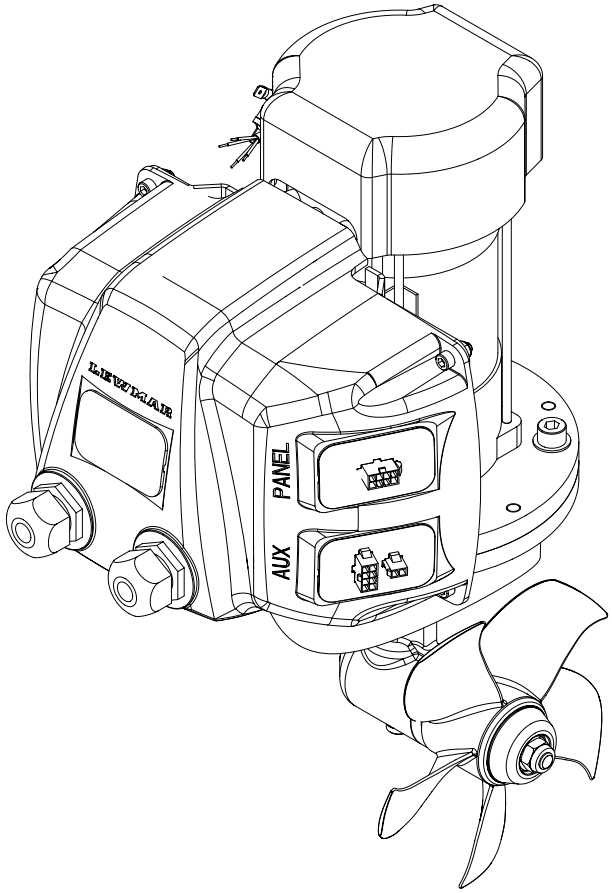
LEWMAR®

Proportional Thruster

140 (2.2Kw) to 250TT (8Kw)

55090001 Issue 1



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. This manual is based on a GRP tunnel installation.**
- 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. Should there be a need to install in a damp /wet location then the IP (Ignition Protected) version must be used.
- 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.

- 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.

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 Choosing the location

⚠ A competent, marine engineer must carry out any work on the hull of your boat.

⚠ The boat MUST be out of the water, levelled and secure in its cradle.

The actual position of the Thruster will depend on the internal & external construction of the Motor Boat or Sailing Yacht. For optimal performance the Thruster should be mounted within the following:

- As far forward as possible (Fig 3.1.1 / lever effect).
- 1 x Ø below the waterline to prevent air being sucked into the tunnel. (Fig. 3.1.2 / 0.75 x Ø minimum.).
- Minimum suggested tunnel length 2 x Ø.

NOTE: Ensure there is sufficient space for the Thruster assembly complete with motor and controls in the boat.

Ø = Tunnel Diameter

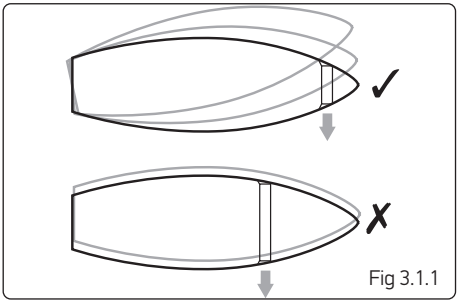


Fig 3.1.1

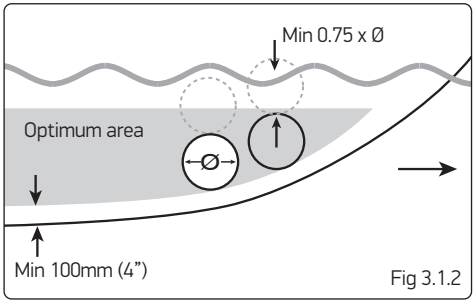


Fig 3.1.2

TT Thruster can be fitted new or as a replacement for an existing thruster. Tunnel dimensions listed on the following table.

NOTE: Check mounting holes on the saw template

THRUSTER MODEL	INSIDE DIAMETER		WALL THICKNESS	
	mm	inch	mm	inch
140	140	5 ½	4.0-5.0	$^{5}/_{32}$ - $^{3}/_{16}$
185 (3.0 & 4.0)	185	7 $^{9}/_{32}$	4.0-6.0	$^{5}/_{32}$ - ¼
185 (5.0 & 6.0)	185	7 $^{9}/_{32}$	6.0	¼
250	250	9 $^{27}/_{32}$	7.5	$^{9}/_{32}$

- The recommended tunnel is designed to fit a Lewmar saddle, take the weight of the Thruster and the torque of the motor.
- Fig 3.1.3 - To reduce any potential loss of performance or damage to the propeller the entrance of the tunnel can be altered to improve thrust as well as reduce noise.

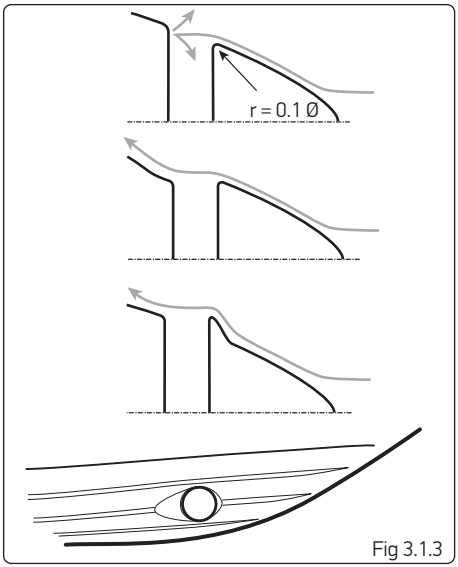


Fig 3.1.3

3.2 Preparing the hole for the tube

⚠ For general guidance for GRP boats only. Problems caused by faulty installation of the tunnel are the installers full responsibility.

⚠ A competent, marine engineer must carry out any work on the hull of your boat.

When you are satisfied the best location for the Thruster unit has been found within the parameters available proceed as follows.

- Fig 3.2.1 - Make a jig to precisely align the drill holes either side of the hull.

NOTE: Double check everything before drilling.

- Drill a pilot hole in both sides of the hull.

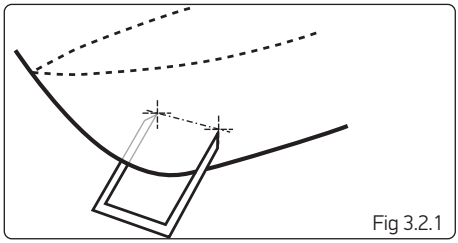


Fig 3.2.1

- Form a wire guide to diameter of the tunnel hole, mark, check and cut.
- Insert tube in the hole, mark and remove excess.

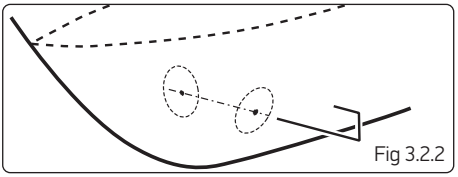


Fig 3.2.2

- Grind off gel coat etc. Insert tunnel and fix allowing enough room inside for saddle location on the tunnel.
- Gel coat finished installation and anti foul.

