

Operating Manual

Vehicle

PistenBully®

400 4F

From WKU 824 11319.en



www.pistenbully.com



Kässbohrer Geländefahrzeug AG

Kässbohrerstraße 11

D-88471 Laupheim

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OTHER ON-BOARD DOCUMENTS

- Operating manual: maintenance instructions
- Logbook
- Operating manual for the diesel engine (DVD)
- Operating manual for the front mounted tiller blower (optional equipment)
- Operating manual for the drum winch (optional equipment)



Your experience is important to us!

We strive relentlessly to create a complete and correct documentation for your product. However, we very much appreciate your comments and suggestions for improvement; please do not hesitate to share this with us.

Kässbohrer Geländefahrzeug AG
Technical Documentation
Kässbohrerstraße 11
88471 Laupheim
Deutschland

Technical Customer Service and Replacement Parts Sales

You can find the responsible contact person for your application / country on the Internet:
Homepage: <http://www.pistenbully.com>

- Your vehicle number is required for technical support and replacement parts ordering.


Use of genuine spare parts

We recommend using original parts from Kässbohrer Geländefahrzeug AG and conversion and accessory parts that have been expressly approved for your vehicle type. We have subjected these parts to special test procedures to certify their reliability, safety and suitability specifically for vehicles from Kässbohrer Geländefahrzeug AG. We are not able to judge the suitability of for third-party products, even if these have TÜV approval or an official approval and we shall not be held responsible for these.

You can obtain original parts at your Kässbohrer Geländefahrzeug AG service center. Our service personnel can provide you with complete information about technical modifications and also perform a proper installation.

Any and all warranty claims shall become invalid for the use of third-party products. We do not accept any responsibility for consequential damages resulting from this.

This operating manual provides:

- Information on how to handle, maintain and care for your PistenBully.
 - Important instructions concerning correct and economical operation.
 - Warnings so that you recognise dangers in good time and avoid them.
-  Make sure that the operating manual is always in the storage compartment in the driver's cab.

Abbreviations used

e.g. = for example

M_A = tightening torque

SP no. = order number for spare part

min./max.= minimum/maximum

Sec. = Section



Symbols used



DANGER!

There is an immediate danger to life and limb unless appropriate precautions are taken.



WARNING!

**Possibly a very dangerous situation!
There is an immediate danger to life and limb unless appropriate precautions are taken.**



CAUTION!

**Dangerous situation!
Can result in injuries unless appropriate precautions are taken.**



Important information!
The machine or surroundings may get damaged.



This symbol draws your attention to tips for users

EC DECLARATION OF CONFORMITY

Manufacturer

Kässbohrer Geländefahrzeug AG
Kässbohrerstraße 11
88471 Laupheim
Deutschland

We herewith declare that the machine described in the following and the version available on the market correspond in design and construction to the fundamental safety and health requirements stipulated by the EC Directive on Machinery. This declaration shall become null and void should any alterations be made to the machine without our express approval.

Description of the machine

Snow groomer

Machine type

PistenBully 400 4F

Applicable EC directives:

EC Directive for Machinery MRL 2006/42/EC
EMC Directive 2014/30/EU
EC Directive on Noise Emission 2000/14/EC

Measured sound power level

110 dB(A)

Guaranteed sound power level

113 dB(A)

Applied harmonized standards, in particular:

EN ISO 12100:2010
EN ISO 14982:2009
EN 15059:2009 + A1:2015

Applied national standards:

EN ISO 3471:2008

Authorized representative for the compilation of the technical documents: Jürgen Magg

The detailed EC declaration of conformity can be found in the delivery/sales documents.



NOTE



Vehicle number

The **vehicle number** is stamped on the front of the vehicle, on the face end of the right-hand frame.

This operating manual is for the vehicle

Please insert the appropriate entries

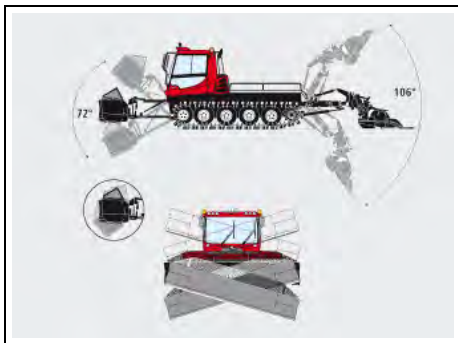
WKU.....



Engine number

The **engine number** is stamped on the engine type plate.

TECHNICAL DATA



Dimensions

Width

Without tracks	2500 mm
Across aluminium tracks	4206 mm
Across steel tracks	4206 mm

Across AlpinFlex tiller	5500 mm
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Height	2830 mm
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Height with cab tilted	3250 mm
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Length

With tiller and pusher blade	9010 mm
Load platform	2120 x 1920 mm

10/162

Weight

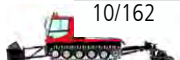
Dead weight with aluminium tracks	8045 kg
Dead weight with steel tracks	8645 kg
Permissible gross weight with auxiliary equipment	11800 kg
Maximum carrying capacity of the load platform when the tiller/front blade is not attached	1,500 kg

Operating parameters

Continuously variable speed	0 - 21 km/h
Ground pressure with aluminium tracks	0.052 kg/cm ²
Ground pressure with steel tracks	0.057 kg/cm ²
Production rate with tiller	93,000 m ² /h
At maximum	126,000 m ² /h

Engine

Type	Cummins QSL9 Tier 4 final
Number of cylinders	6
Displacement	8.9 litres/8900 cc ³



TECHNICAL DATA

Output, ECE rating	298 kW (400 hp)
Maximum torque	1,627 Nm at 1,500 rpm
Oil capacity with filter	21 litres
Fuel consumption	at least 19 l/h
Tank capacity	2 x 114 (228) litres
Exhaust-emissions standard	TIER 4 final

Brakes

Wear-free (hydrostatic)
2 multi-plate brakes

Electrics

Light-current circuit	24 V
Alternator	28 V/140 amperes
Batteries	2 x 12 V/135 Ah
Cold-start power	900 A

Suggested garage dimensions

Length	11000 mm
Width	6000 mm
Height	3500 mm

Noise emission measurement

EU Directives
2000/14/EG

Measured sound power level L wA,m	110 dB(A)
Guaranteed sound power level L wA,g	113 dB(A)

Maximum sound pressure level at the work station

A-evaluated emitted sound pressure level L pA	79 dB(A)
---	----------

Measured during grooming (vector sum)

Vibrations at the steering wheel	<2.5 m/s ²
Vibration at driver's seat	<0.5 m/s ²

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TABLE OF FLUIDS AND LUBRICANTS

Designation	Grade	Capacity	Interval between changes
Cummins QSL9 Tier 4 final	API CJ-4 (CES 20081) Avia Turbosynth LS Plus 5W30 Service Bulletin No. 3810340	21 litres	At least: once a year Every 500 hours
Fuel tank	Diesel fuel Maximum sulphur content of 0.0015% by weight (ASTM S-15)	2 x 114 (228) litres	At least: once a year Drain condensate.
Cooling/heating system	50% water + 50% antifreeze Avia Antifreeze NG	35 litres	At least: every 2 years Every 2,000 hours
AdBluetank/SCR system	NOx reducing agent to DIN 70070	40 litres	At least: once a year Every 1,200 hours
Transfer box	Poly-alpha-olefin (PAO) - CLP HC VG 150/220 ISO VG 220 (for summer operation) - API GL4, SAE 75 W 90 (PAO)	1.8 litres	At least: once a year Every 800 hours New vehicle: 100 hours
Wheel drive (planetary gears)	Poly-alpha-olefin (PAO) - CLP HC VG 150/220 ISO VG 220 (for summer operation) - API GL4, SAE 75 W 90 (PAO)	1.9 litres	At least: once a year Every 400 hours New vehicle: 100 hours



TABLE OF FLUIDS AND LUBRICANTS

Designation	Grade	Capacity	Interval between changes
Hydraulics Propulsion unit + auxiliary equipment (See maintenance instructions)	HVLP DIN 51524 DEXRON II D/III F ATF Type A Suffix A < -30°C -AVIA Synthofluid PE-B 30 (PAO)	47 l tank 80 l total	At least: once a year Every 1,200 hours
Hydrostatic vehicle drive (See maintenance instructions)	OKS 250		
Lubricate wheel hubs and rocker arms Greasing	Calcium-based lubricant KP2K-30, DIN 51502 e.g. Aviacal 2 LD		Every 400 hours
Other lubrication points	Calcium-based lubricant KP2K-30, DIN 51502 e.g. Aviacal 2 LD		Every 100 hours
Electrical system Battery terminals	Bosch FT 40V1 grease		

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Intended use

Snow groomers may only be used in accordance with the manufacturer's operating instructions.

➤ **The PistenBully may be used for the following purposes only:**

- Preparing slopes for downhill skiing
- Removing snow from paths
- Removing snow from car parks on private land
- Tracks in countryside (not public roads)
- Preparing trails for Nordic skiing
- Transporting people in the special people-carrier cabin (optional extra)

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

DRIVERS

- Drivers must be specifically appointed to drive snow groomers.
- You may appoint people to drive the snow groomers on their own only when you are certain that they will be able to reliably perform the tasks assigned to them.

In particular, they must:

- Have reached the age of 18 (depending on the law in the relevant country).
- Be physically and mentally equipped for it.
- Be trained in how to drive the snow groomer and have demonstrated their driving ability to the operating company.

- Be familiar with snow conditions and the peculiarities of operating equipment on ski slopes.
- Be familiar with the area where the vehicle is to be used, especially with regard to particularly dangerous areas.
- Be familiar with first-aid procedures in the event of an accident.
- In order to help ensure safe operation, drivers must wear appropriate footwear with non-slip soles.



ANGER ZONE FOR PERSONS

- The driver of the snow groomer may only operate it when there is nobody in the immediate vicinity of the vehicle or on its tracks (i.e. in the immediate danger zone).
- The driver must issue warnings to draw attention to potential dangers.
- Special protection measures must be taken if the snow groomer is being used in an area where the driver does not have a clear view of the surrounding terrain, or the nature of the terrain is such that the machine might not be immediately visible to people in its vicinity. Depending on the circumstances of each case, these measures may take the form of warning signs, closed runs or off-limit markers.

GETTING IN

- Complete the daily checks and maintenance tasks.
- Walk right round the vehicle and make sure that the danger zone is clear of persons and objects.
- Step onto the track!
There is a risk of slipping on the track when getting in and out of the driver's cab.
Always take a firm grip on the handle of the driver's door when entering the vehicle.
- When parking on a slope, be particularly careful when opening the door. The door opens suddenly.
- Buckle the safety belt.

