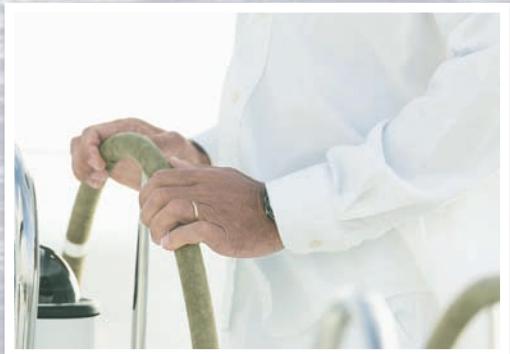


MARINE EQUIPMENT GUIDE | 08 | 09



LEWMAR®

Lewmar Steering

Lewmar steering systems are designed for style and convenience. Each wheel, system and accessory was created to help improve the time you spend out on the water and make boating an easier, more enjoyable experience.

Steering you in the right direction.

Lewmar's steering systems and products have been world leaders for over 40 years, constantly evolving to meet the performance and aesthetic needs of both cruisers and elite racers.

Each product is thoroughly tested in the most adverse conditions possible and then finished with care to suit every type of yacht.



Wheel Selection Guide

	66 cm in	81 cm in	97 cm in	112 cm in	127 cm in	142 cm in	157 cm in	173 cm in	188 cm in
Folding Wheel									
Commodore™ Flat									
Commodore™ Dished									
Mini Maxi™									
Carbon									
Fastnet									

Multi-Tooth Wheel Disengagement Units

This is a quick, safe and efficient way to disengage the steering wheel while still allowing the system to operate. This is particularly useful when using a dual-wheel system or operating the steering by Autopilot. The unit incorporates precision multi-tooth gears to ensure zero backlash or play.



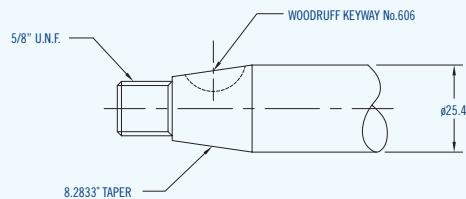
Note: This product cannot be retrofitted to an existing wheel and must be requested when ordering a new wheel. This multi-tooth disengagement unit can be added to any style of newly built Lewmar wheel. For prices and part numbers of wheels incorporating this product please speak to a Lewmar representative or your local distributor.

The Lewmar Steering Wheel Shaft

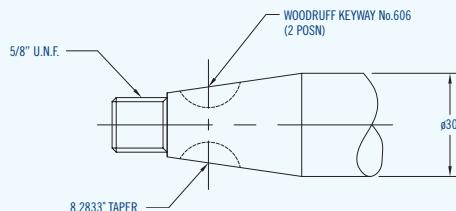
All Lewmar wheels listed in this catalogue have the 25mm/1" taper shaft. Angle of taper ensures the wheel is easily removable. Larger wheels (1.6m and up) can also be supplied with the 30mm/1 3/16" taper shaft. The folding wheel dual-hub also fits a 25mm/1" parallel shaft.

Lewmar uses the industry standard 25mm/1" tapered and keyed shaft to ensure positive fit of the steering wheel. The 30mm/1 3/16" taper shaft is only used in custom super yacht systems.

25mm taper shaft



30mm taper shaft



Brake Spinner

A brake spinner is used to lock the wheel and rudder when in port or at anchor. Lewmar uses a powerful and progressive through shaft friction brake. It is specific to the type of wheel used. For more information and part numbers, refer to the wheel section on pages 184 to 187.

Cockpit living is easy with the space-saving Lewmar Folding Wheel.

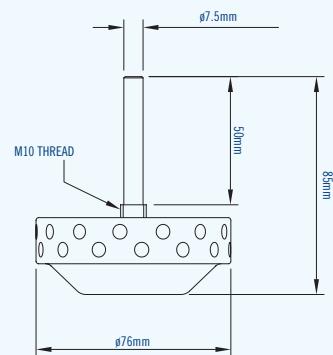
Lewmar's innovative and patented Folding Wheel is now available at your local retailer. Its unique, fast-action folding system is a concept in space-saving technology. Conventional wheels significantly restrict your cockpit space, but the Lewmar Folding Wheel breaks down that barrier. Ideal for a wide range of yachts, including those with twin-wheeled layout. The Folding Wheel has a two-turn, buttress-threaded, split-spoke design, and a unique hinging system with fast-action handgrip release. This allows you to easily fold and unfold the wheel, using a simple twist of the composite handgrip. At a fraction of the cost of custom versions, the Folding Wheel is appealing to both production boat builders and owners looking to improve their deck layouts.





6-spoke Folding Wheel with Hide Cover

Part No.	Description	Size		Fit Shaft
		cm	in	
89700375	Folding Wheel 6-spoke Hide Cover	81	32	1" taper
89700376	Folding Wheel 6-spoke Hide Cover	91	36	1" taper
89700377	Folding Wheel 6-spoke Hide Cover	102	40	1" taper
89700520	Folding Wheel 6-spoke Hide Cover	107	42	1" taper
89700406	Folding Wheel 6-spoke Hide Cover Dual Hub	81	32	1" taper & 1" parallel
89700407	Folding Wheel 6-spoke Hide Cover Dual Hub	91	36	1" taper & 1" parallel
89700408	Folding Wheel 6-spoke Hide Cover Dual Hub	102	40	1" taper & 1" parallel
89700521	Folding Wheel 6-spoke Hide Cover Dual Hub	107	42	1" taper & 1" parallel



8910 0143
Brake Spinner

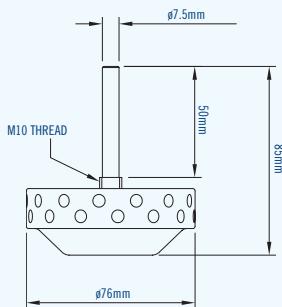
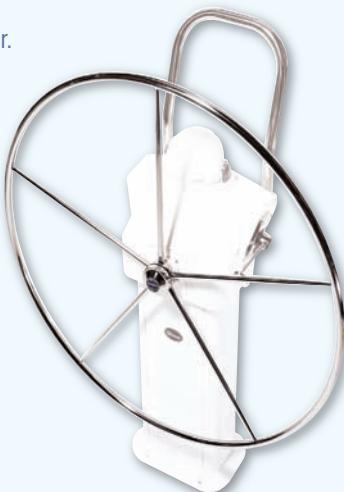
The Commodore™ Wheel

Durable and elegantly styled, the Commodore™ is a standard choice for yachtsmen the world over.

Choose from sizes ranging in diameter from 66cm (26") to 122cm (48").

Part No.	With	With Hide	Description	Size	
	Hide Cover	Cover & Spats		cm	in
89700253	89700264	89700275	5-spoke flat	66	26
89700254	89700265	89700276	5-spoke flat	71	28
89700255	89700266	89700277	5-spoke flat	76	30
89700256	89700267	89700278	5-spoke flat	81	32
89700257	89700268	89700279	5-spoke flat	91	36
89700286	89700297	89700308	5-spoke dished	66	26
89700287	89700298	89700309	5-spoke dished	71	28
89700288	89700299	89700310	5-spoke dished	76	30
89700289	89700300	89700311	5-spoke dished	81	32
89700290	89700301	89700312	5-spoke dished	91	36
89700291	89700302	89700313	5-spoke dished	102	40
89700011	89700024	89700037	8-spoke flat	107	42
89700431	89700432	89700646	8-spoke flat	112	44
89700012	89700025	89700038	8-spoke flat	122	48
89700050	89700063	89700076	8-spoke dished	107	42
89700051	89700064	89700077	8-spoke dished	122	48

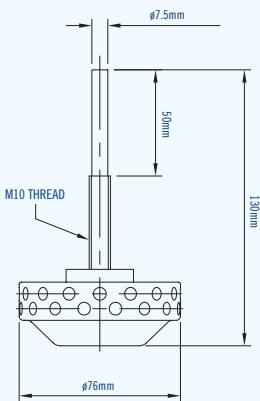
Note: Contact Lewmar for smaller wheel sizes if required.



89100143
Brake Spinner

The Mini Maxi™ Wheel

The Mini Maxi™ wheel is designed for use where a larger wheel is required or for exceptional rigidity. The Mini Maxi™ wheel is available up to 1.5m/60" in diameter.



89100144
Brake Spinner

Part No.	With	With Hide	Description	Size	
	Hide Cover	Cover & Spats		cm	in
89700078	89700085	89700092	Mini Maxi™ 10-spoke	91	36
89700079	89700086	89700093	Mini Maxi™ 10-spoke	102	40
89700080	89700087	89700094	Mini Maxi™ 10-spoke	107	42
89700081	89700088	89700095	Mini Maxi™ 10-spoke	122	48
89700082	89700089	89700096	Mini Maxi™ 10-spoke	132	52
89700083	89700090	89700097	Mini Maxi™ 10-spoke	137	54
89700084	89700091	89700098	Mini Maxi™ 10-spoke	152	60

Carbon Wheel

The Y-Spoke carbon wheel combines the ultimate in weight saving with sleek and slender styling. Ideal for Grand Prix Race Yachts or as a solution to increasing demand for race technology on cruising yachts. These wheels are built and supplied to order in a variety of sizes ranging from under 1m/39" to 1.8m/71".

Part No.	Description	Size		Weight	
		m	in	kg	lb
89700411	Carbon Y-Spoke/painted finish	0.9	36	1.9	4.2
89700412	Carbon Y-Spoke/painted finish	1	39	2	4.4
89700410	Carbon Y-Spoke/painted finish	1.1	43	2.1	4.6
89700413	Carbon Y-Spoke/painted finish	1.2	47	2.2	4.8
89700414	Carbon Y-Spoke/painted finish	1.3	51	2.5	5.5
89700415	Carbon Y-Spoke/painted finish	1.4	55	2.8	6
89700383	Carbon Y-Spoke/painted finish	1.5	59	3	6.6
89700416	Carbon Y-Spoke/painted finish	1.6	62	3.1	7
89700451	Carbon Y-Spoke/painted finish	1.7	67	3.3	7.3
89700417	Carbon Y-Spoke/painted finish	1.8	71	3.5	7.7



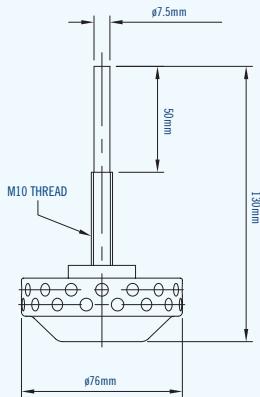
Will fit **89800108**
Carbon wheel st/st brake spinner
or
89800098 Carbon look brake spinner



Fastnet Wheel

The Fastnet wheel is made from Alloy 6082 and is lightweight and stylish. These wheels are built to order and supplied powder coat painted black with black leather to the wheel rim as standard. We can offer white painted wheels and alternative leather color options to cover the wheel rims upon request. The Fastnet wheel range starts at 122cm/48" with incremental sizes up to 175cm/69".

Part No.	Description	Size	
		cm	in
89700601	Fastnet Alloy Hide Fitted, Black paint and black leather	122	48
89700602	Fastnet Alloy Hide Fitted, Black paint and black leather	127	50
89700603	Fastnet Alloy Hide Fitted, Black paint and black leather	132	52
89700604	Fastnet Alloy Hide Fitted, Black paint and black leather	137	54
89700605	Fastnet Alloy Hide Fitted, Black paint and black leather	140	55
89700571	Fastnet Alloy Hide Fitted, Black paint and black leather	147	58
89700591	Fastnet Alloy Hide Fitted, Black paint and black leather	150	59
89700581	Fastnet Alloy Hide Fitted, Black paint and black leather	160	63
89700607	Fastnet Alloy Hide Fitted, Black paint and black leather	175	69



89100144
Brake Spinner

Wheel Accessories (continued)

Quick Release Bi-square Wheel Nuts

The quick release wheel nut – with a standard winch handle bi-square. As you always have a winch handle on hand, this is a quick and simple way to remove your wheel. The quick release wheel nut is available in 316 grade stainless steel, to mirror polish finish.



Part Number	Wheel Type
89700161	Commodore™ Wheel / Folding Wheel
89700162	Mini Maxi™/Carbon/Fastnet



Rail Mount Wheel Holder

The Rail Mount wheel holder can be used on most boat rails to store the wheel when not in use, thus providing a clear area in the cockpit.

- Manufactured in 316 investment cast Stainless Steel
- Designed to suit 25mm/1" taper or parallel steering wheel shaft
- Will fit 25.4mm/1", 28.6mm/1¹/₈" & 32mm/1¹/₄" diameter rails



89400327
Rail Mount
Wheel Holder

Luxury Hide Covers

Hide covers add a touch of luxury to a stainless steel or aluminum wheel and increase the comfort and pleasure of helming. Hide covers can either be supplied fitted to the wheel or as an easy-to-fit kit for new wheels or to replace old covers. The following table shows kits for the Commodore wheels.

Lewmar can also provide hide cover kits for Mini Maxi wheels.

Luxury Hide Cover Kits

Commodore Wheels

Part No.	Hide Cover Kit	Size	
89700344	Hide Cover 5-spoke	66	26
89700345	Hide Cover 5-spoke	76	30
89700346	Hide Cover 5-spoke	81	32
89700347	Hide Cover 5-spoke	91	36
89700348	Hide Cover 5-spoke	101	40
89700125	Hide Cover 8-spoke	106	42
89700126	Hide Cover 8-spoke	122	48
89700354	Hide Cover & Spats 5-spoke	66	26
89700355	Hide Cover & Spats 5-spoke	76	30
89700356	Hide Cover & Spats 5-spoke	81	32
89700357	Hide Cover & Spats 5-spoke	91	36
89700358	Hide Cover & Spats 5-spoke	101	40
89700137	Hide Cover & Spats 8-spoke	106	42
89700138	Hide Cover & Spats 8-spoke	122	48



Note: Above leather kits are supplied in Tan leather; other colors are available upon request. Please speak to your local distributor for further details, part numbers and pricing.

Lewmar also offers leather cover kits to suit Mini Maxi and Fastnet wheels upon request as well as a re-covering service for existing older wheels.

Pedestal Selection Guide

Specification Guidelines

Pedestals	Aft Cockpit					Center Cockpit		Tiller-Wheel Conversions	
	For Boats Up to 60ft Constellation™ (Open Wire)	For Boats Up to 60ft Cobra™ Cruising	For Boats Up to 60ft Cobra™ Ocean	For Boats Up to 60ft Cobra™ Racing	For Boats Up to 200ft Mamba™	For Boats Up to 80ft Constellation™ (Conduit)	For Boats Up to 80ft Mamba™	Constellation™ (Open Wire)	Cobra™ Cruising
Enguard	•	•		•	•	•	•	•	•
Integra	•	•		•	•	•	•	•	•
Reliant	•	•			•	•	•	•	•
Royale	•	•	•		•	•	•		
Maximum Wheel Size	2m/78"	1.2m/48"	1.2m/48"	2m/78"	2m/78"	2m/78"	2m/78"	2m/78"	1.2m/48"

- Lewmar pedestals are manufactured from modern composites, which guard against electrolytic action and the corrosive nature of salt water.
- All standard Lewmar pedestals measure 710mm/28" from the base to center of steering shaft. Custom pedestal heights are available upon request.
- All Lewmar pedestals (except the Athena range) are available in Constellation, Cobra and Mamba steering systems.
- Guardrails are not included (except Athena and Ranger models). For guardrail options refer to p.194-195.
- Lewmar offers a comprehensive range of pedestal accessories and options from guardrails and engine control to compasses, cockpit tables and instrument pods.

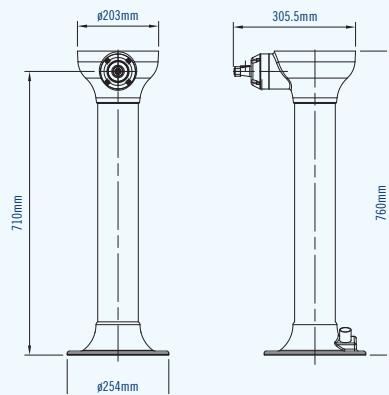


Enguard Pedestal

The Enguard pedestal incorporates an integral guardrail pedestal base, which minimizes the footprint area the pedestal takes up on the deck.

The Enguard pedestal can be found fitted to many production boats around the world such as Hunter, Hanse and Northshore.

Enguard Pedestal Dimensions



Features

- Integrated guardrail base providing compact and rapid installation
- Wide range of accessories available

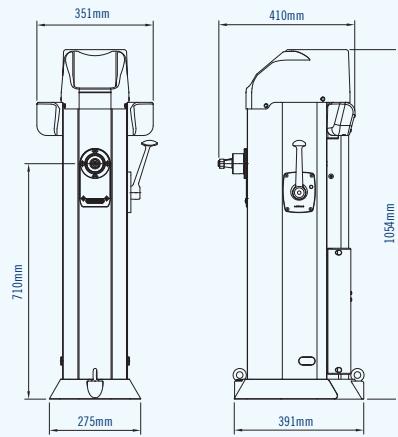


A typical installation with accessories

Integra Pedestal

The Integra pedestal is the latest in Lewmar's range of integrated pedestal steering systems. The Integra offers quick and easy above-deck access to fit Lewmar's patented autopilot drive motor. The Integra pedestal can be found fitted to many production boats around the world such as Hunter, Delphia, Northshore and Linjett.

Integra Pedestal Dimensions



Part No Description

89900302	Constellation Integra - Sprocket: 5/8P 11T
89900303	Constellation Integra - Sprocket: 5/8P 13T
89900305	Constellation Integra - Sprocket: 3/4P 11T
89900299	Cobra Cruising Integra
89900300	Cobra Racing Integra
89900306	Mamba Integra BH10

Features

- Compass mounting platform and integrated housing
- Ability to mount one single instrument to the uPVC top molding
- Pre-installed single lever engine control
- All Integra Cobra pedestals enable you to install an integrated autopilot drive
- Removable access door for quick and simple autopilot installation
- Harness bolts supplied as standard on the forward and aft sides of the pedestal deck flange
- Pedestal pre-drilled for cockpit table mounting
- Pedestal stop ring included

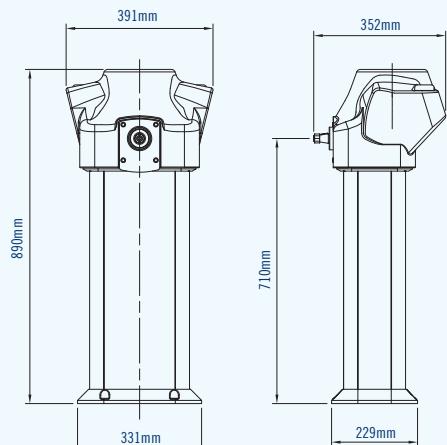


A typical installation with accessories

Reliant Pedestal

The Reliant pedestal is the first step in the 'Console' range of Lewmar pedestals. The Reliant utilizes the 'Premier Tube' platform, shared with the Royale and Ranger Pedestals. The Reliant pedestal can be found fitted to many production boats around the world such as Oyster, and Moody.

