

Operating manuell

Drum winch, 4 metric tons

From WKU 5825 MA 3 L 011769

For WKU 5825 MA 3 L.....

EN



PistenBully®



KÄSSBOHRER GELÄNDEFahrZEUG AG

Printed in Germany

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CONTENTS

OVERVIEW

- Abbreviations used 5
- Symbols used 5
- Description 6

- BASIC SAFETY INSTRUCTIONS 7**
 - Correct usage: 7
 - Basic rule 7
 - Warning signs affixed to the equipment 8

TECHNICAL DATA

- TECHNICAL DATA 10**
 - Fluids and lubricants 12

SAFETY

- OPERATING SAFETY INSTRUCTIONS 13**
 - Danger zone for persons 13
 - Drum winch 13
 - Tensile loads - upper frame 14
 - Auxiliary equipment. 15

- NOTES FOR THE WINCH CABLE 16**
 - Winch-cable designation 16
 - Winch-cable useable life 16

- INSPECTIONS AND CHECKS 25**

CHECKS

- Inspection work before operation 25
- Greasing guide roll 27

OPERATION

– Moving the vehicle into position	28
– Attaching winch cable to anchor point	29
– Checking operation of pulling-force controller	30
– Operating the drum winch	32
– Turning the PistenBully	33
– Driving downhill	34
– Driving uphill	35
– Relieving tension on the winch cable	36
– Ceasing operation	37
EMERGENCY STOP	39
TILTING THE LOAD PLATFORM.	40
TILTING THE WINCH BOOM.	42
INSTALLING/REMOVING THE DRUM WINCH	43



This operating manual provides information about:

- how to handle, maintain and care for your drum winch.
- important instructions concerning correct and economical operation.
- warnings so that you recognise dangers in good time and avoid them.

ABBREVIATIONS USED

e.g. = for example

MA = tightening torque

SP no. . . = order number for spare part

SYMBOLS USED



Failure to comply with working and operating instructions with this symbol may result in danger to life and limb.



Failure to comply with working and operating instructions with this symbol may result in damage to machines or property.



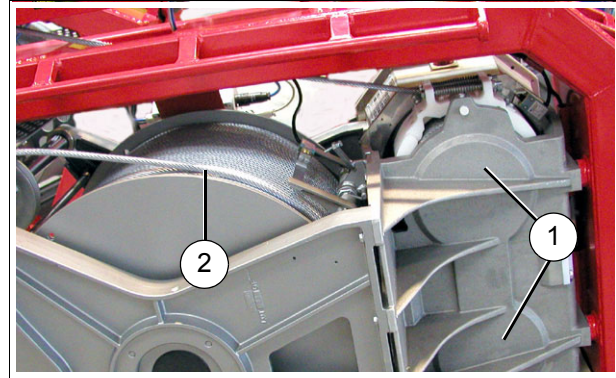
Important information and recommendations.

- Handling information

INTRODUCTION

DESCRIPTION

- The drum winch is used to keep the PistenBully from slipping downhill and to assist it to climb very steep gradients.
- The drum winch is **not** a rescue winch.
- The PistenBully's fourth pump pressurises the hydraulic fluid for the winch drive.
- The winch is driven by the pair of multi groove drums **1**.
- The windlass **2** keeps the cable under a defined tension.
- The pull on the cable can be varied by means of pull controller **3**.
- Usable cable length 1000 meters.



CORRECT USAGE:

The drum winch:

- is an accessory for the PistenBully.
- must be operated on the platform of the PistenBully.

Use the drum winch only:

- to secure the PistenBully to prevent it slipping on descents.
- to assist the PistenBully when ascending steep gradients.
- when it is in perfectly safe operating condition.



If you wish to use the equipment for any other purpose, you must obtain for written approval from the manufacturer.

BASIC RULE

Always comply with the operating instructions for the drum winch and the PistenBully 300W or Polar, as applicable.

An employee of Kässbohrer Geländefahrzeug AG or a person expressly appointed by the company has:

- commissioned the equipment.
- instructed the driver in the use of a drum winch.
- instructed the personnel for checking and maintenance work.



When drivers change the owner-operator is responsible for providing correct and adequate instruction for the new driver.

WARNING SIGNS AFFIXED TO THE EQUIPMENT

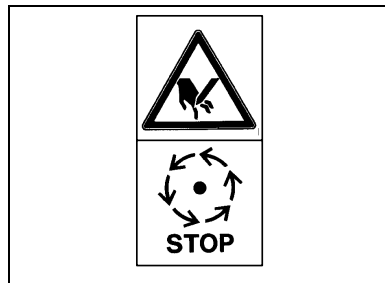


Strict compliance with the warning signs affixed to the drum winch is mandatory.



Warning signs must be replaced immediately if lost or damaged.

Warning sign:



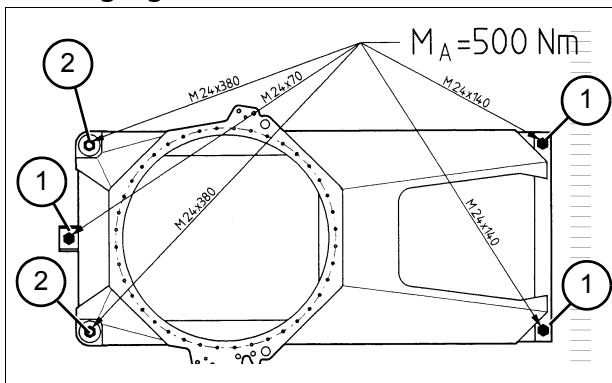
Affixed to: **Winch frame**
SP No. 8.762.638.058E

 **WARNING!**

Rotating components can crush fingers and hands.
Keep well clear of component until it has come to a complete standstill.



