

## Installation, Operation & Maintenance Manual

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**RANSOMES<sup>®</sup> Spider<sup>®</sup>** *Stabilizing Hydraulic Winch*  
**HSN 02**

For Spider Slope Mowers IDL01 & IDL02



WARNING: If incorrectly used this machine can cause severe injury. Those who use and maintain this machine should be trained in its proper use, warned of its dangers and should read the entire manual before attempting to set up, operate, adjust or service the machine.





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## INTRODUCTION

Thank you for purchasing the stabilizing hydraulic winch HSN 02 (further referred to as “winch”).

The winch was designed as an accessory to slope mowers Spider (further referred to as “mower”) and increases the possibilities of their application. Our company devoted great efforts to the development of this device.

This INSTALLATION, OPERATION & MAINTENANCE MANUAL describes proper winch operation and installation on the mower

Your dealer provides you with this Operation and Maintenance Manual, which is an inseparable part of the machine. Get acquainted with this Manual while taking over the delivery of your new machine and make sure you fully understand everything you need to know. Should you have any difficulties understanding any part of this Manual, don't hesitate and contact your local dealer in order to find an explanation. Full understanding of and complying with all instructions in this Manual are the basic preconditions for your safe work with this machine.

The manufacturer reserves the right to make modifications to the product and the accompanying documentation without a prior notice of such a change and without undertaking any obligation or liability.

The manufacturer – company **Dvorak – svahove sekacky s.r.o.** - does not recognize or bear responsibility for any damage caused by the neglect of this Manual.

In several places the Operation Manual contains instructions for safe work. These instructions are marked in text by the following symbol:

### **WARNING:**



**We warn you against danger of severe injury or life threat  
if appropriate instructions are not followed.**

other symbols:

### **NOTICE:**

**Provides useful information**

No part of this document may be further reproduced without a prior written consent.

**CONFORMITY CERTIFICATE****PROHLÁŠENÍ VÝROBCE**

vydané dle směrnice 98/37/EC příloha č.3, část B

My, výrobce

**DVOŘÁK - svahové sekačky s.r.o.**  
**Kyjov-Dvorce 62, 580 01 Havlíčkův Brod**  
**IČ: 260 13 797**

prohlašujeme že zařízení

název : **Stabilizační hydraulický naviják**  
typ : **HSN 02**

určený pro:

**stabilizaci sekačky na svahu**

nařízení vlády použitá pro posouzení shody

**direktiva ES 98/37/EC – machinery**Seznam technických norem a  
specifikací, harmonizovaných  
norem použitých při posouzení  
shody**EN 953, EN 982, EN 1050, EN ISO 12100-1,2, ISO**  
**11 684**

Popis

Parametr	jednotka	Hodnota
průměr lana	mm	8
délka lana	m	15

Strojní zařízení – stabilizační hydraulický naviják nesmí být uveden do provozu, dokud  
nebude vydáno prohlášení o shodě strojního zařízení do něhož má být začleněno

V Dvorcích dne 4.5.2006

razítko výrobce

.....  
Lubomír Dvořák, jednatel

## **1. PRODUCT DESCRIPTION**

### **1.1 GENERAL DESCRIPTION**

The winch was designed as an accessory to slope mowers Spider. The winch is a stabilizing device, which improves the mower stability on slopes, prevents the mower from sliding down and reduces lawn erosion.

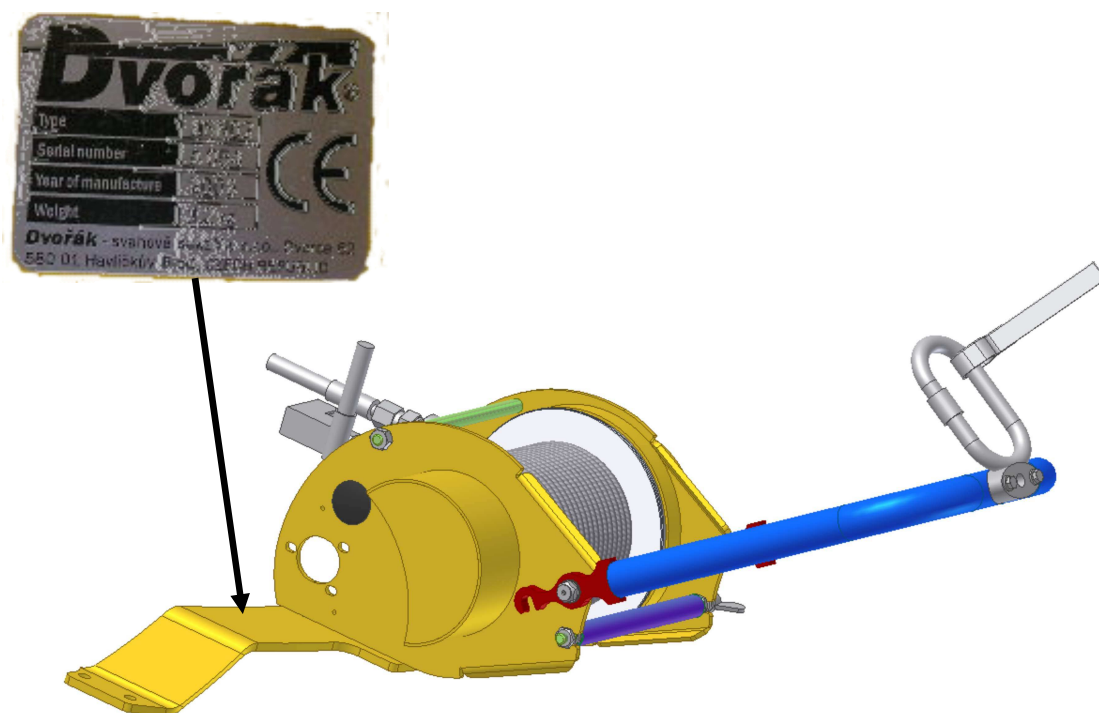
### **1.2 PROHIBITED USE**

The winch must not:

