaging the shaft. Checking on the actuator that the cylinders are in the outboard position (inboard will be fully aft, outboard will be fully forward). Ensure that the actuator stays in the outboard position when fin is being installed.

7. - Remove the transportation protection from the Stabilizer fin assembly.
   - Unscrew all nuts and washers.
   - Inspect and clean the internal hub.







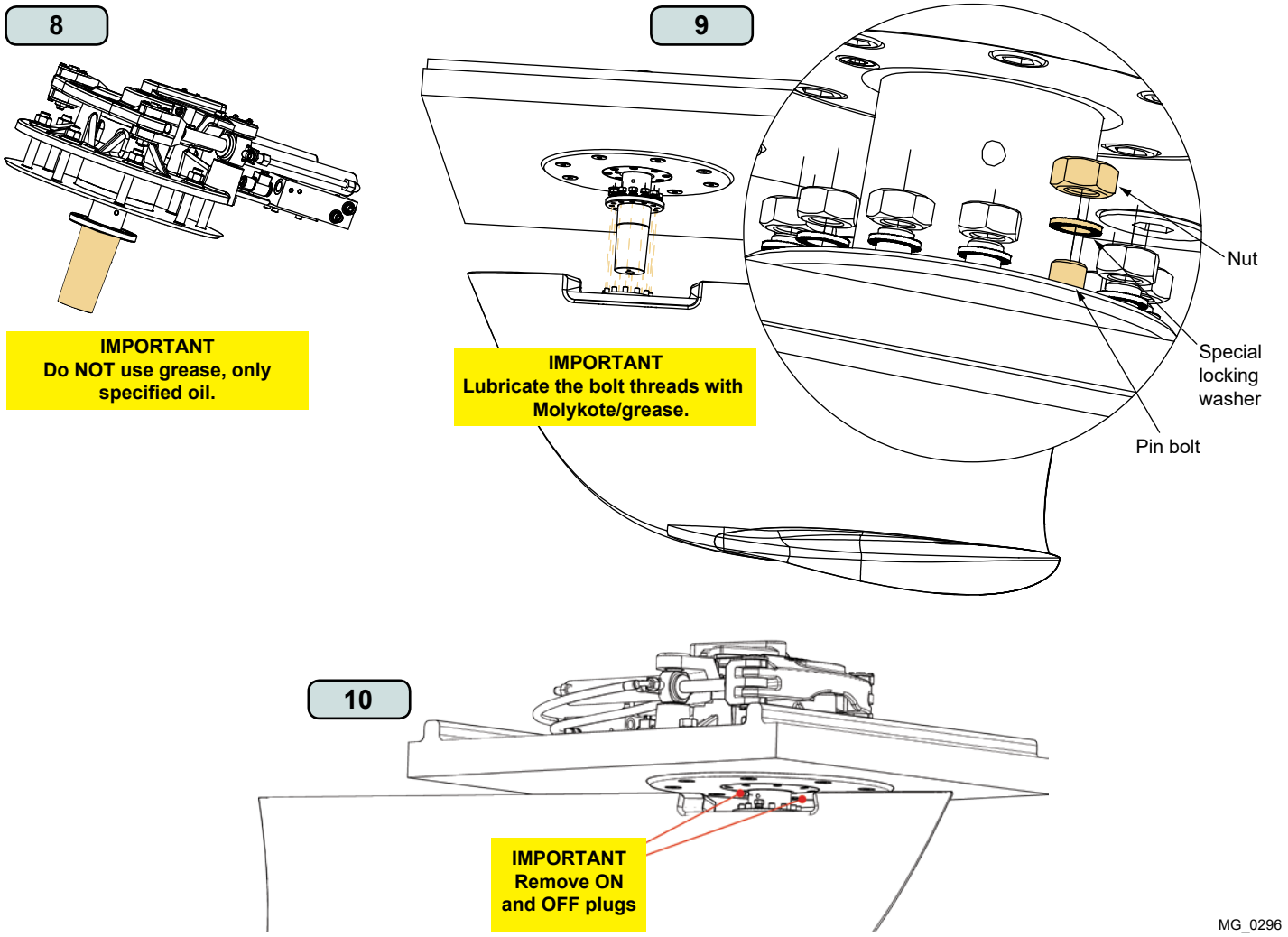
MG_0295

8. Lubricate the shaft and the securing ring with the hydraulic oil (ISO VG 100).

9. When handling the fin assembly, ensure enough manpower is available to assist with the careful insertion and alignment positioning avoiding any unnecessary damage to the shaft.

   - Lift the correct handed fin assembly in the appropriate direction and insert the fin shaft into the actuator.
   - Fit two nuts with washers back onto the securing bolts opposite each other to prevent the fin from falling.

10. Remove both oil port plugs from where the shaft enters the fin.

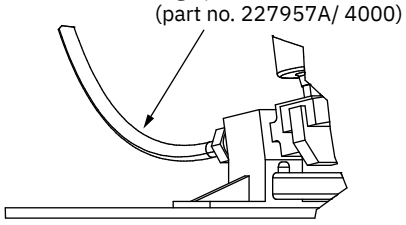


10. Assemble the high-pressure pump according to the manual included with the pump.
    a. Connect the high-pressure hose.
    b. Fill up the container with oil.
    c. Use the pump to bleed out the air in the hose.
    d. When free oil flows connect the hose to the shaft ON fitting.
    e. Fitting to shaft

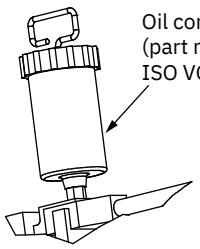
11. Lock the actuator cylinders in its absolute setting then also position the fin as far outboard as possible without hitting the outer edge of the hull.

10

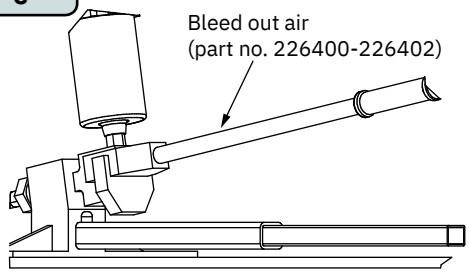
a



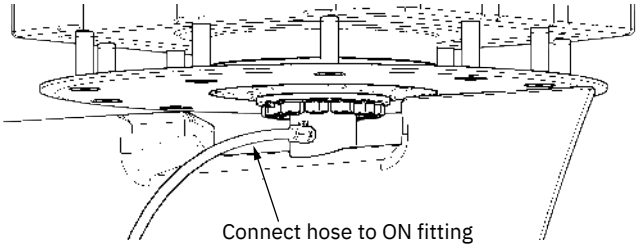
b



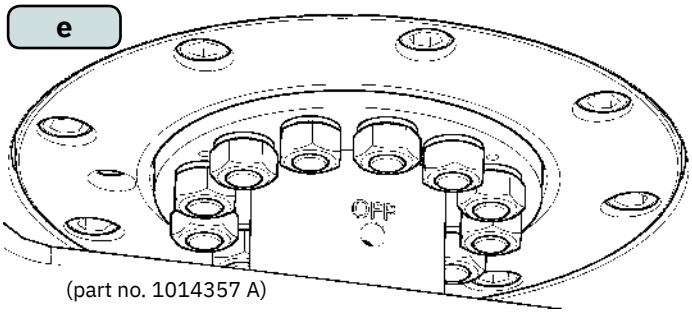
c



d

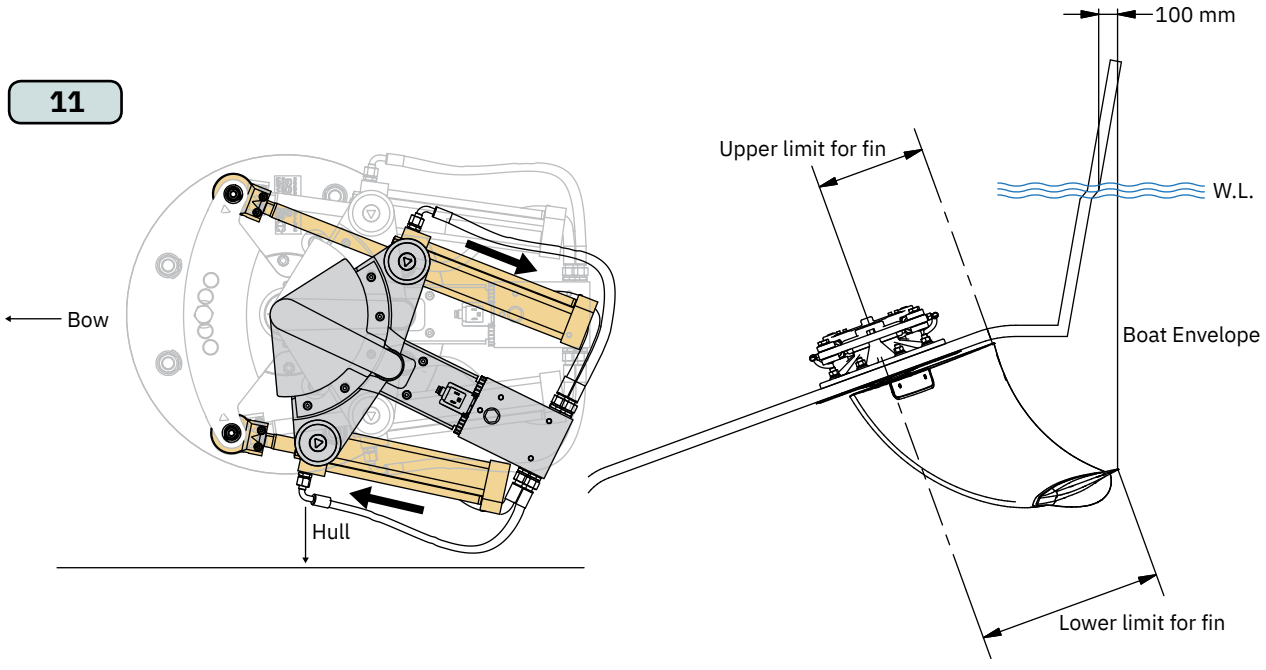


e



IMPORTANT
OFF port must be open for drainage

11



MG_0342

12. Fit the rest of the Nord-lock washers and nuts. Lift the fin until the two conical surfaces are fully in contact (shaft and hub), and tighten the nuts to 10 Nm(cross pattern). Measure the distance from the flange to the base through the holes (x7) as illustrated. All measurements should be the same, if not the flange is tilted. Take record of the measurements.

