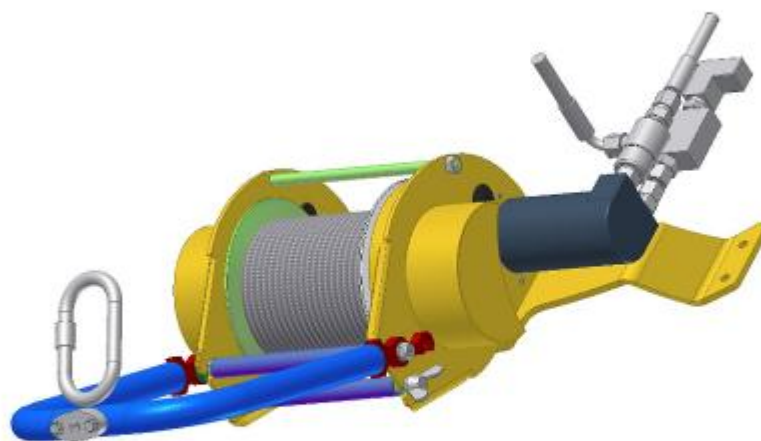




SERVICE MANUAL WINCH HSN02



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Winch HSN02 for SPIDER ILD01, ILD02

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1 Troubleshooting

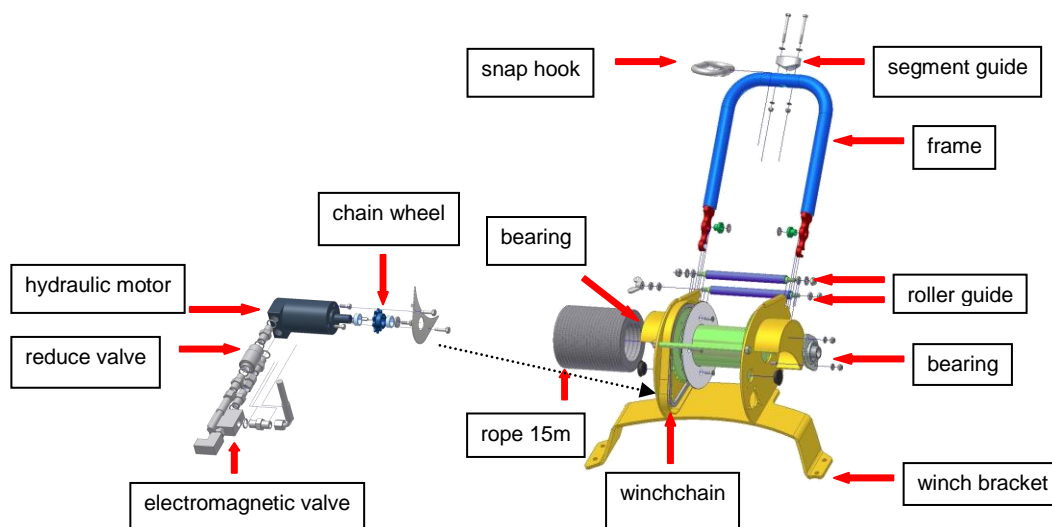
Trouble shooting	Possible reason	Correction
The drum is not turning	Lack of oil in the hydraulic system of the machine	Add hydraulic oil
	The throttle valve closed too much	Loose and adjust the throttle valve
	Roller chain failure	Replace the roller chain
Jerking motion of the drum	Lack of oil in the 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 adjust the throttle valve

2 Technical specification:

2.1 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 (Picture 1). 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 (Picture 2).



Picture 1



Picture2

2.2 Basic technical specification

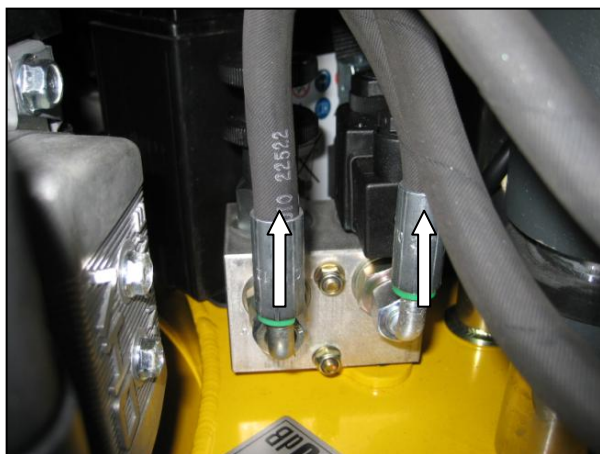
parameters	unit	value
length	mm	350
length with guiding frame	mm	650
width	mm	460
height	mm	240
weight	kg	12
rope length	m	15
rope diameter	mm	8
min. strength	kN	11
type of snap hook	-	SINGING ROCK kN 30/9
min. strength	kN	20
Drum drive chain		$\frac{1}{2}$ " / $\frac{3}{16}$ "
length (number of chain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

3 Winch maintenance

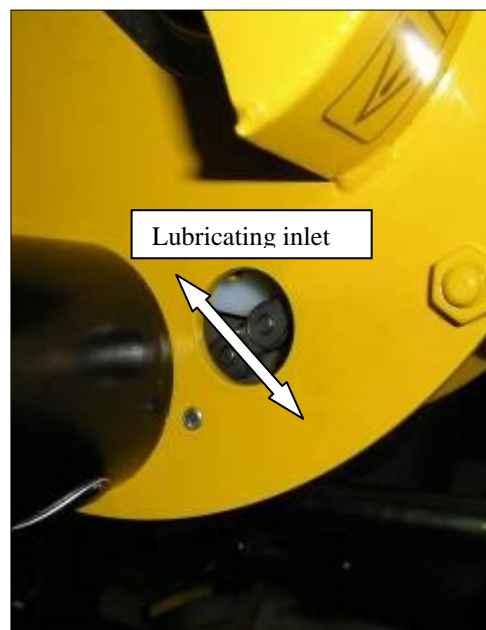
The winch as an accessory for the mower is not demanding in terms of maintenance, but requires regular maintenance.



- Replace regularly pressure hoses between the hydraulic motor generator. Make the replacement at least once every three years starting from the date printed on the hose (Picture 3)
- Check tension and wear of the roller chain for the drum drive (Picture 4).
- Make regular inspections



Picture 3



Picture 4

3.1 Maintenance chart

action/intervals in hours	Before every using	5 1.maintenance	200 2.maintenance	State of operating hour meter							
				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)											

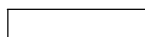
x performed by service technician

• performed by operator

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



Device check



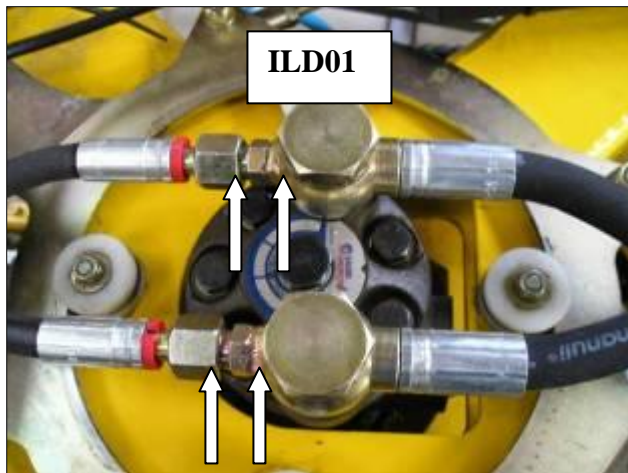
Parts replacement

3.2 Maintenance of the hydraulic circuit

- Regular maintenance should focus on checking for possible leakage between connections, replacement of pressure hoses and oil (Picture 5, 6, 7, 8)

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.

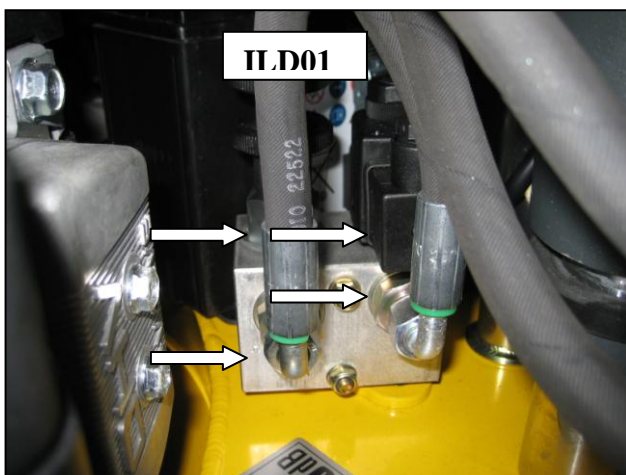
NOTICE: The winch **MUST NOT** work without oil or with lack of oil.
Not even for a short time.



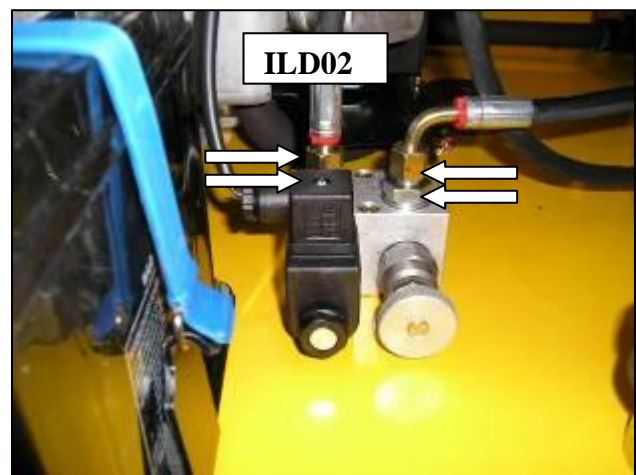
Picture 5



Picture 6



Picture 7



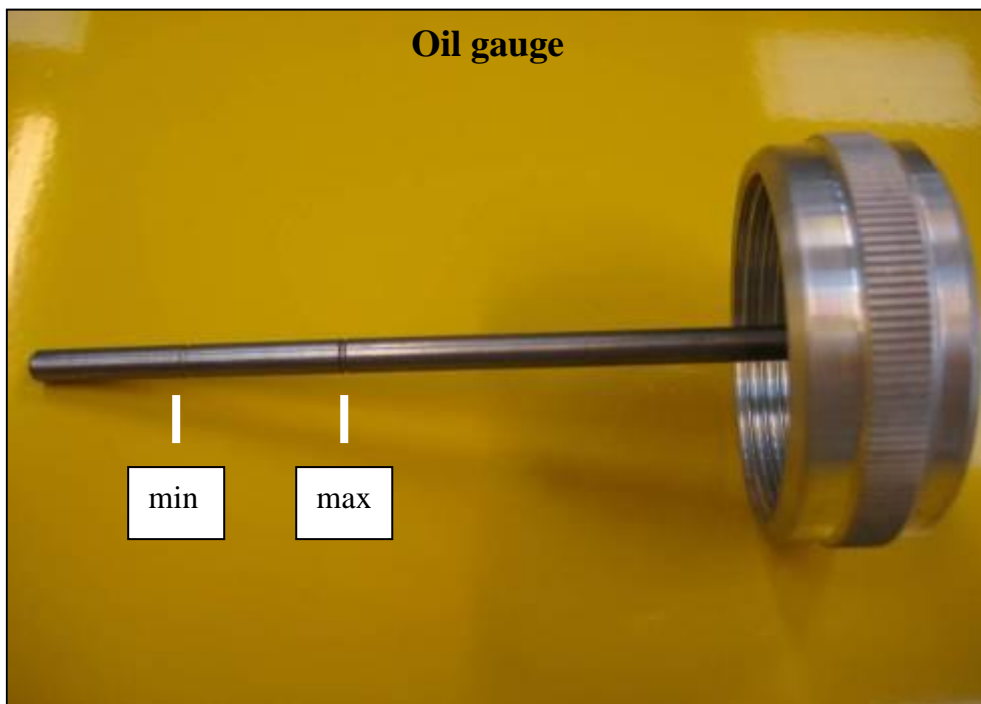
Picture 8

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 (Picture 9)
- 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.