OPERATION

- Never leave the vehicle unattended with the engine running.
- Risk of inhaling poisonous fumes! Never leave the engine running in enclosed spaces.
- The use of proprietary starting agents (such as Startpilot, for example) is prohibited on account of the risk of explosion.
- Do not attempt to adjust the driver's seat or steering wheel when driving.
- Snow groomers must be used and operated in a manner which ensures their stability.
- Drivers must always restrict the vehicle to a speed at which they can stop within the distance visible. On slopes that are so steep that it is not possible to stop, protective measures must be taken. Depending on the

SAFETY INSTRUCTIONS

circumstances, these may take the form of warning signs or barriers.

- Drivers may drive the snow groomer only at a speed at which they can maintain control at all times. The speed depends on the snow conditions, terrain and visibility as well as the effect of the snow groomer's auxiliary equipment.
- Risk of accidents caused by loose parts moving around!
Do not keep any loose parts in the driver's cab.
- Close the doors!
If you fail to do this, there is a risk of an accident caused by the doors slamming shut.
- Switch on the rotating beacon.
- Check that loads are correctly secured.
- When driving past people, slow down, keep at a safe distance and

always bear in mind that people may behave unexpectedly.

- Always come to a complete stop before reversing the vehicle.
- Make sure that there is nothing behind the machine. When visibility is poor, the driver needs someone to act as a banksman.
- When a tracked vehicle is being driven, the traction is so great that the vehicle may be driven well beyond the tipping point; if this happens, the vehicle may suddenly tip over.
- Use the parking brake only to keep the vehicle at a standstill.
The PistenBully brakes with full force when the parking brake is engaged during operation.

STOPPING/GETTING OUT

- Park in places where the vehicle can be clearly seen.
- Engage the parking brake only when the vehicle is at a standstill.
- Risk of poisoning!
Do not leave the engine running in an enclosed space.
- Turbocharger – risk of overheating!
Do not immediately switch off the diesel engine after it has been run at full load. Drive for approx. 2 minutes in the part-load range and then switch off.
- Lower the auxiliary equipment at the front and back, switch off the tiller, and turn the direction-of-travel switch to "neutral".
- Before you get out:
 - Engage the parking brake.
 - Switch off the engine.
 - Remove the ignition key from the lock.

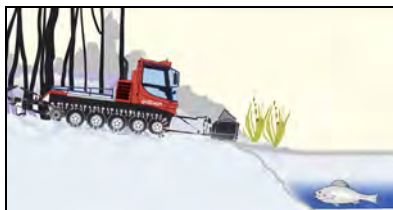


- Swivel up the steering column and left armrest completely.
- Step onto the track!
There is a risk of slipping on the track when getting in and out of the driver's cab.. Always take a firm grip on the handle of the driver's door when getting out of the vehicle.
- Lock the driver's cab.

TERRAIN

- Before using the snow groomer, check that the intended terrain is drivable.
- A public road may be crossed directly only with approval from the responsible authorities. Comply with all applicable national regulations.

Risk of breaking through ice



- Driving on frozen rivers and lakes is very dangerous. Consequently, you are urgently advised not to do this.

Snowdrifts



Risk of an avalanche or rockfall



- Where the driver does not have a clear picture of the surrounding terrain and in poor weather conditions, the driver must be in constant radio

SAFETY INSTRUCTIONS

contact with the company responsible for organising rescue efforts in the event of an emergency. The exception to this is when a number of vehicles are being used together or there is a co-driver.

- When snow groomers are used at night, the driver must have portable spotlights.
- When the winch is in use, the driver must wear the seat belt at all times.

DRIVING WITH PASSENGERS

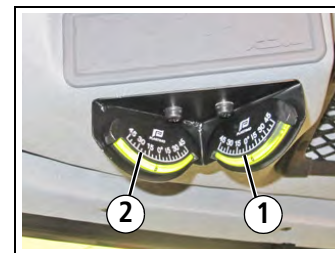
- Only one co-driver may sit in the driver's cab.
- The co-driver must be seated in the co-driver's seat at all times when the vehicle is in motion.
- Passengers in the passenger cab (optional equipment) must be in their seats, wearing seat belts and holding on tight. See the operating manual for the passenger cab.
- In the case of the rear deck, which is optional equipment:
Comply with all applicable national regulations.
- **Do not allow anyone to ride on:**
 - The load platform
 - The front blade/ParkBlade
 - The tiller
 - Equipment attached to the snow groomer

Rear deck *(optional equipment)*

Intended use

The opened rear deck is developed for the safe transport of materials and people.

- National regulations must be complied with when transporting people.
- When the vehicle starts up, everyone must be standing and have a firm grip on the open rear deck.



Inclinometer

- If the inclinometer indicates a longitudinal incline **1** of over 30° or a transverse incline **2** of over 25°, in



the interests of safety, passengers should no longer be carried.

- The rear deck must be secured at both ends. Both safety chains must be closed and locked.
- Risk of burns caused by the exhaust muffler. Keep clear.
- Avoid abrupt changes of direction and angles of inclination.
- Danger of slipping on the track and load platform!
When climbing onto and off the rear deck, hold onto the load platform railing.
- Risk of being crushed!
There is a risk of crushing when the rear deck is lowered.
Close the rear deck using holding points.

MAINTENANCE

- Snow groomers must be maintained by trained staff specifically appointed by the operator.
- Do not perform maintenance work under moveable parts in their open or raised positions unless they have been secured to prevent them from slamming closed or falling.
- Snow groomers and raised equipment must be secured before maintenance work is started to prevent them from accidentally moving.
- Markings, warnings and information plates on the PistenBully and auxiliary equipment must not be removed or made illegible.
- Compliance with the manufacturer's maintenance instructions is mandatory.
- Faults which could affect safety levels must be rectified immediately.
- When repair welding is carried out, comprehensive safety measures must be taken (*see the service portal data sheet*).

MONITORING

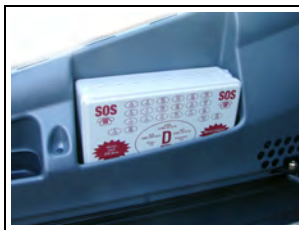
- Before starting off, the driver must check the operation of the safety-relevant components, e.g.:
 - Test the brakes.
 - Switch on the lights.
 - Test the operation of the warning equipment.
 - Test the controls of the working equipment.
- Do not permit fluids or lubricants to come into contact with the skin (wear protective gloves, change wet clothing).
Do not inhale or swallow fluids or lubricants (risk of poisoning).
- Risk of explosion from gas build-up in the fuel tank!
Make sure there is no source of ignition nearby when refuelling the vehicle.
- Risk of being cut or crushed!
This applies to all moving parts.
When the engine is running, keep a safe distance from rotating parts.
- If radios are required to ensure the safe operation of the snow groomer, before starting off, checks must be performed to ensure that the radio is functioning correctly and that there is a radio connection.
- The driver must immediately report any defects or problems to his superior and to the next driver when there is a change.
- In the event of damage, defects or changes that endanger operational safety, the driver must immediately switch the vehicle off.
- The supervisor must be notified immediately in the event of accidents involving injury to persons or damage to property or to the vehicle.
- The supervisor must perform random checks in order to ensure that the snow groomer is operated in a safe manner.

INSPECTION

- The operator must ensure that the snow groomers are inspected whenever necessary, at least once a year and after maintenance work. This inspection must ensure that the snow groomers are safe and must be performed by a skilled specialist. Comply with all applicable national regulations.

Skilled specialists are people who have an extensive knowledge about vehicle technology as a result of their specialist training and experience. They are also sufficiently familiar with the appropriate national safety at work legislation, accident prevention guidelines, directives and generally accepted rules of engineering practice (e.g. DIN publications, VDE regulations or national equivalents) to ensure that they can judge whether snow groomers are in a condition suitable for operation.

- The results of the inspection must be recorded in writing and filed.



FIRST-AID BOX

The first-aid kit is secured to the co-driver's door or stowed beneath the co-driver's seat.

- Always make sure that the first-aid kit is complete.



FIRE EXTINGUISHER

The fire extinguisher is in front of the co-driver's seat.

- Note the expiry date.
Replace used fire extinguishers immediately.



NOTES

WARNING SIGNS

- It is essential to heed the warning signs on the PistenBully and auxiliary equipment.
- If the warning signs are damaged or lost, ensure they are replaced immediately.



WARNING SIGN

Location: **rear bulkhead of driver's cab**

No. 8.762.658.000E

Text:

Risk of falling!

Do not transport people on the load platform.



WARNING SIGN

Location: **rear deck**

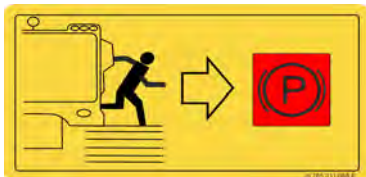
No.8.762.750.000E

Text:

Risk of falling!

Do not transport people on the load platform. Rear deck open for transporting materials and passengers.

SAFETY INSTRUCTIONS



WARNING SIGN

Location: **driver's cab/parking brake**
No. 8.765.311.058E

Text:

Important!

Engage the parking brake before leaving the driver's cab.



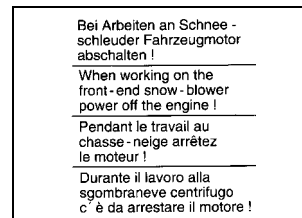
WARNING SIGN

Location: **fan/engine**
No. 8.762.634.054E

Text:

Important!

The fan ring rotates when the diesel engine is running.



WARNING SIGN

Location: **KFS (tiller blower)**
No. 8.762.435.058E

Text:

Switch off the engine of the vehicle before work is started on the snow blower.



SAFETY INSTRUCTIONS



WARNING SIGN

Location: **Tiller**
No. 8.762.638.058E

Text:

Warning!
Wait until all parts have come to a complete standstill before touching.



WARNING SIGN

Location: **Load platform**
No. 8.766.062.000.0

Text:

Risk of being crushed!
Support the load platform to prevent it lowering.



WARNING SIGN

Location: **auxiliary equipment**
No. 8.762.660.000E

Text:

Warning!
Do not reach into the crushing zone when parts may still be moving there.

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Achtung!	Attention!
Vor dem An- oder Abkuppeln der Hydr.-Schläuche unbedingt den Dieselmotor abstellen.	Before connecting or disconnecting hydraulic hoses, diesel engine must be shut down.

WARNING SIGN

Location: **tiller**

No. 8.762.271.053C

Text:

Important!

Switch the diesel engine off before connecting or disconnecting the hydraulic hoses.



WARNING SIGN

Location: **rear deck**

No. 8.762.702.000.0

Text:

Rear deck open

Make sure that the safety catch of the locking lever is engaged.



SIGN

Location: **driver's cab**

No. 8.762.642.000E

Text:

Read the operating manual and safety information before putting the vehicle into operation.



