



TerrAdaptor™

Winch Brackets

The TerrAdaptor Standard and Capstan Winch Brackets are lightweight and compact brackets designed specifically for use with the TerrAdaptor tripod system. There are three options to choose from: the Standard Winch Bracket, Capstan Winch Bracket and the Capstan Winch Bracket Assembly (includes the Harken 40.2 ST two speed winch).



Standard Winch Bracket (P/N 230550)

The **Standard Winch Bracket** is designed primarily for mounting crank operated winches used in the work and rescue markets. The standard winch bracket was designed specifically with the bolt pattern predrilled and ready to assemble the DBI/SALA9000004 mounting bracket and the Tractel Winch T2S5OG directly onto the bracket. Follow the winch manufacturer recommendations for proper mounting of the winch to the bracket using the supplied hex bolts and lockwashers (4 each are supplied). The bolts should be torque to 20 lb/ft (DO NOT OVER TIGHTEN).

Other winch models can be mounted to the standard bracket. The dimensions of the bracket are 3½" x 9" x ½" thick and is made from aluminum plate. The top plate will need to be drilled and tapped with additional holes to meet the specific bolt pattern of your winch. See the winch manufacturer recommendations for proper mounting and do not exceed manufacturers rating.

The bracket is designed to be used with winches utilizing rope, wire rope or cable. If wire rope or cable is selected, be sure to use the TerrAdaptor Steel Sheave Assembly (P/N 230360) rather than the Standard TerrAdaptor Sheave Assembly (P/N 230350) as your re-direct accessory.

Capstan Winch Bracket (P/N 230551)

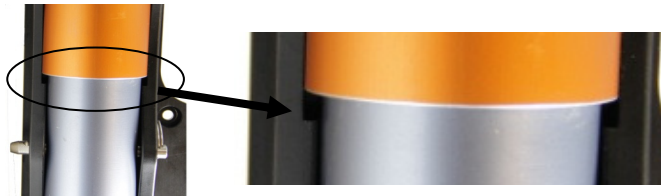
The Capstan Winch Bracket is designed specifically for mounting a Harken 40 ST or 40.2 ST capstan winch. The top plate is predrilled and ready for assembly. Follow the Harken recommendations for proper mounting of the winch to the bracket using the supplied stainless cap screws, washers and hex nuts (5 each). The screws should be torque to 6 or 7 lb/ft (*DO NOT OVER TIGHTEN*).

The TerrAdaptor Capstan Winch Bracket employs a lightweight stainless loop that guides the rope into the capstan at the correct angle for maximum grip of the rope. The guide loop can also mind prussics which can simplify progress capture rigging.

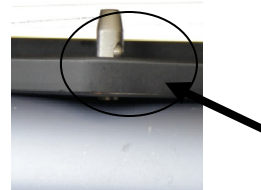


Attaching The Winch Bracket to the TerrAdaptor System

The bracket is normally located on the rear leg of a tripod, but it can be located on any leg provided the rope or cable is safely routed. It can be attached anywhere along the smaller diameter Perf Tube. It can also be attached at the junction between the Perf Tube and larger Mid Tube by lining up the relief in the sideplates of the bracket at the junction of the two tubes as shown in the picture below. Once positioned, insert the three long quick release pins (with rings) so that the ball detent is fully exposed on the opposite side as shown in the picture below.



Attached at Junction



Ball should be visible

The bracket also has high strength auxiliary attach points (see Table 2-1) at each end for rigging belays, progress capture, tie down, and other rigging needs.

Capstan Winch Bracket Assembly

The Capstan Winch Bracket Assembly comes fully assembled with the Harken 40.2 ST two speed winch, including the Harken 10 inch lock-in aluminum speed grip handle. Simply attach the assembly to the TerrAdaptor leg with the long quick release pins as described above. For more information on the Harken winch go to www.harken.com.

