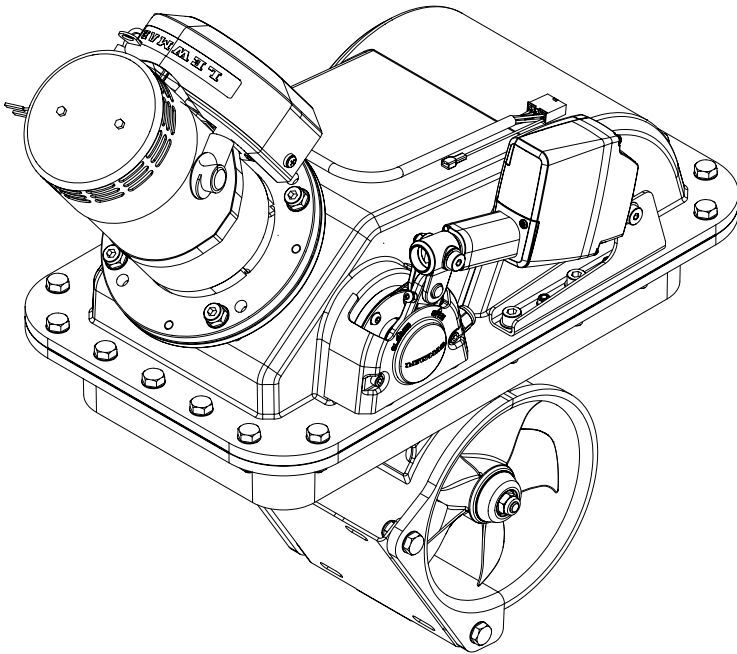


Retractable Thruster

Electric / Hydraulic Manual ref 55110070 iss.4



Owner's Installations, Operation & servicing manual

1 - Introduction

Dear Customer,

Thank you for choosing Lewmar. Lewmar products are world renowned for their quality, technical innovation and proven performance. With a Lewmar product you will be provided with many years of outstanding service.

Product support

Lewmar products are supported by a worldwide network of distributors and Authorised Service Representatives. If you encounter any difficulties with this product, please contact your national distributor, or your local Lewmar dealer. Details are available at: www.lewmar.com

CE Approvals

For CE approval certificates contact Lewmar.

Important information about this manual

Throughout this manual, you will see safety and product damage warnings. You must follow these warnings carefully to avoid possible injury or damage.

2 - Safety Notice

 WARNING!

General

Please ensure that you thoroughly understand the operation and safety requirements of the thruster before commencing the installation. Only persons who are completely familiar with the controls and those who have been fully made aware of the correct use of the thruster should be allowed to use it. If there is any doubt of how to install or operate this unit please seek advice from a suitably qualified engineer.

- ▶ Please ensure that you thoroughly understand the operation and safety requirements of the thruster.
- ▶ Your thruster should not be operated close to swimmers, as a powerful suction of water is generated when in use.

The tunnel installation and any hull modifications should only be carried out by a specialist.

- ▶ We recommend that a qualified person install the thruster. Faulty installation will place the boat and crew in danger and make the warranty invalid.
- ▶ It is the unavoidable responsibility of the owner or master or other responsible party to assess the risk of any operation on the vessel.

Thruster supply

- ▶ The thruster is securely packed for transit. However all parts should be inspected for signs of damage before installation. If any parts are found to be damaged please contact Lewmar.

Fitting


- ▶ This equipment must be installed and operated in accordance with the instructions contained in this manual. Failure to do so could result in poor product performance, personal injury and/or damage to your boat.
- ▶ Electric thrusters must be located in a dry environment.
- ▶ Electric bow thrusters use powerful electric motors, it is very important that there is sufficient battery capacity and large enough cables for safe operation. Using smaller than recommended battery and cables will cause loss of performance and may cause dangerous overheating.
- ▶ Electric motors spark and run hot. Do not place near flammable or sealed areas.
- ▶ Main battery must not be connected and power must not be switched on until all covers and terminal protectors are correctly fitted.
- ▶ It is very dangerous to run the thruster out of the water, even for a few seconds, the motor will over speed by 300%, causing damage to the motor seals etc. And the propeller will cause serious damage to whatever comes into contact with it. This action will invalidate the warranty.
- ▶ Consult the boat manufacturer if you have any doubt about the strength or suitability of the mounting location.

Electrical

- ▶ Make sure you have switched off the power before you start installing this product.
- ▶ If in doubt about installing electrical equipment please seek advice from a suitably qualified electrical engineer.
- ▶ For safety RT to only be supplied with Lewmar ICU or control system.

To the best of our knowledge, the information in this manual was correct when it went to press. However, Lewmar cannot accept liability for any inaccuracies or omissions it may contain.

In addition, our policy of continuous product improvement may change specifications without notice. As a result, Lewmar cannot accept liability for any differences between the product and the manual.

 This manual forms part of the product and **MUST BE RETAINED** along with, OR incorporated into, the Owner's Manual for the vessel to which the thruster is fitted.

3 - Installation

3.1 Fitting the Thruster

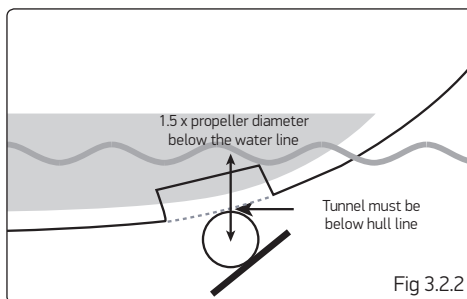
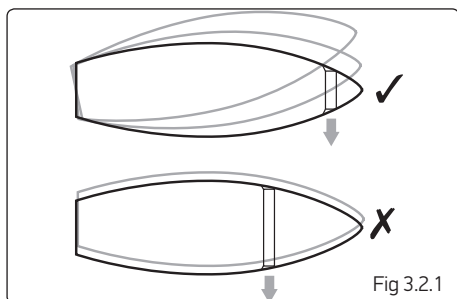
The RT Thruster is supplied with the leg raised for ease of installation. Correct installation of the Thruster, associated equipment and the watertight integrity of the vessel is the responsibility of the installer.

3.2 Placement

For Bow installation the thruster should be installed as far forward as possible. When the RT is lowered to the Thrust position, the centre line of the hub must be a minimum of 1.5 x propeller diameter below the water line and clear of the hull. The performance of the Thruster is largely due to the power source supplying the Thruster motor. Adequate space should be allowed inside the hull for hydraulic hoses, electric cables and access for service etc. It is also important that the area around the thruster be kept clear of any loose items. It is recommended that if the area is to be used for additional storage that a removable cover or barrier be constructed around the unit to prevent damage to the unit. This area must also be kept dry to avoid damage.

⚠ It is important that nothing can cause jamming of the raise/lower mechanism or damage to the stop switches.

This area must be kept dry while leaving sufficient room to allow the motor and other electrical to breathe. Ideally this area should be ventilated.



3.3 - Lower Flange Fitment

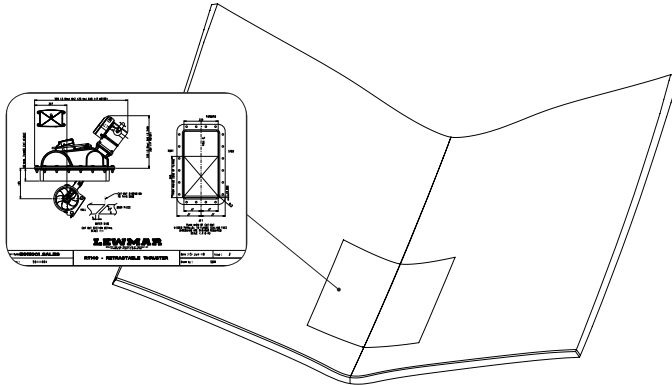


Fig 3.3.1

Cut the marked up hole in the hull with a jigsaw. We recommend you cut with an angle of 45° degrees to the hull on all sides (Fore, aft, port, starboard)

Map out location and mark door opening,

- ▶ Note each RT size is different
- ▶ See section 13 for setting-out dimension

⚠ Important!: Keep the flange as level as possible when fitting.

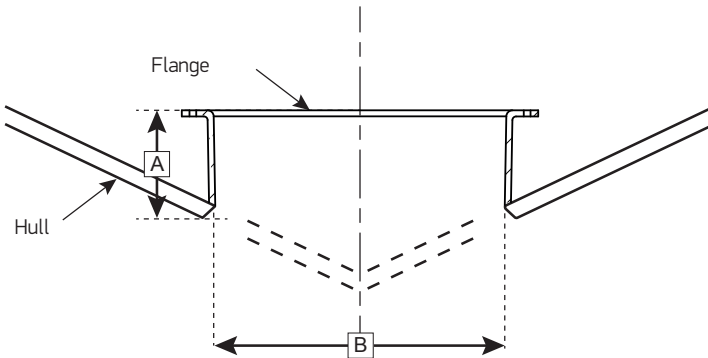


Fig 3.3.2

Cut opening piece of hull and prepare area for bonding in the lower flange

- ▶ Measure and cut lower flange to suit hull design

Note minimum cut Height!

