



3500 Gypsy/Drum Windlass Installation Manual

Issue B

LEWMAR®

PART 1 - ELECTRICAL ANCHOR WINDLASS INSTALLATION

VERTICAL ELECTRIC MODELS

- Windlass Installation**
- 1 Remove the anchor windlass from the packing case. Ensure that you have the necessary parts required to complete your system.

There are four items to position, the windlass deck unit, motor/gearbox, chain pipe (optional) and controls. Remember to allow space below deck for the motor - gearbox.
 - 2 Position the windlass deck unit on the deck or in the anchor well (see drawings for cut out dimensions) such that the centre-line of the chain on the gypsy aligns with the bow roller in a horizontal plane, and that the vertical line is within 10 degrees of the chain gypsy. Ensure that the chain achieves maximum contact around the chain gypsy (i.e. at least 120 and preferably 180 degrees contact).
 - 3 Cut and drill clearance holes in the deck for the windlass and chain pipe, to the size detailed on the installation template.
 - 4 Apply bedding compound onto the joint faces to seal the windlass and chain pipe to the deck.
 - 5 Apply a small amount of grease to the deck unit drive shaft before bolting the motor/gearbox into position. Ensure that the gearbox is mounted squarely on the shaft. If the underside of the deck is not parallel with the gearbox-mounting flange, packing must be used to correct any misalignment.

- Wiring**
- 6 The wiring of your unit and switch controls are shown in the diagrams at the end of this section. Please ensure that you follow the diagram for your system (Dual Direction or Single Direction).
 - 7 Mount the control box close to the motor, (within 1 meter), preferably in a dry environment.
 - 8 Connect the electrical cables from the control to the motor (customer supply). Ensure that the cables are secure and that the rubber boots are fitted before final crimping of the terminal ends. Check that the cables are connected as per the wiring diagram, before operating the windlass under power.
 - 9 Run the electrical cables from the control box to the batteries (customer supply). Ensure that the cables are secure and that the rubber boots are fitted before final crimping of the terminal ends. Check that the cables are connected as per the wiring diagram, before operating the windlass under power.
 - 10 Smear all terminals with grease, for extra protection against corrosion, before fitting the rubber boots.

NOTE

AIR Deck Switches

If using an AIR deck switch system. Please ensure that the small breather hole, located on the underside of the switch body, is kept clear and free from sealing compound on installation.

ELECTRIC Deck Switches

Use 16/0.2 wire to connect the deck switches to the control box.

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Cable Sizes Lewmar recommend the use of the following cable sizes.

System	Distance from Battery to Motor	Cable Size mm ²	Wire (USA)
12v	1m – 10m	35	1
	10m – 15m	50	1/0
	15m – 20m	70	2/0
24V	1m – 10m	25	3
	10m – 15m	35	1
	15m – 20m	50	1/0

Note: The windlass performance is directly related to the cable size and its length. A voltage drop of more than 2 volts will increase the amps required to power the motor and will effect the performance of the unit. In all cases this will cause the motor to overheat and in some to burn out. We recommend the use of PVC or Butyl Rubber Insulated cable. A larger cable will give increased performance.

The thermal cutout on the motor **must be connected** to the switch wiring to protect the motor from overheating. **The Motor Warranty will be invalidated if the thermal cutout is not connected as shown in the wiring diagrams supplied.**

Circuit Breaker The windlass circuit **must be protected** by a “Slow Blow” Circuit Breaker fitted as shown in the wiring diagram

Model (Slow Blow)	System	Circuit Breaker Value
3500	12v (68000628)	225 Amp
3500	24v (68000627)	160 Amp

Isolator Switch An isolator switch (ON/OFF) switch **must be used** to isolate the unit when not in use, or when carrying out routine maintenance to the unit.

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ANCHOR WINDLASS ELECTRIC SPECIFICATIONS

CUSTOM 3500 VERTICAL ELECTRIC MODELS

Electric Motors	Model	Motor Type	Motor Power	
	3500	24v DC	1.5kW Nominal	

Anchor Windlass Specifications	Model	Max Pull	Max Line Speed	Working Load
	3500	1600 kg 3520 lb	4-16 m (13-52 ft) / min	213 kg 469 lb

Model	Line Speed @ Working load	Weight
3500	14m(46ft)/min	Deck unit 25kg(55lb) Motor/gearbox 5kg(11lb)

PART 3 - HYDRAULIC ANCHOR WINDLASS INSTALLATION

VERTICAL HYDRAULIC MODELS

Windlass Installation

- 1 Remove the anchor windlass from the packing case.
Ensure that you have the necessary parts required to complete your system.

There are four items to position, the windlass deck unit, motor/gearbox, chain pipe (optional) and controls. Remember to allow space below deck for the motor - gearbox and for the connection of the hydraulic lines from the windlass to the power unit.
- 2 Position the windlass deck unit on the deck or in the anchor well (see drawings for cut out dimensions) such that the centre-line of the chain on the gypsy aligns with the bow roller in a horizontal plane, and that the vertical line is within 10 degrees of the chain gypsy. Ensure that the chain achieves maximum contact around the chain gypsy (i.e. at least 120 and preferably 180 degrees contact).
- 3 Cut and drill clearance holes in the deck for the windlass and chain pipe, to the size detailed on the installation template.
- 4 Apply bedding compound onto the joint faces and mount the windlass and chain pipe with the gypsy pawl facing aft and the chain stripper facing forward.
- 5 Apply a small amount of grease to the deck unit drive shaft before bolting the motor/gearbox into position. Ensure that the gearbox is mounted squarely on the shaft. If the underside of the deck is not parallel with the gearbox-mounting flange, packing must be used to correct any misalignment.

