



Installation Guide

For Electric Retractable Thruster Models
SR-L&V80, SR-L&V100



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Products

SRV100/185T-12V - SRV100 Vertical Retract 12V
 SRV100/185T-24V - SRV100 Vertical Retract 24V
 SRV80/185T-12V - SRV80 Vertical Retract 12V
 SRV80/185T-24V - SRV80 Vertical Retract 24V
 SRL100/185T-24V - SRL100 Retract thruster 24V
 SRL80/185T-12V - SRL80 Retract thruster 12V
 SRL80/185T-24V - SRL80 Retract thruster 24V
 SRL100/185T-12V - SRL100 Retract thruster 12V



Accidental activation of the retract mechanism can cause serious injury due to the high-pressure force used for closing the hatch. IF operating the hatch during any work/ maintenance around or inside the retract hatch, USE CAUTION.

MC_0411

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 installer's 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 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.

Responsibility of the installer

MC_0440

For retract thrusters:

MC_0474

- The installation position of stern-mounted retract thrusters must not conflict with the propulsion propellers or their water trail. **(NB: consult a naval architect for an exact position.)**
- Paint inside the retract housing with anti-fouling. **(NB: Do not paint the drive shaft.)**

For Sleipner thruster systems:

MC_0425

- Do not install the thruster system in any position that requires modifying the stiffener/ stringer/ supports, which may jeopardize the hull integrity. Consult with the boat builder to see if this can be done safely if absolutely necessary.
- Never run the thruster out of water without load. Without load or resistance, the thruster propeller RPM will reach extremely high speed, damaging the system.
- The thruster motor must be handled with care. Do not rest the thruster on its drive shaft, as its weight can damage it.

For on-board electric motor driven systems:

MC_0031

- Ensure motors installed in small compartments are dry and well-ventilated to allow the electric motor to cool.
- The electric motor, components, and cables must be mounted to remain dry.
- The electric motor can reach over 100°C before activating the temperature switch. Any loose items near the thruster motor are a potential fire hazard and can cause short-circuiting.
- The thruster power supply circuit must include the recommended sized fuse and a battery isolation switch.

For DC electric motors:

MC_0426

- The electric motor will generate some carbon dust. Storage compartments must be separated from the thruster to prevent nearby items becoming dusty/ dirty. **(NB: IP version motors generate dust but are enclosed.)**

For lithium batteries for on/off thruster systems:

MC_0501

- High capacity lithium batteries are capable of supplying a higher operating voltage to the motor than the on/off thrusters are rated for. Running thrusters at higher than rated voltage will reduce operating time, increase wear and damage the thruster. Operating the thruster outside specified ratings will void warranty.

For Sleipner S-Link™ systems:

MC_0105

- When installing an S-Link™ system, connect ONLY original Sleipner S-Link™ products or other authorized control equipment directly to the S-Link™ bus. When connecting non-authorized third-party equipment, it must always be connected through a Sleipner-supplied interface product.
- Any attempt to directly control or connect to the S-Link™ control system without a designated and approved interface from Sleipner will void all warranties and responsibilities of the connected Sleipner products. If you interface the S-Link™ bus by agreement with Sleipner through a designated Sleipner-supplied interface, you are still required to install at least one original Sleipner control panel to enable efficient troubleshooting if necessary.

Do NOT remove the Red spacer block until the installation is completed.



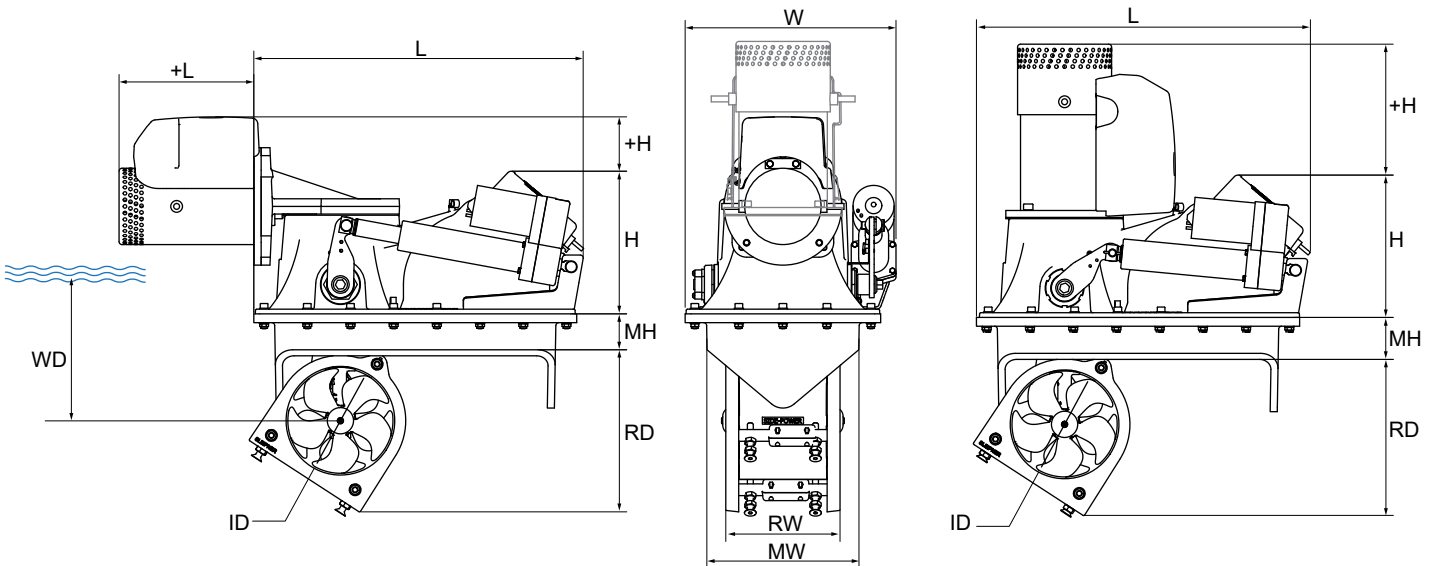
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Measurement	Measurement description	SRL80 12V		SRL80 24V		SRL100 12V		SRL100 24V	
		mm	inch	mm	inch	mm	inch	mm	inch
+ L	Motor supplementary measurement (Length)	230	9,04	245	9,63	287	11,29	281	11,06
L	Thruster housing length	561	22,09	561	22,09	561	22,09	561	22,09
+ H	Motor supplementary measurement (Height)	93	3,64	96	3,77	129	5,07	128	5,06
H	Thruster housing height	243	9,56	243	9,56	243	9,56	243	9,56
MH	Minimum flange height	62	2,43	62	2,43	62	2,43	62	2,43
RD	Twist ring depth	276	10,85	276	10,85	276	10,85	276	10,85
ID	Tunnel diameter	185	7,28	185	7,28	185	7,28	185	7,28
RW	Tunnel width	195	7,66	195	7,66	195	7,66	195	7,66
MW	Flange width	257	10,11	257	10,11	257	10,11	257	10,11
WD	Water depth	185	7,28	185	7,28	185	7,28	185	7,28
W	SRF flange & thruster housing width	359	14,12	359	14,12	359	14,12	359	14,12

Measurement description	SRV80 12V		SRV80 24V		SRV100 12V		SRV100 24V		
	mm	inch	mm	inch	mm	inch	mm	inch	
L	Thruster housing length	561	22,09	561	22,09	561	22,09	561	22,09
+ H	Motor supplementary measurement (Height)	193	7,59	184	7,25	226	8,91	221	8,68
H	Thruster housing height	244	9,60	243	9,56	243	9,56	243	9,56
MH	Minimum flange height	62	2,43	62	2,43	62	2,43	62	2,43
RD	Twist ring depth	276	10,85	276	10,85	276	10,85	276	10,85
ID	Tunnel diameter	185	7,28	185	7,28	185	7,28	185	7,28
RW	Tunnel width	195	7,66	195	7,66	195	7,66	195	7,66
MW	Flange width	257	10,11	257	10,11	257	10,11	257	10,11
WD	Water depth	185	7,28	185	7,28	185	7,28	185	7,28
W	SRF flange & thruster housing width	359	14,14	359	14,14	359	14,14	359	14,14

SRL

SRV



Thruster specifications

MC_0164

Product	Nominal Operating Voltage*	Thrust at stated operating voltage*		Power Output	Weight	Maximum Operation Time
SRL&V80 12V	10.5V	80 kg / 176 lbs (10.5V)	96 kg / 212 lbs (12V)	4.4 kW / 6 hp	31 kg / 61 lbs	S2 2-3 min. At 20°C ambient temperature
SRL&V80 24V	21V	80 kg / 176 lbs (21V)	96 kg / 212 lbs (24V)	4.4 kW / 6 hp	31 kg / 61 lbs	
SRL&V100 12V	10.5V	100 kg / 220 lbs (10.5V)	116 kg / 256 lbs (12V)	6.3 kW / 8.4 hp	44 kg / 97 lbs	
SRL&V100 24V	21V	100 kg / 220 lbs (21V)	116 kg / 256 lbs (12V)	6.3 kW / 8.4 hp	44 kg / 97 lbs	

*Voltage measured at motor terminals when thruster is running

Hull specifications

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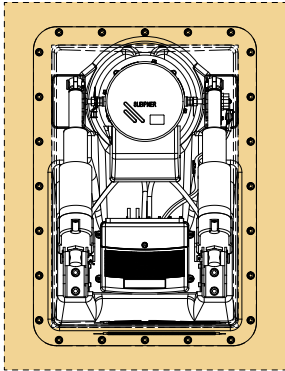
Use sealants, adhesives or bonding material compatible with the materials of your vessels hull and Slepner product.
For information regards the material in Slepner products, see table.

Product		Resin
Housing	SR(P)80/100	Polyester
Flange	SRF-185-GRP	Polyester
Flange	SRF-250-GRP	Polyester
Flange	SRF-300-GRP	Polyester
Flange	SRF-386-GRP	Polyester

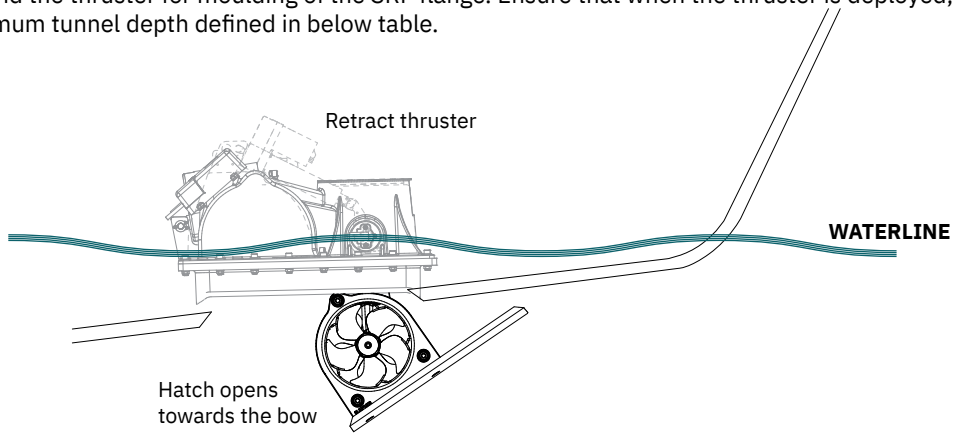
Positioning of the retract thruster

Retract Thruster

The thruster must always be installed so the hatch is opened towards the bow. Ensure enough space for the complete retract unit including room for installation of SRF flange and for future service. Allow minimum 100mm of clear space around the thruster for moulding of the SRF flange. Ensure that when the thruster is deployed, the depth of the propeller exceeds the minimum tunnel depth defined in below table.



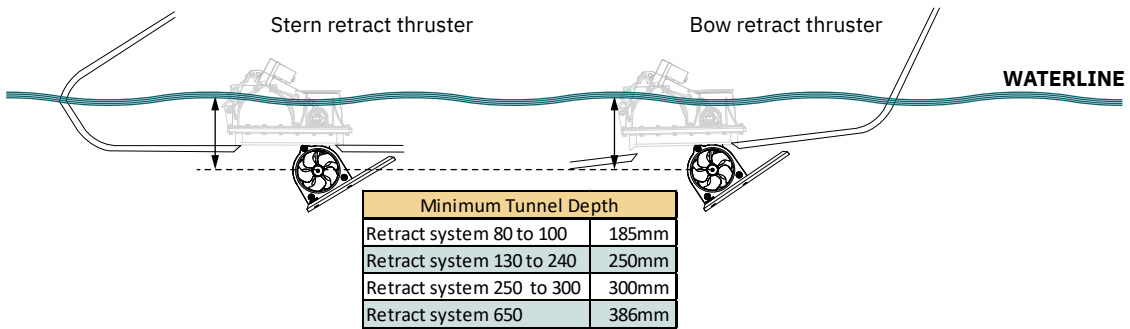
100mm of clear space around the thruster for moulding of the SRF flange.



Hatch opens towards the bow

Installing the thruster below the waterline as outlined is important for two reasons:

- Avoid drawing air from the surface which will reduce performance and increase noise levels.
- To get as much water pressure as possible to achieve maximum thrust.

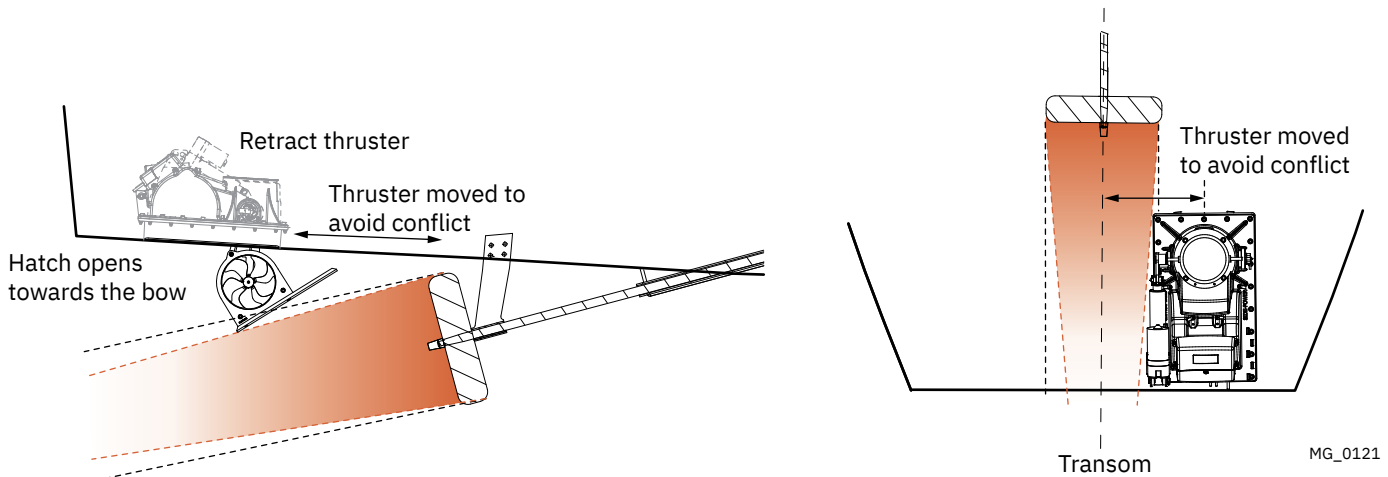


Bow installation

The thruster must be installed in the center line of the keel and as far forward as possible while following the minimum tunnel depth requirement.

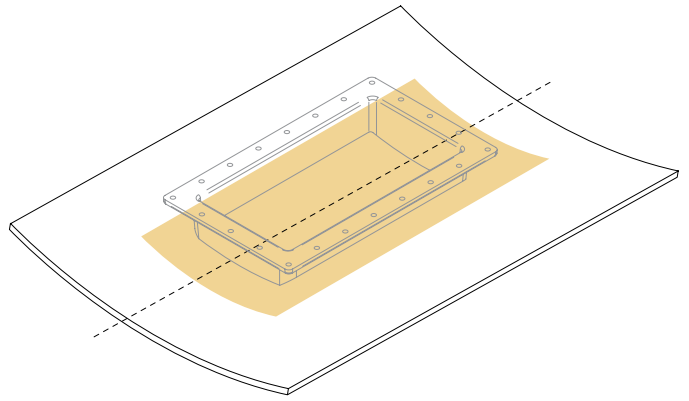
Stern installation

To avoid conflict between the thruster and propulsion propellers, trim tabs or rudders, the stern installation can be offset from the keel center line.