SAFETY INSTRUCTIONS



SIGN

Location: **frame**

No. 8.766.017.000 E

Text:

Lever for raising and lowering the driver's cab and load platform.



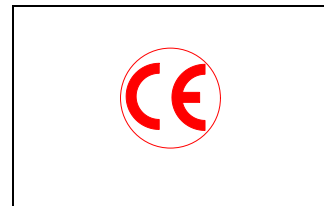
400 W SIGN

Location: **frame**

No. 8.762.689.000 E

Text:

Lever for raising and lowering driver's cab and load platform.



SYMBOL

Location: **console/co-driver's seat**

No. 8.762.631.000E

Text:

The CE symbol indicates the manufacturer's compliance with all directives, standards and laws applicable to the product.

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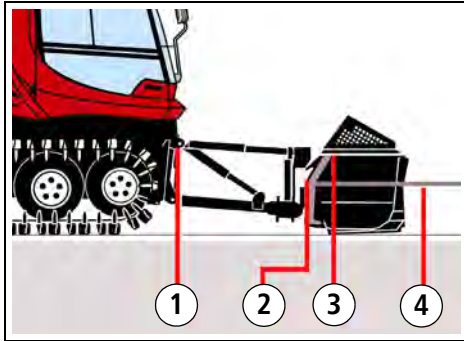
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PERMISSIBLE WEIGHTS OF FRONT-MOUNTED AUXILIARY EQUIPMENT



ATTACHED WEIGHTS

When transporting loads, always bear in mind the maximum attachment weights at the attachment points.

1 main frame / **2** quick-change system / **3** front blade /
4 ParkBlade fork

1 = swivel point (main frame, quick-change system)

2 = hook plane, quick-change system

3 = end face, front blade centre

4 = fork, length 400 mm (ParkBlade)

Attachment to swivel point, main frame (1)

- Maximum long-term attachment weight: 1,650 kg.

Attachment to hook plane, quick-change system (2)

- Maximum long-term attachment weight: 1,315 kg.

Attachment to quick-change system with front blade(3)

- Maximum long-term attachment weight: 665 kg.

- Maximum short-term attachment weight: 1,100 kg.

Attachment to fork (4) at a length of 400 mm

- Maximum short-term attachment weight: 1,000 kg.

Safety instructions

Note: Attaching excessively heavy equipment or equipment with an excessively high moment voids the vehicle manufacturer's warranty and excludes liability on the part of the vehicle manufacturer.

The only exception to this is auxiliary equipment approved by the vehicle manufacturer.



PERMISSIBLE WEIGHTS OF FRONT-MOUNTED AUXILIARY EQUIPMENT

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Safety instructions for long-term and short-term attachment weights

- Collision hazard when lifting and pivoting the additional equipment. Check the danger of a collision with the vehicle during the initial installation of the additional equipment.
- Operation with the maximum short-term attachment weight is restricted to the intended purpose and is subject to the limit of the time required for said purpose (short-term). Drive at no more than walking pace.
- The high moment of the attachment restricts the manoeuvrability of the vehicle.
- Risk of tipping!
Check the terrain and make sure it is suitable for driving.
- Do not permit the load to obstruct the driver's field of vision.
- The load must be adequately secured to ensure that it cannot shift.
- The tiller has to be installed as a counterweight.
- Note requirements regarding transport positions of auxiliary equipment.
See the operating instructions issued by the manufacturer of the auxiliary equipment

Safety instructions, ParkBlade

- Risk of being crushed
This applies when extending/retracting the forks.
Make sure there is nobody in the danger zone.
- Transporting people is prohibited.
- Always retract the forks when they are not needed.
- When the forks are extended, the side section of the front blade must be swivelled all the way out.
- Alterations to the forks are prohibited.
- The load must be suitable for lifting with the forks.
- The load weight must be evenly distributed on both forks.

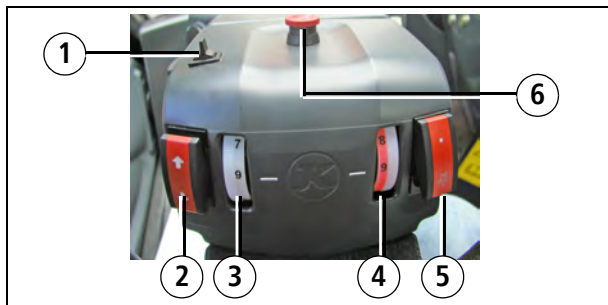


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Steering wheel



1 Swivelling rear equipment carrier
(see the section entitled "Using the joystick")

2 Direction-of-travel button



Top section pressed = forward
Neutral position = press again
Bottom section pressed = reversing (with reversing alarm)

Note:

Engine speed increases when you press the direction-of-travel button.

3 Knurled knob for driving speed

The speed at which the vehicle travels depends on the engine speed, the selected position of the potentiometer and the drag. You bring the engine to the correct speed by depressing or releasing the accelerator pedal and set the maximum speed by means of the potentiometer.

4 Knurled knob for adjusting the tiller shaft speed

The potentiometer controls the tiller shaft speed. The tiller speed is increased/reduced to suit the snow conditions.

5 Tiller drive ON/OFF button



i When the parking brake is engaged, the tiller drive automatically switches off. Once the parking brake has been released, the tiller drive remains off. (Indicator for tiller flashes.) You must operate the button again in order to reactivate the tiller.

6 STOP button

The PistenBully does not have a separate service brake for stopping; it only has a parking brake. The PistenBully does not stop abruptly when you lift your foot off the accelerator pedal or set the direction-of-travel switch to the neutral position.



If you press the stop button, the Pistenbully brakes with full force.

➤ Press the stop button if there is sudden danger.

The PistenBully stops and can no longer be steered.

➤ Immediately engage the parking brake.

Restart = turn the STOP button and pull it up.

The PistenBully is again ready for operation.



7 Button for wipers

Press to have front wipers execute a single stroke.

To heat the windscreen wipers:

Move the lever 8 in the direction of the arrow.



Button/rocker switch

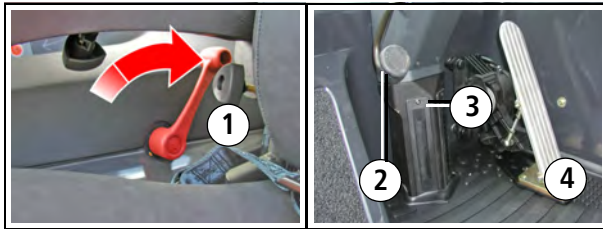
Rear equipment carrier horizontal

Rigid position/floating position

Top section pressed = centred

Neutral position = tiller locked

Bottom section pressed = floating position



Parking brake

i When the parking brake is engaged, the direction-of-travel switch automatically goes into the neutral position.

- 2 Lock for steering-column adjustment** Height adjustment
- 3 Warm-air nozzles, adjustable**
- 4 Accelerator**

Parking brake



WARNING!

Only use the parking brake 1 as a parking brake. The PistenBully brakes with full force when the parking brake is engaged during operation.

- Always engage the parking brake before you park or exit the vehicle.
Buzzer sounds as reminder: Door open, but brake not applied.

Engaging the parking brake

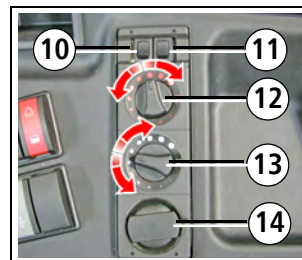
- Only move the lever in the direction of the arrow when the PistenBully is stationary.



Instrument displays

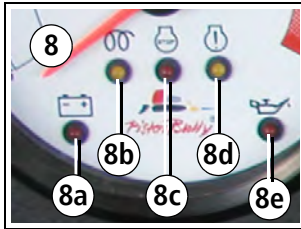
- 1 Tiller depth indicator**
- 2 Ignition lock**
 - 0 Insertion/removal of the ignition key.
Switches the engine off.
 - I Ready for operation
 - II Start
- 3 Snow-flap adjustment for tiller**
- 4 AdBlue**
- 5 Outdoor temperature**

- 6 Coolant temperature, diesel engine**
- 7 Diesel fuel**
- 8 Revolution counter**



Cab heating

- 10 Blower and heating to maximum**
- 11 Button: windscreen heating ON**
- 12 Stepless temperature control**
- 13 Heater blower, steplessly adjustable**
- 14 12 V socket**



Revolution counter

8a Battery charge indicator

If the indicator light comes on while the vehicle is on the move:

- Stop operation.
- Ascertain the cause of the problem.

8b Air-intake preheating

See the section on starting the diesel engine.

8c Indicator for the engine management system

Lights up to indicate faults in the engine management system. If the light is ON, proceed with caution to the nearest workshop. Only trained specialists are permitted to carry out repair work.

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Reading out fault messages

- Switch the engine off
- Ignition ON
- Rocker switch, engine diagnostics ON



Rocker switch

Engine diagnostics ON/OFF

Top section pressed = OFF

Bottom section pressed = check flashing code

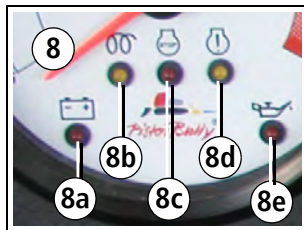
- The indicator light for the engine management system flashes red; the flashes represent a three-digit code.
List of fault codes, see Cummins CD supplied with the equipment.

What to do

Fault code 131 is represented by the following sequence of flashes:

- **1** flash
- brief pause
- **3** flashes
- short pause
- **1** flash
- long pause





The acoustic warning (buzzer) sounds to indicate that an operating parameter has reached its minimum or maximum permissible value: Stop the vehicle – Engage the parking brake – Ascertain the cause. Do not drive the vehicle.

Check for other faults or repeat:



Button

Engine-fault check

Upper part pressed = read out other engine faults.

Lower part pressed = recently displayed engine faults.

8d Flashes yellow = low-priority engine fault

To check, see the section on the indicator light for the engine management system

8e Engine oil pressure indicator

If the oil pressure falls to an impermissible level, a **buzzer** sounds.



Warning symbols



Warning light

Important!

Braking-air check for the parking brake. The release pressure has fallen below 120 bar.

Indicator light shows for:

Parking brake engaged.



Not used



Warning light

Important

Driver's cab tilt-locking device not engaged.



Indicator light

Tiller relief (up pressure).



Indicator light

Tiller shaft turning



Indicator light

Tiller drive ON



Indicator light

Floating position, rear

Raise/lower (vertical)



Indicator light

Floating position, rear (horizontal)



Indicator light flashes
Track_relief actuated
Do not drive the vehicle.