Hydraulic Installation

- 5 The Lewmar 3500 hydraulic windlass is designed to be used with Lewmar Commander power packs or similar power packs that give the required flow and pressure. Plan the routing of the hydraulic lines **(including case drain lines)** and run them from the hydraulic supply to the windlass motor (see hose type recommendations).
- 6 Connect the hydraulic feed and return lines to the hydraulic windlass motor, ensuring that the connections are secure (see motor specifications). Ensure that pipe work is flushed through to remove any dirt and debris before final connection to the motor and power pack.
- 7 Connect the case drain line (see case drain line specifications). Ensure that it is of adequate size.
- 8 Find a suitable position for electric safety deck switch(es), remote control and / or toggle switch in view of the windlass, anchor line and bow roller. Connect up the switch wiring to the Commander system (see Commander manual) or a suitable proprietary system ensuring that the minimum supply is 3 amps. The switches require a 12V or 24V DC system depending on available supply.
- 9 Check correct operation of the windlass (eg up / down).

If the rotation is incorrect, swap the A + B hoses at the motor, or swap the switch wiring, or swap the Directional Control Valve (DCV) caps.

ANCHOR WINDLASS HYDRAULIC SPECIFICATIONS

CUSTOM 3500 VERTICAL HYDRAULIC MODELS

Hydraulic Motors

The hydraulic motor is a fully reversible, high efficiency motor gearbox.

Model	Motor	Flow Min / Max (Ltr / min)	Pressure Max (Bar)
3500	80 cc/Rev	10 - 40	175 (2538 psi)

Note: (a) 3.78 litres $\approx$ 1 US Gallon
4.54 litres $\approx$ 1 Imperial Gallon
(b) 14.5 psi = 1 Bar

Anchor Windlass Specifications

Model	Max Line Speed	Working Load
3500	8-29 m (26-95 ft) / min	213 kg 496 lb

Model	Max Pull	@ Pressure (Bar)
3500	1300 kg 2860 lb	140 (2035psi)
3500	1600 kg 3520 lb	175 (2538psi)

Model	Line Speed @ Working load	Weight
3500	Dependant on Power Pack	Deck Unit 25kg(55lb) Motor/gearbox 28kg(62lb)

Hose Types

For reliable operation and safety reasons, it is essential to use the correct bore size of hose. To reduce pressure drops in hose runs greater than 5 - 7 m it is recommended a larger hose size is used.

The recommended hose bore sizes with their flow requirements are given below.

Model	Motor	Flow (Ltr / min)	Min Bore Size
3500	80 cc/Rev	Up to 20 Up to 40	1/2" 3/4 "

- Note:** (a) 3.78 litres $\approx$ 1 US Gallon
4.54 litres $\approx$ 1 Imperial Gallon
(b) It is important that the correct hose specification is used as this affects the efficiency of the hydraulic motor and the performance of the windlass.

IMPORTANT

Drain Line

To obtain optimum shaft life a case drain line **must** be fitted.

Min drain line bore diameter: 6mm (1/4")

Safe working pressure : 18 Bar (250 psi)

All drain lines should if possible be connected to the reservoir separately.

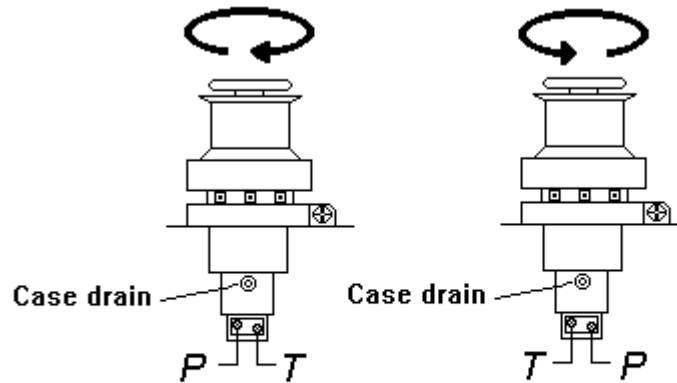
Hydraulic Fittings

The Lewmar Anchor Windlass hydraulic motors accept the following fittings :

Motor ports - 1/2" BSP Female
Case Drain - 1/4" BSP Female

Hydraulic Connections

The connection of the service lines should be plumbed in as follows: -



A Case Drain Line Must Be Fitted.

PART 3 - OPERATION, MAINTENANCE.

CUSTOM 3500

OPERATION OF VERTICAL HYDRAULIC MODELS

Operation Explained

The main shaft, driven by the motor/gearbox, is splined directly to the capstan. The gypsy can either be powered by the capstan or free running. The gypsy is powered by engaging the dog drive teeth of the capstan to the those of the gypsy. Engagement and disengagement of the dog drive is controlled by turning the top nut, which lifts and lowers the capstan. Spring loading between the capstan and gypsy facilitates engagement / disengagement.

The free running gypsy is controlled by tightening or loosening the full wrap brake band. A pawl is available for short-term gypsy locking when the capstan is used independently.

Power Up

Press the deck switch, remote control or toggle switch (Anchor Up).

NOTE: Ensure that the brake band and gypsy pawl is released and that the dog drive is fully engaged.

Power Down

Press the deck switch, remote control or toggle switch (Anchor Down).

NOTE: Ensure that the brake band and gypsy pawl is released and that the dog drive is fully engaged.