Reliant Pedestal Dimensions



Features

- Mounting areas for a single engine control on port or starboard
- Wide range of accessories available

Part No Description

89900010	Constellation Reliant - Sprocket: 5/8P 11T
89900011	Constellation Reliant - Sprocket: 5/8P 13T
89900012	Constellation Reliant - Sprocket: 3/4P 11T
89900033	Cobra Cruising Reliant
89900043	Cobra Racing Reliant
89900050	Mamba Reliant BH10



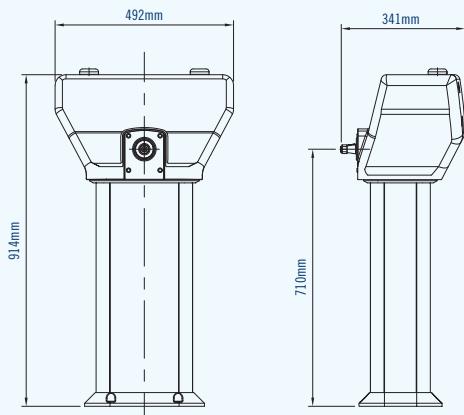
A typical installation with accessories

Royale Pedestal

The Royale is an evolution of the console style pedestal range.

The Royale head provides maximum flexibility for instrument mounting, and the Royale pedestal can be found fitted to many production boats around the world such as Harmony, Tartan and Najad.

Royale Pedestal Dimensions



A typical installation with accessories



Features

- Mounting areas for a single engine control on port or starboard
- Accepts 4 industry standard 110mm/4 1/4" yachting instruments
- Flush mount compass platform

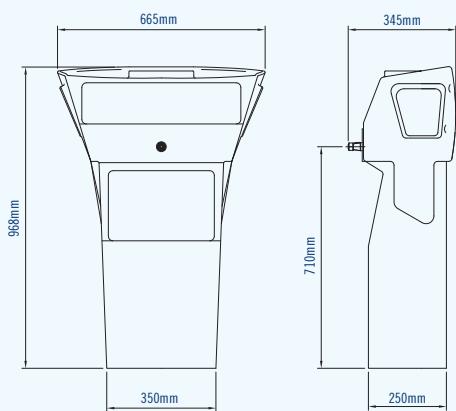
Part No Description

89900014	Constellation Royale - Sprocket: 5/8P 11T
89900015	Constellation Royale - Sprocket: 5/8P 13T
89900016	Constellation Royale - Sprocket: 3/4P 11T
89900034	Cobra Cruising Royale
89900037	Cobra Ocean Royale
89900052	Mamba Royale BH10

Athena Pedestal

The Athena has been designed for the larger yacht to provide a greater area for mounting instrumentation and controls. It can be found fitted to custom and production boats around the world such as Oyster.

Athena Pedestal Dimensions



A typical installation with accessories



Features

- Available in Constellation and Mamba steering systems
- Molded in glass fiber with reinforced stainless steel mounting plate and bearing supports
- Mounting areas for a single engine control on port or starboard
- Flush mount compass platform
- Large area for multiple control instruments
- Guardrail included

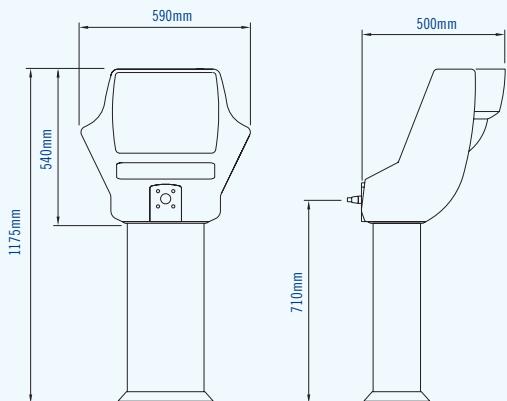
Part No Description

89900022	Constellation Athena - Sprocket: 5/8P 11T
89900023	Constellation Athena - Sprocket: 5/8P 13T
89900024	Constellation Athena - Sprocket: 3/4P 11T
89900056	Mamba Athena BH10
89900057	Mamba Athena BH130

Ranger Pedestal

Designed in response to the market demand for more pedestal-mounted instruments, including Radar and chart plotter.

Ranger Pedestal Dimensions



A typical installation with accessories

Features

- GRP head manufactured to the highest quality finish
- Designed to mount 3 industry standard instruments, plus radar or chart plotter
- Mounting areas for a single engine control on port or starboard
- Flush mount compass platform
- Guardrail included

Part No	Description
89900198	Constellation Ranger - Sprocket: 5/8P 11T
89900199	Constellation Ranger - Sprocket: 5/8P 13T
89900200	Constellation Ranger - Sprocket: 3/4P 13T
89900204	Cobra Cruising Ranger
89900202	Mamba Ranger BH130
89900203	Mamba Ranger BH11

Custom Pedestals

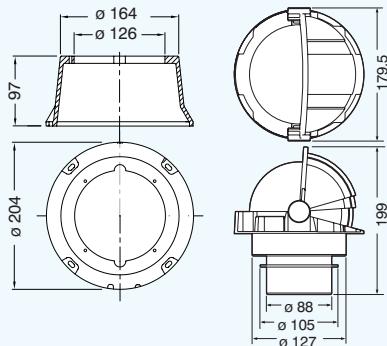
The Lewmar steering design team provides a unique service: they design and build pedestals for volume boat builders as well as one-off specials. If you have a specific design or need a specific pedestal solution, let our engineering team take care of your needs; we can provide a total package from the pedestal design to a delivered product ready to install.



Pedestal Accessories

Compasses

The Lewmar 135 Compass is a stylish, precision instrument to complement any cockpit. The high-quality compass is manufactured with precision components. The compass utilizes a real sapphire to ensure ultimate reliability and durability. The diaphragms, made of Viton®, are fully waterproof and absorb the fluid variations resulting from differing temperatures and air pressure. Every compass complies with rigorous vibration, temperature, stability and precision specifications.



Part No	Description
89400000	Flush mount 135 compass with hood
89400001	135 compass complete with binnacle housing
89400002	Compass binnacle housing

Features

- Apparent diameter of card: 130mm
- Flush mounting or pedestal mounting (with addition of a binnacle)
- Minimal flush mount depth
- Double lighting (12 or 24V mounting)
- Unique Lewmar binnacle
- Black card
- 5-year warranty



Engine Control Mechanism

Lewmar offers engine and gear controls to complement the steering pedestal of your choice. The engine control designed exclusively for Lewmar is non-magnetic and can be guardrail or pedestal mounted without interfering with the compass.

Part No	Description
89400109	Control Mech kit cranked handle and Fascia Plate
89400084	Engine control Housing to suit Morse SL3 Mechanism
89400133	Fascia Plate Control Mechanism
89400136	Handle Cranked Stainless Steel
89400118	Engine Control Housing to suit Volvo Mechanism
89400137	Mechanism Only (No Handle)
89400146	Fitting Kit for Control Mechanism
89400196	Control Mech Cranked Handle & Pod Assembly
89800013	Rubber button and plunger kit



89800013



Single Lever
Engine Control

Features

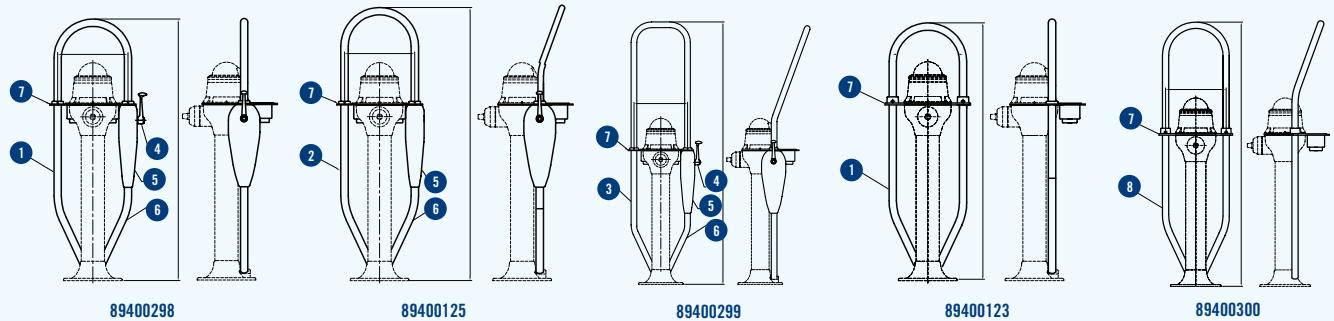
- Housed in pod
- Guardrail mounted
- Bulkhead mounted with fascia plate
- Exclusive design for Lewmar
- Non-magnetic
- 316 stainless steel cranked handle

Guardrails

Lewmar guardrails are designed to protect the compass and pedestal and to provide assistance while moving about in the cockpit. Our wide range of straight, kickback and extended guardrails is manufactured from a 32mm/1.25" 316 stainless steel tube. The extensive choice of guardrails is complemented by our instrument pod range; see pages 196-197.



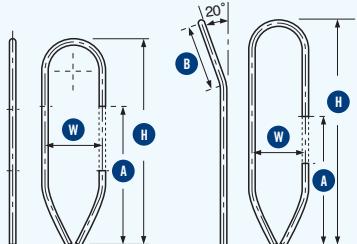
Enguard Guardrail Kits



① - ⑨ Individual parts 1-9 can be ordered separately

Enguard Guardrail Kits

Part Number	Description
89400298	Enguard Guardrail Kit – Straight Guardrail, Engine Pod, Control Mechanism (Stbd), Top Plate & Cup holder
89400125	Enguard Guardrail Kit – Guardrail with Kickback, Engine Pod, Top Plate & Cup holder
89400299	Enguard Guardrail Kit – Super Extended Guardrail with Kickback, Engine Pod, Control Mechanism (Stbd), Top Plate & Cup holder
89400123	Enguard Guardrail Kit – Full Straight Guardrail, Top Plate & Cup Holder.
89400300	Enguard Guardrail Kit – Full Guardrail with Kickback, Top Plate & Cup Holder.



Enguard Guardrail Spares

Key	Part Number	Description	H mm	H in	A mm	A in	W mm	W in	B mm	B in	20° kickback
①	89400031	Guardrail Straight - STBD	1097	43 3/16	740	29 1/8	305	12	-	-	
	89400032	Guardrail Straight - PORT									
②	89400033	Guardrail Kickback - STBD	1293	50 7/8	740	29 1/8	305	12	378	15	Yes
	89400034	Guardrail Kickback - PORT									
③	89400035	Guardrail Extended Kickback - STBD	1458	57 3/8	740	29 1/8	305	12			Yes
	89400036	Guardrail Extended Kickback - PORT									
④	89400109	Control Mechanism									
⑤	89400084	Engine Pod									
⑥	89400120	Drop Tube									
⑦	89400122	Top Plate & Cup Holder									
⑧	89400261	Full Guardrail - Straight	1097	43 3/16	-	-	305	12	-	-	
⑨	89400260	Full Guardrail - Kickback	1293	50 7/8	-	-	305	12	378	15	Yes

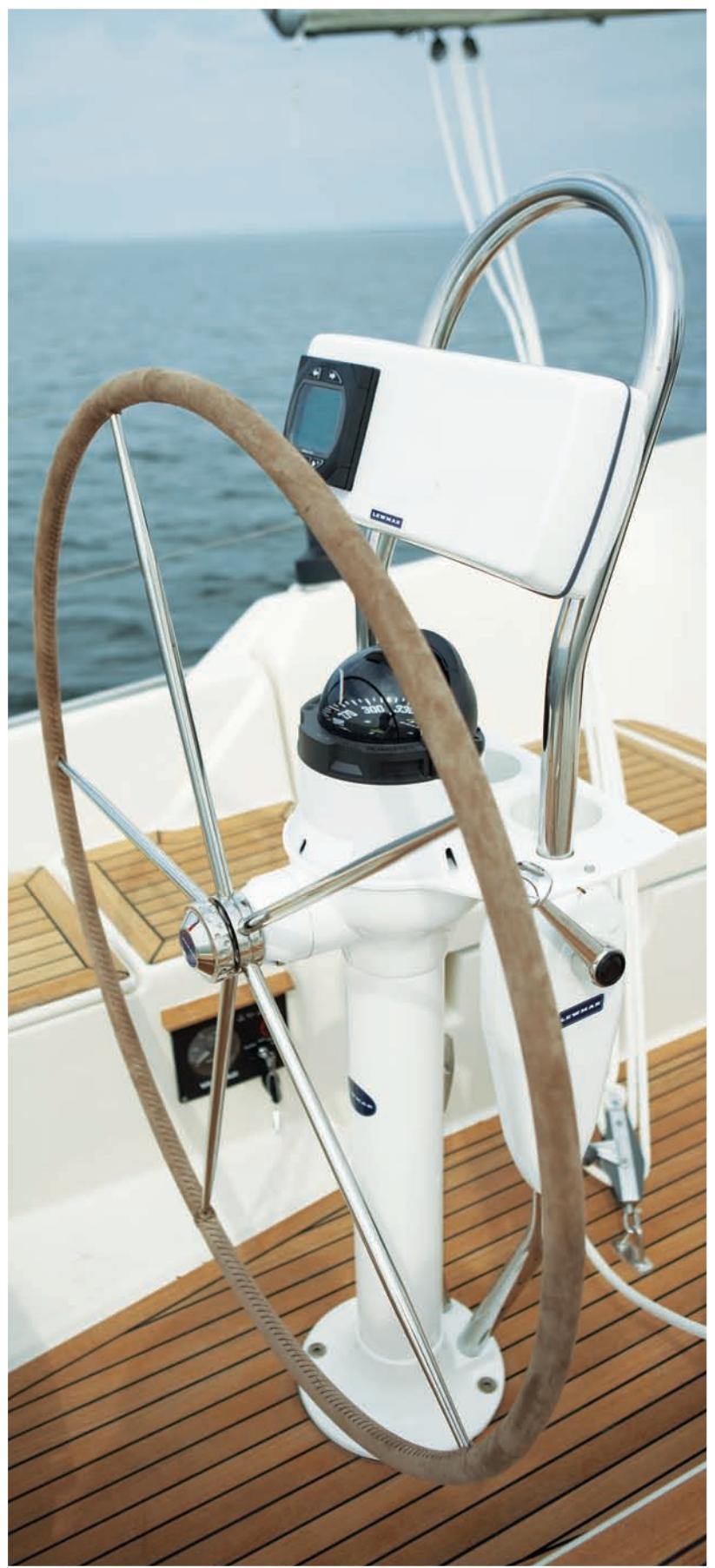
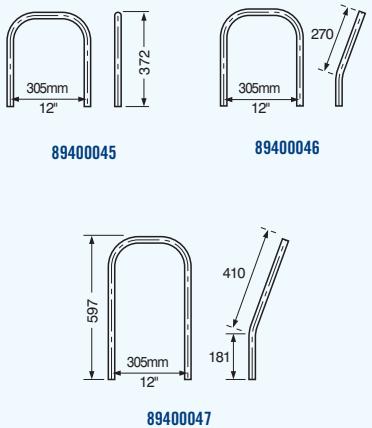
Reliant & Royale Guardrail Kits

Part Number Description

89400045 Std straight guardrail

89400046 Kickback rail

89400047 Extended kickback rail



Integra Guardrail Kits

Part Number Description

89400361 Std Integra guardrail

89400362 Extended Integra guardrail

89400363 Extended Integra guardrail

Instrument Pods

Display your instruments in an easily accessible and attractive Lewmar Instrument Pod. Our comprehensive range of pods is designed to complement Lewmar pedestals. The pods are available as either retrofit accessories or as a complete assembly, and can house most sizes of yachting instruments, radars and chartplotters. Each one comes with fitting instructions and fasteners for easy, drill-and-tap installation.