Warning sign:

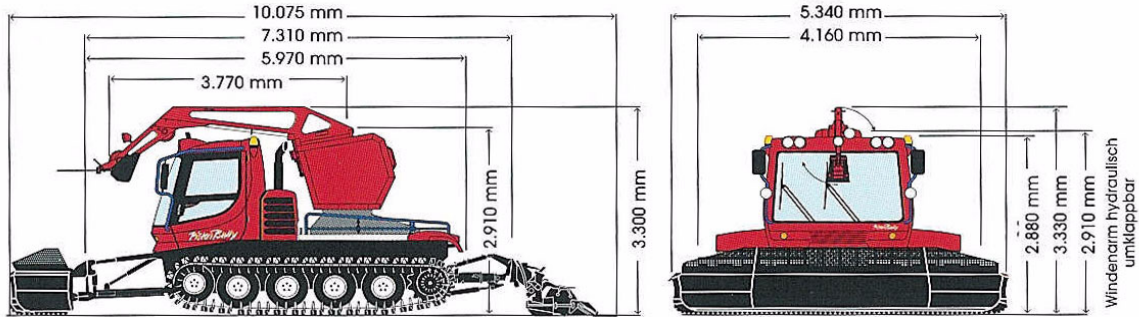


Affixed to: **Winch frame**
SP No. 8.762.651.000 E

WARNING!

Danger: Slackening of threaded fasteners.
Always make sure that all threaded fasteners on the winch mount are tightened to their specified torques.

TECHNICAL DATA PISTENBULLY 300W POLAR



PistenBully 300 W Polar

Speed

With drum winch 0 - 19 km/h

Drum winch in operation

Speed 0 - 17 km/h

Fuel consumption 22 - l/h

Weight

Drum winch 1,700 kg

Without cable 1,000 kg

Dimensions

Height with PistenBully 3,300 mm

With winch arm lowered 2,910 mm

Winching drum system

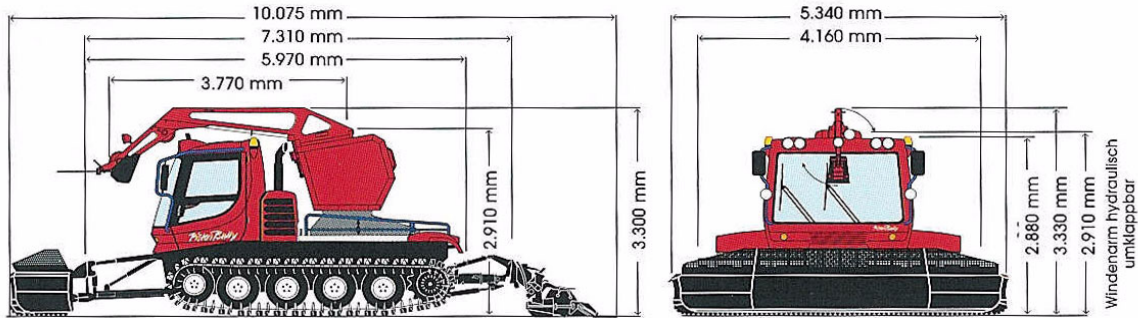
Type TL40 60 AH 1050/11 Plumettaz

Winch pump

Type A4 VG90 Hydromatik



TECHNICAL DATA PISTENBULLY 300W



PistenBully 300 W

Speed

With drum winch 0 - 19 km/h

Drum winch in operation

Speed 0 - 17 km/h

Fuel consumption at least 18l /h

Weight

Capstan winch 1,700 kg

Without cable 1,000 kg

Dimensions

Height with PistenBully 3,300 mm

With winch arm lowered 2,910 mm

Winching drum system

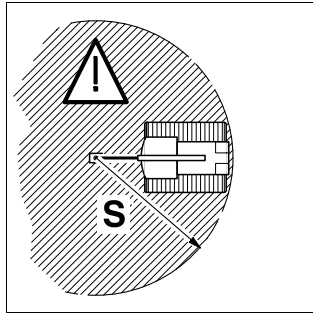
Type TL40 60 AH 1050/11 Plumettaz

Winch pump

Type A4 VG90 Hydromatik

Designation	Grade	Capacity	Interval between changes
Gear oil	<p>Fully synthetic gear oil Base: Poly Alpha Oleofin (PAO) Classification: DIN 51517 T3 CLP HC Viscosity class: ISO VG 220</p> <p>Fully synthetic gear oil Base: Poly Alpha Oleofin (PAO) Classification: API GL 5 / MIL-L-2105 B/C Viscosity class: SAE 75W140</p>	10 litres	<p>after 100 operating hours. At least: once a year Every 1250 operating hours. 100 operating hours after W4 maintenance</p>
<p>Windlass gear</p> <p>Gear</p> <p>Slewing gear drive</p>	<p>Polyalphaolefin (PAO) Classification: DIN 51517 T3 CLP HC Viscosity class: ISO VG 150 ISO VG 220 (Sommer)</p> <p>Polyalphaolefin (PAO) Classification: API - GL 4 Viscosity class: SAE 75 W 90</p>	<p>0.5 litre</p> <p>0.9 litre Gear Slewing gear drive</p>	<p>after 100 operating hours. At least: once a year Every 600 operating hours. Every 2500 operating hours. 100 operating hours after W4 maintenance</p>
Winch brake	<p>Engine oil MB sheet 228.5 Viscosity class: 5W40</p>	0.08 litre	<p>At least: once a year Every 2500 operating hours.</p>
<p>Lube grease for cable guide roller and slewing gear</p>	<p>Calcium saponified grease KP 2 G-30 DIN 51502 AVIACAL 2 LD - 1kg - 0.946.047.000</p>		<p>Cable guide roller: Daily Slewing gear: Every 100 operating hours.</p>





DANGER ZONE FOR PERSONS

⚠ WARNING!