- be used with a damaged rope
- be used with a damaged snap hook
- be mounted on other types of mowers or for other purposes than the stabilization of Spider mowers
- be used for pulling objects, securing persons or other objects on slopes.
- be used on slopes with terrain obstacles, which could catch or damage the rope

## 2. PRODUCT IDENTIFICATION

The winch can be identified by the serial number, which can be found on the factory label. The serial number and the year of manufacturing must be provided during every request for servicing and with every order of spare parts.



## 3. SAFETY INSTRUCTIONS

### 3.1 GENERAL SAFETY INSTRUCTIONS

- The mower may only be used and operated with Spider slope mowers.
- When operating the winch the operator must respect and follow the Operation Manual of the Spider mower.
- The operator must be acquainted with both the winch and mower operation and their Operation Manuals. The operator must receive a practical training in the winch operation.
- The user's manual must be stored at a place permanently accessible to the operator and must be available to him at any time.
- Do not ever allow children or unauthorised persons use the product.
- The winch may only be used on areas without obstacles, bushes, trees, sharp rocks and other objects and obstacles, which could damage the rope.
- The operator of the machine is responsible for any damage caused to third parties by operating the machine.
- Do not remove or damage any of the safety labels.
- Do not remove any covers or safety elements. They are here for your protection.
- Do not use the machine if any of the protecting devices or covers are damaged or missing.
- Keep the machine and its accessories clean and in a good technical condition at all times.
- It is strictly prohibited to make any changes or modifications to the machine that were not previously approved by the manufacturer. Any modification to the machine may lead to a hazardous situation or injury. If these instructions are not followed, the manufacturer does not bear any liability for the machine.
- Do not lead or anchor the rope across roads, pavements and other areas where other people may be present.
- The operator/user is responsible for the safety of persons that enter the working area of the machine. Immediately interrupt your work and stop the machine if third persons enter the working area or approach the mower.
- Every time you stop the mower on a slope, turn its wheels across the slope in order to prevent the mower from moving down the slope.
- Do not use the machine when other persons, children or animals are nearby.
- Do not place any objects or tools on the product.
- Check the tightness of bolted connections at regular intervals. The first check should be done after 5 operating hours. For their tightening use a torque wrench and a specified torque.
- Winch servicing and maintenance may only be performed when the machine is turned off.
- Keep the product clean by brushing and wiping it after use. Do not use gasoline or similar oil products while cleaning.
- Do not touch the surface of the hydraulic motor and the hydraulic coupling, danger of getting burned.
- Before operating test the function of safety devices (EMERGENCY STOP...) on the mower and the radio remote controller, which cut off the hydraulic oil supply to the hydraulic motor of the winch.

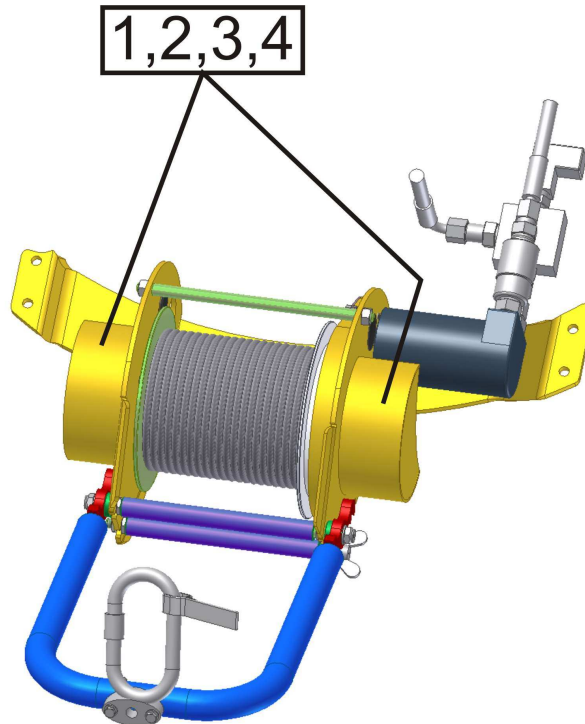


- Do not operate the machine after drinking alcohol or using drugs or medicaments influencing perception.
- Before storing the machine in a closed room, let the engine and the hydraulic drive of the mower cool properly.
- The operator's position while using the winch should always be above the mower and above the point where the mower is anchored so as to avoid cross the path of the rope.
- Do not step over the tightened rope
- Do not operate the mower with the winch if you cannot see it
- While operating the mower, make sure the mower is clearly visible at all times and within the range of the remote control unit and that you can clearly recognize dangerous situations and react to them properly. Do not abuse the maximum reach of the remote control or the maximum length of the rope
- When using the mower, follow all general work safety regulations.
- Work with the mower may only be started if the mower and the winch (including the rope) are not damaged by previous operation.
- **The winch may only be used with maximum engine speed.**
- Do not reach with your hand into the coiling drum and do not try to align or adjust the rope. The rope will align onto coiling drum according to the momentary situation.
- The snap hook must not be exposed to other outer forces than the pulling force.
- The snap hook must always be properly closed and secured by the lock – the snap hook will work safely only when it is closed and locked.