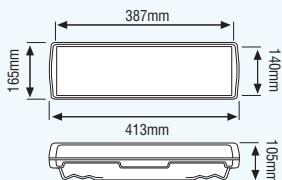
Extended Compact Pod

- Manufactured from thermoformed uPVC
- Available for the 304mm/12" center guardrail only
- Suitable for instruments 256mm/10" wide x 137mm/5" high x 75mm/3" deep

89400218 Extended Compact Pod to suit 304mm/12" Center rail



89400218
Extended Compact Pod



Single Pod

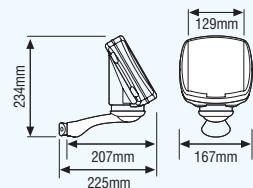
- Manufactured from thermoformed uPVC
- Allows for one single instrument
- Dashboard mount or pedestal guardrail mount with s/s pod arm
- Instrument pod will swivel through 180°
- Pod arm will fit 28.6mm/1 1/8" and 32mm/1 1/4" diameter guardrail tubes
- All wiring of products mounted to the pod arm/instrument housing are hidden internally

89400329 Pod Single with s/s Pod Arm

89400330 Pod Single Cockpit-Dashboard Mount



89400330
Single Pod



Tandem Vertical Pod

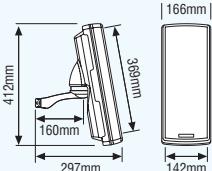
- Manufactured from thermoformed uPVC
- Allows for 2-3 single instruments
- Dashboard mount or pedestal guardrail mount with s/s pod arm
- Instrument pod will swivel through 180°
- Pod arm will fit 28.6mm/1 1/8" and 32mm/1 1/4" diameter guardrail tubes
- All wiring of products mounted to the pod arm/instrument housing is hidden internally

89400355 Pod Tandem Cockpit-Dashboard Mount

89400356 Pod Tandem Vertical Mount with Pod Arm



89400356
Tandem Vertical Pod



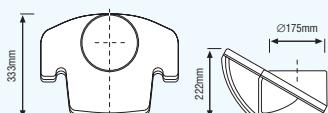
Classic Pod

- Fits directly to the Enguard and Classic style pedestals, via a special top plate
- Offers increased mounting space for instruments on the pedestal
- Available with kickback guardrail for the inclusion of additional instrument pod options

89400100 Classic Pod



89400100
Classic Pod



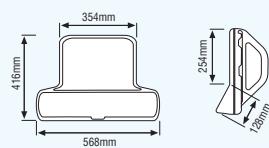
Radar Multipod

- Manufactured in thermoformed uPVC
- Allows for the installation of 1x radar or similar, plus 4 industry standard instrument displays
- Available for the 304mm/12" center guardrail only

89400274 Radar Multipod for 304mm/12" Guardrail



89400274



89400274
Radar Multipod

Radar Swivel Mount & Guardrail Pods

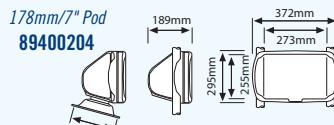
- Manufactured from thermoformed uPVC
- 178mm/7" Pod: Allows for 1x Radar with 7" screen color version
- 254mm/10" Pod: Allows for 1x Radar/Chart Plotter 10" screen color version
- Swivel base mount or guardrail mounting 304mm/12" centers

89400204 Radar Pod 178mm/7" c/w Swivel base

89400222 Radar Pod 178mm/7" for 304mm/12" Guardrail

89400205 Radar Pod 254mm/10" c/w Swivel base

89400223 Radar Pod 254mm/10" for 304mm/12" Guardrail



178mm/7" Pod
89400204

254mm/10" Pod
89400205

Radar Swivel Mount & Guardrail Pods



Large Radar Swivel Mount & Guardrail Pods

- Manufactured from thermoformed uPVC
- Swivel base mount or guardrail mounting 304mm/12" centers
- Suitable for Raymarine E 120

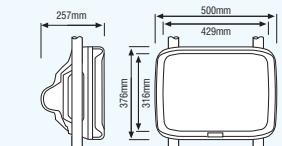
89400371 Large Radar Pod c/w Swivel base

89400372 Large Radar Pod for 304mm/12" Guardrail

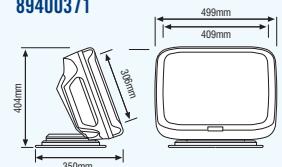


89400371
89400372

Large Radar Swivel Mount & Guardrail Pods



89400371



89400372

Multipod

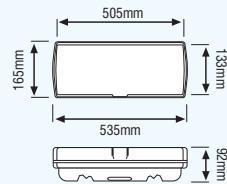
- Manufactured as a thermoformed uPVC molding
- Available for 304mm/12" and 241mm/9 ½" center guardrails
- Offers the ability to fit 4 x 110mm square industry standard instruments

89400200 Multipod for 241mm/9 ½" Guardrail

89400203 Multipod for 304mm/12" Guardrail



89400200 / 89400203
Multipod



LED Instrument Pod Cockpit Light

- Factory fitted to pod or optional accessory
- 10–33 Volt DC power required
- Waterproof sealing gasket provided

89400206 Lamp Pod 10–33 volt LED



89400206
LED Instrument Cockpit Light

Stainless Steel GPS/Mobile Phone Holder

- Manufactured from 316 investment cast stainless steel
- Pod arm will fit 1", 1 ¼" and 1 ½" diameter guardrail tubes
- All wiring of products mounted to the pod arm are hidden internally

89400328 Stainless Steel GPS/Mobile Phone Holder



89400328
Stainless Steel GPS/Mobile Phone Holder

Cockpit Living & Steering Accessories

Composite Table

Lewmar offers the Composite double-leaf folding table, manufactured from uPVC with a high strength composite core.

- Double-leaf fold out
- High-strength uPVC compact core
- Luxury finish



89400013

Measures 660mm/26" wide by 698mm/27 1/2" long when open.

Composite Tables

Double-Leaf DIY Ready

Part Number	Description
89400013	Table Composite double-leaf with mounting kit for Enguard pedestal
89400014	Table Composite double-leaf with mounting kit for Reliant pedestal
89400015	Table Composite double-leaf with mounting kit for Athena pedestal
89400024	Table Composite double-leaf with mounting kit for Royale pedestal
89400409	Table Composite double-leaf with mounting kit for Integra pedestal

Teak Tables

This three-leaf cockpit table in teak is available to suit all pedestal types and is supplied as standard with bracket, support and easy fitting instructions. When not in use, the table can be folded up against the forward edge of the pedestal.

- All Teak from sustainable forests
- Suits all pedestal types
- Quick-release hinge for simple storage
- Folds against pedestal



Measures 660mm/26" wide by 698mm/27 1/2" long when open.

Solid Teak Tables Double-Leaf with Fitting Kits

Part Number	Description
89400283	Table Kit for Classic Pedestal unvarnished
89400284	Table Kit for Enguard Pedestal unvarnished
89400285	Table Kit for Reliant/Athena Pedestal unvarnished
89400286	Table Kit for Royale Pedestal unvarnished
89400365	Table Kit for Integra Pedestal unvarnished

Fitting Kits only for Teak Tables

Part Number	Description
89400009	Classic pedestal DIY table fitting kit
89400117	Enguard pedestal DIY table fitting kit
89400011	Reliant pedestal DIY table fitting kit
89400192	Royale pedestal DIY table fitting kit
89400410	Integra pedestal DIY table fitting kit



Canvas Storage Bag

Canvas Storage Bag

Part Number	Description
89400291	Canvas Storage Bag for Tables

Mug Holders

Part Number	Description
89400003	Composite Mug Holder snap on



89400003
Composite Mug Holder - Snap On



Stainless Steel Cockpit Locker Latch

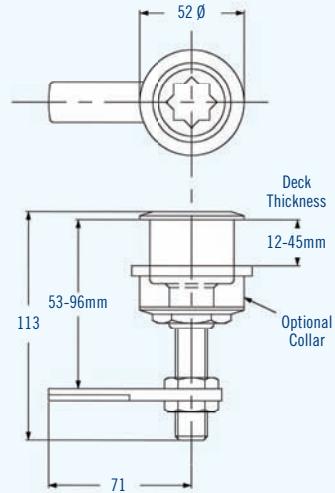
The Lewmar locker latch is a high-quality product designed for any boat. Easy operation via a winch handle.

Features

- 316 investment cast product
- Easy installation
- Watertight 'O' ring seal
- Easy operation via winch handle
- Adjustable deck thickness



89400061
Stainless Steel Cockpit Locker Latch

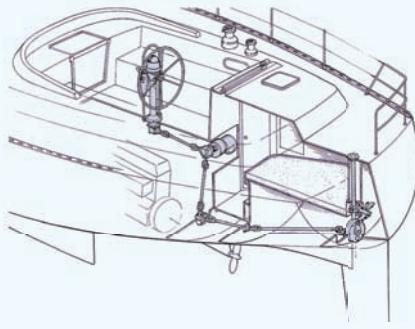
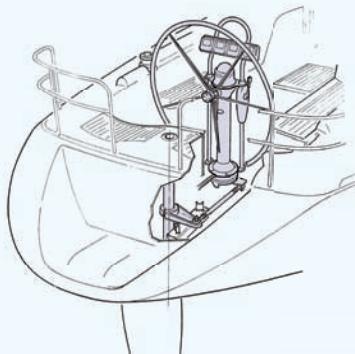
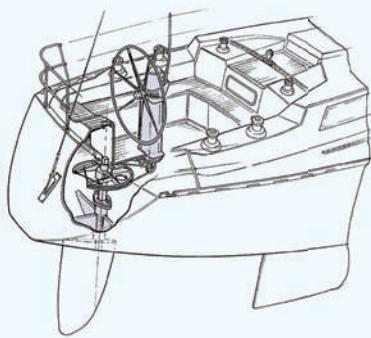


Steering Systems

Lewmar offers a comprehensive range of steering equipment based on 3 different mechanical concepts.

- **Constellation™** - Wire Steering
- **Cobra™** - Rack & Pinion
- **Mamba™** - Rotating Torque Tube & Bevelhead

This product portfolio offers today's boat builders a solution for any steering installation.



Constellation™ – Wire Steering

Wire steering systems are suitable for yachts from 7m/25' to Maxi's. This diversity has enabled us to develop the Constellation™ system with feedback from various types of boat builders. Wire systems are ideal for aft cockpit installations, either single or tandem. Wire-in conduit systems are also available for center cockpit installations. The conduit system overcomes the difficulties that are experienced when using open wire in center cockpit installations.

Cobra™ – Rack & Pinion

Cobra™ uses rack and pinion in the head of the pedestal to provide the necessary mechanical advantage required for sensitive steering. Cobra™ has been designed for use in aft cockpit sailboats and is a world leader in its field. Lewmar also offers customized Cobra™ systems for use in non-aft cockpit applications.

Mamba™ – Rotating Torque Tube & Bevelhead

The ultimate steering system providing feedback and strength: both features that are unique to gear box and bevelhead steering systems. Mamba™ is a suitable steering system for a diverse range of sailboats from blue water cruisers to America's Cup contenders. It offers unique features such as power assisted steering while retaining versatility in the type of installation in which it can be used (i.e. Tandem systems.)

Steering manuals and installation guides for the Constellation, Cobra and Mamba systems can be found on the Lewmar website www.lewmar.com

Constellation™ Systems

Constellation is made up of a complete range of wire steering systems, offering award winning design and high-quality construction for vessels up to 18m/60'. The systems have been developed in conjunction with both production boat yards and the world's racing community.

All aluminum parts are etched, alochromed and stoved using powder coated polyester resins.

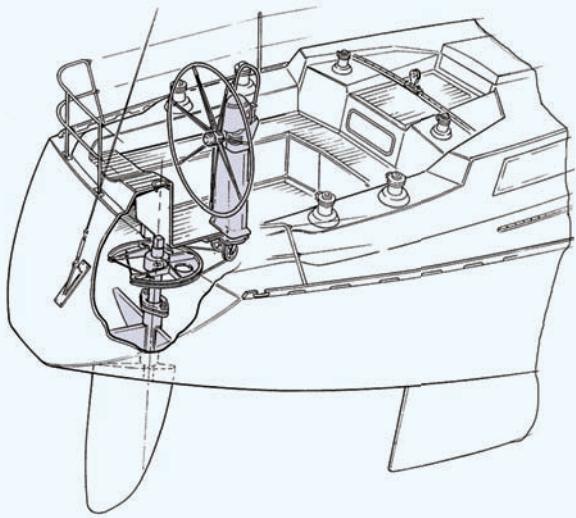
OPEN Wire Systems

Constellation™ Aft Cockpit Radial Steering Systems

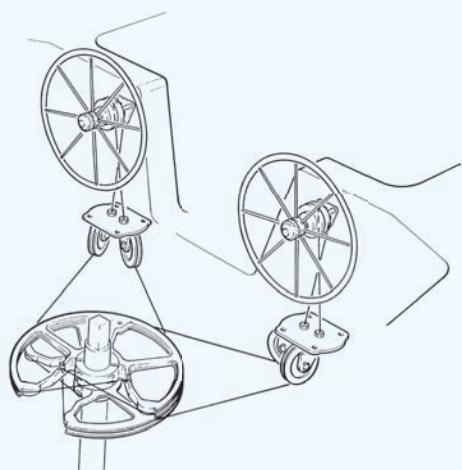
The simplest wire system available for aft cockpit yachts with vertical, or near vertical, rudders using a radial quadrant in conjunction with a cross-wire idler, (universal idler if the pedestal is mounted aft of the rudder stock). Dependent on sheave and quadrant sizes, this equipment can be employed on sailing yachts up to approximately 18m/60'.

Please note the sheaves are fully adjustable in the angular mode to obtain perfect lead from sheave to quadrant. The splay angle is dependent on:

- A) Distance from pedestal center to rudder stock
- B) Quadrant diameter



A typical aft cockpit radial wire system incorporating 260° radial quadrant crosswire idler.



Typical twin wheel Constellation™ installation incorporating bulkhead steerers and beveled cross-wire idlers.

Constellation™ features

- Steering shaft supported in triple high-efficiency ball bearings, ensuring no axial and radial play
- Cross-wire idlers, beveled and adjustable to ensure perfect cable alignment
- Composite construction quadrants for maximum reliability and compactness
- Range of terminal units, sheaves, bulkhead steerers, quadrants and accessories
- Efficient installation
- Pedestal sprocket options, dependent on boat size: 5/8P 11T, 5/8P 13T or 3/4P 11T
- Electrostatically applied, polyester coating for maximum corrosion protection
- Integrated autopilot drive kit for mounting drive units



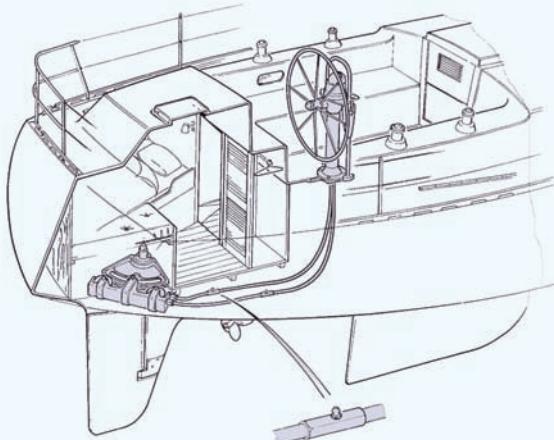
Wire-in Conduit Systems

Due to their ease of installation, wire-in conduit systems have largely replaced open wire for center cockpit yachts.

Advances in conduit technology have resulted in Constellation systems that are simple to install and easy to maintain.

Self contained sheave assemblies have been developed to fit into the conduit route, eliminating the requirement for re-enforced pads.

Lewmar offers a range of components to complete your wire-in conduit installation, including conduit end fittings, conduit greasers and terminal units to align the cables with the quadrants.



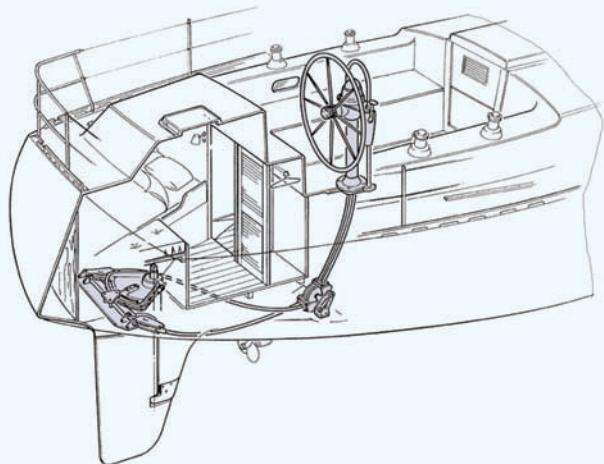
In-line conduit greasers

Features

- Simple to install
- Ultimate reliability
- Pedestal or bulkhead mounting for wheels
- Heavy duty double armored conduit with low-friction liner to ensure efficiency
- In-line conduit greasers

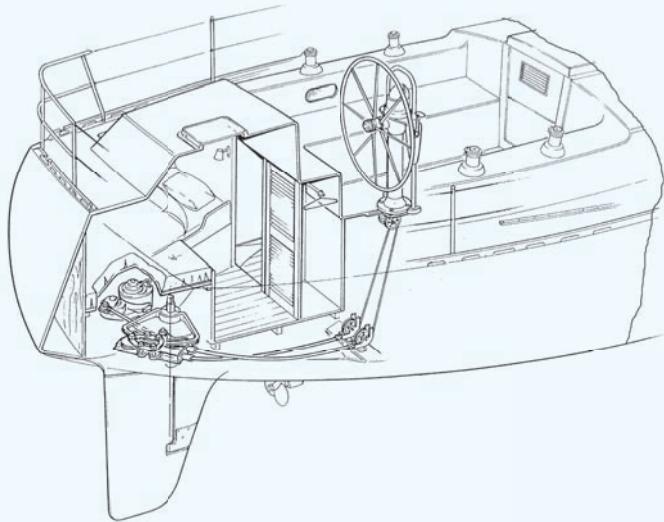
Most common conduit installation for center cockpit yachts up to 12m/40'. To achieve the maximum sensitivity and life from a conduit system please follow the following rules:

1. Keep the number of bends to a minimum.
2. Do not exceed 270° of total curves.
3. Avoid 'S' bends.
4. Orientate the quadrant to achieve the best conduit lead.
5. Minimum bend radius 200mm/8".



A typical 15m/50' center cockpit installation, utilizing conduit from the pedestal to the conduit sheave adaptor. The steering then follows the curve of the hull in conduit, terminating at an articulated terminal unit.

Combination Conduit / Open Wire Systems



Example where the quadrant is offset to starboard and the tangential terminal unit has been fitted. A universal idler at the bottom of the pedestal using open wire to conduit adaptors is illustrated as an option. In this instance therefore, the conduit adaptors have to be rigidly installed.

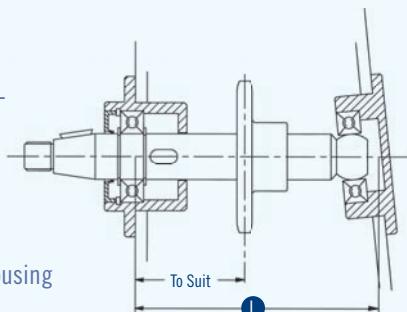


Constellation™ Bulkhead, Shelf and Self-aligning Steerers

The Bulkhead steerer incorporates twin high-efficiency ball races, which are double sealed and pre-lubricated for a long and maintenance-free life.

Self-aligning Steerer

- Self-aligning ball to take up misalignment or draft angle when installing within a console
- Compact installation with a minimum distance of 100mm/4" between bulkhead faces
- Available with sliding sprocket to aid line-up with multiple sheaves
- Steering shaft supported by high-efficiency, sealed-for-life bearings
- Through-shaft mounted friction brake
- Forward and aft flange housing manufactured in polymer composite material



Self-aligning Steerer

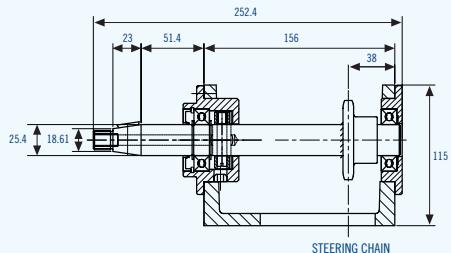


Self-aligning Steerer

Part Number With Brake	Part Number No Brake	Sprocket Type	Dimension L
Standard Self-aligning Steerer			
89100***	89100***	5/8P-11T	100 to 300mm
89100***	89100***	5/8P-13T	101 to 300mm
Stainless Steel Self-aligning Steerer			
89100***	89100***	5/8P-11T	100 to 300mm
89100***	89100***	5/8P-13T	101 to 300mm

Shelf Steerer

- For a mounting alternative, the Shelf Steerer is available.
- Suitable for installation inside an existing pedestal
 - Can be mounted on a horizontal surface
 - Available with a wide range of sprocket options
 - Steering shaft supplied as standard with a secondary fixing position to fit an autopilot sprocket



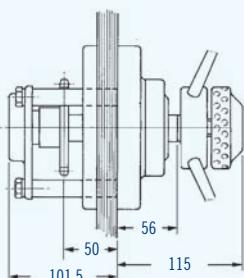
Shelf Steerer

Quick-mount Bulkhead Steerer

- The unit comes complete with a through shaft brake, autopilot stub shaft take-off
- The steerer is manufactured in stainless steel and powder coated to a high-gloss finish
- The steering shaft is supported by a pre-lubricated sealed ball race bearing, which provides low friction



Part Number	Sprocket Type
89100004	5/8P-11T
89100006	5/8P-13T
89100008	5/8P-15T
89100010	3/4P-11T



Quick-mount Bulkhead Steerer

Features

- Incorporates twin high-efficiency, double sealed ball races
- Rapid and simple installation
- Stainless steel backing plate for maximum rigidity
- Variety of sprocket sizes
- Custom steering shafts are available



Constellation™ Chain and Wire Assemblies

Breaking Strength

The figures shown in the tables below indicate the minimum breaking strength of Lewmar cables and chain. Due to the reduction in strength caused by cable fatigue over time, the maximum loading (torque) should never exceed 25% of the breaking strain shown. For example, a 305mm/12" radius quadrant used in conjunction with 6mm/0.23" wire is suitable for the following maximum rudder torque.