- ▶ Note minimum height, width & depth required for each lower flange. (See Fig 3.3.3)

RT MODEL	(A) MINIMUM HEIGHT MM	(B) MINIMUM WIDTH MM	MINIMUM DEPTH MM
140	82	220	265
185	88	235	330
250	110	325	460

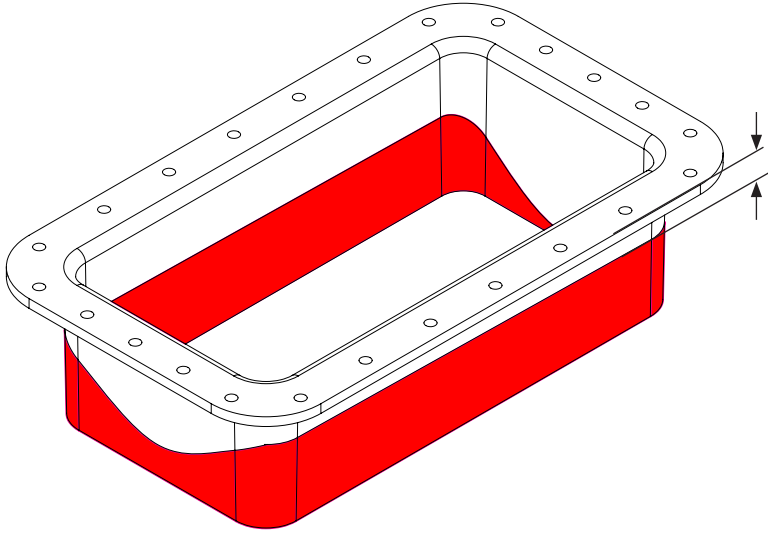


Fig 3.3.3

Using a suitable GRP system glass/bond in the lower flange to the hull. Do not protrude into the path of the retractable thruster tunnel. Follow the manufactures instructions for bonding and curing of the chosen bonding agents and materials.

3.4 Lifting the unit

The Thruster is heavy so when lifting the Thruster unit from its packing case, ensure that adequate lifting strops are used. The thruster should not be lifted by its actuator assembly or propeller shroud. Extra caution should be used to avoid damaging these parts and the micro switches and control box. When moving the Thruster, ensure that the seating surfaces of the main housing are protected against potential damage.

3.5 Fitting into the hull

The thruster requires a compartment to be constructed within the hull to house the assembly, with an opening in the bottom of the hull for thruster to be deployed and retract through.

The top of this watertight compartment is to act as the mounting seat for the thruster base plate. This watertight compartment must be designed to take the weight of the thruster, the transfer of thrust to the hull and any additional forces created while the vessel is in motion. It is recommended that this is carried out by a qualified navel architect.

The RT Thruster is supplied in the retracted position for ease of transportation. The thruster will need to be lowered once located, to have the hull faring fitted.

4 - Fitting

4.1 Place upper RT assembly on to the lower flange.

The motor should be pointed towards the bow of the boat.

1. When placing the upper assembly onto the lower flange, ensure that the housing gasket is not misplaced or damaged.
2. Remove the screws of the microswitch cover, slacken the cable gland and move the microswitch cover away from the thruster to allow access to the hold down bolts.

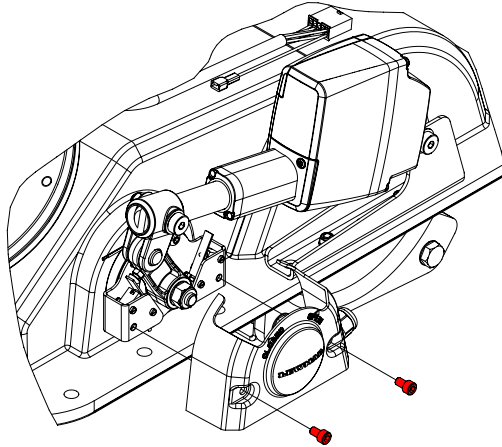


Fig 4.1.1

3. Remove the pin from the actuator arm:
4. Support the lower assembly under the closing piece adjustment plate.

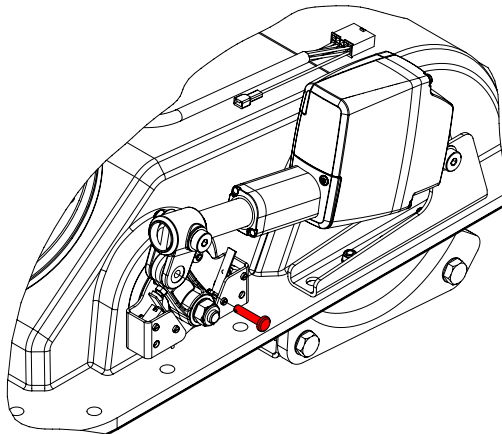


Fig 4.1.2

5. Remove the actuator pin by using a flat screwdriver under the head.
6. Rotate the actuator on its rear screw to give access to the hold down screws (x3) in the actuator bracket.
7. Bolt the upper housing to the lower flange using the supplied M10 hex bolts and M10 socket cap screws for the actuator bracket. Torque all bolts to 30Nm.
8. Reassemble in reverse order see Section 8.1

5 - Fit Motor To RT

5.1 For RT140 & RT185

- ▶ Align motor shear pin with pin cut-out on the drive shaft
- ▶ Place motor on the motor mount plate
- ▶ Secure in place with 4Qty supplied M10 screws and nuts
Torque each bolt to 43Nm (+/-3Nm)

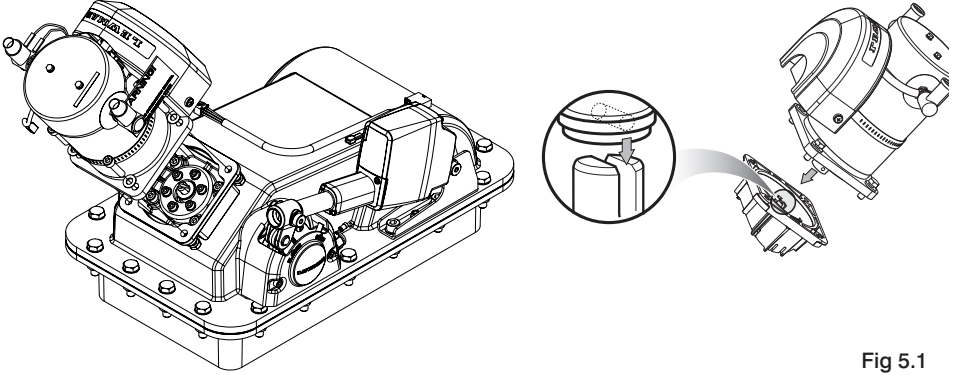


Fig 5.1

5.2 For the RT250

- ▶ Align keyway on the drive-shaft with the motor keyway cut-out
- ▶ Place motor on the motor mount plate
- ▶ Secure in place with 4Qty supplied M10 screws and nuts
Torque each bolt to 43Nm (+/-3Nm)

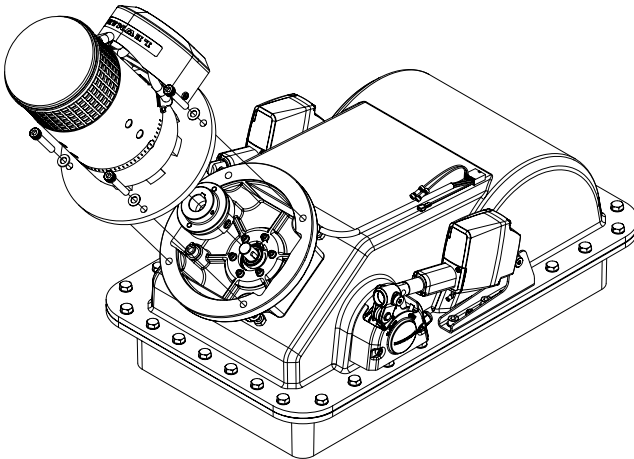


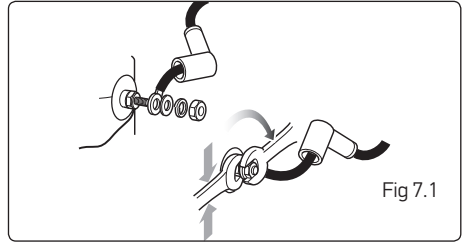
Fig 5.2

7 - Installation of electric motor

7.1 Motor Terminal connections

- ▶ Terminals must be correctly clamped to motor studs. Use a pair of spanners - the one nearest motor to stop rotation of the stud.
- ▶ Spanner sizes are 13 mm for RT140 and 17 mm for RT185 - RT250. Tighten the bolts to 20 Nm (15 lbs.ft).

⊘ DO NOT overtighten electric motor terminal nuts.



7.2 Battery cable connections

⚠ Incorrect installation of battery cables or damage to connection studs may result in a short to the thruster body. Use the examples above to check for a correct installation on both +V and -V battery connections.

- ▶ Correct installation. Supplied cable boots are used and no bare wires exposed (Fig 7.2.1).
- ▶ Live wire exposed! (Fig. 7.2.2). Correct the cable installation to match (Fig 7.2.1).
- ▶ Terminal or motor is damaged. Contact Lewmar Limited (Fig 7.2.3).
- ▶ Crimp inverted and is touching motor! (Fig 7.2.4).

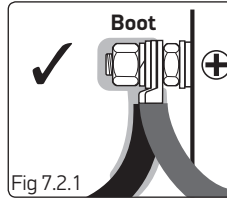


Fig 7.2.1

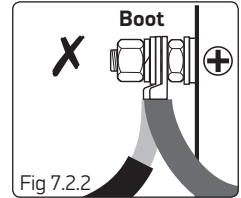


Fig 7.2.2

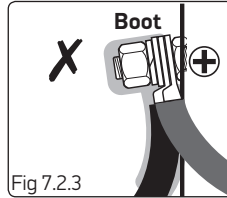


Fig 7.2.3

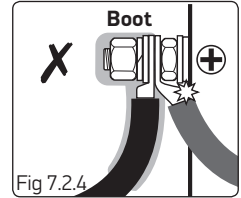


Fig 7.2.4

7.3 Correct cable sizes

NOTE: Cable length is total from battery to thruster and back.

- ▶ Battery crank capacity should be at least equal to the thruster current.
- ▶ Main power cables should be run from the batteries and must have an in line fuse fitted.