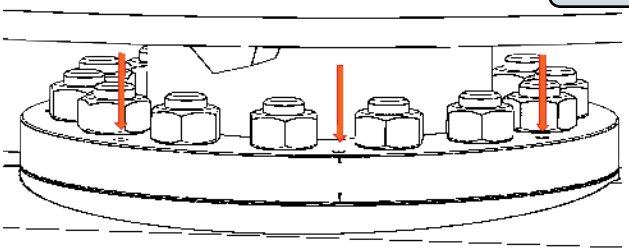
13. Place rags or oil soaking pads underneath the fin or around the shaft and underneath the hydraulic pump.

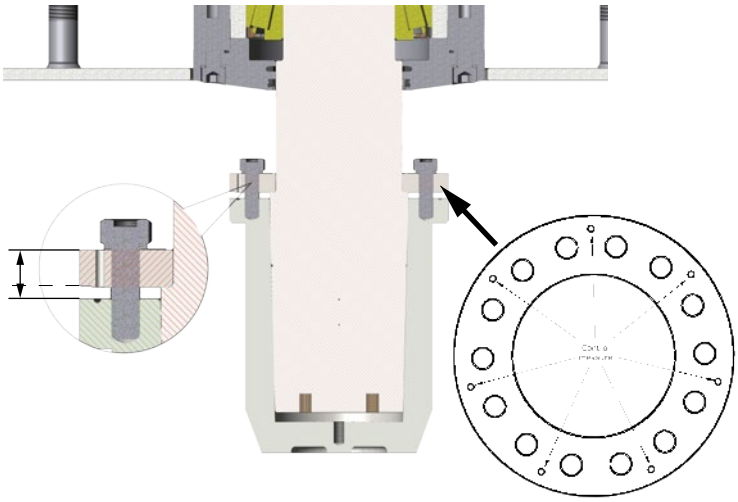
14. Pump until pump pressure gets stiff or visual oil around the shaft port entrance, then use a 19mm spanner move around in a circular pattern tightening the nuts to pull the fin into the shaft/hub.

15. Once the nuts are all tight, using a 19mm spanner tighten bolts in a circular pattern again while using the hand pump to maintain constant oil pressure.

16. Repeat step 15 until correct internal drive up distance is achieved. Control the measurements again from the flange to the base through the holes as in step 12. The measured distance should now be shorter according to following measurements:
SPS66: 2,8-3,0mm.
SPS92,93,96: 4,7-5,0mm.
Control tighten all nuts to torque 60Nm when correct drive up distance is achieved.

12





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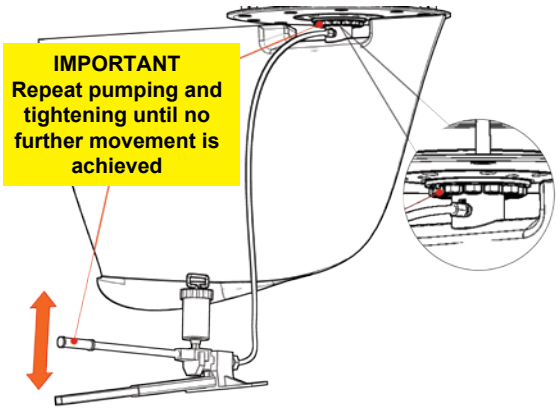

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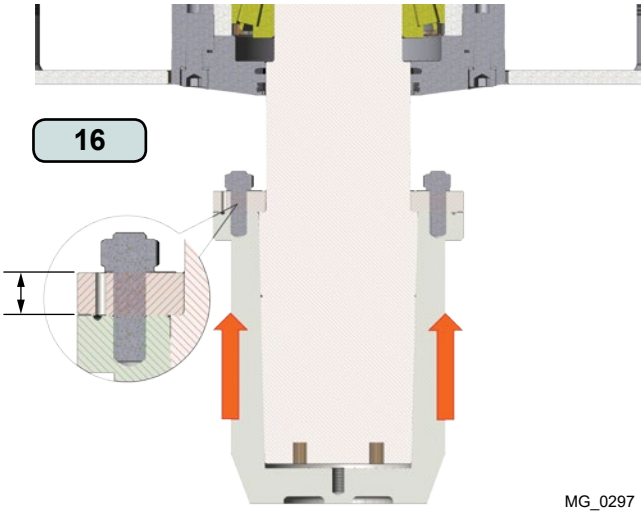
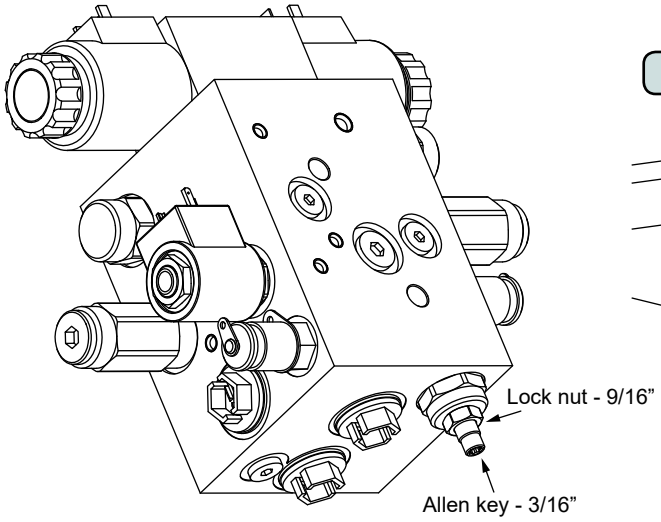


MG_0297

17. Re-tighten the manual decouple valve from Step 3 on the fin valve unit.
18. Refit the ON and OFF plugs into their position 15 min after fin drive up procedure is completed in step 16.
19. Loosely place the shaft protectors and inspect the top face to see if it will rub against any section of the actuator face. If rubbing will occur grind and sand off material on the shaft protectors to remove enough material to ensure clearance.
20. Secure shaft protectors using a 4mm Allen key.

17



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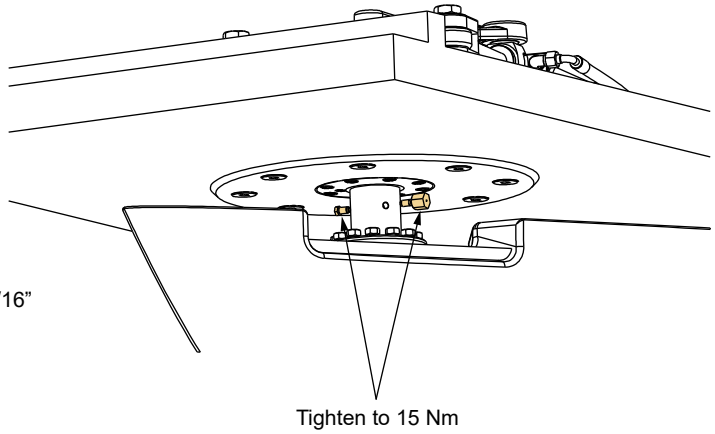

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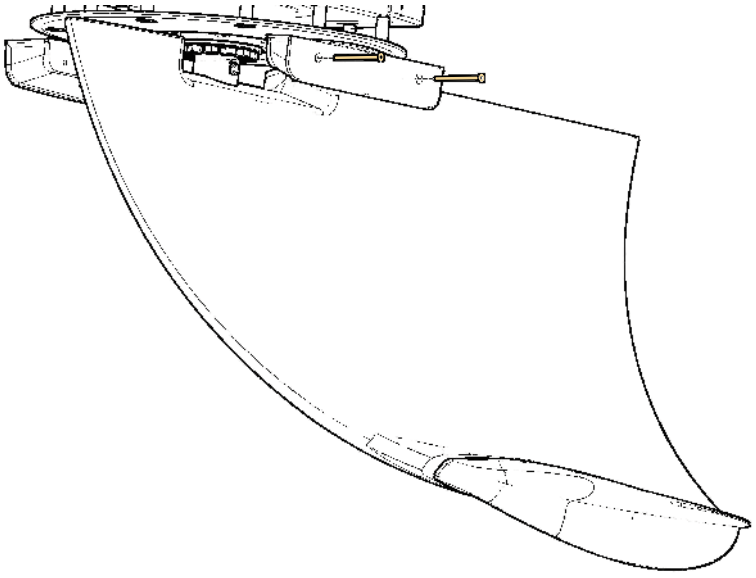