Rigging the Capstan Winch

The rope is routed from the load, through the redirect accessory (pulley, sheave assembly or other gear) located at the tripod head, through the guide loop on the winch bracket and then onto the winch. Specifically, begin at the bottom of the capstan, wrap the rope clockwise around the capstan several times (number of wraps varies with rope diameter) without overlapping until the rope has reached the top of the drum. Finish by putting the tail of the rope over the chrome stripper arm and then between the upper and lower spring loaded jaws of the self tailing mechanism. Install handle. (Please see the Harken User Manual for further information on proper use of the winch).

Raise loads by turning the handle in the direction that provides the best mechanical advantage for your situation. Depending on the weight of the load and the speed needed to raise the load, it may be more efficient to place one foot near the base of the tripod leg or lash the leg to the surface for greater stability. Note that the winch can be rigged for progress capture by attaching prussic or other progress capture devices to the rigging points on the winch bracket.



Lower loads by using the capstan as a belay drum to provide friction. While retaining a firm grasp on the rope tail and supplying tension on the capstan, unwind the rope from between the upper and lower spring loaded jaws and then from the stripper arm. While remaining in control of the rope tail, slowly decrease tension and allow the rope to slip on the capstan to lower the load at the desired speed. Capstan winches must be tailed either manually or by means of the self tailing mechanism. To return to a raise, again wrap the tail of rope over chrome stripper arm and then between the upper and lower spring loaded jaws and turn with the handle.

The TerrAdaptor system employing a capstan style winch is used for raising and lowering typical rescue loads of 300 to 600 pounds using ropes common to rope rescue. Capstan winches are not designed to catch a falling load nor does it employ any type of braking mechanism. If fall protection or a belay line is required then it should be rigged independently.

Also see www.harken.com for more information and recommendations for proper winch mounting and use. Do not exceed winch manufacturers rating.

Best Practice:

Cable winches should be mounted on the inside of the tripod so the cable does not drag on the leg tubes. Capstan winches are easier to operate when they are mounted on the outside of the leg. When possible, secure feet directly to anchors to create a more rigid setup.

Care & Maintenance:

Check all components for bending and warping which could indicate overloading.

Auxiliary attach points can be both tied into and clipped into. As a result, pay careful attention to sharp edges or burrs that may have developed. Lightly file or sand off burrs before use.

Warnings:

- Carabiners clipped into auxiliary attach points should be positioned to avoid cross or side loading
- Do not use the normal leg coupling pins to attach the winch bracket as they are too short and could result in the winch bracket detaching from the leg and resulting in injury or death
- See winch manufacturers recommendations for proper winch mounting and do not exceed manufacturers rating when operating winches
- Failure to maintain control of the rope tail on Capstan winches could result in injury or death due to falls

Table 2-1 - Strengths of auxiliary attachment points

Auxiliary Attach Point	Breaking Strength
Lash Ring – Single Hole	4,500 lbf. (20kN)
Lash Ring – Opposing Holes	5,600 lbf. (25kN)
Talon Foot	6,744 lbf. (30kN)
Rocker Foot	6,744 lbf. (30kN)
Articulating Foot Adaptor	6,744 lbf. (30kN)
Quick Lash – Straight Pull	6,744 lbf. (30kN)
Quick Lash – Pulled to Side	3,372 lbf. (15kN)
Winch Brackets	6,744 lbf. (30kN)
Head Auxiliary Attachment Points	8,000 lbf. (36kN)