Torque	= Breaking Strain x Radius x Safety Factor
(metric)	= 2040Kg x 0.305m x 0.25 = 155 mKg
(imperial)	= 4500lb x 12" radius x 0.25 = 13500 in.lb

Steering Cable 7x19

Stranded Stainless Steel

Part Number	Cable Diameter mm	Cable Diameter in	Breaking Strain kg	Breaking Strain lb
89100077	5	0.1	1406	3100
89100078	6	0.2	2040	4500
89100079	8	0.3	3628	8000
89100080	10	0.4	5306	11700



Non-Magnetic Stainless Steel

Roller Chain Assemblies

Part Number	ANSI SPEC	Pitch in	Breaking Strain kg	Breaking Strain lb
89100090	ANSI 50	5/8	2267	5000
89100093	ANSI 60	3/4	3175	7000
89100096	ANSI 80	1	4988	11000

Conduit

Part Number	Description
89100069	Conduit (sold per meter)
89100116	Conduit end fitting

Pre-swaged Cables

Part Number	Description
89100401	Cable Set 6mm Swaged 2000mm
89100403	Cable Set 6mm Swaged 3000mm
89100405	Cable Set 6mm Swaged 4000mm
89100407	Cable Set 6mm Swaged 5000mm
89100409	Cable Set 6mm Swaged 6000mm
89100411	Cable Set 6mm Swaged 7000mm
89100413	Cable Set 6mm Swaged 8000mm
89100415	Cable Set 6mm Swaged 9000mm

Features

- Precision engineered in non-magnetic stainless steel
- Two off-master links for easy connection to the cable
- Custom length chain sets available on request
- Cable supplied in 7 x 19 stainless steel stranded construction
- Cable can be supplied to be finished with eyebolts and thimbles
- Fully assembled with pre-swaged eyebolts



Constellation™ Quadrant, Sprocket & Chain Kit Specification Table

Part Numbers

APPROPRIATE CHAIN KIT

5/8"P Sprocket	3/4"P Sprocket	Quadrant Type	5/8"P 11T	5/8"P 13T	5/8"P 15T	3/4"P 11T
89100090	89100093	152mm/6" radius 260°	1.08	0.92	0.79	0.9
89100090	89100093	190mm/7.5" radius 80°	1.35	1.14	1.0	1.12
89100090	89100093	203mm/8" radius 260°	1.44	1.22	1.06	1.20
89100090	89100093	228mm/9" radius 260°	1.62	1.37	1.18	1.35
89100090	89100093	254mm/10" radius 260°	1.8	1.52	1.32	1.50
89100090	89100093	304mm/12" radius 80°	2.2	1.86	1.61	1.80
89100090	89100093	304mm/12" radius 260°	2.2	1.86	1.61	1.80
89100091	89100094	381mm/15" radius 80°	2.71	2.29	1.98	2.25
89100091	89100094	381mm/15" radius 260°	2.71	2.29	1.98	2.25
89100091	89100094	457mm/18" radius 80°	3.25	2.75	2.38	2.70
89100091	89100094	457mm/18" radius 260°	3.25	2.75	2.38	2.70
89100092	89100095	508mm/20" radius 80°	3.61	3.05	2.64	3.00
89100092	89100095	609mm/24" radius 80°	4.35	3.68	3.19	3.60
89100100	89100096	762mm/30" radius 80°	5.44	4.60	4.00	4.50

Note: Other specific cable lengths are available upon request.

The table (left) illustrates the turns at the helm for a range of standard sprocket and quadrant sizes.

Lewmar Steering offers custom quadrants in 6082T6 alloy or composite up to 1020mm/40" radius. We can also offer custom sprockets with any number of teeth in 15.87mm/5/8" or 19.05mm/3/4" or 1" / 25.4mm pitch stainless steel or 60802T6 high-strength aluminum.

Constellation™ Sheave Assemblies

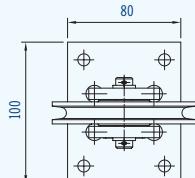
Lewmar offers an extensive range of open wire sheave assemblies from 102mm/4", 127mm/5", 152mm/6", 203mm/8" and 254mm/10" diameters. For each size, Lewmar offers upright, flush, flat and articulated versions. Lewmar sheaves are available in bronze, aluminum and A100 glass reinforced nylon.

Features

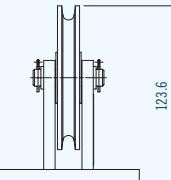
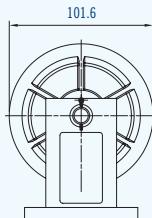
- 102mm/4" & 152mm/6" sheave assemblies are supplied with A100 glass reinforced, nylon sheaves, which are corrosion resistant
- 127mm/5" sheaves are available upon request
- The 203mm/8" and 254mm/10" versions incorporate anodized aluminum sheaves, housed in laser cut 316 grade stainless steel carriers
- High operation efficiency and sensitive steering operation – sheaves run on 45mm/1.77" caged roller bearings
- All open wire sheave assemblies incorporate wire guides to prevent cable jump



Single Articulated Sheave



89100750
4" Sheave



Double Upright Sheave Assembly

Open Wire Sheaves

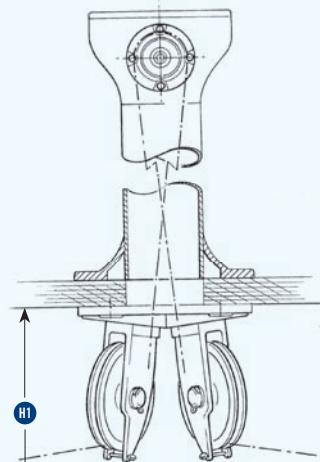
Part No Single	Part No Double	Sheave diameter		Description
		mm	in	
89100750	-	101	4	Upright
89100026	89100029	152	6	Upright
89100027	89100030	152	6	flat
89100028	89100031	152	6	Flush
89100032	89100033	152	6	Articulated

Constellation™ Idlers

Lewmar Idlers are designed to prevent chafing when the cable straightens into the sheave track. The drawing (bottom right) demonstrates the advantage of Lewmar's beveled cross-wire idler plate.



Universal Idler



Cross Wire Idler

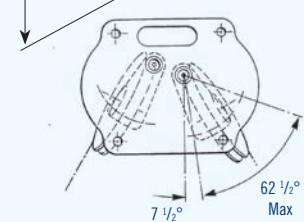


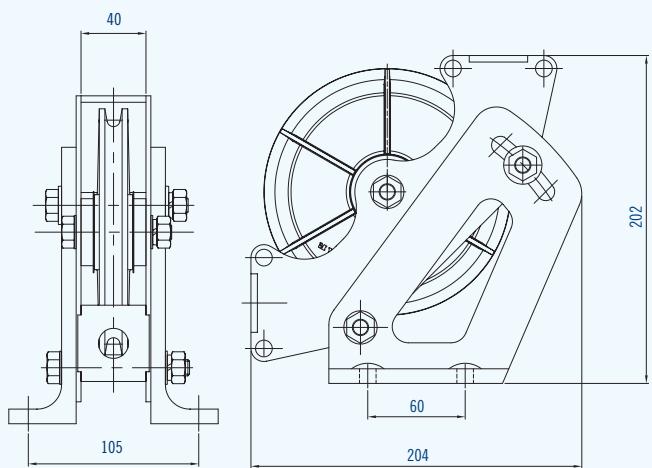
Illustration showing the flexibility of a Beveled Idler

Part Size Number	Idler Type	Sheave Ø		Cable Ø	
		mm	in	mm	in
89100015	Cross-wire Idler	101	4	5	3/16
89100016	Universal Idler	101	4	5	3/16
89100018	Cross-wire Idler	127	5	5-6	3/16-1/4
89100019	Universal Idler	127	5	5-6	3/16-1/4
89100022	Cross-wire Idler	152	6	6	1/4
89100023	Universal Idler	152	6	6	1/4
89100024	Cross-wire Idler	203	8	8	5/16
89100025	Universal Idler	203	8	8	5/16

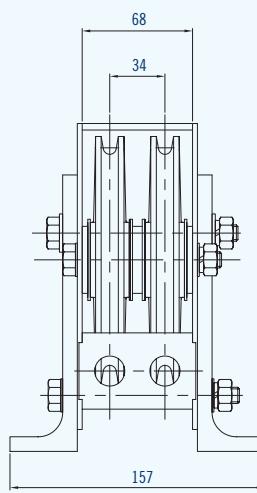


Conduit Steerers

Part Number	Description
89100098	152mm/6" Single Conduit Sheave
89100099	152mm/6" Double Conduit Sheave



89100098
Single Conduit Sheave



89100099
Double Conduit Sheave



89100098
6"/152mm Single Conduit to
Sheave adaptor



89100099
6"/152mm Double Conduit to
Sheave adaptor

Constellation™ Quadrants

Lewmar offers a range of unique, composite 80° and 260° quadrants.

Features

- Fabricated from 6082 aluminum alloy
- Strong yet ductile, almost impossible to fracture under impact loading
- Compact, where transom space is restricted
- Attachment point for linear drives on larger quadrants
- Quadrants with integral stopping surfaces for use against the rudder stop
- Radial versions supplied pre-drilled for optional bolt on stop block
- Generous groove depths and a large guide bend radii, for longevity of the cable.
- 80° quadrants supplied with cable retaining pins to prevent cable jump

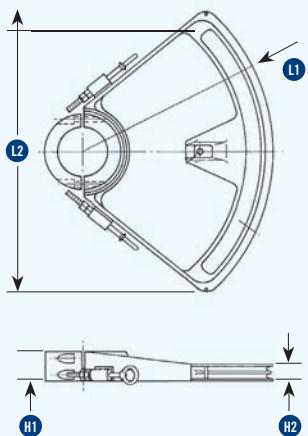
Note: Guidelines for suitable boat length/quadrant size combinations are based on typical boat design and may vary significantly dependent on boat displacement, rudder shape, wheel diameter, etc. It is important to verify your selection in conjunction with your Naval Architect. Typical boat lengths for 80° quadrants are based on cable-in conduit steering systems.



80° High Strength Quadrants

Part Number	Operating Radius		Maximum Bore Size Ø		Typical Boat Length		Boss Height mm in	Boss Height mm in	H1 L1	H2 L2	Maximum Rad Width mm in	Maximum Rad Width mm in
	mm	in	mm	in	m	ft						
89100058	190	7.5	80	3	10	32	60	2.4	35	1.3	195	7.7
89100059	228	9	80	3	9–11	30–37	60	2.4	35	1.3	233	9
89100060	305	12	80	3	10–13	36–42	60	2.4	35	1.3	308	12
89100061	305	12	100	4	10–13	36–42	60	2.4	35	1.3	308	12
89100062	381	15	80	3	12–15	40–48	60	2.4	35	1.3	382	15
89100063	381	15	100	4	12–15	40–48	60	2.4	35	1.3	382	15
89100064	457	18	100	4	14–16	45–52	60	2.4	35	1.3	465	18
89100065	457	18	125	5	14–16	45–52	100	4	42	1.6	465	18
89100066	508	20	125	5	15–19	50–62	100	4	42	1.6	512	20
89100067	609	24	125	5	18–24	60–80	100	4	42	1.6	615	24
											938	37

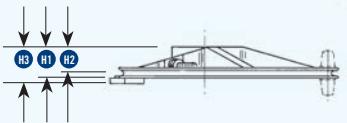
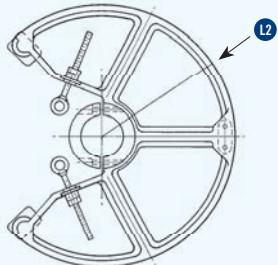
Note: All above part numbers are for standard quadrants supplied pilot bored. Lewmar offers a machining service to supply the quadrant ready to suit the rudder stock of the boat. Please contact your Lewmar Distributor for part number and price prior to ordering.



260° High Strength Quadrants

Part Number	Operating Radius		Maximum Bore Size Ø		Typical Boat Length		Boss Height mm in	Boss Height mm in	H1 L1	H2 L2	H3 L3	Maximum Rad Width mm in	
	mm	in	mm	in	m	ft							
89100049	152	6	80	3	10	32	60	2.3	48	1.8	60	2.3	155
89100050	203	8	80	3	9–11.5	30–38	60	2.3	48	1.8	60	2.3	210
89100051	254	10	80	3	10–13	35–42	60	2.3	48	1.8	60	2.3	260
89100052	254	10	100	4	10–13	35–42	60	2.3	48	1.8	60	2.3	260
89100053	305	12	100	4	12–15	40–50	60	2.3	50	2	62	2.4	315
89100054	381	15	125	5	14–18	45–60	100	4	86	3	98	3.8	390
89100055	457	18	125	5	17–24	55–80	100	4	86	3	98	3.8	470
													18.5

Note: All above part numbers are for standard quadrants supplied pilot bored. Lewmar offers a machining service to supply the quadrant ready to suit the rudder stock of the boat. Please contact your Lewmar Distributor for part number and price prior to ordering.



Eye bolt tensioner kit

Eye bolt/cable tensioner are not supplied with quadrants and must be ordered separately.

89100569 Eye bolt tensioner kit for 5mm wire cable

89100196 Eye bolt tensioner kit for 6mm wire cable

Articulated Terminal Units

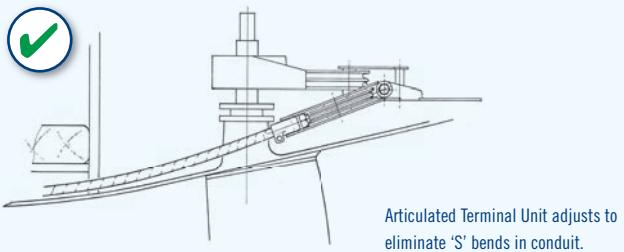
Lewmar offers a range of terminal units to assist the alignment of the cables into the quadrant. The unique, articulated terminal unit provides easy routing of the conduits.

The sheaves on the articulated unit can be adjusted to a maximum 45° take-up angle from the horizontal. This unit greatly reduces the friction within the system, prolonging the life of both the cable and conduits. The unit is supplied complete with rudder stops and fully prepared for mounting.

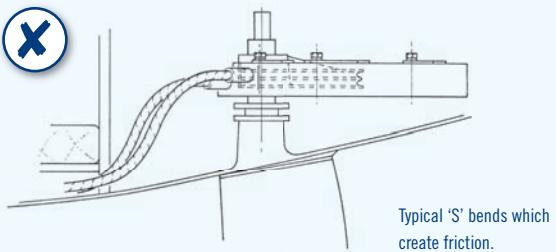
Part Number	Description
89100113	Articulated terminal unit to fit up to 12" quadrant
89100114	Articulated terminal unit to fit up to 18" quadrant
89100115	Articulated terminal unit to fit up to 24" quadrant



Correct and incorrect installation of an Articulated Terminal Unit



Articulated Terminal Unit adjusts to eliminate 'S' bends in conduit.



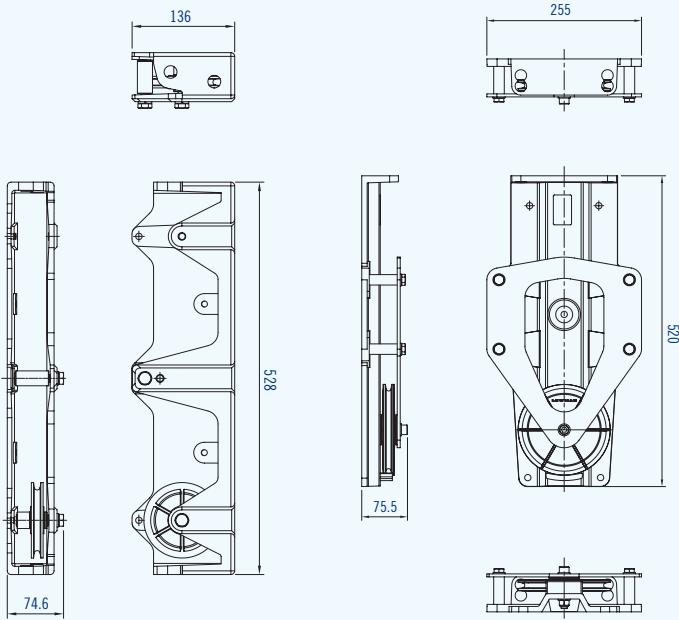
Typical 'S' bends which create friction.

Tangential Terminal Unit

Part Number	Description
89100111	2-turn Tangential Unit
89100112	152mm/6" Tangential Terminal Unit



Tangential Terminal Unit



89100111

89100112

Cobra™ Systems

With over 40 years of technological development, Cobra has become the first choice for boat builders worldwide for aft cockpit vessels.

Cobra systems are the world leader in terms of performance, reliability and appearance, for Rack and Pinion.