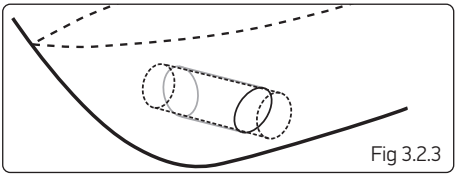


Fig 3.2.3

3.3 Preparing for fitting the thruster

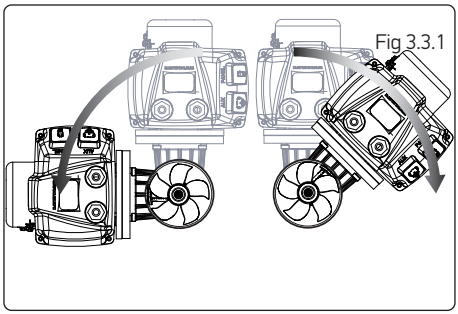


Fig 3.3.1

- The Thruster can be installed at any angle within 90° from vertical.

⚠ Electric motors must be supported if installed more than 30° from vertical (Fig 3.3.1).

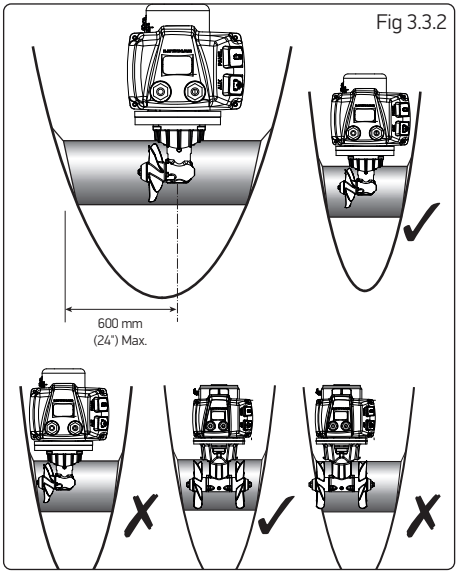


Fig 3.3.2

- Choose position of thruster, ensuring internal room for motor and controls and that the propeller is easily reached from outside.

NOTE: Fig 3.3.2. - Normal install is to Port (single propeller unit)

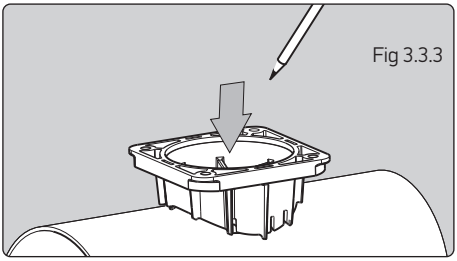


Fig 3.3.3

- Place the thruster saddle in the desired position, ensure the fit is firm and free from movement then mark centre.

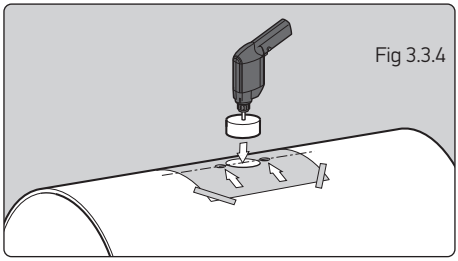


Fig 3.3.4

- **Position template on centre line, verify correct and carefully cut thruster hub hole using an appropriate hole saw for GRP and applying light cutting pressure only taking care not to splinter the tube. Remove any burrs with care, seal with resin mix and fair as required.**
- **Note: Poor alignment may affect hub positioning.**

3.4 Installing hub unit and saddle - 140TT & 185TT models

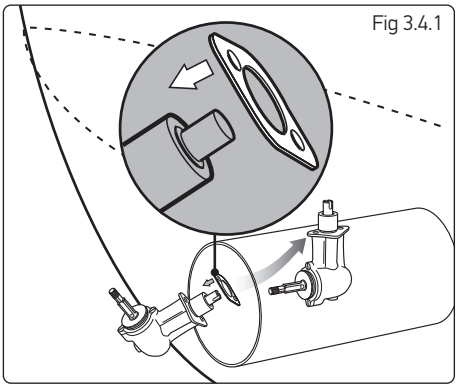


Fig 3.4.1

Note: illustrations based on 140TT saddle

- To suit the wiring configuration supplied fit the thruster propeller on the port side.
- Place gasket on hub and locate through centre hole. Sealant can be applied to gasket and flange to aid sealing.

NOTE: To achieve the correct position of the propeller in the tunnel the gasket must be in place.

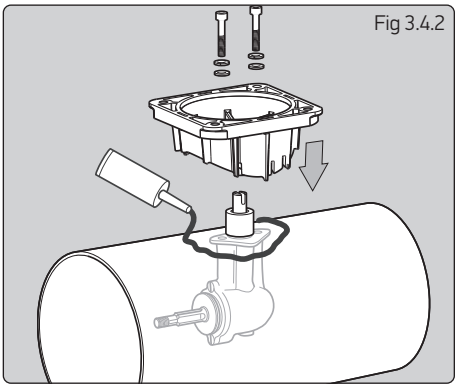


Fig 3.4.2

NOTE: Poor exterior tunnel surface could cause leakage and noise. Apply sealant to this area as required (Fig. 3.4.2).

- Apply zinc chromate paste or marine grease to location bore and assemble saddle onto hub (SikaFlex® or similar maybe used to seal saddle in place). Apply Blue Loctite® 243 to bolts and hand tighten along with supplied washers (Fig. 3.4.2).

NOTE: Tighten to full torque within 10 minutes.

3.5 Gearbox position - 185TT models

On installation check the position of the gearbox (leg) stem in the saddle.

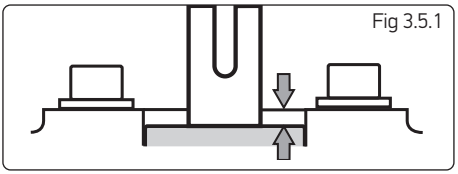


Fig 3.5.1

- If it is below 2 mm ($^{1}/_{16}$"), material must be removed from the tunnel (Fig 3.5.1).

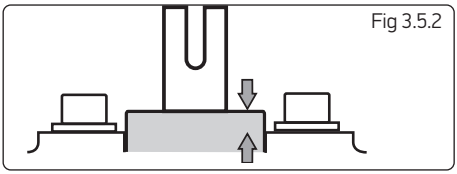


Fig 3.5.2

- If it is above 3.5 mm (⅛"), the tunnel should be packed under the saddle (Fig 3.5.2).

3.6 Propeller assembly - all models

- Check the hub gasket is in place.
- Fig 3.6.1 - Assemble anode kit and propeller in this order: large washer, propeller, anode, small washer and nyloc nut onto propeller shaft.

⚠ Check the propeller has been assembled in the correct order.

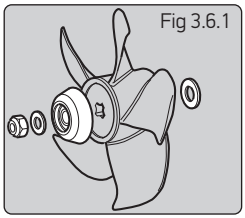


Fig 3.6.1

Note: Tighten each bolt alternately a number of times to full torque.

- Fig 3.6.2 - Tighten hub/saddle bolts to 9 Nm (6.6 lb.ft) for 140 or 21 Nm (15.5 lbs.ft) for 185.

DO NOT allow propeller to touch tunnel.