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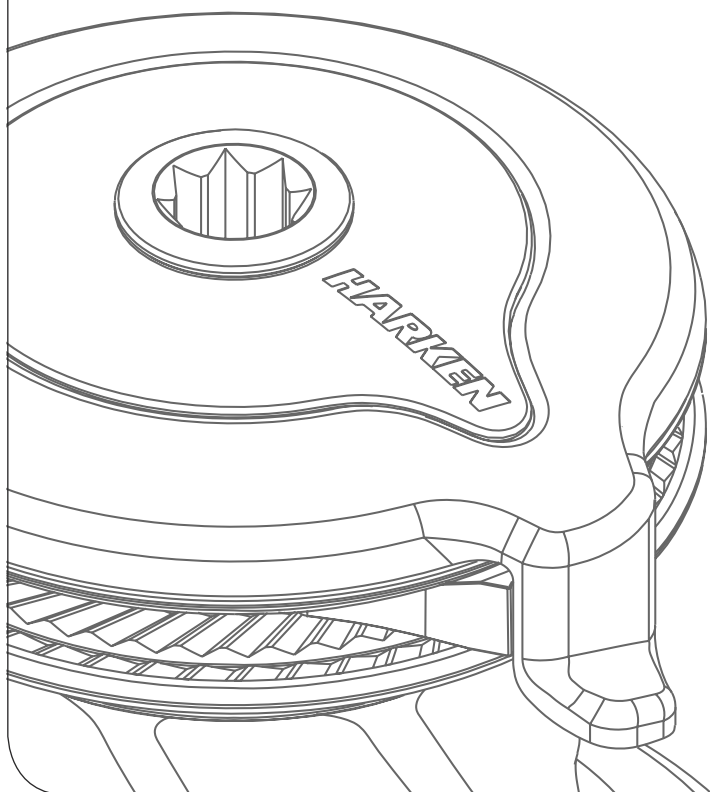
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Installation and Maintenance Manual

MRW-01

Radial Winch 40.2 ST



HARKEN[®]

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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	13,50 : 1	2,13 : 1
2nd speed	39,90 : 1	6,28 : 1

The theoretical power ratio does not take friction into account.

Weights

	ST A version	ST C version
Weight (Kg)	3,8	5,4

Versions:

A = drum in anodised aluminium

C = drum in chromed bronze

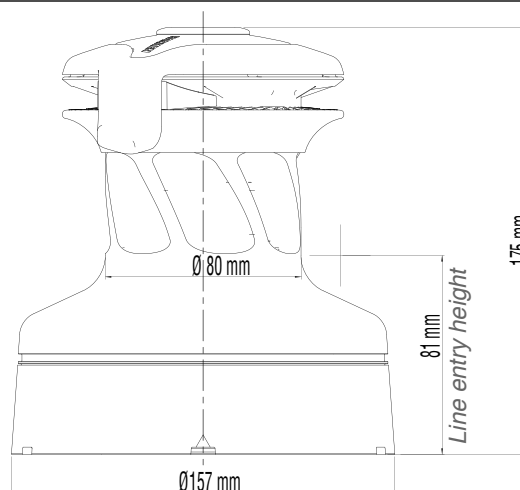
Maximum working load



WARNING!

The maximum working load (MWL) for the 40.2 ST Radial Winch is 850Kg (1874 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.

Outline



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.



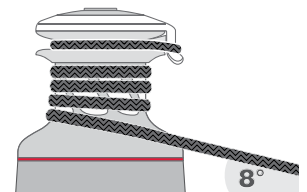
WARNING!

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.



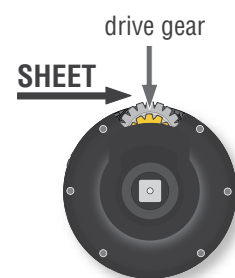
WARNING!

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.



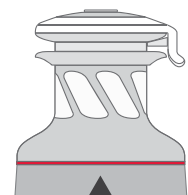
WARNING!

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.



NOTICE

You can find the icon ▲ on the skirt to identify the drive gear position.



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

The winch can be installed following one of the two procedures below (**Procedure 1** or **Procedure 2**):


Procedure 1

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

Tools needed

 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. Unscrew the central screw ($\approx 2\text{Nm}/18\text{ in-lb}$)



2. Slide off the hub n°28 and the cover n°29



3. Unscrew the three screws n°27 ($\approx 4\text{Nm}/35\text{ in-lb}$)



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



5. Lift off the drum n°22

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.
(See paragraph on installation)

Procedure 2

To install, you must remove the winch skirt and use hexagonal headed bolts.

Tools needed



One medium flat-bladed screwdriver

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



1. Remove the skirt n°2 with the help of the screwdriver placed as shown by the symbol 



2. Take off the base n°2



3. Position the 5 M6 hexagonal headed bolts in their holes



4. Reposition the skirt n°2 in its housing



5. Press down the skirt to position it correctly

NOTICE

Make sure the skirt is correctly clipped on to the base of the winch.