Danger to life!

Use the drum winch only when the danger zone is clear. Close off the ski-slope.

- Before using the drum winch, secure the **danger Zone "S"**: the size of this zone depends on the length of the cable.

DRUM WINCH

⚠ WARNING!

Risk of fatal injury if cable breaks. Operation prohibited on slopes without in sufficient flat runout at botton.

- Steep slopes must have sufficient runout.
- Additional safety measures:
 - Snow wall
 - Stopper nets
 - Flashing beacons
- Note that the cable can whip over several meters if the Surface of the slope is irregular.
- Driving with the cable atacked and the drum winch switched off is prohibited.
- Risk of collision!
 - Do not attempt to drive under:
 - cables
 - high voltage line
 - drag lifts-
 - cable - car runs

- The anchor point for the load hook must be rated for at least 150 kN.
- The mount for the load hook must be of non-swiveling design.
- Operation of the winch is permissible only when the winch cover is closed.
- Driving is permitted only with the front windscreen of the cab installed.

TENSILE LOAD - UPPER FRAME

CAUTION!

High tensile load on the upper frame.
Note tension control when the PistenBully changes direction relative to the anchor point.

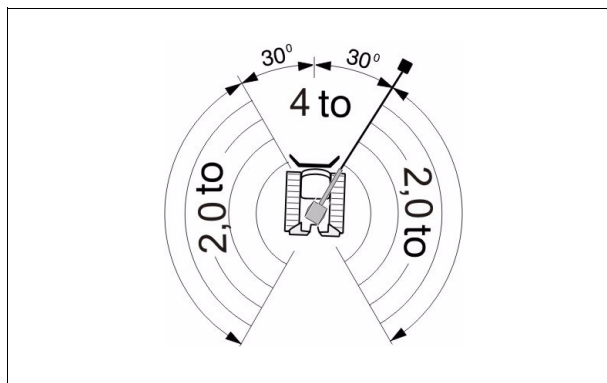
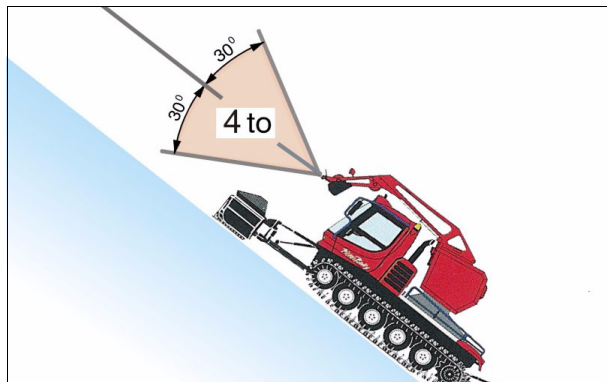
Change in direction up to 30°:
(winch arm / outside mirrors)

- Set tension control to a max. of 4.

Change in direction over 30° :

- Set tension control to a max. of 2.0.





AUXILIARY EQUIPMENT

The auxiliary equipment of Kässbohrer Geländefahrzeug AG has been approved for winch operation.

⚠ CAUTION!

Risk of collision between auxiliary equipment and winch cable.

Always observe the winch cable when raising the auxiliary equipment.

⚠ CAUTION!

Risk of collision between front snow blower and winch arm!
The front snow blower must be suitable for a vehicle fitted with a winch.



Use only winch cable from Kässbohrer Geländefahrzeug AG.

WINCH-CABLE DESIGNATION

Winch-cable designation:

- Winch cable diameter 11 mm
- Cable length 1050 metres.



Usable cable length 1000 meters.
The rest of the winch cable is marked red.



Use only Kässbohrer winch cables.



Comply with all applicable national safety regulations with regard to cable monitoring.

WINCH-CABLE USEABLE LIFE

Depends on:

- the load on the cable
 - the number of turns over the drums.
 - handling and maintenance.
-
- The winch cable is maintenance-free.
 - **Winch cable:**
 - Do not re-grease.
 - Do not apply preserving agents.
 - Do not clean with a high-pressure cleaner.
 - Use only a dry cloth to wipe off.



WINCH CABLE REQUIRES REPLACEMENT

Winch-cable condition:

- 5 wires are broken over a stretch of 66 mm.
- 10 wires are broken over a stretch of 110 mm.
- one strand is broken.
- if cable is wavy (corkscrew).
- if cable is kinked or crushed.

Situation aid

A wire is broken on the winch cable:

- Slightly raise the broken ends and bend them back and forth until they break off at the root of the strand



Make sure that there are no projecting wires.

- Do not cut off broken wires.

WINCH CABLE



Pockets

Cause:

Over-frequent use of the same length of cable.

Remedy:

When work is completed, unreel the entire winch cable and take the strain off it. Leave the hook attached.

Reel the cable back onto the drum with less tension.



Snags

Cause:

Incorrect unreeling of the winch cable.

Snags damage the structure of the cable, reducing the cable to a fraction of its original strength.



Slack cable

Cause:

Strain applied suddenly and then suddenly relieved.

Remedy:

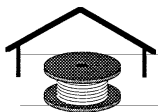
When using the winch, apply strain slowly and relieve the strain slowly as well.

Cable chafing

Do not permit the winch cable to chafe against or be de-flected by hard, sharp-edged obstructions (stones, ice, steel, etc.).

Corrosion

Do not treat the winch cable with or apply acids, sulphur, saline vapour or other aggressive substances.



Storage

If possible, store the winch cable in a closed room.