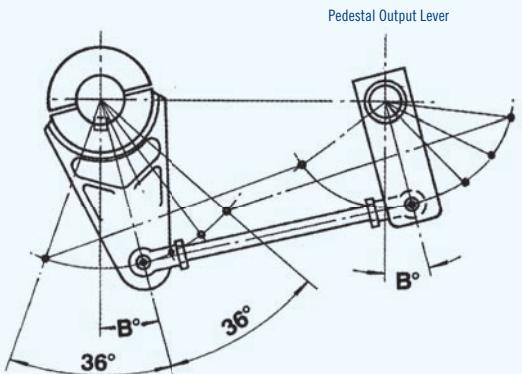
Features

- Absolute precision and feel – as responsive as a tiller
- Simple installation
- Strong and light – no parts to fret, chafe or fatigue
- Minimum maintenance
- Smoother operation
- Greater torque capability
- Full CE Certification available



Wide Angle Geometry

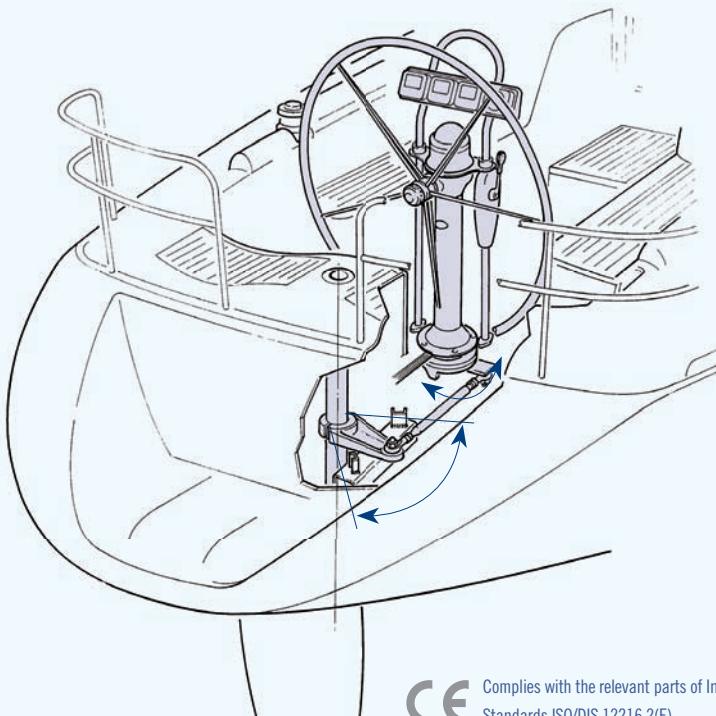
The lever geometry for Lewmar transmission systems is based on the principle of Wide Angle Geometry. This results in a very direct steering amidships and a more indirect and powerful steering at full rudder. Due to this unique feature, the total number of turns of the wheel on a transmission steering system can be reduced by 30-40% compared to a cable system with the same maximum rim loads. This effect is achieved by an unequal length of the output and tiller lever. The output lever has 130 mm centers and the tiller lever 200 mm. The diagram to the right shows the mechanical advantage (lever reduction) in relation to the rudder angle. Around midships the reduction is quite constant, and above 15 degrees rudder the mechanical advantage nearly doubles compared to the midships advantage. The consequence of wide angle geometry is the offset angle of the levers in midships position. This offset angle is necessary to achieve the same travel to port and starboard. The offset angle varies with the distance from the output lever to the tiller lever. Offset angles can be avoided when the complete gearbox is put on an offset distance.



Cobra™ Cruising

The principle of the Cobra™ steering system is based on the precision gearcut circular rack and pinion in the head of the pedestal, providing the necessary mechanical advantage. The quadrant gear is connected to a stainless steel downtube, at the base of which is an output lever. This connects to a similar lever, mounted on the rudder stock, via a fully adjustable draglink.

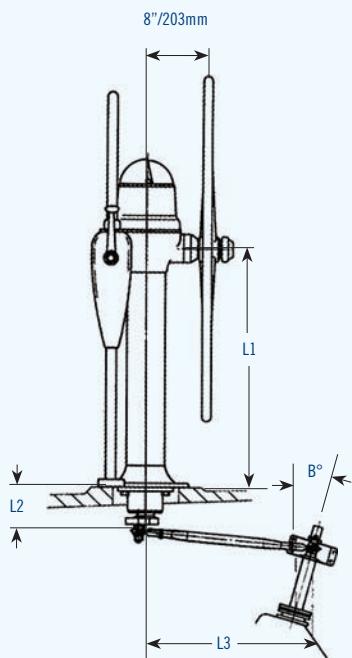
All shaft work is carried through high-efficiency sealed ball races, and the mesh of gears is controlled via shims under the input, eliminating any lost motion. The input socket also houses a powerful and progressive friction brake for dampening the wheel, when at anchor, for example.



CE Approved Complies with the relevant parts of International Standards ISO/DIS 12216.2(E). This standard covers the applicable essential safety requirements of the Recreational Craft Directive 94/25/EC.

COBRA CRUISING/COBRA OCEAN/COBRA

- Rated output load 12234 N
- Maximum rudder torque at midships 252 Kgf.m
- Maximum rudder torque at full lock 474 Kgf.m



Cobra™ Installation Guidelines

L1 Standard pedestal height L1 = 710mm/28". Minimum possible height = 178mm/7", maximum possible height 915mm/36".

L2 Standard under deck dimension L2 = 102mm/4". The minimum dimension is governed only by the thickness of the cockpit sole. Where an extended L2 under deck is required, it may be necessary to also add a torque snubber plate, as seen on page 213.

L3 The distance between the center of the pedestal and the rudder stock, L3 can vary between 120mm/5" and 2000mm/79". Draglinks are made to specification and are adjustable by 20mm/0.78" upon installation.

The draglink should not exceed an angle of 5° from the horizontal.

A standard Cobra installation can accommodate a rudder rake up to a maximum of 30°. This does, however, depend on the boat size and type, and the length of L3. Where this angle exceeds 20°, please consult our technical department.

As standard, all levers are mounted to the starboard side and the pedestal is mounted forward of the rudder stock.

Cobra™ Racing

Cobra™ Racing is designed specifically for racing and fast cruising yachts up to 17m/55', providing the ultimate in feel and responsiveness.

Features

- Incorporates uprated components to handle the higher torque demands of a large wheel installation
- More direct gear ratio offering 1.5 turns lock to lock
- Can be reduced to less than 1 turn where required
- Larger diameter pinion for greater strength and more direct steering
- Light, strong pedestal shell incorporating 101mm/4" diameter tube
- Uprated gear quadrant in super nickel aluminum bronze



Cobra™ Racing in Enguard Pedestal

Cobra™ Ocean

Designed for Blue Water yachts, with smaller wheels requiring a greater number of turns lock to lock, while offering the same superb feel and simple, compact installation as other Cobra™ variants.

Features

- For yachts up to 18m/60'
- Suitable for maximum rudder torque of 4905Nm/3618 lb ft
- Additional space for a larger gear set
- 2.4 turns lock to lock
- Larger bearings and a 60mm/2.3" stainless steel down shaft
- Royale and Ranger pedestals specific to the Cobra™ Ocean system

Cobra™ Ocean available with Royale pedestal

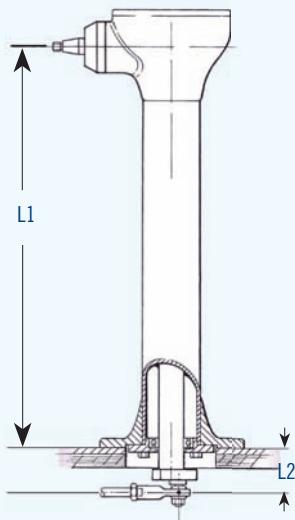


Cobra™ System Customized for specific installations

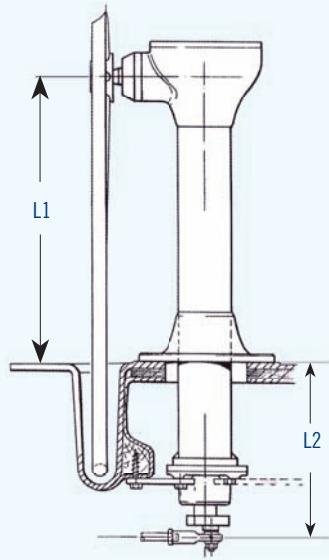
A Cobra system can be customized for twin rudder installations, bridge deck consoles, transom mount rudders and center cockpit vessels. Cobra™ offers a simple steering solution for this arrangement that ensures the rudders remain in phase and Ackerman effect can be achieved.

Features

- One-piece Power input assembly, easy maintenance and gear adjustment
- High-efficiency double sealed deep groove ball bearings
- Powerful and progressive, front mount friction brake
- One-piece heavy duty stainless steel down tube
- Computer optimized gear quadrant design
- Gear quadrant secured via twin
- 10mm/0.39" stake pins with double shear
- High-strength stainless steel output level welded to down shaft
- Stainless steel rose jointed draglink
- Nybroil gear quadrant and pinion for ultra high strength
- Ability to withstand shock loads



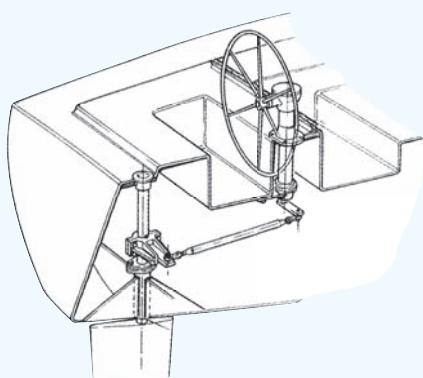
Frequently the space directly below the cockpit floor is limited and this special bearing arrangement reduces the intrusion into the accommodation.



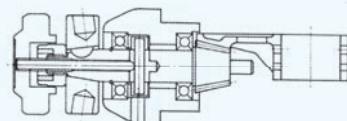
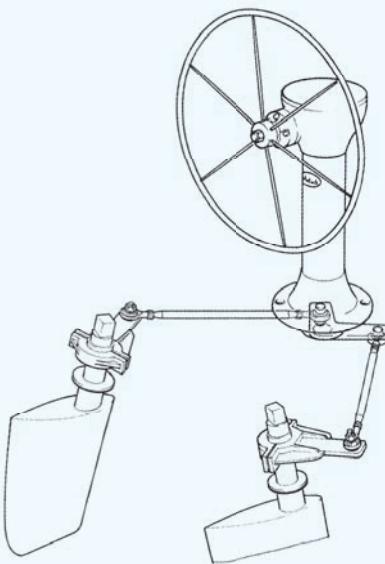
This illustrates the use of a wheel trough and shortened height pedestal, which is particularly common on Cobra™ Racing installations where large wheels are fitted.

Besides giving more mechanical purchase, the large diameter wheel enables the helmsman to sit out and still reach the helm.

Please note that the use of a torque snubber plate may be necessary to counteract the extra pitching movement caused by the large L2 dimensions (greater than 15mm/6").



A further variation on the extended under deck setup is shown here. In this case, the pedestal is mounted on a bridge deck. The minimum height between the base and center of the wheel shaft is 178mm/7", and the base flange can be cropped on its fore and aft face to reduce the width it occupies.



The PowR™ Input cartridge.

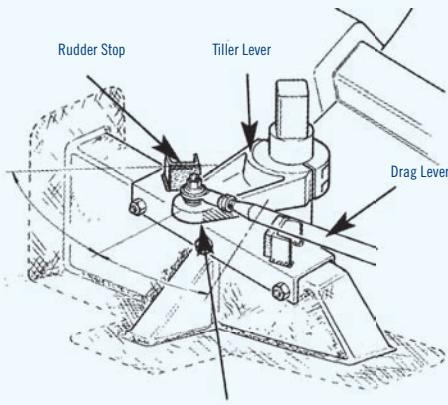
This input socket design prevents the quadrant gear from lifting the pinion gear under high load conditions.



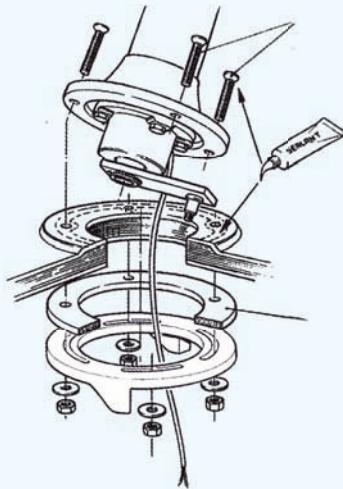
Stop Rings

Limiting the amount of rudder travel is essential on all steering arrangements. The Cobra™ system provides an alternative, simpler-to-install device than conventional rudder stops – the stop ring.

The stop ring, mounted directly below the pedestal, ensures that the output lever travel does not exceed the designed limit. Stops should operate adjacent to operating centers.



Additional rudder stop can be fitted to tiller lever if a stop ring cannot be installed



*Illustration showing detail of Stop Ring.
Custom Stop Ring also available.*



89000004
Stop Ring Cobra

Rod Ends

Part Number Description

82000356	Rod End AHFT10 Stainless Steel
82000357	Rod End AHFT12 Stainless Steel

Rods ends can be purchased separately from draglink assemblies as spare parts.



Tiller Lever

Can be machined to

Part Number	Bore Size mm	Bore Size in	Description
89500002	80	3	Tiller Lever
89500005	100	4	Tiller Lever
89500008	125	5	Tiller Lever

Lewmar also offers extended versions to enable the fitting of linear drive type autopilots at 250mm/10" and 50mm/14" centers, in conjunction with the standard 203mm/8" position for the steering draglink.

Draglinks

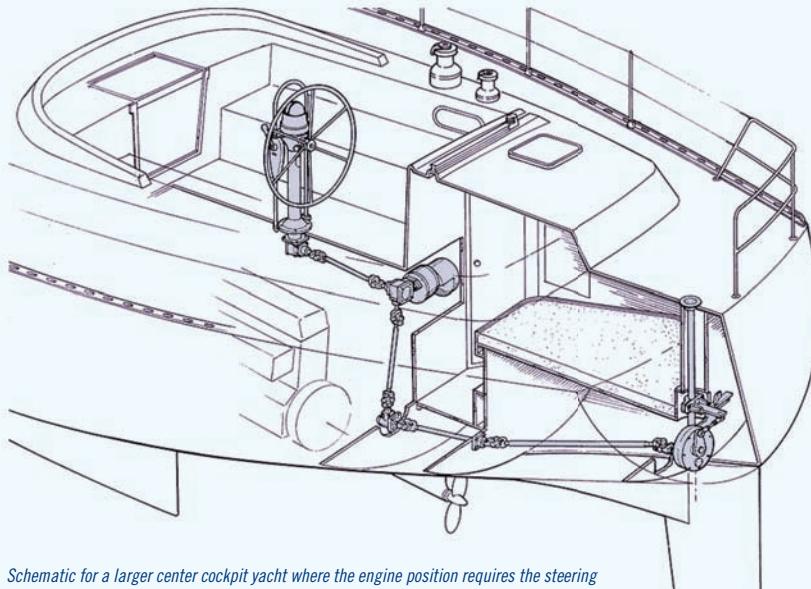
Part Number	Description	Length one end loose		System Type
		mm	in	
89500011	Draglink Assemblies AHFT 10	1000	40	Cruising
89500012	Draglink Assemblies AHFT 10	2000	80	Cruising
89500013	Draglink Assemblies AHFT 12	1000	40	Racing and Ocean
89500014	Draglink Assemblies AHFT 12	2000	80	Racing and Ocean

The draglinks specified above are supplied with one end fitting loose to enable the tube to be cut to size and welded. If you know the correct centers for the draglink, contact your Lewmar dealer prior to order for the part number relating to the center required.

All above part numbers are for standard Tiller Levers supplied pilot bored. We offer a machining service to supply the Tiller Lever ready to suit the rudder stock of the boat. Please contact your Lewmar Distributor for part number and price prior to ordering assemblies as spare parts.

Mamba™

The Mamba™ system provides the ultimate in marine steering, in terms of precision, feedback and strength. Mamba™ systems are chosen for a diverse range of sail and power craft such as blue water cruising yachts, pilot vessels and sail training vessels.



Schematic for a larger center cockpit yacht where the engine position requires the steering to run immediately aft from under the pedestal before dropping to sub floor level.

Please note the autopilot drive attachment.

Features

- All parts are CNC machined, gearcut and assembled for the highest precision
- Bevelheads and gearboxes are manufactured using only marine grade materials
- Mamba™ offers enormous strength with minimal maintenance
- Maintained well, Mamba™ delivers a lifetime of service
- Reduction gearboxes accommodate rudder torques up to 5400mKg
- Instant rudder feedback
- Gearboxes and bevelheads provide high efficiency – fully reversible and totally positive



Principle of Operation

Mamba™ steering is a rotating torque tube and bevelhead system, transmitting the helmsman's input to a high-efficiency reduction gearbox, mounted adjacent to the rudder stock. A tiller lever is fitted to the rudder stock and is driven by a similar lever integral to the gearbox, via a fully articulating jointed draglink.

Two or three station systems, catamarans and tandem wheel steering systems are regularly supplied. The integration of autopilot drives and remote controlled disengagement units are easily achieved.

The Mamba™ range of steering systems is offered in two sizes of transmission bevel boxes called BH10 and BH130, which are coupled with 12 models of reduction gearbox, providing equipment to suit all craft from 10.6m/35' to 61m/200'.

In most cases, either high-efficiency spur, or reduction gearboxes are chosen, offering between 1.0 and 26 turns lock to lock. Each option also provides a high reverse efficiency, transmitting rudder feel to the helmsman.

To simplify installations, Mamba™ equipment offers the following examples of versatility:

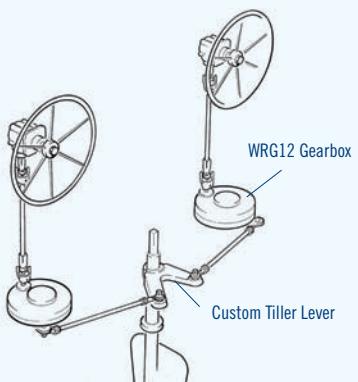
- Bevelheads can be supplied with 2, 3 or 4 steering shafts, permitting integration for secondary steering stations, tandem wheel arrangements and direct coupled autopilot drives.
- A choice of mounting plates and brackets for bevel and gearboxes.
- Availability of step ration gears to adjust overall steering ratio.

The lever geometry for Lewmar transmission systems is based on the principle of Wide Angle Geometry. Refer to p.210

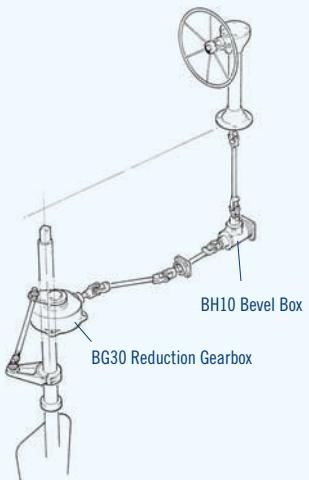
Mamba™ Typical Installations

Lewmar can accept a Naval Architect's designs in Autocad or DXF format as well as conventional drawings.