Picture 9



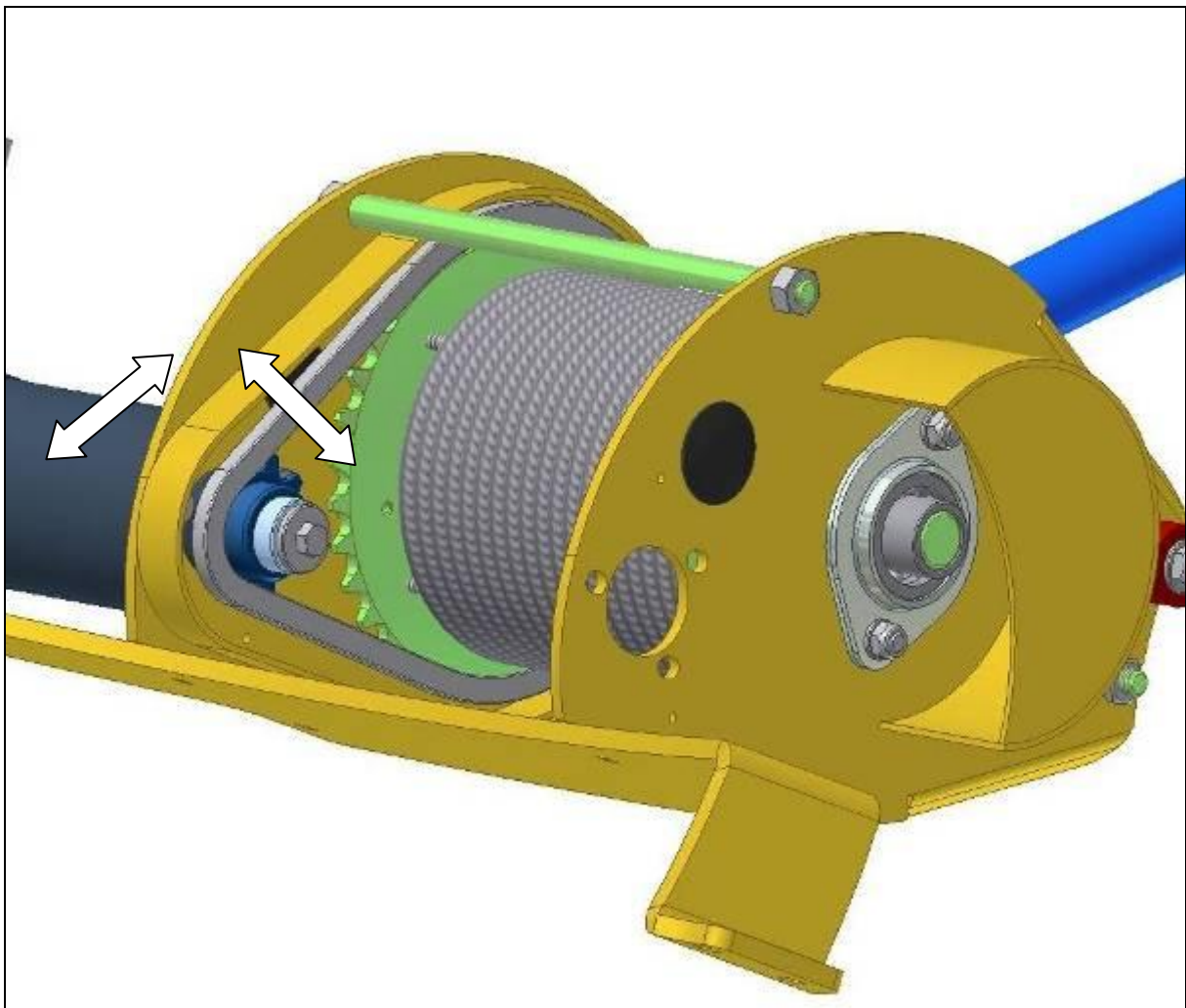
Picture 10

3.3 *Roller chain maintenance*

Drum drive chain

- Check the chain tightness and wear. If wear is too big, the risk of failure of the winch is much higher (Picture 11)
- The chain is tensioned by the movement of the hydraulic motor in its oval mounting holes (Picture 11)

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



Picture 11

3.4 *Rope and snap hook maintenance*

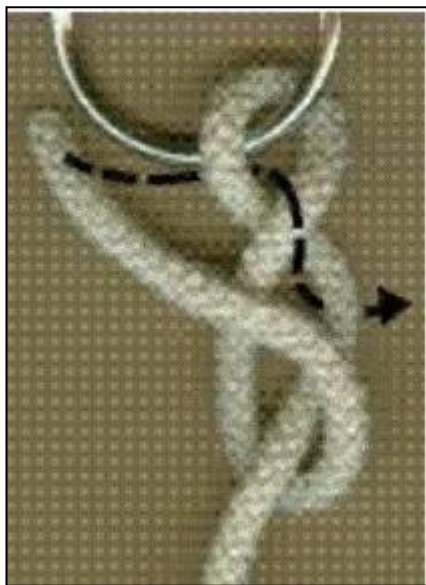
a) Inspection

- 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!!!

b) Linking the snap hook

- Tie the rope to the snap hook according to the diagram below:



Picture 12



Picture 13

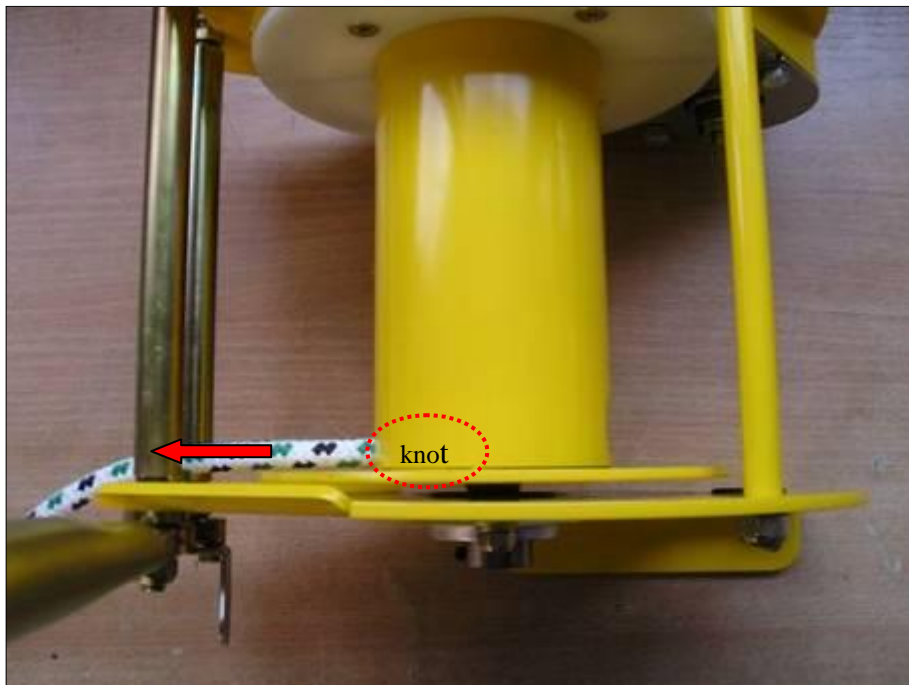
- Leave at least 8 cm free at the end of the rope. Tight the knot properly to avoid its loosening.
- Clean the rope with only dry stuff without using any water or chemical liquid.
- The rope must not come in contact with oil products and lubricants.

c) Mounting the rope on the winch drum

- The winch drum has got two opposite drilled holes on its case. One is bigger than the other one.
- First lead the rope through the smaller hole and proceed to the bigger one.
- Pull the end of the rope through the bigger hole, approximately 20 cm and make the knot in the middle of the section (Picture 14)
- Pull the rope before the drum and elongate the knot inside of the drum (Picture 15)
- Wind the whole length of the rope by turning the drum with the help of hydraulic. The direction of drum rotation is arbitrary.



Picture 14



Picture 15

3.5 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.

3.6 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

4 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)



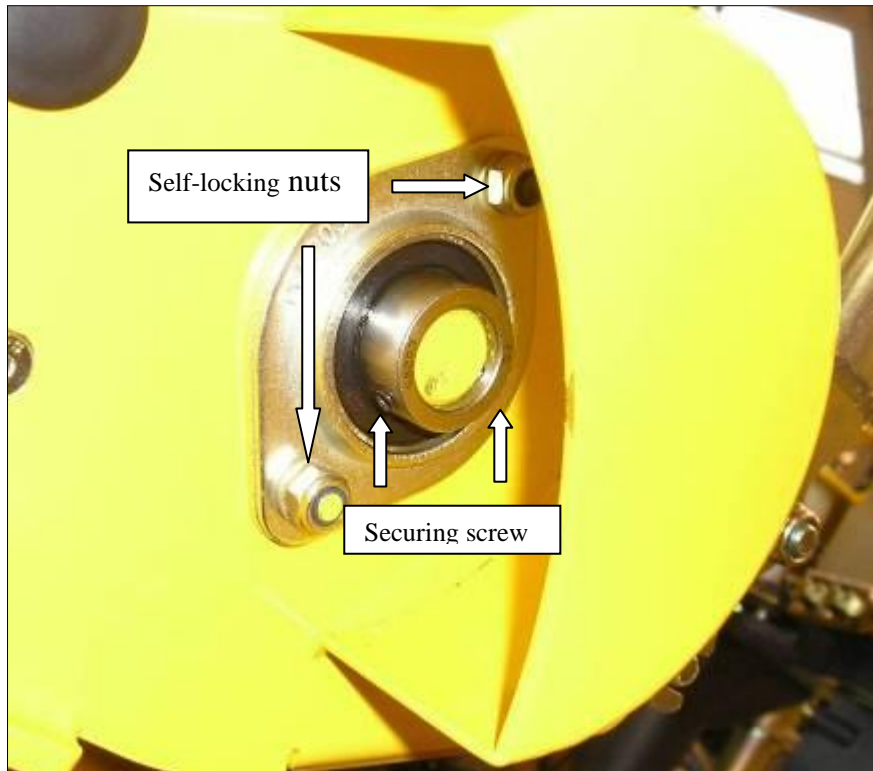
When working on the winch you must switch the mower engine off and push the STOP button

5 Instruction manual Winch HSN02

5.1 Exchange of the bearings

Dismount:

- Release the securing screw (Picture 16)
- Release two self-locking nuts (Picture 16)
- Pull out the bearing



Picture 16

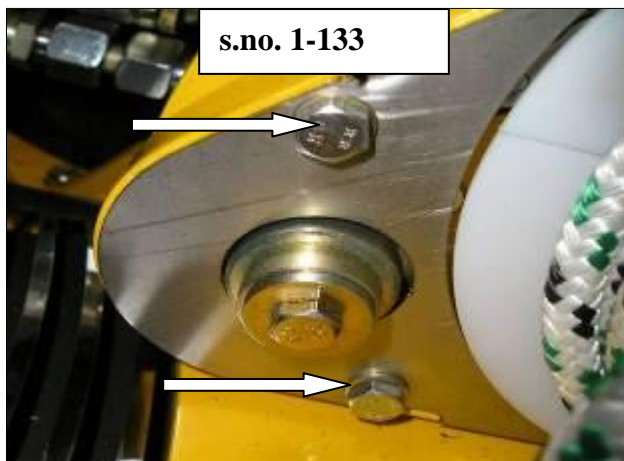
Mounting:

- Put on a new bearing
- Tight the self-locking nuts
- When you change the both bearings, centre the winch drum shaft
- Tight the securing screws (Picture 16)

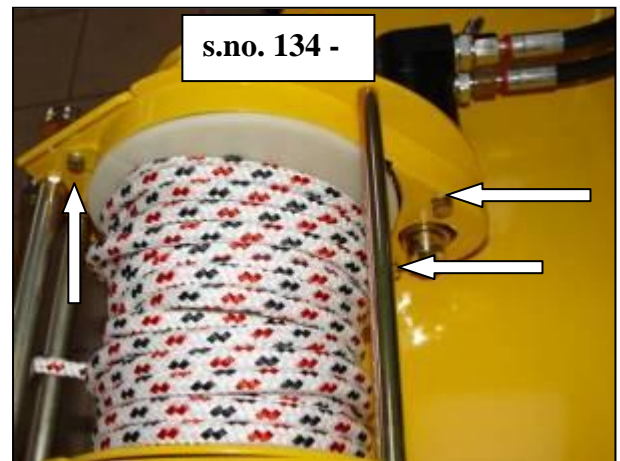
5.2 Exchange of the hydraulic motor and the winch chain

Dismount:

- Dismount the winch chain cover(Picture 17, 18))
- Slacken the chain by releasing both bearings
- Disconnect the chain by the chain link (Picture 19)
- If it is coupled, without the link, it's necessary to dismount sprocket wheel Z10 (Picture 21) by removing the side frame with hydromotor
 - unscrew securing screw (Picture 21)
 - unscrew screws winch frame - skeleton (Picture 23)
 - dismount bearing self locking nuts, release bearing securing screws (Picture 16, 22), winch roller guides, rope frame, and winch brace ([see the exchange of the roller guide and the frame](#)) (Picture 23)
 - at the same time remove the side frame with hydromotor and sprocket wheel Z10 and slacken the chain
- Dismount the sprocket wheel Z10 from the hydromotor (Picture 21)
- Disconnect hydraulic hoses
- Release the screws of the hydromotor (Picture 20)
- Pull out the hydraulic motor



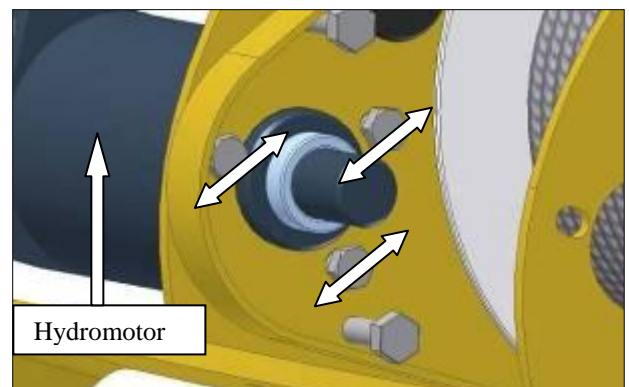
Picture 17



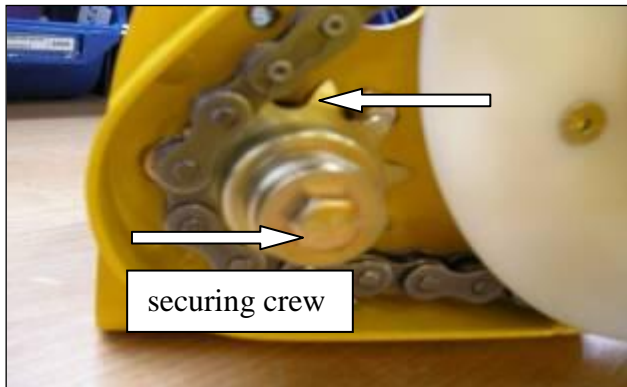
Picture 18



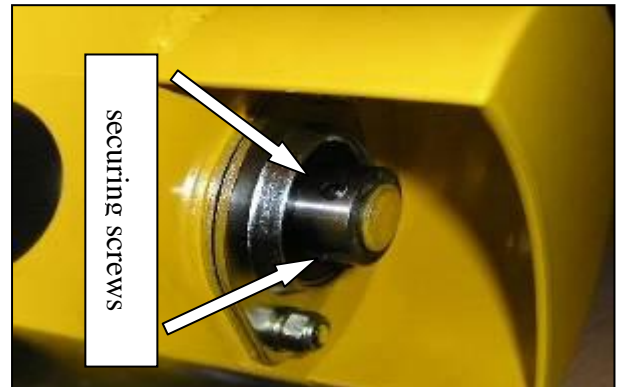
Picture 19



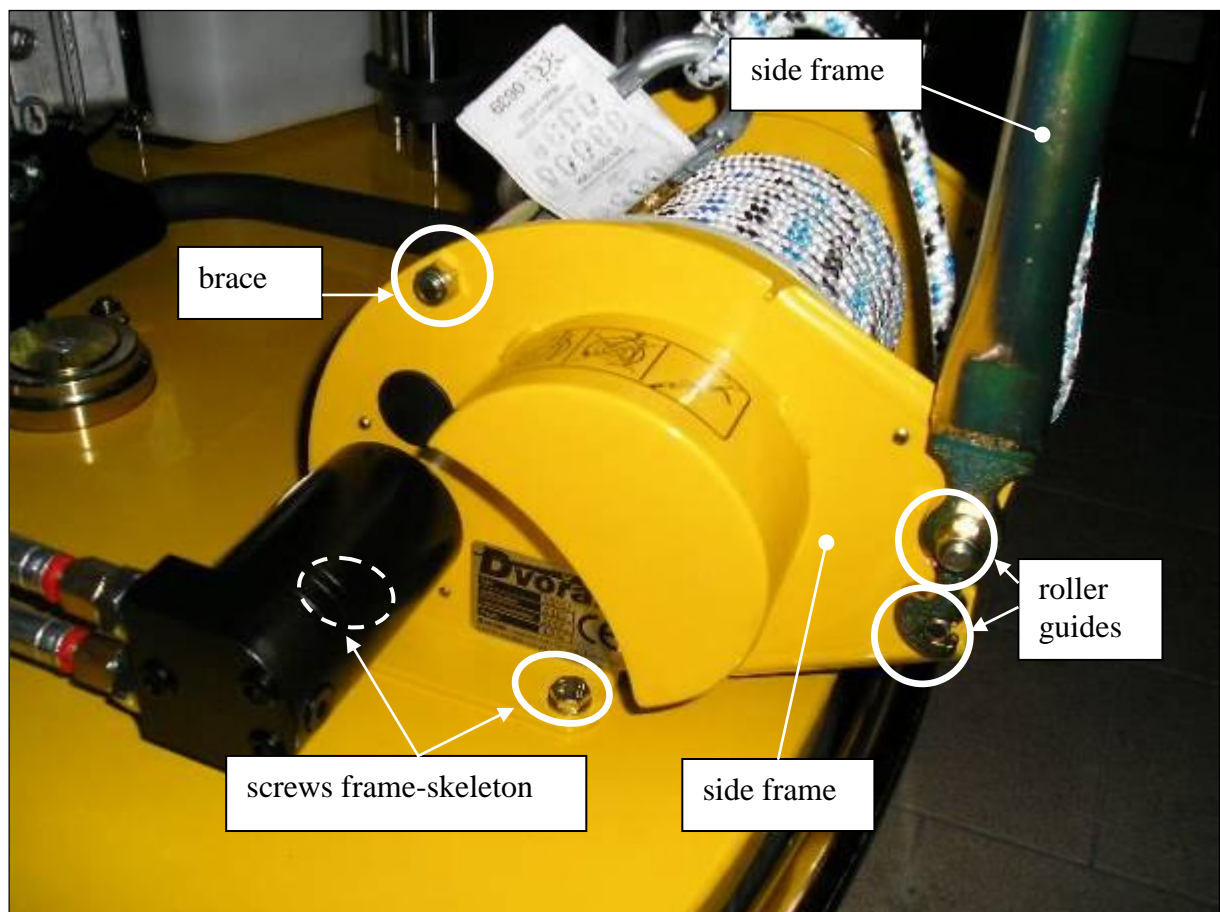
Picture 20



Picture 21



Picture 22



Picture 23

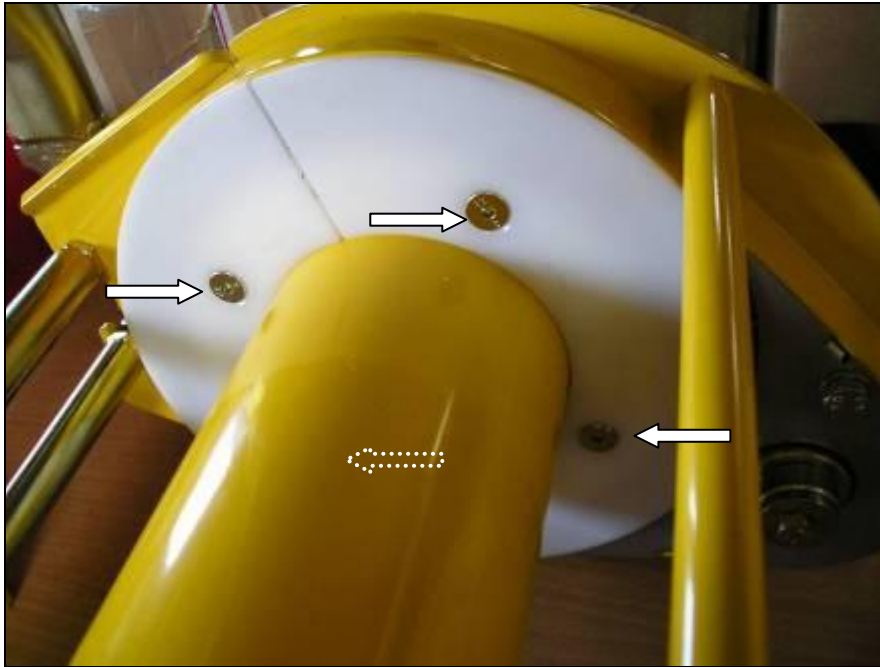
Mounting:

- Mount the hydraulic motor
- Glue and screw up the hydromotor screws (Loctite 243) (Picture 20)
- If the chain is coupled, without the chain link,
 - mount side frame together with sprocket wheel Z10 to the drum shaft and on the brace, check the correct chain setting on the sprocket and the drum (Picture 23) don't forget to put on the chain cover (Picture 18)
 - mount the bearing on the drum shaft and the side frame (Picture 22)
 - tighten the brace self locking nut (Picture 23)
 - mount the rope frame ([see the exchange of the roller guide and the frame](#)) with roller guides (Picture 23)
 -
 - screw the side frame of the winch to the skeleton (Picture 23)
- Secure the sprocket wheel Z10 by the screw, use Loctite 243 (Picture 21)
- Eventually connect the chain by the link
- Tension the chain by shifting the bearings, tighten the self locking nuts of both bearings and both securing screws (Picture 16, 22)
- Mount the chain cover, use Loctite 243 (Picture 18)
- Connect both hydraulic hoses to the hydromotor

5.3 Exchange of the cover ring

Dismount:

- Unwind all the rope
- Release four screws of the cover ring (Picture 24)



Picture 24

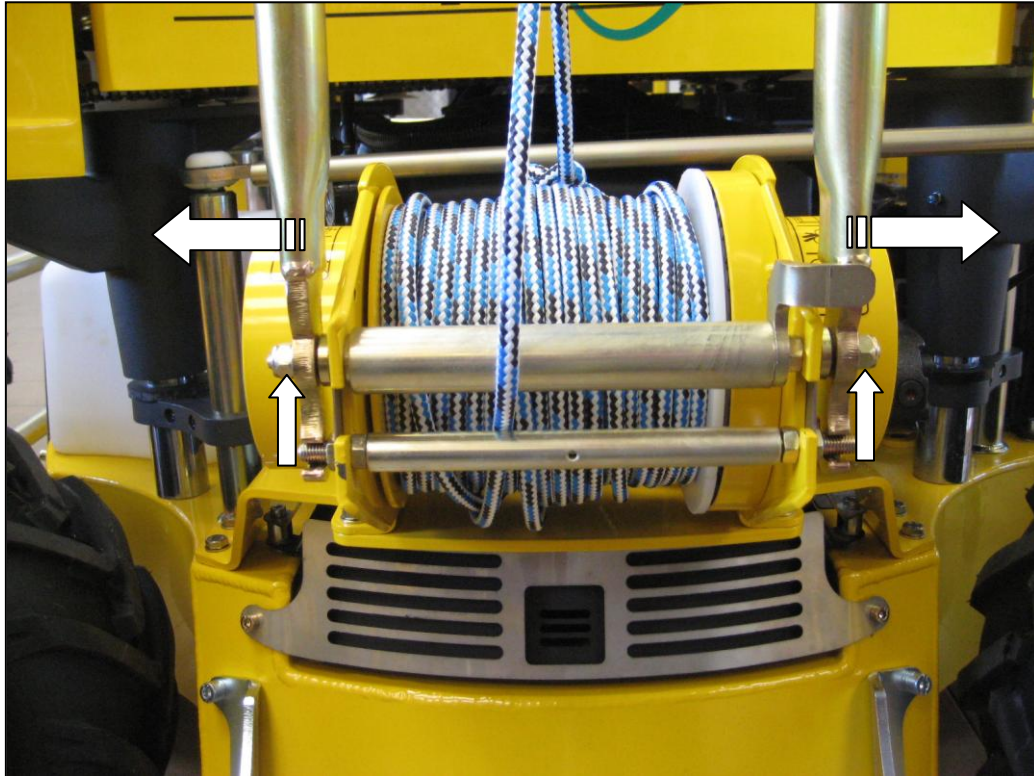
Mounting:

- Pull on the cover ring
- Glue and tight four screws of the cover ring (Picture 24)
- Wind the rope

5.4 Exchange of the frame

Dismount:

- Remove self securing nuts and washers M8 from the winch bolt
- Stretch out the frame and remove it from the winch bolt



Picture 25

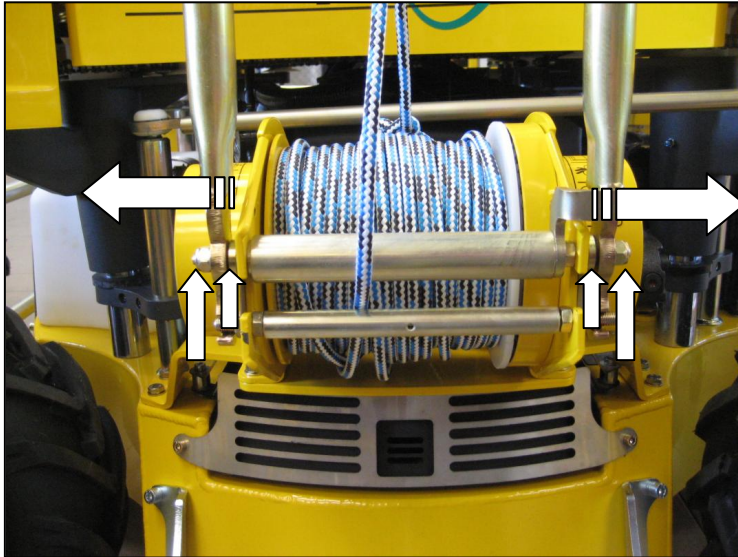
Mounting:

- Take reverse steps
- Try the frame function, installed frame must be able to return freely to a vertical position

2.2 Exchange of the upper roller guide with the spring

Dismount:

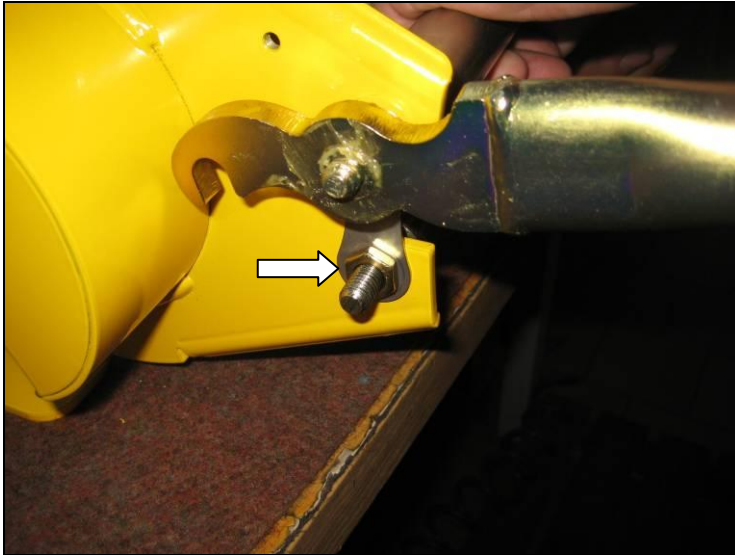
- Remove self securing nuts and washers M8 from the winch bolt
- Remove bushing guides



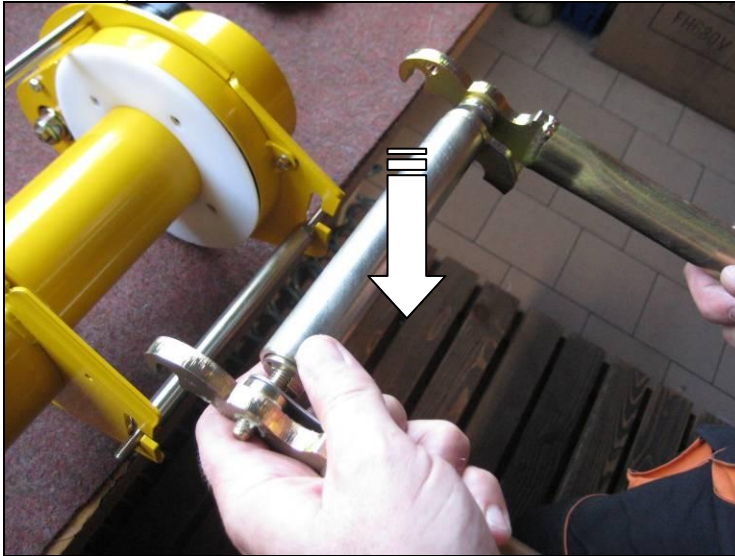
- Release inner nut M8



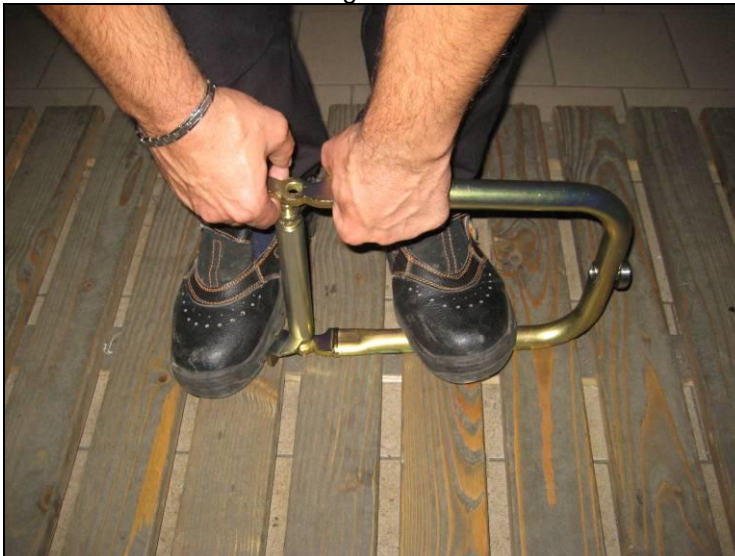
- Remove both nuts M8 from the lower winch bolt



- Bend and put out winch bolt locks then remove the frame with the roller guide out from the winch



- Stretch out the frame for the guide removal



Mounting:

- Lubricate the winch bolt I with a standard grease



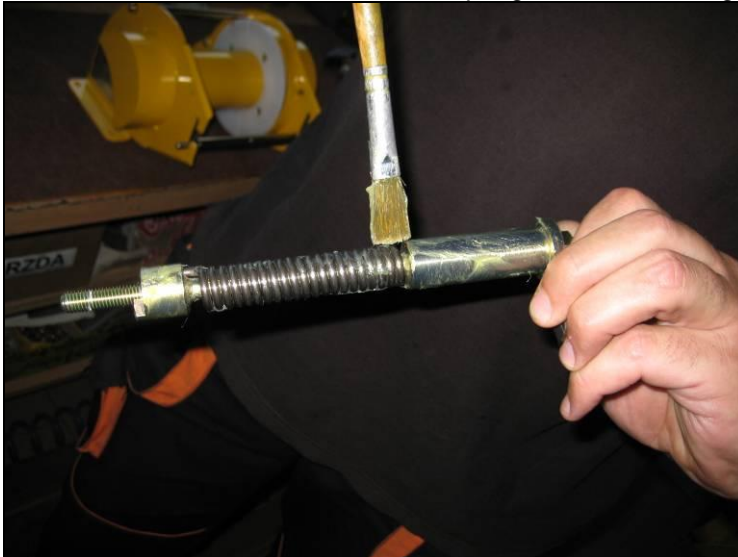
- Install the spring and winch bolt II onto the winch bolt I
 - install both spring ends into the holes