WINCH CABLE - LOAD HOOK

Load hook

The winch cable is fitted with a load hook with safety lock. In order to help prevent the cable from unravelling, the load hook is attached to the cable without a swivel.

ANCHOR CABLE

The anchor cable (belay) is between the anchor point and the load hook of the winch cable.

- Always use a double cable or twist stopper between the anchor cable and the load hook of the winch cable.

This will stop the winch cable from unravelling.



INSTRUMENTS

1 Slewing-gear brake

lights up when the brake is applied.

Intermittent warning buzzer sounds when the cable is reeling in.

2 Winch boom indicator

lights up when the winch boom is not locked.

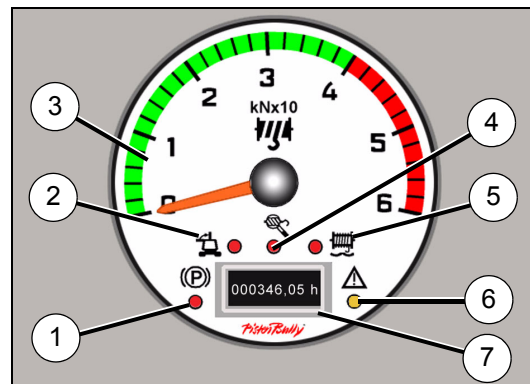
Intermittent warning buzzer sounds.

3 Pulling-force gauge**4 Cable strand indicator**

- this is **not** a substitute for visual inspection of the cable
- lights up if the winch cable is defective.

Intermittent warning buzzer sounds.

- Cease operations and ascertain the cause of the problem.

**5 Cable-reel indicator**

- lights up when cable is unreeled to its maximum usable length.
- lights up if there is a fault when the cable is reeling in.

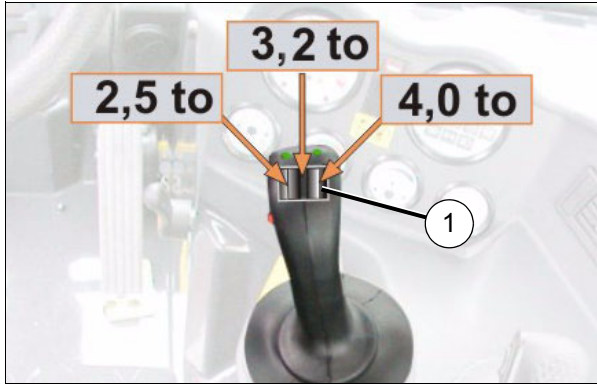
Warning buzzer sounds

Turn immediately or check cable reeling (*see the section on ascending*).

6 Electronic pulling-force regulator

lights up when electronic pulling-force control is **OFF**.

7 Operating-hours counter for winch

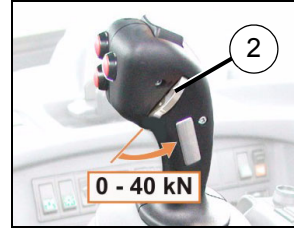


1 3-position switch for driving speed

Moved to right = pulling force 4.0 metric tons / 8 km/h

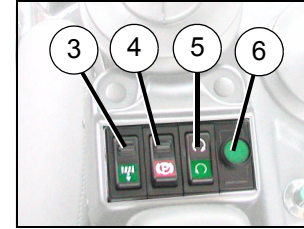
Centred = pulling force 3.0 metric tons / 11 km/h

Moved to left = pulling force 2.5 metric tons / 7 km/h



2 Pulling-force controller for winch cable

adjustable from 0 - 40 kN



3 Latching rocker switch

Winch cable - reel in / unreel



Top section pressed = cable reeling in

Centred = winch OFF

Bottom section pressed = cable unreeling

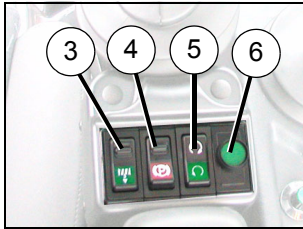
4 Latching rocker switch

Slewing gear brake



Top section pressed = apply brake

Bottom section pressed = release brake



5 Rocker switch



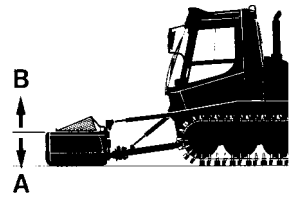
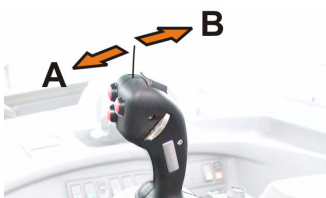

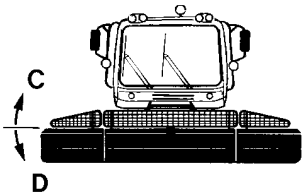
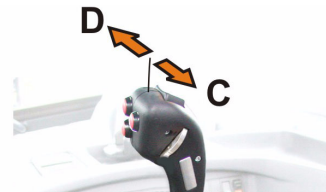
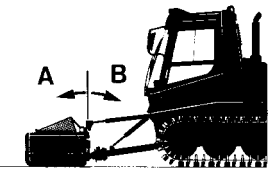
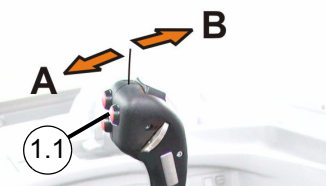
Swivel winch arm