DO NOT anti foul zinc anode

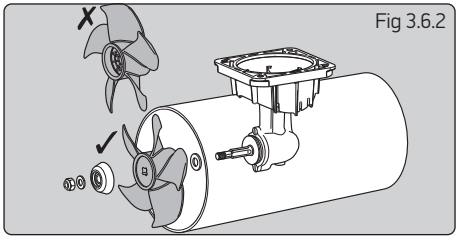


Fig 3.6.2

- Fig 3.6.3 - Check that propeller is centred and free turning (within 10 minutes of applying Blue Loctite® 243).

- Anti foul bronze hub and propeller if desired.

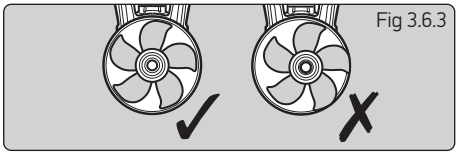


Fig 3.6.3

- Tighten propeller nut to 10 Nm (7.4 lbs.ft) for 140 or 15 Nm (11 lbs.ft) for 185, a length of wood placed between propeller blade and tunnel will stop movement.

DO NOT overtighten propeller nuts.

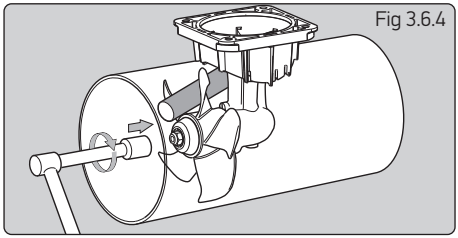


Fig 3.6.4

3.7 Installing hub unit and saddle models 250TT

- Place gasket on hub and locate through centre hole. Sealant can be applied to gasket and flange to aid sealing.

NOTE: To achieve the correct position of the propeller in the tunnel the gasket must be in place.

NOTE: Poor exterior tunnel surface could cause leakage and noise. Apply sealant to this area as required (Fig 3.7.2).

- Apply zinc chromate paste or marine grease to location bore and assemble saddle onto hub (SikaFlex® or similar maybe used to seal saddle in place). Apply Blue Loctite® 243 to bolts and hand tighten along with supplied washers (Fig 3.7.2).

NOTE: Tighten to full torque within 10 min

NOTE: Tighten each bolt alternately a number of times to full torque.

- Tighten hub/saddle bolts to 33 Nm (24 lbs. ft) for 250. Check that propeller is centred and free turning (within 10 minutes of applying Blue Loctite® 243).

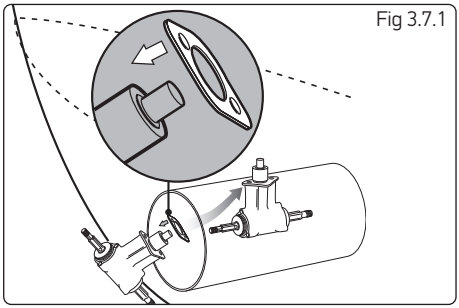


Fig 3.7.1

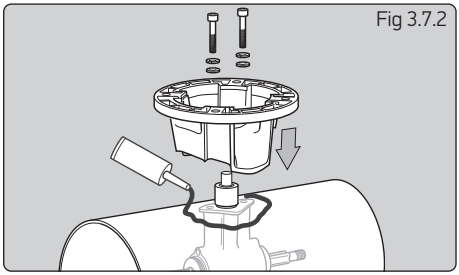


Fig 3.7.2

- Assemble anode kit and propeller in this order:- large washer, propeller, anode, small washer and nyloc nut onto propeller shaft. To suit the wiring configuration supplied fit the thruster LH propeller on the port side.

⚠ Check the propeller has been assembled correctly (Fig 3.6.1).

DO NOT allow propeller to touch tunnel.

DO NOT anti foul zinc anode

- Anti foul bronze hub and propeller if desired.

- Tighten propeller nut to 35 Nm (26 lbs.ft), a length of wood placed between propeller blade and tunnel will stop movement.

DO NOT overtighten propeller nuts.

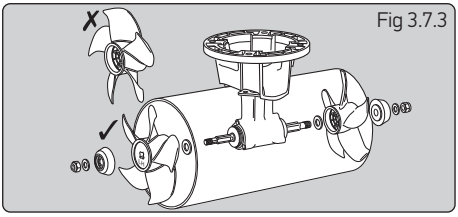


Fig 3.7.3

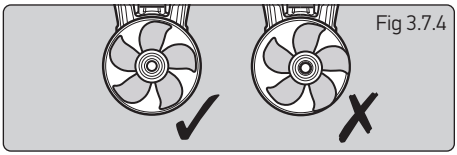


Fig 3.7.4

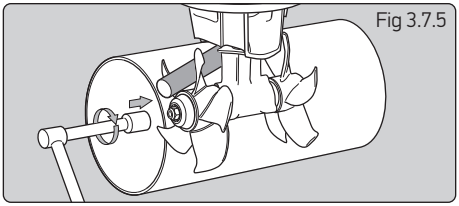


Fig 3.7.5

3.9 Installing electric motor unit - 110TT & 185TT models

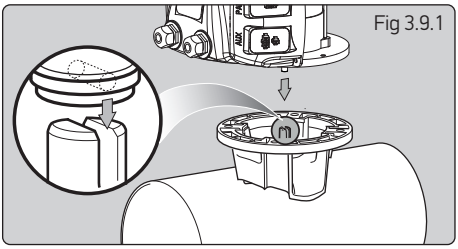


Fig 3.9.1

Note: illustrations based on 140TT saddle

- Align motor drive pin in line with slot in shaft. Apply grease to hub shaft.

DO NOT REMOVE the drive pin plastic retainer tie on the motor drive shaft.

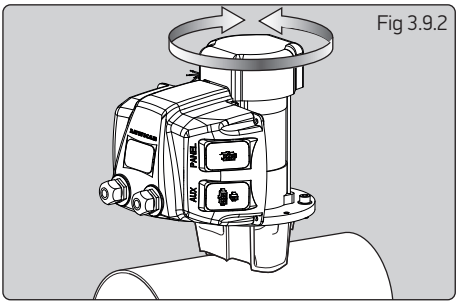


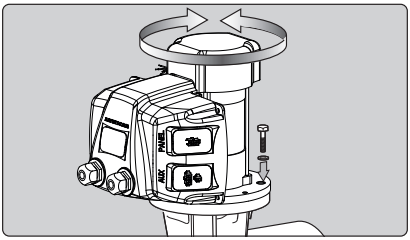
Fig 3.9.2

- Slide motor into position and align holes for most suitable installation.
- Bolt motor assembly to saddle and tighten bolts to 20 Nm (15 lbs.ft) for 140 or 35 Nm (25.8 lbs.ft) for 185. Apply Blue Loctite® 243 to all bolts.

3.10 Installing electric motor unit model 250TT

- Remove drive shaft key retaining tie, grease shaft, slide motor into position and align holes for most suitable installation and bolt motor assembly to saddle applying Blue Loctite® 243 to bolts.

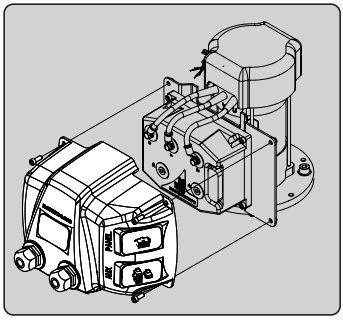
NOTE: Postion motor for control in FWD/AFT direction is preferable.