Warning light
Hydraulic fluid is below the minimum level
 Additional audible signal from buzzer



Warning light
Hydraulic-fluid temperature is above maximum
 Additional audible signal from buzzer



Warning light
Hydraulic-fluid filter indicator
 - Rectify the fault



Indicator light
Intake air preheating ON
(see the section entitled "Diesel engine")



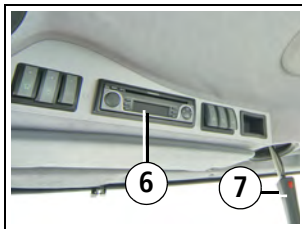
Indicator light
Electric heater for windscreen ON.



Indicator light
Direction indicator left/right



Indicator light
Full beam switched on



Overhead console

6 Radio installation prepared for

7 Spotlight



Rocker switch

Rotating beacon

Note:

When the circuit is active, the indicator lights up
(see arrow).

A 2-stage switch has indicators at the top and bottom



Rocker switch

Parking lights/driving lights

Pressed once = parking lights

Pressed again = dipped-beam headlights



Rocker switch

Worklights, front



Rocker switch

Worklights, front



Rocker switch

Worklights, rear



Rocker switch (optional equipment)

Treeline worklights



Rocker switch/button

1 Potentiometer Contact pressure/relief pressure of tiller



Button
Horn ON



Rocker switch, 2-stage (*optional*)
Acoustic warning
Top section pressed = acoustic warning for reversing
Bottom section pressed = acoustic warning OFF



Rocker switch, 2-stage
Direction indicators
Bottom section pressed = flash right
Bottom section pressed = flash left



Rocker switch (*optional*)
Spotlight ON/OFF
Top section pressed = OFF
Bottom section pressed = ON



Latching rocker switch
Unlatched and bottom section pressed =
Front equipment carrier in floating position



Rocker switch (*optional*)
Offset Kahlbacher **front blower to either side.**
Bottom section pressed and move joystick to left/right.



Rocker switch

ParkBlade (*FunPark*)

Top section pressed = extend

Bottom section pressed = retract



Button

Windscreen heating

- Clear a thick coating of ice or snow from the screen by hand before switching on the heater.



ON time is limited to approximately 10 minutes with the engine running. Press the switch again if a longer ON time is necessary.

Power consumption is relatively high, so the drain on the battery is correspondingly severe. Switch off the screen heater as soon as the screen is demisted or de-iced.



Rocker switch, 2-stage

Front wiper

Top section pressed = OFF

Bottom section pressed = intermittent wipe

Pressed again = level 1

Setting the interval for intermittent wipe

- Briefly switch on intermittent wipe then switch OFF.
- Wait for desired interval for intermittent wipe.
- Switch on intermittent wipe.
The time you waited is saved as the interval for intermittent wipe.



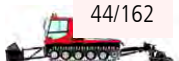
Rocker switch

Side-window heating/exterior-mirror heating



Rocker switch

Rear window heater





Rocker switch, 2-stage

Rear wiper

Top section pressed = OFF

Bottom section pressed = intermittent wipe

Pressed again = level 1

Setting the interval for intermittent wipe

- Briefly switch on intermittent wipe, then switch OFF.
- Wait for the desired interval for intermittent wipe.
Switch on intermittent wipe.
The time you waited is saved as the interval for intermittent wipe.



Rocker switch

Diesel fuel heater as of WKU 010274

- Switch the heater on when the outdoor temperature is below -10° .
- Switch the heater off after operation.



Latching rocker switch

Unlocked and pressed down = **relieve track tension**



If the PistenBully is not going to be used for a significant length of time, relieve the track tension to prevent the track belts from being overstretched unnecessarily.

Before relieving track tension:

- Engage the parking brake
- Park the vehicle on a flat, level surface
- Secure the vehicle to prevent it moving



Indicator light, top

Air-filter monitor

Check/replace air filter

Indicator light, bottom

Coolant level below the minimum level

- If the indicator light comes on while the vehicle is on the move:
 - Bring the vehicle to a stop.
 - Determine the cause of the problem.



Rocker switch

Engine diagnostics ON/OFF

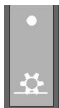
See page 39



Button

Engine-fault check

See page 39



Button

Adjusting tiller depth

Top section pressed and held down = reduce tiller depth

Bottom section pressed = increase tiller depth

See instrument display for tiller depth



Button

Side finisher/smooother, left

Top section pressed and held down = swivel forward

Bottom section pressed and held down = swivel to rear



Button

Side finisher/smooother, right

Top section pressed and held down = swivel forward

Bottom section pressed and held down = swivel to rear



Latching rocker switch (optional)

Nordic-trail tracker plates tiller ON/OFF

Unlatched and bottom section pressed = tiller ON

See the section on the Nordic-trail tracker plates.



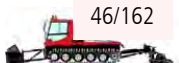
Button/rocker switch (optional)

Adjusting Nordic tracking tiller depth

Top section pressed and held down = reduce tiller depth

Centred = tiller locked

Bottom section pressed = tiller depth





Button/rocker switch *(optional)*

Raise/lower tracker plate

Top section pressed and held down = raise

Centred = locked

Bottom section pressed = lower



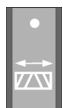
Button *(optional)*

Track spacing narrow/wide

Top section pressed and held down = narrow

Centred = locked

Bottom section pressed and held down = wide



Button *(optional)*

Tracking-plate spacing narrow/wide

Top section pressed and held down = narrow

Centred = locked

Bottom section pressed and held down = wide

See the section on the Nordic-trail tracker plates.



Rocker switch

Retract side finisher in reverse



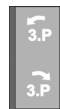
Rocker switch

Tiller snow flap

Top section pressed = reduce tiller snow-flap depth

Bottom section pressed = increase tiller snow-flap depth

See the section on the Alpinflex tiller



Rocker switch

Tiller forward operation/counter-rotating

Top section pressed = forward operation

Bottom section pressed = counter-rotating



Latching rocker switch

Unlatched and bottom section pressed =

reverse without automatic raising of the auxiliary equipment at the rear.

See the section on drive hydraulics for auxiliary equipment



Tiller in rigid position (FunPark)

Top section pressed = unlock tiller

Bottom section pressed = tiller locked in rigid position



Rocker switch

Drive hydraulics for auxiliary equipment front/rear

Top section pressed = front

Bottom section pressed = rear



Button

AdBlue override

Pressed down = AdBlue override ON

Diesel engine power at 100% for up to 30 minutes, see page 81.

Drive hydraulics for auxiliary equipment at the front ON + tiller drive ON

► Stopping the PistenBully

If the PistenBully won't stop on a steep slope due to the load attached, stop it by setting the potentiometer to 0 to -3.



Reversing when the direction-of-travel display indicates forward movement!

When the PistenBully comes to a standstill and the driver turns the driving potentiometer to 0 to -3 and operates the accelerator, the PistenBully goes into reverse. Steering takes place in the opposite direction.

- Only change the direction of travel by means of the direction-of-travel switch.





Rocker switch

SCR exhaust system cleaning

Upper part pressed = manual exhaust system cleaning.

Neutral position = automatic exhaust system cleaning.

Lower part pressed = no exhaust system cleaning.



Manual SCR exhaust system cleaning

Indicator light on

The exhaust temperature increases up to 800°C.



WARNING!

Risk of burns from the exhaust pipe!

- Keep a safe distance.
- Keep flammable materials away from the exhaust pipe (up to 1.5 m).



Rocker switch

Automatic SCR exhaust system cleaning

Switches on automatically as soon as the exhaust temperature in operation is not sufficient for cleaning.

The indicator light comes on.

The exhaust temperature increases up to 800°C.



WARNING!

Risk of burns from the exhaust pipe!

- Keep a safe distance.
- Keep flammable materials away from the exhaust pipe (up to 1.5 m).



Rocker switch

No SCR exhaust system cleaning

Automatic and manual SCR exhaust system cleaning is not possible.

The indicator light comes on.

Drum winch



Rocker switch

Turret-gear parking brake

Top section pressed = apply brake

Bottom section pressed = release brake



Latching rocker switch

Reel in/pay out winch cable

Top section pressed = reel in cable

Centred = winch OFF

Bottom section pressed = pay out cable



Button

Swivel winch boom

Top section pressed = swivel right

Bottom section pressed = swivel left



Button

Bottom section pressed =

reset acoustic warning, strand monitor

Indicator light comes on to indicate winch ON



Rocker switch

Release seat-belt lock, cockpit

Note: The indicator light is ON.

The belt lock is switched off!



Button

Raise/lower tiller

Top section pressed = raise

Centred = locked

Bottom section pressed = lower



Button

Press tiller into snow/relieve pressure

Top section pressed = relieve pressure

Centred = floating position

Bottom section pressed = apply pressure.



Adjustable by means of potentiometer.

➤ See the operating instructions for the drum winch.



Preconditions for operation of the drive hydraulics for auxiliary equipment

- The driver's cab must be fully lowered and locked in position.
- The load platform must be fully lowered.
- The rear-mounted tiller must be less than 500 mm clear of the surface of the snow.
- The plug of the auxiliary equipment must be in the socket (socket E).
Note: Failure to comply with this precaution will mean that the electronically controlled speed reduction function is not available.
- The diesel engine must have a starting speed of at least 800 rpm.



As a safety precaution, the tiller hydraulics are deactivated when the rear-mounted auxiliary equipment is raised to a height of approx. 50 cm.

- If there is a leak in the drive hydraulic system, switch the diesel engine off and deal with the problem.

Tiller forward operation/counter-rotating



Rocker switch

Tiller forward operation/counter-rotating

Top section pressed = forward operation

Bottom section pressed = counter-rotating

- On account of the additional draw on engine power it would cause, counter-rotating mode is not advisable while climbing slopes.

Automatic lifting of rear auxiliary equipment for reversing



Latching rocker switch

Unlatched and bottom section pressed =
**reverse without automatic raising of the
auxiliary equipment at the rear.**

When the rocker switch is set to "**Automatic lifting**", the hydraulic circuits listed below are automatically actuated when the direction-of-travel switch is moved to the "**Reverse**" position:


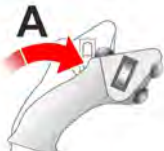

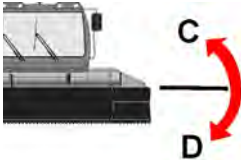

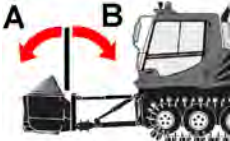


- Vertical and horizontal floating position OFF.
- The equipment carrier moves to the middle position.
- Equipment carrier lifts the auxiliary equipment approx. 1.2 m clear of the surface of the slope.
- If the tiller is in operation, the tiller is deactivated when lifted more than 0.5 m clear of the surface of the slope.
- Reversing light is switched on.