Top section pressed = swivel to right
 Bottom section pressed = swivel to left

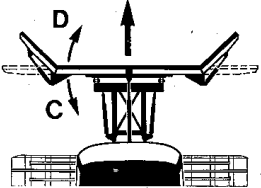
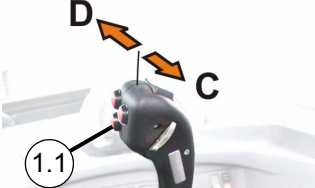
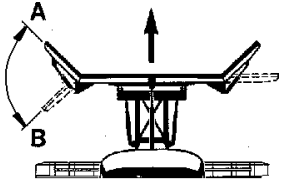
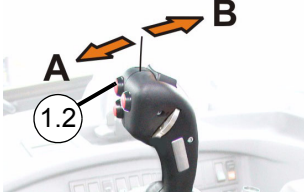
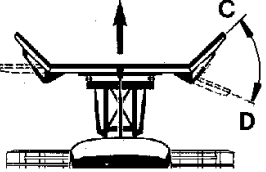
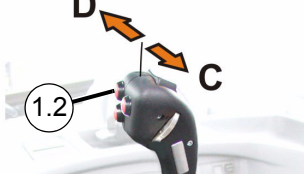
6 Reset buzzer for cable-strand monitor

(see section on ascending).

Function	Joystick
<p>HEBEN</p>	

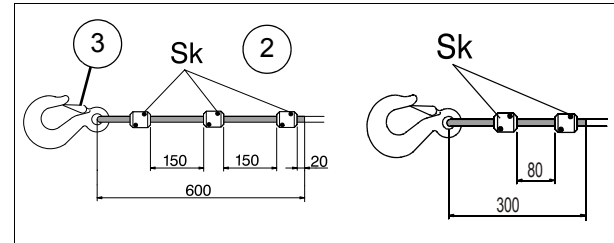
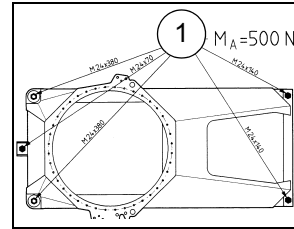
Function U-scraper plate	Joystick electrical / hydraulic	Joystick position	Pushbutton / rocker switch
<p>RAISE - LOWER</p> 		<p>A - lower</p> <p>B - raise</p>	<p>floating position</p> 
<p>TILT</p> 		<p>C - to the left</p> <p>D - to the right</p>	
<p>DIP</p> 		<p>A - forwards</p> <p>B - backwards</p>	<p>1.1</p>

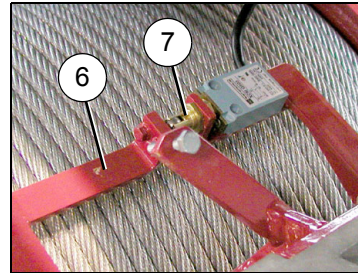
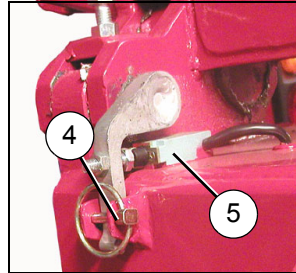
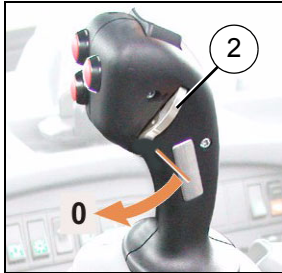


Function U-scraper plate	Joystick electrical / hydraulic	Joystick position	Button or Rocker switch
<p>SWIVEL</p> 		<p>C - swivel to the left. D - swivel to the right.</p>	<p>1.1</p>
<p>LEFT SIDE SECTION</p> 		<p>A - side section inward. B - side section outward.</p>	<p>1.2</p>
<p>RIGHT SIDE SECTION</p> 		<p>C - side section inward. D - side section outward.</p>	<p>1.2</p>

1. INSPECTION WORK BEFORE OPERATION

- Remove snow and ice from the winch.
- Check winch fasteners **1**.
Tightening torque $M_A = 500 \text{ Nm}$.
- Check operation of slashing - gear brake.
- Check that hydraulic lines and connectors are free of leaks and check chafing.
- Check that the cable guide arm moves freely on the windlass.
- Clean viewing screen for winch cable winding.
- **3 cable cleats (Sk)** are installed spaced at 150 mm (see drawing). The specified tightening torque is **25 Nm**.
- **2 cable cleats (Sk)** are installed spaced at 80 mm (see drawing). The specified tightening torque is **30 Nm**.
- Checking operation of pulling-force controller **3**.
- Check ease of movement of the cable relay rollers in the winch arm and of the cable guide arm.





Checking the winch-arm indicator

- Ignition of diesel engine ON.
- Set pulling-force controller 2 to 0.



- Move rocker switch to the "reel in cable" position

- Release pin 4 and open the toggle.

The winch-arm indicator lights up. The buzzer sounds.

Checking the cable-reel indicator

- Ignition of diesel engine ON.

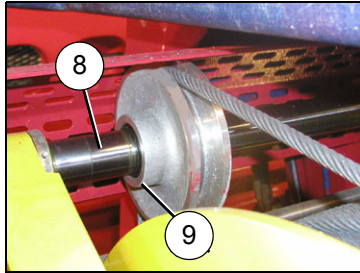


- Move rocker switch to the "reel in cable" positiv.

- Press toggle 6 until switch contact 7 is open.

The cable-reel indicator lights up. The buzzer sounds.





Greasing guide roll

- Lubricate the grease nipple **9** and shaft **8** with special grease.

Approved special greases:

Saponified calcium grease

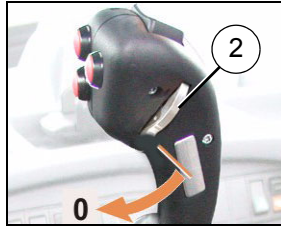
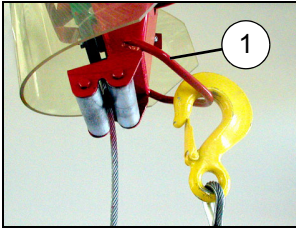
Specification: Aviacal 2 LD, KP2K-20 DIN 51502

Do not mix special greases.