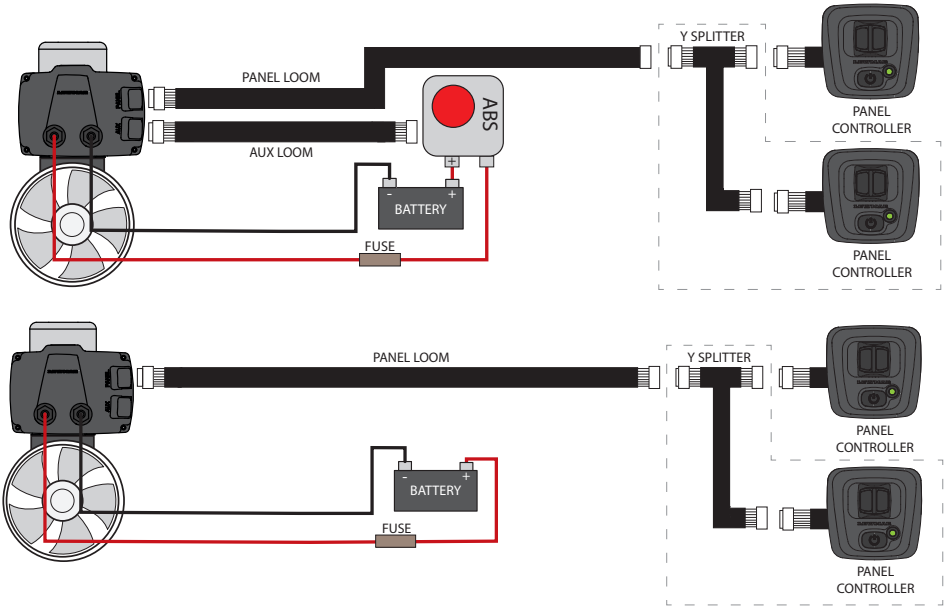


4- Electrical wiring installation

4.1 Removal of cover from 140 2KW, 185 3KW & 4KW

1. Remove the four retaining bolts
   (10mm Spacer & 5mm Hex Key)
2. Pull the cover away from the motor assembly
3. Pass battery cabke through the cable glands
   - Use 90, Cable ring terminals with atleast 8mm hole
4. Fix the battery cables to the motor control using a M6 Hex bolts
   - Recommended to use brass Hex set screw with M6 spring washer
5. Attach the thermal trip wire to the positive (B+) terminal.
6. Replace cover, Do not over tighten retaining bolts, Max torque 3nm





If the control direction on the controller is incorrect- Open the back of the controller and move the related direction switch on the back of the PCB.

NOTE: Automatic switch (if fitted). Main power is switched on when thrusting.

⚠ Do NOT remove contactor cover unless authorised by Lewmar

⚠ It is vital that the positive battery lead is connected to the positive motor terminal or damage to the electronics may occur.

4.4 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.

- Live wire exposed! Correct the cable installation to match (Fig 4.4.1).
- Wrong Cable installation see (Fig 4.4.2).
- 90º Terminals must be used

⚠ Insure the thermal trip wire is connected to the positive (B+) terminal.

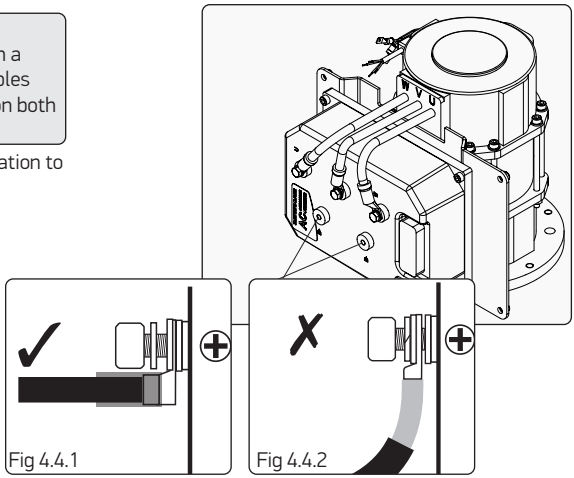


Fig 4.4.1 Fig 4.4.2

4.5 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.

Cable sizes based on typical usage

- Motor thermal trips must be wired in as specified in the product manual
- The circuit must be protected by the recommended thermal circuit breaker
- These figures are provided as guidance only, please seek professional assistance where required

⃠ 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 140TT and 10 mm (⅜") for 185TT, 250TT and 300TT. 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.

24V		Max Distance in Meters (+VE → product → -VE)							
Current (A)	Cable Size	5	10	15	20	25	30	35	40
150	mm²	10	16	25	35	50	50	50	70
	AWG	8	4	4	2	1	1	0	2/0
175	mm²	10	25	25	35	50	50	70	70
	AWG	8	4	2	2	1	0	2/0	2/0
200	mm²	10	25	35	50	50	70	70	95
	AWG	6	4	2	1	0	2/0	2/0	3/0
225	mm²	16	25	35	50	70	70	95	95
	AWG	6	4	2	1	0	2/0	3/0	3/0
250	mm²	16	25	35	50	70	70	95	95
	AWG	6	2	1	0	2/0	3/0	3/0	4/0
275	mm²	16	35	50	70	70	95	95	120
	AWG	6	2	1	0	2/0	3/0	4/0	4/0
300	mm²	16	35	50	70	70	95	120	120
	AWG	4	2	1	2/0	3/0	3/0	4/0	2 x 2/0
325	mm²	16	35	50	70	95	95	120	2 x 70
	AWG	4	2	0	2/0	3/0	4/0	4/0	2 x 2/0
350	mm²	25	35	50	70	95	120	120	2 x 70
	AWG	4	2	0	2/0	3/0	4/0	2 x 2/0	2 x 2/0
375	mm²	25	35	70	70	95	120	2 x 70	2 x 70
	AWG	4	1	0	3/0	4/0	4/0	2 x 2/0	2 x 3/0
400	mm²	25	50	70	95	95	120	2 x 70	2 x 95
	AWG	4	1	2/0	3/0	4/0	2 x 2/0	2 x 2/0	2 x 3/0
425	mm²	25	50	70	95	120	120	2 x 70	2 x 95
	AWG	4	1	2/0	3/0	4/0	2 x 2/0	2 x 3/0	2 x 3/0
450	mm²	25	50	70	95	120	2 x 70	2 x 95	2 x 95
	AWG	4	1	2/0	3/0	4/0	2 x 2/0	2 x 3/0	2 x 3/0
475	mm²	25	50	70	95	120	2 x 70	2 x 95	2 x 95
	AWG	2	0	2/0	4/0	2 x 2/0	2 x 2/0	2 x 3/0	2 x 4/0
500	mm²	25	50	70	95	120	2 x 70	2 x 95	2 x 95
	AWG	2	0	3/0	4/0	2 x 2/0	2 x 3/0	2 x 3/0	2 x 4/0
525	mm²	25	50	95	120	2 x 70	2 x 95	2 x 95	2 x 120
	AWG	2	0	3/0	4/0	2 x 2/0	2 x 3/0	2 x 4/0	2 x 4/0
550	mm²	35	70	95	120	2 x 70	2 x 95	2 x 95	2 x 120
	AWG	2	0	3/0	4/0	2 x 2/0	2 x 3/0	2 x 4/0	2 x 4/0
575	mm²	35	70	95	120	2 x 70	2 x 95	2 x 95	2 x 120
	AWG	2	2/0	3/0	4/0	2 x 2/0	2 x 3/0	2 x 4/0	2 x 4/0
600	mm²	35	70	95	120	2 x 70	2 x 95	2 x 120	2 x 120
	AWG	2	2/0	3/0	2 x 2/0	2 x 3/0	2 x 3/0	2 x 4/0	x
625	mm²	35	70	95	120	2 x 95	2 x 95	2 x 120	2 x 120
	AWG	2	2/0	4/0	2 x 2/0	2 x 3/0	2 x 4/0	2 x 4/0	x
650	mm²	35	70	95	2 x 70	2 x 95	2 x 95	2 x 120	x
	AWG	2	2/0	4/0	2 x 2/0	2 x 3/0	2 x 4/0	2 x 4/0	x

4.7 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 pre-installed seal and is secured with the 4x screws included in the packaging

The small plug connects at the panel. If two or more panels are installed use the optional Y connectors (Sec 6.6).