When the rocker switch is set to "**Automatic lifting**", the hydraulic circuits listed below are automatically actuated when the direction-of-travel switch is moved to the "**Neutral/Forward**" position:

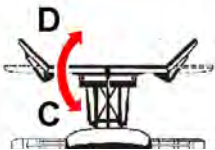
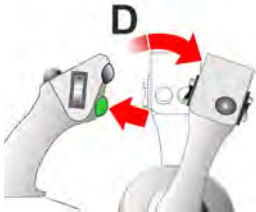

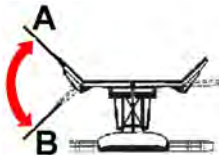
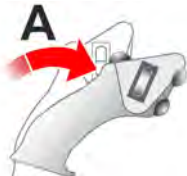

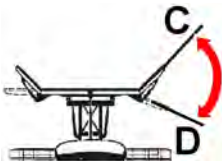


- The equipment carrier is automatically lowered.
- If a tiller is installed, it restarts when it is lowered to less than 0.5 m above the surface of the slope.
- If the floating/centred position was selected beforehand, it is automatically reselected. Any other position, if required, must be selected accordingly.



USING THE JOYSTICK

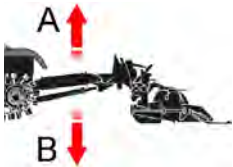


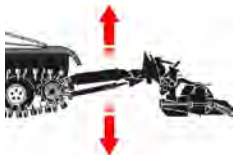
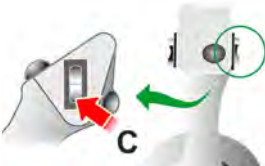

Front blade	Joystick	Button	Position
Raise - lower 		Floating position 	A - Lower B - Raise
Tilt 			C - Left D - Right
Roll 			A - Forward B - Back

USING THE JOYSTICK

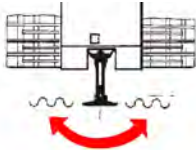

Front blade	Joystick	Button	Position
Swivel 			<p>C - Swivel left.</p> <p>D - Swivel right.</p>
Wing, left 			<p>A - Move wing in.</p> <p>B - Move wing out.</p>
Wing, right 			<p>C - Move wing in.</p> <p>D - Move wing out.</p>



USING THE JOYSTICK



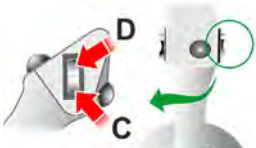
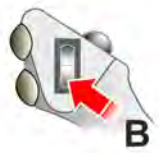


Rear equipment carrier	Joystick	Button	Position
Raise - lower 			A - Raise Neutral position = fixed B - Lower
Raise - lower 	Option 1 		Option 1 Pushbutton in position C Pushbutton 1 pressed = Raise tiller Press again = Lower tiller Note: Press before the tiller is fully raised = stop tiller Option 2 Pushbutton 1 pressed = Raise tiller Release pushbutton = Hold tiller in position Pressed again = Raise tiller.

USING THE JOYSTICK

Rear equipment carrier	Joystick	Button	Position
Floating position 			Rocker switch Rear equipment carrier horizontal Rigid position/floating position Upper part of button pressed = centring Neutral position = tiller locked Bottom section pressed = floating position



USING THE JOYSTICK

Rear equipment carrier	Joystick	Button	Position
Floating position 	1.  2. 	 	<p>Button in position B</p> <p>Button D - pressed = relieve tiller</p> <p>Centred = floating position</p> <p>C - pressed = press tiller into snow</p>  <p>Adjustable by means of potentiometer.</p>

Overview

Technical data

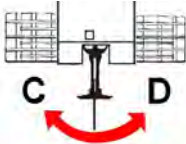





Safety

Use

Checks

Operation

USING THE JOYSTICK

Rear equipment carrier	Joystick	Button	Position
Swivel horizontally 			<p>Button see <i>steering wheel</i></p> <p>C = swivel left</p> <p>D = swivel right</p>
Depth setting 			<p>Button</p> <p>Adjusting the tiller depth</p> <p>Top section pressed and held down = raise tiller</p> <p>Neutral position = tiller locked</p> <p>Bottom section pressed and held down = lower tiller</p> <p>Tiller depth shown on terminal</p>
Side finishers <i>optional</i> 			<p>Button</p> <p>Side finishers</p> <p>Top section pressed = swivel forward</p> <p>Bottom section pressed = swivel to rear</p>





As a safety precaution, the drive hydraulic system of auxiliary equipment is deactivated when the rear-mounted auxiliary equipment is raised to a height of approx. 50 cm. The FunPark configuration includes a function that enables the drive hydraulics for auxiliary equipment to be switched on with the equipment raised. Consequently, it is very important to ensure that the danger zone is completely clear.

Starting the tiller when raised



WARNING!



Risk of being cut or crushed!
It is very important to ensure that the danger zone is completely clear.

- Tiller drive ON

The tiller indicator light shows.






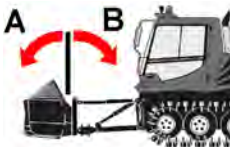
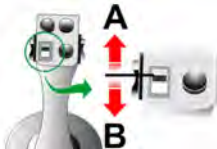
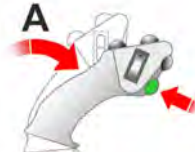
- Diesel engine speed higher than 1100 rpm



- Button pressed

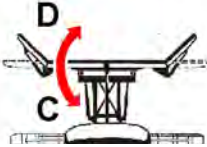


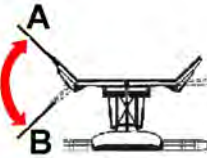


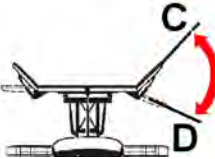


The tiller is switched on.

USING THE FUNPARK JOYSTICK

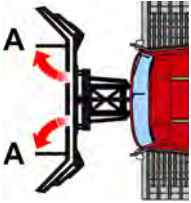

Front blade	FunPark joystick	Button	Position
Raise - lower 		Floating position 	A - Lower B - Raise
Tilt 			C - Left D - Right
Roll 	Option 1 	Option 2 	A - Forward B - Back



USING THE FUNPARK JOYSTICK

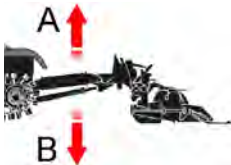




Front blade	FunPark joystick	Button	Position
Swivel 			C - Swivel left D - Swivel right
Wing, left 			A - Move wing in B - Move wing out
Wing, right 			C - Move wing in D - Move wing out

USING THE FUNPARK JOYSTICK

Front blade	FunPark joystick	Button	Position
ParkBlade 			A - Extend ParkBlade B - Retract ParkBlade



USING THE FUNPARK JOYSTICK

Rear equipment carrier	FunPark joystick	Button/potentiometer	Position
Raise - lower 			A - Raise Neutral position: Locked B - Lower
	Option 1 		Option 1 Pushbutton in position C Pushbutton 1 pressed = Raise tiller Press again = Lower tiller Note: Press before the tiller is fully raised = stop tiller Option 2 Pushbutton 1 pressed = Raise tiller Release pushbutton = Hold tiller in position Pressed again = Raise tiller.

Overview

Technical data



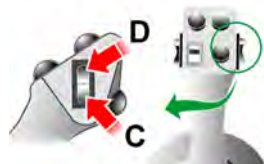



Safety

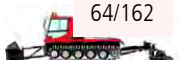
Use

Checks

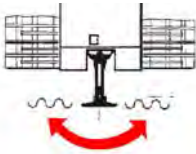

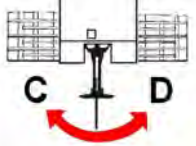
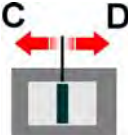


Operation

USING THE FUNPARK JOYSTICK

Rear equipment carrier	FunPark joystick	Button/potentiometer	Position
Floating position 	1.  2. 	 	<p>Button in position B Press upper part D = relieve</p> <p>Centred = floating position</p> <p>Press lower part C = press.</p>  <p>Adjustable by means of potentiometer.</p>



USING THE FUNPARK JOYSTICK

Rear equipment carrier	FunPark joystick	Button	Position
Floating position 			Rocker switch Rear equipment carrier horizontal Rigid position/floating position Top section pressed = centred Neutral position = tiller locked Bottom section pressed = floating position
Swivel horizontally 			Button see <i>steering wheel</i> C = swivel left D = swivel right
Switch tiller on 			Tiller ON/OFF

Overview

Technical data

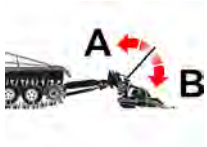

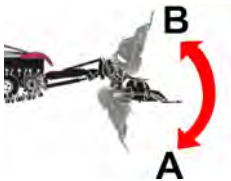


Safety

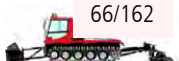
Use

Checks

Operation

USING THE FUNPARK JOYSTICK

Rear equipment carrier	FunPark joystick	Button	Position
Depth setting 			<p>Button</p> <p>Adjusting the tiller depth</p> <p>Top section pressed and held down = raise tiller</p> <p>Neutral position = tiller locked</p> <p>Bottom section pressed and held down = lower tiller</p> <p>Tiller depth shown on terminal</p>
Power angle 			<p>Button</p> <p>A - Retract tiller</p> <p>B - Extend tiller</p>



Operating the stick



Forward

Both sticks pushed forward

Note:

Controlling driving speed

- By using the accelerator
- By using stick neutral position and swung out all the way.



Reverse

Both sticks pulled back



Corner left

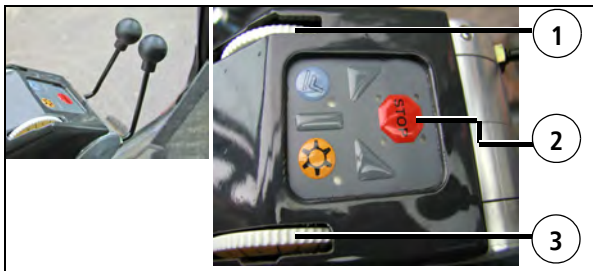
Push right stick forward



Turn right on the spot

Right stick pulled back

Left stick pushed forward



1 Knurled knob for driving speed

The speed at which the vehicle travels depends on the engine rpm, the setting of the knob and drag. You bring the engine to the correct rpm by depressing or easing up the accelerator pedal, and set the maximum speed by turning the knob.

2 STOP button

The PistenBully does not have a separate service brake for stopping; it only has a parking brake. The PistenBully does not stop abruptly when you lift your foot off the accelerator pedal or set the direction-of-travel switch to the neutral position.

If you hit the stop button, the PistenBully brakes with full force.