⊘ The installation **MUST** have a battery switch that is switched off whilst the thruster is not in use or the boat is unoccupied.

- ▶ The cables should be terminated with a ring terminal corresponding to the motor studs, 8 mm (5/16") for RT140 and 10 mm (3/8") for RT185 and RT250. It is important that this termination is secure so that the high current is transferred to the motor efficiently. The minimum voltage at motor when running should be 10V for 12V and 21V for 24 V units.
- ▶ Ensure the insulating boots, supplied with the unit, are correctly fitted.

NOTE: If very large cables are used discard supplied boots and fit appropriate sized ones.

7.4 Wiring Table

MODEL	VOLTAGE (V)	STATED CURRENT DRAW (A)	CIRCUIT BREAKER (A)	MIN CABLE SIZE CSA mm ²	MAX CABLE LENGTH (METERS) AT MIN CABLE SIZE
ICU	12V	8	-	2.5	15
ICU	24V	8	-	1	15
140 2.0 kW	12	280	200	70	14
140 2.2 kW	12	280	200	70	13
185 4 kW	12	470	400	150	17
185 4 kW	24	235	130	70	32
185 5 kW	12	480	400	150	17
185 5 kW	24	240	130	70	31
185 6 kW	12	700	500	150	11
185 6 kW	24	370	325	120	36
250 8 kW	24	500	400	150	33

Note: ICU requires its own power supply and return, the cable should be rating for 8-amps for the voltage and total length (Battery - ICU - Battery). ICU power cable sizing not to exceed 4mm² / 12AWG

- ⚠ Lewmar recommends cable insulation rated 90°C or higher. It is the responsibility of the installer to confirm current capacity and voltage drop are within the limits as specified by local marine electrical regulations. Cable sizes are for guidelines only, always consult a marine electrician.

7.5 Electrolytic test

- ⚠ To prevent electrolytic corrosion or faults, the thruster motor body and assembly **MUST** remain isolated from any power supply or grounds. The installer can check for this using a multimeter in the following ways.

Test 1. Fig 7.5.1

With the negative not connected and the positive cable connected but with battery switch off or fuse removed. Use a continuity tester to check for a connection between the -VE stud and motor body and also between +VE stud and motor body. In both cases the meter should give no indication of an electrical connection.

If a connection is measured between the +VE stud and the motor body, check installation for cables or wires touching the assembly or for damage to assembly.

If a connection is measured between the -VE stud and the motor body, remove any bonding straps attached to the assembly and check as before.

Test 2. Fig 7.5.2

With the battery applied: Use a voltmeter to test the voltage between the -VE motor stud and the thruster motor body. If the supply voltage (12V / 24V) is measured, disconnect power immediately and inspect the assembly for faulty installation or damage.

Fig 7.5.1

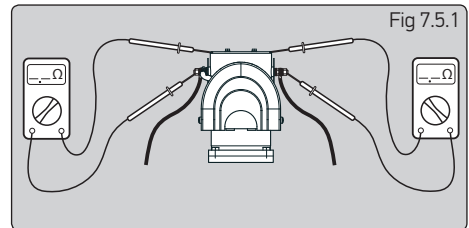
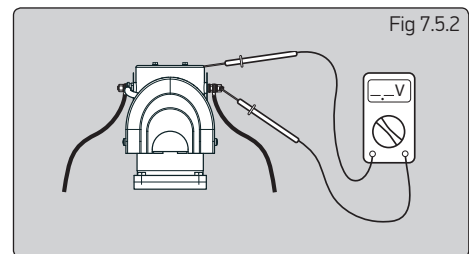


Fig 7.5.2



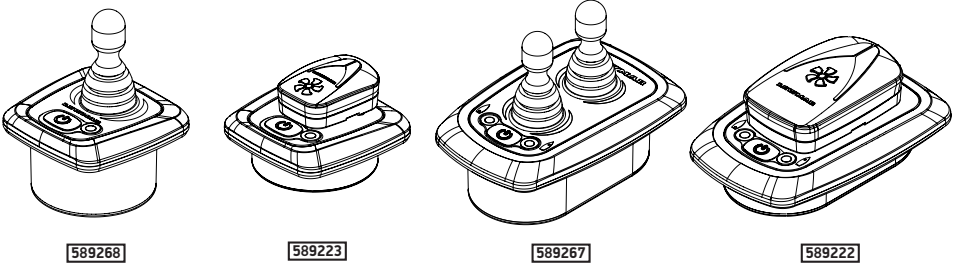
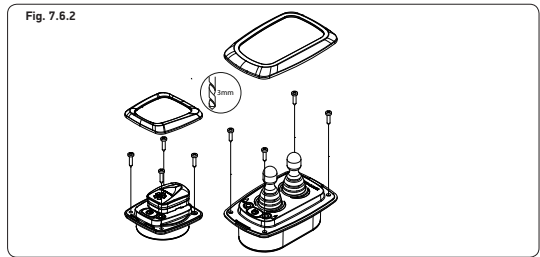
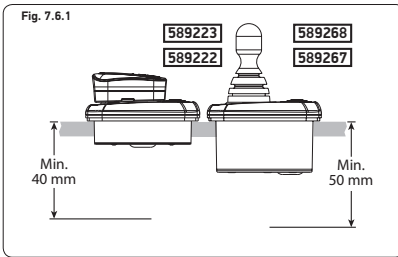
7.6 Installing control panel - all models

A 63.5 mm (2½") hole saw is required. Ensure there is sufficient depth for the control panel and access for the switch leads and plug (see saw template).

The panel has an integral seal and can be clamped from the rear or with the bezel from the top. Trim clamp depending on panel thickness.

The small plug connects at the panel. If two or more panels are installed use the optional Y connectors (Sec 6).

The auxiliary wire is used to connect an automatic battery switch. Please refer to the units instructions. If automatic battery switch not fitted, disregard auxiliary wire.



7.7 Final checks

⊘ Check the power is OFF

⚠ The thruster must not be operated unless it is in water.

Check list electrical

- ▶ Check motor connections are tight with rubber boots in place.
- ▶ The correct fuse is in place.
- ▶ Check all switch wires are connected to correct motor terminal.
- ▶ Now the cables can be connected to the battery..

Operation of electrical unit

- ▶ Ensure batteries are fully charged before switching on the main power.
- ▶ When first operating the thruster, make sure you are not close to other vessels.

8 - Fit Closing Piece & Split Pin

8.1 RT Split pin fitting

Refit the actuator to the cam by locating the actuator cuplink over the cam.

Pushing the pin through the eye and using the supplied split pin to retain the V actuator pin in place. Use the door closing piece supports to adjust the height of the closing piece to align the eye of the cam with the actuator.

Once fitted bend the split pin round to secure.

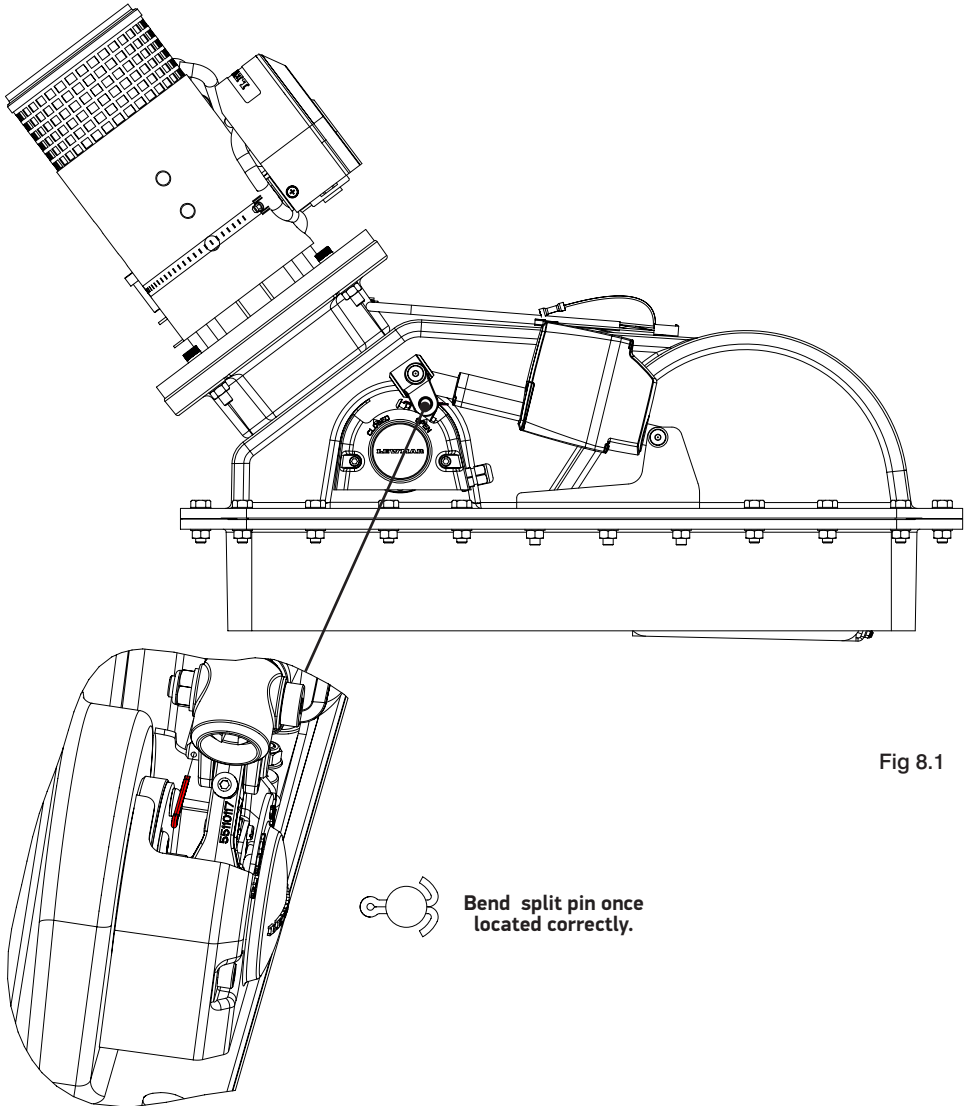


Fig 8.1

8.2 Fitting Closing Piece

Usually, the hull piece that has been cut out of the hull would be re-used to provide the thruster closing plate. This can be attached to the door plate. A landing or register should be moulded into the hull cut out, to allow the hull closing piece to 'locate' when the thruster is fully retracted. This is to prevent water flooding the RT housing at high pressure, potentially damaging the gasket/seal and to eliminate load being applied to the Thruster leg when the vessel is pounding at sea.