### 3.1 SAFETY DECALS

This chapter is devoted to the safety label symbols (pictograms) used on the product and their meaning. Under each symbol you will find a number of the position of the label on the machine. Safety labels inform the operator about risks while using the product. Understanding their meaning will make the use of this product safe.

			
			
1	2	3	4
Před použitím prostuduj návod k používání	Nebezpečí vtažení končetin mezi vodící válce	Nezasahuj do rotujícího navijáku, bubnu	Nebezpečí popálení, horké části



### 3.2 WINCH DELIVERY

The winch is supplied by the manufacturer as part of the machine and will be installed on the mower if ordered together with a new machine.



**If the winch is ordered separately, it will be installed on the mower by the manufacturer.**

### 3.3 PROTECTIVE AND SAFETY ELEMENTS OF THE WINCH

The winch is supplied in such a condition, which eliminates health and safety risks to the operator and to third persons as well as the risk of damage to their property. For this purpose the hydraulic circuit is equipped with an electric valve, which closes the oil outlet from the winch and blocks its further use in emergency situations.

Proper adjustment of the throttle valve is also important for the proper functioning of the winch. This valve was pre-set by the manufacturer. Do not change this setup.



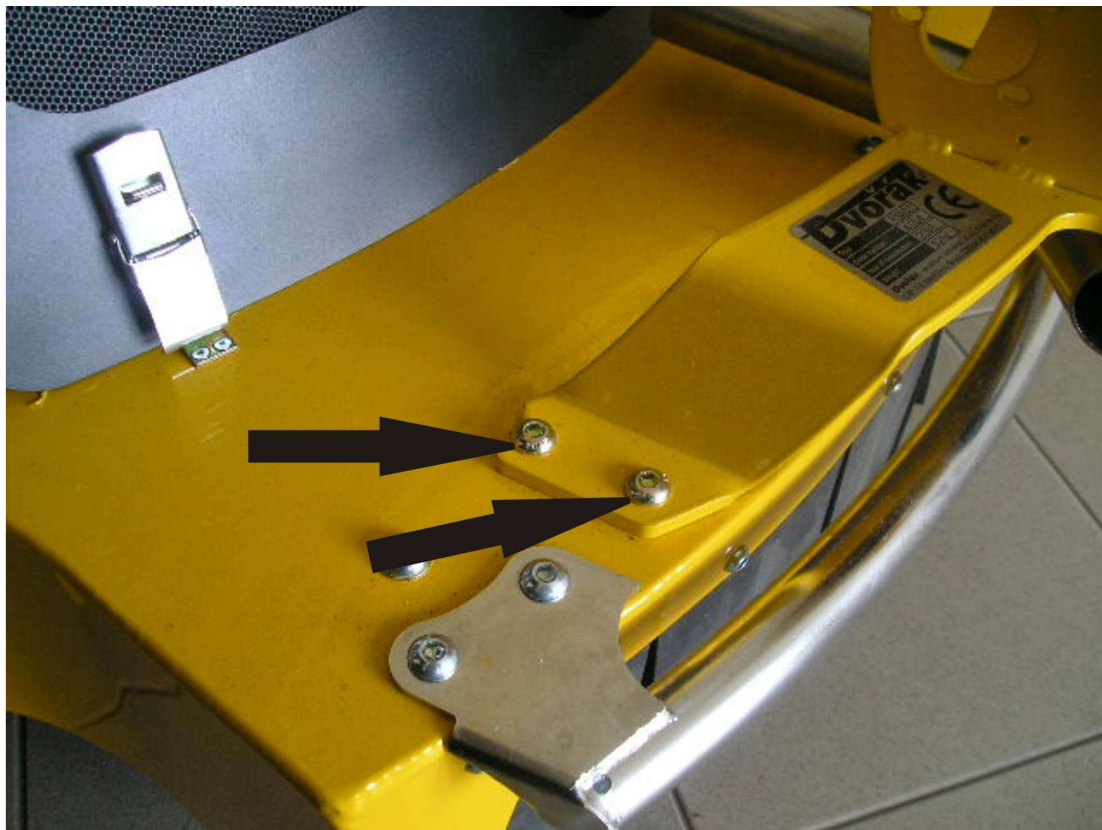
The use of the right rope and snap hook are crucial for the reliable functioning of the winch. The winch is equipped by a safety snap hook and a rope with guaranteed strengths. These parts must not be replaced by parts with lower lifting capacity.



## 4. WINCH ASSEMBLY

During the assembly it is necessary to make certain modifications to the machine. It is recommended to have the assembly performed by a manufacturer or an authorized service / dealer.

The winch is mounted on the upper part of the skeleton, just above the exhaust pipe. There are no other possibilities to mount winch elsewhere as this might disturb other mower operating or safety functions.