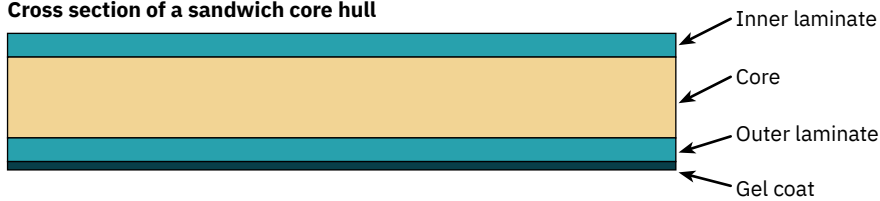
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- Ensure to have a minimum of 100mm space around the thruster installation to have service access.
- Bow thrusters must be positioned on the boat center line.
- Stern thrusters can be positioned off the centre line.

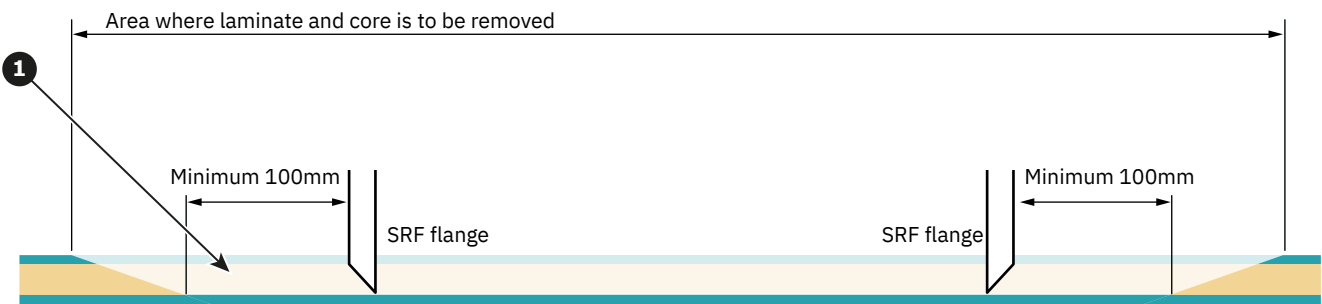


For vessels with sandwich hull construction, additional reinforcement of the area around the SRF flange is required.

Cross section of a sandwich core hull



- To achieve maximum strength and bonding in the area around the installation of the SRF flange remove the inner laminate and core material to expose the outer laminate. Remove enough area for a 100mm (minimum) clearance surrounding the SRF flange. (**Reference 1**).
- Reinforce the area by applying several bonding layers to strengthen the hull for the operation of the retract thruster. (**Reference 2**).

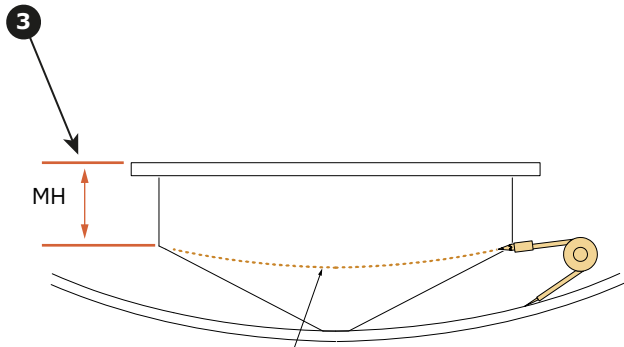
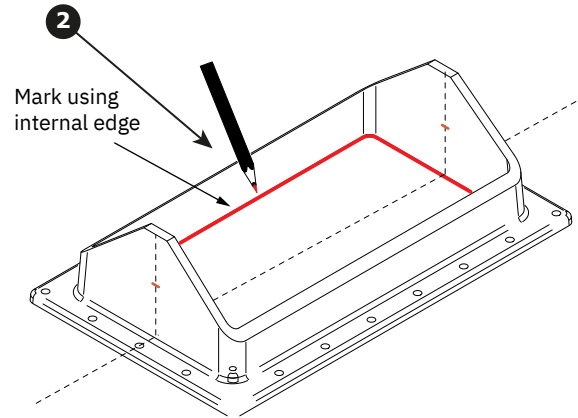
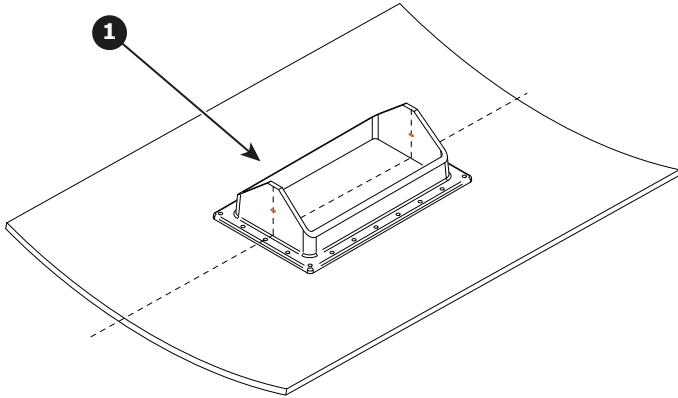


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- Flip the SRF flange upside down and position it at the identified installation location. **(Reference 1)**.
 - For bow thrusters, this is usually symmetrical about the vessel centerline.
 - For stern thrusters, the position of the thruster may deviate from centerline.
- Use the internal edge to mark where to cut out the thruster hatch from the hull. **(Reference 2)**.
- The SRF flange must be adapted so that the two longitudinal edges on the SRF flange run flush with the hull. To do so the SRF flange must be trimmed down to match the hull profile curvature. Use a suitable tool to mark the cutting line on the SRF flange. **(Reference 3)**.

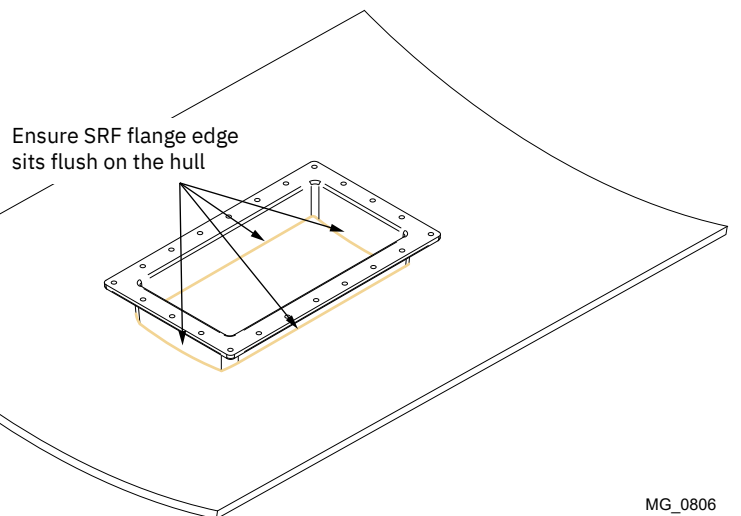
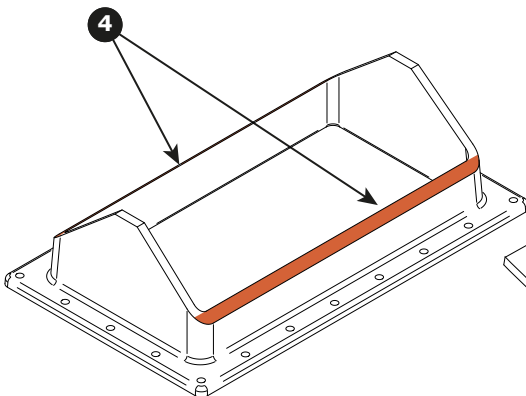
Important: The cutting line position must be according to the MH measurement for the actual thruster model. See table in topic "Thruster measurement".

For guidance or methods to transfer the hull profile to the SRF flange for cutting, consult a naval architect.
- DO NOT cut the SRF flange length edge at this stage. **(Reference 4)**

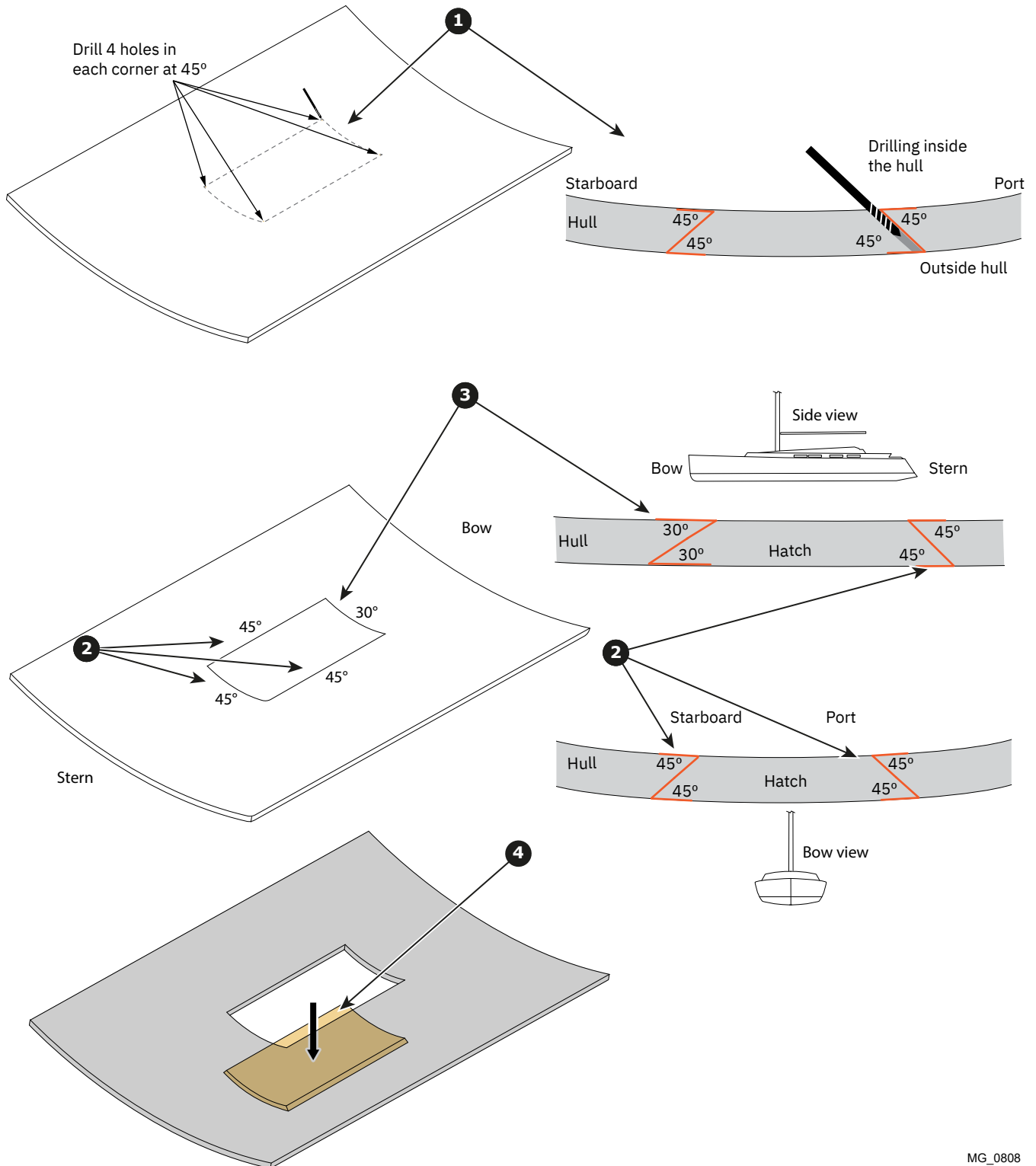


Important
 The minimum SRF flange height is stated on the product measurement page (MH)

- Ø185mm = 72mm
- Ø250mm = 97mm
- Ø300mm = 115mm
- Ø386mm = 148mm

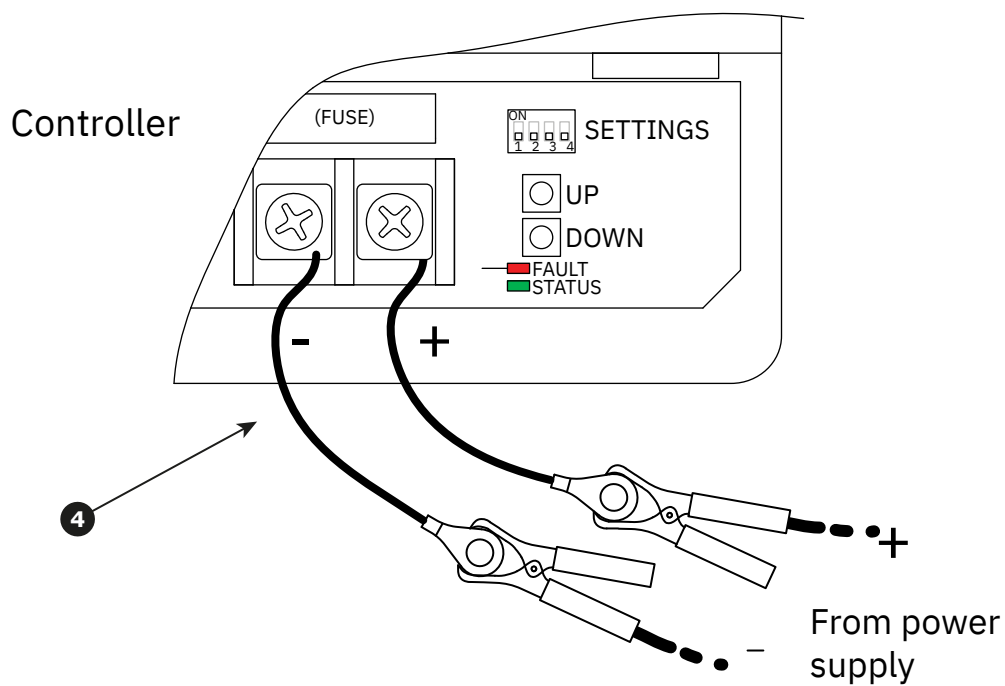
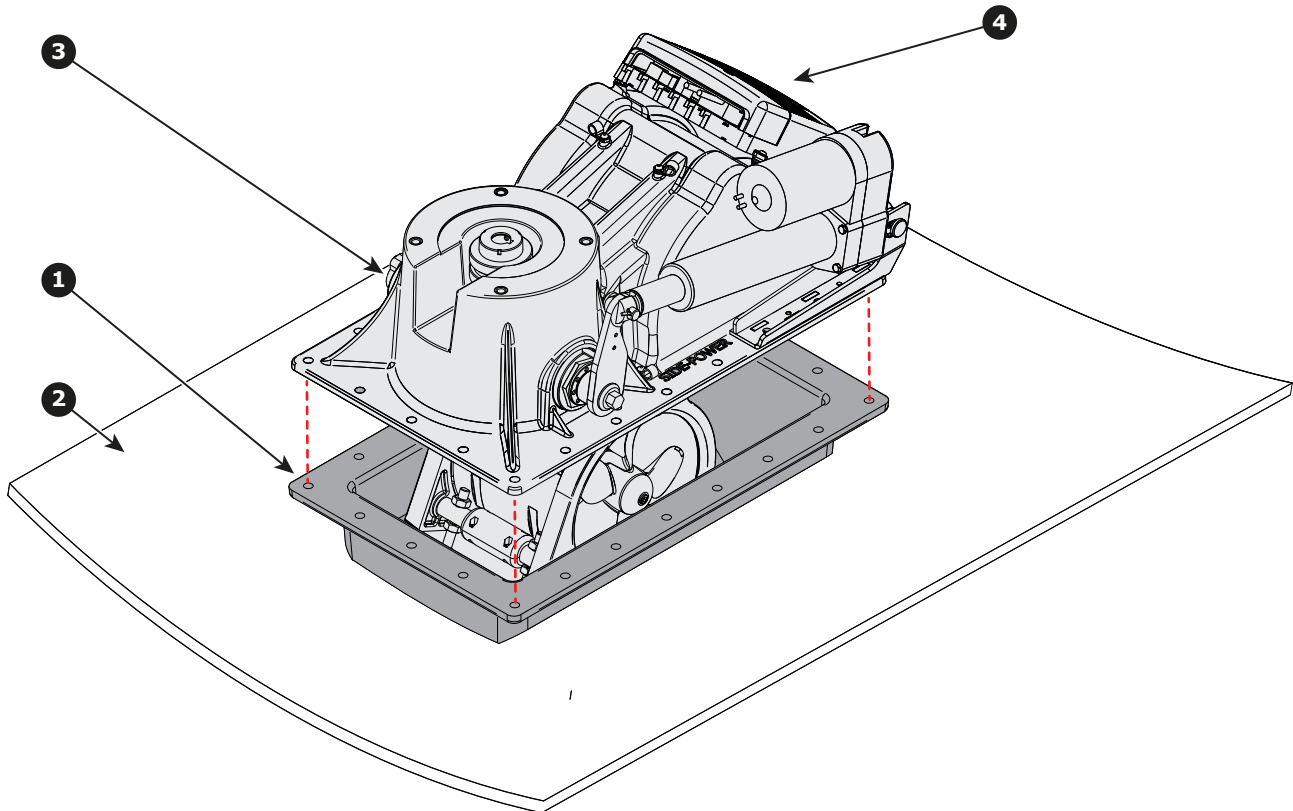


- When cutting from inside, prepare for cutting by drilling 4 holes in each corner of the marked area at 45° angle inwards against the centerline (**Reference 1**).
- The hatch opening must be cut at an angle of 45° on starboard, port and stern sides, (**Reference 2**), and 30° on the side facing the bow (**Reference 3**). This ensures that forces from water hitting the closed hatch is absorbed by the hull. **NOTE: It is of great importance that these cutting angles are correct. Otherwise the hatch will jam during opening. Use a suitable cutting tool able to be set to the desired angle, e.g. a jigsaw.**
- Remove the hatch from the hull. Prevent the hatch from falling down, ensure proper support to the hatch when cutting. (**Reference 4**).