- ▶ Bond or mechanical fit the closing door piece to the adjustment plate found on the bottom of the tunnel. Using M10 nyloc nuts (Not supplied). Recommended trq 43Nm
Note: The door must be fully supported from the door bracket to the tunnel.
- ▶ Actuator movement is set to the maximum at the factory.
- ▶ Using the ICU, power on the system Ensure that no items are in the way of the movement of the tunnel or the actuator, as the RT will deploy when the controller panel is turned on.
- ▶ To adjust the movement of the actuator, adjust the screws on the actuator cam:
 1. Remove microswitch cover - See Fig 4.1.1
 2. Slacken off the retaining nut
 3. Adjust the screw length in/out
 4. Re-tighten retaining nut - Trq 4Nm
 5. Re-install the microswitch cover - Trq 3Nm

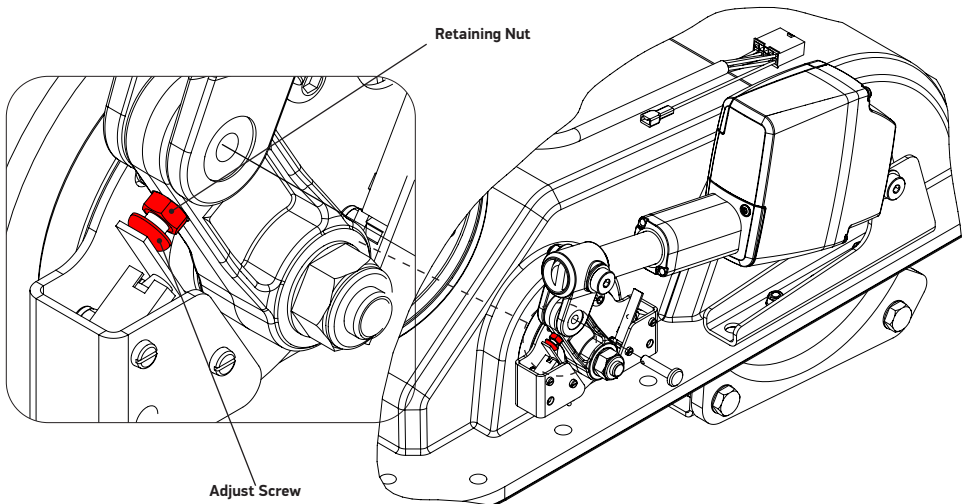


Fig 8.2

Note: the RT250 has dual actuators; however the adjustment is only needed on the PORT side of the RT. The actuators are linked in the Firmware of the ICU.

Check the adjustment of the actuator screws after the first 10/15 cycles.

9 - Operating your thruster

9.1 RT140 to RT250 Operation and safety features

Turning system On/Off

- ▶ To turn the system on press and hold the ON button for 1 second. If the system is active the panel LED will Flash green during retracting, LED light will turn solid once deployed
- ▶ To turn the system OFF press the ON button once. The system will flash green while retracting then switch off and the LED will turn off.
- ▶ If the system is in fault mode (Solid RED LED) Pressing the ON button will turn the system off.

Safety Features

- ▶ If the thruster is operated constantly in one direction for more than 3 minutes, the system will enter fault mode. When in fault mode, the control panel LED will turn RED.
- ▶ If the system is receiving a PORT/STBD signal when turning the system on, the system will enter fault mode. When in fault mode, the control panel LED will turn RED. This prevents the thruster from unintentionally activating during start-up due to a wiring fault, or a second joystick accidentally being operated.
- ▶ If PORT and STBD signals are received simultaneously then the system will stop thrusting.
- ▶ The system will automatically power down after 5 minutes of inactivity for RT thrusters.
- ▶ When changing thrust instantly from PORT to STBD / vice-versa there will be a short delay to allow the propeller to come to rest before acceleration in the opposite direction.
- ▶ The thruster motor is fitted with a thermal switch to prevent thruster activation if the motor overheats. If the motor temperature is too high the system will stop operating and the panel LED will FLASH RED. Once the motor returns to a safe temperature the LED will turn GREEN and thruster operation can recommence.
- ▶ The system will detect if the battery voltage is low and indicate this by turning the control panel LED AMBER. This is for indication only and will not affect thruster performance.

COLOUR	STATUS
Green (Flashing)	RT Thruster Extending / Retracting
Green	System ON
Amber	Low Voltage
Red (Flashing)	Motor High Temperature
Red	Fault
Black	Off / No Power Source

10 - Servicing your thruster

10.1 Service schedule

⚠ Before any intervention on the thruster, switch off the device by operating the battery switch or removing the fuse.

Thrusters are more likely to attract 'debris', so it is necessary to regularly check the tunnel.

New install:

The anode should be checked after approximately 3 - 4 months to gauge an appropriate replacement schedule.

At the annual boat service:

- ▶ Remove any debris from tunnel, propeller and hub.
- ▶ Replace the anode.
- ▶ If the propeller is damaged or heavily contaminated, replace it, best to be safe.
- ▶ Apply grease to exposed thruster seal and shaft.
- ▶ If hub is removed the tunnel gasket must be replaced.
- ▶ Inspect motor, ensure all leads are still tight.

- ▶ Check all bolts and nuts are to correct torque.
- ▶ Check the motor assembly is dry and that the compartment is water tight.
- ▶ Check and clean out thruster compartment.

Electric:

- ▶ Inspect electric motor, ensure all leads are still tight.
- ▶ Brush out carbon dust from top of electric motor especially on aluminium boats. Recommend qualified electrician.

Hydraulic:

Refer to hydraulic system supplier for service requirements.

10.2 Changing drive pin

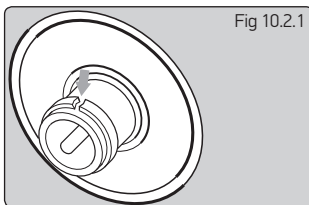


Fig 10.2.1
Cut cable tie on shaft (if fitted)

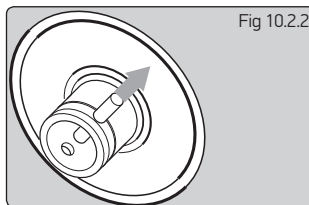


Fig 10.2.2
Punch out pin parts

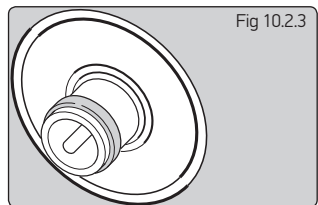


Fig 10.2.3
Tap in new pin and secure with new plastic cable tie

10.3 Final checks - All models

Check list hydraulic

- ▶ Check drain line fitted.
- ▶ All fittings are tight with seals in place.
- ▶ Hydraulic system has been checked and adjusted to correct pressures and flows.

Operation of Hydraulic unit

- ▶ Refer to system suppliers instructions.

Check list mechanical

- ▶ Check all bolts and nuts are tight.
- ▶ Check the propeller/s are correctly installed and the nuts tightened.
- ▶ Check the motor control box cover is in place.
- ▶ Check the propeller/s can be turned - before working on unit check battery switch is off or remove the fuse.