Manual Chain Release

Place a Lewmar winch handle in the brake band bi-square and secure the chain gypsy. Place a Lewmar winch handle into the top nut and raise the capstan until the dog drive is fully disengaged.

Replace the handle in the brake band bi-square and carefully release the brake to allow the gypsy to run free. The descent of the chain can be controlled and stopped by tightening or loosening the brake band.

Capstan Operation

Gypsy/Capstan model - To use the capstan (with rope only) lock the gypsy off with the brake band or pawl to stop the chain from free running. Place a Lewmar winch handle into the top nut and raise the capstan until the dog drive is fully disengaged.

Press the Up button to power the Capstan.

Dog Drive Engagement

Place a Lewmar winch handle into the top nut and lower the capstan down onto the gypsy until resistance is felt, then backwind one quarter of a turn.

Press the Up/Down switch and the dog drive will spring down into positive engagement. Tighten down the top nut securely if required.

Once the dog drive has been fully engaged, stop power operation and release the brake band or gypsy pawl before powered operation is continued.

Warning!

Ensure that the dog drive is fully engaged when powering in or out.

Keep hands and feet clear of free running chain.

Do not leave a winch handle in the windlass while operating.

Classification society rules require that a vessel lying at anchor should have its chain held by a cable/chain stopper or equivalent strong point as a windlass should not be subjected to the loads generated under storm conditions.

We recommend that the vessels engine should always be used to aid anchor recovery.

Do not attempt to pull a load greater than the rated load of the windlass.

When the windlass is not in use the anchor must be tied off onto a cleat or equivalent strong point to prevent damage.

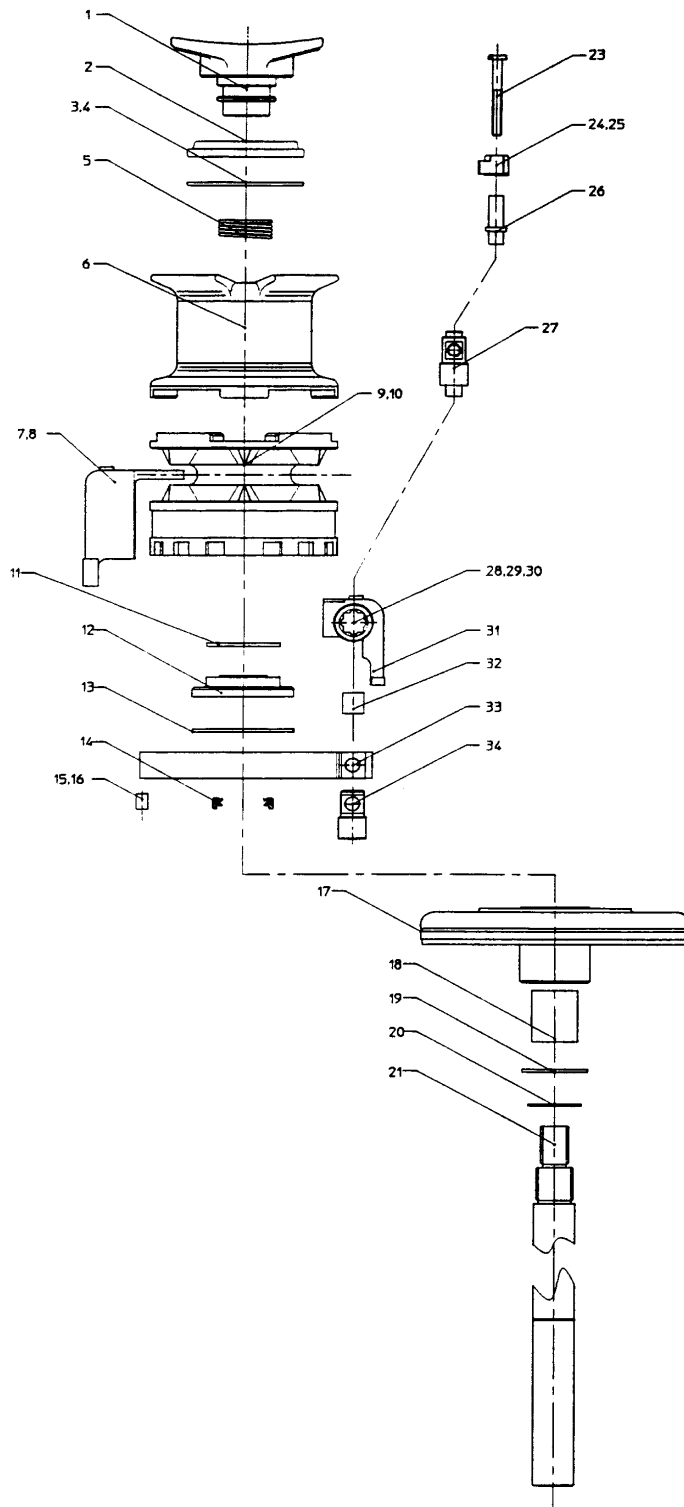
Maintenance

The windlass is housed in the harshest environment on the vessel. The windlass should be checked and cleaned every six months. Wash away salt deposits using fresh water, clean and grease the main shaft, spline and bearings (using marine grade grease).

Remove the brake band assembly, clean brake band and gypsy (**Do not allow grease onto the brake band surface**). Check for wear and replace if necessary.

Check the motor/gearbox for signs of corrosion. If corrosion is evident, clean and repaint with marine grade oil based enamel paint.