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 bolts.
(See paragraph on installation)

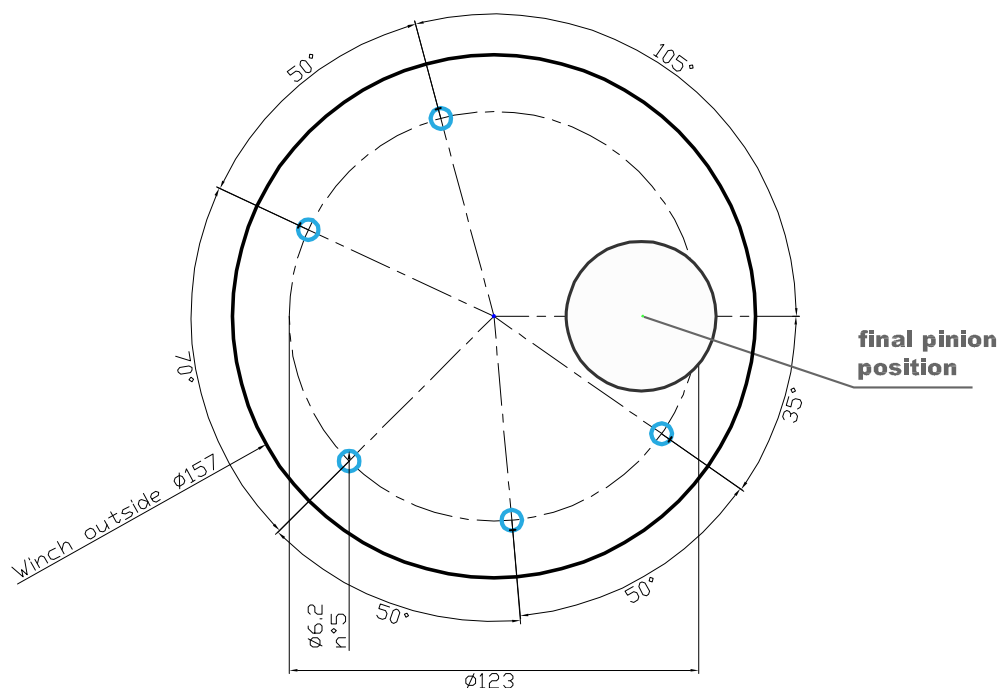
Installation procedure

Carry out **Procedure 1** or **Procedure 2**, 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 five 6.2 mm diameter holes.

- C.** Bolt the base of the winch to the deck using five M6 Socket Head (SH) bolts for Procedure 1 or five hexagonal headed M6 bolts for Procedure 2 (neither is 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 **Procedure 1** or **Procedure 2** 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.

MaintenanceWashing

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 or stickers on the winches. 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

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.

 Torque to be applied in assembly phase

Carry out **Procedure 1** as shown in the paragraph on winch installation and then do the following:



6. Completely unscrew the three screws n° 27




7. Remove the self-tailing arm support n°21



8. Slide out the central shaft n°19



9. Unscrew the 6 hex screws n°16
( 8Nm/71 in-lb)



10. Remove the drum support n°15
Important: washer n°12 may remain inside the drum support!



11. Remove the washer n°12



12. Remove the gear n°7 and remove the pawls n°5. To facilitate the operation press the spring against the pawl with a blade.



13. Slide off gear n°3



14. Slide off gear n°14



15. Slide off gear n°10



16. Remove the pawls n°5. To facilitate the operation press the spring against the pawl with a blade.



17. Remove washer n°9

If it is necessary to replace any **jaws** of the winch, proceed as follows:



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



II. Remove the jaws n°24

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.