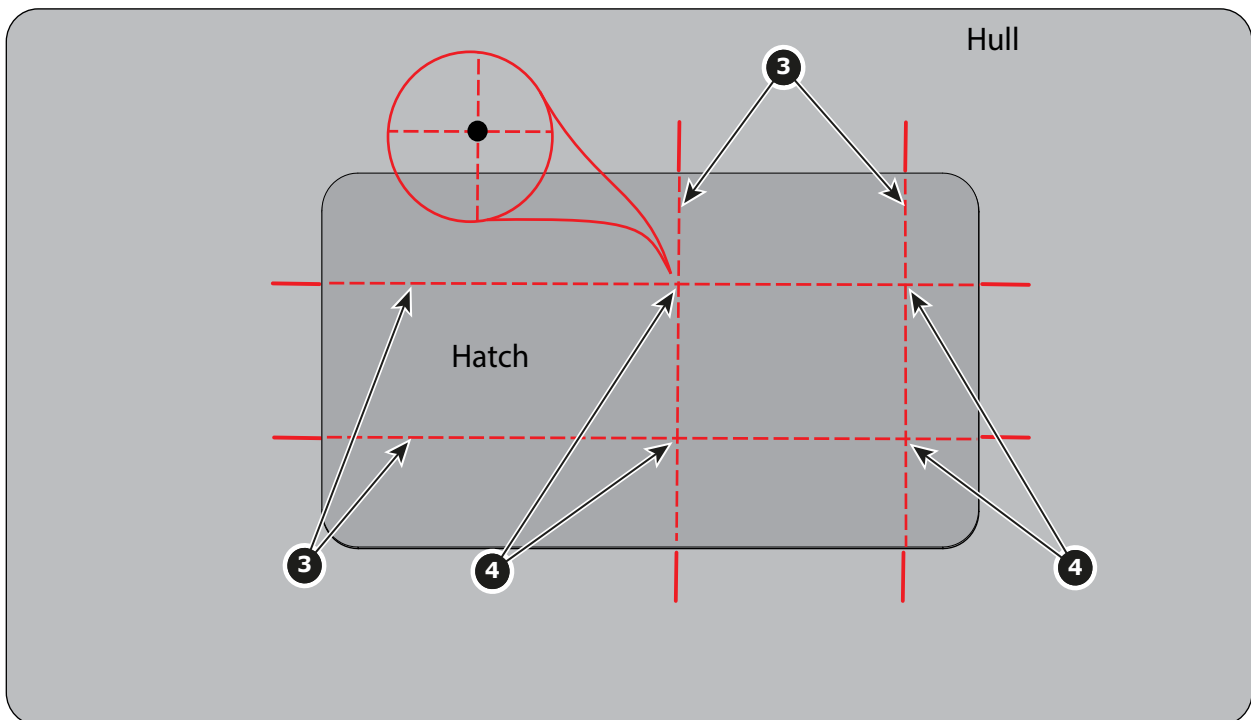
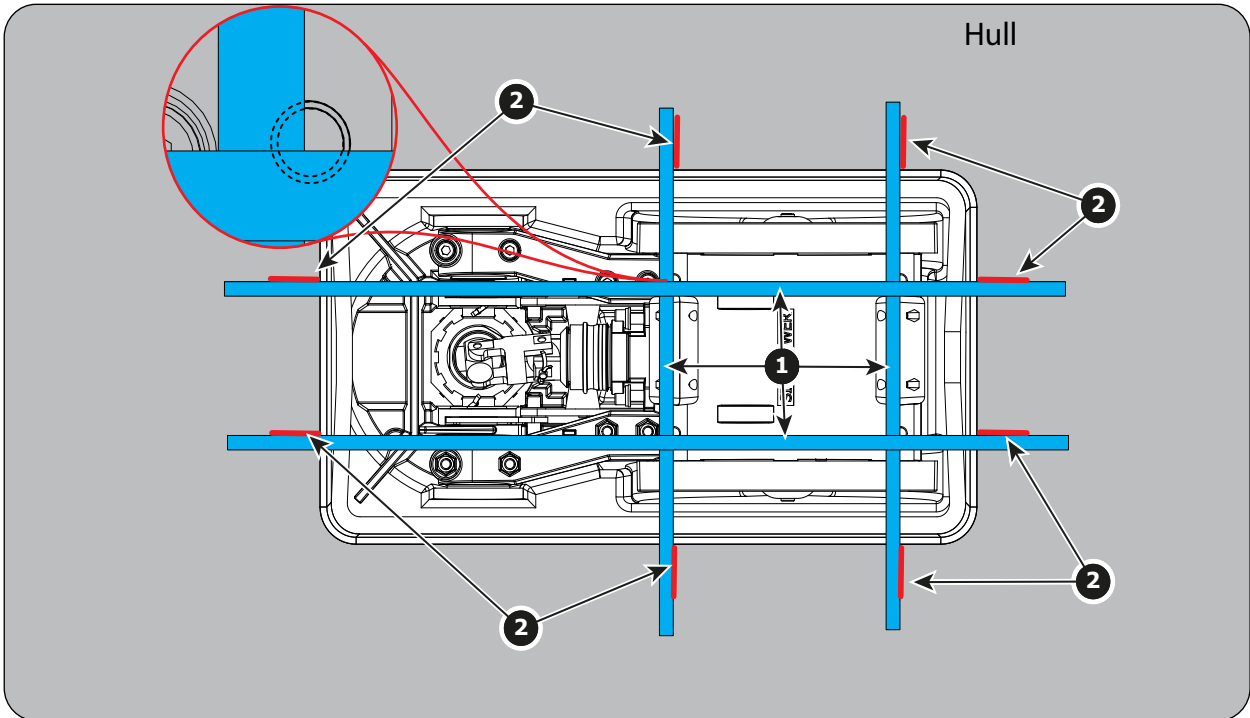
MG_0808

- Position the trimmed SRF flange (**Reference 1**) in the correct position over the hatch cut-out in the hull (**Reference 2**).
- Install the thruster housing (**Reference 3**) provisionally on the SRF flange, and secure it with 4 screws. Verify that the complete thruster assembly (SRF flange and thruster housing) is still in correct position.
- Prepare two power supply cables from the retract controller (**Reference 4**). Do not connect to the power supply yet.



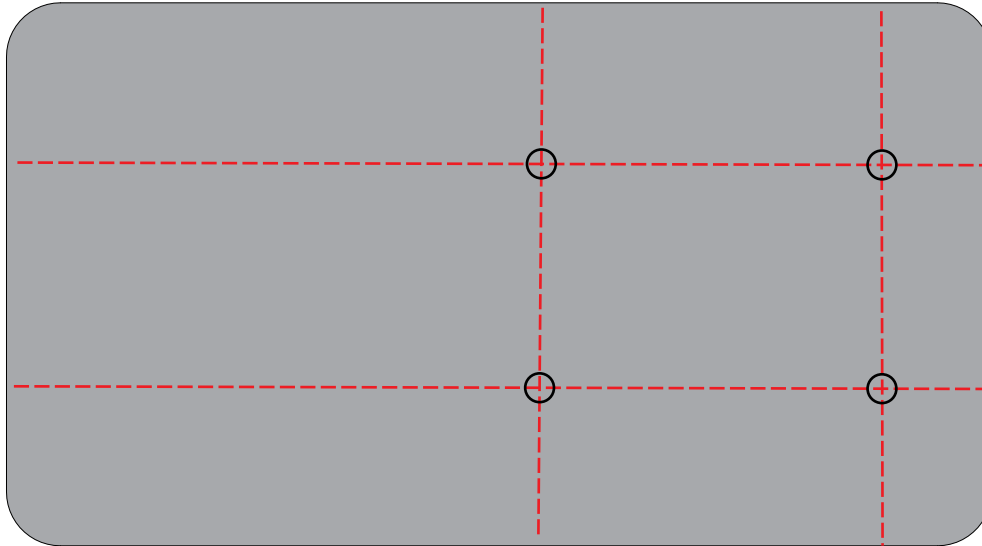
MG_0810

- Ensure that the SRF flange and the thruster housing are positioned correctly inside the hull. (See the previous topic).
- Use a suitable aid, e.g. adhesive tape, straight edge, laser or other adequate aid to follow a straight line over the center of the hatch bolt holes, in two directions. (**Reference 1, and detail bubble**).
- Apply marks on the hull, at the edges of the used aid, on the side facing the center of the bolt holes. (**Reference 2**)
- Remove the adhesive tape (or other used aid).
- Position the pre-cut hatch in the opening in the hull, and support it in its position.
- Use a flexible ruler or similar to draw extended lines on the hatch, between the marks created on the hull. (**Reference 3**).
- The correct position of the hatch attachment holes are now in the intersection of the extended lines on the hatch. Make a mark in each intersection (**Reference 4**).



MG_0807

- Drill four $\varnothing 11$ mm holes in the center of each marking created in the previous step.
- It is recommended to use a pillar drill with a proper construction surface to ensure that the holes are drilled perpendicular to the hatch.
- Countersunk the holes after drilling.



MG_0811

Temporarily setting up the complete installation to ensure no conflicts during the final operation of the thruster.

- Temporarily attach the hatch to the thruster housing by using the M10 countersunk bolts through the drilled holes in the hatch and screw them in to the hatch bolt holes. **(Reference 1)**.
NB: Ensure correct orientation for the thruster to open the hatch facing the bow. Remember attachment is for temporary checking of thruster operation only.
- Ensure that the hatch is in proper place **(Reference 2)**.
- Connect the prepared power supply cables from the thruster controller to a power supply.
(NB: Refer to the label on actuators for correct voltage)
- Set switch no. 4 on the DIP-switch marked "SETTINGS" to ON.
- Press "DOWN" to extend the tunnel and check the hatch opens fully without touching the hull. If the hatch is obstructed by the hull in the front, **(Reference 3)**, the SRF flange must be adapted so that the hatch does no longer touch the hull when in open position. **(Reference 4)**.
- If necessary:
Grind the front and side edges of the flange a necessary amount to obtain space between the hull and the hatch. **(Reference 5)**. Note that the reference 5 illustration shows an excessive grind down in the shaded area to clarify the operation.
- Ensure that there is a space between the twist ring and the hatch during the grinding process. **Do not allow this space to be zero. (Reference 6)**.

IMPORTANT

- If the space between the hull and the hatch is not obtained by the grinding process alone, (still with a space between the twist ring and the hatch), the flange must in addition be lifted in the aft end. Use wedges to obtain the correct height **(Reference 7)**. When correct position is obtained, mark the wedge positions, and note the distance between the flange and the hull.

IMPORTANT

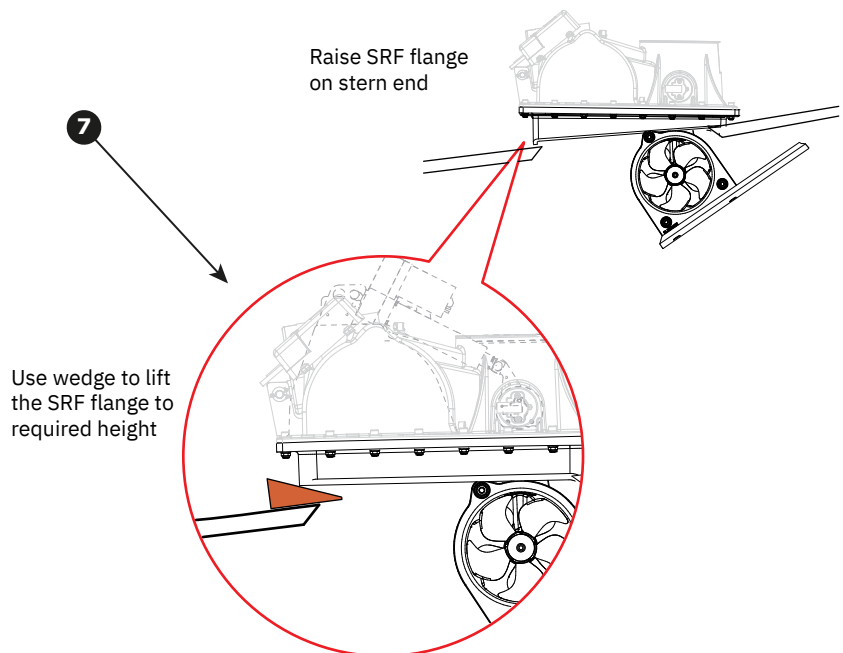
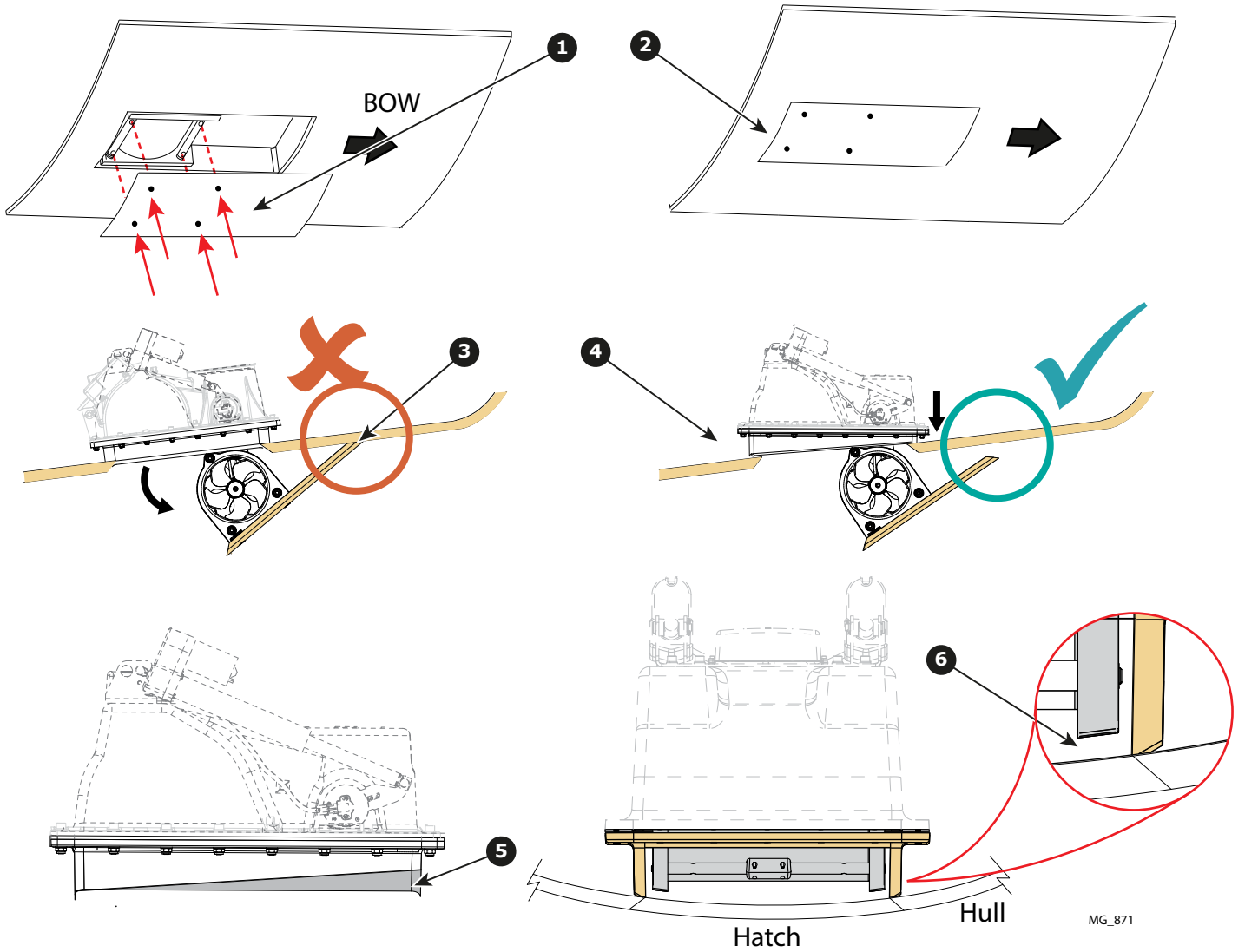
The hatch contact edges and the hull contact edges MUST work as the mechanical end stop. During cruising, slamming forces from the water must be absorbed by these areas, not the thruster.



