Installation and Maintenance Manual

MRPW-03

Powered Performa[™] Winch 60.3 STP E/HY



Index

Introduction	3
Technical characteristics	3
Performance data	3
Weight	4
Maximum working load	4
Outline	5
Winch 60.3 STP E	5
Horizontal electric motor	5
Vertical electric motor	5
Hydraulic motor	5
Installation	6
Installation procedure	7
Winch installation procedure	9
Positioning the self-tailing arm	10
Motor installation procedure	10
Electric wiring diagrams	11
Hydraulic connections diagram	13
Maintenance	14
Washing	14
Maintenance table	14
Winch disassembly procedure	14
Winch exploded view with maintenance products	18
Winch assembly	19
Harken [®] limited worldwide warranty	20
Ordering spare parts	20
Exploded view	21
Performa Winch 60.3 STP E/HY	21
Horizontal electric motor	24
Vertical electric motor	25
Hydraulic motor	26
Parts list	23
Performa Winch 60.3 STP E/HY	23
Horizontal electric motor	24
Vertical electric motor	25
Hydraulic motor	26

Introduction

This manual gives technical information on winch installation and maintenance, including disassembling and reassembling.

This information is DESTINED EXCLUSIVELY for specialised personnel or expert users. Installation, disassembling and reassembling of the winch by personnel who are not experts may cause serious damage to users and those in the vicinity of the winch.

Harken® accepts no responsibility for defective installation or reassembly of its winches. In case of doubt the Harken® Tech Service is at your disposal at techservice@harken.it This Manual is available only in English. If you do not fully understand the English language, do not carry out the operations described in this Manual.

Technical characteristics

	Power ratio	Gear ratio		
1st speed	9,2 : 1	2,2 : 1		
2nd speed	20,3 : 1	4,8 : 1		
3rd speed	61,0 : 1	14,4 : 1		

The theoretical power ratio does not take friction into account.

Performance data

Winch 60.3 STP E (electric)

		horizontal motor					
		12 V (1500 W)			24 V (2000 W)		
		1st speed	2nd speed	3rd speed	1st speed	2nd speed	3rd speed
line speed (m/r	nin)**	38,8	17,7	5,9	46,8	21,4	7,1
max load (K	(g)	290	600	1800	290	600	1800

**Line speed is measured with no load

	vertical motor					
	12 V (1500 W)			24 V (2000 W)		
	1st speed	2nd speed	3rd speed	1st speed	2nd speed	3rd speed
line speed (m/min)**	44,5	20,3	6,8	53,5	24,4	8,1
max load (Kg)	290	600	1800	290	600	1800

**Line speed is measured with no load

		motor nomin	al power (W)	current absorption at winch MWL (A)			
		12 V	24 V	12 V	24 V		
winch 60.3 ST E	horizontal	1500	2000	250	140		
	vertical	1500	2000	225	120		

Winch 60.3 ST HY (hydraulic)

	1st speed	2nd speed	3rd speed		
line speed (m/min)*	66,5	30,3	10,1		
max load (Kg)***	290	600	1800		

* at 20 L/min oil flow (5,28 Gal/min)

*** at 140 bar at 20 l/min

NOTE

The ratio of the line load - pressure is evaluated at nominal flow rate.

The performance is evaluated measuring the pressure and flow on the motor ports.

The performance data are based on oil with a viscosity of 35mm^2 /s [165 SUS] and temperature of 50°C [120°F].

<u>Weight</u>

	ST EH	ST EV	ST H
weight (Kg)	23,2	22,1	19,2

Versions:

EH = horizontal electric winch

EV = vertical electric winch

H = vertical hydraulic winch

Maximum working load



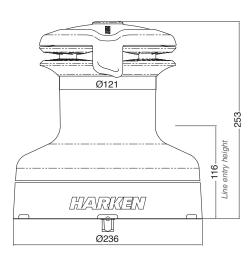
WARNING!

The maximum working load (MWL) for the 60.3 ST Performa[™] Winch is 1800 Kg (3968 lb) Subjecting the winch to loads above the maximum working load can cause the winch to fail or pull off the deck suddenly and unexpectedly during high loads causing severe injury or death.