- Install nut M8 on the winch bolt II



- Lubricate the winch bolts I,II and the spring with a standard grease



- Install roller guide 25 on the winch bolts I and II



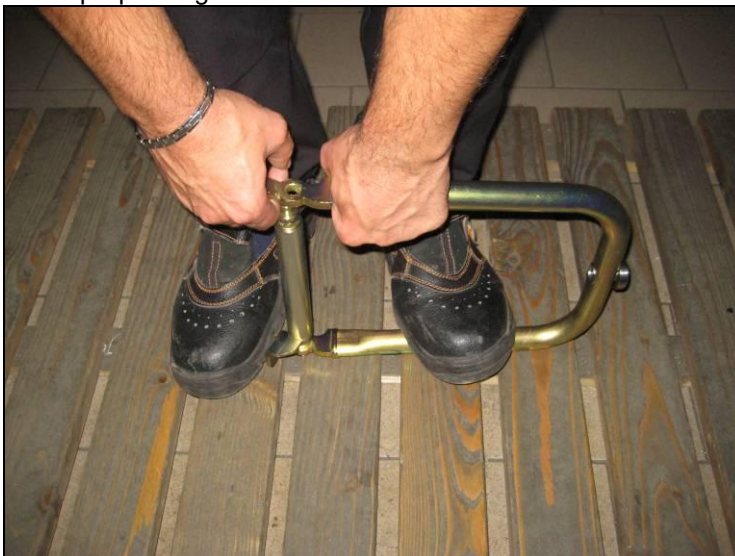
- Install which bolt locks and bushing guides on both ends of the which bolt



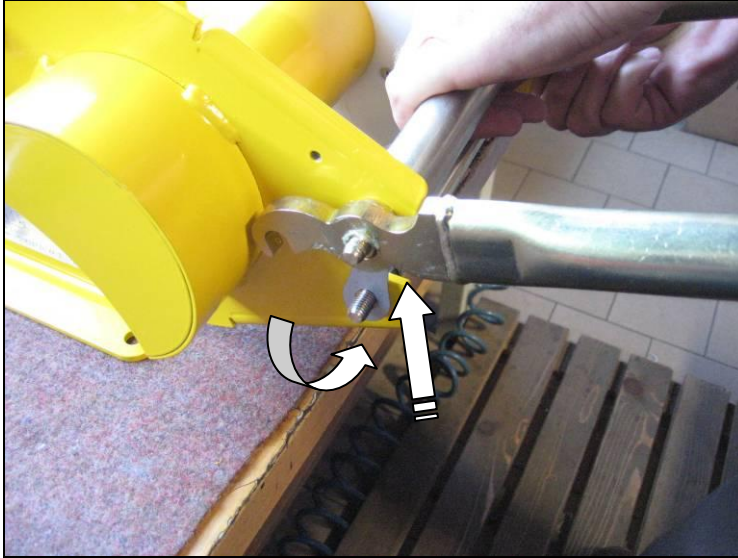
- Lubricate holes of the frame



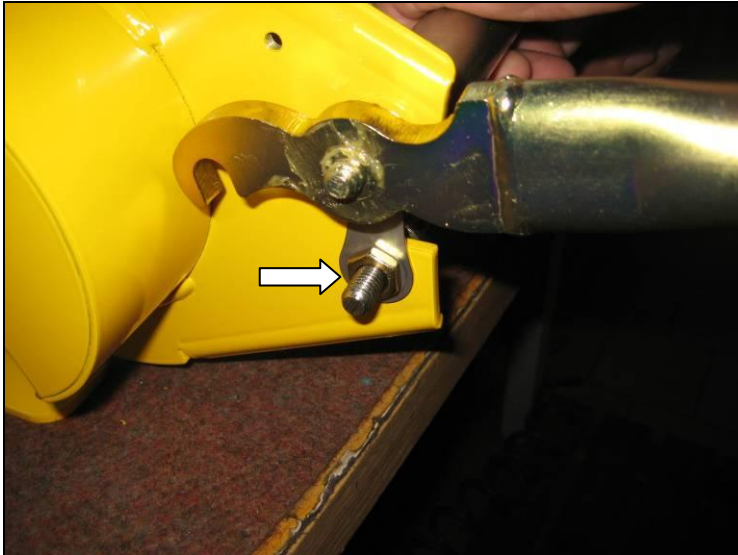
- Install prepared guide into the frame



- Install the frame to the winch, bend and install which bolt locks onto the lower bolt



- Secure both which bolt locks with low nuts M8



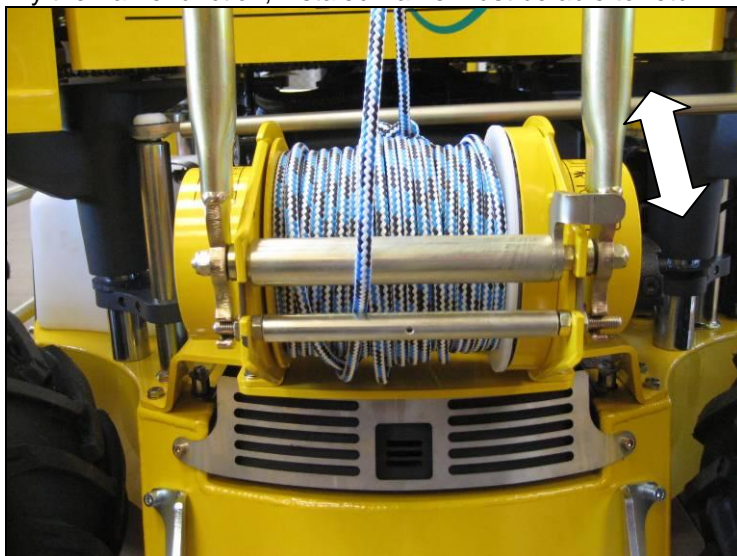
- Preload the spring
 - on the right side of the bolt thread I tighten two nuts together or use a special tool
 - using these two nuts rotate with the bolt until the lock on the left side engages the slot in the winch
- Install self securing nut and washer M8 on the left side of the bolt to secure it in the position



- Install self securing nut and washer M8 on the right side of the bolt and tighten it
- Tighten inner nuts of the guides
- The guides must rotate freely



- Try the frame function, installed frame must be able to return freely to a vertical position



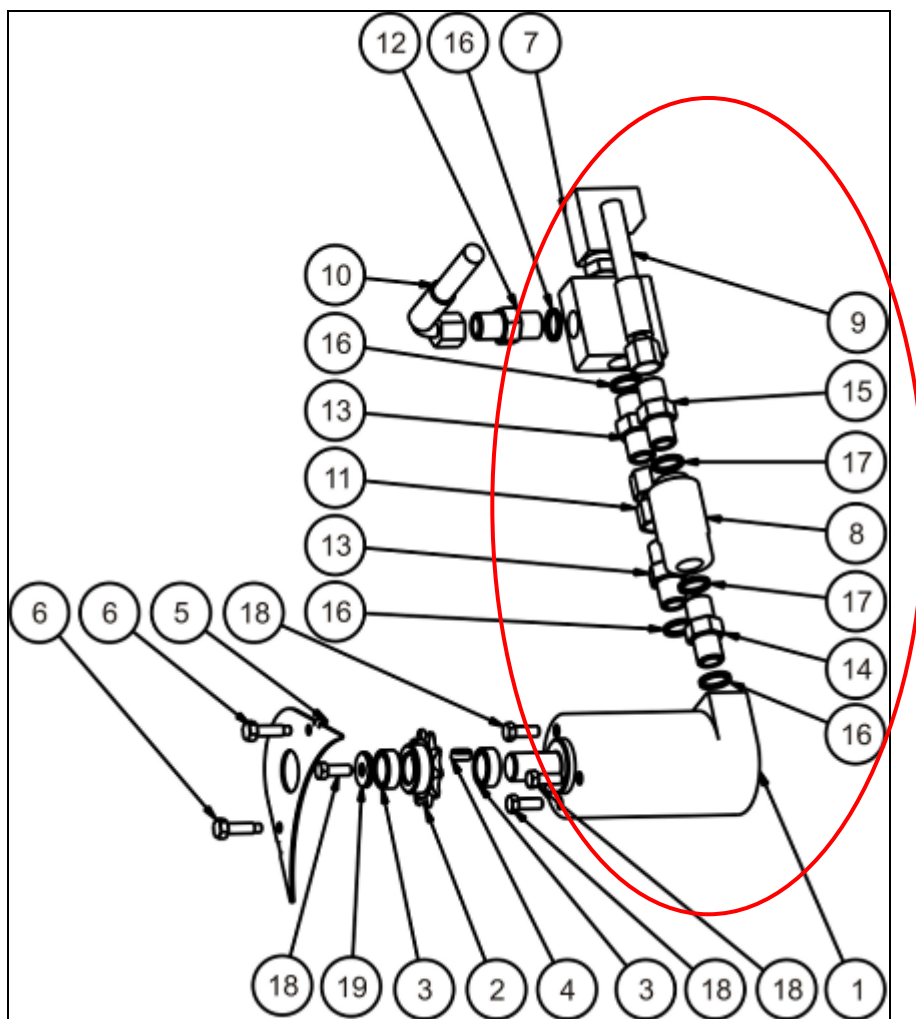
5.5 Exchange of the reduce valve for winches serial no. 1-133

a) Winch HSN02 for ILD01

NOTICE: Maintenance of the hydraulic may only be performed in a perfectly clean working area

Dismount:

- Suck out the hydraulic oil from the hydraulic tank, c. half of the oil
- Disconnect the hydraulic hose pos.9 from the tube fitting pos.15 (Picture 27)
- Screw out the reduce valve pos.8 with tube fittings pos.14,15
- Screw out these tube fittings from the reduce valve, use a vice



Picture 27

Mounting:

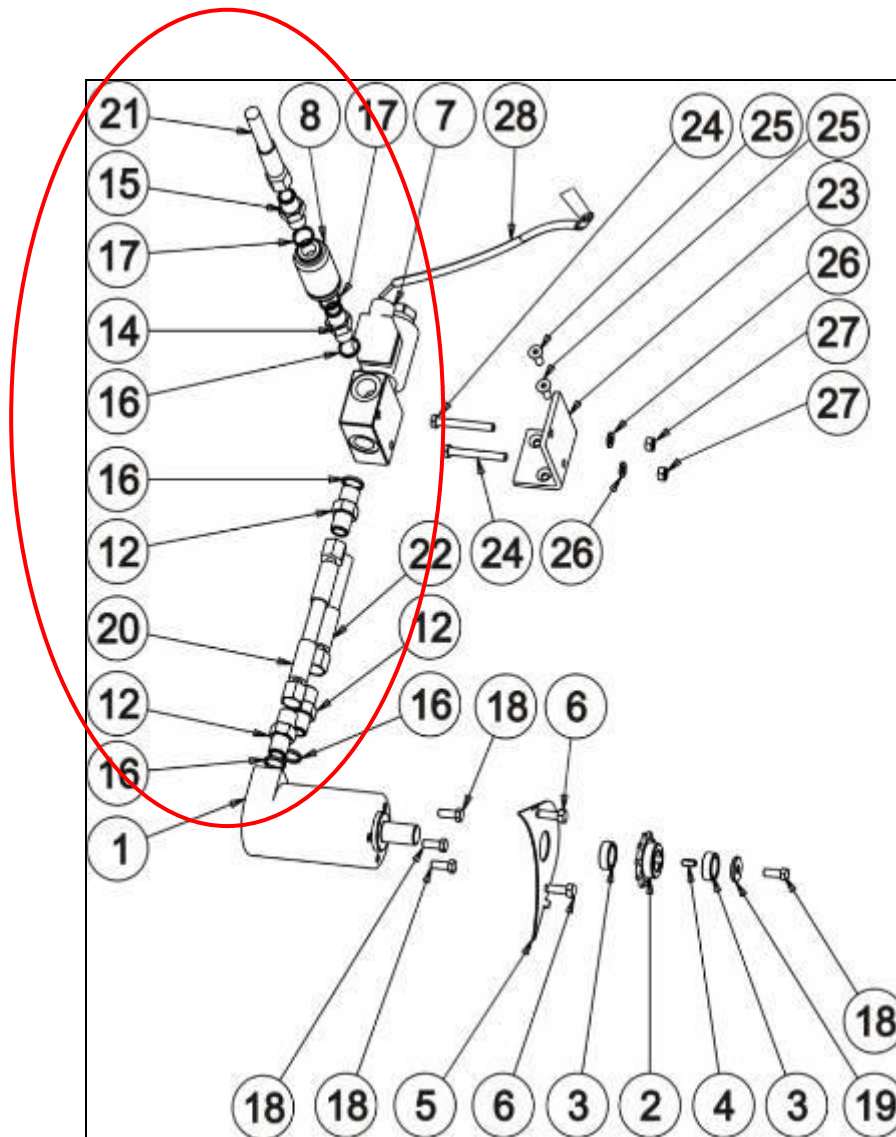
- Take reverse steps
- Use a new seals pos. 16,17 ([see Parts Manual Winch HSN02 revision 03-01-09-2007](#))
- Fill in the hydraulic oil OHM32

b) Winch HSN02 for ILD02

NOTICE: Maintenance of the hydraulic may only be performed in a perfectly clean working area

Dismount:

- Suck out the hydraulic oil from the hydraulic tank, c. half of the oil
- Disconnect the hydraulic hose pos.21 from the tube fitting pos.15 (Picture 28)
- Screw out the reduce valve pos.8 with tube fittings pos.14,15
- Screw out these tube fittings from the reduce valve, use a vice



Picture 28

Mounting:

- Take reverse steps
- Use a new seals pos. 16,17 ([see Parts Manual Winch HSN02 revision 03-01-09-2007](#))
- Fill in the hydraulic oil OHM32

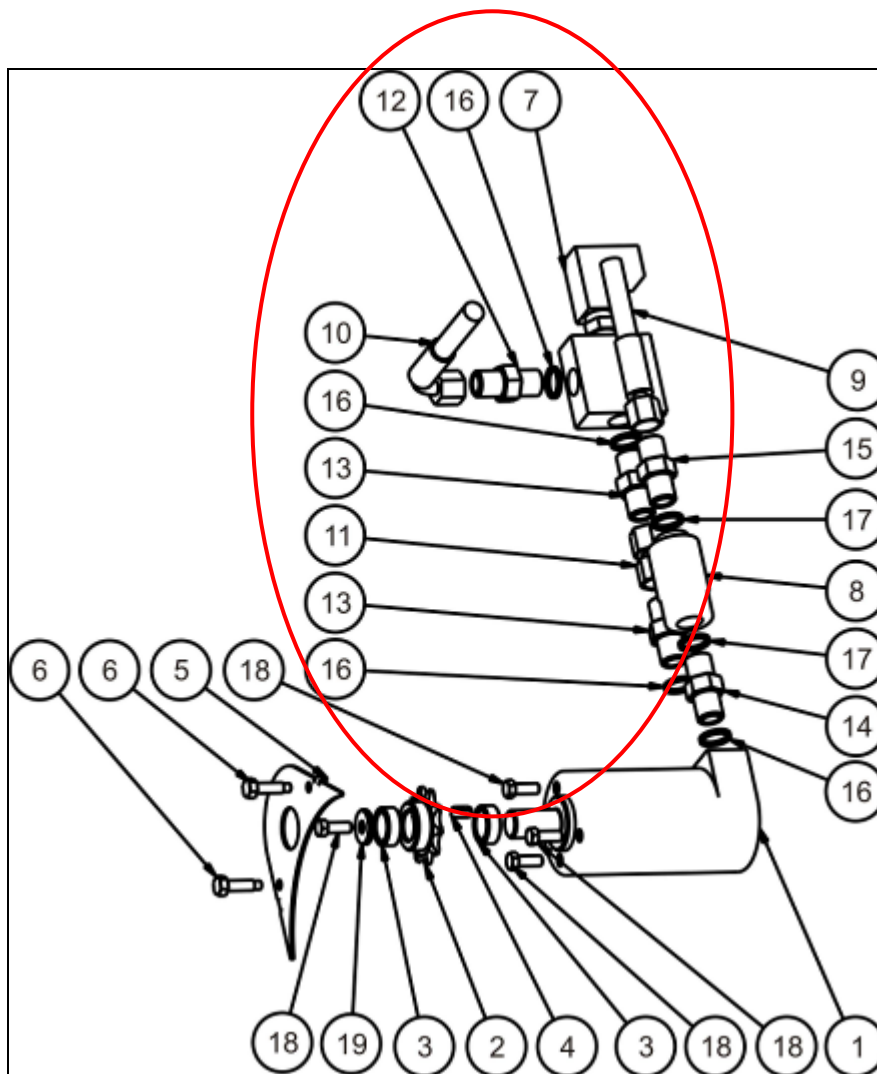
5.6 Exchange of the electromagnetic valve for winches serial no. 1-133

a) Winch HSN02 for ILD01

NOTICE: Maintenance of the hydraulic may only be performed in a perfectly clean working area

Dismount:

- Suck out the hydraulic oil from the hydraulic tank, c. half of the oil
- Dismount the reduce valve ([see the exchange of the reduce valve](#))
- Disconnect the hydraulic hose pos.10 from the tube fitting pos.12 (Picture 29)
- Release the straight pipe joint pos.11
- Screw out the electromagnetic valve pos.7 with tube fittings pos.12,13
- Screw out these tube fittings from the electromagnetic valve, use a vice



Picture 29

Mounting:

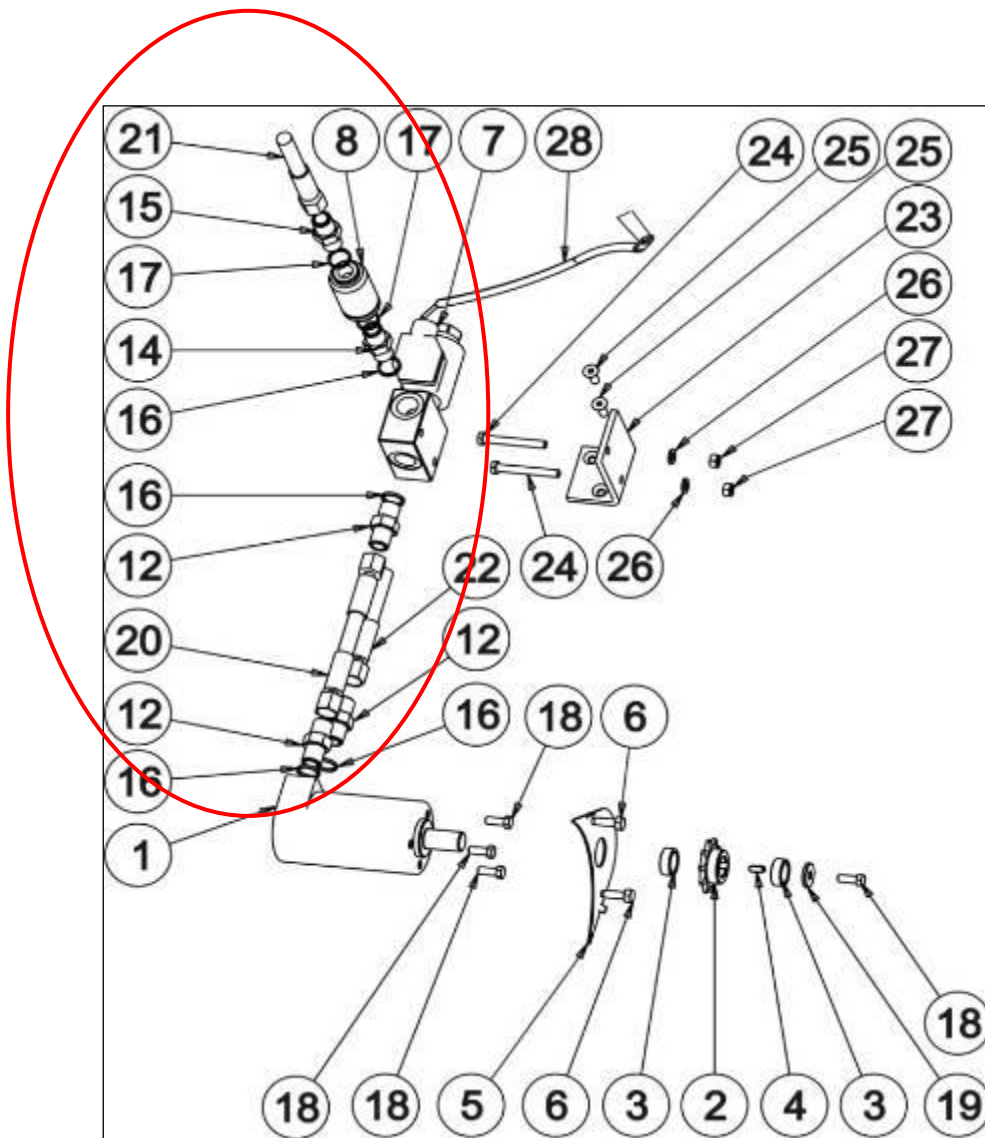
- Take reverse steps
- Use a new seals pos.16 and new straight pipe joint pos.11 ([see Parts Manual Winch HSN02 revision 03-01-09-2007](#))
- Fill in the hydraulic oil OHM32

b) Winch HSN02 for ILD02

NOTICE: Maintenance of the hydraulic may only be performed in a perfectly clean working area

Dismount:

- Suck out the hydraulic oil from the hydraulic tank, c. half of the oil
- Dismount the reduce valve ([see the exchange of the reduce valve](#))
- Disconnect the hydraulic hose pos.20 from the tube fitting pos.12 (Picture 30)
- Release the hydraulic hose pos.21 and screw out the reduce valve pos.8 from the tube fitting pos.14
- Screw out the electromagnetic valve pos.7 with tube fittings pos.12,14
- Screw out these tube fittings from the electromagnetic valve, use a vice



Picture 30

Mounting:

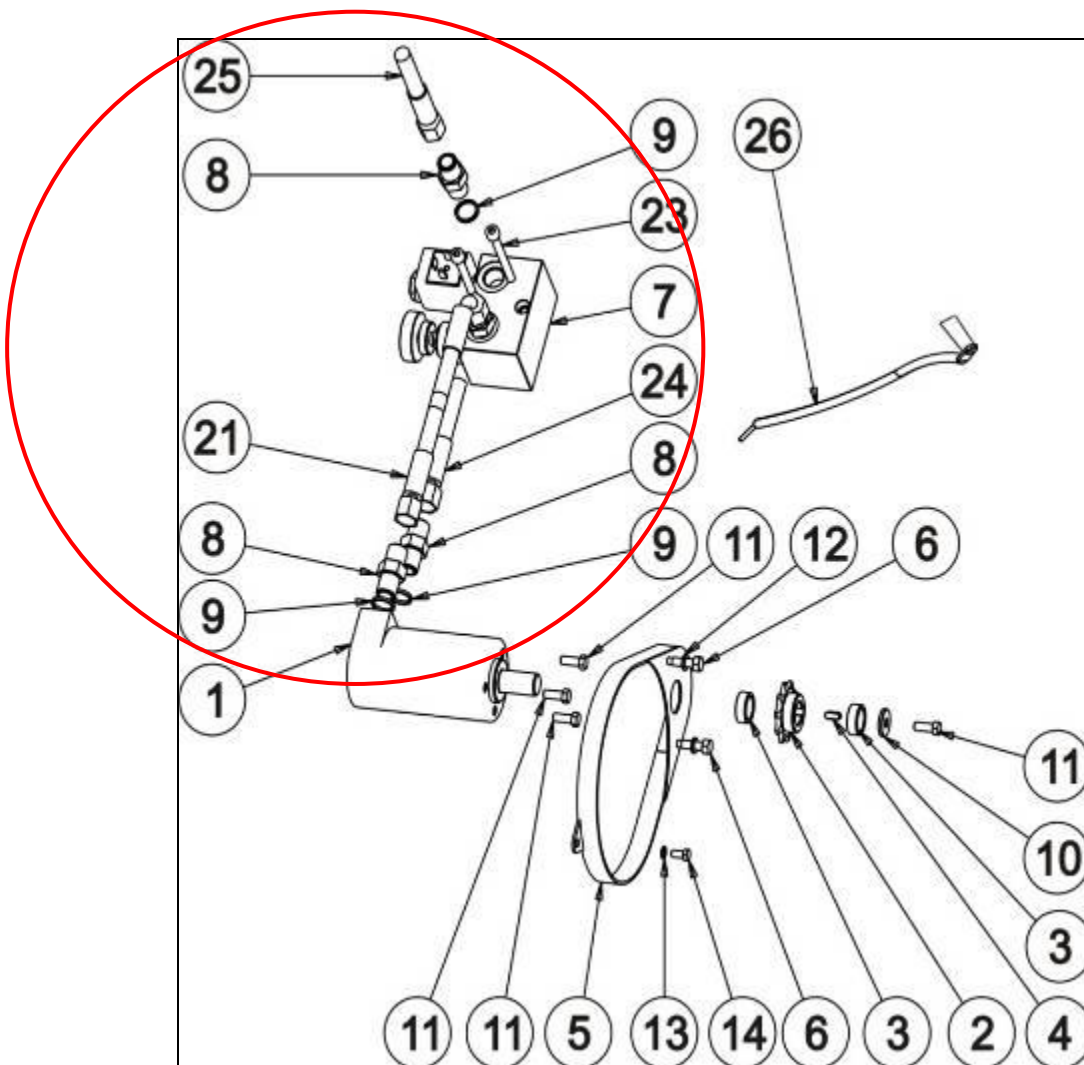
- Take reverse steps
- Use a new seals pos.16 ([see Parts Manual Winch HSN02 revision 03-01-09-2007](#))
- Fill in the hydraulic oil OHM32

b) Winch HSN02 for ILD02

NOTICE: Maintenance of the hydraulic may only be performed in a perfectly clean working area

Dismount:

- Suck out the hydraulic oil from the hydraulic tank, c. half of the oil
- Disconnect the hydraulic hoses pos. 25 and 21 from the tube fittings pos. 8 (Picture 32)
- Dismount valves pos.7 with tube fittings pos.8 from the skeleton
- Screw out these tube fittings from the electromagnetic valve, use a vice

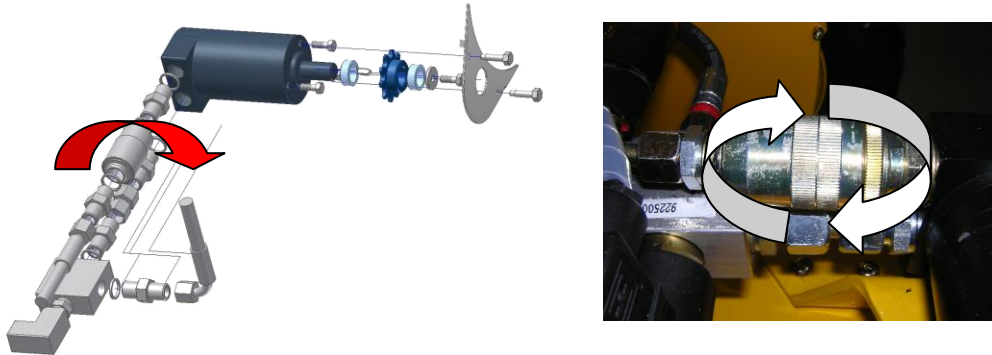


Obrázek 32

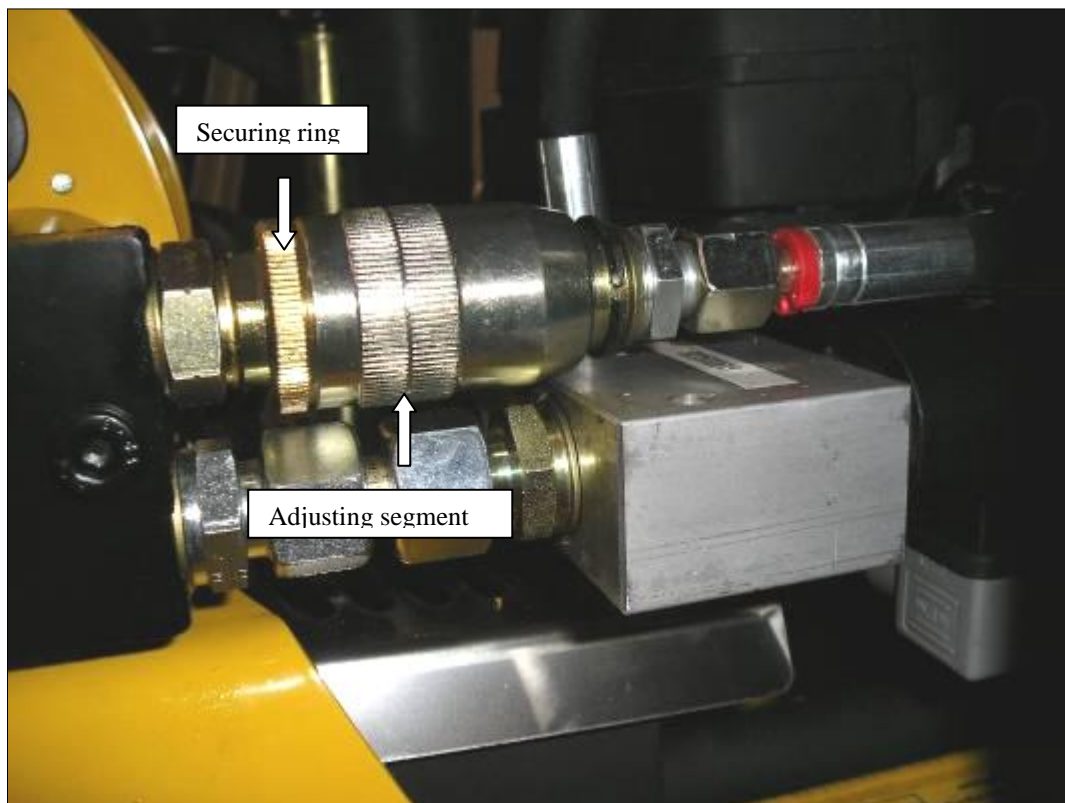
Mounting:

- Take reverse steps
- Use a new seals pos.9 ([see Parts Manual Winch HSN02 revision 03-01-09-2007](#))
- Fill in the hydraulic oil OHM32

6 Adjusting of the reduce valve



- This valve reduces flow oil inside of the hydraulic motor during its work and regulates power output of the winch.
You can change the power output by adjustment of the winch in the way that tension force of the rope should be exact to avoid slipping and running of the wheels during work on a slope
- Adjust the reduce valve by the adjusting segment to + or – position (Picture 33,34)
- The right adjusted winch must not unwind the rope too much.
- The rope must be tense up and down the hill