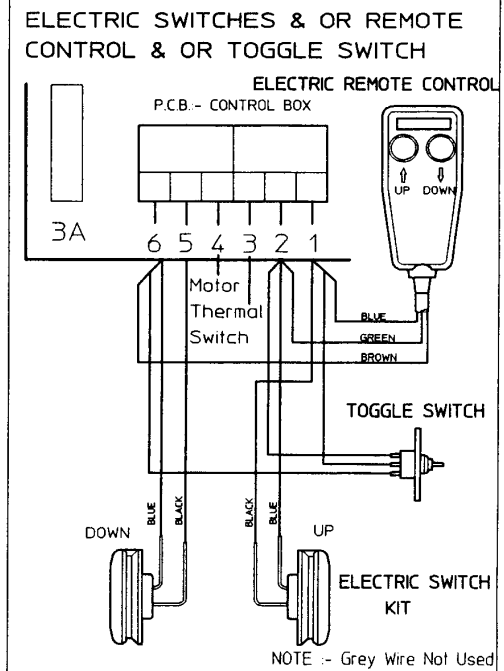
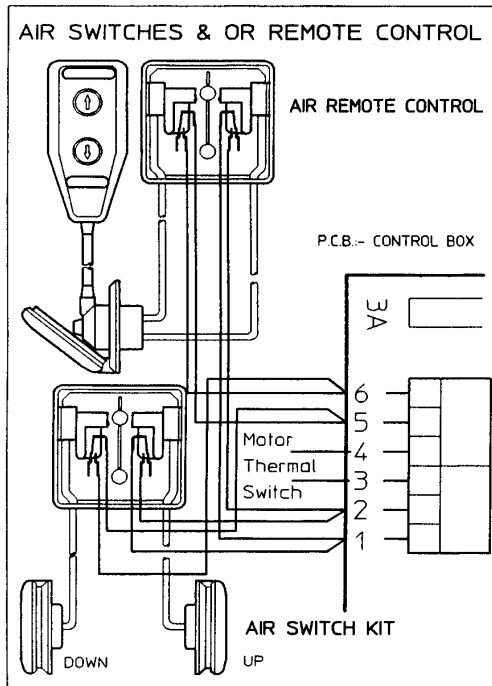
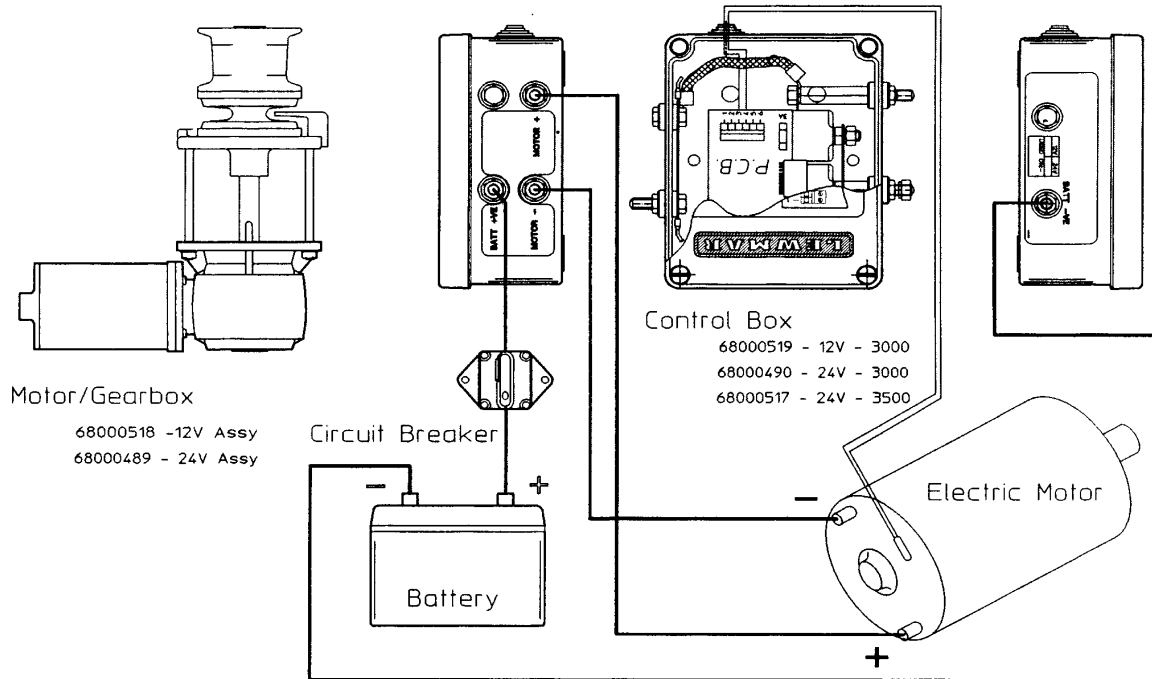
3500 ANCHOR WINDLASS



DESCRIPTION	QTY.	PART NO.
1 Cleat Nut	1	65000007
2 Collet ring	1	65000052
3 Collet washer	1	65000019
4 M6 X 10 Screw	4	80748
5 Spring	1	15300019
6 Drum	1	65000006
7 Stripper	1	*****
8 M8 X 100 Screw	1	80537
9 Gypsy	1	*****
10 Bearing	1	65000264
11 Washer	1	65000020
12 Shaft flange	1	15003573
13 Washer	1	15003715
14 Seal	1	87030
15 M6 X 20 Screw	1	80680
16 Support Pin	1	65000018
17 Base	1	65000010
18 Bearing	1	65000264
19 Washer	1	15003572
20 Circlip	1	82352
21 Driveshaft	1	65000009
22 Key	1	15003577
23 M8 X 70 Screw	2	80322
24 Pawl	1	65000016
25 Ball spring	1	81554
26 Pawl Boss	2	65000017
27 Fixed pin	1	65000013
28 Adjusting screw	1	65000014
29 Spiral pin	1	81541
30 M12 washer	1	80537
31 Cover	1	65000015
32 Spacer	2	65000309
33 Band brake	1	65000011
34 Swivel pin	1	65000012