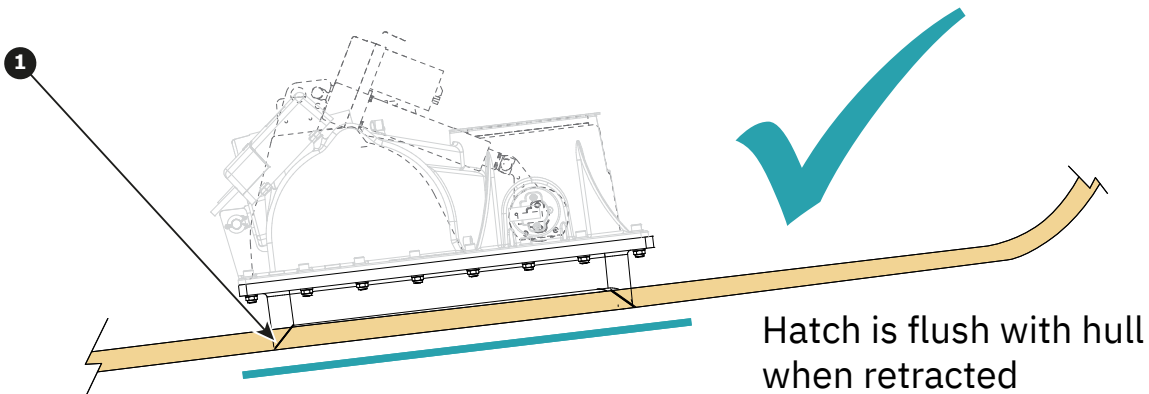
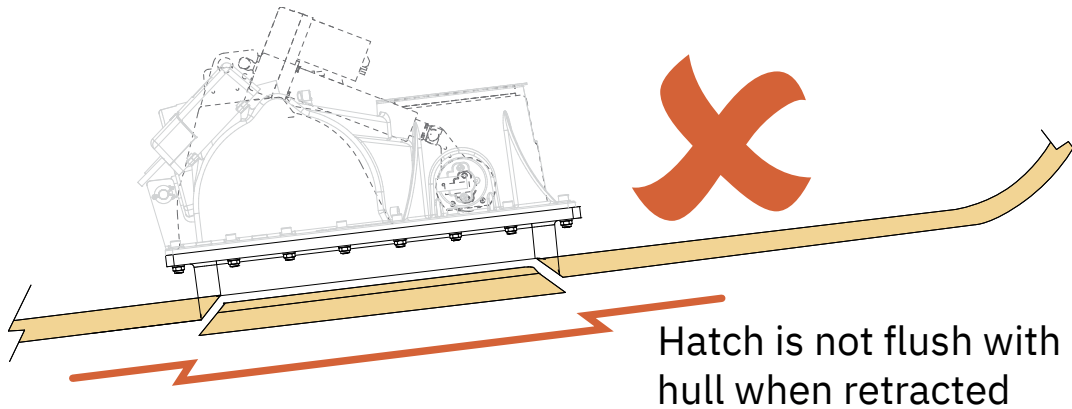
CAUTION.

Accidental activation of the retract mechanism can cause serious injury due to the high pressure force used for moving the hatch. Use caution when performing any work or maintenance around or inside the retract mechanism / hatch.

Pre-install the hatch



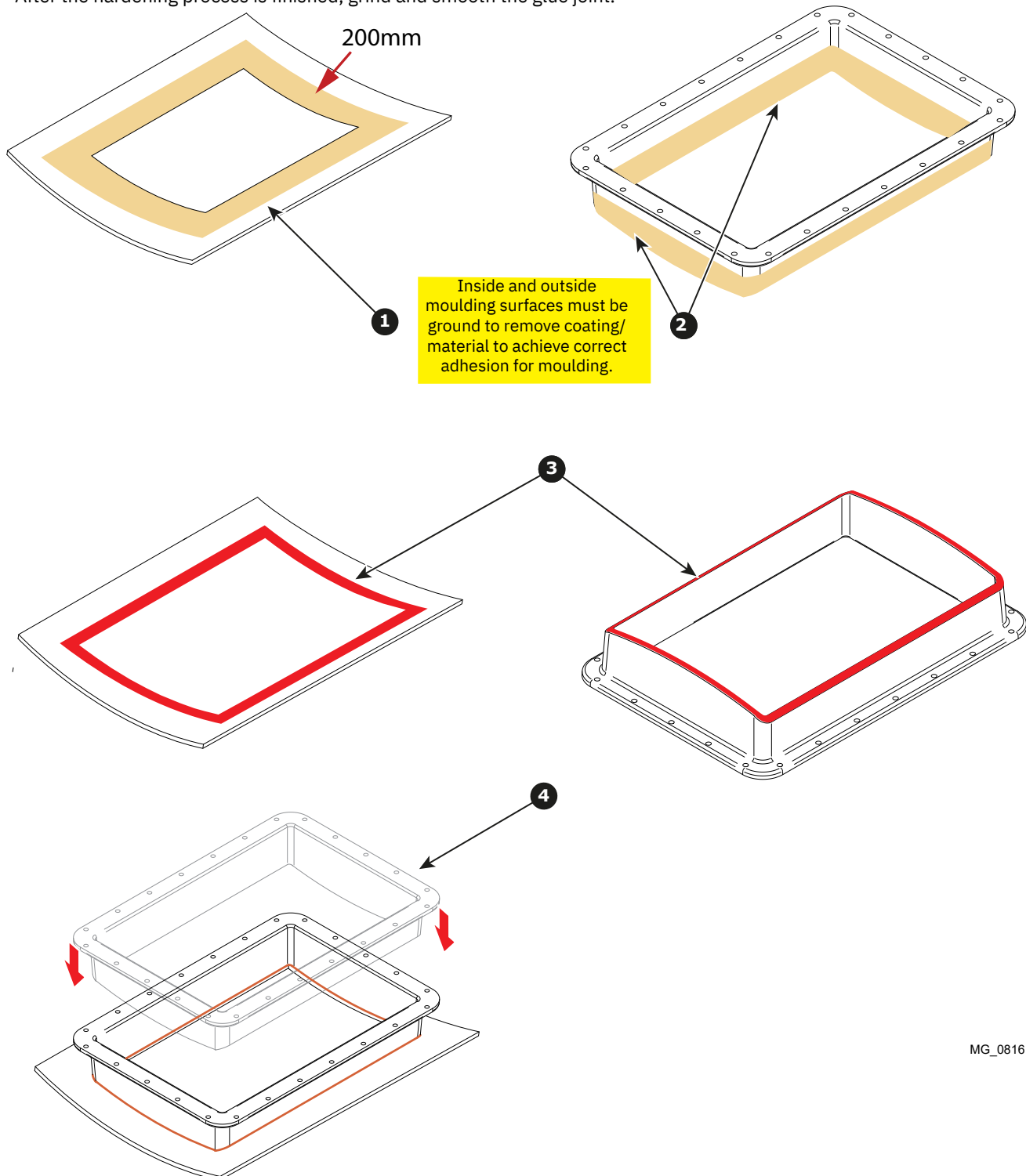
- Press “UP” to retract the tunnel.
- Ensure that the hatch is fitted in the hatch opening, and that the hatch is aligned flush with the hull at all edges. (**Reference 1**).
- Ensure that there is pressure on all the contact surfaces between the hatch and the hull when the hatch is closed.
- If the hatch is not closing with pressure on all the contact surfaces, the entire SRF flange must be raised to obtain this.
- When the thruster is operating as required, ensure that the position of the SRF flange can be recreated by adding position marks and leveling measurements.
- Remove the thruster housing from the SRF flange.



MG_0815

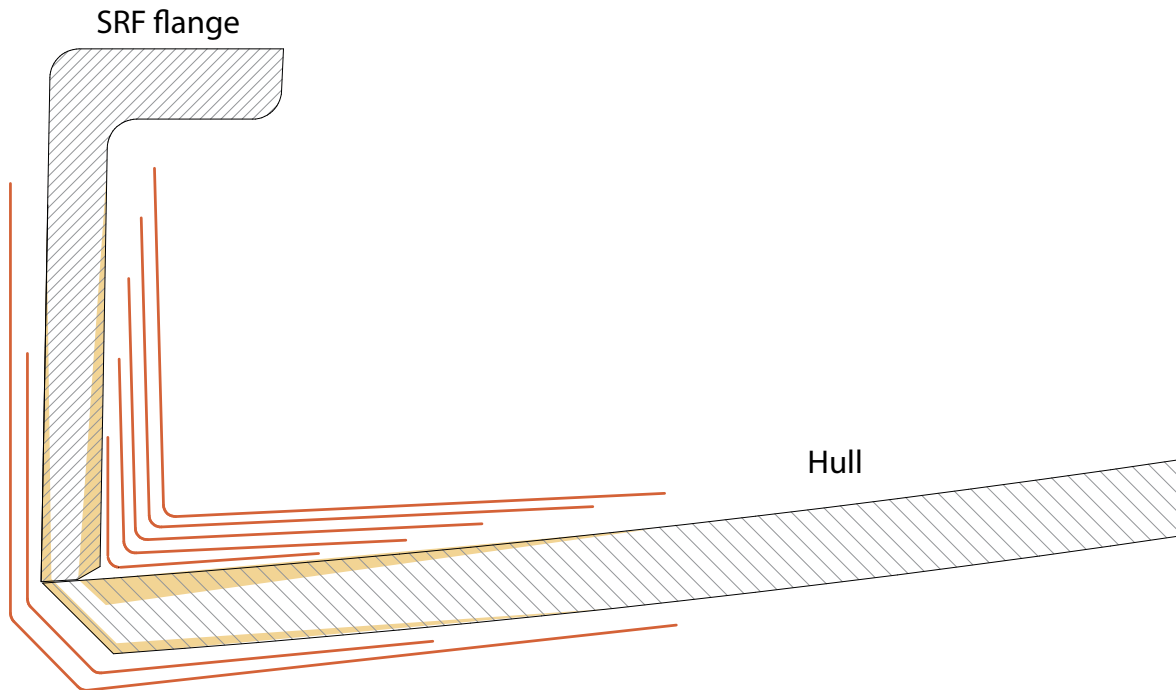
Before grinding of hull and SRF flange, precautions must be taken against grinding dust inside the boat. Surfaces to be moulded/bonded must be ground to remove coating and material to achieve sufficient adhesion.

- Grind and smooth the area inside the hull opening to remove the gelcoat. Remove the gelcoat in a width of 200mm. (**Reference 1**).
- Grind the inside and outside of the SRF flange to remove the gelcoat (**Reference 2**).
- Apply appropriate glue / adhesive inside the hull opening and on the bottom of the SRF flange (**Reference 3**). Apply enough glue to fill the possible space between the raised SRF flange and the hull. Reinstall the wedges from the pre-install procedure if used to obtain the correct height in the aft end of the flange.
- Lower the SRF flange on to the hull, and position it according to the marks and measurement performed in the previous steps. (**Reference 4**).
- After the SRF is positioned correctly, remove the excessive glue before the hardening process starts.
- After the hardening process is finished, grind and smooth the glue joint.



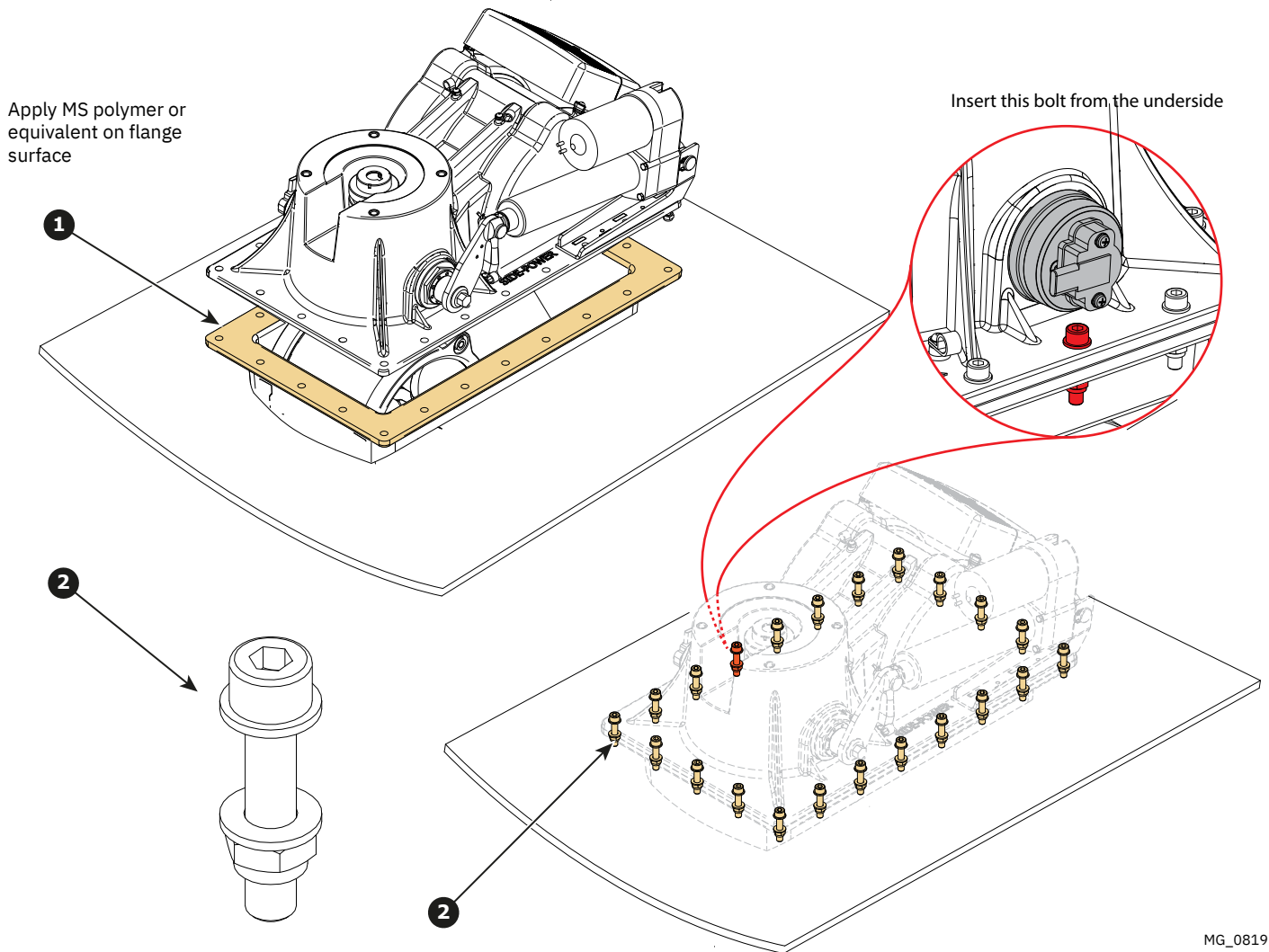
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- After the glue / adhesive has hardened completely, the inside and outside of the SRF flange and hull must be laminated. Apply several layers of fibreglass and ensure that the resin and fibreglass is compatible with hull and flange materials.
- When the laminated area has cured properly, smooth all moulded surfaces and apply coating.
- Apply putty before coating if necessary.