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.

Fig. 4.7.1

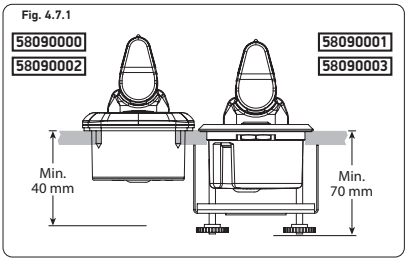
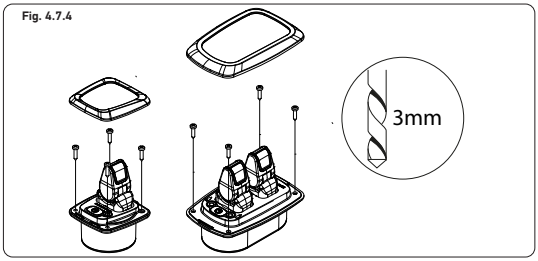
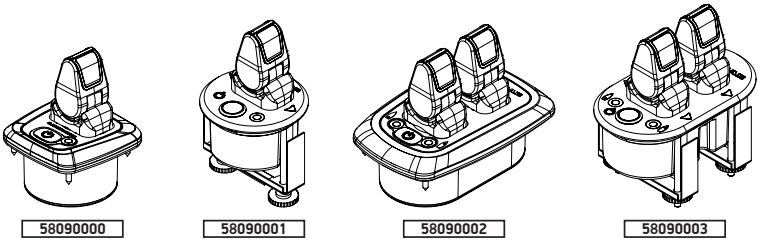


Fig. 4.7.4





4.8 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.
- Perform electrical check , Section 2.8.

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.

4.9 110TT 1.5kW to 300TT 15kW Operation and safety features

Turning system On/Off

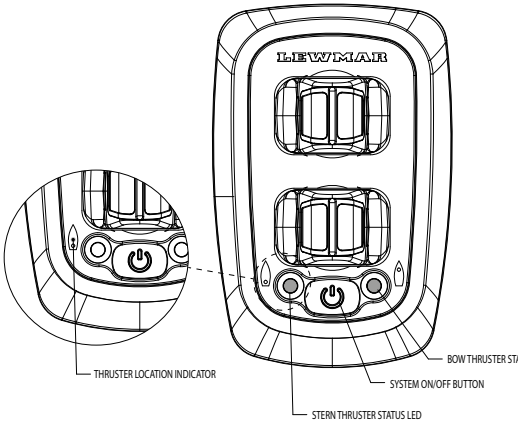
- To turn the system on press and hold the ON button for 1 second. If the system is active the panel LED will turn green.
- To turn the system OFF press the ON button once. The system will turn off immediately. The LED will switch off.
- If the system is in fault mode (Solid RED LED) Pressing the ON 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 15 minutes of inactivity for TT, & 5 minutes for RT thrusters.
- The thruster motor and controller are fitted with temperature monitoring devices. In the event of Over-temperature, the system will enter a "limp-home" mode.

LED Colour Diahgnostics

COLOUR	STATUS
Green	System ON
Green (Flashing)	RT Thruster Extending / Retracting
Red (Flashing)	Motor High Temperature
Red	Fault



5- Servicing your thruster

5.1 Service schedule

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.

5.2 Changing drive pin 140TT & 185TT

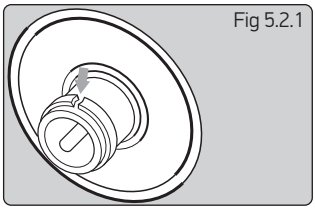


Fig 5.2.1

Cut cable tie on shaft (if fitted)

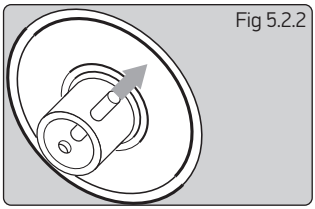


Fig 5.2.2

Punch out pin parts

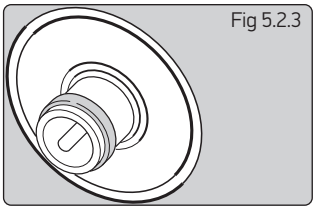


Fig 5.2.3

Tap in new pin and secure with new plastic cable tie

Additional controller

Pressing opposite button on a second control panel when thruster is operating will cancel operation of thruster

Operating same direction button when still in operation on other control panel will have no effect.