- Hit the stop button in the event of sudden danger.



CAUTION!

The PistenBully brakes with full force.



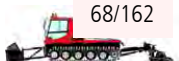
The PistenBully stops and can no longer be steered.

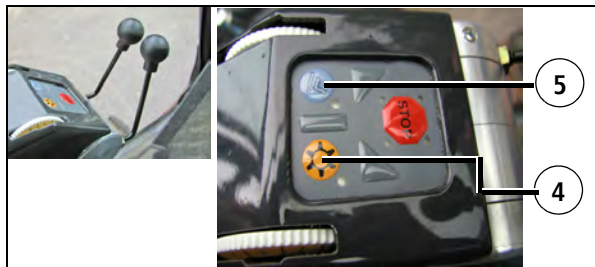
- Immediately engage the parking brake.

Restart = press the STOP button and hold it down for 5 sec.

3 Knurled knob for adjusting the tiller shaft speed

Turn the knob to adjust the tilling speed. The tilling speed is increased/reduced to suit the snow conditions.





4 Button, tiller drive ON - OFF



When the parking brake is engaged, the tiller drive automatically switches off. When the parking brake is released, the tiller drive remains off (indicator for tiller flashes). You must operate the button again in order to reactivate the tiller.

5 Button for manual throttle control

You use manual throttle control when moving slowly over very difficult terrain with a high tiller speed.

The diesel-engine speed can be adjusted up to max. 1,600 rpm.

Activating manual throttle control

- Use the accelerator to bring the engine up to the desired diesel-engine speed.
- Hold down the button **5** for at least three seconds. The diesel-engine speed remains constant.



WARNING!

Driving with manual throttle control!

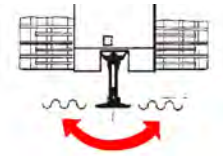
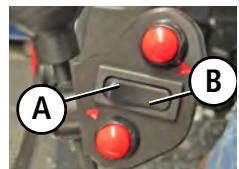
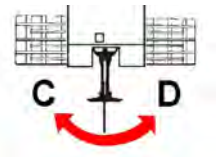
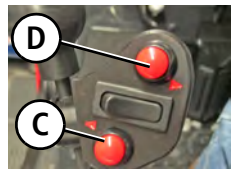
Easing the accelerator will no longer produced a reduction in driving speed and diesel-engine speed.

Engine rpm will respond only by increasing in response to increased pressure on the accelerator.

Reducing diesel-engine speed/driving speed

- Version 1
Move the sticks toward the neutral position.
- Option 2
Press the manual throttle button **5**.

STICK OPTIONAL

Rear equipment carrier	Joystick	Button	Position
Floating position 			Rocker switch Rear equipment carrier horizontal Rigid position/floating position Button A pressed = centring Neutral position = tiller fixed B pressed = floating position
Swivel horizontally 			Button <i>see steering wheel</i> C = swivel left D = swivel right

NORDIC-TRAIL TRACKER PLATES

Overview

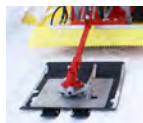
Technical
data

Safety

Use

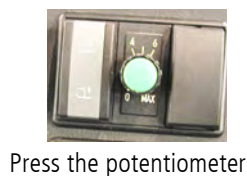
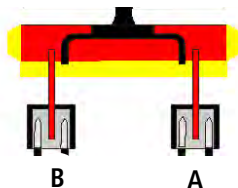
Checks

Operation



Nordic-trail tracker plates

Raise/lower/press into snow



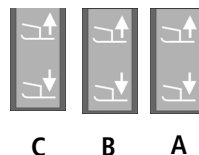
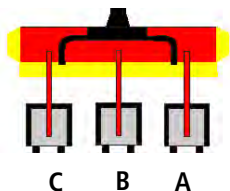
Press the potentiometer



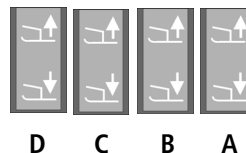
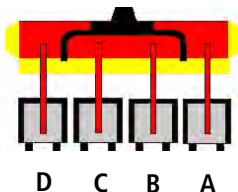
A - Right tracker plate
Raise/lower

B - Left tracker plate
Raise/lower

Pressing using the potentiometer

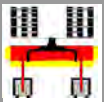
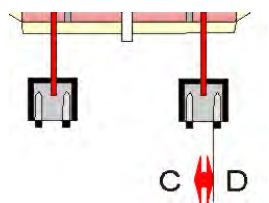
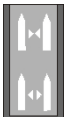
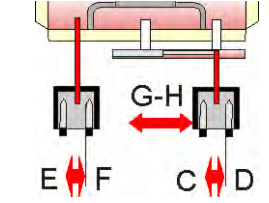
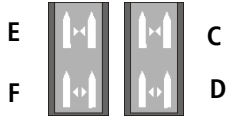



A-D - Tracker plates
Raise/lower




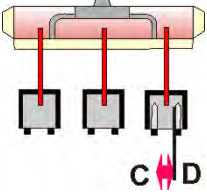
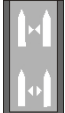
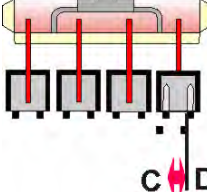
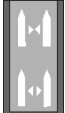
A-D - Tracker plates
Raise/lower

NORDIC-TRAIL TRACKER PLATES

	<p>Option 1/2</p> <p>2x Nordic-trail tracker plates</p>		
			<p>C/D Track spacing</p>
			<p>C-F Track spacing G/H Distance between tracker plates</p>



NORDIC-TRAIL TRACKER PLATES

	Option 3/4 3/4x Nordic-trail tracker plates		
			C/D Track spacing
			C/D Track spacing

Overview

Technical
data

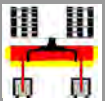
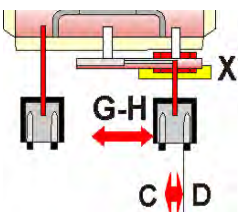




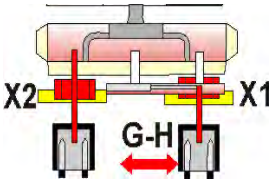


Safety

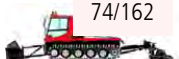
Use

Checks


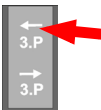


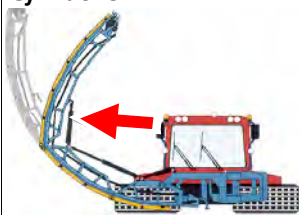
Operation

NORDIC-TRAIL TRACKER PLATES

	<p>Option 5/6</p> <p>2x Nordic-trailer tracker plates with 1/ 2 Nordic-trail tracking tillers</p>		
			<p>C/D Track spacing</p> <p>G/H Distance between tracker plates</p>
			<p>X1 Nordic-trail tiller Unlatched and bottom section pressed = tiller ON</p> <p>A/B Nordic-trail tracking tiller, raise/lower</p>
			<p>X1 Nordic-trail tracking tiller</p> <p>X 2 Unlocked and lower part pressed = tiller ON</p> <p>G/H Distance between tracker plates</p>



MAGICAN OPTIONAL

Magican	Joystick	Tiller	Position
Cylinder 1 		 	<ul style="list-style-type: none"> ► Read the accompanying Magican operating manual ► Joystick assignment Contact the service centre.
Cylinder 2 			
Cylinder 3 			

Overview

Technical
data

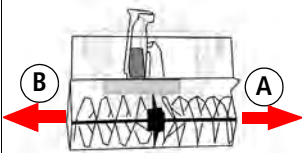

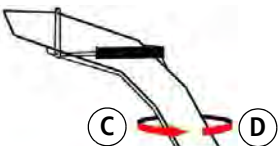


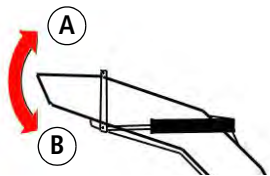

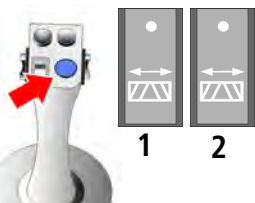
Safety

Use

Checks

Operation

FRONT-MOUNTED AUXILIARY DRIVEN IMPLEMENT OPTIONAL

Front blower	Joystick	Tiller	
Tiller to the left/right 			
Turn discharge chute 			
Discharge flap 			<p>○ Chute, left, toggle switch 1 depressed.</p> <p>Chute, right, toggle switches 1 and 2 depressed.</p>



Terminal display

Checking settings:

- Start the diesel engine.
- Select a function button **F1 - F5**.
- Change setting using knurled knob **P1** to **P3**



Press the **ESC** button to cancel



- Average diesel fuel consumption
(Reset F3)



- Engine-oil temperature
- Coolant temperature
- Steering setting
- Operating hours today

Press F4 to set to zero



- Operating hours, total
- Operating-hours counter

Press F4 to set to zero



- Tiller speed



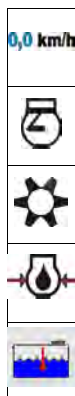
- Show video-camera image
(optional)

- Proceed to next level



- Return 1 level at a time to start page.

Bar chart



Speed display

Diesel engine speed

Tiller speed

Engine oil pressure

Coolant temperature

Control symbols



Medium-priority fault!

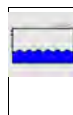
See the section on terminal fault codes



High-priority fault!

Stop working.

See the section on terminal fault codes



Coolant below minimum level!

Switch off. Eliminate the cause.

Top up the coolant. *See the section on checks.*



Hydraulic oil level too low!



Boost function ON

Tiller speed up to 1,600 rpm



Tiller control emergency operation



Tiller control automatic operation





Parking brake engaged

In addition:

Braking-air check, parking brake

Release pressure has dropped below 120 bar



Parking brake released



Neutral direction of travel



Direction of travel forwards



Direction of travel backwards



Front blower attached



Magican attached



AlpinFlexTiller attached



Tiller 2000 attached



Multiflex tiller attached



Drum winch switched on



PARK PRO

Incline display
Horizontal/vertical



Tiller standing



Tiller ON



Tiller running

Indicator lights



Engine stop light

Display: terminal/revolution counter

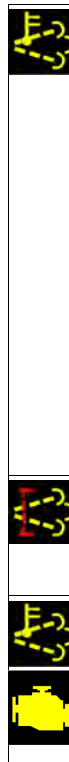
- Stop operation
- Drive to the nearest workshop

Engine test light

Display: terminal/revolution counter


- Low-priority engine fault

➤ Engine fault query by means of engine control indicator light *See page 39*



Active SCR exhaust system cleaning

Switches on automatically as soon as the exhaust temperature in operation is not sufficient for cleaning.

 Exhaust temperature up to 800 °C.



WARNING!

Risk of burns from the exhaust pipe!