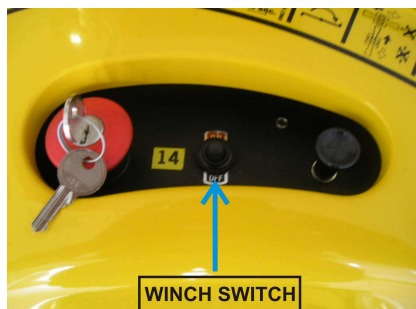


*Mounting items of the winch bracket. The bracket is mounted on the both sides.*

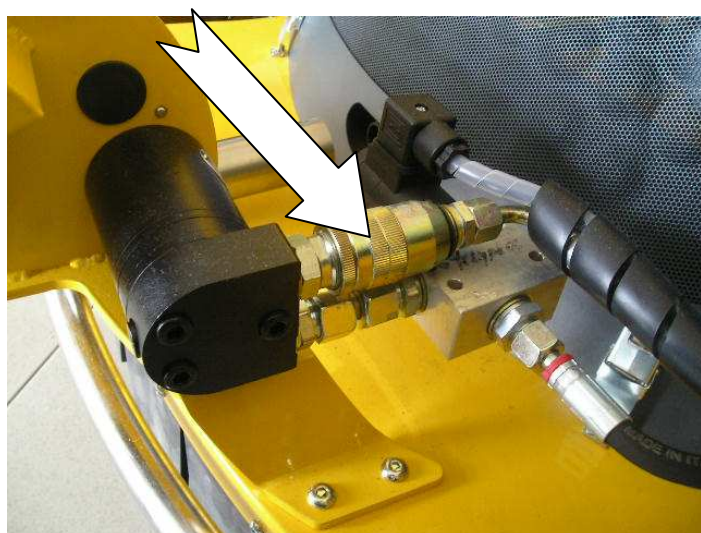
During winch assembly you must connect hydraulic lines and all controllers.

## 4.1 CONTROLLERS

### 4.1.1 Controllers on the mower



The winch on/off switch button is placed on the controller bracket of the mower. This button activates electromagnetic valve, which closes the outlet of the oil from the winch. The winch drum stops rotating after the winch is switched off.



There is the throttle valve on the feeding oil line. This valve is pre-adjusted and secured. This valve reduces oil flow inside of the hydraulic motor during its work and regulates power output of the winch.

You can adjust the power output of the winch so that it meets the performance/tension force requirement of a particular terrain. This will prevent the slipping of the wheels during work on a slope.

**Wrong throttle valve adjustment may result and may lead to damage on the mower or to operator.**



**in hazardous situation  
severe injuries to the**

## 5. WORKING WITH THE WINCH

The winch is a device, which extends and improves the mower application possibilities, but it doesn't allow you can use the mower on all kinds of slopes. The winch has a folding part, which guides the rolling rope on the drum. This part is in upper position for the transport and it must be folded down before anchoring. The upper position is secured by a latch. (see the figure)



### 5.1 ANCHORING

For the best function of the winch and optimum tension force of the rope it is necessary to choose a fixed point where you can mount the end of the rope with the snap hook.



Choose a sufficiently firm anchoring point, which to be able to carry the continuous load caused by mower (max. tension in the center line of the rope 200 kg) and possible dynamic effects such as a sudden slip or fall of the mower.

Mount the rope at least 300mm above the ground. Never anchor the rope directly to the ground!!!

Conditions for anchoring point:

- There must not be any obstacles, which could jam or damage the rope such as trees, bushes etc. in operating area of the rope and the mower
- The surface of the anchoring point must be smooth without sharp edges so as to preserve the rope with snap hook in the preset position throughout the operation of the mower

#### 5.1.1 Anchoring procedure

1. Transport the mower to the area you want to mow and to the suitable anchoring point.
2. Turn the across the slope.
3. Switch on the electromagnetic valve



4. Set and idle engine speed, slightly deflect the joystick in backward direction and watch the winch drum, which will start rotating in one direction. If the rope is unwinding, grasp the end of the rope with the snap hook and unwind necessary length for anchoring.

**NOTICE:** When the drive joystick is only slightly deflected, the mower is not moving and only the winch is driven. This allows you to wind or unwind the rope.



*Unwinding the rope, procedure according to points 1. – 4.*



*Procedure according to the points 5-8*

5. Mount the rope around a fixed point, loose the screw lock on the snap hook, lock it to the rope and finally fasten the screw lock.
6. Deflect the drive joystick in order to wind in the loose rest of the rope. The rope on the winch drum should be slightly tight.
7. Increase engine speed from idling to the running revolutions
8. Turn the wheels down the slope and by slight deflection find out the direction of wheels motion and winch un/winding.

If the wheels rotation direction is synchronized with the winch un/winding direction, drive mower into the bottom starting position for the mowing of the desired area. If you drive mower down from a slope (forward) and the rope is wind on the winch you **MUST** turn the wheels by 180° so that the driving direction is synchronized with the rotation of the winch.

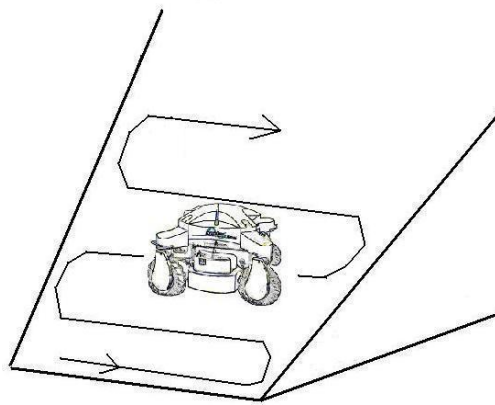
## **5.2 CUTTING**

When driving on a slope the operator of the machine must carefully watch and evaluate the movements of the mower and the characteristics of the terrain, especially momentary adhesion of the wheels to the ground.