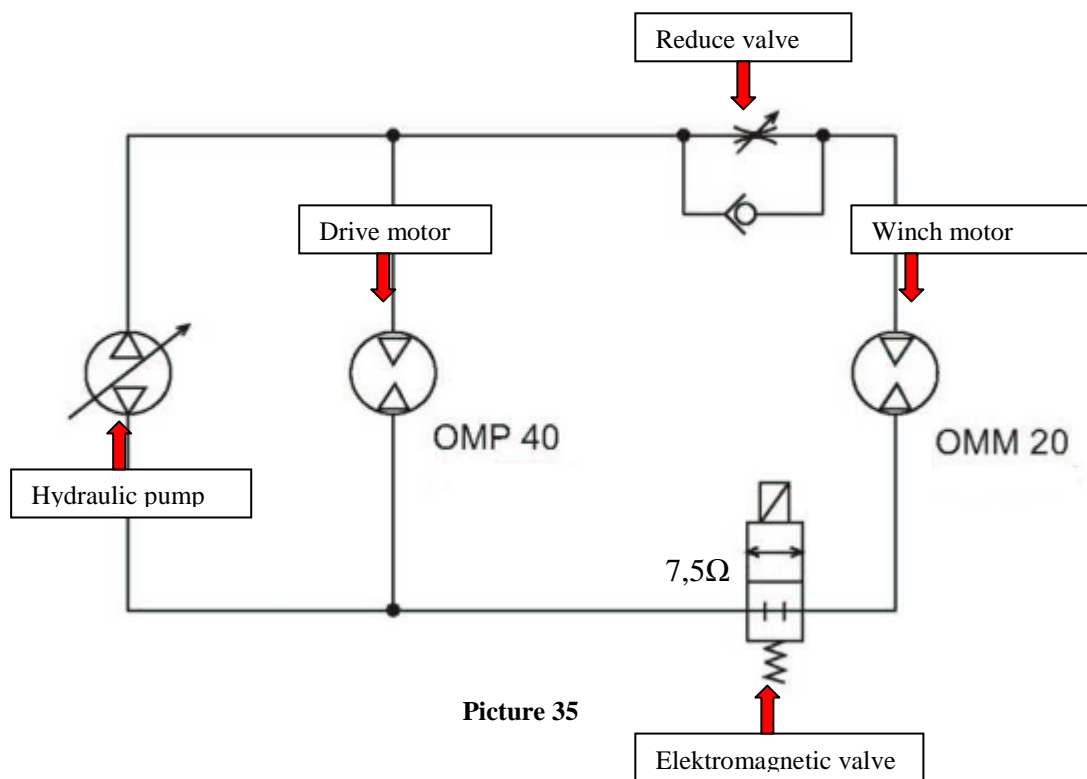


Picture 33



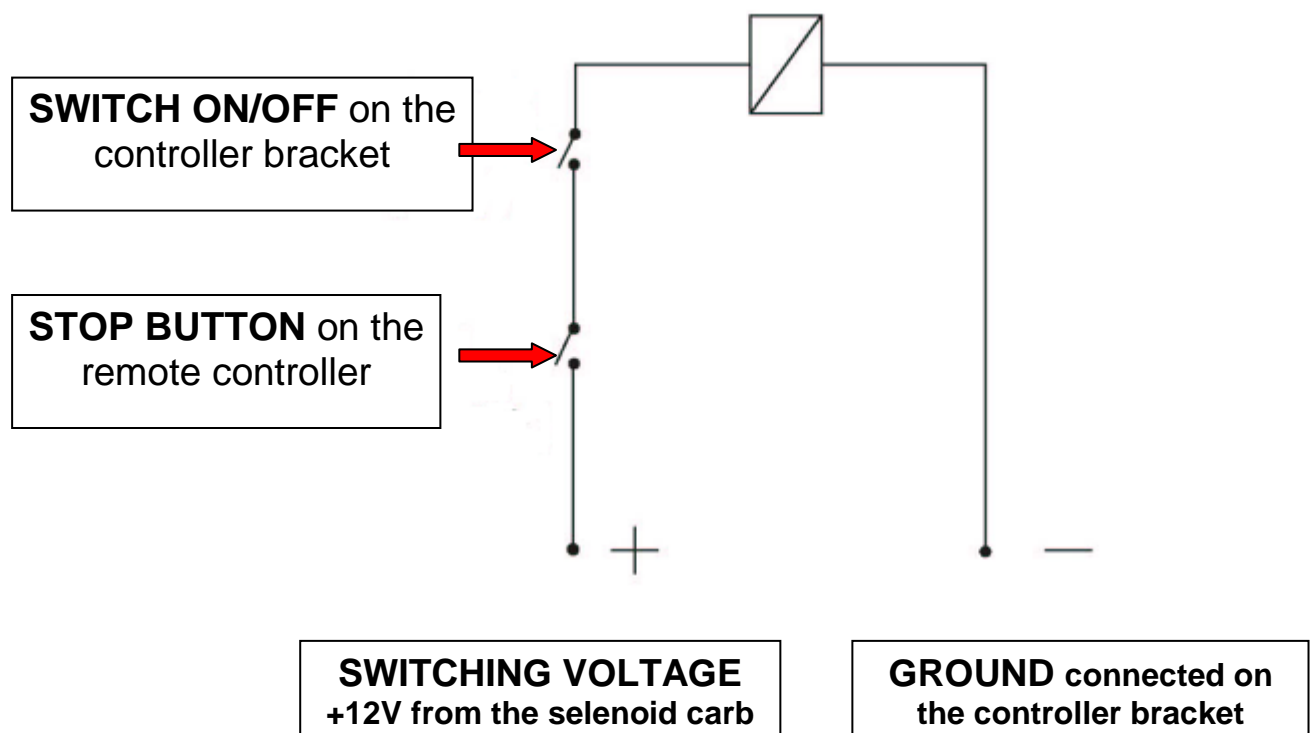
Picture 34

7 Diagram of hydraulic circuit



Picture 35

8 Wiring diagram



Picture 36
35 / 41

9 Enclosure – Service Bulletins, Parts and Product Information

9.1 Winch frame guide

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		Date:	1. 2. 2008
	Winch frame guide	Informative	

Informative	Technical change, servicing not necessary
Recommended	Technical change, which reflects frequent defect. Change should be carried out during next servicing.
Obligatory	Technical change, which reflects possible danger. Immediate servicing is necessary.

General Issue

Innovation of the Guide Segment of the Winch HSN02.

Valid for

Winch HSN02 S/N 168 and onward.

Importance

Preventive or by the Segment guide wear.

Background



Significant wear of the Guide Segment of the winch when working on extreme slopes with a winch.

Technical Description

Innovation of design and material of the Guide Segment.

The newly designed segment now has an large lead-in radius for easier winding of the rope on the winch. Stainless steel reduced the friction between the Guide Segment and the rope.

Innovated design without extra hardware.

Original design	New design
	

Working time

5 minutes

Related information

- Strengthened steel profile of the winch guide stopper.
- Used as standard on winches HSN02 S/N 168 and onward
- Original Guide Segment replaced by an innovated stainless steel segment.



Material

New/superseded/superseding parts

<i>Superseded parts</i>			<i>Superseding parts</i>		
<i>Description</i>	<i>Number</i>	<i>Qty</i>	<i>Description</i>	<i>Number</i>	<i>Qty</i>
Segment guide	1W01S060	1	Segment guide steel - set	1W01K061	1

Price and availability

Price: See latest Price list.

Availability: March 2008

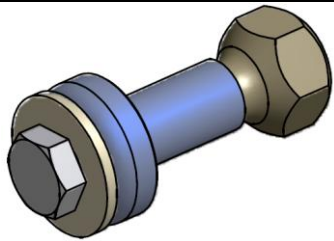
Retrofit ability

Original Guide Segment (1W01S060) will no longer be supported, it is now replaced by Guide Segment - set 1W01K061. The innovated guide segment can be mounted on any HSN02 winch.


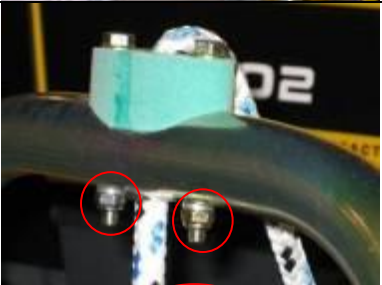


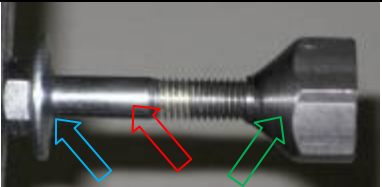

Use the Guide Segment – set (1W01K061) mounting kit to exchange the guide segment. Proceed according to the following instructions.




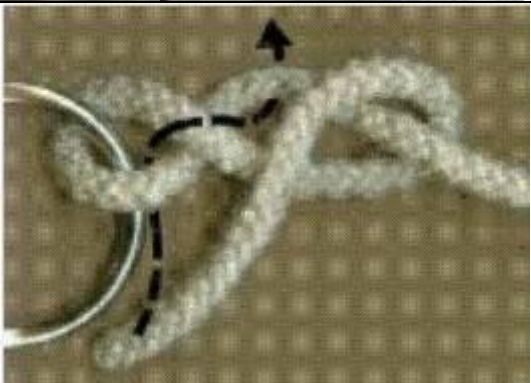
Installation instructions

Tools

<i>Description</i>	<i>Qty</i>	
Flat spanner 8	2	
Flat spanner 17	1	
Flat spanner 22	1	
Steel pin – 15mm diameter	1	
Bolt M10 - 55 (part of the installation set)	1	
Washer M10 (part of the installation set)	1	
Mounting nut 22 (part of the installation set)	1	

Technique

Op.	Description	Tools	Figure
1	Untie the knot on the rope or cut the rope behind the snap hook knot. Pull the rope out of the guide segment.		
2	Loosen two self-locking nuts M5 and dismount the original guide segment.	Flat spanner 8	
3	Use the steel pin with the outer diameter of 15 mm to knock out the original steel bushing of the guide	Steel pin – 15 mm diameter	
4	Dismount the original bushing.		
5	Assembly diagram of the mounting tool: - Bolt M10 - 55 - Washer M10 - Guide segment but („Mounting nut“)		
6	- Firmly attach bolt M10 - 55 - Place the washer M10 on the bolt - Place the Guide segment on top		

7	<ul style="list-style-type: none"> - Place the winch guide frame on the guide segment. - Tighten the “<u>mounting nut</u>“ on the bolt M10-55 with the cone aiming toward the segment. 	Flat spanner 17 Flat spanner 22	
8	<ul style="list-style-type: none"> - By tightening the Mounting nut distend the tube part of Guide segment. - Dismount the Mounting nut. 	 	
9	Lead the winch rope through the Guide segment and attach the snap hoop by means of the KNOT ON THE FIGURE !!!		

Check

Check if the winch works properly and the rope runs freely through the guide segment.

9.2 Bolt lock

Dvořák – svahové sekačky s.r.o. Dvorce 62, 58001 Havlíčkův Brod Tel: +420 569 425 767 Fax: +420 569 429 239 Info@spider-cz.com	Service Bulletin		Bulletin:	48
			Date:	1. 2. 2008
	Bolt lock		Informative	

Informative	Technical change, servicing not necessary
Recommended	Technical change, which reflects frequent defect. Change should be carried out during next servicing.
Obligatory	Technical change, which reflects possible danger. Immediate servicing is necessary.

General

Issue

Lock preventing the release of the winch roller guides.

Valid for

Spider ILD01 a Spider ILD02 with Hydrostatic winch HSN02.

Importance



Preventively or if roller guides get released and fall out frequently.

Background

The new construction secures the bolts of the roller guides of the winch from accidentally falling out from the winch bracket during heavy load on the winch.

Technical description

The Bolt lock (1W01S390) secures the Bolt II (1W01S160) and Bolt III (1W01S170) in the winch bracket.

Original design	New design
	

Working time

10 minutes

Material

New/superseded/superseding parts

<i>New parts</i>		
<i>Description</i>	<i>Number</i>	<i>Qty</i>
Winch Bolt Lock	1W01S390	2

Price and availability

Price: See latest Price list

Availability: March 2008

Retrofit ability


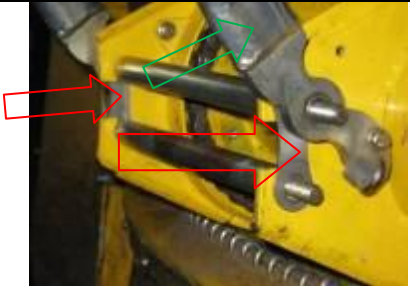
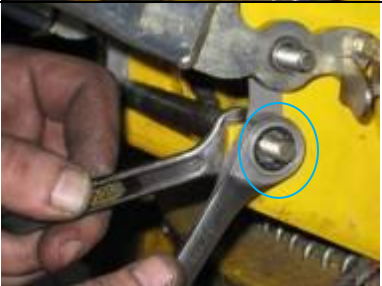

Fully compatible.

Installation instructions

Tools

<i>Description</i>	<i>Qty</i>
Flat spanner 13	2

Working instructions

<i>Op.</i>	<i>Description</i>	<i>Tools used</i>	<i>Figure</i>
1	<ul style="list-style-type: none">- Dismount the self-locking nut M8 and the low nut M8- Spread the guide frame and dismount it from the winch bolt.	Flat spanner 13	
2	<ul style="list-style-type: none">- Insert the winch bolt lock on both sides of the winch bolt.- mount back the guide frame.		
3	Tighten the low nut M8 of the winch bolt	Flat spanner 13	
4	Tighten the self-locking nut M8 of the winch bolt	Flat spanner 13	

Check

Check the free rotation of the roller guides and the free movement of the guide frame.