When changing to another special grease, grease entire guide roll.

You can now start **moving the vehicle into position**.

2. MOVING THE VEHICLE INTO POSITION



Make sure there is no-one in the immediate danger zone.

- Apply the parking brake.
- Move direction of travel switch to "Neutral" position.
- Engage load hook of winch cable to winch boom 1.



- Move rocker switch for slewing-gear brake to close position.

- Set pulling-force controller 2 to 0.
- Start the diesel engine.
- Move rocker switch to the "reel in cable" position. **Warning buzzer** for slewing-gear brake sounds.



- Swivel the winch arm toward the anchor point
Top section pressed = swivel to right
Bottom section pressed = swivel to left



- Swivel winch arm to direction of travel.
- Move rocker switch to central position.



- Drive the PistenBully up to the anchor point.
- Move direction of travel switch to "Neutral" position.
- Apply the parking brake.



- The indicator lamp is OFF.





- Move rocker switch to the "reel in cable" position.
Warning buzzer for slewing-gear brake sounds.



- Swivel the winch arm toward the anchor point
Top section pressed = swivel to right
Bottom section pressed = swivel to left

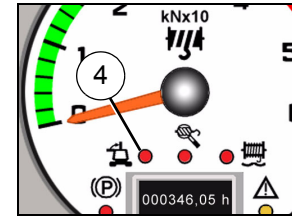
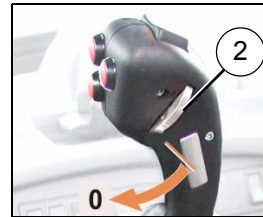


- Move rocker switch to central position.

The vehicle is now in position.

- You can now start **attaching the winch cable to the anchor point**.

3. ATTACHING WINCH CABLE TO ANCHOR POINT



- Check that winch arm indicator lamp **4** is OFF.
- Set pulling-force controller **2** to 0.



- The indicator lamp is **ON**.
Electronic pulling-force control is ON.



- Move rocker switch past detent to "unreel" position.

⚠ CAUTION!

The drive discs rub against the winch cable.
This causes heating and accelerated wear.

Remedy: Pull the winch cable out quickly and smoothly.

- Disengage the load hook from the winch boom and pull it quickly to the anchor point.
- Engage load hook at anchor point.
- Move rocker switch to central position.



- Set the 3-position switch for driving speed to the position for pulling force 4.0 metric tons / 8 km/h.
- You can now proceed to the **function check of the pulling-force controller**.

4. FUNCTION CHECK - PULLING-FORCE CONTROLLER



⚠ CAUTION!

High load on winch arm.

Keep far enough away from the anchor point to ensure that the high pulling force does not pull the winch arm downward.

- Check: The pulling-force controller must be at 0, otherwise the cable cannot be reeled in.



- Move rocker switch to the "reel in cable" position.
Warning buzzer for slewing-gear brake sounds.

- Turn the pulling-force controller to max. 5 kN.



- Symbol **flashes**.



- Move rocker switch for slewing-gear brake to open position.
Symbol **lights up**



- The brake indicator lamp is **OFF**.

- Use the accelerator to set the diesel engine to approx. 1,200 rpm.
- Turn the pulling-force controller clockwise past the detent (up to approx. 13 kN).
Pulling force diminishes slightly.



- The indicator lamp is **OFF**.

- Slowly turn the pulling-force controller clockwise to its limit.



- The pulling-force indicator must show a reading of 38 - 40 kN.

- Turn the pulling-force controller back to the detent, pulling force approx. 13 kN.



- The indicator lamp is **OFF**.
Electronic pulling-force control is **ON**.

This completes the test of the pulling-force controller.

- You can now start **working with the drum winch**.

5. OPERATING THE CAPSTAN WINCH



- Put on the safety belt and lock it in place electrically with the rocker switch in the driver's cab. The seatbelt does not provide protection unless electrically locked by means of the swita.
- **Passenger:**
Put on the safety belt.
- Use the manual throttle control to set idle speed to 900 rpm. Set direction of travel switch to forward.



- Check: The indicator lamp is **OFF**.
- Set the 3-position switch for driving speed to the appropriate position
 Moved to right = pulling force 4.0 metric tons / 8 km/h
 Centred = pulling force 3.0 metric tons / 11 km/h
 Moved to left = pulling force 2.5 metric tons / 17 km/h.
- Use the accelerator to regulate the speed.
- Set pulling - force control to between 13 kN and max.40 kN.



If the slope is not particelarly steep, reduce pulling force to minimse wear and tear on the drum winch.



TURNING THE PISTENBULLY



CAUTION!

Risk of collision between auxiliary equipment and winch cable. Always observe the winch cable when raising the auxiliary equipment.

Turning the PistenBully

- Lift the auxiliary equipment.
- Turn the pulling-force controller back to the detent, pulling force approx. 13 kN.



The indicator lamp is **OFF**
Electronic pulling - force control is ON.

- Turn the PistenBully and start driving downhill.

Situational help!

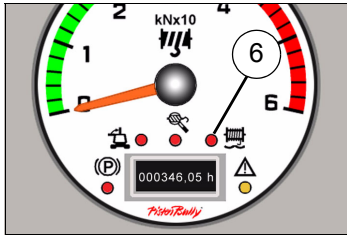
The winch cable is swinging:

- Do not drive when the winch cable is swinging.

The boom deflects the winch cable:

- Check the slewing - gear broke..