- Keep a safe distance away.
- Remove flammable materials from the vicinity of the exhaust pipe (up to 1.5 m).








SCR system cleaning prevented

You use the rocker switch to prevent cleaning
See page 46.

Manual SCR exhaust system cleaning ON

You use the rocker switch to prevent cleaning
See page 46.

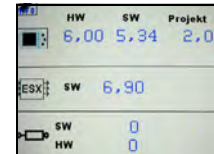
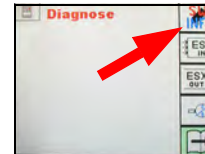
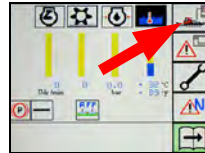


Display	AdBlue level	SCR system
 	<p>Tank under 20% filled</p> <ul style="list-style-type: none"> <input type="checkbox"/> AdBlue indicator is on. ➤ Check the AdBlue level and top up if necessary. <p>Tank filling volume under 5%</p> <ul style="list-style-type: none"> <input type="checkbox"/> AdBlue indicator is flashing. 	
 	<p>Tank under 2.5% filled</p> <ul style="list-style-type: none"> <input type="checkbox"/> Terminal/AdBlue indicator is flashing. ➤ Check the AdBlue level and top up if necessary. 	<ul style="list-style-type: none"> <input type="checkbox"/> 25% reduction in performance of the diesel engine ➤ Stop working and drive to the nearest workshop.
  	<p>Tank 0% filled</p> <ul style="list-style-type: none"> <input type="checkbox"/> Terminal/AdBlue indicator is flashing. 	<ul style="list-style-type: none"> <input type="checkbox"/> 50% reduction in the performance of the diesel engine <p>i After 30 minutes of driving or 10 seconds of idling, it is no longer possible to drive the vehicle.</p> <p>What to do AdBlue override Diesel engine power at 100% for up to 30 minutes <i>see page 46</i></p>





Command	Display	2. Display	Result
---------	---------	------------	--------

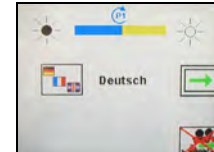
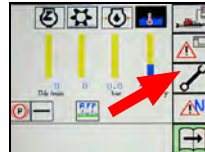
Checking the software version

-  Press **F5** twice
-  Press **F1**
-  Press **F1**




Selecting the language of your choice

-  Press **F5** twice
-  Press **F3**
-  Press **F1**
-  **F3** Select language



Setting the display brightness

-  Use **P1** to adjust brightness
- Press **ESC** to cancel.



Command	Display	2. Display	Result
---------	---------	------------	--------

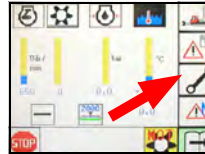
Idling diesel engine speed



Press **F3**



The input remains in the event of a restart.



Enter workshop code



Press **F5** three times

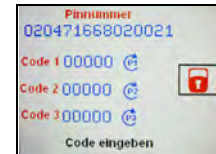


Press **F1**

- Request codes 1 to 3 from Kässbohrer AG Service.



If an incorrect entry is made three times, the PistenBully cannot be driven for 5 driving hours.



Emergency-mode driving electronic system

Emergency operation is to be used in the event of the failure of the:

- Steering potentiometer
- Accelerator pedal
- Direction-of-travel switch



Driving in emergency mode is only permissible to the nearest workshop.

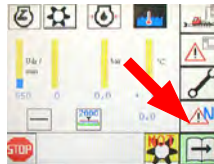
- Drive at low speed only. When driven at different loads, the engine may stall.

Adjusting

Press **F5** twice

Press **F4**

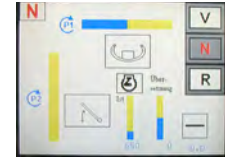
i If you press **ESC**, the PistenBully stops, and the direction-of-travel switch has to be pressed again.



Driving steering

- Use **P1** to adjust driving steering.

Driving straight ahead = blue and yellow bars of **P1** are equal in length.



Driving speed


- Use **P2** to increase/reduce driving speed.
- Turn **P2** back to reduce the driving speed.

Direction of travel

- **F1** forward
- **F2** neutral
- **F3** reverse



Adjusting steering sensitivity

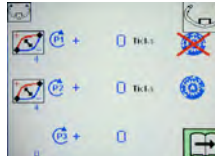
 Press **F5** twice

 Press **F3**

 Press **F2**.



- Use **P1** to increase value without an active winch.
Use **P2** to change value with an active winch.
Slight steering movement has increased steering effect.



 Press **F5** to continue

- **P1** Change value:
Track speed for cornering.
- Use **P2** to change value.
Adjusts forward movement in a straight line.
- Use **P3** to change value:
Adjusts reversing in a straight line.



Calibration – teach-in

- Switch on the ignition

Press **F5** twice

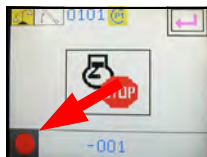
Press **F3** twice

Calibrating the accelerator pedal

- Set a value of 0101 for P1

Press **F1** to confirm

- Without operating the accelerator, press **F5** to confirm.
- Applying uniform pressure, slowly depress the accelerator pedal to the limit of its travel.
- Keep **the** accelerator pedal pressed down and press **F5**.
- Confirm with **F5**.



- Switch ignition off/on
The calibration value is saved.

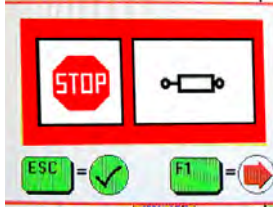
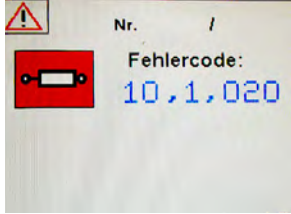
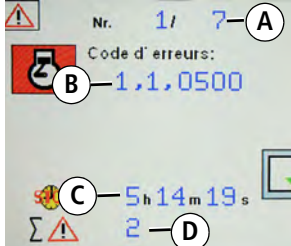
Further P1 values

101 Accelerator pedal	106 Inclinometer
102 Steering potentiometer	204 Tiller potentiometer
103 Inch potentiometer	206 Tiller depth
104 Stick, left	207 Lateral positioning
105 Stick, right	250 Winch

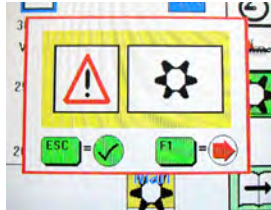
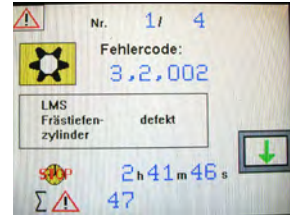




Fault-code displays

Category	Display	Action
<p>High-priority fault!</p> <p>Warning buzzer sounds: continuous</p> <ul style="list-style-type: none"> - Display shows STOP - Red warning symbol - Stop operation <p>Check the fault code: Press F1.</p> <p>Fault acknowledgement: ESC key</p>		
	<p>A = number/number of faults B = fault code no. C = fault occurred at operating hour D = total number of faults</p>	

Repeated message: If you ignore a message indicating a fault that would result in damage to the vehicle.

Category	Display	Action
<p>Medium-priority fault!</p> <p>Warning buzzer sounds: 10 seconds ON and 0.5 seconds OFF</p> <ul style="list-style-type: none"> - ATTENTION displayed - Yellow warning symbol - Restriction possible! 		
<p>Low-priority fault!</p> <p>Warning buzzer sounds: 0.5 seconds ON and 1.5 seconds OFF</p> <ul style="list-style-type: none"> - WARNING displayed - Green warning symbol - Slight restriction possible! 		

Fault-code legend

3,2,001

Subassembly

- 1 = engine
- 2 = vehicle control unit
- 3 = tiller
- 4 = winch control unit
- 5 = ESX
- 6 = display
- 7 = CAN monitoring
- 10 = working hydraulics
- 14 = rear equipment

3,2,001

Fault

- 1 = high-priority fault (red)
- 2 = medium-priority fault (yellow)
- 3 = low-priority fault (green)

3,2,001

001 = sequential fault code



See the fault code table in the service workshop information

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DRIVER'S SEAT



2 Knob

For flank adjustment

3 Knob

For lumbar support adjustment

4 Knob

For stepless adjustment of backrest rake.

5 3-stop lever

For limiting float to

- 150 mm travel
- 90 mm travel
- 75 mm travel (no-float position)

6 Knob

For stepless adjustment of the seat cushion through 8°.

7 Stepless adjustment of the seat depth

8 Switch for two-stage control

Heating for seat and back

9 Horizontal longitudinal adjustment

via rail latched on both sides

Driver's seat

1 Headrest

Adjustable height and angle



PistenBully transport

- Due to the transport limitations, only use suitable means of transport and lifting gear with a sufficient load capacity.
See VDI Guideline 3968 from 2700.
- Comply with all applicable national regulations.
- Switch the PistenBully diesel engine off. Close the cab.
- Retract the external mirrors.



WARNING!

Parking brake not working!

- Put the PistenBully on an even surface.
- Secure the wheels with wheel chocks.



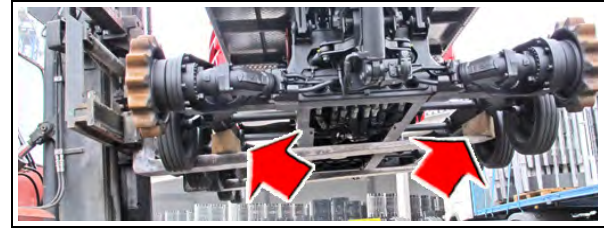
DANGER!

Risk of the load slipping or falling!

- Secure the PistenBully to prevent it from slipping.
- Use chains or straps.
- Use wooden chocks for the wheels.
- Place anti-slip pads under the wooden chocks.

TRANSPORT

- Remain in eye contact with the banksman when loading / unloading.
- Use wooden planks as a base.
- Place anti-slip pads under the wooden chocks.
- Use of a shackle.
See the rear securing point in the picture.
- Note the PistenBully's net weight.
See the technical data.



Wooden planks for base



Loading points for forklift truck



Wooden chocking



Rear securing point



Front securing point

TRANSPORT

- Load the chains standing as shown.
Each chain has a net weight of around 1,000 kg.
- Use edge protectors when loading the chains.