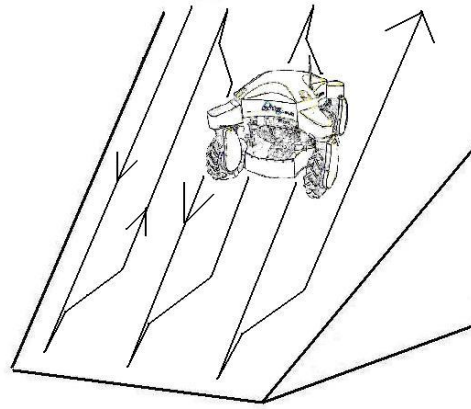
Pay attention to climatic conditions. Do not rely on the anchoring the mower on the rope.

Climbing ability of the mower will rapidly change on dry, wet or moist grass.

It also depends on soil characteristics. Sideslip is much bigger on the newly built slopes than on hard ground. When working on a slope with the winch, mow only in two directions: vertically or horizontally



Horizontal mowing



Vertical mowing



- the mower is able to work on slopes listed in the mower operation manual under dry surface conditions. If the grass is wet or moist, safe working angle is 26°



- check the area and terrain very carefully before starting to cut the grass. This procedure is very important. Pay attention to stones and uneven ground. Remove all obstacles if it is possible.



- tyre pressure must be 250 kPa (2,5bar)



- start cutting the grass at the bottom of the slope and proceed to the top. Always start on less steeper slopes. You will be able to analyze the actual climbing ability for further work. Be careful about dynamic effects during mowing. These can cause extreme tension of the rope.



- **DO NOT try to stop the mower in case it is slipping or rolling over, DO NOT approach the mower, especially the area below the mower!!!!**



- Always stay above the working mower or aside in its driving line.



- Make sure no other persons are present in the working area of the mower. Always check the area before operating. DO NOT endanger third persons or their property by the movement of the mower.



- Stay in the safe distance from the area to which the mower may fall of throw grass. The direction of the thrown grass may change according to the driving direction.

- Working on a slope increase demands on the hydraulic circuit, especially in hot weather. This may cause overheating of the hydraulic oil. For optimization of the hydraulic oil temperature mow across the slope.



- **For the proper functioning of the winch drive the mower always in the forward direction when mowing across the slope.** The direction of winch rotation will change if you drive backwards. The rope will get loose and may jam in the drum. **WINCH WILL STOP PERFORMING THE STABILIZING FUNCTION**

- Do not drive the mower into bushes or similar obstacles that you want to cut (especially when driving down from a slope). These obstacles may stop the mower, cause the rope to unwind undesirably and consequently jam. **The rope must be always tight.**



- **AVOID:**

- Sudden sharp steering or braking
- driving too fast. Use only the Low (turtle) speed range.
- driving on uneven surfaces



- changing wheel adhesion (moving from areas exposed to sun to shade)
- driving on the grass that has been already cut



## Prohibited use

- Do not work on a slope with a loose or unwound rope
- Do not drive on slopes with idling engine speed
- Do not leave the mower on a slope with wheels positioned down the slopes. Avoid maintenance work on slopes. **The mower may uncontrollably drive down from a slope.**
- Do not operate in the area below the mower
- Do not manipulate with the anchoring if the rope is tight or the ground extremely slippery.
- Always leave at least 3 coils of wound rope on the winch drum.
- Do not use human power for the stabilization of the mower or for tensioning/holding the rope
- Do not use the High (rabbit) speed range when working or driving on a slope.

### 5.2.1. Emergency situations during winch operation



Emergency situation	Recommended action
Sudden loosening of the rope or anchoring point.	Turn wheels immediately to be positioned across a slope and stop driving. Find a new anchoring point.
Rope fracture /fraying	Turn wheels immediately to be positioned across a slope and stop driving. Use a new rope. <b>You must not connect (tie) the rope again.</b>
Snap hoop failure	Turn wheels immediately to be positioned across a slope and stop driving.
Speed drop, the mower starts running uncontrollably	Immediately increase the engine speed to maximum. Turn wheels to be positioned across a slope and stop driving. Push the STOP button.
Hydraulic line breakage	Turn wheels immediately to be positioned across a slope and stop driving. Push the STOP button.
Unwinding the whole length of the rope from the winch drum and winding in the different direction on the drum.	<ul style="list-style-type: none"> <li>- Turn wheels 180° around and keep on working or</li> <li>- Drive in the opposite direction, unwind the part of rope that has been already wound and drive in the forward direction and turning wheels 180° around.</li> </ul>
Failure of the chain drive of the drum	Turn wheels immediately to be positioned across a slope and stop driving. Replace the chain.



## 6. TECHNICAL SPECIFICATION:

Basic assembly:

welded frame  
drum  
hydraulic motor  
control

The welded frame is the base component of the supporting structure of the winch. Other components are mounted on this frame. The frame is mounted on the skeleton by four bolts M10. The drum is set in side plates of the frame, and it is driven by a roller chain leading from the hydraulic motor.

The hydraulic motor is connected to oil pressure circuit of the mower through the oil pressure hoses, throttle and electromagnetic valve. Control switch for operation of the electromagnetic valve is situated on the controller bracket.