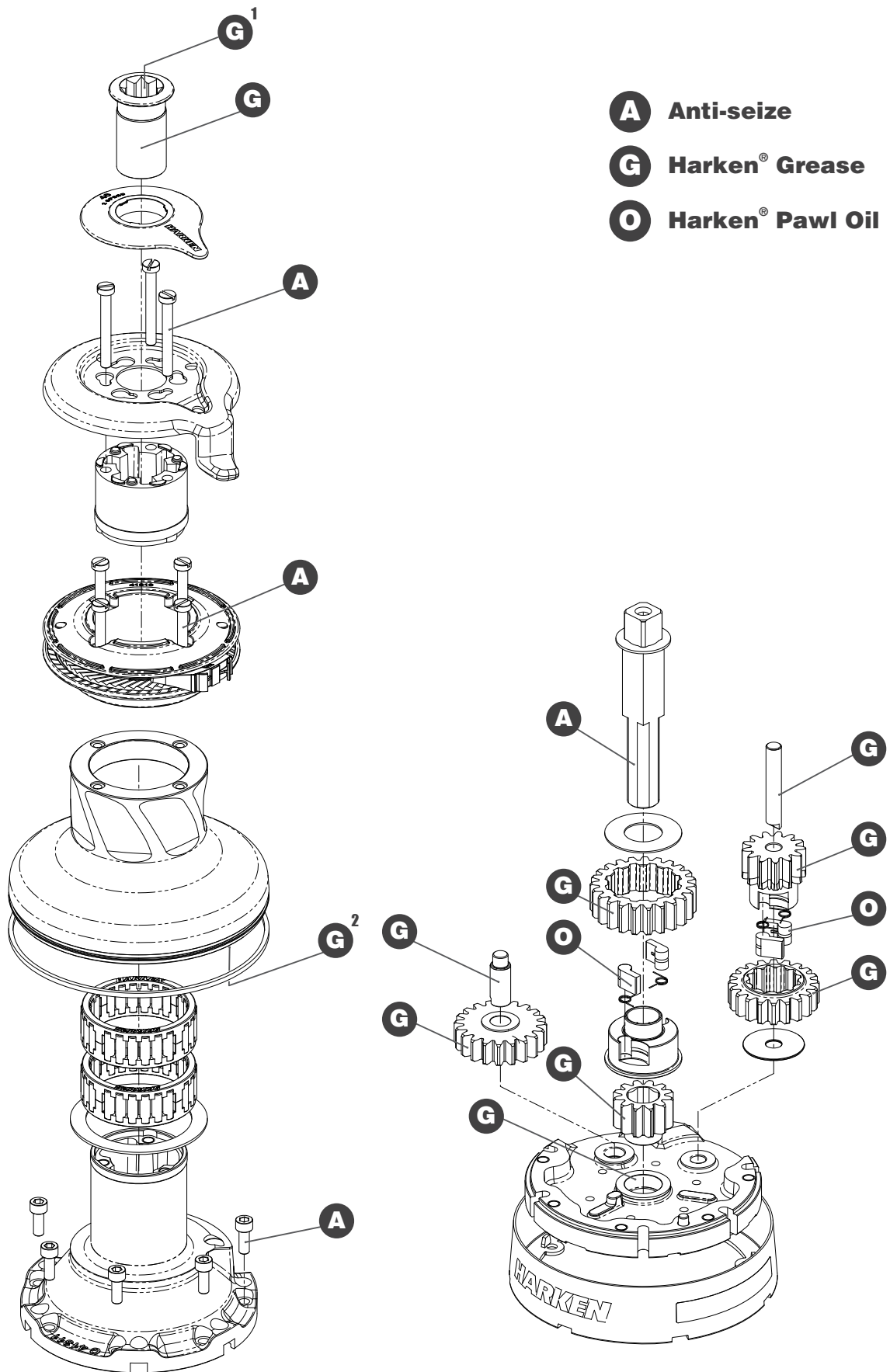
Carefully check the teeth of gears and ring gears to make sure there are no traces of wear.

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



¹Apply Harken® grease on assy socket screw
²Apply Harken® grease on drum gear

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.

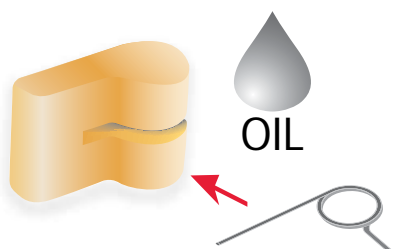
To tighten bolts, use the torque indicated in the disassembly procedure.