LEWMAR 3000-3500 ANCHOR WINDLASS

12 - 24V DUAL DIRECTION CONTACTOR BOX WITH OVERLOAD PROTECTION



3000-3500 AW

DRN AMCC
DATE 210294

DRG No
WSD0217

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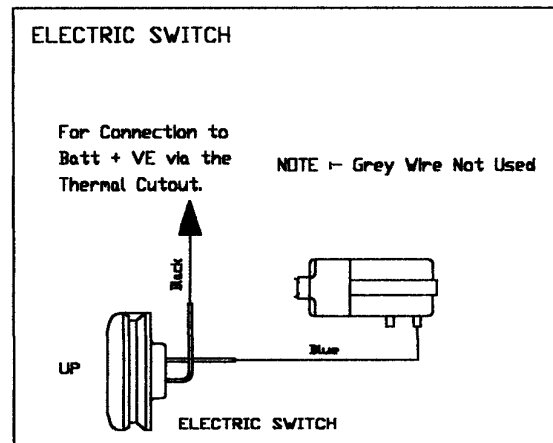
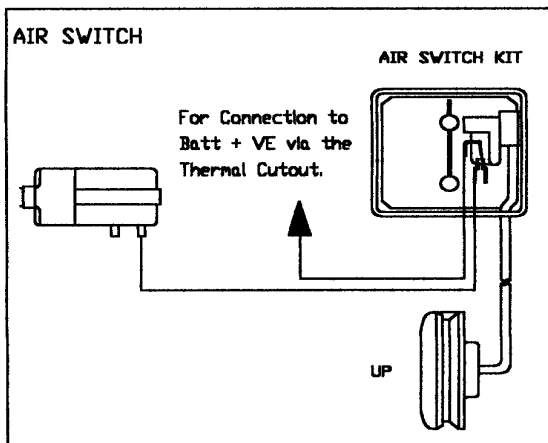
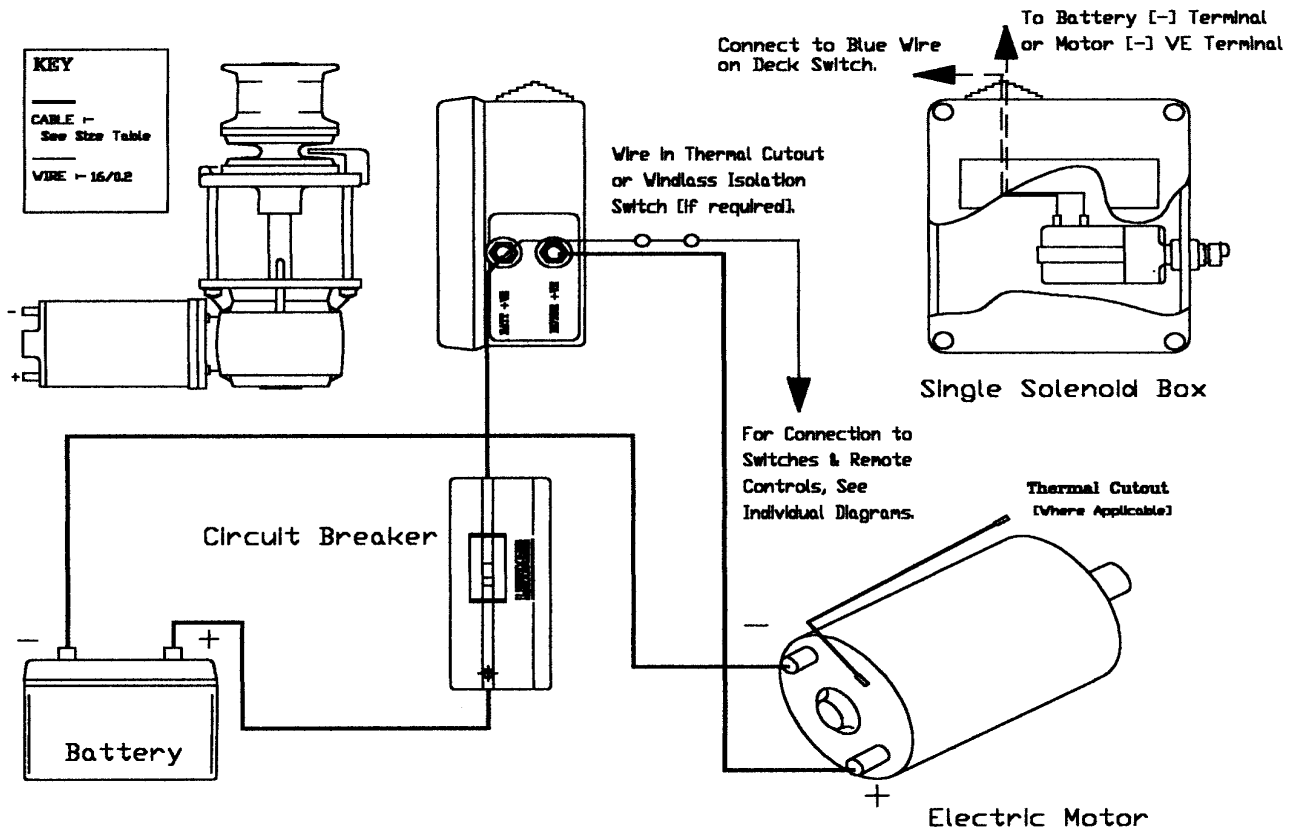
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SHEET 1 OF 1