### 6.1 BASIC TECHNICAL SPECIFICATION

parameters	unit	value
length	mm	350
length with guiding frame	mm	650
width	mm	460
height	mm	240
weight	kg	12
rope length	m	15
rope diameter	mm	8
min. strength	kN	11
type of snap hook	-	SINGING ROCK kN 30/9
min. strength	kN	20
Drum drive chain		$\frac{1}{2}$ " / $\frac{3}{16}$ "
length (number of chain links)	-	40
Hydraulic mottoe - type	-	SAUER DANFOSS, OMM 20

## 7. WINCH MAINTENANCE

The winch as an accessory for the mower is not demanding in terms of maintenance, but requires regular maintenance.



- Replace regularly pressure hoses between the hydraulic motor and hydraulic generator. Make the replacement at least once every three years starting from the date printed on the hose.
- Check tension and wear of the roller chain for the drum drive.
- Make regular inspections

### 7.1 MAINTENANCE CHART

action/intervals in hours		before working	5 h. 1. maintenance	200 2. Maintenance	State of operating hours counter								
					400	600	800	1000	1200	1400	1600		

Check for oil leakage in the hydraulic system	•	X	X	•	•	•	•	•	•	•
Inspect the rope	•		X							
Check tension and wear of the roller chain	•	X	X	•	•	•	•	•	•	•
Clean and lubricate the roller chain (*)		X	X	•	•	•	•	•	•	•
Check mounting of the drum	•	X	X	•	•	•	•	•	•	•
Check mounting of the winch	•	X	X	•	•	•	•	•	•	•
Check the level of the hydraulic oil	•	X	X	•	•	•	•	•	•	•
Check right function of the electromagnetic valve by switching the ON/OFF switch and the EMERGENCY STOP button	•	X	X	•	•	•	•	•	•	•
Check throttle valve adjustment			X		X			X		
Replace the rope				•*		•*		•*		•*
Replace the snap hook						•				•
Replace the roller chain					•			•		
Replace the hydraulic oil (min. once a year)								•		
Replace the hydraulic hoses (min. once / 3 years)										

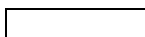
x performed by service technician

• performed by operator

\* replacement is carried on after certain number of operating hours or before season.



Device check



Parts replacement

## 7.2 MAINTENANCE OF THE HYDRAULIC CIRCUIT

Maintenance of the hydraulic should be performed only by a trained and authorized person. For maintenance call specialized service / dealer.

Regular maintenance should focus on checking for possible leakage between connections, replacement of pressure hoses and oil.

**NOTICE:** Maintenance of the hydraulic may only be performed in a perfectly clean working area. Dirt inside the hydraulic system can cause very serious trouble or failure!!! Wash every part in clean liquid before replacement.



**NOTICE:** The winch **MUST NOT** work without oil or with lack of oil. Not even for a short time.

### 7.2.1. Checking and refilling oil

Check regularly the oil level in the hydraulic tank. Measure the level by dipstick mounted in the cap. The level must be between two dipstick marks. When working on extreme slopes, the required cold oil level must reach to the upper limit mark.

The machine must be switched off. Always check cold oil.

**NOTICE:** When checking warm or hot oil, the oil level can reach above the mark due to its heat expansion.

DO NOT overfill hydraulic oil tank with cold oil. (above „MAX“ level in cold oil). After warming up the oil may overflow from the tank and cause trouble or serious injury.

## 7.3 ROLLER CHAIN MAINTENANCE

### 7.3.1 Drum drive chain

Check the chain tightness and wear. If wear is too big, the risk of failure of the winch is much higher. The chain is tensioned by the movement of the hydraulic motor in its oval mounting holes.

Do not over tension the chain, this may reduce its service life. Lubricate the chain with oil.

## 7.4 ROPE AND SNAP HOOK MAINTENANCE

### 7.4.1 Inspection

Inspect the rope before every shift especially when you were previously working in hard conditions.

Min. after 200 hours of operation unwind the whole length of the rope and check very carefully if the external surface of the rope has not been damaged.



In the case of damages you must replace the rope or shorten it if its length is suitable for your further work. Usage of damaged rope is strictly forbidden.

Do not put the rope on hot items!!!

### 7.4.2 Linking the snap hook

Link the rope to the snap hook by the help of knot of love. See the figure





Leave at least 8 cm free at the end of the rope. Tight the knot properly to avoid its loosening.

Clean the rope with only dry stuff without using any water or chemical liquid.

The rope must not come in contact with oil products and lubricants.

### 7.4.3 Mounting the rope on the winch drum

The winch drum has got two opposite drilled holes on its case. One is bigger then the other one. First lead the rope through the smaller hole and proceed to the bigger one. Pull the end of the rope trough the bigger hole, approximately 20 cm and make the knot in the middle of the section. Pull the rope before the drum and elongate the knot inside of the drum.

Wind the whole length of the rope by turning the drum with the help of hydraulic. The direction of drum rotation is arbitrary.

## 7.5 WINCH CLEANING

Remove all dirt from the surface of the winch as well as from hydraulic hoses after every shift. Clean surface helps better cooling of the hydraulic oil and simplifies the detection of faults. Sweep out dirt with a brush. Do not use pressure water. In the case of using water, lubricate the chain.

Do not use petrol or other oil products for cleaning.