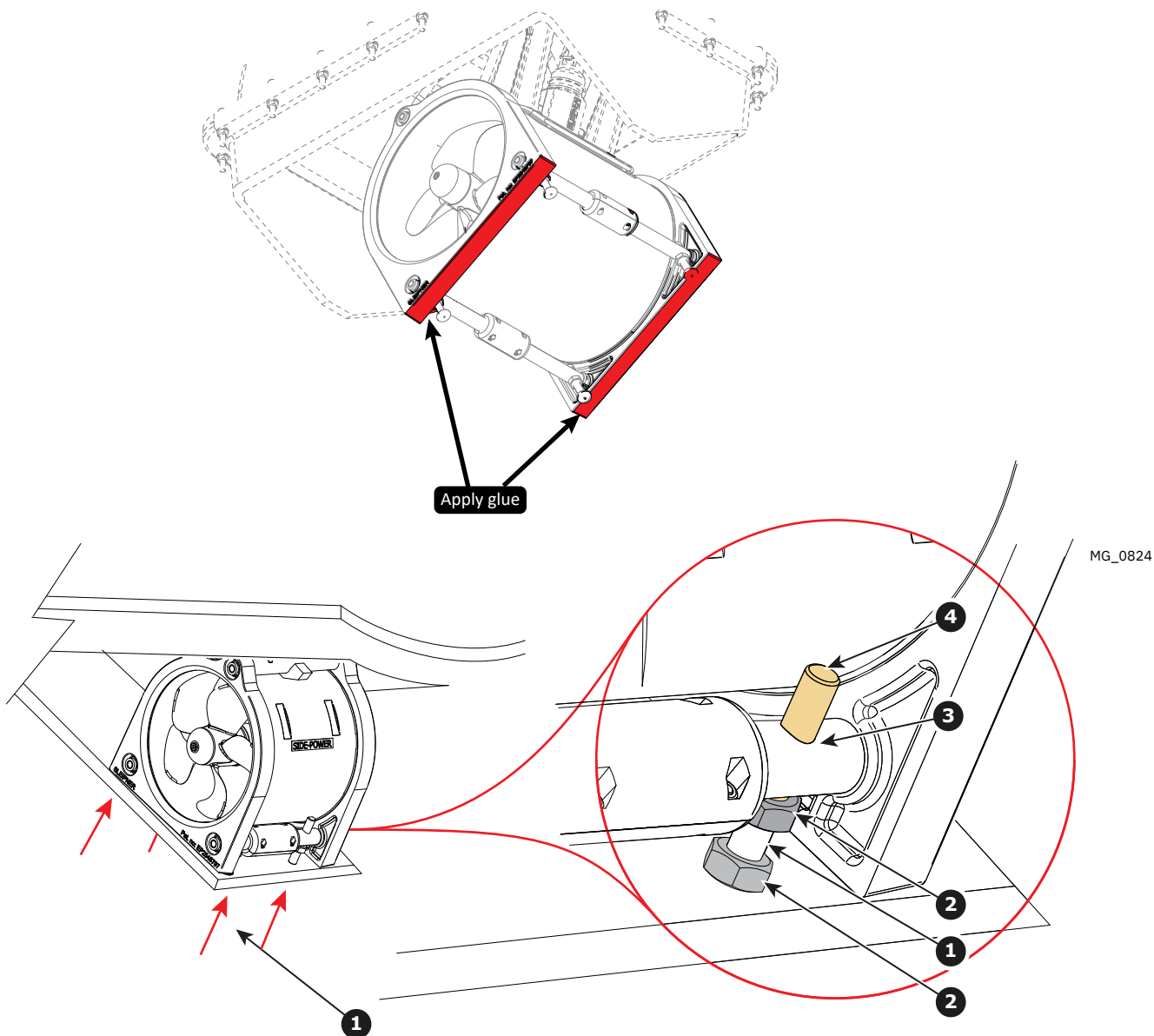
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- When the lamination process is completed, the thruster housing can be installed.
- Apply MS polymer or equivalent on the SRF flange surface (**Reference 1**).
- Lower the thruster housing down on the SRF flange.
- Install bolts, washers and nuts (**Reference 2**) in each mounting hole.
- **NOTE: It may be necessary to insert two of the bolts from the underside of the SRF flange with the nut then on the top to avoid conflict with the position sensor. (For SR L&V 80 and 100 variants only).**
- Tighten the bolts with a torque of 4Nm - 2,9lb/ft. Start with a corner bolt, then continue tighten the bolts in a cross pattern.

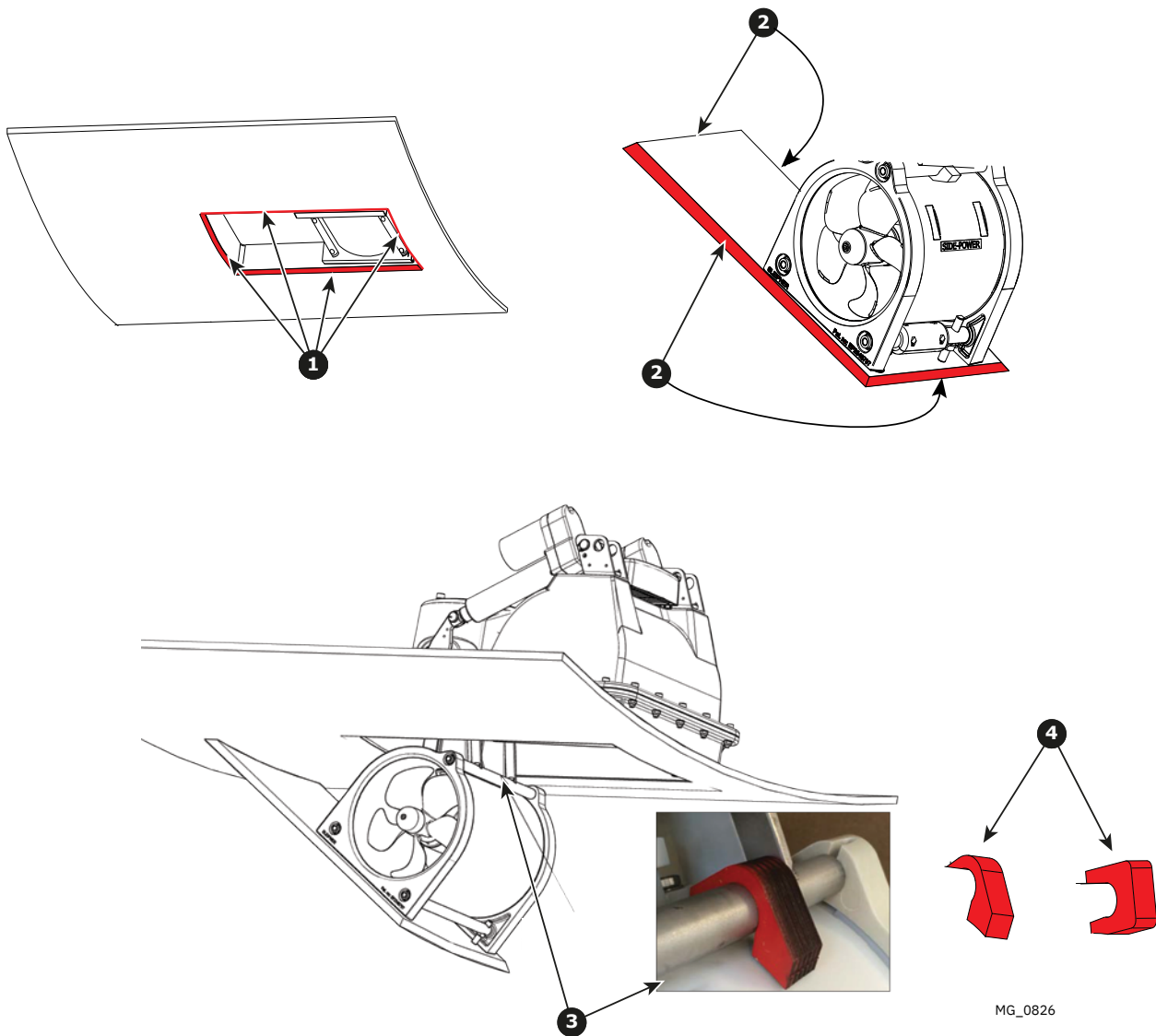


MG_0819

- Ensure that the thruster is in the outer position
- Apply glue on the twist ring facing the hatch.
- Enter the hatch bolts through the hatch, (**Reference 1**) and enter the lock nuts (**Reference 2**) on the bolt. Position the nuts close to the inside of the hatch, but do not tighten.
- Enter the bolts in to the bolt holes in the thruster housing (**Reference 3**).
- Bolt the hatch to the tunnel. Ensure the bolts do NOT conflict with the tunnel. (**Reference 4**).
(NB: Bolts can be cut, depending on hatch thickness.)
- When all four bolts are tightened so that the hatch is in tight connection to the twist rings, tighten the lock nuts (**Reference 2**) to the hatch and bolt holes in the tunnel housing respectively.
- Retract the thruster to verify that the movement is smooth, and that the hatch is in correct position when the thruster is in both open and closed position.

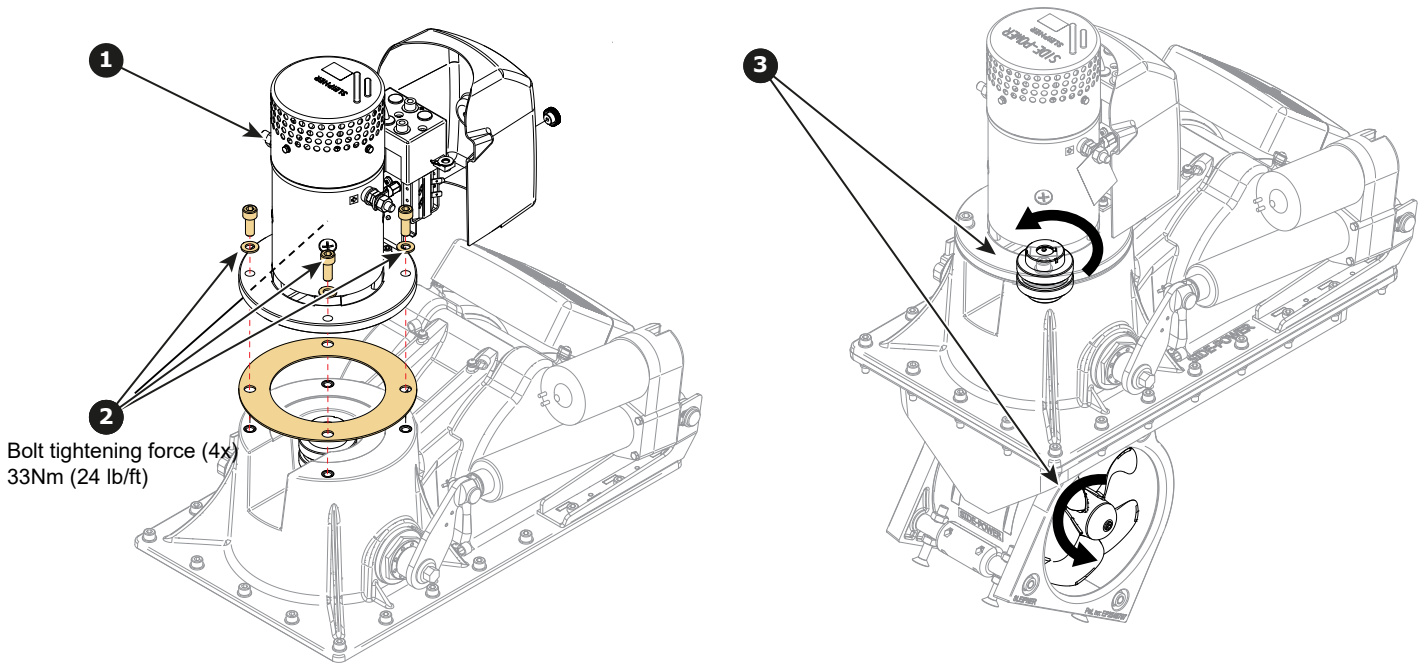


- Lower down the thruster.
- Apply a layer of aluminium or duct tape on hatch opening edges on the hull. (**Reference 1**). This is for masking out for the adhesive in the next step.
- Apply filler or equivalent to hatch edges in such amount that it will fill the gap between the hull and the hatch. (**Reference 2**).
- Operate the thruster to "IN" position. Smooth out the filler and add more if needed. After curing time, grind and smooth the surface. Apply glue on twist rings contact surface.
- Apply coating inside and outside of the hatch and on the hull to cover the fiberglass and filler.
- Remove the red spacer block located above the tunnel. (**Reference 3**). Note: Two types of spacer block is used. (**Reference 4**).

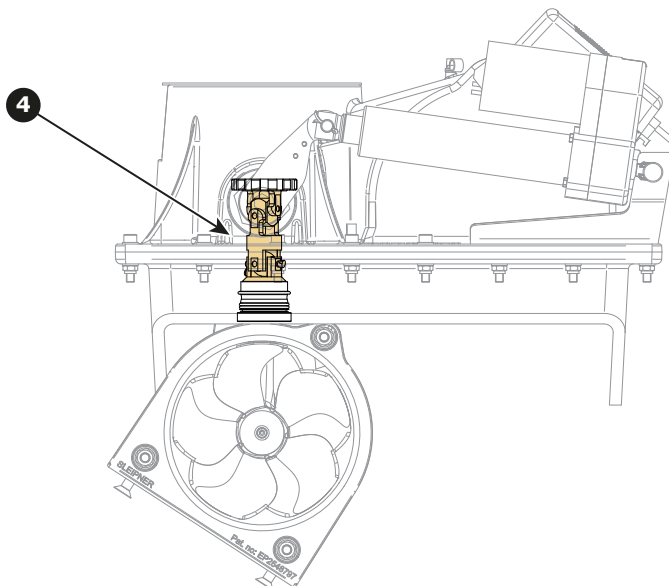


- Install the motor onto the motor bracket ensuring the couplings and the drive shafts have locked together. **(Reference 1)**. **NB: depending on your coupling you may need to wiggle the motor into place. Ensure the couplings are engaging correctly. Ensure the motor cable terminals are accessible for electrical installation later.**
- Enter the bolts with washers holding the motor to the motor bracket. **(Reference 2)**. Tightening torque 33Nm (24lb/ft)
- Check the drive shafts engage by rotating the propeller. **(Reference 3)**. It is required the propeller can rotate via hand power. **(NB: Rotating the propellers can be hard because of the gear reduction and the motor.)**
WARNING. The propeller blades may be sharp.
- Apply grease to the internal drive shaft. **(Reference 4)**. We advise painting the gear house and propellers with anti-fouling. **(NB: Do not paint the anodes, sealing, rubber fittings or propeller shafts)**

(NB: The motor must be covered to avoid dust from fabrication/ maintenance operation entering the motor or the solenoids. After fabrication maintenance operations have ceased the cover must be removed before operating the thruster.)