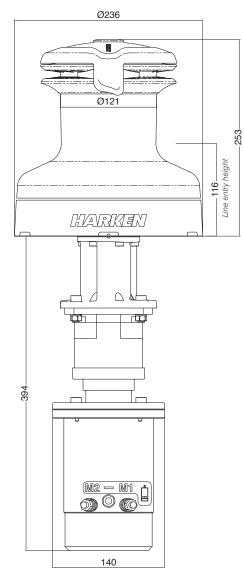


<u>Outline</u>

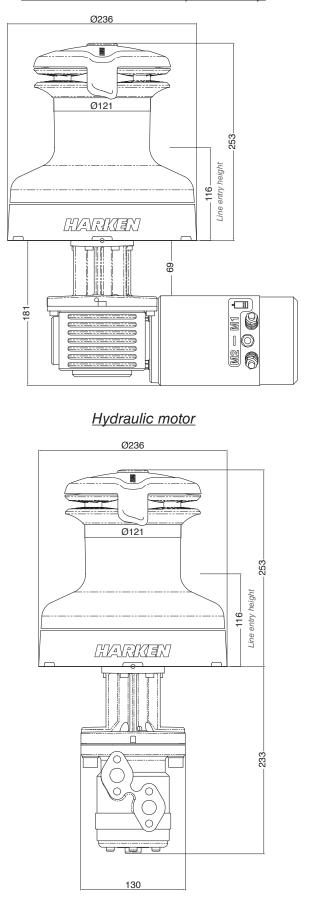
Winch 60.3 STP E/HY



Vertical electric motor (12 V / 24 V)



Horizontal electric motor (12 V / 24 V)



Installation

The winch must be installed on a flat area of the deck, reinforced if necessary to bear a load equal to at least twice the maximum working load of the winch.

It is the installer's responsibility to carry out all structural tests needed to ensure that the deck can bear the load.

Harken[®] does not supply the screws needed to install the winch since these may vary depending on the deck on which it is to be installed.

It is the installer's responsibility to choose the correct screws taking account of the loads they will have to bear.

Harken[®] assumes no responsibility for incorrect installation of its winches or for an incorrect choice of mounting screws.



DANGER!

Incorrect installation of the winch may cause severe injury or death. Consult the yard that built the boat in the case of doubt over the correct positioning of the winch.



WARNING!

Failure to use the correct number and type of mounting fasteners or failure to ensure the correct deck strength can result in the winch pulling off the deck suddenly and unexpectedly during high loads causing severe injury or death.



WARNING!

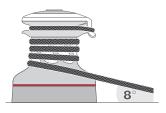
Verify the entry angle of the sheet. This must be 8° with tolerance of $\pm 2^{\circ}$, to avoid sheet overrides and damaging the winch or making the winch inoperable leading to loss of control of the boat which can lead to severe injury or death.



WARNING!

Mount the winch on the deck so that the drive gear is positioned where the sheet enters the winch drum.

Incorrect position of drive gear can weaken winch leading to failure which can cause an accident leading to severe injury or death.





Once you have chosen the correct mounting position for the winch on the deck proceed with installation.

After correctly positioning the final drive gear with respect to the load, check that the motor, gearing, electrical wiring and/or hydraulic pipes can be housed below decks. To help find the optimal compromise, remember that, to make the installation of the motor easier, it can be coupled to the winch in different positions.

Once you have decided the correct mounting position for the winch on the deck and checked the space available below deck, proceed with the installation.



Installation procedure

To install the winch you must remove the drum and use Socket Head (SH) bolts.

Tools needed Composed One medium flat-bladed screwdriver

To identify the various parts, refer to the exploded view at the end of this Manual.

Torque to apply when assembling



1. Pull out the disconnect rod n°37



2. Unscrew the central screw (~2Nm/18 in-lb)



3. Slide off the assy socket $n^\circ 29$ and the cover $n^\circ 28$

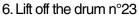


5. Remove the self-tailing arm n°26 by rotating and lifting it.



4. Unscrew the three screws n°27 (∛4Nm/35 in-lb)





Install the winch on the deck in the position you have chosen, keeping in mind the limits described on page 4 and using socket head (SH) bolts.

Follow steps below only to install the winch using hexagonal headed bolts



7. Remove the stripper arm housing n°21



8. Slide out the assy clutch n°36



9. Slide out the central shaft n°19



10. Unscrew the 6 hex screws n°17 (~20Nm/177 in-lb)



11. Remove the drum support $n^\circ 16$

Install the winch on the deck in the position you have chosen, keeping in mind the limits described on page 4 and using hexagonal headed M8 bolts.