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.



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.

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.



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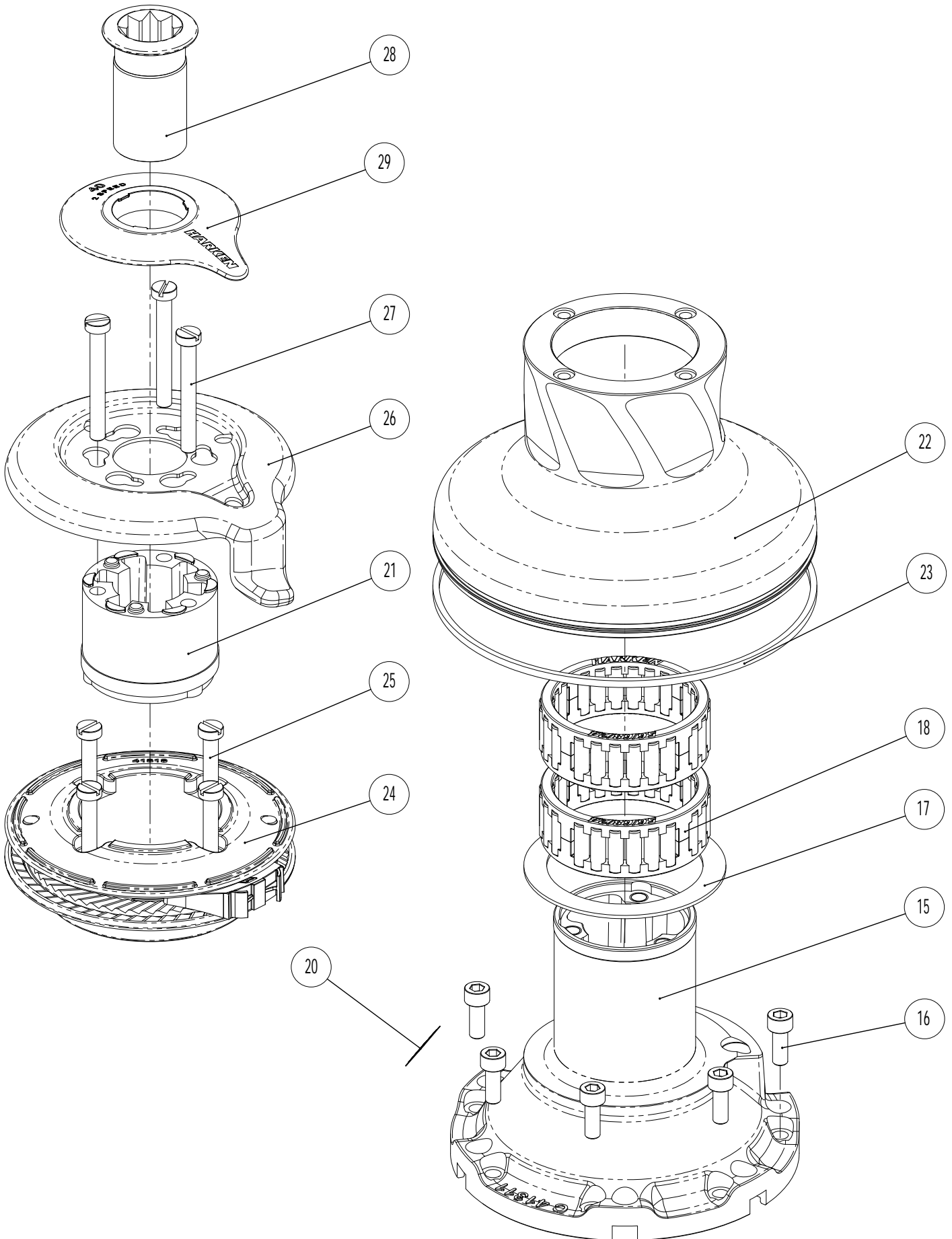
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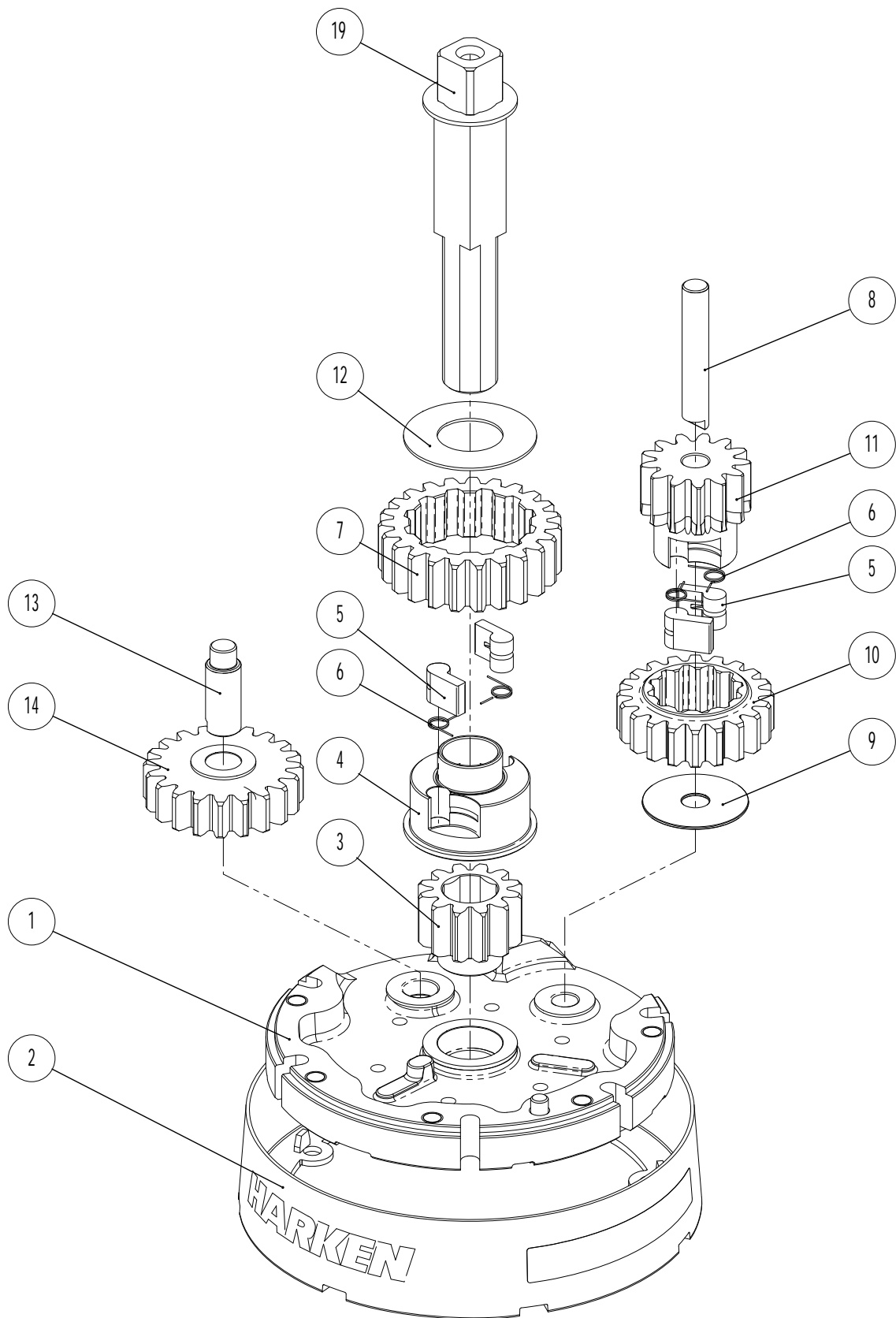
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Radial Winch 40.2 STA