REVISION	DATE / ISSUE	FIG. No.
A	12.05.00	072

LEWMAR 3000-3500 ANCHOR WINDLASS

12V & 24V SINGLE DIRECTION SOLENOID BOX WITHOUT OVERLOAD PROTECTION



WIRING

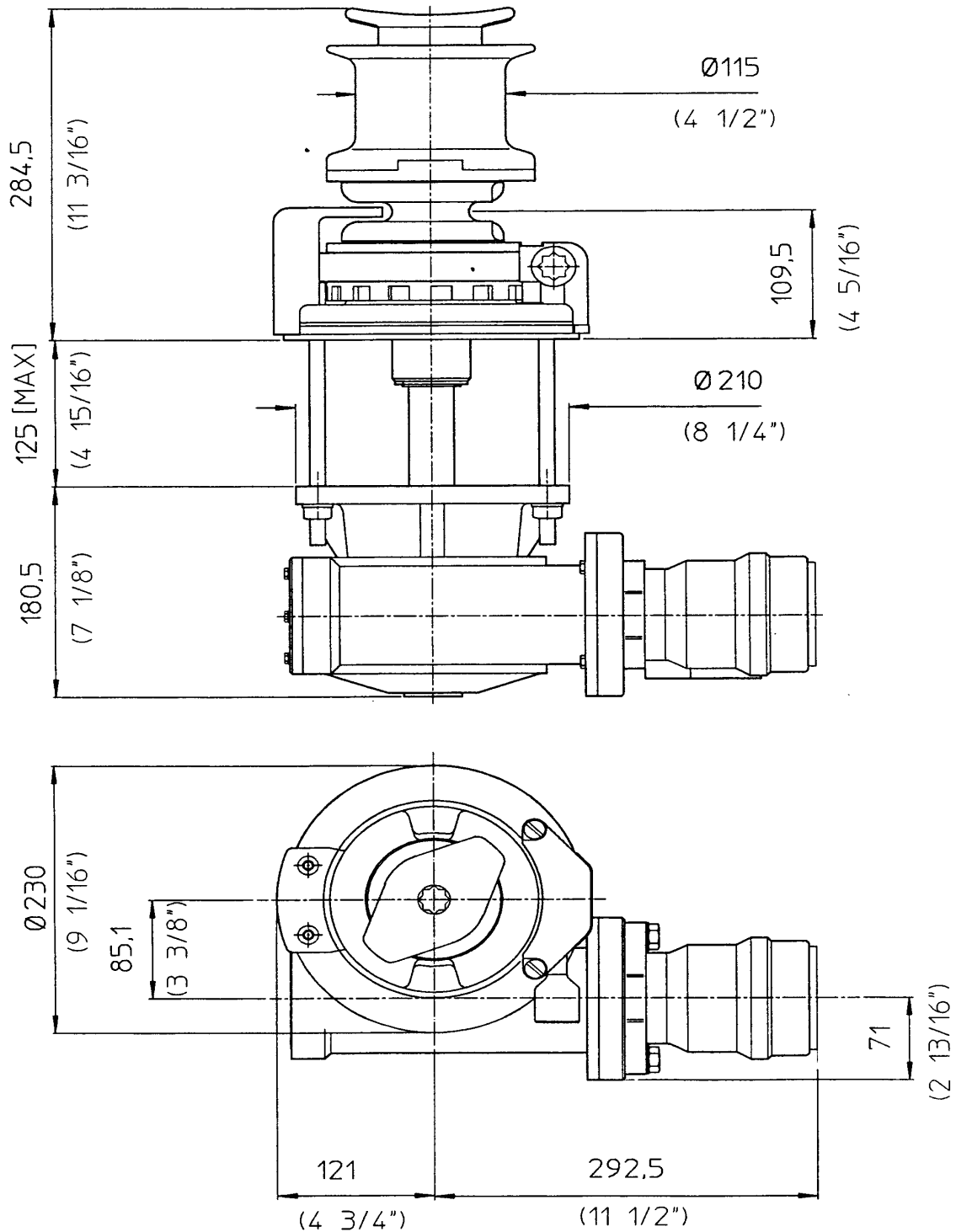
DRN GFS
DATE 12.05.00

FIG. No.
58400454

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SHEET 3 OF 3

ISSUE	DATE / NAME	MOD No
A	08.03.94 A.M.C.C.	N/A



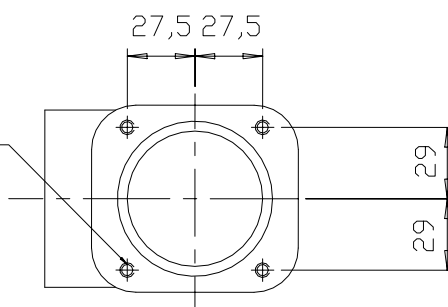
3500AW HYD DIMS