6- Weight & Specifications

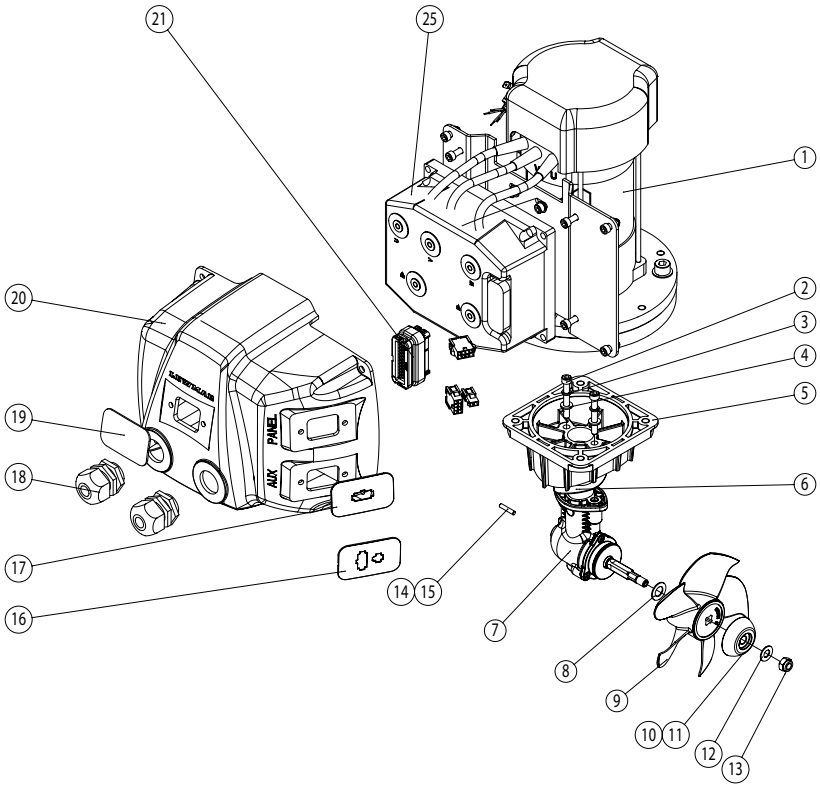
6.1 Electric

PART NO	DESCRIPTION	TUNNEL SIZE	POWER		VOLTAGE	SHEAR PIN MATERIAL	GEARBOX MATERIAL	PROPELLER
		(MM)	KW	HP				
59092000	TT 140 2.2KW PROPORTIONAL	140	2.2	3	24	St/St	Composite	Single 5 Blade
59092001	TT 140 2.2KW PROPORTIONAL BRASS	140	2.2	3	24	Brass	Composite	Single 5 Blade
59093000	TT 185 3KW PROPORTIONAL ST/ST	185	3	4	24	St/St	St/St	Single 5 Blade
59093001	TT 185 3KW PROPORTIONAL ALLOY	185	3	4	24	Alloy	St/St	Single 5 Blade
59093002	TT 185 4KW PROPORTIONAL ST/ST	185	4	5	24	St/St	St/St	Single 5 Blade
59093003	TT 185 4KW PROPORTIONAL ALLOY	185	4	5	24	Alloy	St/St	Single 5 Blade
59093004	TT 185 5KW PROPORTIONAL ST/ST	185	5	7	24	St/St	St/St	Single 5 Blade
59093005	TT 185 5KW PROPORTIONAL ALLOY	185	5	7	24	Alloy	St/St	Single 5 Blade
59093006	TT 185 6KW PROPORTIONAL ST/ST	185	6	8	24	St/St	St/St	Single 5 Blade
59093007	TT 185 6KW PROPORTIONAL ALLOY	185	6	8	24	Alloy	St/St	Single 5 Blade
59094001	TT 250 8KW 24V PROPORTIONAL	250	8	11	24	-	Bronze	Twin CR 5 Blade

PART NO	DESCRIPTION	THRUST @ 100% THROTTLE		WEIGHT		AMPS	FUSE		FUSE HOLDER	
		KGF	LBS	KG	LBS	CURRENT DRAW	RATING	PART NUMBER	T1 - 589006	T2 - 589013
59092000	TT 140 2.2KW PROPORTIONAL	21	46	18	40	100	130	589007	●	●
59092001	TT 140 2.2KW PROPORTIONAL BRASS	21	46	18	40	100	130	589007	●	●
59093000	TT 185 3KW PROPORTIONAL ST/ST	45	99	44	96	150	130	589007	●	●
59093001	TT 185 3KW PROPORTIONAL ALLOY	45	99	44	96	150	130	589007	●	●
59093002	TT 185 4KW PROPORTIONAL ST/ST	55	121	44	96	180	200	589012	●	●
59093003	TT 185 4KW PROPORTIONAL ALLOY	55	121	44	96	180	200	589012	●	●
59093004	TT 185 5KW PROPORTIONAL ST/ST	67	147	29	64	215	200	589012	●	●
59093005	TT 185 5KW PROPORTIONAL ALLOY	67	147	29	64	215	200	589012	●	●
59093006	TT 185 6KW PROPORTIONAL ST/ST	76	167	29	64	240	250	589008	●	●
59093007	TT 185 6KW PROPORTIONAL ALLOY	76	167	29	64	240	250	589008	●	●
59094001	TT 250 8KW 24V PROPORTIONAL	119	262	49	107	360	325	589009	●	●