DRIVING DOWNHILL



Note the following when driving downhill:

- Maximum usable length of winch cable to be used: 1000 m.
- Excess length of cable:
- The excess length of the cable is red.
- Warning buzzer sounds.
- Warning lamp 6 lights up.

WARNING!

The end of the winch cable is not connected to the winch.
If the warning buzzer sounds and warning lamp 6 lights up:
immediately turn the PistenBully or stop and check the winch
cable winding.

Driving downhill

- Set pulling-force control to between 13 kN and max.40 kN.



If the slope is not particularly steep, reduce pulling force to minimise wear and tear on the drum winch.

- Select 3-stage vehicle speed.

Situational help!

The level of capstan winch tension increases when driving downhill:

- Reduce speed using potentiometer.

Cable-reel indicator light 6 flashes

- Bring the vehicle to an immediate stop.
- Check winch cable winding.



DRIVING UPHILL



⚠ CAUTION!

High load on winch arm.

Keep for enough away from the anchor point to ensure that the onigh pulling force does not pull the winch arm downward.

⚠ CAUTION!

Risk of collision between winch cable and PistenBully.

The winch cable must always be taut when being reeled in.
Use the driving-speed potentiometer to reduce your speed on level ground.
Keep the engine running at high speed.

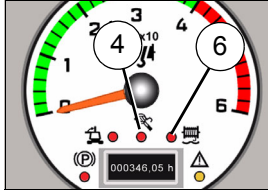
Driving uphill

- Increase the pulling force from 15 kN to a max. imum of 40 kN as required.
- When working on flat terrain, preserve the capstan winch by reducing the tensile force.



Adjust the pulling force controller to a setting at which the tracks do not laose traction.

- Select 3-stage vehicle speed.
Use the accelerator to regulate the speed.
- Check that the winch cable is reeling in correctly onto the reel. You can watch the reeling in process through the viewing screen on the capstan winch.



Situation help

Warning lamp 4 lights up:

- Cease operations and ascertain the cause of the problem.

Warning lamp 6 lights up:

- Bring the vehicle to an immediate stop.
- Move direction of travel switch to the neutral position.
- Apply the parking brake.
- Check winch cable on the drum.

The level of tension drops:

- Reduce speed via the potentiometer. Keep the engine running at the same speed.

BELIEVING THE WINCH CABLE



Relieve the tension on the winch cable before ceasing operations.

- Unreel winch cable to the red mark.
- Lay the cable on the ground and check twist. (see customer's workshop information).
- Use a low pulling - force setting to reel in the cable and check it for damage.



CEASING OPERATION

- Bring the PistenBully up as close as possible to the anchor point.



- Move rocker switch for slewing-gear brake to close position.



- The brake indicator lamp is **ON**.

- Set pulling-force controller to 0.



- The indicator lamp is **ON**.

- Apply the parking brake.
- Move the direction of travel switch to the neutral position.



- Move rocker switch across detent to "unreel" position.

- Disengage load hook from anchor point.

⚠ CAUTION!

Risk of damage due to untwisting

Make sure that the strands of the wire rope cannot untwist.



- Move rocker switch to the "reel in cable" position.

Warning buzzer for slewing-gear brake sounds.

⚠ WARNING!

Risk of accident:

- Make sure there is no-one in the danger zone as the cable is being reeled in.
- Do not leave the cockpit.

- Reel the cable onto the drum at low pulling force.
- Set pulling-force controller to 0.



- The indicator lamp is **ON**.



- Move the rocker switch to the centre position. The drum winch is not operational

OPERATION

- Engage load hook on the winch boom.



- Move rocker switch to the "reel in cable" position.
Warning buzzer for slewing-gear brake sounds.



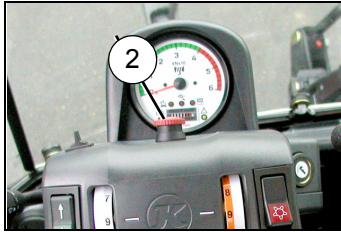
- Swivel the winch boom to the direction of travel.



- Move the rocker switch to the centre position.
The drum winch is not operational

The drum winch is in its **transport position**.





Initiate an emergency stop:

- in dangerous situations.



The vehicle comes to a stop and cannot be steered.

- Immediately engage the parking brake.
- Move the direction of travel switch to the "neutral" position.
- Switch off diesel engine.
- Inspect drum winch and rectify fault.



An emergency stop places a severe strain on the brakes of the drum winch.

- Have the brakes checked for wear and malfunction.

CAUTION!

Driving with the capstan winch switched off and the winch cable attached is not permitted.

Operating the capstan winch after an emergency stop

- Set pulling-force controller to 0.



- Move the rocker switch to the centre position.
The drum winch is not operational
- Turn emergency stop pushbutton **2** and pull upward.

The capstan winch is again ready for operation.

Tilting the load platform

CAUTION!

Risk of PistenBully slipping:

Do not tilt the winch unless the vehicle is on level ground.



Make sure there is no-one in the danger zone.



○ Move rocker switch for slewing-gear brake to close position.

- Move direction of travel switch to "Neutral" position.
- Apply the parking brake.
- Set pulling-force controller to 0.



○ Move the rocker switch to the centre position.
The drum winch is not operational

- Start the diesel engine.
- Lower the auxiliary equipment.



○ Move rocker switch to the " reel in cable " position.

Warning buzzer for slewing-gear brake sounds.



○ Swivel winch arm to the rear.