## 7.6 TORQUE

Bolt	M 6	M 8	M 10	M 12	M 14	M 16	M 20
Torque /Nm/	10	25	50	85	135	215	410

## 8. TROUBLESHOOTING

Trouble shooting	Possible reason	Correction
The drum is not turning	Lack of oil in the hydraulic system of the machine	Add hydraulic oil
	The throttle valve closed too much	Loose and call authorized service for adjustment
	Roller chain failure	Replace the roller chain
Jerking motion of the drum	Lack of oil in the hydraulic system	Add hydraulic oil
	Dirt screen in pump	Clean
	Loose chain skipping over teeth	Tension the chain, replace
The drum is turning only until the oil gets warm.	Worn out the hydraulic motor	Replace
	Bad throttle valve	Replace
	Low engine revolutions	Increase revolutions on max.
The drum is too noisy	Bad bearings of the winch drum	Replace bearings
	Throttle valve is closed too much	Loose and call authorized service for adjustment

## 9. AFTER SEASON MAINTENANCE

After the end of the season or when not using the machine for longer than one month, it is advisable to prepare it for the storage.

Check the whole machine according to the maintenance schedule and the number of operating hours.

- clean the whole machine
- replace worn or damaged parts
- check all bolted connections. Tighten loose bolts and nuts.
- Lubricate all moving parts – the whole machine (lubrication chart – see figure)



**When working on the winch you must switch the mower engine off and push the STOP button**



## 10. DISASSEMBLY AND LIQUIDATION

The winch is made predominantly of metal parts. This metal includes mainly iron. Before disposal and scrapping it is recommended:

- to let out hydraulic oil from the machine into a special tanks and dispose of this oil in specialized places for oil disposal.
- to separate steel, plastic and rubber parts and hand them over for recycling.

When disposing of the machine, you must follow all rules and statutory regulations for waste disposal.