11 - Specifications

PART NUMBER	DESCRIPTION	TUNNEL SIZE	ACTUATOR		POWER		MOTOR		IP	POWER SWITCH 12 to 24	GEARBOX MATERIAL	PROPELLER	THRUST		WEIGHT		FUSE		FUSE HOLDER	
			12v	24v	Kw	Hp	12v	24v					Hyd	Kgf	lbs	Kg	lbs	Rating	Part Number	T1 - 589006
59111001	RT140 2.0Kw 12v	140	✓		2.0	2.7	✓				Composite	Single 5 Blade	37	82	65	200A	589012	✓	✓	
59111002	RT140 2.2Kw 12v	140	✓		2.2	3.0	✓				Composite	Single 5 Blade	42	93	65	200A	589012	✓	✓	
59111003	RT140 2.0Kw 12v IP	140	✓		2.0	2.8	✓	✓			Composite	Single 5 Blade	37	82	66	200A	589012	✓	✓	
59111004	RT140 2.2Kw 12v IP	140	✓		2.2	3.0	✓	✓			Composite	Single 5 Blade	42	93	66	200A	589012	✓	✓	
59112004	RT185 4.0Kw 12v	185	✓		4.0	5.4	✓				Brass	Dual 5 Blade	65	143	99	400A	589010		✓	
59112005	RT185 4.0Kw 24v/12v	185	✓		4.0	5.4	✓			✓	Brass	Dual 5 Blade	65	143	95	130A	589007		✓	
59112006	RT185 4.0Kw 24v	185	✓		4.0	5.4	✓				Brass	Dual 5 Blade	65	143	95	130A	589007		✓	
59112007	RT185 5.0Kw 12v	185	✓		5.0	6.7	✓				Brass	Dual 5 Blade	82	181	118	400A	589010		✓	
59112008	RT185 5.0Kw 24v/12v	185	✓		5.0	6.7	✓	✓		✓	Brass	Dual 5 Blade	82	181	114	130A	589007	✓	✓	
59112009	RT185 5.0Kw 24v	185	✓		5.0	6.7	✓				Brass	Dual 5 Blade	82	181	114	130A	589007	✓	✓	
59112010	RT185 6.0Kw 12v	185	✓		6.0	8.0	✓				Brass	Dual 5 Blade	97	214	117	500A	589011		✓	
59112011	RT185 6.0Kw 24v/12v	185	✓		6.0	8.0	✓			✓	Brass	Dual 5 Blade	97	214	114	325A	589009	✓	✓	
59112012	RT185 6.0Kw 24v	185	✓		6.0	8.0	✓				Brass	Dual 5 Blade	97	214	114	325A	589009	✓	✓	
59112013	RT185 Hyd 12v	185	✓		7.0	10.0		✓			Brass	Dual 5 Blade	100	220	33					
59112014	RT185 Hyd 24v	185	✓		7.0	10.0		✓			Brass	Dual 5 Blade	100	220	33					
59112019	RT185 4.0Kw 12v IP	185	✓		4.0	5.4	✓		✓		Brass	Dual 5 Blade	65	143	102	400A	589010		✓	
59112020	RT185 4.0Kw 24v/12v IP	185	✓		4.0	5.4	✓	✓	✓		Brass	Dual 5 Blade	65	143	98	130A	589007		✓	
59112021	RT185 4.0Kw 24v IP	185	✓		4.0	5.4	✓	✓	✓		Brass	Dual 5 Blade	65	143	98	130A	589007		✓	
59112022	RT185 5.0Kw 12v IP	185	✓		5.0	6.7	✓		✓		Brass	Dual 5 Blade	82	181	121	400A	589010		✓	
59112023	RT185 5.0Kw 24v/12v IP	185	✓		5.0	6.7	✓	✓	✓		Brass	Dual 5 Blade	82	181	117	130A	589007	✓	✓	
59112024	RT185 5.0Kw 24v IP	185	✓		5.0	6.7	✓		✓		Brass	Dual 5 Blade	82	181	117	130A	589007	✓	✓	
59112025	RT185 6.0Kw 12v IP	185	✓		6.0	8.0	✓		✓		Brass	Dual 5 Blade	97	214	120	500A	589011		✓	
59112026	RT185 6.0Kw 24v/12v IP	185	✓		6.0	8.0	✓	✓	✓		Brass	Dual 5 Blade	97	214	117	325A	589009	✓	✓	
59112027	RT185 6.0Kw 24v IP	185	✓		6.0	8.0	✓	✓	✓		Brass	Dual 5 Blade	97	214	117	325A	589009	✓	✓	
59113001	RT250 8.0Kw 24v/12v	250	✓		8.0	10.8	✓		✓		Bronze	Twin CR 5 Blade	140	308	107	236	400A	589010		✓
59113002	RT250 8.0Kw 24v	250	✓		8.0	10.8	✓				Bronze	Twin CR 5 Blade	140	308	107	236	400A	589010		✓
59113005	RT250 Hyd 12v	250	✓		15.0	20.0		✓			Bronze	Twin CR 5 Blade	200	440	74	163				
59113006	RT250 Hyd 24v	250	✓		15.0	20.0		✓			Bronze	Twin CR 5 Blade	200	440	74	163				

12 - Fault finding

The system will not turn on?

- ▶ Check heath LED on ICU, Replace ICU fuse if not flashing
- ▶ Check battery cables to ICU

The Panel LED flashes Green then goes to solid red, this means the actuator movement has not been completed in allowed time?

- ▶ Check down switch when thrusting in both directions
- ▶ Check wiring to actuator
- ▶ Check UP and DOWN switches are adjusted correctly

Thrusting in wrong direction?

- ▶ Change contactor wires on motor solenoid.

Fuse keeps blowing?

- ▶ Wrong fuse fitted - check rating and replace.
- ▶ Propeller restricted or jammed causing excessive load on motor - check and clear. Check that propeller washer is fitted.

Poor thrust or thrust in one direction only?

- ▶ Batteries not large enough or charged, cables not recommended size. Voltage at motor when running should be a minimum 10V for 12V and 21V for 24V units.
- ▶ Blockage in tunnel/propeller jammed with debris, switch off main power, inspect and clear.
- ▶ Propeller washers fitted wrong.
- ▶ Check motor brush springs are located properly, brushes should have good contact with the commutator.
- ▶ Check down switch when thrusting in both directions
- ▶ Check D1 and D2 terminals are tight

Motor turns but no drive?

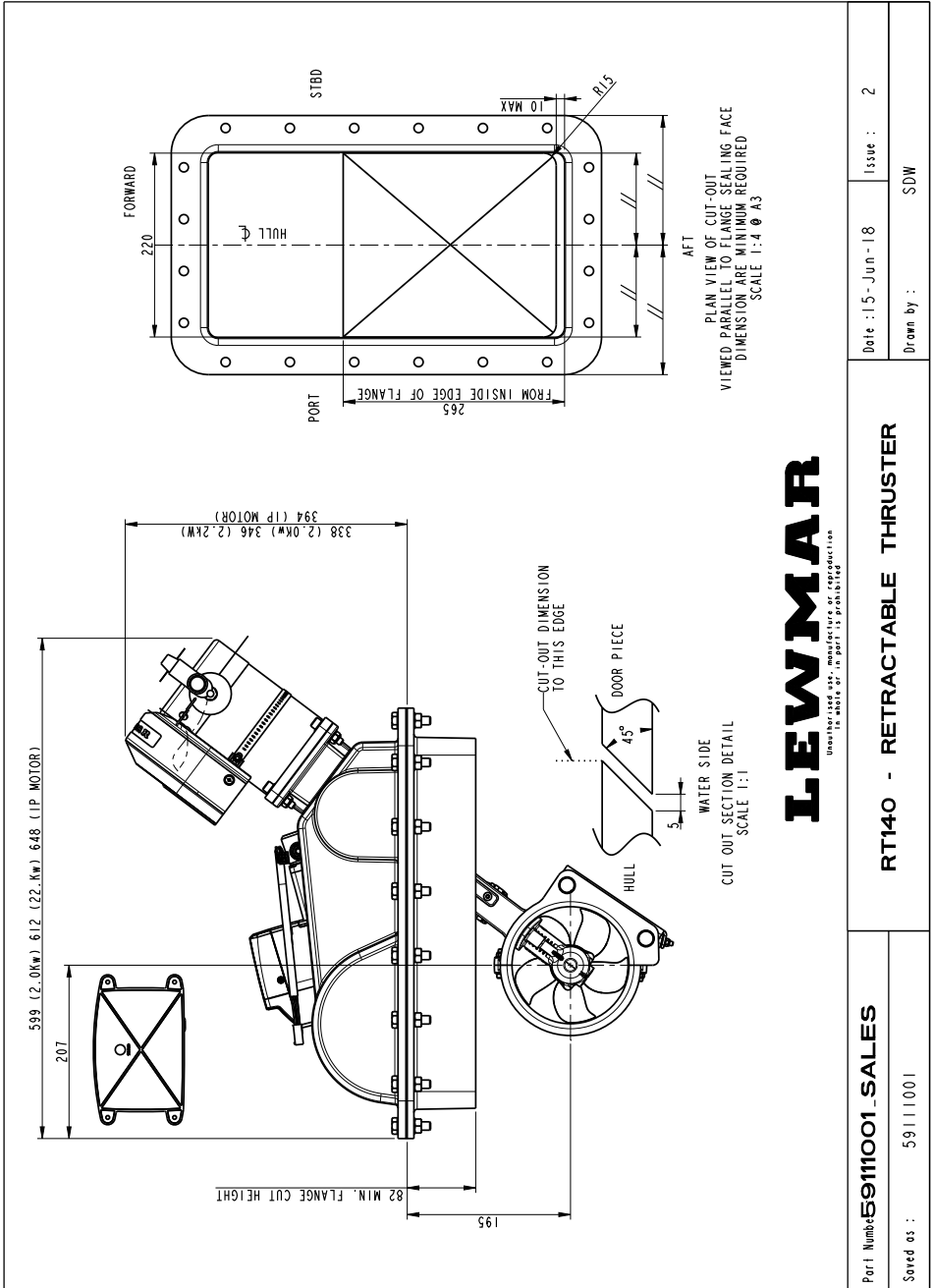
- ⚠ DO NOT continue to run thruster.
- ▶ Shear pin broken, remove 4 motor bolts, drive out old pin and replace with new pin.
- ▶ Propeller blades broken. Replace with new.

Thruster noisy and vibrating?

- ▶ Check propeller is not touching the tunnel wall.
- ▶ 140-185 models - Check hub height is correct.