DRN A.M.C.C.
DATE 08.03.94

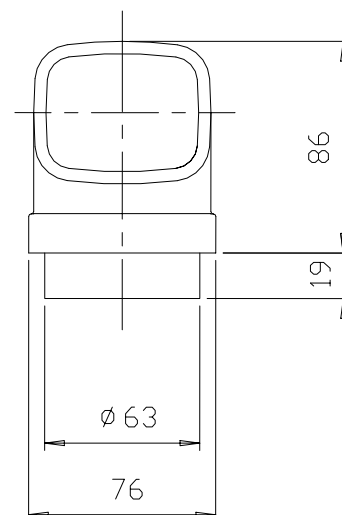
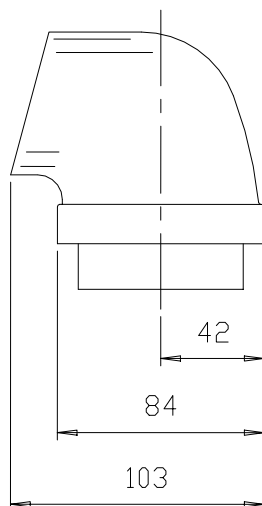
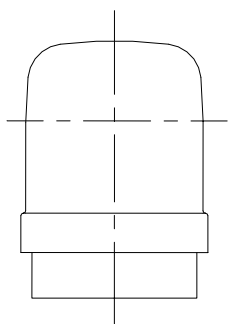
DRG. No
WSD0305

LEWMAR

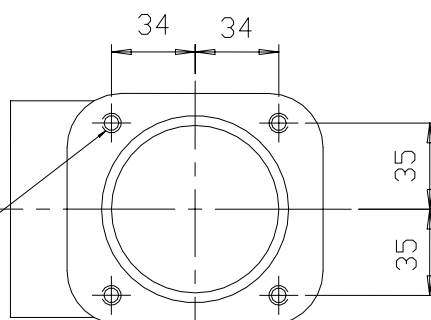
4 HOLES: M6 X 1.0-6H
X 12 DEEP FULL THREAD



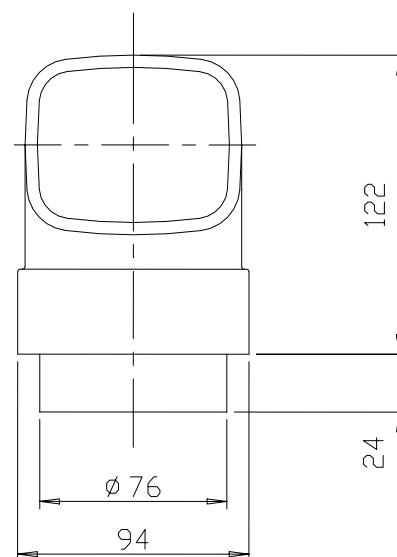
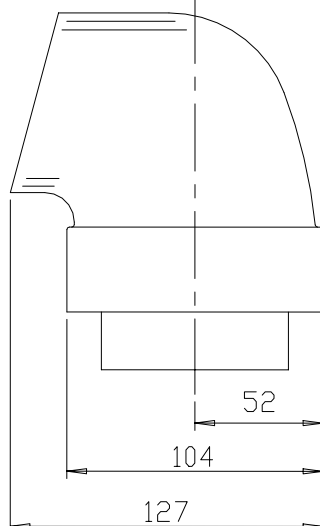
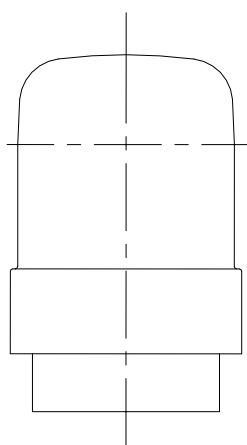
8-13mm REMOTE CHAINPIPE
680000024