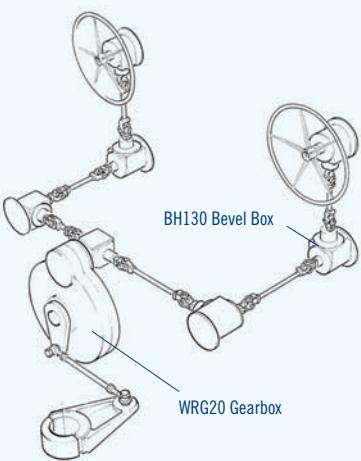
Here are some sample schematics showing the versatility of the Mamba system.



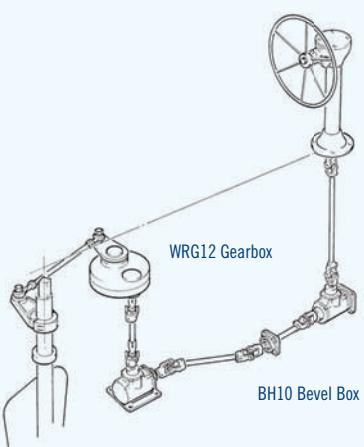
Tandem wheel arrangement operating through twin WRG series reduction gearboxes. This is a simple installation with minimum steering equipment and provides independent steering at each helm station.



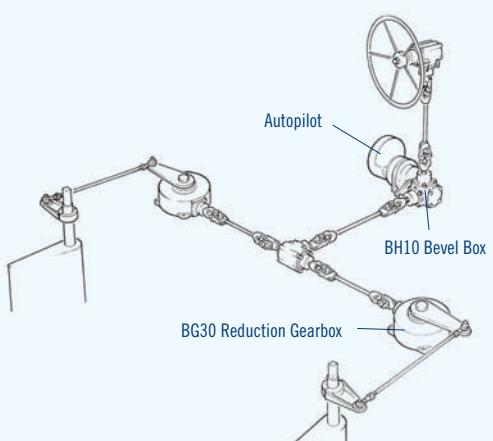
In this arrangement a BG30 reduction gearbox is situated adjacent to the rudder stock. The gearbox is mounted parallel to the hull, which assists in keeping the torque tubes low in the boat.



An alternative tandem wheel installation for the larger yacht.



Where the rudder stock and bearing are mounted higher in the boat, this arrangement is preferable.



An illustration showing a typical Mamba™ installation for a catamaran. The rigidity and backlash-free nature of the Mamba™ system means that it is unnecessary to have a draglink between the rudders to achieve synchronization.

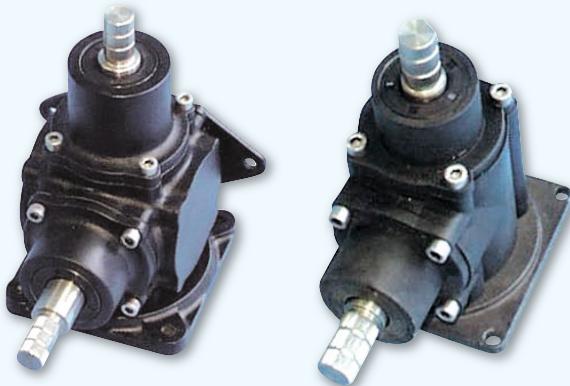
In addition, Lewmar can arrange the geometry to provide the Ackerman effect, which increases the turn angle on the inside rudder to improve steering reaction.

This example also illustrates the simple connection of the Lewmar autopilot drive.

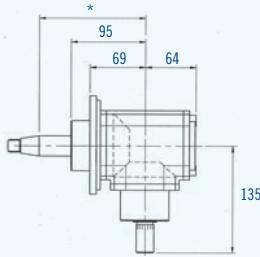
Mamba™ Bevelheads

BH10

Lewmar BH10 torque tubes are made of marine grade stainless steel depending on the specific installation requirements. Torque tubes are supplied in standard lengths with one end loose for welding by the installer. Or we offer fully welded torque tubes to pre-specified lengths.

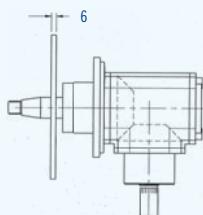


Bevelheads

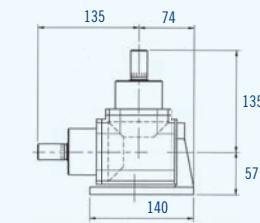


Steering Bevelhead (BH10)

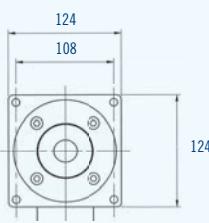
* To suit customer requirements



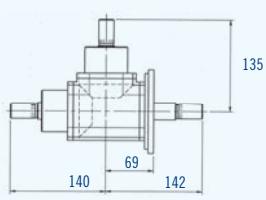
Steering Bevelhead with Brake (BH10)



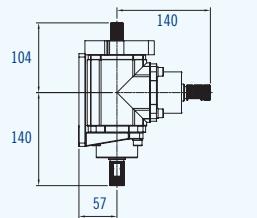
Transfer Bevelhead (BH10)



Steering Bevelhead (BH10) Front View



Transfer Bevelhead 3-way (BH10)



3-way Bevelbox with AP Flange (BH10)

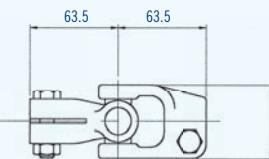
Useful information

- 1 Steering shafts can be made to customer's preferred length.
- 2 Bevelheads are available with either rotation.
- 3 Standard bevelheads have 1:1 ratio, but other ratios are available as detailed in specification.
- 4 Mounting plate (or bracket) can be fitted to all faces to facilitate ease of mounting.
- 5 All bevelheads can be configured to accept the Lewmar direct fit autopilot mount.
- 6 For detailed dimensions refer to Lewmar CAD library.
- 7 Due to the custom nature of this product, contact Lewmar for part number.



Features

- Manufactured from marine grade aluminum castings
- Precision machined and chromed
- Stainless Steel shaft work coupled with high alloy steel or Nickel ali bronze bevel gears
- Shaft work runs in high-efficiency roller bearings with oil seals and fully greased housings
- Bevelheads are shimmed for zero backlash
- All components are fully bedded in, prior to supply



89200057

AMK10 Universal Joint



Mamba Universal Joint and Self-Aligning Bearing

Universal Joints

Must be fitted at both ends of a torque tube. Where a self-aligning bearing is used, one universal joint connects both torque tubes, as shown in illustrations. Self-aligning bearings work up to an angle of 15°. AMK10 universal joints have a maximum permissible working angle of 25°. Where practical, the angle at each joint should be balanced.

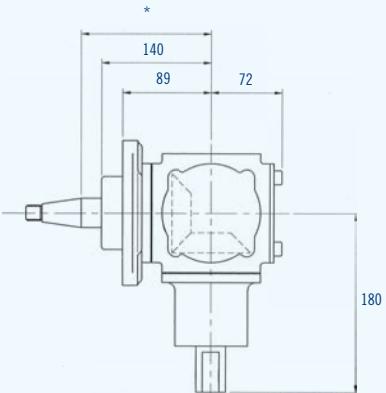
Mamba™ Bevelheads

BH130

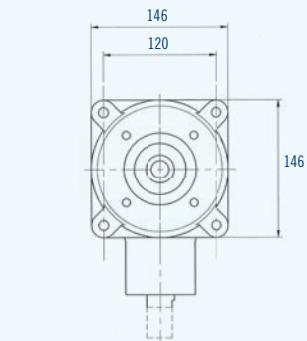
Lewmar BH130 torque tubes are made of marine grade stainless steel. Depending on the specific installation requirements, torque tubes are supplied in standard lengths with one end loose for welding by the installer. Or, we offer fully welded torque tubes to pre-specified lengths.



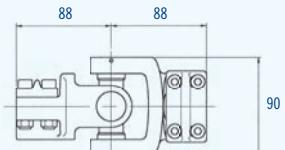
Bevelheads



Steering Bevelhead (BH130)

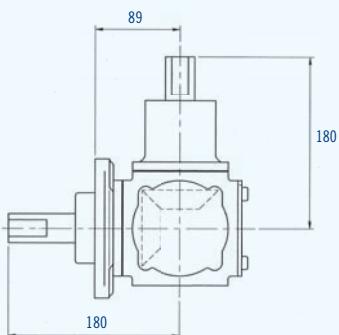


Steering Bevelhead (BH130) Front View

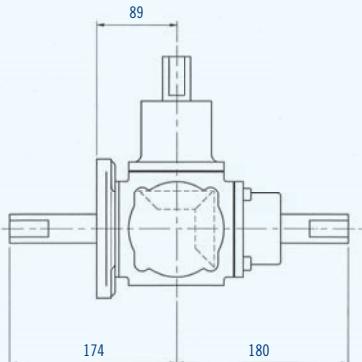


89200070
WUJ6 Universal Joint

The WUJ6 universal joint is suitable for use with large gearboxes 18, 20 and 45, see page 220. It has a maximum permissible working angle of 25°. Where practical, the angle at each joint should be balanced.



Transfer Bevelhead (BH130)



Transfer Bevelhead with
Autopilot Adaptor Flange 3-way (BH130)



Mamba™ BG Reduction Gearboxes

The BG Series of high-efficiency reduction gearboxes employs bevel gears manufactured from either high-alloy steel or nickel bronze alloy running in precision roller bearings. Gear casings are manufactured from marine grade aluminum, and shaft work is stainless steel or nickel bronze alloy. All gearboxes are grease filled and shimmed for zero backlash.

Mamba™ Reduction Gearboxes

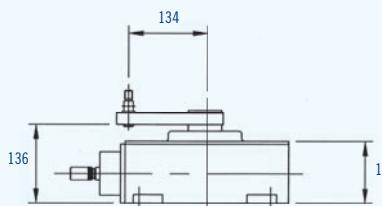
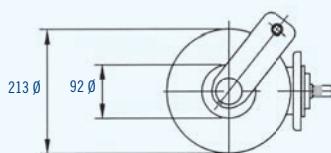
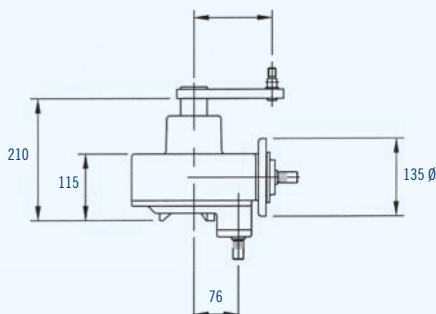
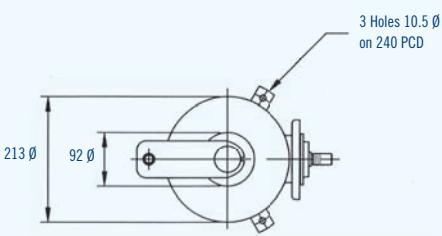
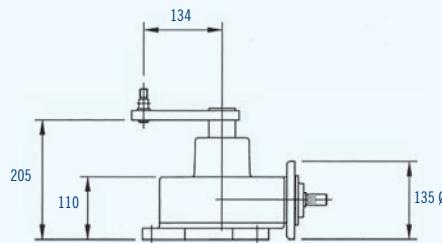
Part Number	Gearbox Type	Gear Ratio	Mechanical Advantage at Midships	Turns Ho to Ho	Maximum Rudder Torque Nm	Typical Boat Range ft-lbs
89200034	BG12	5:1	8:1	1.8	2,943	2,170 -45'
89200035	BG12/2	5:1	8:1	1.8	2,943	2,170 -45'
89200040	BG30	6.7:1	10.2:1	2.4	4,905	3,617 45'-60'

Notes

- 1 Mechanical advantage and turns lock to lock are based on standard level geometry.
- 2 Reduction gearboxes can be mounted anywhere within the general proximity of the rudder stock (7"/0.2m to 6.5'/2m).
- 3 For detailed dimensions refer to Lewmar CAD library.

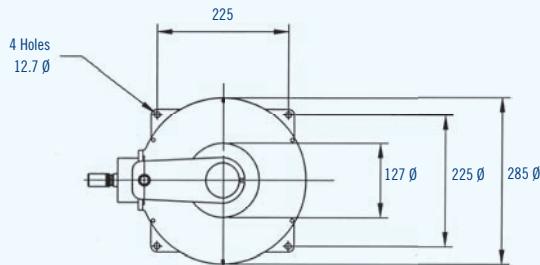


89200034
Gearbox (BG12)



89200034
Gearbox (BG12)

89200035
Gearbox with second output for autopilot drive or additional steering position (BG12/2)



89200040
Gearbox (BG30)

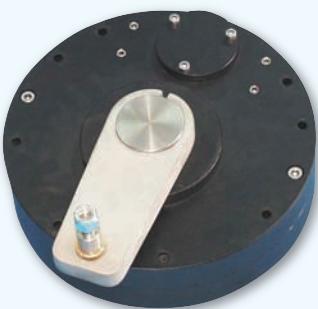


Mamba™ WRG Reduction Gearboxes

The WRG series of high-efficiency gearboxes employs precision cut, stub tooth form, spur gears running in deep groove ball and roller bearings. Gear casings are manufactured from marine grade aluminum, and shaft work is in stainless steel or nickel ali bronze. All gearboxes are CNC Machined and grease filled to ensure a perfect fit and maintenance free life.



89200032
Gearbox (WRG10)



89200041
Gearbox (WRG12)



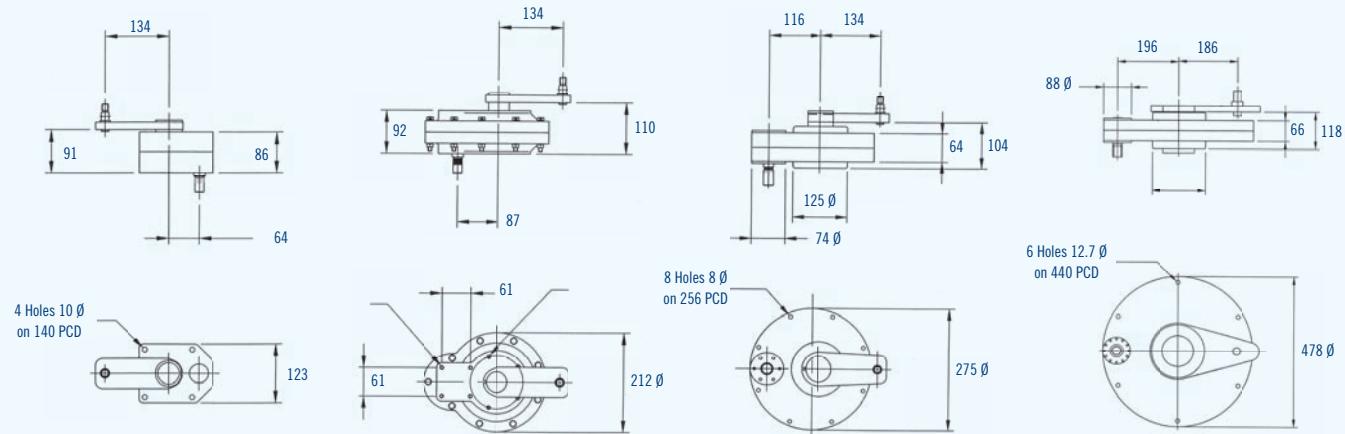
89200046
Gearbox (WRG18)

Mamba™ Reduction Gearboxes

Part Number	Gearbox Type	Gear Ratio	Mechanical Advantage at Midships	Turns Ho to Ho	Maximum Rudder Torque	Typical Boat Range
					Nm ft. lbs	m ft
89200032	WRG10	4:1	6.1:1	1.4	2,452 1,808	-13 -45
89200037	WRG11	5:1	8:1	1.8	2,943 2,170	11.5-14 38-45
89200041	WRG12	7:1	10.8:1	2.45	5,150 3,798	13-20 45-65
89200046	WRG18	10:1	15.2:1	3.5	10,800 7,965	18-27 60-90
89200048	WRG20	12.6:1	19.1:1	4.4	13,700 10,104	24-33.5 80-110
89200050	WRG45	13:1	20:1	4.6	24,000 17,701	20-46 90-120
89201637	WRG60	24.7:1	37.5:1	8.6	36,250 26,740	33-45 110-150
89200052	WRG90	65:1	96:1	21.6	53,000 39,090	36.5-61 120-200

Notes

- 1 Mechanical advantages and turns lock to lock are based on standard lever geometry.
- 2 Overall mechanical advantage and turns lock to lock can be altered via stepped ratio bevelheads within the system or by non-standard lever centers.
- 3 Reduction gearboxes can be mounted anywhere within the general proximity of the rudder stock (0.2m/7" to 2m/6.5'). For more details please refer to the installation and maintenance handbook.
- 4 Bevelheads can be directly integrated to all WRG series gearboxes.
- 5 For detailed dimensions, refer to Lewmar CAD library.