13 - Dimensions

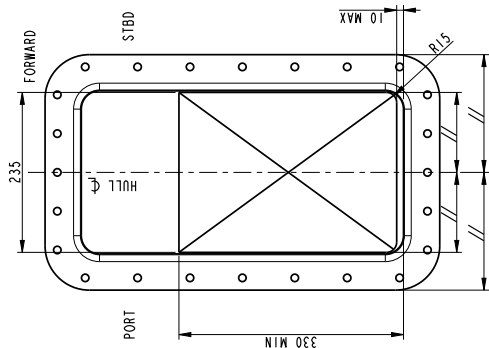
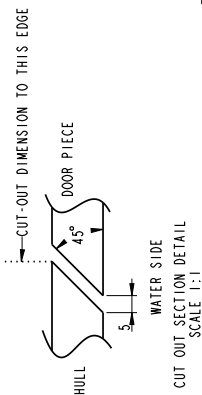
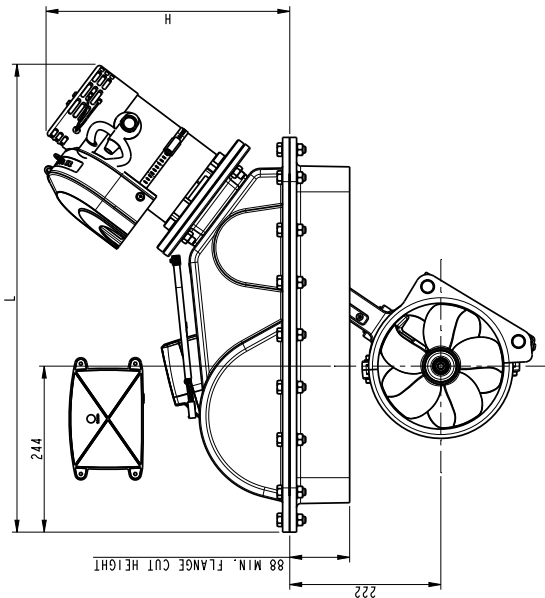
13.1 140 Specification



13.2 185 Specification

PART NUMBER	MOTOR SIZE	VOLTAGE	'H' HEIGHT	'L' LENGTH
59112004	4.0KW	12V	360	690
59112005	4.0KW	24V / 12V	360	690
59112006	4.0KW	24V	360	690
59112007	5.0KW	12V	385	710
59112008	5.0KW	24V / 12V	385	710
59112009	5.0KW	24V	385	710
59112010	6.0KW	12V	410	730
59112011	6.0KW	24V / 12V	410	730
59112012	6.0KW	24V	410	730
59112013	HYD	HYD / 12V	242	605
59112014	HYD	HYD / 24V	242	605

NOTE: IP PROTECTION FOR ALL ELECTRICAL MOTOR AVAILABLE



LEWMAR

Unauthorized reproduction or distribution is strictly prohibited.

PLAN VIEW OF CUT-OUT
VIEWED PARALLEL TO FLANGE SEALING FACE
DIMENSION ARE MINIMUM REQUIRED
SCALE 1:3 @ A3

Part Num**59112001_SALES**

Saved as : 59112001

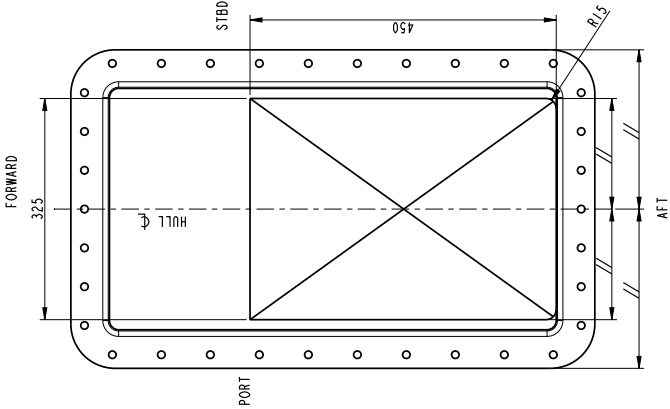
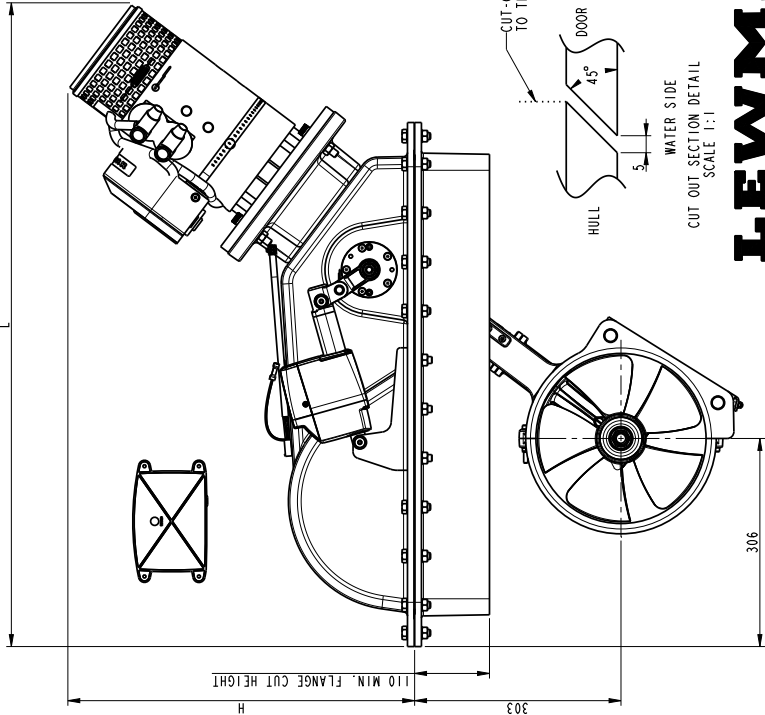
RT185 - RETRACTABLE THRUSTER

Date : 15-Jun-18 Issue : 2

Drawn by : AM

13.3 250 Specification

MOTOR SIZE	VOLTAGE	MOTOR ASSY	H - HEIGHT	L - LENGTH
8.0KW	24V	585029	505	940
15.0KW	Hyd	585041	310	810



PLAN VIEW OF CUT-OUT
VIEWED PARALLEL TO FLANGE SEALING FACE
DIMENSION ARE MINIMUM REQUIRED
SCALE 1:5 @ A3

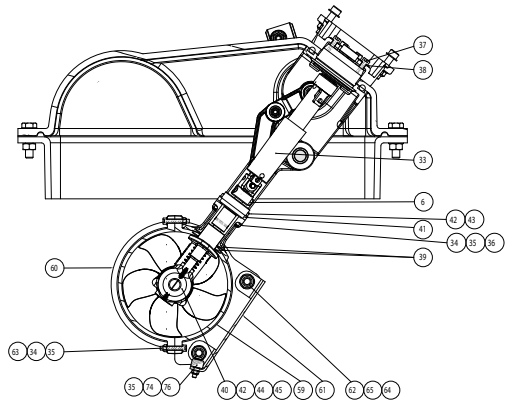
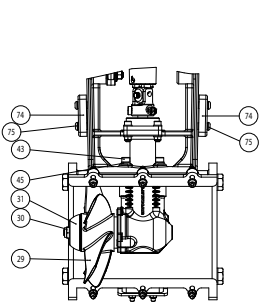
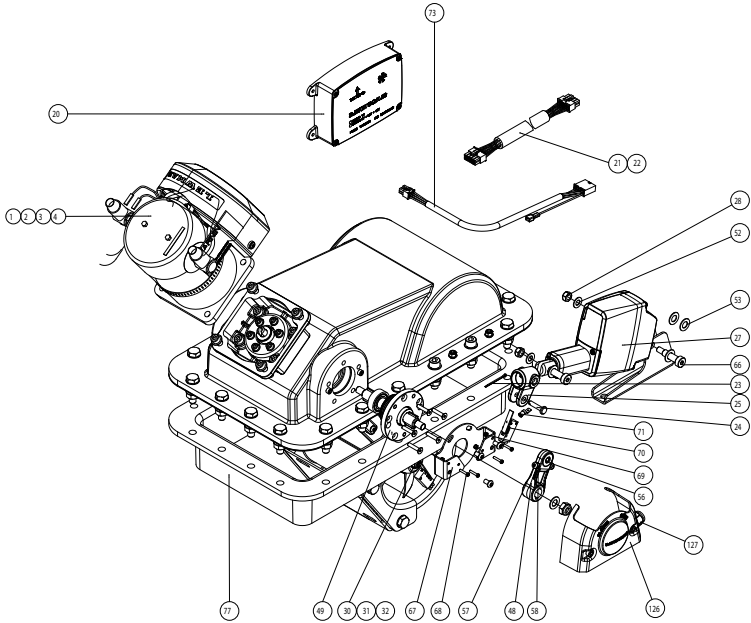
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IN SWEDEN OR IN PART IS PROHIBITED

CUT OUT SECTION DETAIL
SCALE 1:1

Part Num: 59113001-SALES	RT250 - RETRACTABLE THRUSTER	
	Saved as : 59113001	Drawn by : AM
	Date : 15-Jun-18	Issue : 2