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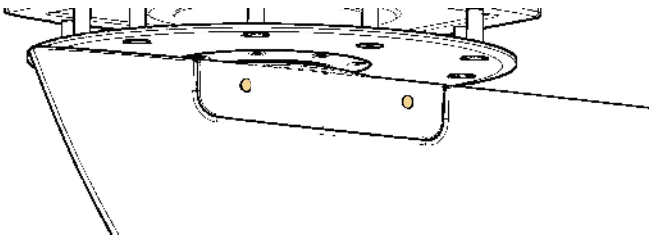


MG_0298

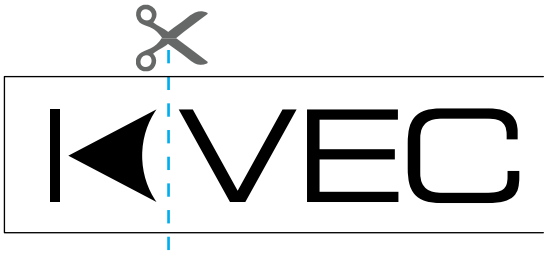
Fin Location Label

After final installation of the fins place the Fin Location Labels to appropriately identify the location of the fins underwater.

Safety Labels
To ensure crane operators and swimmers are aware of the fin's location and operation area, please mount the safety labels on the hull

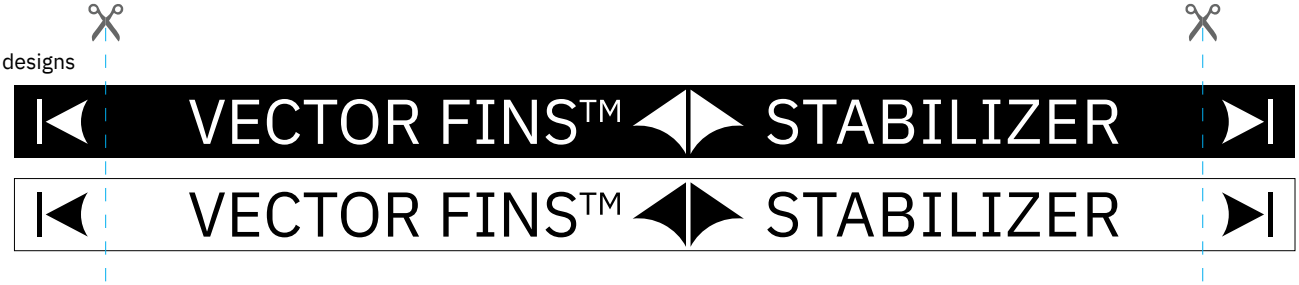
Adjustable length, fits all Sleipner Vector Fins™.
For application, get your ✂ and follow instructions in the manual.

Use scissors to cut the end arrow symbols on the label.



Place the label to the hull and place the end arrow labels to cover the length of the stabiliser fin.

Label designs



MG_0299

21. On the stabilizer panel, Touch HOME.

22. Touch STARTUP and MAINTENANCE

23. Touch STARTUP (Password is 1234 - enter)

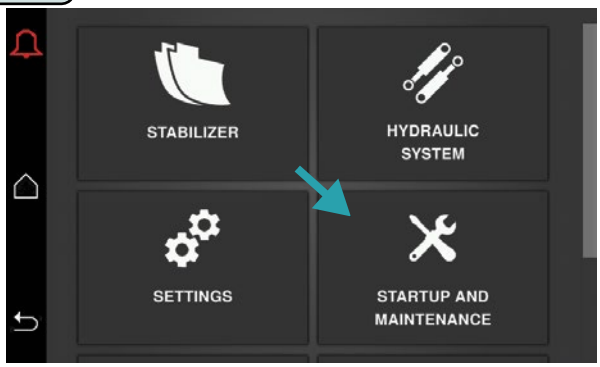
24. Touch FIN INSTALLATION

25. Touch MOVE ACTUATORS MANUALLY (This allows you to open/FLOAT actuators from the panel, without the need to manually open the fin valve unit described in step 3/18. (Step 3 and 18 can be excluded). It requires that Stabilizer control and hydraulic system is wired and connected with 24V power supply.)

26. (a) Touch FLOAT - turn actuators to out most position according to step6
(b) Touch LOCK when desired position is achieved
(c) Install fins according to step 1-20
(d) Touch RETURN when completed

21

22



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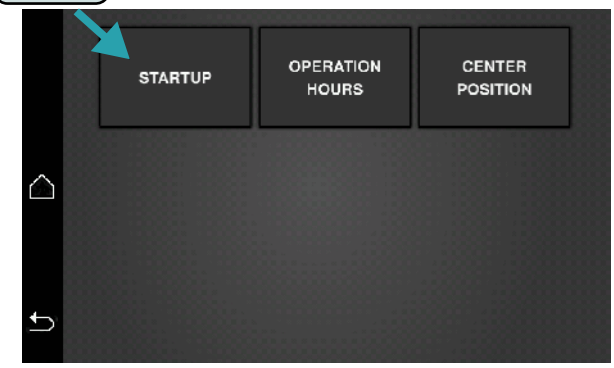

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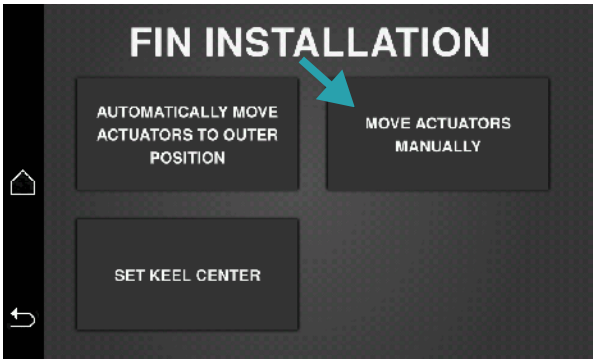

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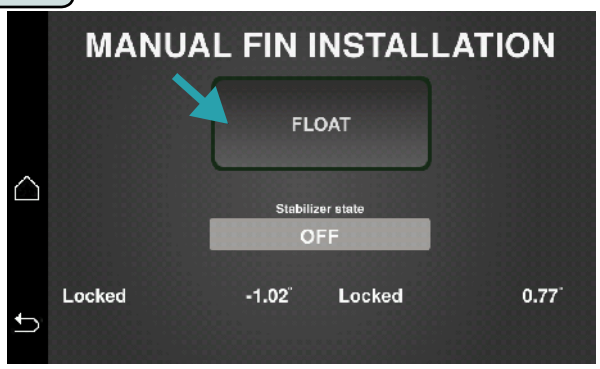


MG_0265

27. Return to FIN INSTALLATION screen and Touch SET KEEL CENTRE.

28. Touch FLOAT - Position the fins manually so the aft. Edge and the fore edge are exactly the same distance from the keel. (Parallel to keel)

29. Touch LOCK and then touch SET KEEL CENTRE when fin positioning is completed. Touch return to proceed to STARTUP.

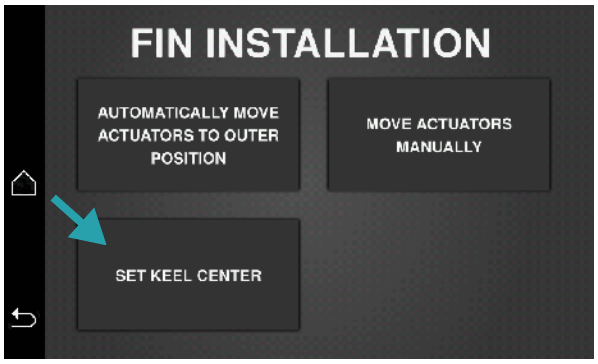
30. Alternative to (25): Touch AUTOMATIC FIN INSTALLATION (This will make the actuators move to outboard position automatically and locked for fin installation It requires that you have full system power with sufficient shore power supply. It also requires that bleed procedure and end-stop detection is completed.)

31. Touch START This will make the actuators move to outboard position automatically and locked/held in outer position for fin installation. Actuator position is now being held by hydraulic power. Now proceed to mechanical fin installation step 1-21. (Step 3,6 and 18 can be excluded)

32. When the mechanical fin installation is completed:
Touch STOP

Actuators/Fins will now move back to centre position.
Proceed to step 28.