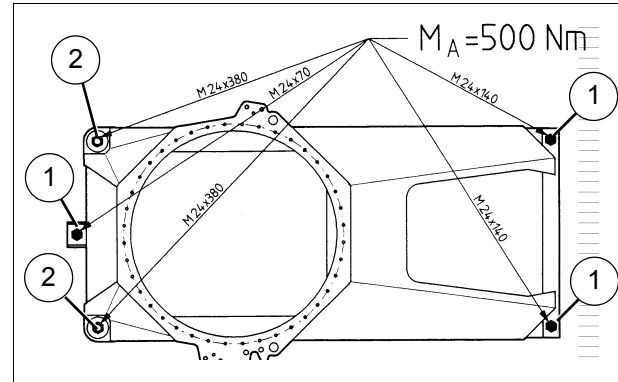


TILTING THE LOAD PLATFORM



- Move the rocker switch to the centre position.
The drum winch is not operational

- Switch off diesel engine.
- Check that screws **1** are secure.
Tightening torque $M_A = 500 \text{ Nm}$.
- Remove screws **2**.
- Tilting load platform: See the operating manual for the PistenBully.
- When the load platform is lowered position, tighten screws **2** to $M_A = 500 \text{ Nm}$.



TILTING THE WINCH BOOM

Tilting the winch boom



Make sure there is no-one in the danger zone.



- Move rocker switch for slewing-gear brake to close position.



- Move the rocker switch to the centre position. The drum winch is not operational

- Move direction of travel switch to the into neutral position.
- Apply the parking brake.
- Start diesel engine.
- Lower auxiliary equipment carrier.
- **Set pulling-force controller to 0.**



- The indicator lamp is ON.



- Move rocker switch to "cable tension".
Warning buzzer for slewing-gear brake sounds.



- Swivel winch arm so that it is not in the direction of travel.

CAUTION!

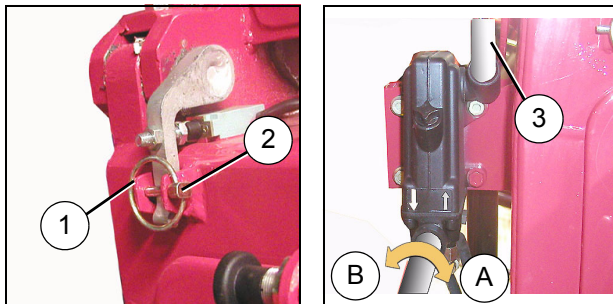
When tilted, the winch boom will collide with the driver's cab if in the direction of travel.



- Move the rocker switch to the centre position. The drum winch is not operational

- Switch off diesel engine.





Using manual pump to tilt winch boom:

- Pull out keeper 1 and remove pin bolts 2.
- Manual pump lever in position B.
- Fit tube 3 to the manual pump and operate the pump.

Using manual pump to raise winch boom:

- Manual pump lever in position A.
- Fit tube 3 to the manual pump and operate the pump.

Removing capstan winch



There must not be anyone in the danger zone.



- Move rocker switch for slewing-gear brake to close position.



- Move the rocker switch to the centre position. The drum winch is not operational

- Park the PistenBully underneath a crane
Rated lifting capacity of crane min. 2 metric tons
and min. 50 cm lift.
Comply with all applicable national regulations.
- Move direction of travel switch to "Neutral" position.
- Apply the parking brake.
- Set pulling-force controller to 0.



- Move the rocker switch to the centre position.
The drum winch is not operational

- Start the diesel engine.
- Lower the auxiliary equipment.



- Move rocker switch to " reel in cable " position.
Warning buzzer for slewing-gear brake sounds.



- Swivel winch arm to the rear.



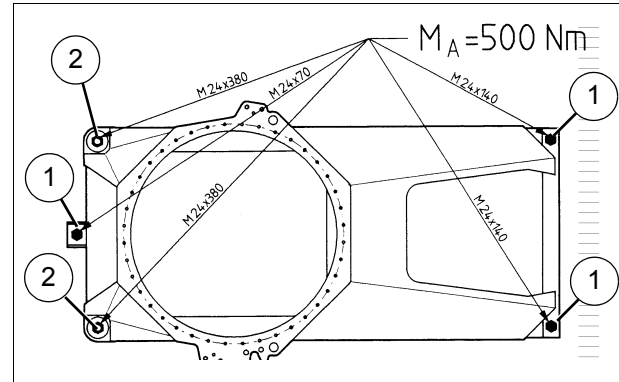
- Move the rocker switch to the centre position.
The drum winch is not operational

- Switch off diesel engine.
- Disconnect hydraulic lines.
- Remove electrical connection.
- Fit protective caps.
- Attach crane retaining loops to the capstan winch.



REMOVING CAPSTAN WINCH

- Remove screws 1 and 2.
- Attach the crane retaining loops to the capstan winch.
- Remove capstan winch.
- Tighten screws 1 and 2 on the load platform.
- Fit cover plate onto upper frame.
- Place winch in storage in the correct manner.
- Install retaining bar.



Installing capstan winch

- Lower the auxiliary equipment.
- Switch off diesel engine.
- Remove cover plate from upper frame.
- Remove retaining bar.
- Place capstan winch on guide points on loading bridge.
- Tighten screws **1** and **2**, tightening torque $M_A = 500 \text{ Nm}$.
- Disconnect crane fixing bolts from the capstan winch.
- Connect hydraulic lines.
Begin by connecting the leak-off oil line.



Make sure that the hydraulic couplings are firmly in place.

- Connect electric connector.
- Move direction of travel switch to neutral position.
- Apply the parking brake.



- Move rocker switch for slewing-gear brake to the close position.



- Move the rocker switch to the centre position.
The drum winch is not operational

- Set pulling-force controller to 0.
- Start diesel engine.



- Move rocker switch to " reel in cable " position.
Warning buzzer for slewing-gear brake sounds.



- Swivel winch arm to direction of travel.



- Move the rocker switch to the centre position.
The drum winch is not operational