14 - Spare Kits

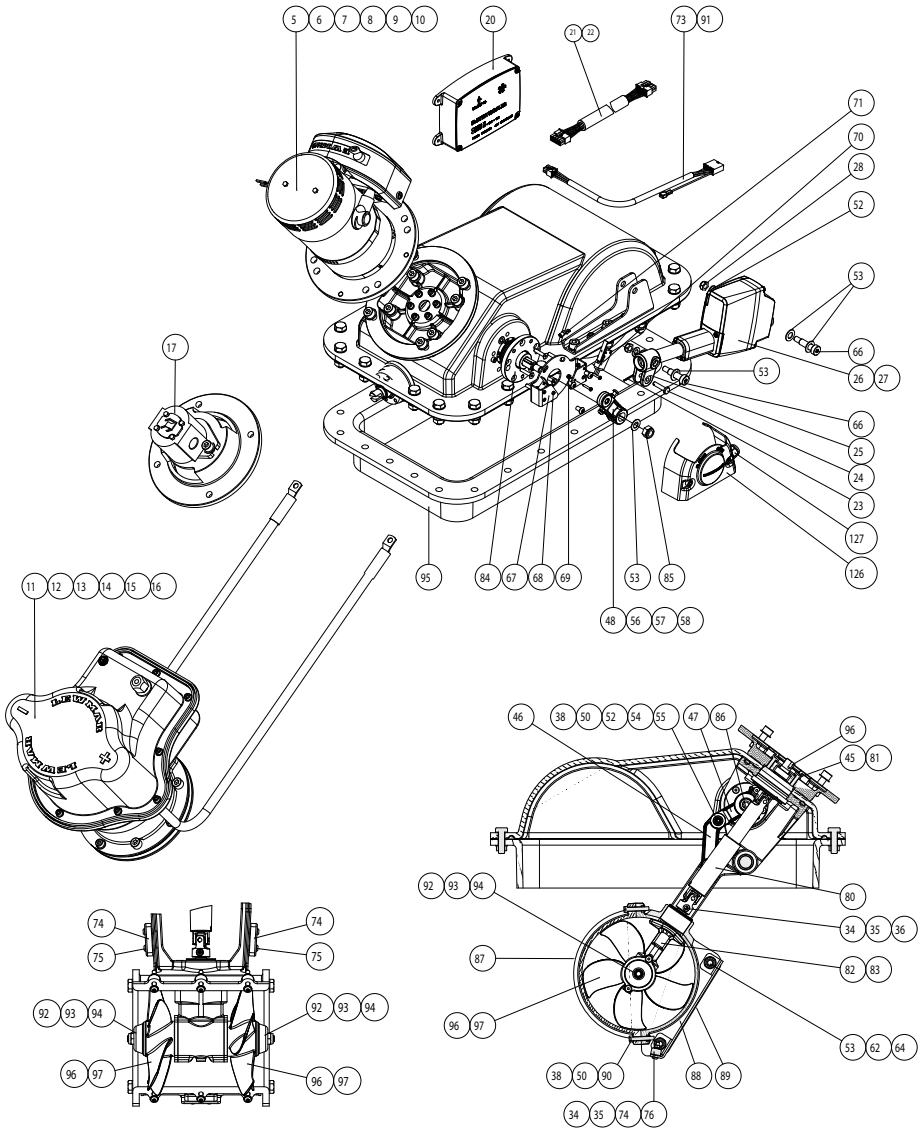
14.1 RT 140 Spares



14.1 RT 140 Spares

PART NO.	DESCRIPTION	ITEMS INCLUDED (QTY)
581111	140 2.0 KW 12V	1(1)
581112	140 2.2 KW 12V	2(1)
581113	140 2.0 KW 12V IP	3(1)
581114	140 2.2 KW 12V IP	4(1)
589151	140 PROPELLOR	29(1)
589157	140 THRUSTER PROP FIXING KIT	30(1), 31(1), 32(1)
589296	RT GEN2 I.C.U. ASSY	20(1)
589808	GEN2 RT MOTOR LOOM 2M	21(1)
589809	GEN2 RT MOTOR LOOM 5M	22(1)
56110001	RT 140 DRIVE SHAFT KIT	33(1), 34(1), 35(1), 36(1) , 37(6), 38(6)
56110004	RT 140 GEARBOX	34(4), 35(8), 39(1), 40(1) , 42(4), 43(2), 44(1) , 45(1)
56110007	RT 140 CAM MECH WITH LINK	38(2), 46(1), 47(1), 48(1), 49(1), 50(2), 51(2) , 52(1) , 53(2), 54(3) , 55(2), 56(1), 57(2), 58(2)
56110010	RT 140 TUNNEL ASSY WITH BRACKET	34(6), 35(6), 59(1), 60(1), 61(1), 62(4), 63(6), 64(4), 65(8)
56110013	RT ACTUATOR SHEAR PIN KIT	23(1), 24(1)
56110014	RT 140 ACTUATOR 12V KIT	23(1), 24(1), 25(1), 27(1), 28(2), 52(2), 53(4), 66(2)
56110019	RT 140 / 185 MICRO SWITCH ASSY	66(1), 67(2), 68(2), 69(2), 70(1), 71(2)
56110021	RT MICRO SWITCH COVER	126(1), 127(1)
56110022	RT 140 / 185 WIRE LOOM	73(1)
56110026	RT 140 ANODE KIT	34(2), 35(2), 74(3), 75(4), 76(2)
56110029	RT 140 LOWER FLANGE	77(1)
56110032	RT 140 SHEAR PIN KIT	23(1), 24(1), 34(1), 35(1), 36(1), 44(2)

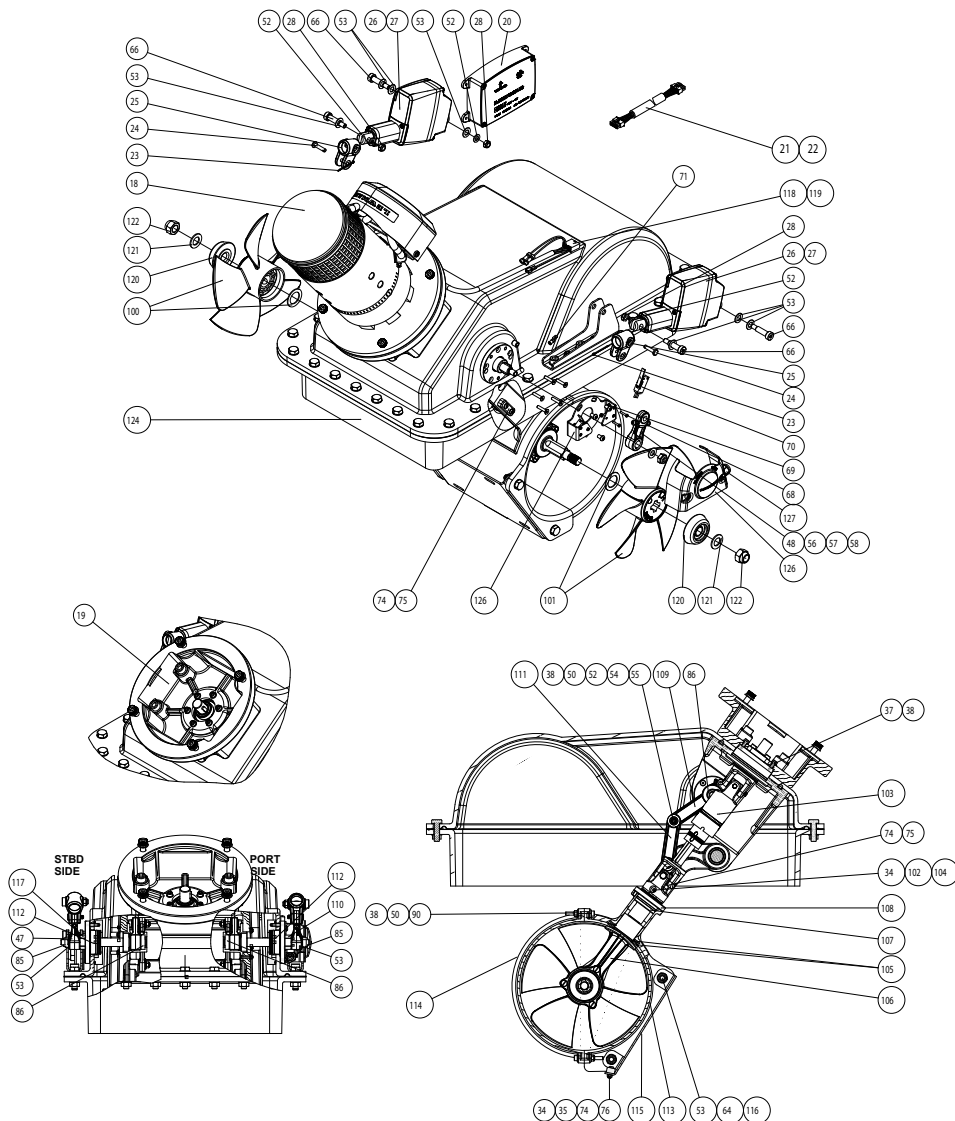
14.2 RT 185 Spares



14.2 RT 185 Spares

PART NO.	DESCRIPTION	ITEMS INCLUDED (QTY)
583041	185 HYD MOTOR	17(1)
583084	185 4.0KW 12V MX	5(1)
583085	185 4.0KW 24V MX	6(1)
583086	185 5.0KW 12V MX	7(1)
583087	185 5.0KW 24V MX	8(1)
583088	185 6.0KW 12V MX	9(1)
583089	185 6.0KW 24V MX	10(1)
583092	185 4.0KW 12V MX IP	11(1)
583093	185 4.0KW 24V MX IP	12(1)
583094	185 5.0KW 12V MX IP	13(1)
583095	185 5.0KW 24V MX IP	14(1)
583096	185 6.0KW 12V MX IP	15(1)
583097	185 6.0KW 24V MX IP	16(1)
589351	185 PROPELLOR	96(1), 97(1)
589296	RT GEN2 I.C.U. ASSY	20(1)
589808	GEN2 RT MOTOR LOOM 2M	21(1)
589809	GEN2 RT MOTOR LOOM 5M	22(1)
56110002	RT 185 DRIVE SHAFT KIT	34(1), 35(1), 36(1), 45(6), 80(1), 81(6)
56110005	RT 185 GEARBOX	82(1), 83(2)
56110008	RT 185 CAM MECH WITH LINK	46(1), 47(1), 48(1), 50(2), 52(1), 53(1), 54(3), 55(2), 56(1), 57(2), 58(2), 84(1), 85(1), 86(1)
56110011	RT 185 TUNNEL ASSY WITH BRACKET	38(12), 50(6), 53(8), 62(4), 64(4), 87(1), 88(1), 89(1), 90(1)
56110013	RT ACTUATOR SHEAR PIN KIT	23(1), 24(1)
56110014	RT ACTUATOR 12V KIT	23(1), 24(1), 25(1), 27(1), 28(2), 52(2), 53(4), 66(2)
56110015	RT ACTUATOR 24V KIT	23(1), 24(1), 25(1), 26(1), 28(2), 52(2), 53(4), 66(2)
56110019	RT 140 / 185 MICRO SWITCH ASSY	66(1), 67(2), 68(2), 69(2), 70(1), 71(2)
56110021	RT MICRO SWITCH COVER	126(1), 127(1)
56110022	RT 140 / 185 WIRE LOOM	73(1)
56110023	RT 140 / 185 HYD WIRE LOOM	91(1)
56110027	RT 185 ANODE KIT	34(2), 35(2), 74(3), 75(4), 76(2), 92(2), 93(2), 94(2)
56110030	RT 185 LOWER FLANGE	95(1)
56110029	RT 185 SHEAR PIN KIT	23(1), 24(1), 36(1), 34(1), 35(1), 96(2)