27



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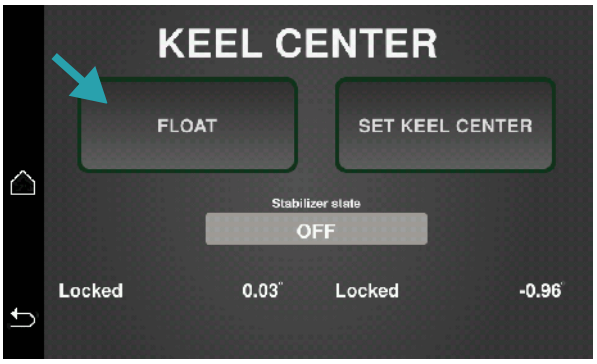

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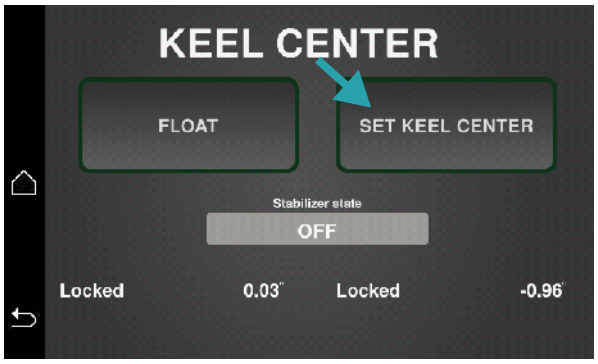

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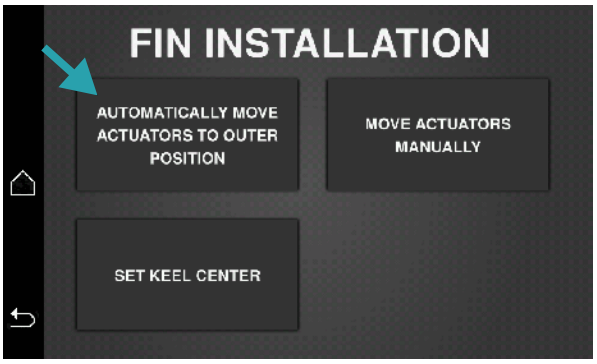

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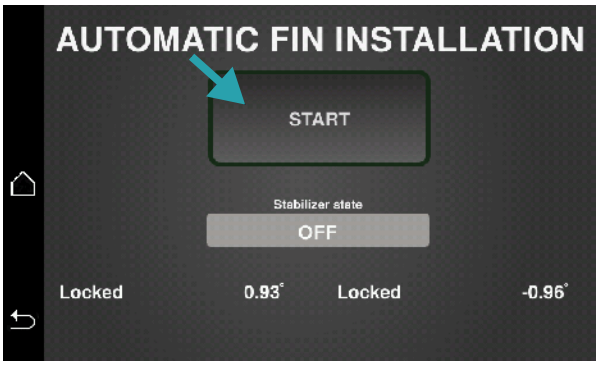

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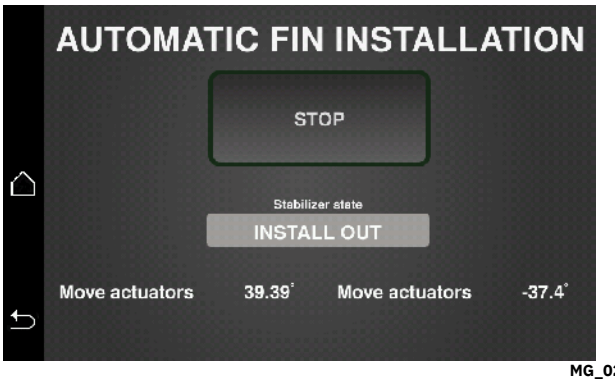


MG_0271

Standard start-up parameters are pre-set from factory. These settings are boat dependant and necessary to achieve optimum performance of the system for a given application. Settings are to be changed only when requested by authorized Side-Power personnel.

Pre-STARTUP procedure

From HOME menu:

Touch SETTINGS, and adjust the parameters to the specific yacht.

Stabilizer settings (Scroll down menu)

1. REVERSE/BACKING DETECTION — SCU input / NMEA2000

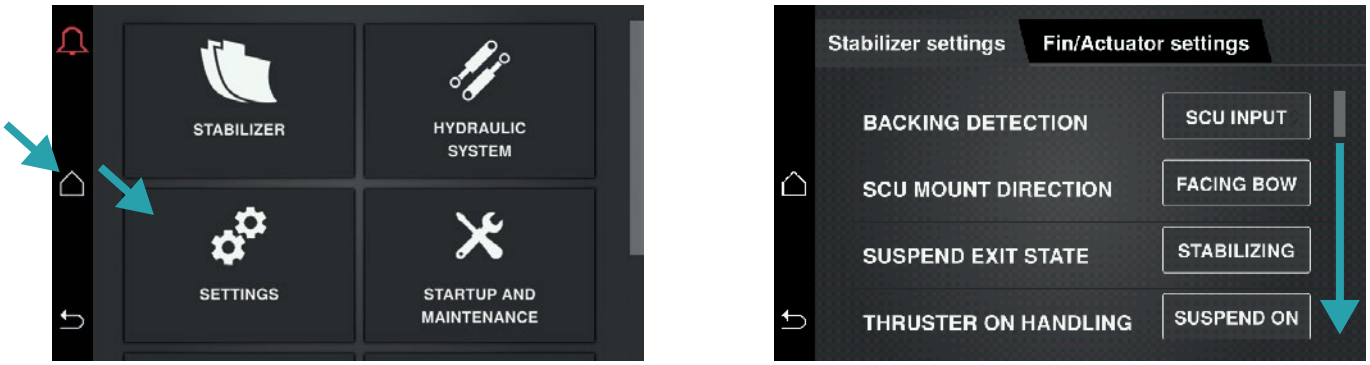
The reverse signal input is either from reverse detection loop input to SCU or from NMEA2000 transmission signal to the Side-Power gateway GW-1.

2. SCU MOUNT DIRECTION — FACING BOW / FACING AFT / NO DIRECTION

Set the direction of the stabilizer control unit to match the installation.

3. SUSPEND EXIT STATE — OFF / STABILIZING

Select which state to return to after using thrusters, reversing one or more engines – off or resume stabilization.



MG_0272

Stabilizer settings (Scroll down menu) continues:

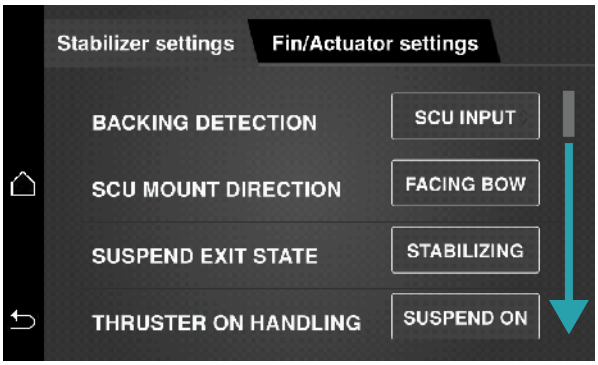
4. THRUSTER ON HANDLING	NO HANDLING SUSPEND ON

Select if thruster(s) and stabilizers should be operating simultaneously (reduced thruster performance), or if the stabilizers should centre and go to suspend mode during thruster operation.

5. CRUISING P	value
6. CRUISING I	value
7. CRUISING D	value
8. AT ANCHOR	value
9. AT ANCHOR P	value
10. AT ANCHOR CENTRE	value
11. SPEED THRESHOLD	value
12. SPEED FACTOR	value
13. OPTION 1	value
14. OPTION 2	value
15. OPTION 3	value
16. OPTION 3	value
17. OPTION 4	value
18. OPTION 5	value
19. OPTION 6	value
20. OPTION 7	value
21. OPTION 8	value

These settings are boat dependant and necessary to achieve optimum performance of the system for a given application. Settings are to be changed only when requested by authorized SP personnel.

Then, proceed to the tab Fin/Actuator settings



MG_0273

Fin/Actuator settings (Scroll down menu)

1. STOP ANGLE value

2. FIN POSITION P FACTOR value

3. FIN POSITION I FACTOR value

4. FIN POSITION D FACTOR value

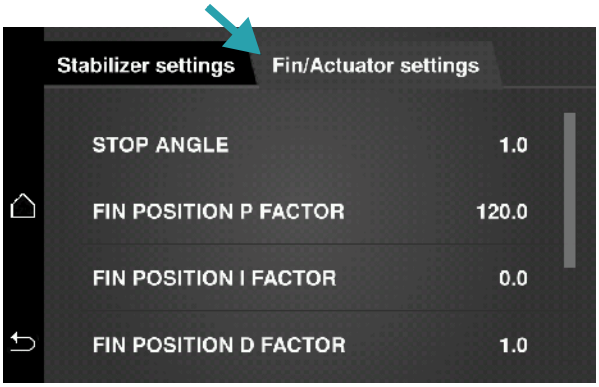
These settings are boat dependant and necessary to achieve optimum performance of the system for a given application. Settings are to be changed only when requested by authorized SP personnel.

5. FIN ACT TYPE select actuator

6. FIN TYPE select fin

Select the actuator and fin size installed in Detect End-stop section.

Pre-STARTUP is now completed. Go to STARTUP.