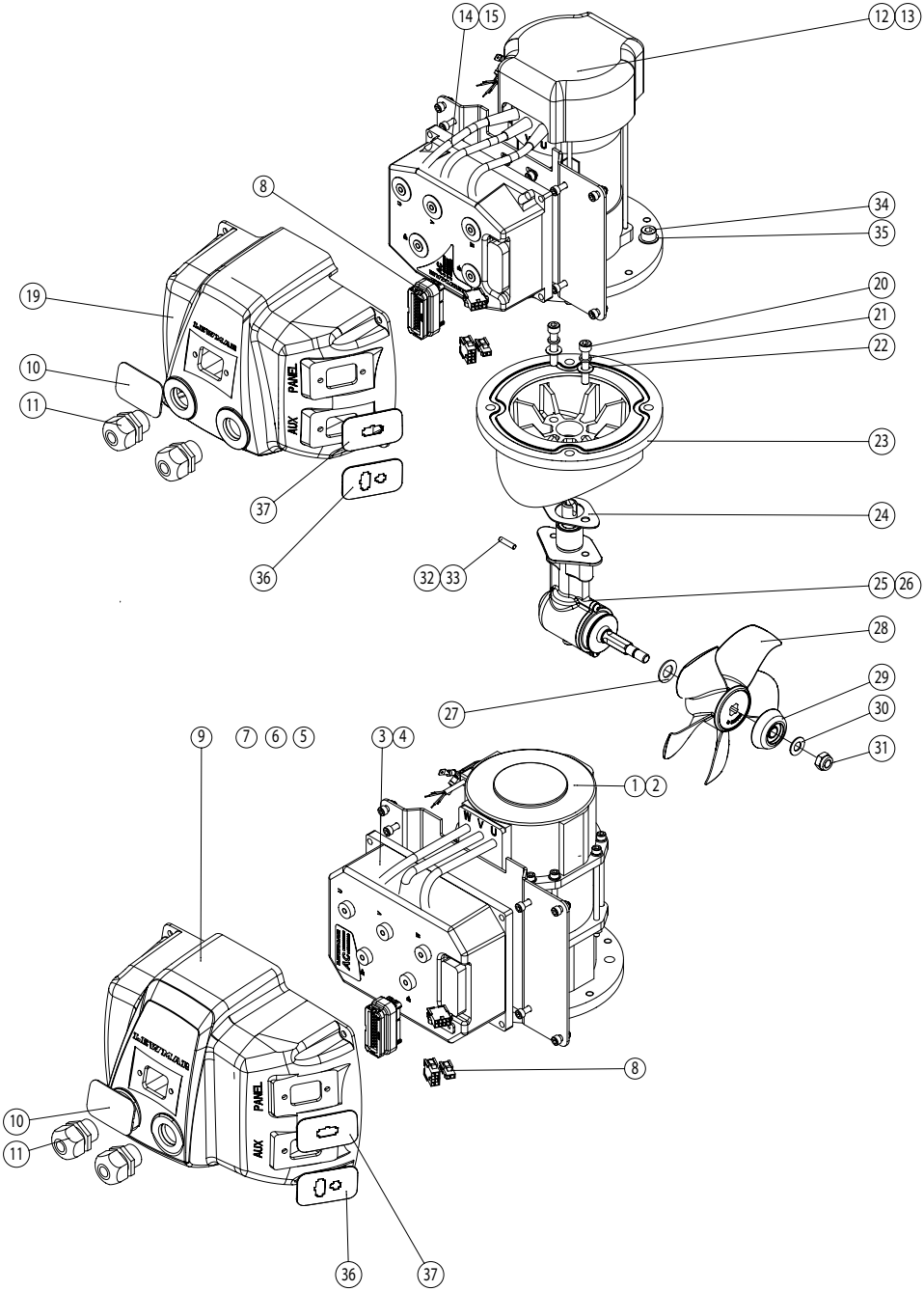
7- Parts list

7.1 Model 140TTΣ



KIT NUMBER	KIT DESCRIPTION	PART INCLUDED (QTY)
551052	TT 140 MOUNT SADDLE	5(1)
551035	TT 140 TUNNEL GASKET	6(1)
559018	TT 140 DRIVE PIN (BRASS)	14(2)
559255	TT 140 DRIVE PIN (ST/ST)	15(2)
589150	TT 140 PROPELLER ANODE KIT	10(1), 12(1) & 13(1)
589157	TT 140 PROPELLER SPACER KIT	11(1), 12(1) & 13(1)
589151	TT 140 PROPELLER & WASHER	8(1) & 9(1)
589156	TT 140 HUB	7(1)
589158	TT 140 HUB INSTALLATION FIXING KIT	2(2), 3(2) & 4(2)
56090000	TT PROPORTIONAL SMALL COVER	16(1), 17(1), 18(2), 19(1) & 20(1)
56090007	TT PROPORTIONAL CONTROL LOOM	21(1)
56092000	TT 140 2.2KW CONTROLLER ASSY	25(1)
56092002	TT 140 2.2KW MOTOR ASSY ST/ST	1(1), 15(1), 16(1), 17(1), 18(2), 19(1), 20(1), 21(1) & 22(1)
56092003	TT 140 2.2KW MOTOR ASSY BRASS	1(1), 14(1), 16(1), 17(1), 18(2), 19(1), 20(1), 21(1) & 22(1)

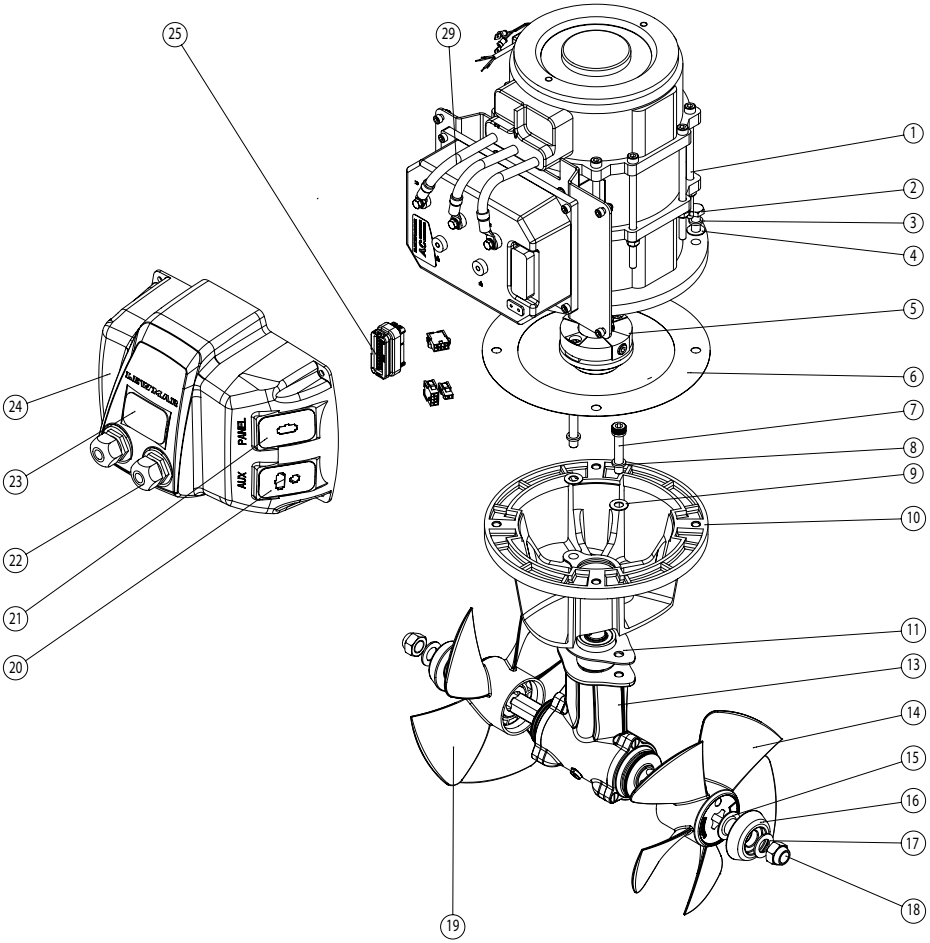
7.2 Model 185TT



7.2 Model 185TT

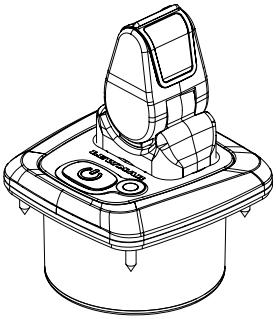
KIT NUMBER	KIT DESCRIPTION	KW	PART INCLUDED (QTY)
553035	TT 185 TUNNEL GASKET	ALL	24(1)
553071	TT 185 MOUNTING SADDLE	ALL	23(1)
559017	TT 185 DRIVE PIN (ST/ST)	ALL	32(2)
559017A	TT 185 DRIVE PIN (ALLOY)	ALL	33(2)
589357	HUB ASSY 3	3	20(2), 21(2), 22(2), 24(1) & 25(1)
583358	HUB ASSY 4, 5 & 6	4,5, 6	20(2), 21(2), 22(2), 24(1) & 26(1)
589350	TT 185 PROPELLER ANODE KIT	ALL	29(1), 30(1) & 31(1)
589351	TT 185 PROPELLER & WASHER	ALL	27(1) & 28(1)
589361	TT 185 HUB INSTALLATION FIXING KIT	ALL	20(2), 21(2) & 22(2)
56090000	TT PROPORTIONAL SMALL COVER	3,4	10(1), 11(2), 18(1), 36(1) & 37(1)
56090002	TT PROPORTIONAL MED COVER	5, 6	9(1), 10(1), 11(2), 36(1) & 37(1)
56090007	TT PROPORTIONAL CONTROL LOOM	ALL	8(1)
56093000	TT 185 3KW CONTROLLER ASSY	3	14(1)
56093001	TT 185 4KW CONTROLLER ASSY	4	15(1)
56093002	TT 185 5KW CONTROLLER ASSY	5	3(1)
56093003	TT 185 6KW CONTROLLER ASSY	6	4(1)
56093007	TT 185 3KW MOTOR ASSY ST/ST	3	8(1), 10(1), 11(2), 12(1), 14(1), 19(1), 32(1), 34(4), 35(4), 36(1) & 37(1)
56093008	TT 185 3KW MOTOR ASSY ALLOY	3	8(1), 10(1), 11(2), 12(1), 14(1), 19(1), 33(1), 34(4), 35(4), 36(1) & 37(1)
56093009	TT 185 4KW MOTOR ASSY ST/ST	4	8(1), 10(1), 11(2), 13(1), 15(1), 19(1), 32(1), 36(1) & 37(1)
56093010	TT 185 4KW MOTOR ASSY ALLOY	4	8(1), 10(1), 11(2), 13(1), 15(1), 19(1), 33(1), 36(1) & 37(1)
56093011	TT 185 5KW MOTOR ASSY ST/ST	5	1(1), 3(1), 8(1), 9(1), 10(1), 11(2), 5(1), 6(1), 7(1), 32(1), 36(1) & 37(1)
56093012	TT 185 5KW MOTOR ASSY ALLOY	5	1(1), 3(1), 8(1), 9(1), 10(1), 11(2), 5(1), 6(1), 7(1), 33(1), 36(1) & 37(1)
56093013	TT 185 6KW MOTOR ASSY ST/ST	6	2(1), 4(1), 8(1), 9(1), 10(1), 11(2), 5(1), 6(1), 7(1), 32(1), 36(1) & 37(1)
56093017	TT 185 6KW MOTOR ASSY ALLOY	6	2(1), 4(1), 8(1), 9(1), 10(1), 11(2), 5(1), 6(1), 7(1), 33(1), 36(1) & 37(1)
56093016	TT 185 MOTOR INSTALLATION FIXING KIT	ALL	34(4) & 35(4)