14.3 RT 250 Spares

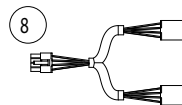
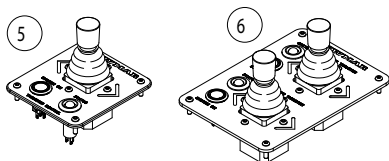
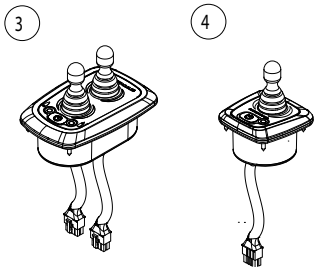
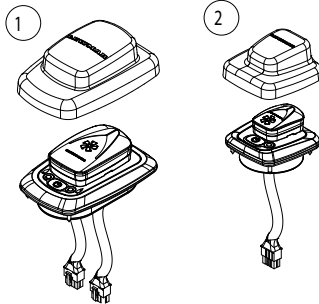


14.3 RT 250 Spares

PART NO.	DESCRIPTION	ITEMS INCLUDED (QTY)
585029	250 8.0KW 24V MOTOR ASSY MX	18(1)
585041	250 HYD MOTOR ASSY	19(1)
589296	RT GEN2 I.C.U. ASSY	20(1)
589551	250 STBD PROPELLOR + WASHER	100(1)
589552	250 PORT PROPELLOR + WASHER	101(1)
589808	GEN2 RT MOTOR LOOM 2M	21(1)
589809	GEN2 RT MOTOR LOOM 5M	22(1)
56110003	RT 250 DRIVE SHAFT KIT	23(2), 34(1), 37(6), 38(6), 102(1), 103(1), 104(1), 123, 120, 121
56110006	RT 250 GEARBOX	105(2), 106(1), 107(1), 108(5)
56110009	RT 250 CAM MECH WITH LINK PORT	38(2), 47(1), 50(2), 52(1), 53(1), 54(3), 55(2), 56(1), 57(2), 58(2), 85(1), 86(1), 109(1), 110(1), 111(1), 112(1)
56110012	RT 250 TUNNEL ASSY WITH BRACKET	38(16), 50(8), 53(8), 64(4), 90(8), 113(1), 114(1), 115(1), 116(1)
56110013	RT ACTUATOR SHEAR PIN KIT	23(1), 24(1)
56110016	RT 250 ACTUATOR 12V KIT	23(1), 24(1), 25(1), 27(1), 28(2), 52(2), 53(4), 66(2)
56110017	RT 250 CAM MECH WITH LINK STBD	38(2), 47(1), 50(2), 52(1), 53(1), 54(3), 55(2), 56(1), 85(1), 86(1), 109(1), 111(1), 112(1), 117(1)
56110018	RT 250 ACTUATOR 24V KIT	23(1), 24(1), 25(1), 26(1), 28(2), 52(2), 53(4), 66(2)
56110020	RT 250 MICRO SWITCH ASSY	66(2), 68(4), 69(4), 70(2), 71(1), 126(1)
56110021	RT MICRO SWITCH COVER	126(1), 127(1)
56110024	RT 250 WIRE LOOM	118(1)
56110025	RT 250 HYD WIRE LOOM	119(1)
56110028	RT 250 ANODE KIT	34(2), 35(2), 74(3), 75(4), 76(2), 120(2), 121(2), 123(2)
56110031	RT 250 LOWER FLANGE	124(1)
56110034	RT 250 SHEAR PIN & DRIVE KEY KIT	23(3), 24(1), 34(1), 102(1), 104(1), 123, 120, 121

14.4 Accessories Spare Kits

ITEM	PART NO	DESCRIPTION
1	589222	Controller, Dual Pad
2	589223	Controller, Single Pad
3	589267	Controller, Dual Joystick
4	589268	Controller, Single Joystick
5	589845	Controller, Single, Hyd
6	589846	Controller, Dual, Hyd
7	589809	5m RT Motor Loom MX
8	589800	Gen2 Y Loom MX
9	589801	Gen2 AUX 2m Loom MX
	589802	Gen2 AUX 7m Loom MX
	589803	Gen2 AUX 10m Loom MX
	589804	Gen2 AUX 18m Loom MX
	589805	Gen2 AUX 22m Loom MX
	589006	Fuse Holder
	589010	T2 Fuse Holder
	589861	3-button remote (gen2 system)
	589862	5-button remote (gen2 system)
	56110035	RT Installation Nut Holder
	589007	130 A ANL TYPE FUSE
	589008	250 A ANL TYPE FUSE
	589009	325 A ANL TYPE FUSE
	589010	400 A ANL TYPE FUSE
	589011	500 A ANL TYPE FUSE
	589012	200 A ANL TYPE FUSE
	589064	MOTOR SUPPORT BRACKET 185 TT
	589066	MOTOR SUPPORT BRACKET 250 TT
	589096	MOTOR SUPPORT BRACKET 140 TT
	589810	Gen2 ABS 12v
	589830	Gen2 ABS 24v
	589811	Gen2 PS 24v/12v
	589813	Gen2 PS 48v/24v



15 - Warranty

Limited Warranty and Key Terms of Supply by Lewmar

Lewmar warrants that in normal private pleasure boat usage and with proper maintenance its products will conform with their specification for a period of three years from the date of purchase by the end user, subject to the conditions, limitations and exceptions listed below. Any product, which proves to be defective in normal usage during that three-year period, will be repaired or, at Lewmar's option, replaced by Lewmar.

A CONDITIONS AND LIMITATIONS

- i Lewmar's liability shall be limited to the repair or replacement of any parts of the product which are defective in materials or workmanship.
- ii Responsibility for the selection of products appropriate for the use intended by the Buyer shall rest solely with the Buyer and Lewmar accepts no responsibility for any such selection.
- iii Lewmar shall not be liable in any way for Product failure, or any resulting loss or damage that arises from:
 - a. Use of a product in an application for which it was not designed or intended;
 - b. Corrosion, ultra violet degradation or wear and tear;
 - c. A failure to service or maintain the product in accordance with Lewmar's recommendations;
 - d. Faulty or deficient installation of the product (unless conducted by Lewmar);
 - e. Any modification or alteration of the product;
 - f. Conditions that exceed the product's performance specifications or safe working loads.
- g. Abuse
- iv Product subject to a warranty claim must be returned to the Lewmar outlet that supplied the product for examination unless otherwise approved by Lewmar in writing.
- v This warranty does not cover any incidental costs incurred for the investigation, removal, carriage, transport or installation of product.
- vi Service by anyone other than authorized Lewmar representatives shall void this warranty unless it accords with Lewmar guidelines and standards of workmanship.
- vii Lewmar's products are intended for use only in the marine environment. Buyers intending to use them for any other purpose should seek independent professional advice as to their suitability. Lewmar accepts no liability arising from such other use.

B EXCEPTIONS

Cover under this Warranty is limited to a period of one year from the date of purchase by the end user in the case of any of the following products or parts of products:

- Electric motors and associated electrical equipment
- Electronic controls
- Hydraulic pumps, valves and actuators
- Hatch & Portlight weather seals
- Products used in "Grand Prix" racing applications
- Products used in commercial or charter applications
- Anchor rodes

C LIABILITY

- i Lewmar's liability under this warranty shall be to the

exclusion of all other warranties or liabilities (to the extent permitted by law). In particular (but without limitation):

- a. Lewmar shall not be liable for:
 - Any loss of anticipated turnover or profit or indirect, consequential or economic loss;
 - Damages, costs or expenses payable to any third party;
 - Any damage to yachts or equipment;
 - Death or personal Injury (unless caused by Lewmar's negligence).

Some states and countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you

- b. Lewmar grants no other warranties regarding the fitness for purpose, use, nature or satisfactory quality of the products.
- ii Where applicable law does not permit a statutory or implied warranty to be excluded, then such warranty, if permitted by that state or country's law, shall be limited to a period of one year from the date of purchase by the end user. Some states and countries do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

D PROCEDURE

Notice of a claim for service under this warranty shall be made promptly and in writing by the end user to the Lewmar outlet that supplied the product or to Lewmar Limited at Southmoor Lane, Havant, Hampshire PO9 1JJ, England.

E SEVERANCE CLAUSE

If any clause of this warranty is held by any court or other competent authority to be invalid or unenforceable in whole or in part, the validity of the remaining clauses of this warranty and the remainder of the clause in question shall not be affected.

F OTHER RIGHTS

This warranty gives you specific legal rights, and you may also have other legal rights, which vary from state to state and country to country.

In the case of European States a Consumer customer (as defined nationally) has legal rights under the applicable national law governing the sale of Consumer Goods; this Warranty does not affect those rights.

G LAW

This warranty shall be governed by and read in accordance with the laws of England or the state or country in which the first end user is domiciled at the time of purchase of the product.

H DISPUTES

Any dispute arising under this warranty may, at the option of the end-user, be referred to alternative dispute resolution under the rules of the British Marine Federation or to the Courts of the State whose law shall govern the warranty or to the Courts of England and Wales.

The British Marine Federation may be contacted at Marine House, Thorpe Lea Road, Egham, England, TW20 8BF

WO: _____

Assembly Checked:

Deployment Checked:

Actuator and Switch Adjustment:

ICU Test:

Deploy / Retract Test:

NOTES

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