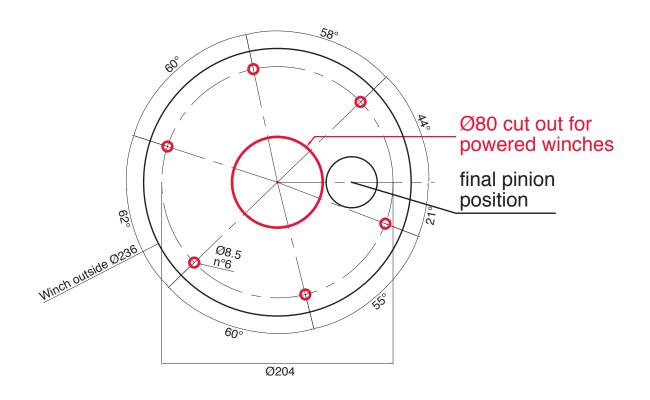
Winch installation procedure

Carry out Installation procedure then install the winch on the deck in the chosen position

A. Position the base of the winch on the deck and mark the position of the holes or use the drilling cut-out template at the point where you have decided to place the winch.

Below is a reduced scale diagram.

The drilling cut out template is available on the Harken[®] website, www.harken.com



B. Remove the winch and drill the six 8.5 mm diameter holes.

C. Bolt the base of the winch to the deck using five M8 Socket Head (SH) bolts (no supplied by Harken[®]), correctly chosen for the thickness and type of the boat deck. Consult the yard that built the boat in case of doubt.



WARNING!

To install the winch on the deck, use only bolts in A4 stainless steel (DIN 267 part11). Bolts made of other materials may not have sufficient strength or may corrode which can result in winch pulling off deck suddenly and unexpectedly during high loads causing severe injury or death.

NOTICE

To mount winches on the deck, do not use countersunk bolts.

- **D.** Fill the mounting holes with a suitable marine sealant.
- E. Remove the excess adhesive/sealant from the holes and base drainage channels
- **F.** Reassemble the winch following the steps in Installation procedure (page 7) in the reverse order, and apply the products indicated in the section on maintenance.

NOTICE

Before closing the winch, make sure the holes and drainage channels in the base of the winch are not obstructed.

Positioning the self-tailing arm

Position the self-tailing arm so that the line leaving the winch is led into the cockpit.

Motor installation procedure



WARNING!

Make sure that the power is switched off before installing or carrying out maintenance on the winch.

Once you have installed the winch on the deck, proceed with motor installation. The motor can be coupled to the winch in different positions. Check the space available below deck and choose the suitable position.

Tools needed



A number five hex key A number six hex key (only for vertical electric motor) A number ten hex key (only for hydraulic motor) Two number thirteen wrenches



1. Position the flange (see Page 10)



2. Tighten six M6 precote coated screws (~8 Nm/ 71 in-lb)



3. Position the reduction gear and motor



4. Tighten the two screws (~8 Nm/ 71in-lb). Be sure to align the flange.



NOTICE

Before positioning the flange, check to make sure that seals (the first one is above the flange and the second one is under the flange) are seated correctly.



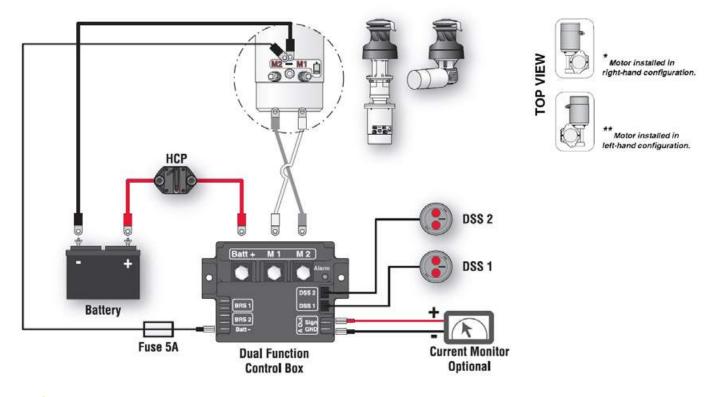
After winch is assembled and before sailing, test the powered winch functioning: insert the lock-in winch handle in the handle socket and check that the disconnect rod must disconnect gearbox.

Electric wiring diagrams

To guarantee greater efficiency in terms of safety and long life, for every winch model is mandatory to install the Dual Function Control Box.

For more information, refer to the Dual Function Control Box manual.

Refer to the following diagrams for the electric wiring:





WARNING!

Read the Dual Function Control Box manual carefully before installing and using the device.

NOTICE

For other installations, refer to the Dual Function Control Box manual.

Fasten the Dual Function Control Box containing solenoids to bulkhead or wall: refer to the Dual Function Control Box manual. Install remote circuit breaker between power supply and Dual Function Control Box. Locate push-buttons on deck in a convenient spot for easy winch operation: refer to the Digital System Switch manual.