4 HOLES: M8 X 1.25-6H
X 14 DEEP FULL THREAD



14-16mm REMOTE CHAINPIPE
680000037 — CH
680000314 — BR



ISSUE	DATE / NAME	MOD No.
C	05.09.96 R.H.	6240

WINDLASS MODEL	3500 ANCHOR WINDLASS				4000/5000 ANCHOR WINDLASS			WINDLASS MODEL
GYPSY IDENT. NO	351	352	353	354	401	402	403	GYPSY IDENT. NO
GYPSY KIT NO.	68000574	68000575	68000576	68000577	68000099	68000173	68000174	GYPSY KIT NO.
GYPSY KIT - CONCEPT [ARM] - FEB.96								
GYPSY KIT, OCEAN - FEB.96								
1/4" BRADNEY GRADE 40								1/4" BRADNEY GRADE 40
1/4" ACCO GRADE 40								1/4" ACCO GRADE 40
8mm GUNNEBO								8mm GUNNEBO
8mm SWEDISH								8mm SWEDISH
8mm FRENCH/ITALIAN								8mm FRENCH/ITALIAN
8mm BRADNEY								8mm BRADNEY
8mm DIN766								8mm DIN766
5/16" ACCO GRADE 40								5/16" ACCO GRADE 40
5/16" ACCO BBB								5/16" ACCO BBB
5/16" MARLOW								5/16" MARLOW
5/16" CAMPBELL SYS.3								5/16" CAMPBELL SYS.3
5/16" CAMPBELL SYS.4								5/16" CAMPBELL SYS.4
9,2mm GUNNEBO								9,2mm GUNNEBO
10mm DIN766	✱							10mm DIN766
10mm HACKET								10mm HACKET
10mm FRENCH/ITALIAN	✱							10mm FRENCH/ITALIAN
10mm ISO 4565	✱							10mm ISO 4565
10mm AP LIFTING GEAR	✱							10mm AP LIFTING GEAR
10mm RKH DIN766	✱							10mm RKH DIN766
10mm BRADNEY GRADE T	✱							10mm BRADNEY GRADE T
3/8" ACCO GRADE 80	✱							3/8" ACCO GRADE 80
3/8" ACCO GRADE 40	✱							3/8" ACCO GRADE 40
3/8" ACCO BBB	✱							3/8" ACCO BBB
3/8" CAMPBELL SYS.3	✱							3/8" CAMPBELL SYS.3
3/8" CAMPBELL SYS.4	✱							3/8" CAMPBELL SYS.4
3/8" MARLOW	✱							3/8" MARLOW
3/8" BRADNEY GRADE 30	✱							3/8" BRADNEY GRADE 30
3/8" BRADNEY GRADE 40	✱							3/8" BRADNEY GRADE 40
11mm DIN766	✱							11mm DIN766
12mm DIN766		✱			✱			12mm DIN766
12mm FRENCH/ITALIAN		✱			✱			12mm FRENCH/ITALIAN
12mm DUTCH/ITALIAN		✱			✱			12mm DUTCH/ITALIAN
12mm ISO 4565		✱			✱			12mm ISO 4565
12mm LEWMAR CHAIN		✱			✱			12mm LEWMAR CHAIN
13mm DIN766		✱			✱			13mm DIN766
13mm BRADNEY GRADE T			✱		✱			13mm BRADNEY GRADE T
13mm RKH DIN766		✱			✱			13mm RKH DIN766
7/16" ACCO GRADE 40		✱			✱			7/16" ACCO GRADE 40
7/16" BRADNEY 30		✱			✱			7/16" BRADNEY 30
7/16" CAMPBELL SYS.4		✱			✱			7/16" CAMPBELL SYS.4
1/2" BRADNEY GRADE 30			✱		✱			1/2" BRADNEY GRADE 30
1/2" BRADNEY GRADE 40			✱		✱			1/2" BRADNEY GRADE 40
1/2" CAMPBELL SYS.3			✱		✱			1/2" CAMPBELL SYS.3
1/2" CAMPBELL SYS.4		✱			✱			1/2" CAMPBELL SYS.4
1/2" ACCO GRADE 40			✱			✱		1/2" ACCO GRADE 40
1/2" ACCO BBB		✱			✱			1/2" ACCO BBB
1/2" ACCO GRADE 80			✱			✱		1/2" ACCO GRADE 80
14mm ISO 4565				✱		✱		14mm ISO 4565
14mm MULTIFAST				✱		✱		14mm MULTIFAST
14mm BRADNEY SHORTLINK				✱		✱		14mm BRADNEY SHORTLINK
14mm DIN766			✱		✱			14mm DIN766
9/16" ACCO BBB				✱		✱		9/16" ACCO BBB
5/8" ACCO GRADE 40						✱		5/8" ACCO GRADE 40
CIM 16mm							✱	CIM 16mm

WINDLASS CHAIN CHART

NOTE

1. GYPSY KIT ✱ - CONCEPT ONLY - PRIOR TO FEB. 96

DRN

A.MCC.

DRG. No

WSD0670

DATE

08.02.96

LEWMAR

LEWMAR LIMITED WARRANTY

Lewmar warrants its products in normal usage to be free of defects in materials and workmanship for a period of three years from date of purchase by the original purchaser, subject to the conditions, limitations and exceptions listed below. Any part, 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 repair or replacement of the goods or parts defective in materials or workmanship.
- ii Determination of the suitability of the material for the use contemplated by the buyer is the sole responsibility of the buyer and Lewmar shall have no responsibility in connection with such suitability.
- iii Lewmar shall not be liable in any way for:
 - a Failures, loss or damage due to use of products in applications for which they are not intended.
 - b Failures, loss or damage due to corrosion, ultra violet degradation, wear and tear or improper installation.
 - c Failures, loss or damage due to incorrect maintenance.
 - d Failures, loss or damage due to conditions that exceed the product's performance specifications.
- iv Product subject to warranty claim must be returned to Lewmar for examination unless otherwise agreed by Lewmar in writing.
- v Lewmar shall not be responsible for shipping charges nor installation labour associated with any warranty claim.
- vi Service by anyone other than authorised 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 for marine purposes. Buyers intending to use them for any other purpose should seek advice from Lewmar, and Lewmar shall be under no liability arising from use, which Lewmar has not approved.

B EXCEPTIONS

Warranty is limited to a period of one year from the date of purchase in the case of the following:

- Bow thrusters
- Electric motors and electrical equipment
- Electronic controls
- Hydraulic pumps, valves and actuators
- Weather seals
- Products used in "Grand Prix" racing applications

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 indirect or consequential loss including (without limitation) any loss of anticipated profits, damage to reputation or goodwill, loss of expected future business, damages, costs or expenses payable to any third party or any other indirect losses.
 - Any damage to yachts or equipment.
 - Death or personal Injury (unless caused by Lewmar's negligence).
 - b Lewmar grants no warranties regarding the fitness for purpose, use, nature or satisfactory quality of the goods.
- ii Where the laws of the country do not permit a warranty to be excluded, then such warranty, if permitted by that country's law, shall be limited to a period of one year.

LEWMAR CONTACT DETAILS

LEWMAR SALES OFFICES

Lewmar UK/Rest of World

Lewmar Ltd, Southmoor Lane, Havant, Hampshire PO9 1JJ. UK

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Tel (+1) 203 458 6200 Fax (+1) 203 453 5669

e-mail info@usa.lewmar.com

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