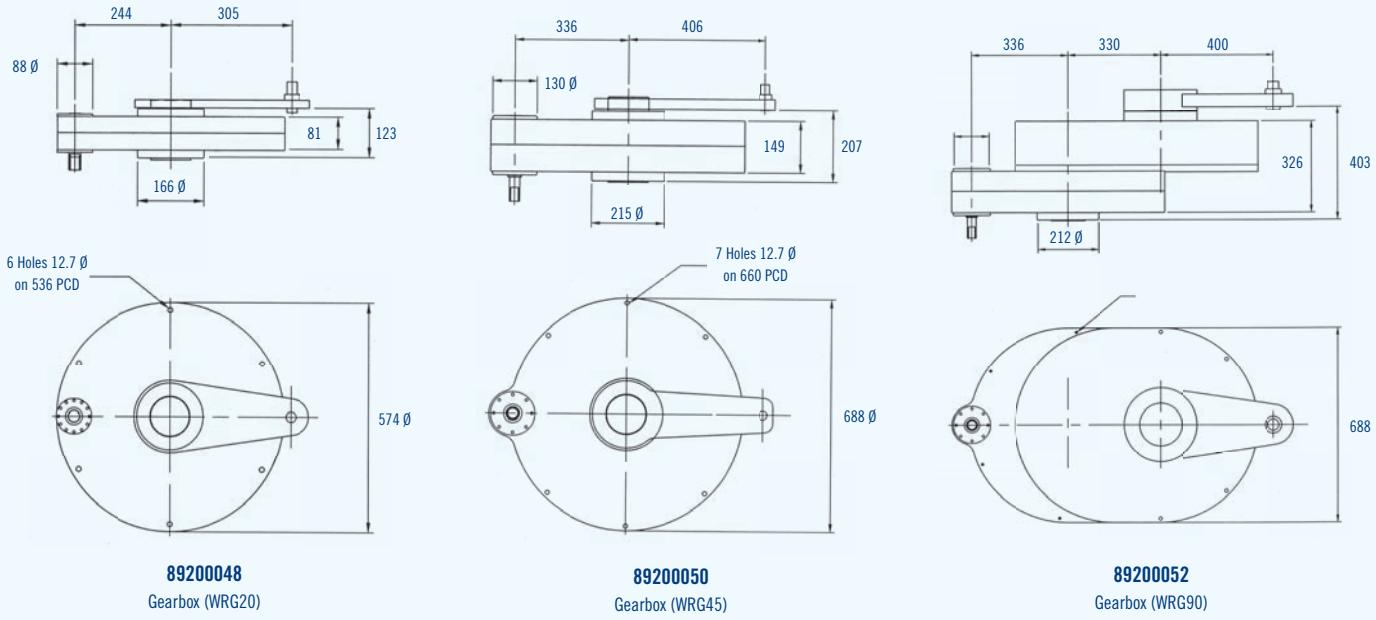
89200032
Gearbox (WRG10)

89200037
Gearbox (WRG11)

89200041
Gearbox (WRG12)

89200046
Gearbox (WRG18)

Mamba™ WRG Reduction Gearboxes (continued)



Mamba™ Bevelhead Integration

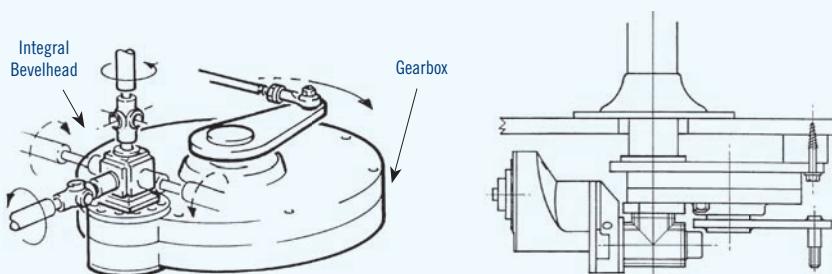
Integration – WRG series of spur reduction gearboxes can be supplied with an integral bevelhead fitted to the input shaft as per illustrations below. The bevelhead can be mounted to either side of the reduction gearbox and rotated at any angle. Custom arrangements are available with great stand-offs between the gearbox and bevelhead. Lewmar provides an in-house design service for Mamba installations.

Pedestal Gearbox Integration

Mamba™ pedestal – BG WRG Integration – For larger aft cockpit yachts, the WRG and BG series gearboxes can be directly mounted to the pedestal.

On the WRG12 gearbox and above – a torque adapter plate is provided to transmit the force directly to the underside of the cockpit floor.

For raked rudders (25° and above), it is normal to use the BG series of gearboxes, see page 219.



Gearbox WRG type showing directional movement of outer lever and torque tubes.

Gearbox WRG type with addition of autopilot drive.

Mamba™ Custom & Power Assistance

The use of hydraulic power assistance superimposed on mechanical rack and pinion steering is now universally used on motor vehicles around the world. A well-designed system enables a much more direct steering to be employed while retaining the essential feel provided by a proportional valve integral within the system.

Lewmar offers a similar arrangement for use in marine steering applications. Utilizing hydraulic power, either from a power take-off from the engine, or its own power pack with integral reservoir, the Lewmar proportional servo valve fits in line with the draglink and directs oil flow to assist the helmsman's efforts.

The amount of power assistance can be varied to suit each owner's taste and can provide everything from a fingertip response to conventional steering loads, but at reduced levels.

In all cases however, the integrity of the mechanical steering is retained and should the power assistance be switched off, or fail, a high flow bypass valve will allow the oil to flow freely, and normal mechanical operation to continue.

Lewmar power assisted Mamba systems are used on a wide variety of craft, varying from large sailing yachts to commercial vessels, all benefiting from quicker, lighter response, coupled with unimpeded feel and accuracy.



Autopilot Drives

Our experience has given us insight into the challenges that can occur when interfacing autopilot drives to the steering system and how important this aspect is to the correct operation of the autopilot. Our comprehensive range of mechanical and hydraulic autopilot drive units helps overcome typical installation problems.

1. All units have an electromechanical clutch, virtually eliminating drag on the steering system.
2. All units are compatible with the majority of electronics suppliers, such as Raymarine, B&G and Simrad.
3. All drives have low current draw.
4. Drives available in 1/4, 1/2 and 1HP capacities, suitable for all Lewmar steering types.



Lewmar recommends the following Drive Units for your boat. If your boat is not listed here, please contact Lewmar for further information.

Boat Builder/ Boat Model	Drive Type	Part Number
Bavaria		
30, 33, 37, 39 cruisers	Integra	89300111
Match 35, 38, 42	Direct	89300100
42, 44, 46, 49, 50 cruisers	Mamba	89300053
Dufour		
34	Constellation	89300109
40, 44	Constellation	89300086
385, 455	Constellation	89300123
Gib Sea 43	Mamba	89300053
365, 385, 445	Rotary	89100160+ 89300003
Halberg Rassy		
40, 43	Mamba	89300051
46, 48, 53 - 12v	Mamba	89300053
46, 48, 53 - 24v	Mamba	89300054
62	Mamba	89300060
Hanse		
341, 371, 411	Direct	89300039+ 89500497
461	Mamba	89300053
531	Mamba	89300057
Hunter		
44, 49	Mamba	89300053
45CC	Integra	89300113

Boat Builder/ Boat Model	Drive Type	Part Number
Island Packet		
370	Direct	89300040
440	Direct	89300040
445	Mamba	89300053
485	Mamba	89300053
Najad		
400	Mamba	89300051
460, 490, 511	Mamba	89300053
Northshore		
Southerly 110	Direct	89300103+ 89300099
Southerly 32	Integra	89300104
Southerly 35RS	Direct	89300103+ 89300100
Southerly 135	Mamba	89300053
Southerly 115	Mamba	89300053
Vancouver 34, 38	Mamba	89300053
Oyster		
62, 655	Mamba	89300060
72, 82	Mamba	89300070
Tartan		
3400	Direct	89300039
3700	Direct	89300039
4100	Direct	89300039
4400	Direct	89300039

Autopilot drive manuals and installation guides can be found on the Lewmar website www.lewmar.com.

Integra Drives

The Integra drive is available in three formats.

The Cobra and Mamba versions mount directly inside the Integra pedestal. This unique installation is only available from Lewmar and provides the installer with a simple and quick installation with no complicated, labor intensive mounting platforms required.

We also offer an Integra Sprocket version, which is very popular with the Bavaria Cruising yachts from 9 to 12m (30 to 39ft) in length.



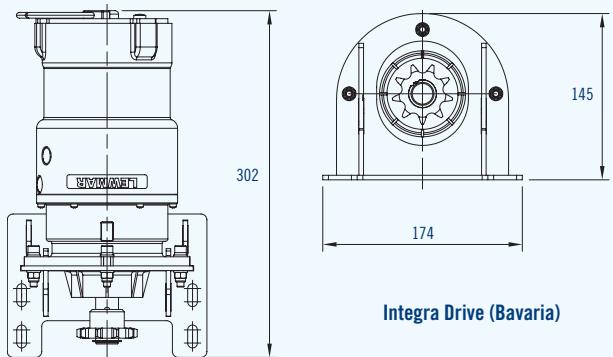
Part Number Description

89300111 Bavaria Integra drive

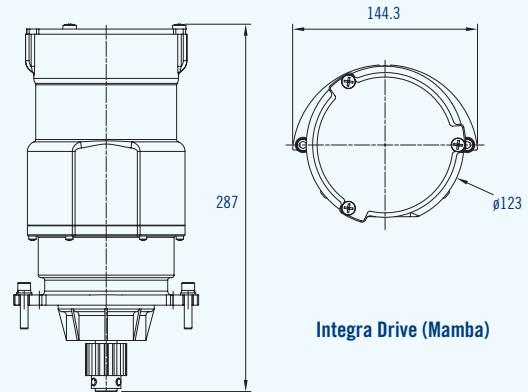
89300104 12V* Integra Cobra drive

89300113 12V* Integra Mamba drive

* Voltage relates to clutch

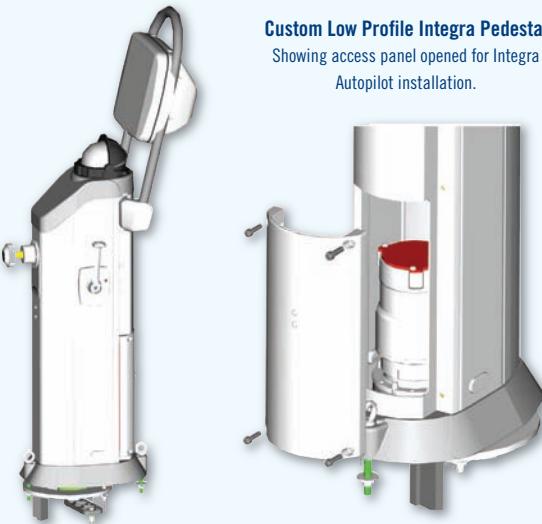


Integra Drive (Bavaria)



Integra Drive (Mamba)

Custom Low Profile Integra Pedestal
Showing access panel opened for Integra
Autopilot installation.



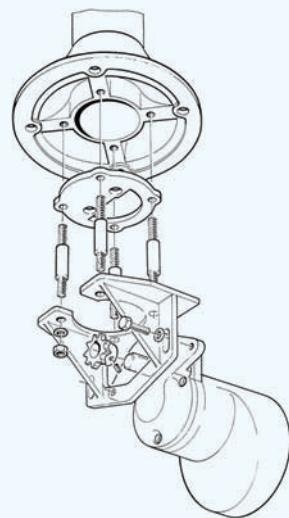
Constellation™ Drives

The Constellation™ Autopilot Drive units are specially designed to interface with Constellation™ Steering, incorporating wire-in-conduit transmission, typically found in center cockpit yachts up to 21m/70'.

Features



- Direct mounting under pedestal for minimal space
- Easy and quick to install
- Flexible – suitable for most deck thicknesses
- Strong and reliable
- 1/4 HP and 1/2 HP version available
- 12 and 24 volt options



Constellation™ Drive Unit Specifications

Part Number	Sprocket Size	HP	*Voltage	Max Output Torque Nm	No Load Speed RPM ft-lb	Max Rudder Torque mKg	Average Current Consumption ft-lb	Weight kg	Weight lb	
89300016	5/8" P Sprocket Standard	1/4	12	169	125	248	1794	4A	9	19.8
89300017	5/8" P Sprocket Standard	1/4	24	169	125	248	1794	2.5A	9	19.8
89300029	5/8" P Sprocket Standard	1/2	24	183	135	426	3080	3.5A	10.5	23.1

* Voltage relates to clutch



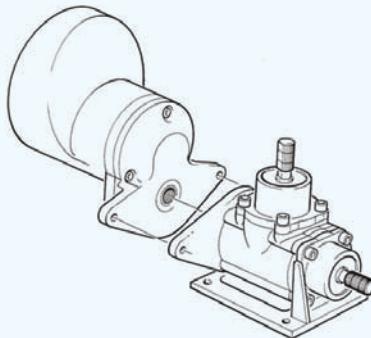
Mamba™ Drives

These unique autopilot drives directly couple to Mamba™ systems, eliminating the need for separate mounting platforms, chain and sprockets.



The illustration (below) shows the simplicity of installation of the Mamba™ drive unit fitted to a BH10 type bevelhead via the interface plate. The drive is transmitted via a splined muff-to-shaft connection.

The bevelhead or gearbox provides the mounting, and no additional support is necessary for the autopilot drive unit.



Mamba™ Drive Unit Specifications

Part Number	Spine Coupling Connection	HP	*Voltage	Max Output Torque Nm	No Load Speed RPM ft-lb	Max Rudder Torque mKg	Average Current Consumption ft-lb	Weight kg	Weight lb	
89300053	3/4 x 48	1/4	12	169	125	248	1794	4A	9	19.8
89300054	3/4 x 48	1/4	24	169	125	248	1794	2.5A	9	19.8
89300055	3/4 x 48	1/4	24	169	125	248	1794	2.5A	9	19.8
89300060	3/4 x 48	1/2	24	183	135	426	3080	3.5A	10.5	23.1
89300061	3/4 x 48	1/2	24	183	135	426	3080	3.5A	10.5	23.1

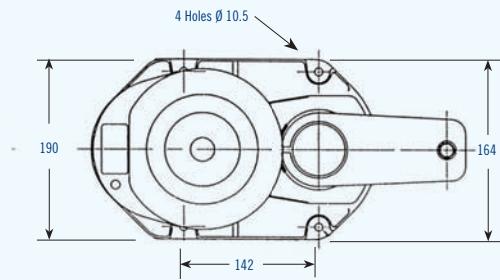
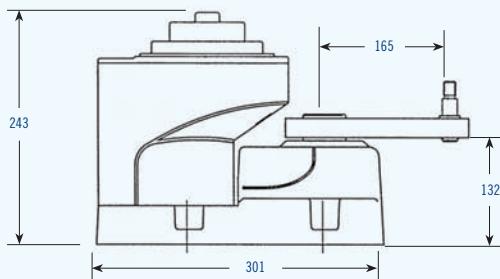
* Voltage relates to clutch.

Direct Drives



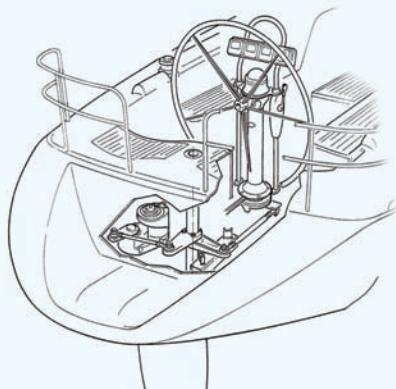
Features

- Available in Constellation™, Cobra™ and Mamba™ steering systems
- Extremely powerful, delivering up to 2432Nm/1794ft-lb of torque
- Virtually zero drag – steering performance is not impaired
- Compact Direct Drive, enabling close mounting to the rudder stock, at any attitude



Direct Drive

Uniquely, the Direct Drive can operate onto the pedestal or gearbox output lever as an alternative to the rudder lever. This offers the installer and boat designer more options for layout as the Direct Drive can be mounted in any attitude.



The illustration (left) shows a typical aft cockpit steering (Cobra™) with a Direct Drive installation mounted alongside the rudder stock. Due to its design, Direct Drive can be mounted far closer to the rudder stock than any other linear drive arrangement. Minimum center distance for the draglink connecting the Direct Drive to the rudder lever is 100mm/4".



Direct Drive Unit Specifications

Part Number	Output Lever Center	HP	*Voltage	No Load Speed Ho-Ho	Max Rudder Torque mKg	Average Current Consumption	Weight kg	Weight lb
89300039	166mm lever	1/4	12	10s	248	1794	4A	8.8
89300041	166mm lever	1/4	24	10s	248	1794	4A	8.8
89300045	166mm lever	1/2	24	12s	345	2496	3.5A	24.8
89300049	166mm lever	1/2	24	17s	493	3566	3.5A	45.5

* Voltage relates to clutch.

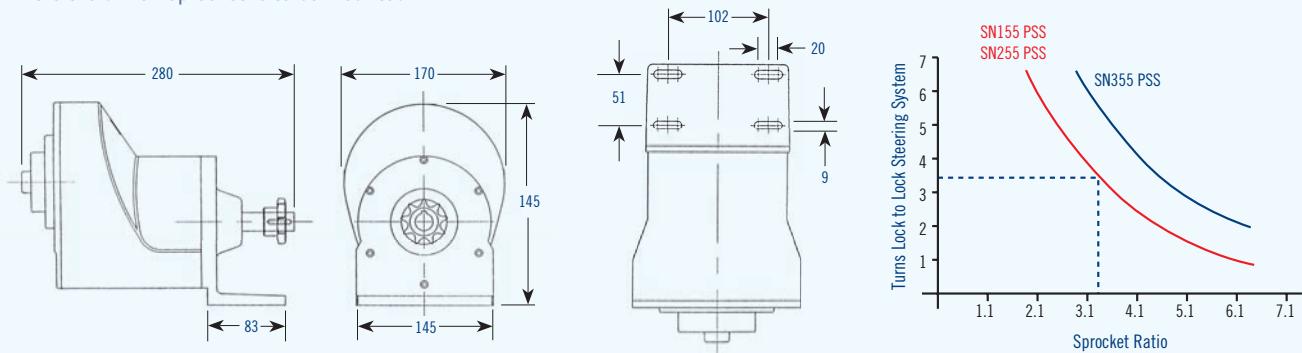
Rotary Sprocket Drives to suit Constellation™ and Mamba™



Lewmar offers three sizes of powerful and compact rotary drive units, which employ conventional chain and sprocket connection to the steering system. The high-efficiency, twin stage, epicyclic gearbox is grease filled, which allows mounting in any attitude. And the wide mounting platform is slotted to aid chain tensioning.

Rotary drives are generally used on cable and push-pull steering systems and it is necessary to calculate the correct driven sprocket, which is dependent on the turns (mechanical advantage) of the steering system. Lewmar can supply fully machined sprockets for your steering system in steel or stainless steel upon request, as well as chain and master links.

Please refer to the graph to calculate the correct sprocket size. The turns lock to lock is referred to at the position on the steering where the driven sprocket is to be mounted.



Rotary Sprocket Drive Unit Specification

Part Number	Sprocket Size	Type	HP	*Voltage	Max Output Torque		No Load Speed RPM	Max Rudder Torque		Avg Current Consumption	Weight kg	Weight lb
					Nm	ft-lb		mKg	ft-lb			
89300000	5/8" P 9T Sprocket	SN155PSS	1/8	12	24	18	44	116	840	2A	7.8	17.2
89300002	5/8" P 9T Sprocket	SN255PSS	1/4	12	43	32	44	207	1500	4A	8.8	19.4
89300004	5/8" P 9T Sprocket	SN255PSS	1/4	24	43	32	44	207	1500	2.5A	8.8	19.4
89300008	5/8" P 9T Sprocket	SN355PSS	1/2	24	47	35	55	332	2400	3.5A	10	22
89300010	5/8" P 9T Sprocket	SN455PSS	1	24	466	344	18	1660	12055	6A	30	66.1

* Voltage relates to clutch.

Mamba™ Sprocket 1HP Drives

Lewmar has developed a 1HP Drive Unit motor suitable for sailing yachts and commercial vessels up to 60m/ 200'.

With the capacity to steer such vessels on a continuous rating basis, utilizing a 1HP twin rotor, ultra high-efficiency printed circuit motor, the unit offers the major advantage of variable speed operation, ensuring far higher steering accuracy and less strain on the steering mechanism and rudder linkage.