Refer to the following chart for wire size:

Total distance between winch and battery

Winch size	Current voltage	Under 16.4 ft AWG	Under 5 m mm²	16.4 - 32.8 ft AWG	5 m - 10 m mm²	32.8 - 49.2 ft AWG	10 m - 15 m mm²	49.2 - 65.6 ft AGW	15 m - 20 m mm²
46.2	12 V	2	32	0	50	00	70	000	95
46.2	24 V	5	16	3	25	2	35	0	50

NOTICE

To connect motor, attach cable terminals to clamps between nut and lock nut. Hold nut in contact with motor using a spanner and tighten other nut with second spanner. Take special care not to turn the central spindles. Be careful not to turn central spindles. These instructions apply when assembling and disassembling. We recommend using a torque wrench so as to obtain a torque equal to and no greater than 10 Nm (88 in-lb).



HARKEN

NOTICE

Note that correct electrical contact sequence is: Nut – Cable Terminal – Self-Locking Washer – Lock Nut





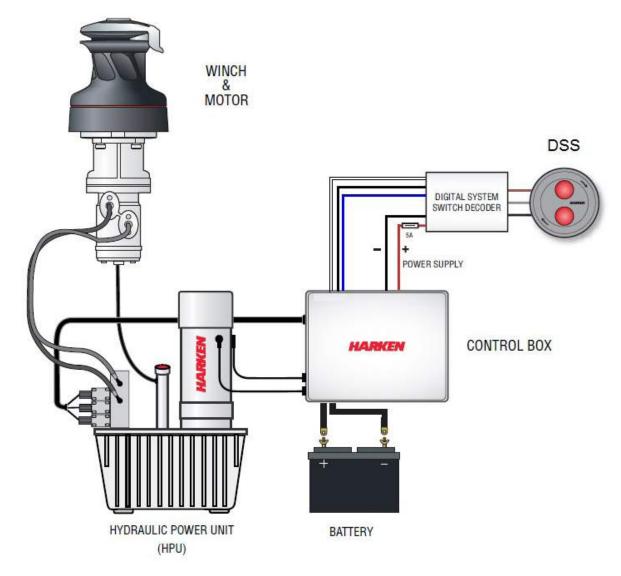
Hydraulic connections diagram

The hydraulic motor must be connected to a hydraulic system using two high-pressure tubes which serve for input or output according to the direction in which the motor will be run. The motor also needs a third connection with a low pressure tube for drainage, so that excess oil can return to the main tank to avoid shortening the life of the motor. This motor uses an open centre valve.

Refer to the following chart for the hydraulic system:

For the hydraulic motor:

Input/output pipe thread: G 1/2 – depth 15 mm Drainage pipe thread: G 1/4 – depth 12 mm





WARNING!

Refer to the Hydraulic Power Unit and Control Box manual.



WARNING!

Refer to the Digital System Switch manual.



Maintenance

Washing

Winches must be washed frequently with fresh water, and in any case after each use.

Do not allow teak cleaning products or other cleaners containing caustic solutions to come into contact with winches and especially anodised, chrome plated or plastic parts.

Do not use solvents, polishes or abrasive pastes on the logos, on the stickers on the winches or on any anodized, chrome plated and plastic surfaces.

Make sure that the holes and drainage channels in the base of the winch are not obstructed so that water does not collect.

Maintenance table

Winches must be visually inspected at the beginning and end of every season of sailing or racing. In addition they must be completely overhauled, cleaned and lubricated at least every 12 months. After an inspection, replace worn or damaged components. Do not replace or modify any part of the winch with a part that is not original.



WARNING!

Periodic maintenance must be carried out regularly. Lack of adequate maintenance shortens the life of the winch, can cause serious injury and also invalidate the winch warranty. Installation and maintenance of winches must be carried out exclusively by specialized personnel.

In the case of doubt contact Harken® Tech Service at techservice@harken.it



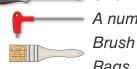
WARNING!

Make sure that the power is switched off before installing or carrying out maintenance on the winch.

Winch disassembly procedure

Tools needed

One medium flat-bladed screwdriver



A number five hex key

Rags

To identify the various parts refer to the exploded view at the end of this Manual.

 $^{\sim}$ Torque to be applied in assembly phase

Carry out **Installation procedure** (page 7) as shown in the paragraph on winch installation and then do the following:



7. Remove the stripper arm housing n°21



8. Slide out the assy clutch n°36



9. Slide out the central shaft n°19



10. Unscrew the 6 hex screws n°17 (~20Nm/177 in-lb)



11. Slide out the drum support $n^\circ 16$



12. Remove the gear n°30, pawls carrier n°32, the bearings n°33 and 35 and the pin n°34 Important: washer n°7 may remain inside the drum support!