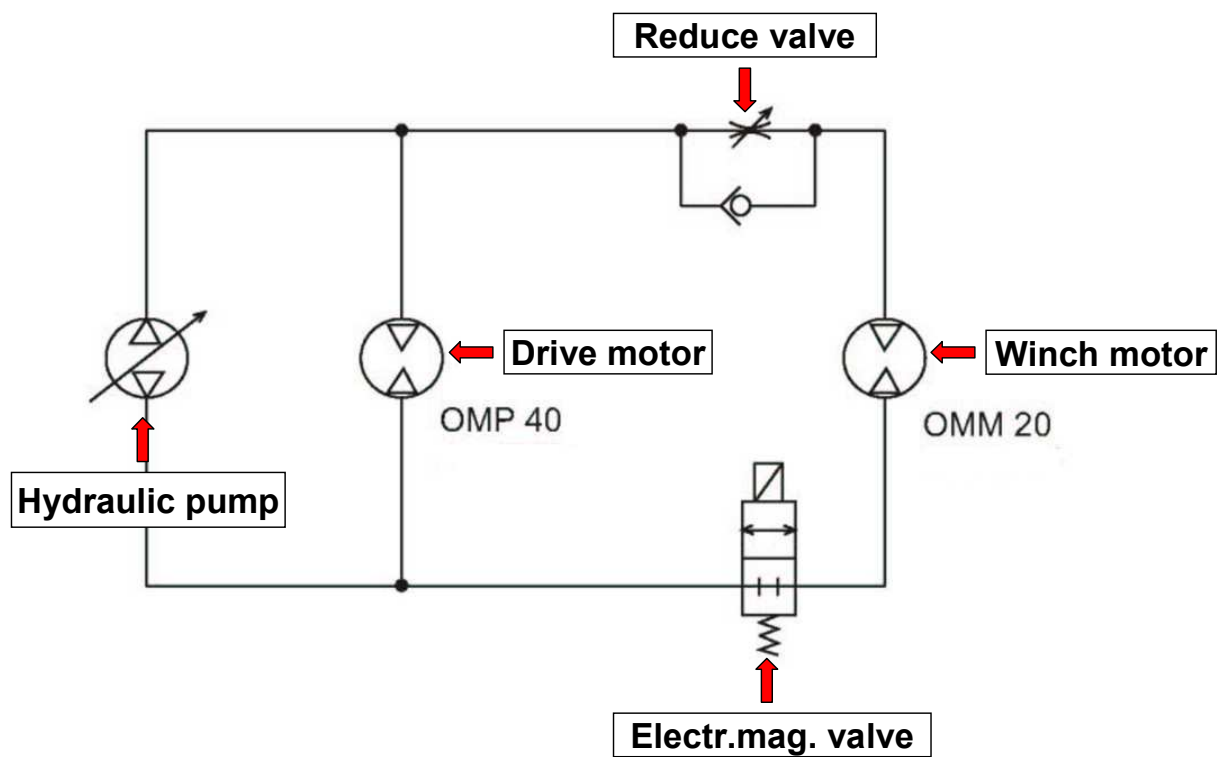
## 11. WARRANTY CONDITIONS

1. The Producer provides a guarantee for new Products according to the set regulations for a period of 24 months from the day the Product is delivered by the Distributor/Dealer or their contractual partner to the Customer, or from such a Product being set into operation, according to whichever happens first.
2. The guarantee begins on delivery of the Product by the Distributor or by their contractual partner or on the Product being set into operation, according to whichever happens first.
3. Claims stemming from the guarantee must be exercised with the Distributor/Dealer and also resolved by them. A properly completed guarantee sheet must be presented and all of the inspections prescribed by the Producer must have been implemented. Incorrect information, additional extracts or overwriting on the guarantee card lead to loss of the guarantee.
4. The guarantee applies to defects on the Product caused by defective raw materials, construction faults or made workmanship. Defective parts on the Product will be replaced free of charge with a new part or repaired. No entitlement to immediate delivery is created and the Producer takes on no liability for damage claimed for as a result of delayed delivery.
5. The guarantee does not relate to regular wear and tear (parts susceptible to regular wear and tear especially include the following: chains, sealing and hydraulic hoses).
6. The guarantee cannot be claimed against if the cause of the defect is:
  - a) The effects of external mechanical or chemical influences on the Product
  - b) Unreasonable handling of the Product, overloading it, neglect or incorrect operation
  - c) Repair of maintenance of the Product performed by a third party, which was not authorised to carry out such work by the Distributor or Producer
  - d) Installation of such parts into the Product, the use of which is not approved by the Producer
  - e) Implementation of changes to the Product, which were not approved by the Producer
  - f) The fact that the Producer's regulations were not adhered to for handling the Product, its maintenance and treatment (e.g. the instruction and maintenance manual), especially if the prescribed guarantee inspections were not carried out
  - g) The fact that the use neglected declaration and removal of defects, which were apparent when they took receipt of the Product or which they did not immediately provide notification of an have removed,

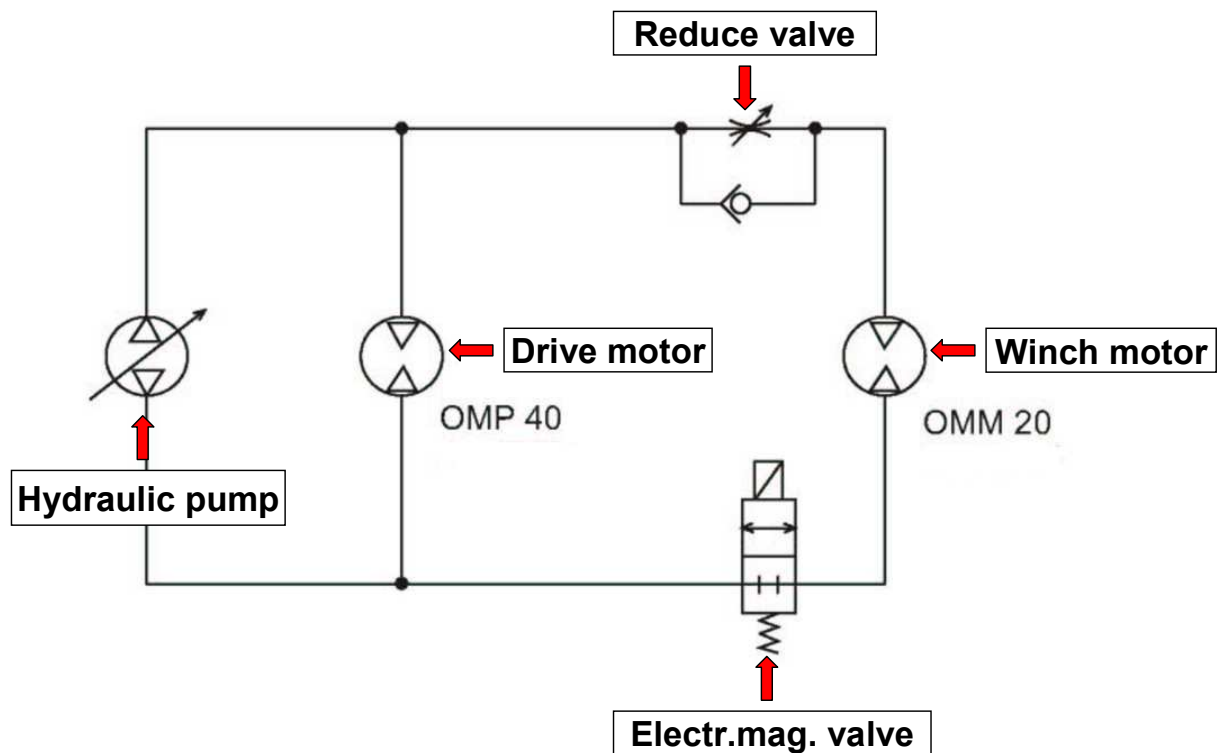
which arose later

7. All claims stemming from the guarantee are forfeit on expiry of the guarantee period. In the case of defects, for which notification was made during the course of the guarantee period and which were not removed during this period, this guarantee remains valid until the defect is removed. In this case, the guarantee is terminated at the latest within 1 month of the last repair or after declaration by the Distributor that the defect was removed or that this does not concern a defect.
8. The Producer is not liable for any economic loss or for any subsequent damage caused to persons or their property, which was created as a result of failure of the Product.
9. The guarantee applies to the Product in the condition in which it leaves the production plant. The Producer is not liable for damage during transportation.
10. In the event of a change in owner, it is possible to transfer the remaining part of the guarantee period to the new owner if the Producer is requested to do so. The new owner confirms that they have taken receipt of the instruction manual at the same time as the Product as well as the guarantee conditions and that they agree with these.

## 12. DIAGRAM OF HYDRAULIC CIRCUIT



## 13. WIRING DIAGRAM









## World Class Quality, Performance and Support

Equipment from Ransomes Jacobsen Limited is built to exacting standards ensured by ISO 9001 registration at all our manufacturing locations. A worldwide dealer network and factory-trained technicians backed by Ransomes Jacobsen Parts Xpress provide reliable, high-quality product support.



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