The 1HP Twin Rota is compatible with a number of autopilot manufacturers' electronics.

This particular unit typically consumes less than 1/5 of the power consumption of a similarly rated hydraulic power pack. The 1HP Drive has an output rating of 248Nm and a maximum output torque of 468Nm.



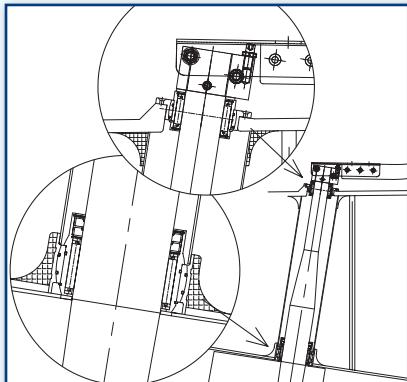
Mamba™ 1HP Drive Unit Specification

Part Number	Type	HP	*Voltage	Max Output Torque Nm	Max Output Torque ft-lb	No Load Speed RPM	Max Rudder Torque mKg	Max Rudder Torque ft-lb	Avg Current Consumption	Weight kg	Weight lb
89300064	SN455PSM	1	24	466	344	18	1,660	12,055	6A	30	66.1

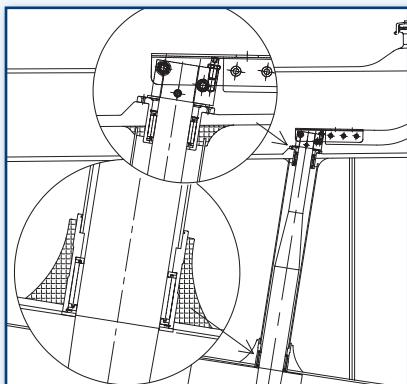
Rudder Bearings and Stocks

Lewmar offers a range of rudder bearings and rudder stocks to complement yacht steering systems. Lewmar's rudder bearings come in two basic types – plain roller and self-aligning roller. We can provide a rudder bearing solution for any yacht, whether it's tiller steered or a Grand Prix racer. Lewmar roller bearings are designed for production yachts as well as custom one-off yachts. Choose from our range or speak to your Lewmar representative for a specification and design to suit your rudder bearing requirements.

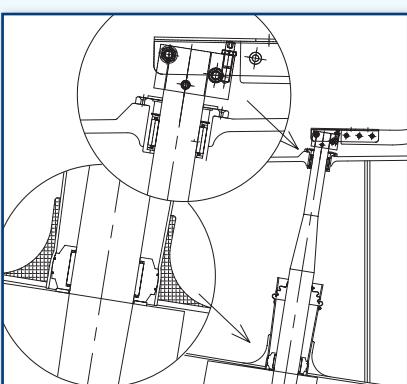
Tiller Steered Yachts – Rudder Bearing Solutions



This tiller steered boat is using self-aligning roller bearings that simplify installation and allow for any bending movement in the rudder shaft when under sailing conditions. A rudder tube is slotted into the lower self-aligning bearing, which extends the lower bearing outer housing up to the upper bearing.



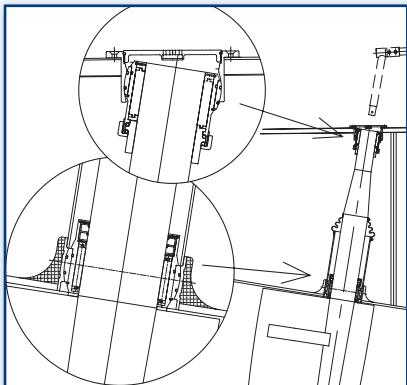
This is a typical example of a production boat using a tiller rudder bearing installation. The lower bearing is quick and simple to install, and there is no laminating or bonding of the bearing to the hull required. When using a conical lower bearing the builder will laminate the hull and the housing, for the bearing is formed using a mold tool. To install, the bearing sealant is applied to the outer surface and then positioned and the nut tightened to hold in position.



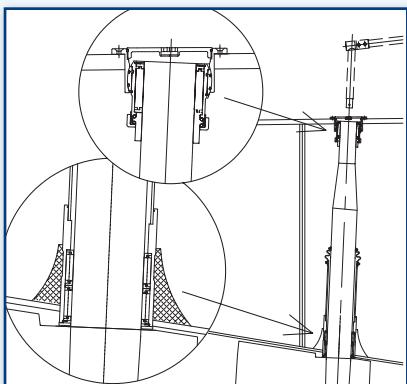
Here is an example of a tiller steered rudder system for a one-off or low volume sailing boat. When aligning the bearings, the rudder shaft must be positioned and the plain roller rudder bearings are either bonded or laminated to the vessel hull and deck.

Rudder Bearings and Stocks (continued)

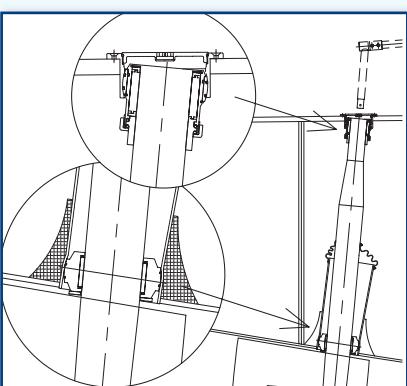
Wheel Steered Yachts – Rudder Bearing Solutions



This wheel steered boat is using self-aligning roller bearings that simplify installation and allow for any bending movement in the rudder shaft when under sailing conditions. A rudder tube is slotted into the lower self-aligning bearing, which extends the lower bearing outer housing up to the upper bearing.



This is a typical example of a production wheel steered boat using a rudder bearing installation. The lower bearing is quick and simple to install, and there is no laminating or bonding of the bearing to the hull required. When using a conical lower bearing, the builder will laminate the hull and the housing, for the bearing is formed using a mold tool inset within the hull mould tool. To install, the bearing sealant is applied to the outer surface and then positioned and the nut tightened to hold in position.



Many production boat builders like this type of solution as it allows for increased angles of the rudder shaft to the hull. The rudder bearing housing is GRP and allows for an easy laminating process to the hull. Sealing the bearing is completed with a gaitor, and these are easily replaced with the requirements to remove the rudder from the boat.



Rudder Bearings and Stocks (continued)

Specification Guidelines

	Tiller Boats	Cruising Yachts	Racing Yachts	Sealing system	
				Lip Seals	Tube & Gaitor
Tiller Head Fittings	•				
Upper Roller Bearings	•	•			
Upper Bearing with deck cover and thrust race		•			
Upper Self-aligning Roller Bearings		•	•		
Upper Self-aligning Roller Brgs with thrust race			•		
Lower Roller Bearings Alloy	•	•		•	•
Lower Self-aligning Roller Bearings Alloy		•	•	•	•
Lower Self-aligning Roller Bearing GRP		•	•		•

Tiller Heads

- Tiller head block manufactured in 6082 alloy and anodized
- Suit shaft diameters 25mm–50mm
- Height and angle adjusted by set screws
- ‘U’ shape channel manufactured in 316 stainless steel

Part Number Rudder Stock Diameter

Part Number	mm	in
89601000	25	1
89601001	30	1 $\frac{3}{16}$
89601002	35	1 $\frac{3}{8}$
89601003	40	1 $\frac{9}{16}$
89601004	45	1 $\frac{3}{4}$
89601005	50	1 $\frac{15}{16}$



Plain Roller Upper Bearing

- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 35mm–109mm
- Precision Delrin rollers
- Low friction co-efficient
- Easy-to-install flanged housing
- Custom sizes available

Part Number Rudder Stock Dia Max Work Load

Part Number	mm	in	kg	lb
89600170-89600179	50 - 59	1 $\frac{15}{16}$ - 2 $\frac{5}{16}$	3000	6614
89600180-89600189	60 - 69	2 $\frac{3}{8}$ - 2 $\frac{11}{16}$	3500	7716
89600190-89600199	70 - 79	2 $\frac{3}{4}$ - 3 $\frac{1}{8}$	4000	8818
89600200-89600209	80 - 89	3 $\frac{1}{8}$ - 3 $\frac{1}{2}$	4500	9921
89600210-89600219	90 - 99	3 $\frac{9}{16}$ - 3 $\frac{1}{8}$	5000	11023
89600220-89600229	100 - 109	3 $\frac{15}{16}$ - 4 $\frac{5}{16}$	5500	12125



Plain Roller Upper Bearing with Deck Cover and Thrust Race

- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 50mm–109mm
- Integral locking ring
- Easy-to-install flanged housing
- Integral deck cover
- Custom sizes available

Part Number Rudder Stock Dia Max Work Load

Part Number	mm	in	kg	lb
89600110-89600119	50 - 59	1 $\frac{15}{16}$ - 2 $\frac{5}{16}$	3000	6614
89600120-89600129	60 - 69	2 $\frac{3}{8}$ - 2 $\frac{11}{16}$	3500	7716
89600130-89600139	70 - 79	2 $\frac{3}{4}$ - 3 $\frac{1}{8}$	4000	8818
89600140-89600149	80 - 89	3 $\frac{1}{8}$ - 3 $\frac{1}{2}$	4500	9921
89600150-89600159	90 - 99	3 $\frac{9}{16}$ - 3 $\frac{7}{8}$	5000	11023
89600160-89600169	100 - 109	3 $\frac{15}{16}$ - 4 $\frac{5}{16}$	5500	12125



Rudder Bearings and Stocks (continued)

Upper Self-aligning Roller Bearings

- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 50mm–120mm
- Bearing includes self-aligning ball and precision Delrin rollers
- Easy-to-install flanged housing
- No grease or maintenance required

Part Number	Rudder Stock Diameter	
	mm	in
89601006-89601015	50 - 59	1 15/16 - 2 5/16
89601016-89601025	60 - 69	2 3/8 - 2 11/16
89601026-89601035	70 - 79	2 3/4 - 3 1/8
89601036-89601045	80 - 89	3 1/8 - 3 1/2
89601046-89601055	90 - 99	3 9/16 - 3 7/8
89600156-89600165	100 - 109	3 15/16 - 4 5/16
89600166-89600175	110 - 119	4 5/16 - 4 11/16
89600176	120	4 3/4



Upper Self-aligning Roller Bearings with Deck Flange and Vertical Thrust Race

- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 50mm–165mm
- Bearing includes self-aligning ball and precision Delrin rollers
- Easy-to-install flanged housing
- Integra Locking ring and vertical thrust race

Part Number	Rudder Stock Diameter	
	mm	in
89600380	50	1 15/16
89600381	60	2 3/8
89600382	70	2 3/4
89600383	80	3 1/8
89600384	100	3 15/16
89600385	115	4 1/2
89600386	120	4 3/4
89600387	140	5 1/2
89600388	150	5 7/8
89600389	165	6 1/2



Lower Aluminum Roller Bearings

- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 50mm–109mm
- Accepts sealing system for lip seals or rudder tube and gaitor
- Low friction co-efficient
- No grease or maintenance required

Part Number	Rudder Stock Dia	Max Work Load	
		kg	lb
89600040-89600049	50 - 59	1 15/16 - 2 5/16	3000 6614
89600050-89600059	60 - 69	2 3/8 - 2 11/16	3500 7716
89600060-89600069	70 - 79	2 3/4 - 3 1/8	4000 8818
89600070-89600079	80 - 89	3 1/8 - 3 1/2	4500 9921
89600080-89600089	90 - 99	3 9/16 - 3 7/8	5000 11023
89600090-89600099	100 - 109	3 15/16 - 4 5/16	5500 12125
89600100-89600109	110 - 119	4 5/16 - 4 11/16	6000 13228

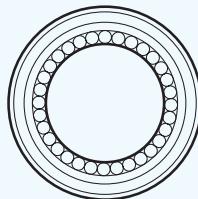
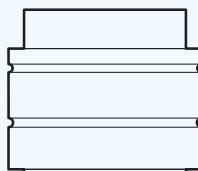


Rudder Bearings and Stocks (continued)

Lower Self-aligning Aluminum Roller Bearings

- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 40mm–140mm
- Bearing includes self-aligning ball and precision Delrin rollers
- Accepts sealing system for lip seals or rudder tube and gaitor
- No grease or maintenance required

Part Number	Rudder Stock Diameter
	mm in
89600453-89600462	40 - 49
89600463-89600472	50 - 59
89600473-89600482	60 - 69
89600483-89600492	70 - 79
89600493-89600502	80 - 89
89600503-89600512	90 - 99
89600513-89600522	100 - 109
89600523-89600532	110 - 119
89600533-89600542	120 - 129
89600543-89600552	130 - 139
89600553	140
	5 1/2



Lower Self-aligning GRP Tube Bearings

- Manufactured with a GRP tube for easy laminating on installation
- Suit rudder stock diameters 50mm–150mm
- Bearing includes self-aligning ball and precision Delrin rollers
- Accepts sealing system for neoprene gaitor
- No grease or maintenance required

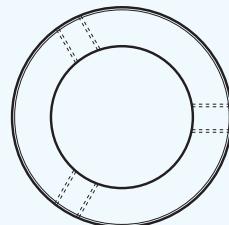
Part Number	Rudder Stock Diameter
	mm in
89601077-89601086	50 - 59
89601087-89601096	60 - 69
89601097-89601106	70 - 79
89601107-89601116	80 - 89
89601117-89601126	90 - 99
89601127-89601136	100 - 109
89601137-89601146	110 - 119
89601147-89601156	120 - 129
89601157-89601166	130 - 139
89601167-89601176	140 - 149
89601177	150
	6



Locking Rings

- Used with upper bearings without integral locking ring
- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 50mm–120mm
- Stainless set screws secure locking ring to rudder stock

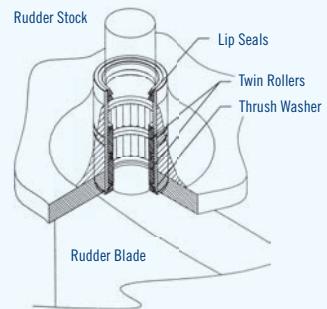
Part Number	Rudder Stock Diameter
	mm in
89600300- 89600309	40 - 49
89600310- 89600319	50 - 59
89600320- 89600329	60 - 69
89600330- 89600339	70 - 79
89600340- 89600349	80 - 89
89600350- 89600359	90 - 99
89600360- 89600369	100 - 109
	3 7/16 - 4 5/16



Rudder Bearings and Stocks (continued)

Lip Seals

- Used with upper bearings without integral locking ring
- Manufactured in 6082 aluminum and anodized
- Suit rudder stock diameters 50mm–120mm
- Stainless set screws secure locking ring to rudder stock



Part Number	Inside Diameter mm	Inside Diameter in	Outer Diameter mm	Outer Diameter in
89600230- 89600239	40 - 49	1 1/2 - 1 15/16	65	2 9/16
89600240- 89600249	50 - 59	1 15/16 - 2 5/16	75	2 15/16
89600250- 89600259	60 - 69	2 3/8 - 2 11/16	85	3 3/8
89600260- 89600269	70 - 79	2 3/4 - 3 1/8	95	3 3/4
89600270- 89600279	80 - 89	3 1/8 - 3 1/2	105	4 1/8
89600280- 89600289	90 - 99	3 9/16 - 3 7/8	115	4 1/2
89600290- 89600299	100 - 109	3 15/16 - 4 5/16	125	4 15/16



Rudder Bearings and Stocks (continued)

Gaitors

- Manufactured from neoprene
- Supplied with stainless steel hose clamps
- Only use a gaitor a minimum 100mm above static water line level



Important Note

Gaitors manufactured upon request to suit rudder stock and alloy tube as required.

Rudder Stocks

Lewmar rudder stocks are produced to specific custom requirements, from either naval architects' designs or via Lewmar's own in-house design capability.

Rudder stocks are manufactured in Aluminum and Stainless Steel – complete with reinforcing tangs to ensure maximum rigidity. Bespoke versions that incorporate aero foils or bar tangs are available to customers' requirements.

Important Note: Never earth electrical equipment to a stainless steel or aluminum rudder stock; this will lead to a galvanic reaction and corrosion of the rudder stock.

Note: When selecting rudder stock and bearing dimensions, Lewmar recommends considering 'non-standard' sizes, e.g. 78mm instead of 80mm. This is because the standard bar material will not provide sufficient tolerances when used, un-machined in the bearing. The necessary tolerance for the rudder shaft to run in roller bearings is +0.00–0.08mm. To achieve the correct fit with the 80mm bearing, it will be necessary to purchase 85mm bar and machine a substantial amount off – 5mm!

Selecting a 78mm stock and bearing that can be manufactured from 80mm bar will be far more economic.

Features

(Rudder Stock)

Aluminum stocks in A1MgSi1 (6082) material

- Stiff, saltwater resistant, light and economic
- Perfect for sailing yachts with GRP and aluminum hulls
- Tensile strength 330N/mm²
- 2% Proof stress is 280N/mm²



Aluminum stocks in A1ZnMgCu1,5 (7075) material

- Very stiff, must be anodized, saltwater resistant and light
- Perfect for racing yachts with GRP and aluminum hulls
- Tensile strength 530N/mm²
- 2% Proof stress is 480N/mm²

Stainless steel aisi316 (1.4401) (SS2347) material

- Saltwater resistant and economic
- Perfect for cruising
- Tensile strength is 600N/mm²
- 2% Proof stress is 205N/mm²

Stainless steel aisi329 (1.4460) (SS2324) material

- Very stiff, and saltwater resistant
- Perfect for cruising yachts
- Tensile strength is 750N/mm²
- 2% Proof stress is 460N/mm²

Distributor List



Argentina

North Sails Sud Argentina

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Harrold Marine Wholesale Pty Ltd

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3/2-4 Moo 5, Koh Keaw, Phuket City,
Phuket, 83200, Thailand
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web: www.phuketsail.com

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email: enquiries@winchservicing.com
web: www.winchservicing.com



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email: info@lewmarusa.com

For a complete list US distributors please visit:

<http://www.lewmar.com/usa/distributors.htm>



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Intermarine

AV Intecomunal De Guatire
Cruse Con C, La Arenera, Venezuela
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web: www.intermarine.com.ve

Caribbean

Antigua Rigging

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web: www.antiguarigging.com

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FKG Marine Rigging & Fabrication NV

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web: www.fkg-marine-rigging.com

Island Rigging and Hydraulics

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fax: 011-340-774-5024
email: islrig@viaccess.net

Martinez Marine Service

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Highway #3, Km 51.4
Fajardo, PR, 00738
tel: (787) 863-4646
fax: (787) 272-8172
web: www.martinezmarine.com



Part Number List

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0057316	28	29101414	125	29163610	163	29399051	156	294433683	174	29473041	176	29901670	140
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66840007	32	68000											

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 rode

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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