13. Remove the gear $n^\circ 6,$ pawls carrier $n^\circ 3$ and the washer $n^\circ 7$



14. Remove the idler and pinion n°14



15. Remove the pawl carrier n°11



16. Remove gear n°10



17. Remove the gear $n^{\circ}2$



18. Remove the roller bearing $n^{\circ}12$



18. Remove roller bearings n°15





I. Unscrew the 4 screws n°25 (~4Nm/35 in-lb)

II. Remove the jaws n°22

If it is necessary to replace any jaws of the winch, proceed as follows: Inspect balls inside the drum and carefully check the correct position; if it is necessary to put back any balls, push balls in the race (as shown below):



Once the winch is completely disassembled, clean the parts: use a basin of diesel oil to soak metal components and rinse plastic parts in fresh water. Once you have done this, dry the parts with cloths that do not leave residue.

Inspect gears, bearings, pins and pawls for any signs of wear or corrosion.

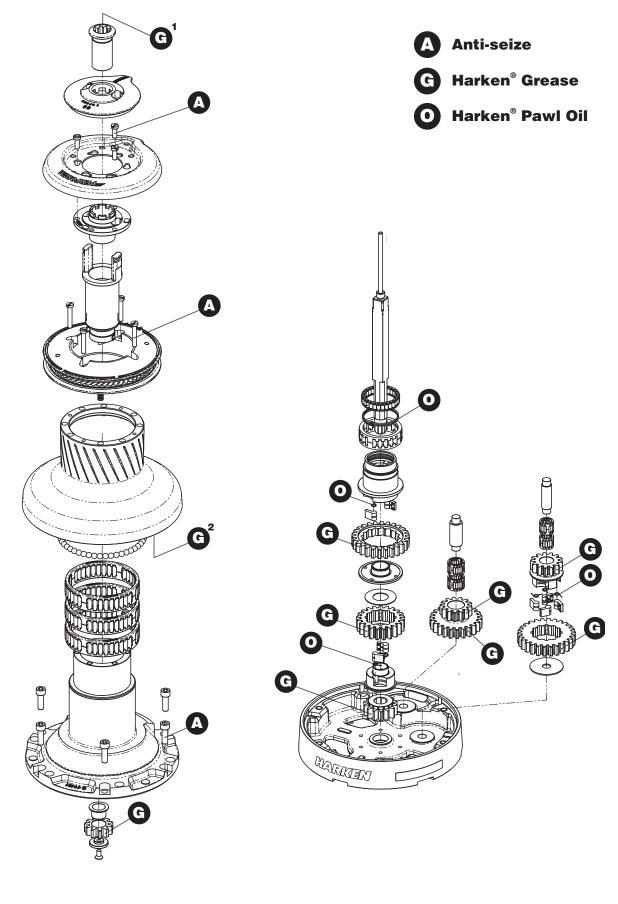
Carefully check the teeth of gears and ring gears to make sure there are no traces of wear.

Check the roller bearings and check there are no breaks in the bearing cages. Replace worn or damaged components.

Carry out maintenance on components using the products listed below. For more information on which products to use where, refer to the exploded diagram below.

Use a brush to lightly lubricate all gears, gear pins, teeth and all moving parts with grease. Lightly lubricate the pawls and springs with oil. Do not use grease on the pawls!

Exploded view with maintenance products



1. Apply Harken[®] grease on assy socket screw - 2. Apply Harken[®] grease on drum gear

Performa[™] Winch 60.3 STP E/HY



Assembly

Make sure that the holes and drainage channels in the base of the winch are not obstructed. Assemble the winch in the reverse order of the sequence in the section on disassembly.

To tighten bolts, use the torque indicated in the disassembly procedure.

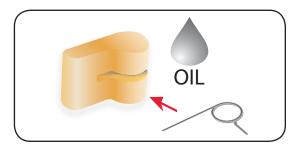


When positioning the stripper arm, align the peeler with it. If the jaws have been disassembled, insert peeler between the two jaws, taking care that the letters TOP on the

peeler are facing upwards.

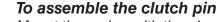


The icon ▲ on the Stripper Arm Housing indicates the Stripper Arm final position. Change the Stripper Arm Housing angle to modify the Stripper Arm final position.

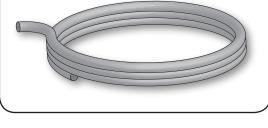


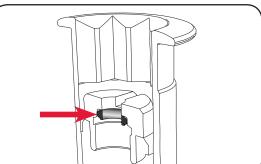
To assemble the pawls

Correctly position the spring in its housing as shown at left. Hold the spring closed and slide the pawl into its housing. Once in position, check that the pawls can be easily opened and closed with a finger.