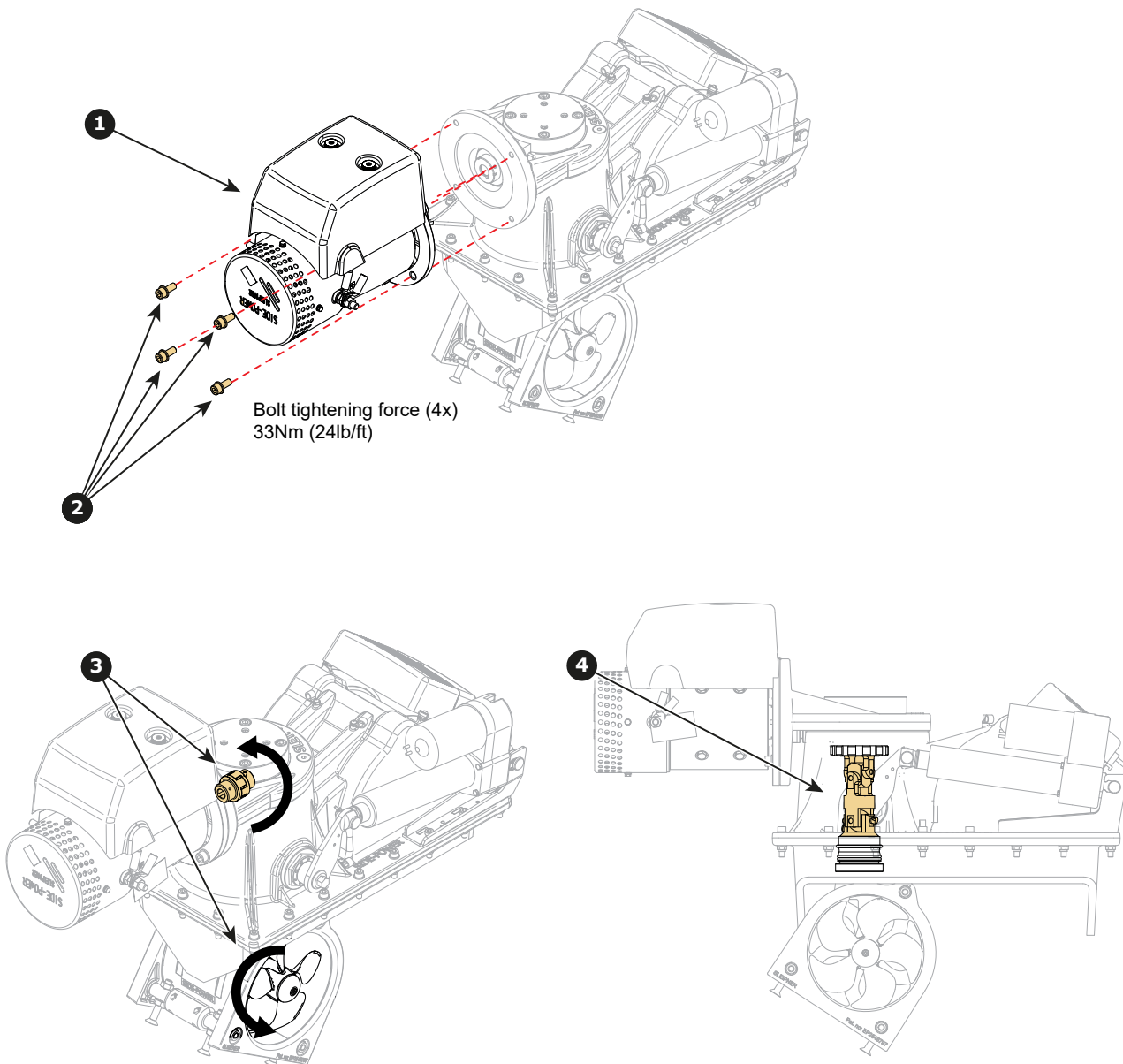


MG_0827



- Install the motor onto the motor bracket ensuring the couplings and the drive shafts have locked together. **(Reference 1).**
NB: depending on your coupling you may need to wiggle the motor into place. Ensure the couplings are engaging correctly. Ensure the motor cable terminals are accessible for electrical installation later.
- Enter the bolts with washers holding the motor to the motor bracket. **(Reference 2).** Tightening torque 33Nm (24lb/ft)
- Check the drive shafts engage by rotating the propeller. **(Reference 3).** It is required the propeller can rotate via hand power. **(NB: Rotating the propellers can be hard because of the gear reduction and the motor.)**
WARNING. The propeller blades may be sharp.
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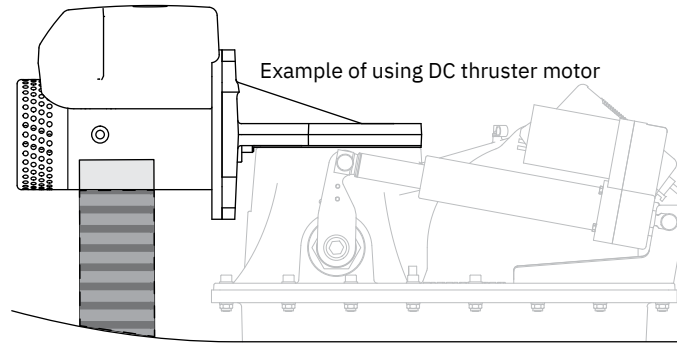
(NB: The motor must be covered to avoid dust from fabrication/ maintenance operation entering the motor or the solenoids. After fabrication maintenance operations have ceased the cover must be removed before operating the thruster.)



MG_0849

Support for the motor

If you are installing the motor at an angle of more than 30 degrees off vertical, the motor will require separate/ additional support.



IMPORTANT
Do not position support on the motor cap.

MG_0717

1. Plan the location of electrical components before starting with the electrical installation. Main electrical components will typically consist of battery, Automatic Main Switch (AMS) or manual main switch and fuse, see Wiring Diagram chapter for an overview.
2. Estimate the total length of the power cables to determine the recommended cross section. The total power cable length is defined as the distances from the positive battery terminal, via fuse, main switch and motor and all the way back to the negative battery terminal.
3. Find the recommended power cable cross section for the installation by using the estimated total power cable length and the table shown in chapter *Electrical Reference Guide*.
4. Find the recommended fuse size by using the table shown in chapter *Electrical Reference Guide*. Use slow blow rated fuses to hold stated nominal current for minimum 5 minutes.
5. Use appropriate dimensioned battery with Cold Cranking Amps (CCA) according to recommendations given in the Electrical Reference Guide chapter. Battery voltage must be compliant with the voltage rating of the thruster motor and control circuitry. Capacity and rated discharge current of battery should be according to rated nominal current drawn and typical duty cycle for thruster operation. Nominal current drawn is listed in the Electrical Reference Guide chapter. The actual voltage at the motor while running the thruster determines the motor RPM and thrust. Using smaller cross section than recommended or low-capacity battery could reduce performance.
Installing a battery close to the thruster reduces the length of the power cables and potentially increase the performance, due to lower voltage drop in the power cables. Thus for installations on large vessels with bow and stern thrusters or catamarans a dedicated battery to each thruster should be considered.
6. Install the cable from the retract mechanism as described in chapter *Retract Thruster Controller Cable Installation*.
7. Install and connect the battery, fuse, main switch and wiring according to instructions in Wiring Diagram chapter. For safety reasons it is always recommended to install a fuse and a main switch on the power cables and as close as possible to the positive battery pole connection. The main switch must be installed such that it is easily accessible so that the thruster can be electrically disconnect to a safe state when not on-board or in the case of an emergency.
For dual thruster systems using only one battery bank a dedicated AMS with fuse, or manual main switch and fuse should be installed for each thruster. These should be installed close to the battery bank.

Follow the instructions in the *Motor Lug Connection* chapter when fastening the power cables to the motor.

Sleipner offers both manual main switches and Automatic Main Switches (AMS). Sleipner AMS is controlled by the control panel in addition to the option of manual operation. Turning on the control panel also turn on the automatic main switch. When the control panel is turned off the automatic main switch is turned off. This ensures that the control electronics and motor is only energized when the control panel is turned on.
Sleipner offers AMS supporting either S-Link or ON/OFF control panels. Ensure to select a main switch with voltage rating according to the chosen motor- and battery-voltage. Note that the AMS requires separate power supply which should be protected by a dedicated fuse.

8. Install control panel according to instructions in the Installation Guide accompanying the control panel to be installed .
9. See S-Link System Description chapter for detailed information on installation of S-Link Power cable and additional S-Link components.

WARNING

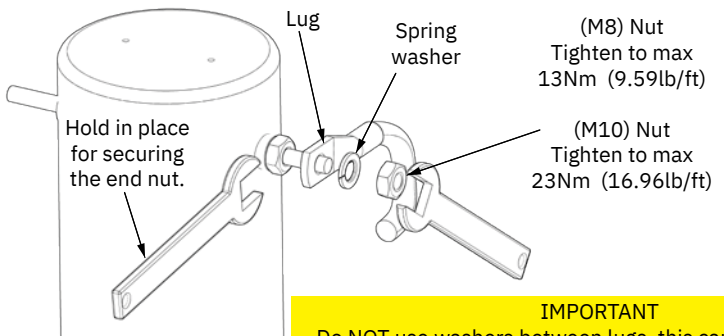
After all electrical connections have been completed, turn off main switch and check the following with an ohmmeter:

1. There is no electrical connection between motor flange and the positive terminal on the motor.
2. There is no electrical connection between motor flange and the negative terminal on the motor.

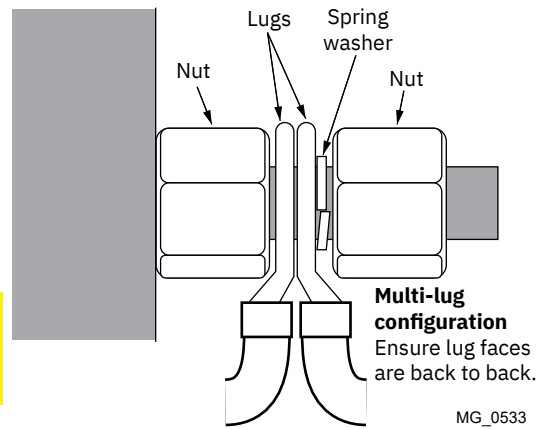
If unsure contact skilled personnel.

Model Size	System Voltage	Nominal current draw	Min. battery CCA	Rec. fuse	Cross Section Guide for Power Cables												
					Unit	<7m total + & -		7-14m total + & -		15-21m total + & -		22-28m total + & -		28-35m total + & -		36-45m total + & -	
						Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.	Min.	Rec.
80/185T	12 V	530 A	DIN: 550 SAE: 1045 EN: 940	ANL 400	mm2	70	70	120	2 x 70	2 x 95	2 x 95	2 x 120	2x 120	2 x 120	NA	NA	NA
					AWG	2/0	2/0	4/0	2 x 2/0	2 x 3/0	2 x 3/0	2 x 4/0	2 x 4/0	2 x 4/0	NA	NA	NA
	24 V	280 A	DIN: 300 SAE: 570 EN: 520	ANL 250	mm2	35	35	35	50	50	70	70	95	95	120	120	2 x 95
					AWG	2	2	2	1/0	1/0	2/0	2/0	3/0	3/0	4/0	4/0	2 x 3/0
100/185T	12 V	740 A	DIN: 750 SAE: 1425 EN: 1320	ANL 500	mm2	95	95	2 x 70	2 x 95	2 x 120	NA	NA	NA	NA	NA	NA	NA
					AWG	3/0	3/0	2 x 2/0	2 x 3/0	2 x 4/0	NA	NA	NA	NA	NA	NA	NA
	24 V	340 A	DIN: 400 SAE: 760 EN: 680	ANL 325	mm2	50	50	50	70	70	95	95	120	120	2 x 95	2 x 95	2 x 120
					AWG	1/0	1/0	1/0	2/0	2/0	3/0	3/0	4/0	4/0	2 x 3/0	2 x 3/0	2 x 4/0

Motor lug connection



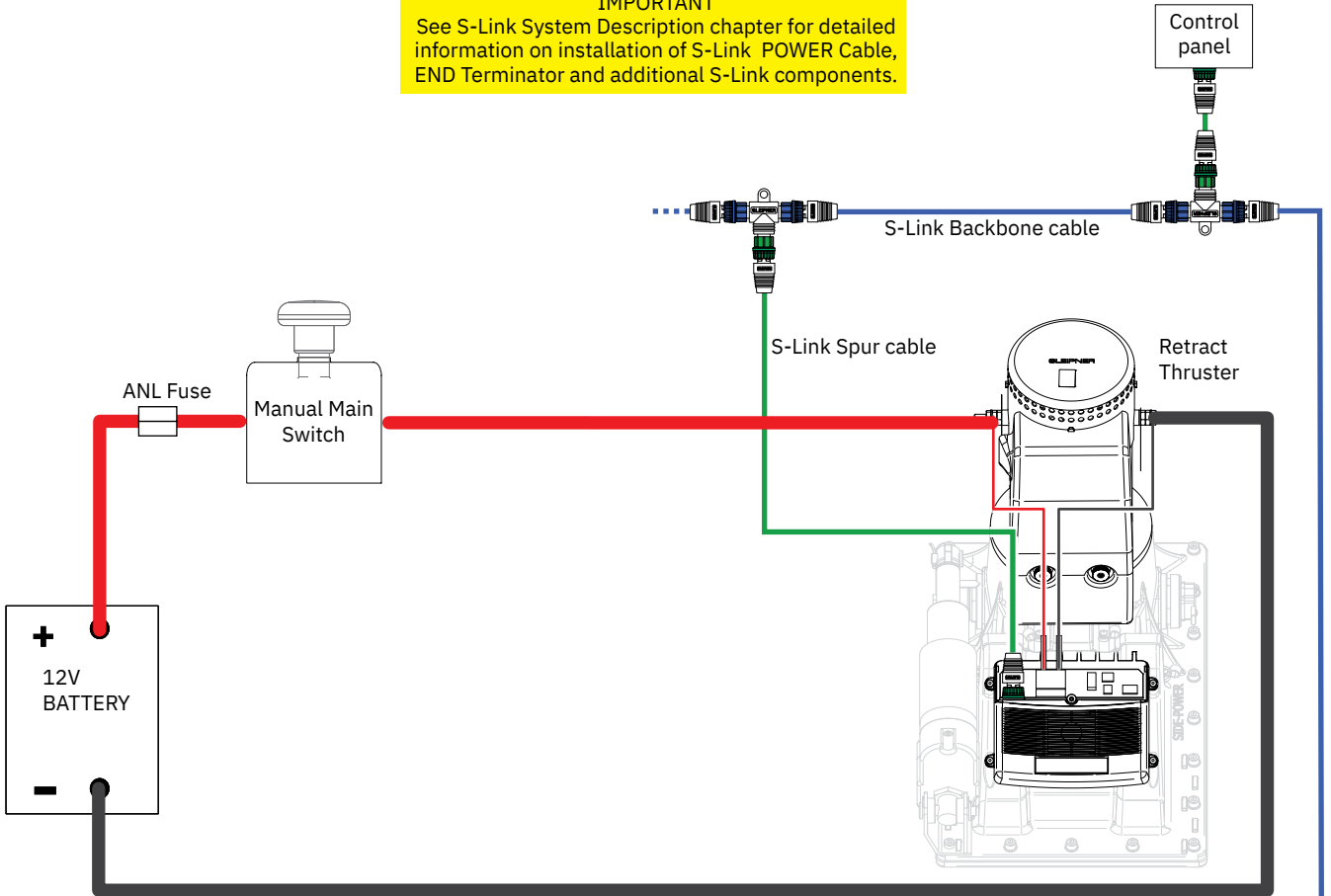
IMPORTANT
Do NOT use washers between lugs, this causes overheating and fire. Spring washers must be placed in the outer position before tightening nut.



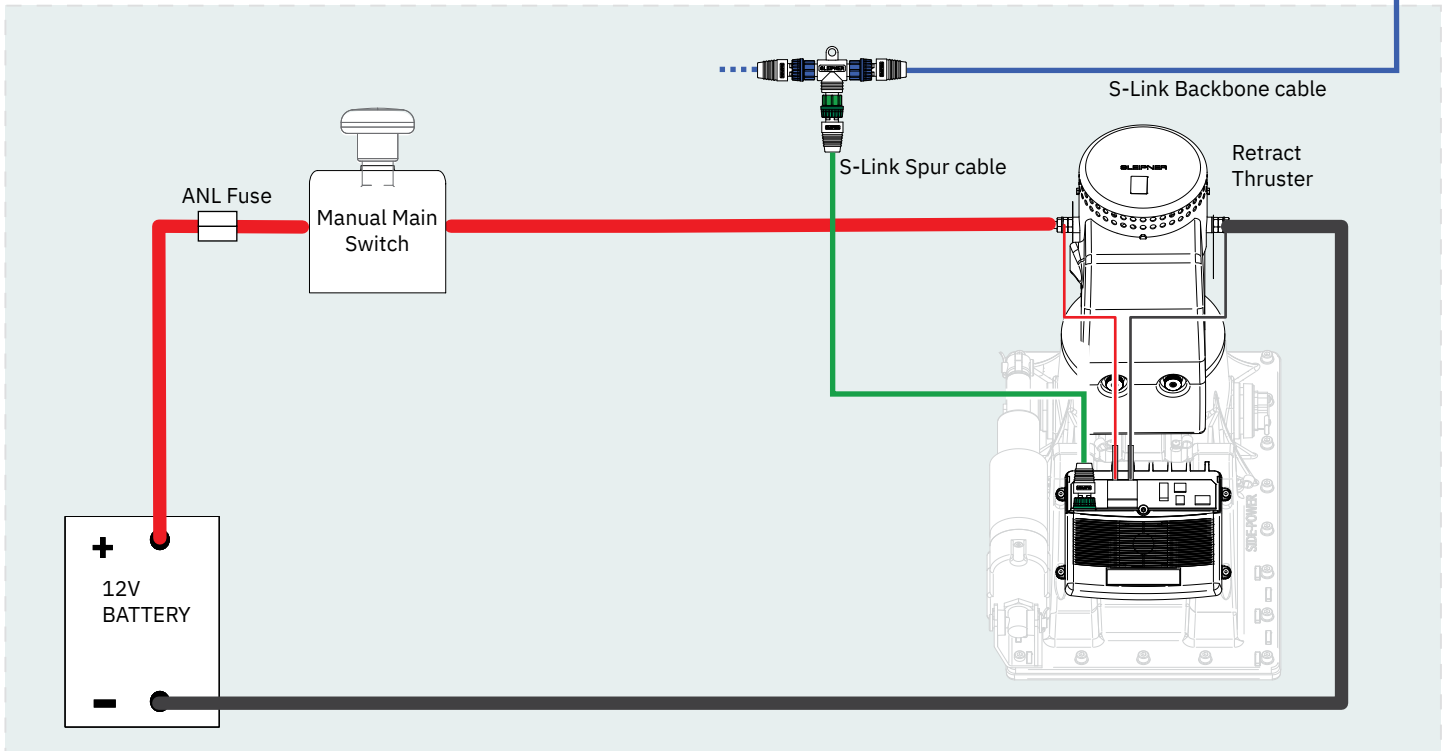
Manual main switch wiring diagram 12V retract thruster

The Top wiring diagram is for a single bow or stern thruster system

IMPORTANT
See S-Link System Description chapter for detailed information on installation of S-Link POWER Cable, END Terminator and additional S-Link components.