MG_0274

IMPORTANT
Before running or making setting adjustments in STARTUP, SEA TRIAL and Parameter SETTINGS ensure that:
- Complete Hydraulic and Electrical system is up and running
- Stabilizer system (also At Anchor) is in OFF status on the panel.
- AC pump is AUTO/ON or PTO is ON.

WARNING
During STARTUP procedure fins/actuators will move, ensure that health and safety measures will be taken

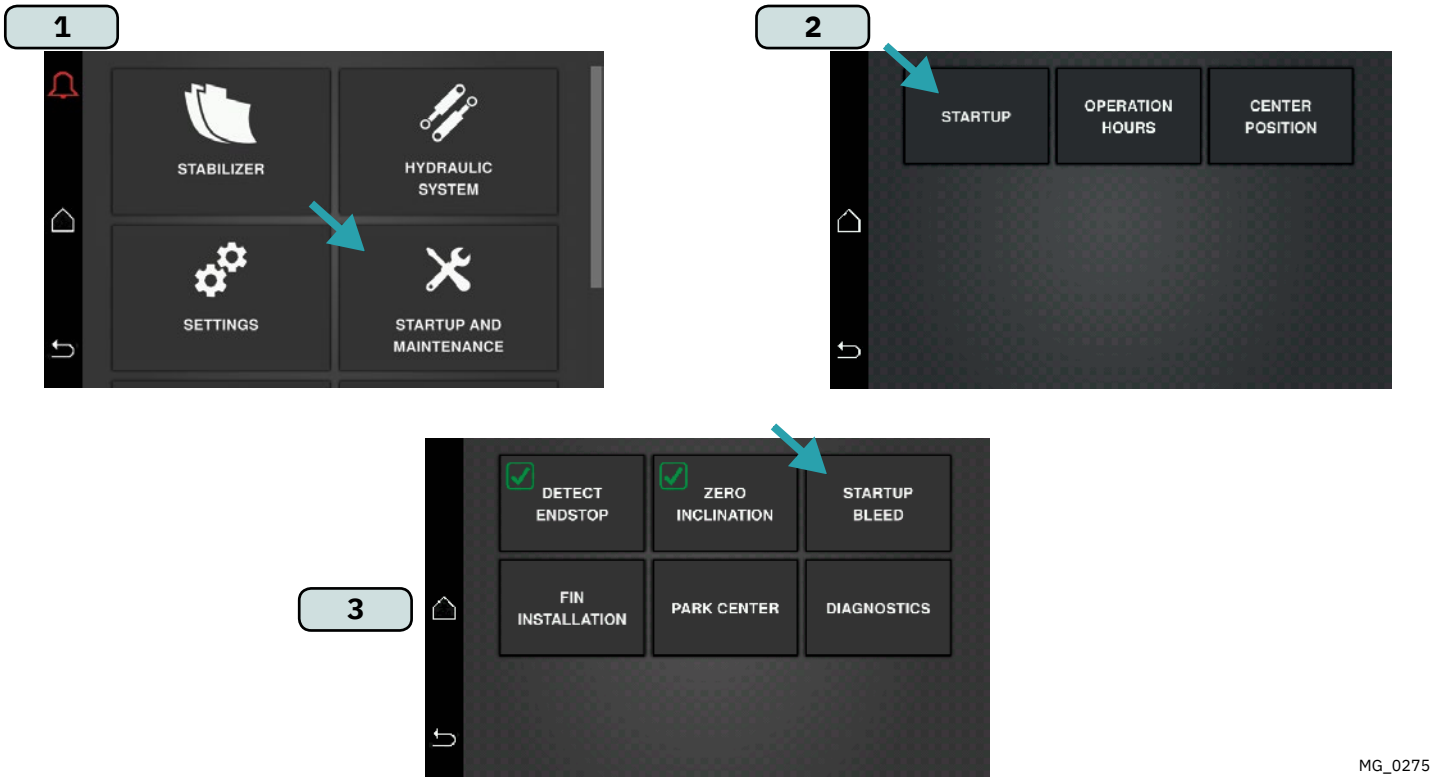
STARTUP procedure

From HOME menu:

1. Touch STARTUP and MAINTENANCE
2. Touch STARTUP (1234 - enter)
3. Touch STARTUP BLEED

Check Pressure On Accumulator Gauge

(NB: Ac Pump Standby Pressure
(75 BAR VF650, 90 BAR VF800/VF1350, 100 BAR VF1050, 110 BAR VF1650/VF1950 Vector Fins.)



MG_0275

1. Touch START (Bleed actuators)

WARNING
Fins/actuators will move

Bleeding procedure will take some time.

The bleeding procedure is used to circulate oil through the hoses to flush any gas (air) out of the hydraulic system. Hose/piping routing might require the bleeding to be performed several times.

Proceed to the DETECT ENDSTOP menu.
Return to STARTUP screen

2. Touch DETECT ENDSTOP

3. Ensure correct Actuator and Fin type selected.
   Touch NEXT

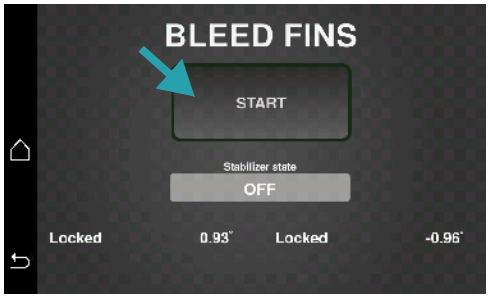
4. Touch START

WARNING
Fins/actuators will move

5. The end stop detection is required as it defines the actuator stroke. When the procedure is complete, press the RETURN arrow to go back to the STARTUP menu:

Proceed to the ZERO INCLINATION menu.

1



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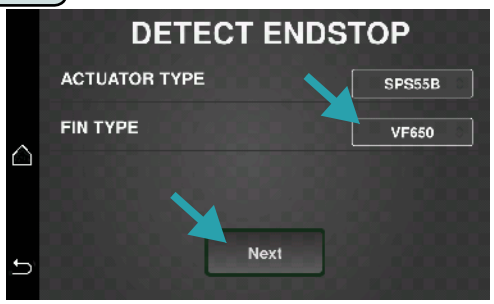

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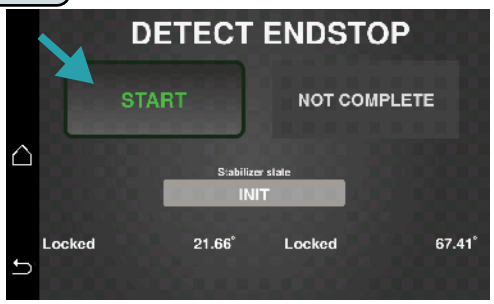


5

MG_0276

Return to STARTUP screen

1. Touch ZERO INCLINATION

2. Select the SCU MOUNT DIRECTION.
   SCU is mounted either facing bow or facing aft of the yacht.
   Ensure the yacht is level and not rolling before setting the 0° keel:

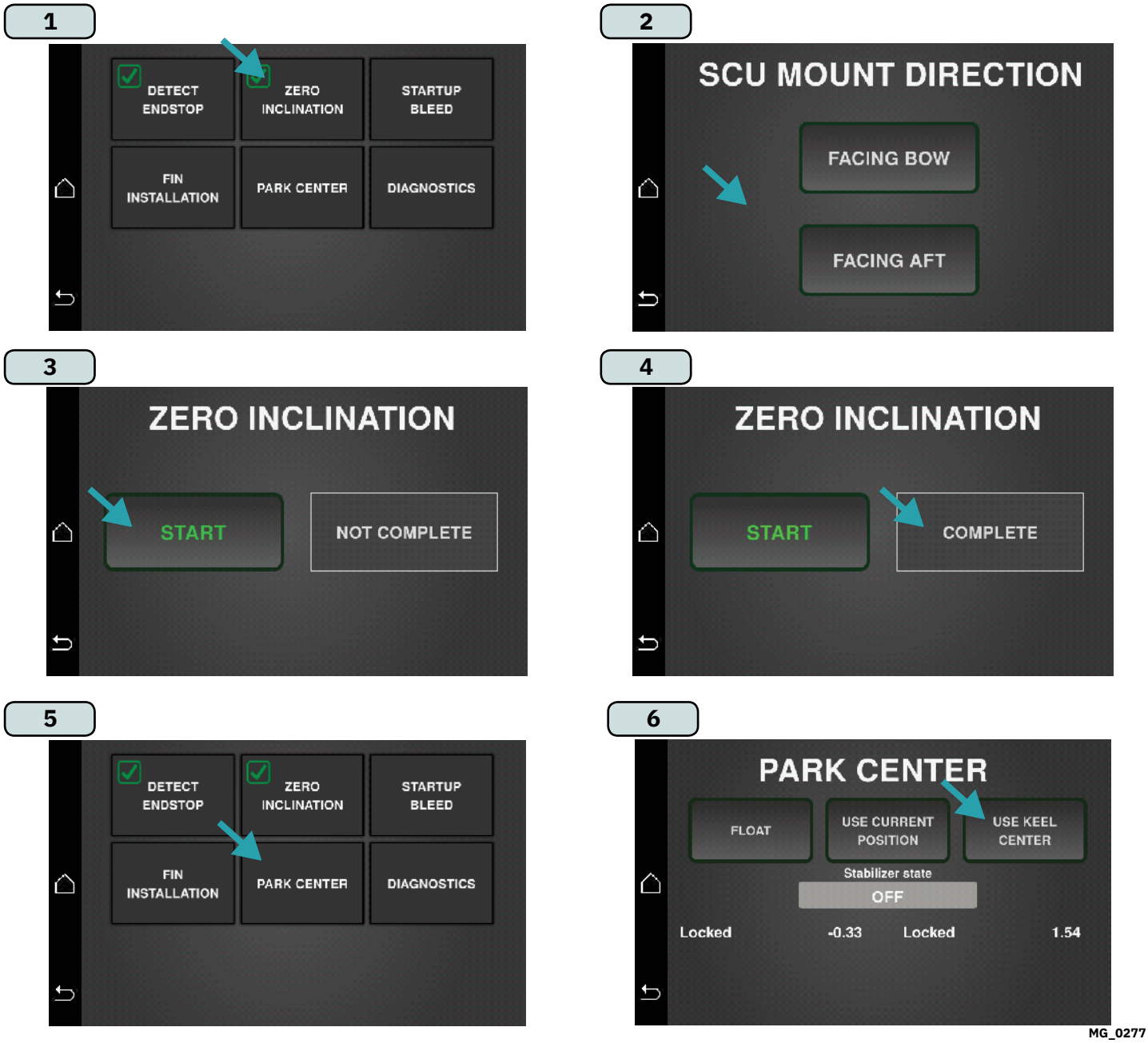
3. Touch START
   When procedure is complete:

4. Touch RETURN
   Return to STARTUP screen

5. Touch PARK CENTRE

6. Touch USE KEEL CENTRE (Recommended) (If on shore)

When Stabilizer system is turned off or in backing mode the fins will now be locked in center position that was performed during fin installation.



MG_0277

If you for some reason want to adjust or use another PARK CENTRE position, it can be performed from this section:

1. Touch related fin value to adjust PARK CENTRE position.
   (NB: Values shown are fin position with actuator mechanical centre as reference.)
   Change value on related fins to desired position.

2. Touch ENTER when completed.
   If you want to adjust PARK CENTRE to a given speed:

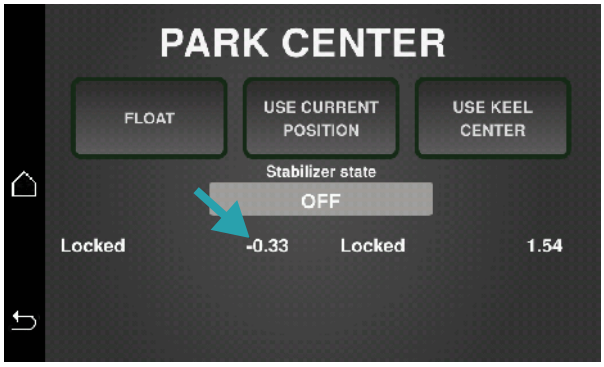
3. Touch FLOAT
   Proceed to wanted speed When desired speed is achieved:

4. Touch USE CURRENT POSITION and then Touch LOCK.
   (NB: Current fin positions are shown i red values. (When in FLOAT state)

5. Touch RETURN to proceed.

STARTUP is now complete, Proceed to SEATRIAL

1



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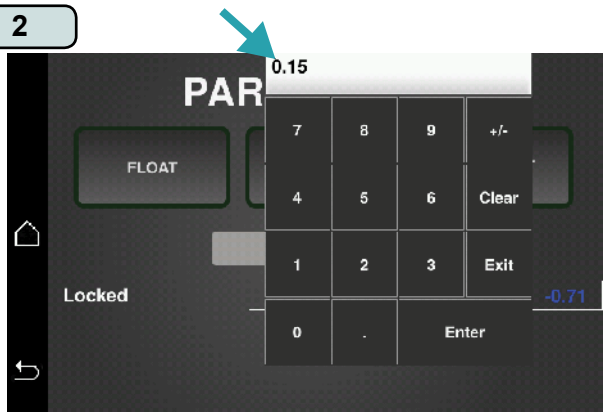

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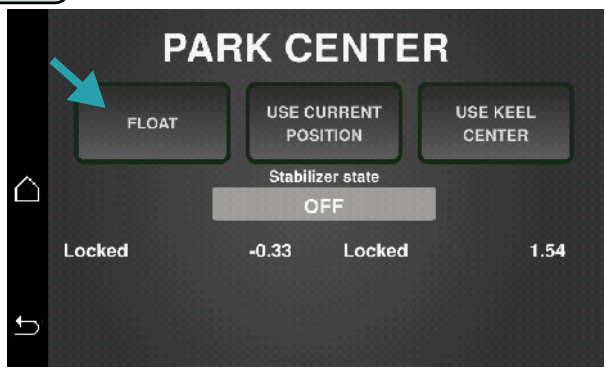

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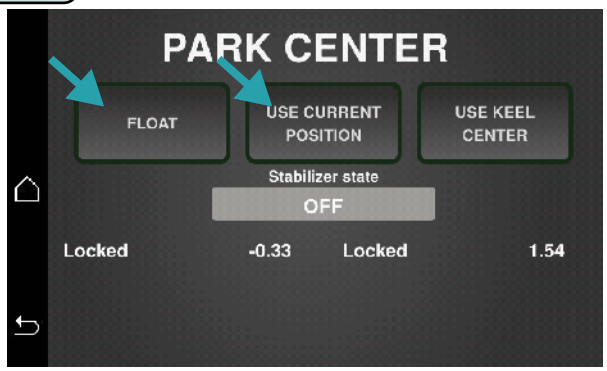


5

MG_0278

DYNAMIC CENTRE EXAMPLES
Typical fin centre angles as found in dynamic centre tests on around 70' planning V- hull boats. The fins are centred by water flow under the boat through test and then fine-tuned manually.

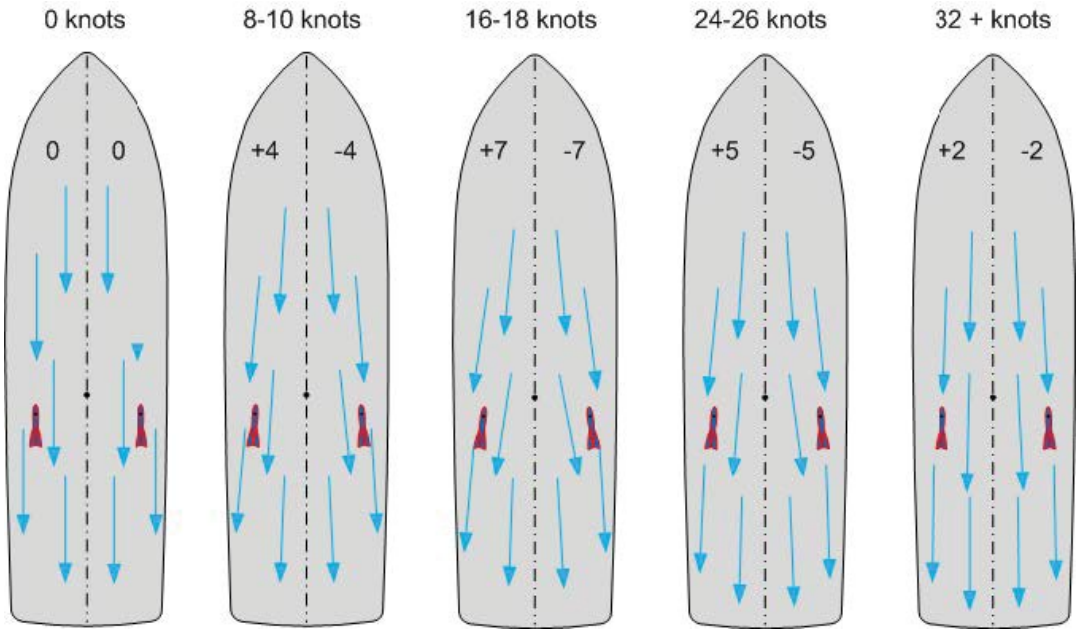
Even if the fins in test at less than 4 knots are found to have an outward angle, the lowest speed should be set to 0 knots (zero) and fins parallel to the keel.