Mount the spring with the pin pointing upwards so that it is wound in an anticlockwise direction starting from the pin.





NOTICE

Before screw the central screw, check the correct position of the o-ring in the assy socket and apply Harken[®] grease.

In case of doubt concerning the assembly procedure contact Harken[®] Tech Service: techservice@harken.it

Harken[®] limited worldwide warranty

Refer to the Harken[®] Limited Worldwide Warranty in the Harken[®] Catalogue and on the website www.harken.com

Ordering spare parts

Spare parts can be requested from Harken[®] as described in the Harken[®] Limited Worldwide Warranty, indicating the part number in the Parts List and including the serial number of the winch for which the parts are required.

The serial number of the winch is printed on a plate on the drum support of the winch.



Manufacturer

Harken[°] Italy S.p.A. Via Marco Biagi, 14 22070 Limido Comasco (CO) Italy Tel: (+39) 031.3523511 Fax: (+39) 031.3520031 Email: info@harken.it Web: www.harken.com

- Tech Service Email: techservice@harken.it
- Customer Service Tel: (+39) 031.3523511 Email: info@harken.it

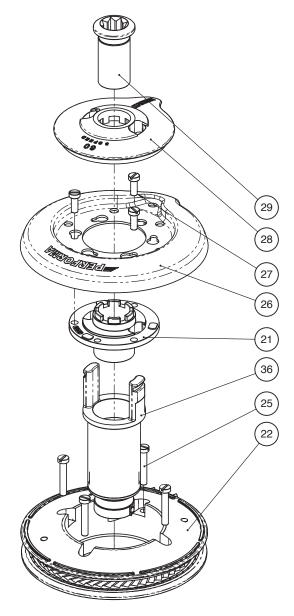
Headquarters

Harken[°], Inc. 1251 East Wisconsin Avenue Pewaukee, Wisconsin 53072-3755 USA Tel: (262) 691.3320 Fax: (262) 691.3008 Email: harken@harken.com Web: www.harken.com

- Tech Service Email: technicalservice@harken.com
- Customer Service
 Tel: (262) 691-3320
 Email: customerservice@harken.com