The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.

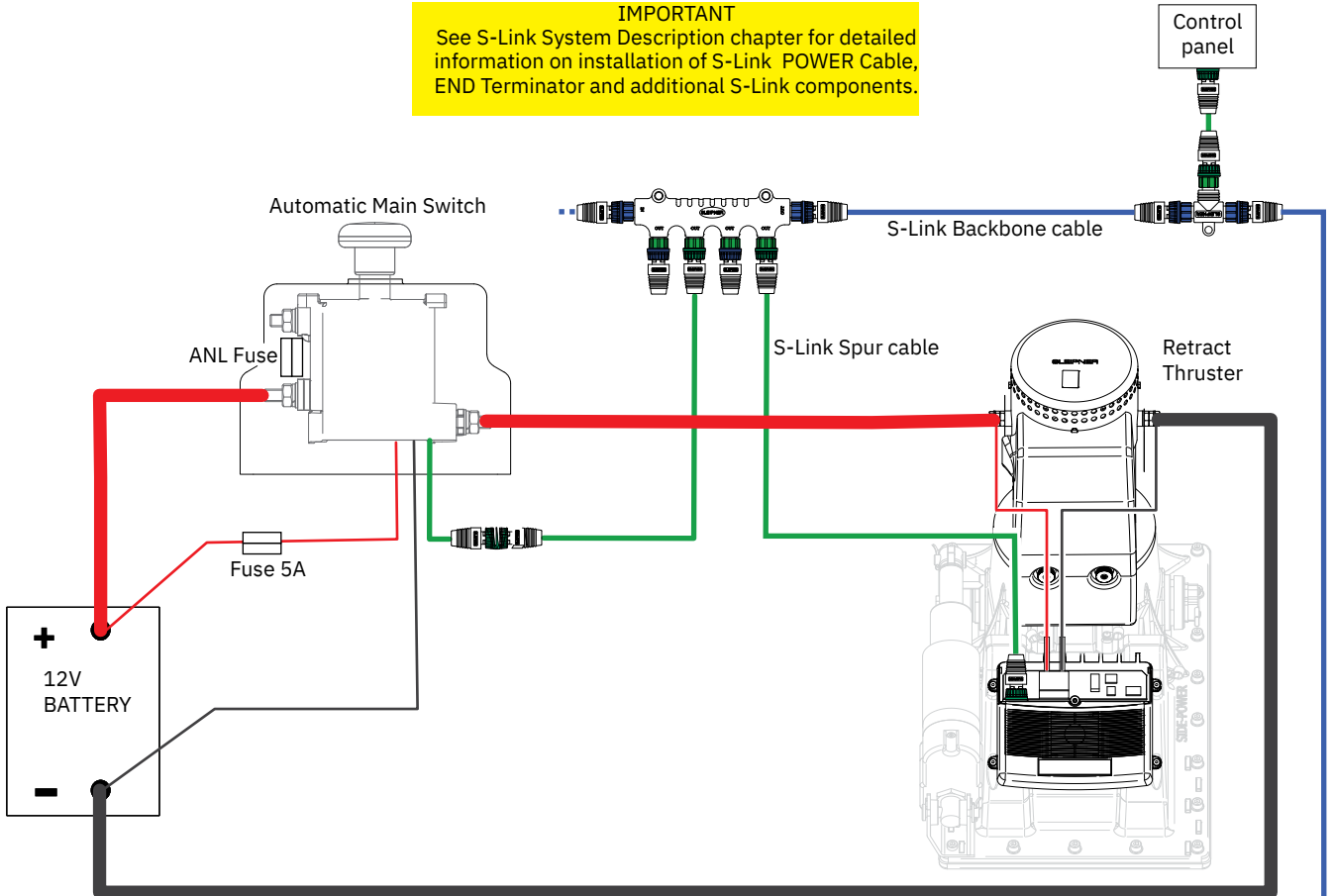


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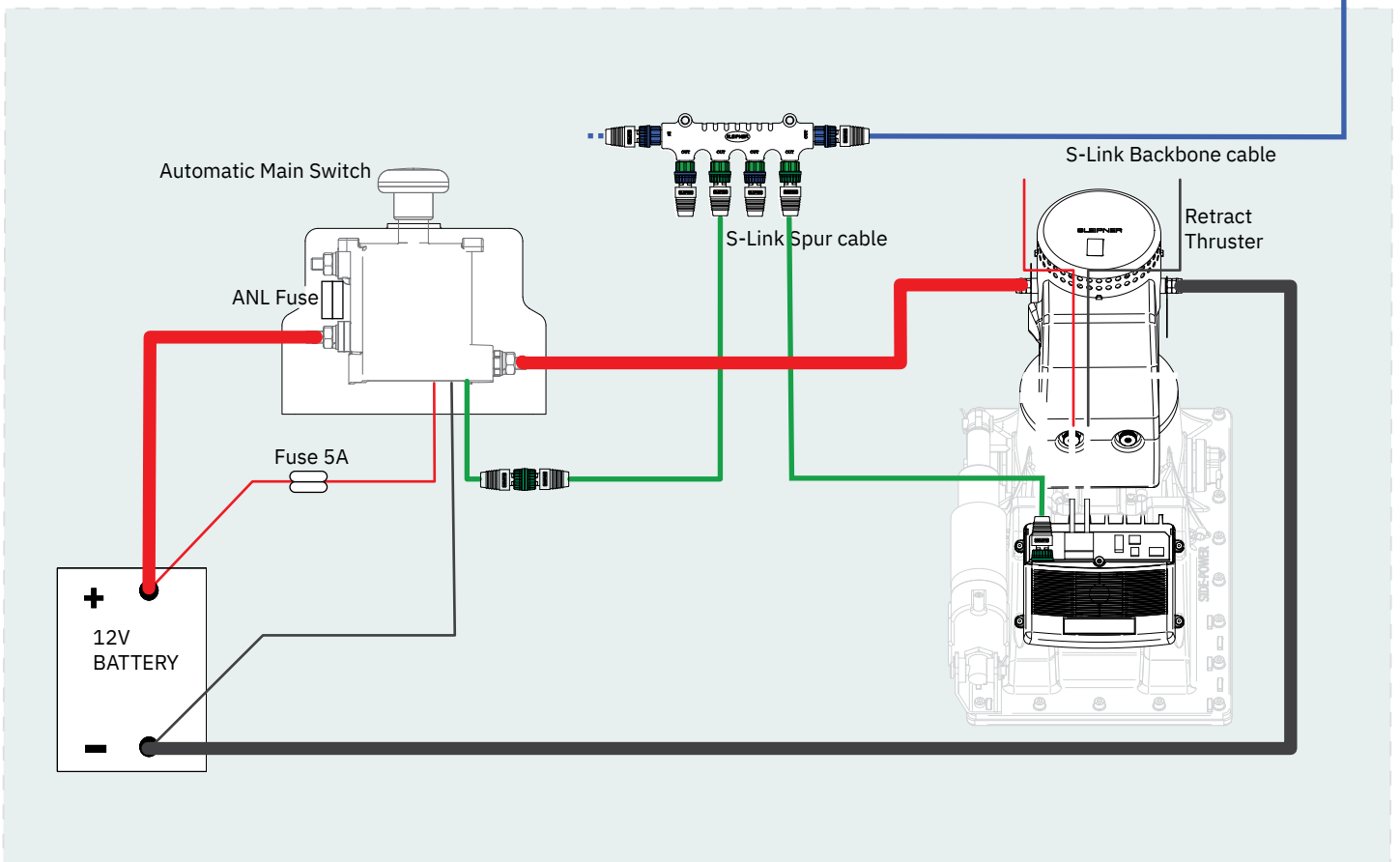
Automatic main switch wiring diagram 12V retract thruster

The Top wiring diagram is for a single bow or stern thruster system

IMPORTANT
See S-Link System Description chapter for detailed information on installation of S-Link POWER Cable, END Terminator and additional S-Link components.



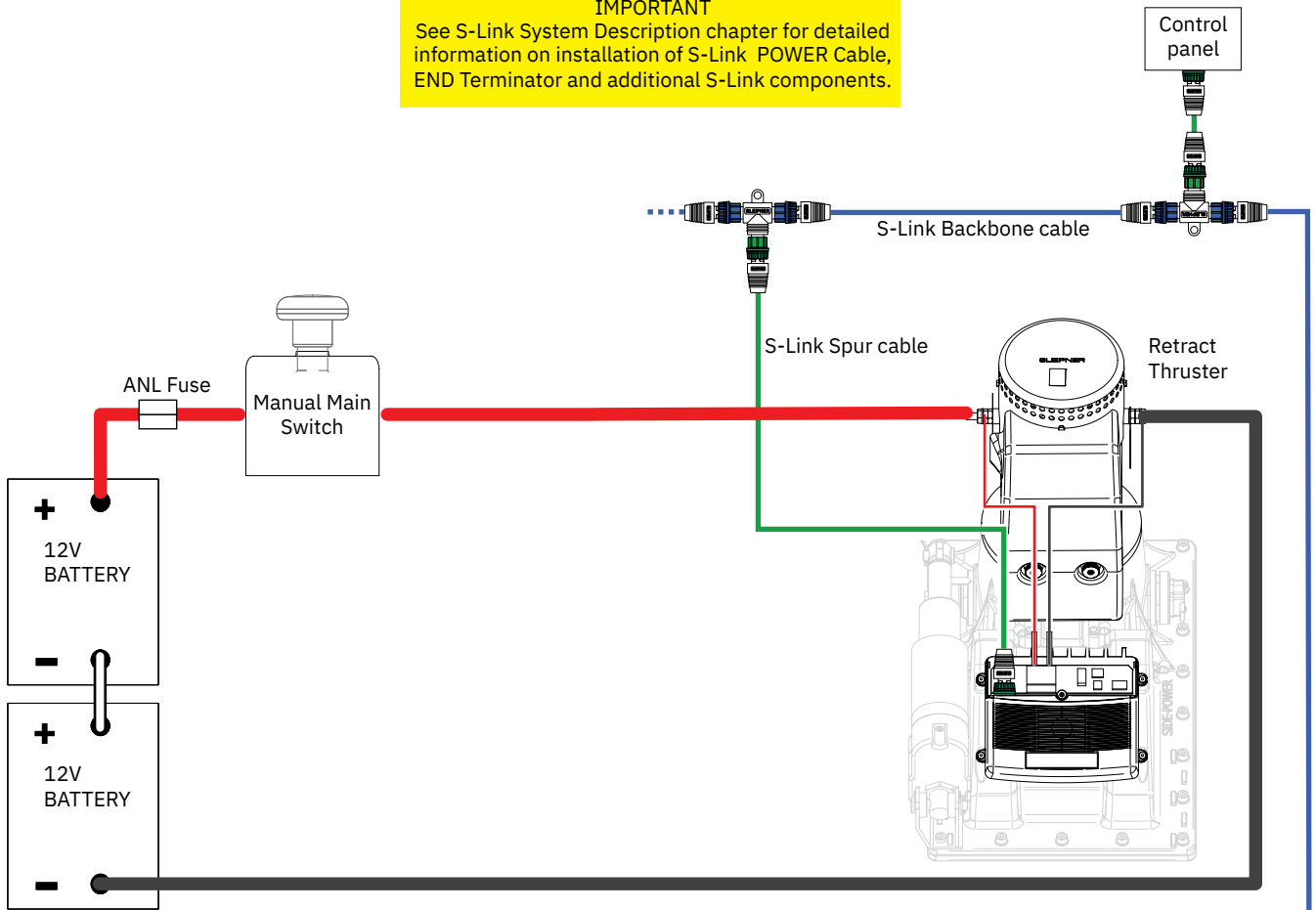
The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.



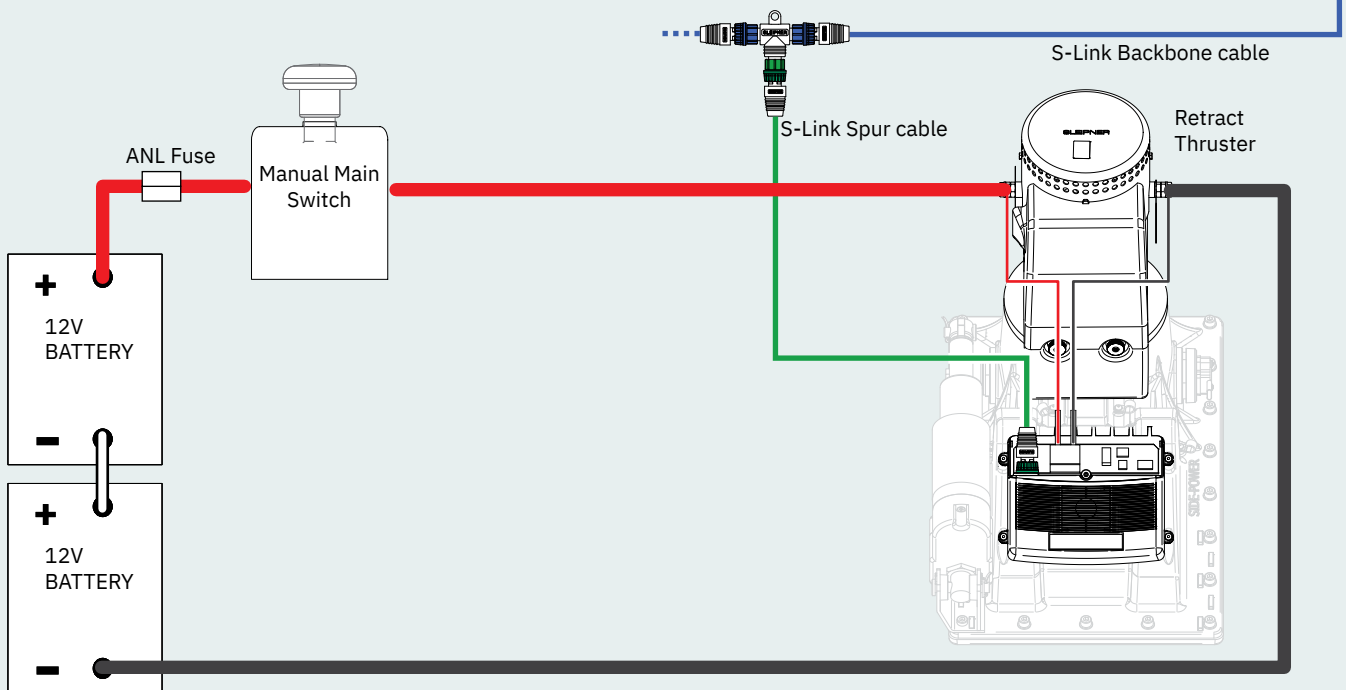
Manual main switch wiring diagram 24V retract thruster

The Top wiring diagram is for a single bow or stern thruster system

IMPORTANT
See S-Link System Description chapter for detailed information on installation of S-Link POWER Cable, END Terminator and additional S-Link components.