From the STARTUP and MAINTENANCE menu:

1. Touch CENTRE POSITION (1234 -enter)

2. Ensure the fins are UNLOCKED and then Touch START

Proceed now to Dynamic fin positioning



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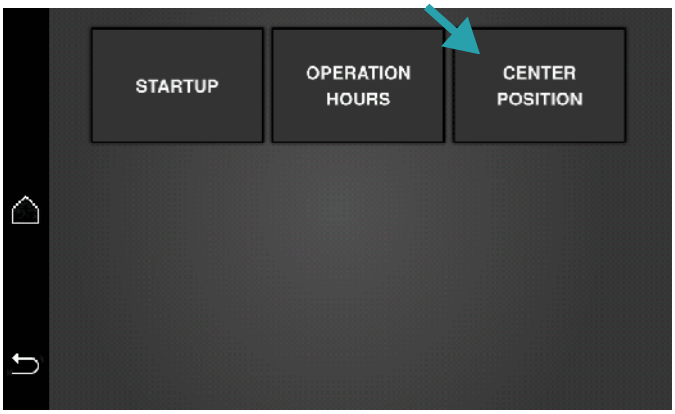

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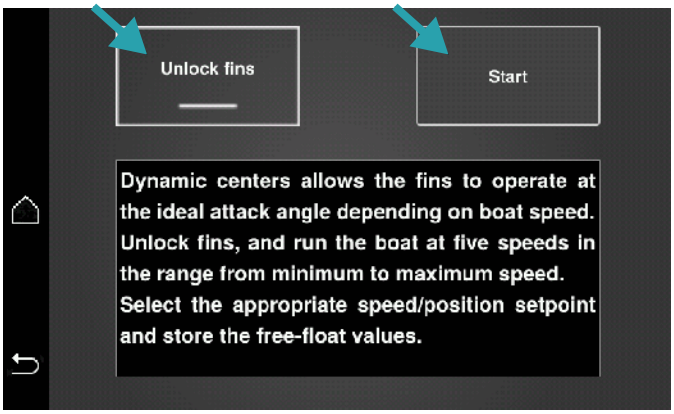


MG_0279

Dynamic fin position setup

The dynamic setup is required to get the best Vector fin performance benefits. A sea trial is required to find the free float positions of the fins at different speeds, and to tune to optimum position for a given speed. It is preferable to have flat sea for the dynamic setup sea trial, to minimize boat roll that will influence fin position.

To find the free float positions, it is necessary to float the fins, start the logger, and take the vessel to maximum speed. Then register the positions at different speeds, starting with the highest and choose speeds steps according to the vessel performance. The position is interpolated between the different speeds, so it is important to have one speed before the planning threshold and one after, as the water flow over the fins often change much during the transition to planning mode.

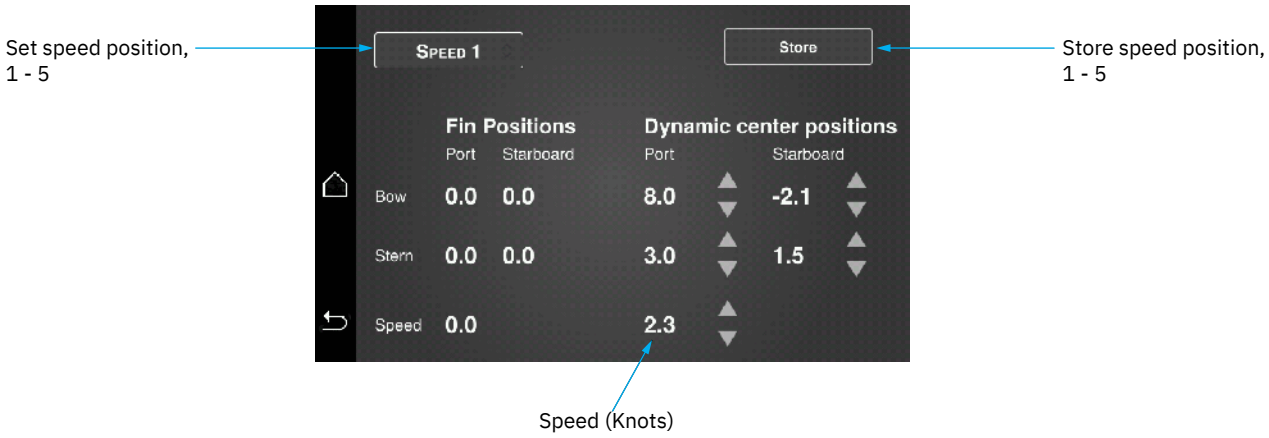
When all speeds/positions have been set, stop the logger.

Dynamic fin position setup continues:

When the free float positions have been recorded, the following table can be used as a starting point for fin position adjustment: (Do NOT press STORE after adjusting with these values)

	Speed (knots)	Port fin adjustment	Starboard fin adjustment
1	12	-3°	+3°
2	18	-4°	+4°
3	24	-5°	+5°
4	30	-4°	+4°
5	36	-3°	+3°

Some boats will require more or less adjustment for optimum performance. Too much correction is to be avoided, as the actuator needs some torque reserve to be able to counter roll.



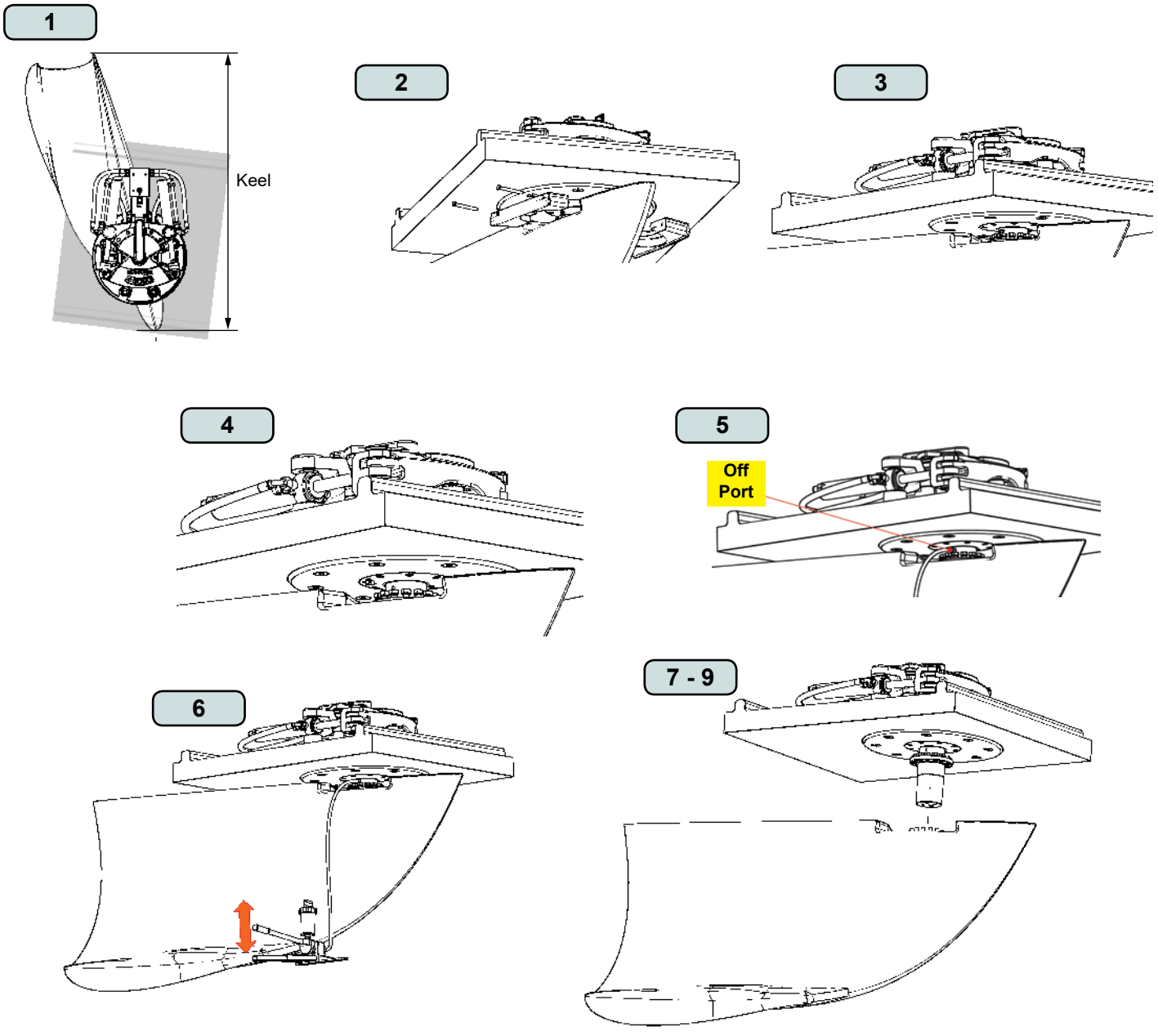
MG_0280

Fin Removal

REMOVING THE FIN

IMPORTANT
A hand oil pump (Installation tool kit, Item nr VFT55) must be used to achieve the fin installation. The pump should only be operated by qualified personnel that follow the pump manual operating instruction and health and safety directives.

1. Take and record measurements of the distances from the aft end of the fin to the keel and the fore end of the fin to the keel.
2. Remove the shaft cover using a 4mm Allen key.
3. Loosen the nuts but do not remove them.
4. Remove the OFF port cover for the hydraulic port.
5. Attach the line into the port marked OFF. The first adaptor is secured with a 22 spanner. The second part is secured with a 15 spanner.
6. Use the hydraulic pump until the fin drops down but is held up by the nuts.
7. Use two people to take the weight of the fin while you remove all the nuts and washers.
8. Lower the fin to the floor and replace the protective shaft cap.
9. Replace the actuator port cover with rubber seal.