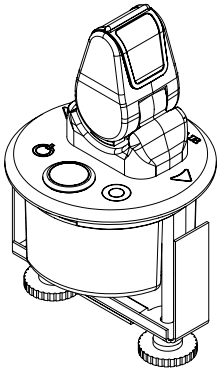
7.3 Model 250TT

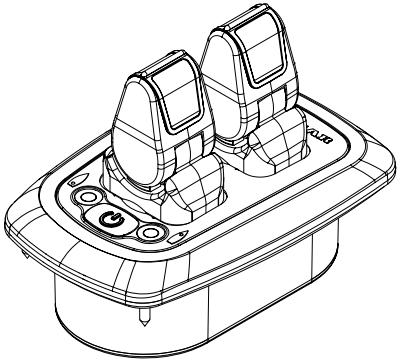


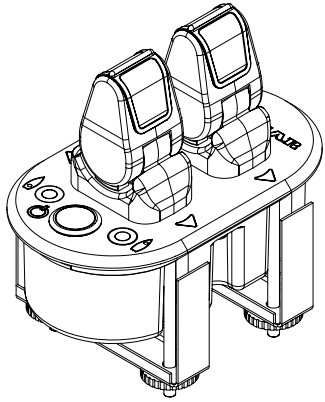
KIT NUMBER	KIT DESCRIPTION	PART INCLUDED (QTY)
555025	TT 250 MOUNTING SADDLE	10(1)
555035	TT 250 TUNNEL GASKET	11(1)
555038	TT 250 PLASTIC WASHER	6(1)
585014	250 CENTA FLEX COUPLING	5(1)
589150	250 ANODE KIT	16(2), 17(2) & 18(2)
589551	RIGHT HAND PROPELLER & WASHER KIT	15(1) & 19(1)
589552	LEFT HAND PROPELLER & WASHER	14(1) & 15(1)
589557	TT 250 HUB ASSY	7(2), 8(2), 9(2), 11(1) & 12(1)
589558	TT 250 HUB INSTALLATION FIXING KIT	7(2), 8(2) & 9(2)
56090002	TT PROPORTIONAL MED COVER	20(1), 21(1), 22(2), 23(1) & 24(1)
56090007	TT PROPORTIONAL CONTORL LOOM	25(1)
56094003	TT 250 8KW CONTROLLER ASSY	29(1)
56094005	TT 250 8KW MOTOR ASSY	1(1), 5(1), 20(1), 21(1), 22(2), 23
56094008	250 8KW TT MOTOR FIXING KIT	2(4), 3(4) & 4(4)

8- Accessories







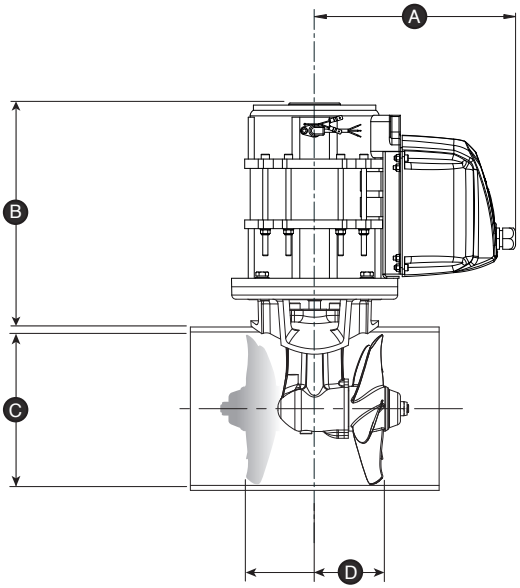


PART NO	DESCRIPTION
58090000	Single, Control Panel
58090001	Single Alloy, Control Panel
58090002	Dual, Controler Panel
58090003	Dual Alloy, Control Panel
58090019	Splitter Assy

PART NO	DESCRIPTION
58090009	Control panel Loom - 2m
58090010	Control panel Loom - 7m
58090011	Control panel Loom - 10m
58090012	Control panel Loom - 18m
58090013	Control panel Loom - 22m

PART NO	DESCRIPTION
58090023	24V Auto Battery Switch - MLX

9- Dimensions



MODEL	VOLTAGE POWER	THRUST @ 100% THROTTLE		A		B		C		D	
		KGF	LBS	mm	in	mm	in	mm	in	mm	in
TT 140 2.2KW PROPORTIONAL	24	21	46	255	10	315	12 2/5	140	5 1/2	73	2 7/8
TT 140 2.2KW PROPORTIONAL BRASS	24	21	46	255	10	315	12 2/5	140	5 1/2	73	2 7/8
TT 185 3KW PROPORTIONAL ST/ST	24	45	99	255	10	310	12 1/5	185	7 9/32	85	3 11/32
TT 185 3KW PROPORTIONAL ALLOY	24	45	99	255	10	310	12 1/5	185	7 9/32	85	3 11/32
TT 185 4KW PROPORTIONAL ST/ST	24	55	121	255	10	310	12 1/5	185	7 9/32	85	3 11/32
TT 185 4KW PROPORTIONAL ALLOY	24	55	121	255	10	310	12 1/5	185	7 9/32	85	3 11/32
TT 185 5KW PROPORTIONAL ST/ST	24	67	147	278	11	292	11 1/2	185	7 9/32	85	3 11/32
TT 185 5KW PROPORTIONAL ALLOY	24	67	147	278	11	292	11 1/2	185	7 9/32	85	3 11/32
TT 185 6KW PROPORTIONAL ST/ST	24	76	167	278	11	292	11 1/2	185	7 9/32	85	3 11/32
TT 185 6KW PROPORTIONAL ALLOY	24	76	167	278	11	292	11 1/2	185	7 9/32	85	3 11/32
TT 250 8KW 24V PROPORTIONAL	24	119	262	313	12 1/3	370	14 4/7	250	9 27/32	238	9 3/8

11- Fault finding

Thrust in wrong direction?	▸ Switch PCB rear
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.
Control panel does not illuminate?	Check ▸ Power - Hold ⏻ for 1 second ▸ Battery is connected. ▸ Main switch ON, check fuse. ▸ Control loom connections. ▸ Long operation has tripped thermal switch. Wait 20 minutes for motor to cool and reset. ⚠ DO NOT attempt to cool motor by any other means.
Control panel illuminates but no thrust?	▸ Are batteries charged? ▸ Check main motor connections are tight.
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 1 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.
Motor turns but no drive? (140TT and 185TT only)	⚠ 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, see section 3.4.

12- 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

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