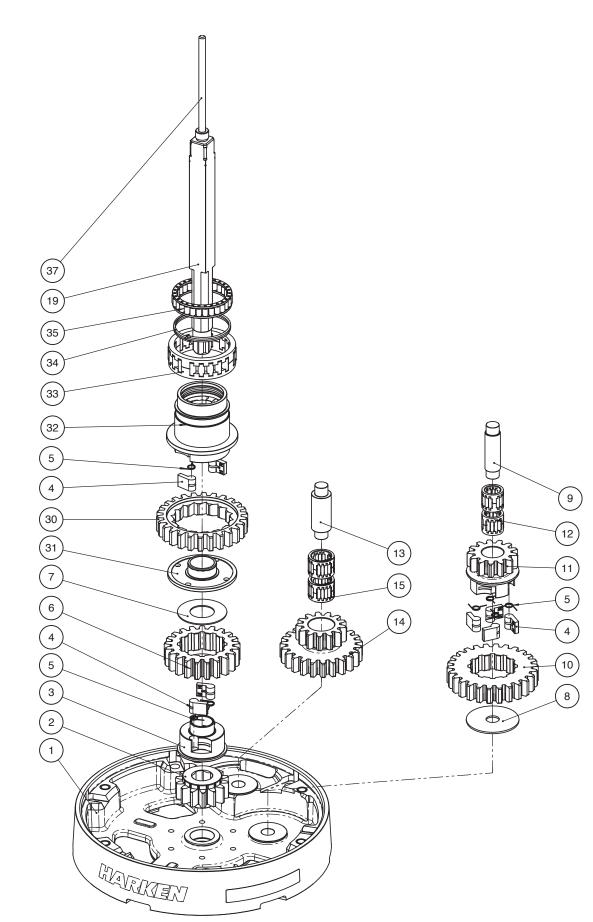
Performa Winch 60.3 STP E/HY

∞ 23 24) 18 16 (17) 0 20 38



HARKEN

Performa Winch 60.3 STP E/HY



HARKEN



Performa Winch 60.3 STP E/HY

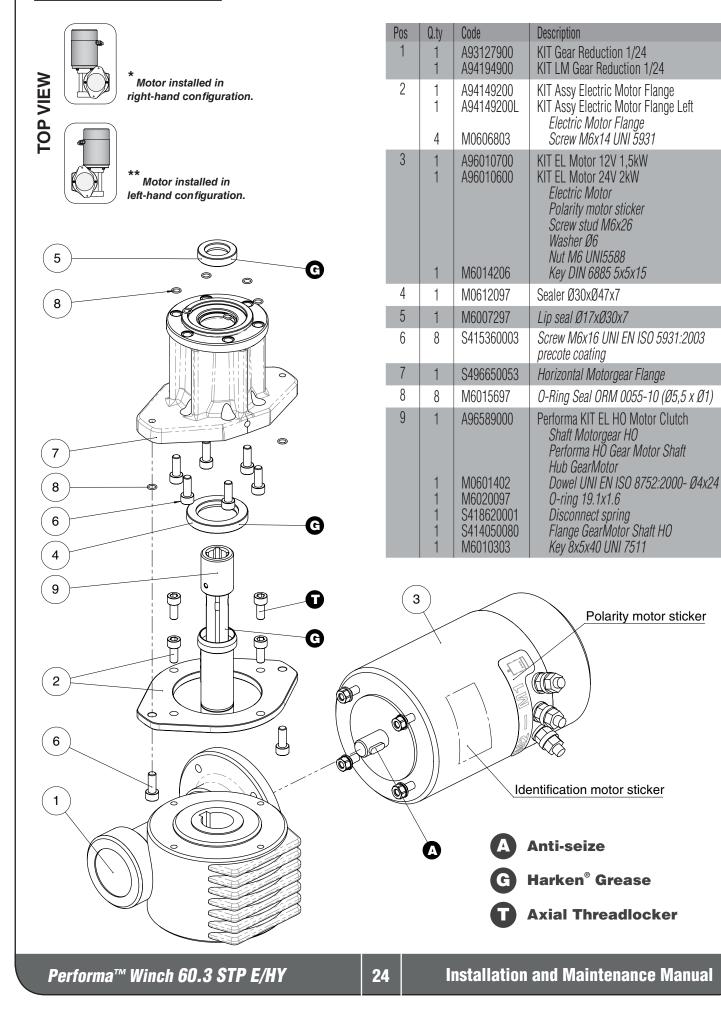
Pos	Q.ty	Code	Description	Pos	Q.ty	Code	Description
1	1	A96574500	Performa Assy Base W60 EL/HY	21	1	S4155700A0	Stripper arm support
			W60 Performa Base	22	1	A96555900	Performa Assy Jaws W60
	1	S476030004	Heli-coil M8x10 Centering bushing Ø12				Lower Jaw W60
	l i	S4130900A7	Bushing Ø22xØ25x8.5		1	S414850080	Upper Jaw W60 Peeler W60 - 70
	2	S415580085	Bushing Ø12xØ35x9		4	S018520001	Spring
			Winch Product Sticker**	23	1	A76537501	Performa Drum Assembly W60
2	1	S414400004	Gear Z14 W60	24	47	M0610280	Ball 5/16"
3	1	S413030004	Pawls Carrier Ø8xN2	25	4	M0601803	Screw UNI EN ISO 1207:1996 - M6x35 - A4
4	8	S000090004	Pawl Ø8*	26	1	S657410019	Performa Black Stripper Arm W60
5	8	S000380001	Pawl Spring Ø8*	27	3	M0601903	Screw M6x16 UNI1207
6	1	S414390041	Ratchet Gear Z21xN2	28	1	S4167500B1	Cover 3 Speed W60
7	1	S413120002	Washer Ø22.5xØ45x1	29	1	A94191400	Assy Socket Handle Winch 3speed EL/HY
8	1	S278170002	Washer Ø12.5xØ48x1.5			0.4.4.0.400.05	Socket Handle 3 speed
9	1	S281010004	Pin for gear		1	S414940085 S414930003	Washer Ø25xØ15x4 Nut Screw for Disconnect Rod
10	1	S414420041	Ratchet Gear Z26xN4			M0679797	O ring RC 2025 series
11	1	S414410004	Pawls Carrier Gear Z13 N4	30	1	S280870041	Gear 1V
12	2	A72821800	Roller Bearing Ø14xØ20x18	31	1	S414580081	Shim Bushing 3 speed
13	1	S416030004	Gear Pin Ø12xØ18x52,5	32	1	S415400004	Pawls Carrier 3 speed
14	1	S414480004	Idler and Pinion Z23/Z13 W60	33	1	A73129200	ROLLER BEARING 50-62-20 ERTA P
15	2	A74162300	Roll bearing Ø24xØ18x18	34	1	S377510001	Clutch Spring
16	1	A94190800	Assy Housing Winch 60.3	35	1	A73422600	Bearing 045x055x12
			Housing Ŵ60 Heli-coil M6x9	36	1	A94158000	Assy Clutch 3rd speed W60
	2	S415580085	Bushing Ø12xØ35x9				Assy Command tube W60
	1	S415810081	Bushing		1	S415420004	Dog Clutch 3 speed
17	6	M0606303	Screw M8x25 UNI 5931	07	2	M6009463	Spring loaded ball plunger Ø6 Disconnect rod W60.3
18	3	A74145000	Roller Bearing Ø95xØ107x26	37 38	1	S419020002 A94145300	Assy Gear 3rd speed
19	1	A96753600	Assy Central Shaft Winch 60 EL/HY	30	1	S41453000	Idler Gear 3 speed
			Čentral Shaft Pred. W60		1	S414550081	Bushing Ø22xØ25x15.5
	1	S413880002	Washer Ø17.2xØ32x1.5		1	S414540080	Washer 3 speed
20			Winch Serial Number Sticker		1	M0604003	Screw M6x12 UNI 5933