The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.

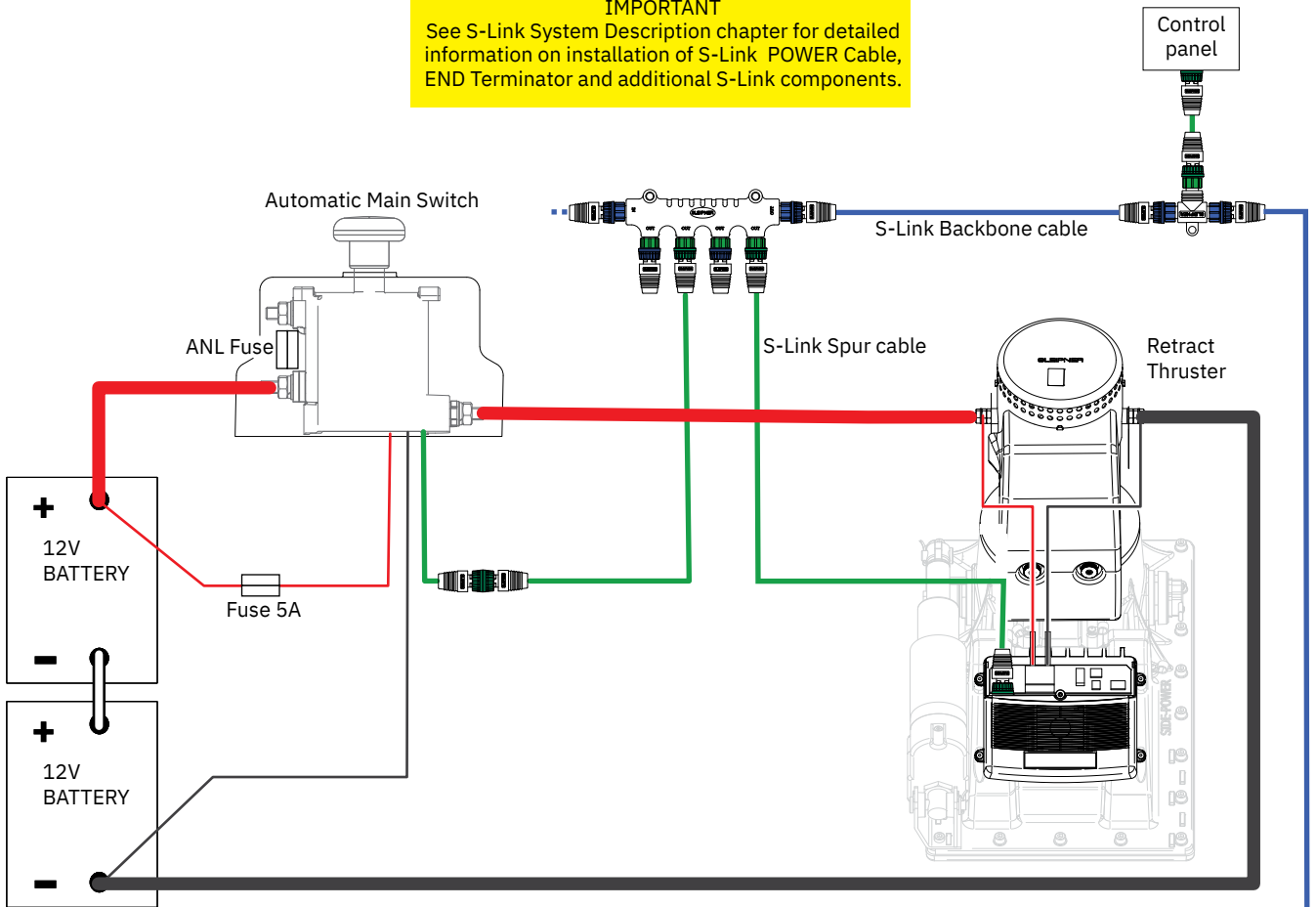


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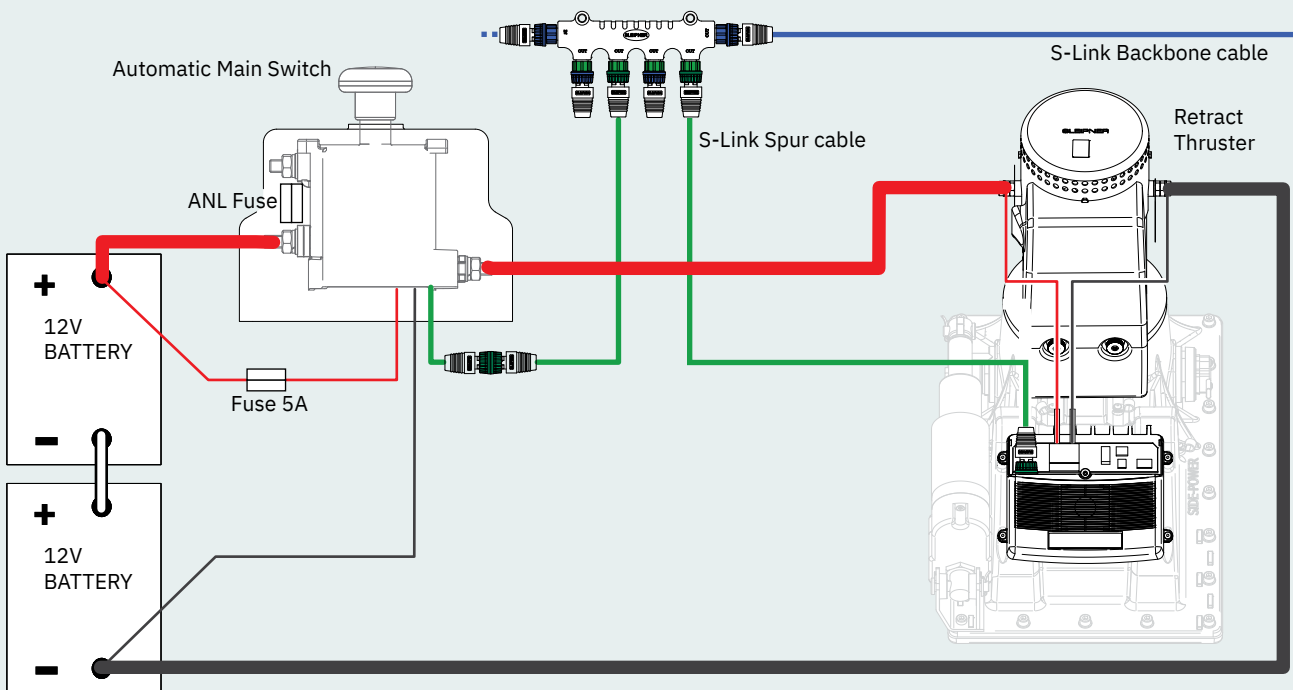
Automatic main switch wiring diagram 24V retract thruster

The Top wiring diagram is for a single bow or stern thruster system

IMPORTANT
See S-Link System Description chapter for detailed information on installation of S-Link POWER Cable, END Terminator and additional S-Link components.



The top and bottom wiring diagram is for a dual thruster system, for example a bow and stern installation.



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.

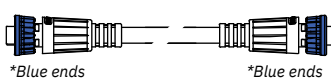
Installation of S-Link cables:

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 also recommended to install cables such that water and condensation do not run along the cables and into the connectors.

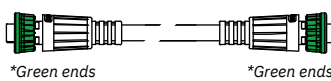
The POWER Cable should ideally be connected around the middle of the BACKBONE bus to ensure an equal voltage drop at each end of the BACKBONE Cable. The yellow and black wire in the POWER Cable shall be connected to GND and the red wire connected to +12VDC or +24VDC.

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.

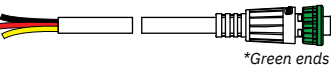
SPUR cables can be left unterminated to prepare for the installation of future additional equipment. In such cases, ensure to protect open connectors from water and moisture to avoid corrosion in the connectors.



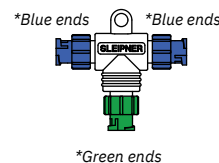
BACKBONE Cable
Forms the communication and power bus throughout a vessel. Available in different standard lengths.



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.



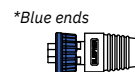
POWER Cable
Required in all installations for connection of BACKBONE Cable to a power supply and should be protected with a 2A fuse.



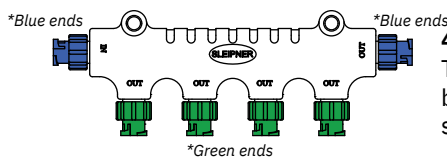
T-Connector
Used for connection of SPUR or POWER Cable to the BACKBONE Cable. One T-Connector for each connected cable.



BACKBONE Extender
Connects two BACKBONE Cables to extend the length.

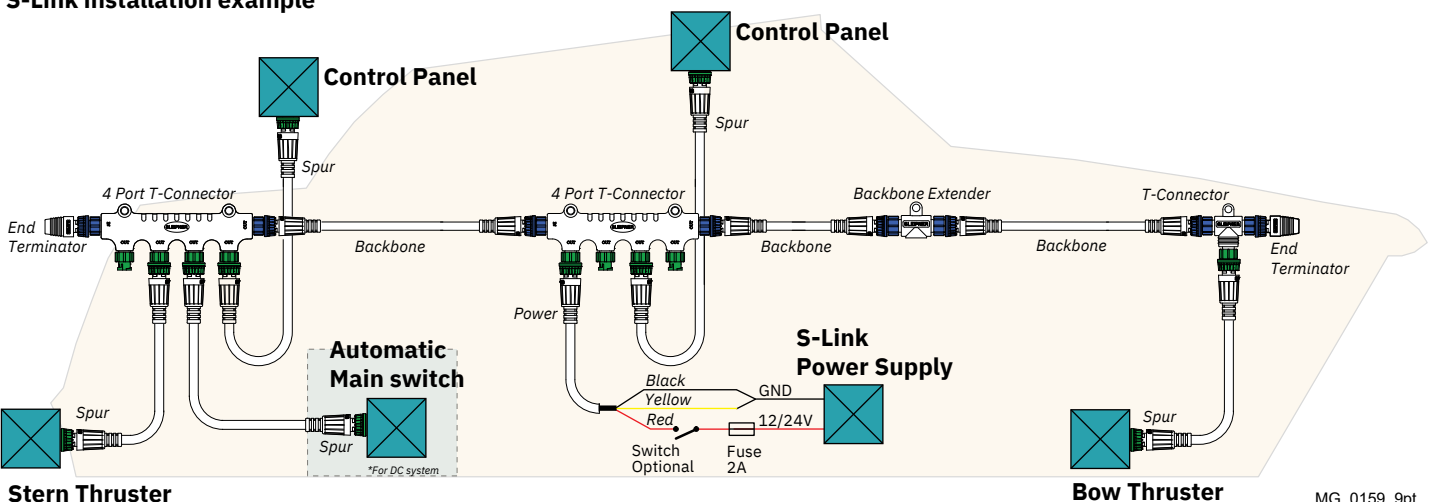


END Terminator
Must be one at each end of the BACKBONE bus.



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



IMPORTANT

Before the thruster motor is operated, check the drive shaft alignment is completely straight when it reaches the end position form the control panel operation:

- 1) Connect power to thruster and S-link system.
- 2) Set DIP-switch on the controller to 0000.
- 3) Turn on the panel. (The thruster deploys.)
- 4) The actuator lever arm is set to alignment marking on the nut
- 5) If marks align, turn panel off. The thruster retracts.
- 6) If the marks do not align, proceed to calibrate drive shaft.

Calibrate drive shaft alignment

(NB: The drive shaft is correctly aligned when manufactured)

- 1) With dip-switches select 'Service Mode'.
- 2) Align the arrow on the actuator arm with the calibration mark, using the UP/DOWN buttons.
- 3) With dip-switches select 'Sensor Calibration Mode'.
- 4) Press and hold both UP and DOWN buttons until STATUS LED light up green.

(NB: If FAULT LED light-up red, then the calibration is out of position (wrong align mark).

- 5) With dip-switches select 'Operation Mode', thruster retracts.

Actuator configuration

Dip-switch number 1 & 2 configures the actuator(s).

No.1 set to OFF when the retract has two actuators.

No.1 set to ON when the retract only has one actuator.

No.2 set to OFF when the retract does not have P8 type actuator(s).

No.2 set to ON when the retract has the P8 type actuator(s).

If dip-switch no.2 is set to ON and the actuator gives a rattling noise when the door closes, then there probably is not P8 actuator(s) and dip-switch no.2 needs to be set to OFF.

The actuator is a P8 type:

-If the actuator has a plastic cap at the back where you can adjust the actuator manually.

-If it is marked with a sticker with P8

-If the manufacturer label says P8

LED indication

Continuous red light:

Motor over-temp, Controller over-temp, Controller no communication, Motor relay failure, Low battery voltage, Position sensor failure, No power to actuators, Retractable unit failure, Temp sensor open circuit.

Flashing red light:

Red light fast blinking: Dip-switch in an invalid position.

Red light short flash every 2 seconds: Shaft not calibrated, or shaft calibrated out of range.

Continuous green light:

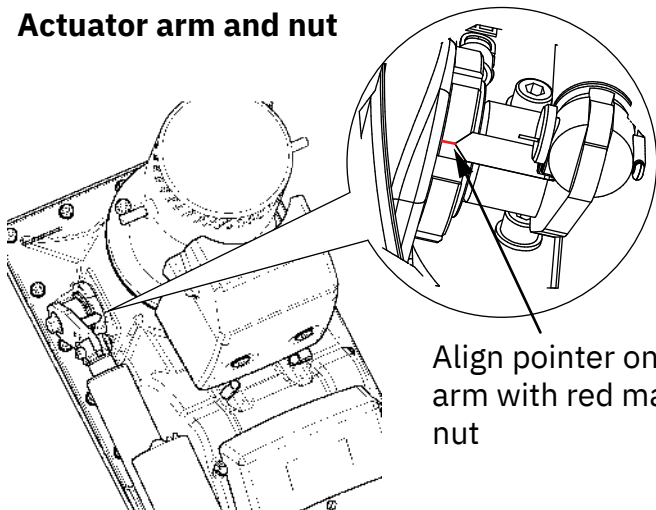
Normal mode, Service mode (actuators operated by UP/DOWN buttons).

Re-calibrated "down"-position.

Flashing green light:

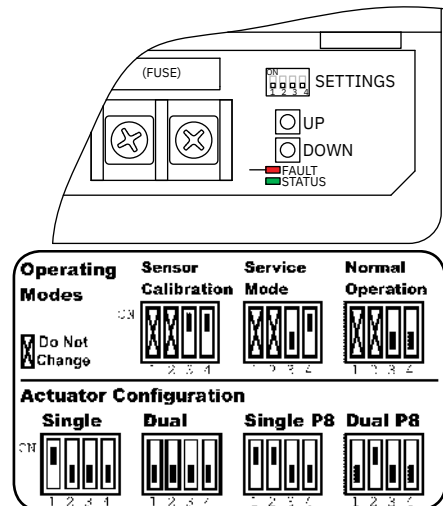
No S-Link communication.

Actuator arm and nut



Align pointer on lever arm with red mark on nut

Controller



- The bolts holding the gear leg and main bracket together are tightened correctly.
- The bolts holding the motor to its bracket are tightened correctly.
- All electrical connections are clean, dry and tight, and the correct cable, fuse and main switch size.
- Check that there is no electrical connection between the electro motor body and positive terminal on the motor, and between the electro motor body and the negative terminal on the motor with an ohm meter.
- Anti-fouling has been applied to the gear leg and propeller but NOT anodes, sealing/ rubber fittings or propeller shafts.
- Propeller is fastened correctly to the shaft.
- Propeller turns freely in tunnel.
- The anode and/ or holding screw is tightened well with thread glue.
- Check the boat for potential water leakage around installation areas.
- Correct drive direction as per control panel.
- User Manual is supplied to the owner.

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

Signed:

Date:

Thruster type:

Serial number:.....

Date of delivery:.....

Correct drive direction as per control panel:

The compartment for the thruster has been isolated from general bilge water and has no obvious or suspected risks for flooding:

.....
.....
.....

Other comments by installer:

.....
.....

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

Product spare parts and additional resources

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

Warranty statement

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.sleipnergrouper.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

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.sleipnergrouper.com/patents

A series of horizontal dotted lines for writing notes.

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