MG_0343

Start-up checks Actuators

- ☐..... Actuator Manual Decouple Valve Tight.
- ☐..... Check Electric operated decouple valve (coil nut) is tightened Under 6.8-9.5 Nm.
- ☐..... Check hose spec from combiner to fin valve(Less than 2.5m)(Recommended).
- ☐..... Actuator Hose Connections Tight/Clear Port/Stb.
- ☐..... Hoses have full range of movement. ***excluding SPS-B 55**
- ☐..... Cylinder rods clean, and without damages/scratches.
- ☐..... Actuator Electrical Connections Clear.
- ☐..... Actuator Encoder Belt, Wheels ok and Belt Tight.
- ☐..... Actuator Bonded to the boats electrical system.
- ☐..... Actuators clear of Boat Structure.

Start-up checks Fin valve unit

- ☐..... Fin Valve Manual Decouple Valve Tight.
- ☐..... Fin Valve Check Hose Connections Port/Stb.
- ☐..... Fin Valve Electrical Connections Correct.

Start-up checks Accumulator block

- ☐..... Accumulator Block Manual Decouple Valve Tight.
- ☐..... Accumulator Block Hose Connections Ok.
- ☐..... Accumulator Block Electrical Connections Correct.
- ☐..... Accumulator Pressure Transmitter Reading Correct.

Start-up checks Electrical components

- ☐..... Check Power Feed is Active.
- ☐..... SCU and FCU Electrical Connections.
- ☐..... GW-1 and GPS Connections Correct and Valid Signal.

Start-up checks Cooling pump

Electric:

- ☐..... PHC-3 settings. See PHC-3 manual.
- ☐..... Check Cooling pump connections are correct and pump runs in correct direction.

Hydraulic:

- ☐..... PHC-3 settings. See PHC-3 manual.
- ☐..... Check connections and drive direction

Both Electric and Hydraulic:

- ☐..... Check cooling pump is installed below waterline.
- ☐..... No air traps in the water lines(continuous rise).
- ☐..... Cooling water discharge should have minimum resistance/back pressure. (Discharge to engine exhaust will cause problems for the water pump.
- ☐..... Pre-startup from PHC-3 manual is performed. (MANUAL OPERATION – START COOLING PUMP)
- ☐..... Cooling pump set to auto when performing Fin Installation from panel. See PHC-3 manual.

Start-up checks AC pump

- ☐..... AC Pump Clockwise.
- ☐..... Ac Pump Standby Pressure (3.5 kW motor 75 bar, 4.6 kW motor 90 bar, 5.5 kW motor 90 bar, 5.5 kW motor VF1050 100 bar, 7.5 kW motor 100 bar, 11 kW motor 90 bar, 15 kW 1-phase 100 bar, 15 kW motor 3-phase 110 bar).

Start-up checks PTO pump

- ☐..... Ensure correct pressure according to specific system drawings

Start-up checks Hydraulics

- ☐..... Check hose connections, all connections may require re-tightening

The stabilizer has been installed as per the instructions in this manual and all points in checklist above have been controlled.

Signed: .....

Date: .....

Extra pre-delivery tests by installer / yard who does not use other quality control systems !

Stabiliser type: .....

Serial number:.....

Date of delivery:.....

Other comments by installer: .....

.....

.....

Sleipner Group Waste Disposal and Recycling Guide

MC_0848

Introduction:
At Sleipner Group, we prioritize sustainability and encourage the repair and re-manufacturing of products to extend their life cycles. If disposal is necessary, please follow these guidelines to recycle and manage waste responsibly, ensuring our efforts align with environmental protection efforts.

Electric Motors and Electronics:
- Disconnect from any power sources and dismantle them carefully.
- Recycle components through certified e-waste recycling centers that can adequately handle and recover electronic materials.
- Dispose of any non-recyclable electronic parts according to local environmental regulations.

Metals:
- Collect and sort metal parts for recycling as scrap metal.
- To increase recycling efficiency, ensure that metals are clean and free from non-metal attachments.

Plastics:
- Identify recyclable plastics based on local recycling guidelines.
- Remove any non-plastic components and clean them before recycling to improve the quality of the recycled material.

Hazardous Materials:
- Correctly identify any hazardous substances within components, such as batteries or capacitors etc.
- Follow local regulations for the safe disposal of hazardous materials to prevent pollution and protect environmental health.

General Disposal Instructions:
- Consult local recycling programs to determine the acceptability of various materials.
- Use authorized disposal services to ensure compliance with environmental standards.

Safe Disposal Practices:
- Adhere to local laws and regulations for waste management to minimize environmental impact and ensure community safety.

This guide is designed to help reduce our products' environmental footprint through responsible end-of-life management. Please contact your local waste management supplier or our support team for more specific disposal information or further assistance.

Service and support

MC_0024

Find your local professional dealer from our certified worldwide network for expert service and support. visit our website www.sleipnergroup.com/support

Product spare parts and additional resources

MC_0024

For additional supporting documentation, we advise you to visit our website www.sleipnergroup.com and find your Sleipner product.

Warranty statement

MC_0024

1. Sleipner Motor AS (The "Warrantor") warrants that the equipment (parts, materials, and embedded software of products) manufactured by the Warrantor is free from defects in workmanship and materials for purpose for which the equipment is intended and under normal use and maintenance service (the "Warranty").
2. This Warranty is in effect for two years (Leisure Use) or one year (Commercial and other Non-leisure Use) from the date of delivery/purchase by the end user, with the following exceptions;
   (a) For demonstration vessels, or vessels kept on the water, the dealer is considered as the end user from 6 months after their launch of the vessel;
   (b) The warranty period starts no later than 18 months after the first launch of the vessel.
   Please note that the boat manufacturer and dealer must pay particular attention to correct maintenance and service both by the products manuals as well as general good practice for the location the boat is kept in the period the boat is in their care. In cases where the 6 and 18 months grace periods for boat builders and dealers are passed, it is possible to obtain a full warranty upon inspection and approval of the warrantor or such representative.
3. Certain parts, classified as wearable or service parts, are not covered by the warranty. A failure to follow the required maintenance and service work as described in the product manual render all warranty on parts or components directly or indirectly affected by this void. Please also note that for some parts, time is also a factor separately from actual operational hours.
4. This Warranty is transferable and covers the equipment for the specified warranty period.
5. The warranty does not apply to defects or damages caused by faulty installation or hook-up, abuse or misuse of the equipment including exposure to excessive heat, salt or fresh water spray, or water immersion except for equipment specifically designed as waterproof.
6. In case the equipment seems to be defective, the warranty holder (the "Claimant") must do the following to make a claim:
   (a) Contact the dealer or service centre where the equipment was purchased and make the claim. Alternatively, the Claimant can make the claim to a dealer or service centre found at www.sleipnergroup.com. The Claimant must present a detailed written statement of the nature and circumstances of the defect, to the best of the Claimant's knowledge, including product identification and serial nbr., the date and place of purchase and the name and address of the installer. Proof of purchase date should be included with the claim, to verify that the warranty period has not expired;
   (b) Make the equipment available for troubleshooting and repair, with direct and workable access, including dismantling of furnishings or similar, if any, either at the premises of the Warrantor or an authorised service representative approved by the Warrantor. Equipment can only be returned to the Warrantor or an authorised service representative for repair following a pre-approval by the Warrantor's Help Desk and if so, with the Return Authorisation Number visible postage/shipping prepaid and at the expense of the Claimant.
7. Examination and handling of the warranty claim:
   (a) If upon the Warrantor's or authorised service Representative's examination, the defect is determined to result from defective material or workmanship in the warranty period, the equipment will be repaired or replaced at the Warrantor's option without charge, and returned to the Purchaser at the Warrantor's expense. If, on the other hand, the claim is determined to result from circumstances such as described in section 4 above or a result of wear and tear exceeding that for which the equipment is intended (e.g. commercial use of equipment intended for leisure use), the costs for the troubleshooting and repair shall be borne by the Claimant;
   (b) No refund of the purchase price will be granted to the Claimant, unless the Warrantor is unable to remedy the defect after having a reasonable number of opportunities to do so. In the event that attempts to remedy the defect have failed, the Claimant may claim a refund of the purchase price, provided that the Claimant submits a statement in writing from a professional boating equipment supplier that the installation instructions of the Installation and Operation Manual have been complied with and that the defect remains.
8. Warranty service shall be performed only by the Warrantor, or an authorised service representative, and any attempt to remedy the defect by anyone else shall render this warranty void.
9. No other warranty is given beyond those described above, implied or otherwise, including any implied warranty of merchantability, fitness for a particular purpose other than the purpose for which the equipment is intended, and any other obligations on the part of the Warrantor or its employees and representatives.
10. There shall be no responsibility or liability whatsoever on the part of the Warrantor or its employees and representatives based on this Warranty for injury to any person or persons, or damage to property, loss of income or profit, or any other incidental, consequential or resulting damage or cost claimed to have been incurred through the use or sale of the equipment, including any possible failure or malfunction of the equipment or damages arising from collision with other vessels or objects.
11. This warranty gives you specific legal rights, and you may also have other rights which vary from country to country.

Patents

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At Sleipner we continually reinvest to develop and offer the latest technology in marine advancements. To see the many unique designs we have patented, visit our website www.sleipnergroup.com/patents

Learn more about our products at www.sleipnergroup.com

SLEIPNER
Ocean born. Tech bred.

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Made in Norway

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