*Available with service kit; see website www.harken.com

**Winch product sticker



Horizontal electric motor



Vertical electric motor

Pos Q.ty Code Description		Pos Q.ty	Code	Description
1 1 A96010500 KIT EL Motor 1 A96010400 KIT EL Motor		3 1	A94150500	KIT EL VT Motor Flange
Electric Ma		4	M0602903	Vertical Motorgear Flange NUT M8 - UNI 5588 - A4
Polarity me	otor sticker	4	M0603103	WASHER 8.4 U1751 DIN127 A4
	20 UNI5931 885 5x5x15	1	M6007297 M6015697	Lip seal Ø17xØ30x7 0
	tion gear box 1/21.3	6	S415360003	0-Ring Seal ORM 0055-10 (Ø5,5 x Ø1) Screw M6x16 UNI EN ISO 5931:2003
	lioli yoai box 1/21.0		14000000	precote coating
		4	M0606303	Screw M8x25 UNI 5931
		4 1	A94193700	KIT EL VT Motor Clutch Connecting Coupling Ø31.5
				Toothed coupling
		1	M0620401	Spring pin 5x40 DIN1481
		1	S326490001 S415040080	Spring Bushing
		1	S329360082	Washer
		1	M0666603	Screw M6x16 UNI 5933
	Ŕ			
				•
		•		0
)))))))))))))))))))))))))))))))))))))))
				/
)
			\bigcirc \circ	4
Ο		0		
				0
			5))@	
G G				")
· · · · · · · · · · · · · · · · · · ·				
	ntification motor sticker			
	Polarity motor sticker	Ì.		
		``		
				Anti-seize
		De la		
				G Harken [®] Grease
				Axial Threadlocker
				-

Performa[™] Winch 60.3 STP E/HY



Hydraulic motor

Dee	0.44	Codo	Description	Dee	0+4	Codo	Description
Pos 1	Q.ty	Code G045942000Y	Description Hydraulic motor W46-60	Pos 4	Q.ty	Code A94149100	Description KIT HV Motor Flance W/6-70
2	1	S415000080	Hydraulic Motor Spacer	4		A34143100	KIT HY Motor Flange W46-70 Hydraulic Motorgear Flange Screw M6x16 UNI EN ISO 5931:2003
3	1	A94193200	KIT Clutch HY Motor W46-70		6	S415360003	Ścrew M6x16 UŇI EN ISŎ 5931:2003
0		A94195200	Toothed couplina		6	M6015697	precote coating O_Ring Seal ORM 0055-10 (Ø5.5 x Ø1)
			Connecting Coupling Ø31.5 Spring pin 5x40 DIN1481		1	M6007297	0-Ring Seal ORM 0055-10 (Ø5,5 x Ø1) Lip seal Ø17xØ30x7 Washer D.13 U1751 DIN127
	1	M0620401 S415010080	Spring pin 5x40 DIN1481 Bushing		2	M0621503	Washer D.13 U1751 DIN127
	1	S326490001	Spring		2	M0667103	Screw M12x35 UNI5931
	1	S329360082 M0635303	Washer Screw M8x16 UNI6109				
		100000000					
		\frown		- G			A Anti-seize
		4		0			
							G Harken [®] Grease
							Axial Threadlocker
						1	
				6			
		4					
				2			
				(1)			A
				\checkmark	,		¥
		3					
		\prec			Ŕ	$\langle \langle \rangle \rangle$	H
				ĺ		\mathcal{M}	
						NO.	
					L		J
					b		
			G		Ø)	
		(3)		(4)	ρ		
) /			U
					Ļ		
					\cup	I	
			L				