A= drum in anodised aluminium

Pos.	Q.ty	Code	Description
1	1	A94141300	Winch 40 Base Assy <i>Winch Serial Number Sticker</i>
2	1	A94141400	Assembly - Skirt Winch 40**
3	1	S 41302 00 04	Gear Z12
4	1	S 41303 00 04	Pawls Carrier Ø8xN2*
5	4	S 00008 00 03	Pawl Ø8*
6	4	S 00038 00 01	Pawl Spring dia 8*
7	1	S 41283 00 41	Gear Z23
8	1	S 41300 00 04	Pin
9	1	S279090002	Washer 36x9,5x1*
10	1	S 41297 00 04	Gear Z20
11	1	S 41285 00 41	Pinion Z13
12	1	S 41312 00 02	Washer Ø22.5xØ45x1*
13	1	S 41307 00 04	Pin
14	1	A94130500	Assy - Gear Z20
15	1	A94141500	Assy - Housing Winch 40
16	6	M0635103	Socket head screw M6x16 UNI 5931*
17	1	S 41315 00 82	Washer Ø62xØ80x1.5*
18	2	A74136000	Bearing Ø56xØ68x24*
19	1	A94139000	Assy - Central Shaft W36/40
20	1	S418760063	Winch Serial Number Sticker
21	1	S4129400A0	Stripper arm support
22	1	S 41417 00 53	Drum A W40
23	1	S281680097	Red line
24	1	A94131800	Assy - Winch 40 Jaws <i>Lower Jaw W35/40</i> <i>Upper Jaw w35/40</i> <i>Peeler W20-40</i> <i>Spring</i>
25	4	M0601803	Screw UNI EN ISO 1207:1996 - M6x35 - A4*
26	1	S 41420 00 19	Stripper Arm W35/40
27	3	M6007103	Screw M6x50 UNI6107*
28	1	A94136400	Assy - Socket W20-80 <i>Screw M8x20 UNI 6109*</i> <i>Washer Ø7.7xØ25x5.8*</i> <i>Socket Handle W20/80</i>
29	1	S 41419 00 A5	Cover 2 speed W40

*Service kit available; see winch kit section on the website www.harken.com

**Winch product sticker



Radial Winch 40.2 STC

C=drum in chromed bronze

Pos.	Q.ty	Code	Description
1	1	A94141300	Winch 40 Base Assy <i>Winch Serial Number Sticker</i>
2	1	A94141400	Assembly - Skirt Winch 40**
3	1	S 41302 00 04	Gear Z12
4	1	S 41303 00 04	Pawls Carrier Ø8xN2
5	4	S 00008 00 03	Pawl Ø8*
6	4	S 00038 00 01	Pawl Spring dia 8*
7	1	S 41283 00 41	Gear Z23
8	1	S 41300 00 04	Pin
9	1	S279090002	Washer 36x9,5x1*
10	1	S 41297 00 04	Gear Z20
11	1	S 41285 00 41	Pinion Z13
12	1	S 41312 00 02	Washer Ø22.5xØ45x1*
13	1	S 41307 00 04	Pin
14	1	A94130500	Assy - Gear Z20
15	1	A94141500	Assy - Housing Winch 40
16	6	M0635103	Socket head screw M6x16 UNI 5931*
17	1	S 41315 00 82	Washer Ø62xØ80x1.5*
18	2	A74136000	Bearing Ø56xØ68x24*
19	1	A94139000	Assy - Central Shaft W36/40
20	1	S418760063	Winch Serial Number Sticker
21	1	S4129400A0	Stripper arm support
22	1	S 414180043	Drum C W40
23	1	S281680097	Red line
24	1	A94131800	Assy - Winch 40 Jaws <i>Lower Jaw W35/40</i> <i>Upper Jaw w35/40</i> <i>Peeler W20-40</i> <i>Spring</i>
25	4	M0601803	Screw UNI EN ISO 1207:1996 - M6x35 - A4*
26	1	S 41420 00 19	Stripper Arm W35/40
27	3	M6007103	Screw M6x50 UNI6107*
28	1	A94136400	Assy - Socket W20-80 <i>Screw M8x20 UNI 6109*</i> <i>Washer Ø7.7xØ25x5.8*</i> <i>Socket Handle W20/80</i>
29	1	S 41419 00 A5	Cover 2 speed W40

*Service kit available; see winch kit section on the website www.harken.com

**Winch product sticker