Front blade securing point



Tiller securing point



Chain securing point

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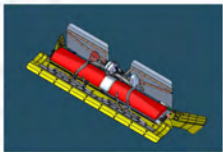
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NOTES



ATTACHING AUXILIARY EQUIPMENT . 96



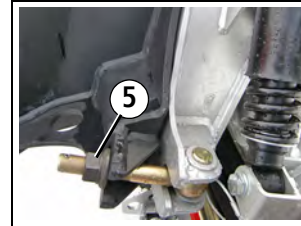
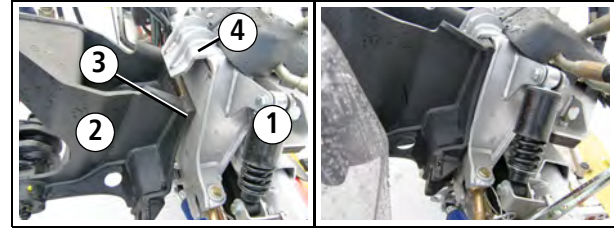
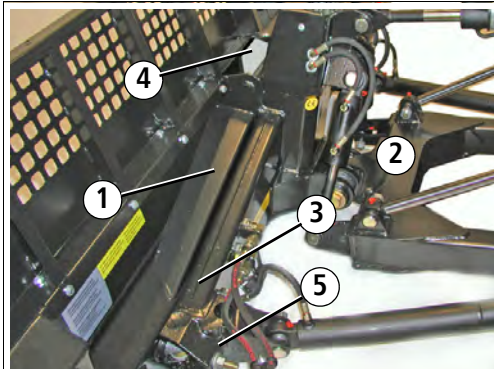
OPENING THE REAR DECK 99



TILTING THE DRIVER'S CAB/LOAD
PLATFORM 102

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AUXILIARY EQUIPMENT



Attaching auxiliary equipment

- Clear all ice and snow off the adapter plate **1** and centring head of the auxiliary equipment.



WARNING!



Do not permit anyone to enter the zone between the vehicle and the auxiliary equipment while the engine is running.

- Lower the carrier plate or blade frame.
- Tilt the adapter plate **3**

- Drive the PistenBully up to the equipment.
- Engage the parking brake.
- Slowly raise the equipment carrier or blade frame **2** The adapter plate **3** engages with the hook **4**, the mating plate **1** sits against the adapter plate and simultaneously centres itself with the two centring wedges on the adapter plate.

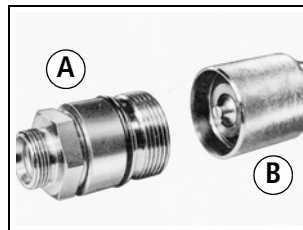


AUXILIARY EQUIPMENT

- Raise the equipment carrier or blade frame just far enough to enable the equipment to sit against the adapter plate. If the centring wedges do not slip under the adapter plate, a few sharp jerks will bring the auxiliary equipment into the correct position.
- Switch the engine off.
- Swing the eyebolts **5** inward, and tighten the nuts (with a tightening torque of 250 Nm).
- After approx. 10 minutes of operation, check the nuts again and make sure they are correctly tightened.
- Lower the auxiliary equipment.



Remove the rear-mounted auxiliary equipment before prolonged periods of pushing work.



Connecting the hydraulic coupling

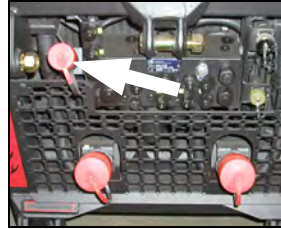
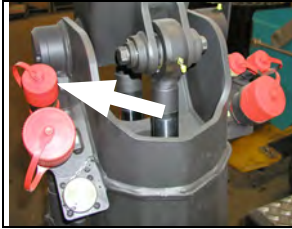
The threaded **high-pressure couplings** are for connecting and disconnecting filled hoses.

Check valves that enable or disable the flow, as appropriate, are actuated automatically during coupling.

A = vehicle end

B = device end

AUXILIARY EQUIPMENT



Before connecting or disconnecting the hoses for auxiliary equipment, always:

- Switch off the engine.
- Engage the parking brake.
- Switch the ignition of the diesel engine ON, and depressurise the hydraulic hoses by means of the corresponding functions.
- Switch the ignition of the diesel engine OFF.
- When making the connections, always make sure that both parts of the couplings are perfectly clean.
- Connect the leakage oil line first. *See the arrow in the picture.*
Any excess pressure in the system is eliminated.
- Connect the hydraulic hoses.

- Make sure that the codes match and that the hydraulic couplings are correctly seated.
- Use suitable tools to tighten the hydraulic couplings.
- Connect the electrical plug of the auxiliary equipment to the socket of the PistenBully and make sure it is correctly engaged. The connector connects the electric circuit for detecting the auxiliary equipment.
- Test the operation of the auxiliary equipment.



WARNING!

There must be nobody in the danger zone.

- Check the auxiliary equipment for fluid leaks and, if necessary, have the equipment repaired by trained, qualified persons.

Removing the auxiliary equipment

- Lower the auxiliary equipment, with the stands fully extended and secured, onto firm, smooth ground.
- Removal is the reverse of the installation procedure.
- Disconnect the leak-off oil line last.
- Protect the auxiliary equipment from the sun if it is to be out of use for a prolonged period of time.



REAR DECK

Opening the rear deck *(optional)*



CAUTION!



There is a risk of slipping on the track and the load platform.
When climbing onto and off the rear deck, hold onto the load platform railing.

- Raise the hinged rear deck.



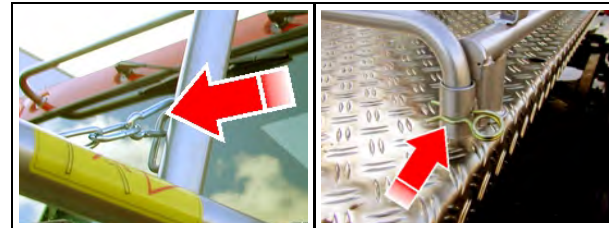
See direction arrows for points to hold for opening.

- Push both locking levers all the way down.



The safety catch on the locking lever must engage.

- Close both safety chains.
- Install the two spring pins to secure the foot bar.
- Always comply with the instructions for carrying passengers in the section entitled "Safety instructions".



Closing the rear deck

- Press the safety catch **1** and open the locking lever.



Risk of being crushed!

There is a risk of this when lowering the rear deck.

Remedy: Close the rear deck using holding points.



Fully lower the rear deck.

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TILTING THE DRIVER'S CAB/LOAD PLATFORM



Precondition:

- Always remove all loose objects before tilting the driver's cab or load platform.
- Park the vehicle on a firm surface that is as horizontal as possible.
- Engage the parking brake.
- Switch off the tiller drive.
- Direction of travel switch in neutral position.
- Lower the front-mounted and rear-mounted auxiliary equipment.



If you fail to do this, there is a risk of a collision between the load platform or driver's cab and the auxiliary equipment.

- Get out of the driver's cab.



CAUTION!

Close the doors!

If you fail to do this, there is a risk of an accident caused by the doors slamming shut.

- Make sure there is nobody in the danger zone.

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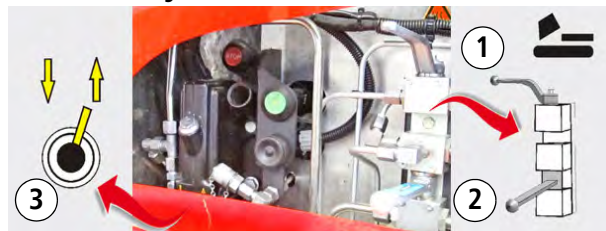
Operation

TILTING THE DRIVER'S CAB/LOAD PLATFORM

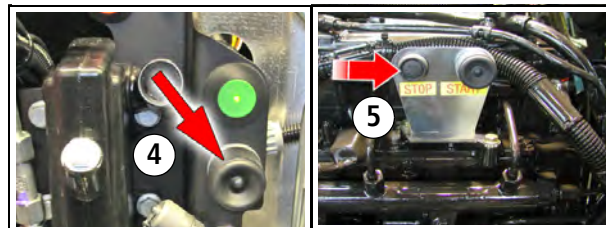
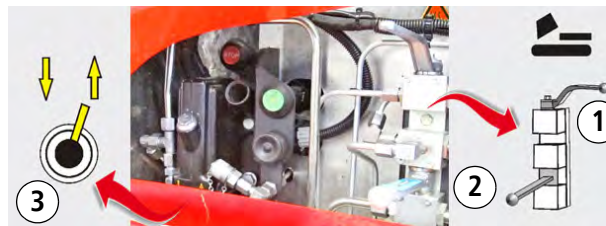
Tilting the driver's cab

- Move the lever of the block ball cock **1** and **2** into position.
- Move the adjusting valve **3** into position.
- Press the button **4**.
The driver's cab will tilt.
You can interrupt this movement by releasing the button.
- Switch off the diesel engine by pressing STOP button **5**.

PistenBully 400



PistenBully 400 W



Lowering the driver's cab

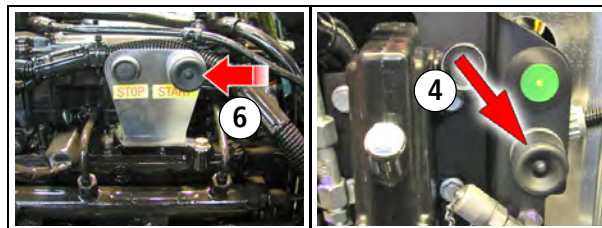
- Move the adjuster valve to the appropriate position.
- Start the diesel engine by pressing button **6**.
- Press the button **4**.
The driver's cab will lower. The warning light for the cab latching mechanism goes out.

i You can interrupt this movement by releasing the button.

PistenBully 400



PistenBully 400 W



TILTING THE DRIVER'S CAB/LOAD PLATFORM

Tilting the load platform

- Remove the toggle screw **7** on the load platform.
- Move the lever of the block ball cock to the appropriate position.
- Fully raise the load platform (see the section on tilting the driver's cab).



WARNING!



Risk of being crushed!

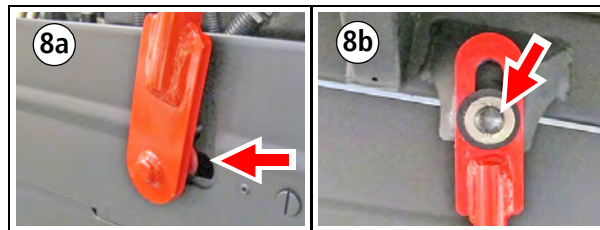
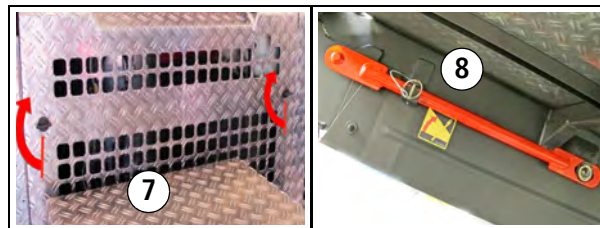
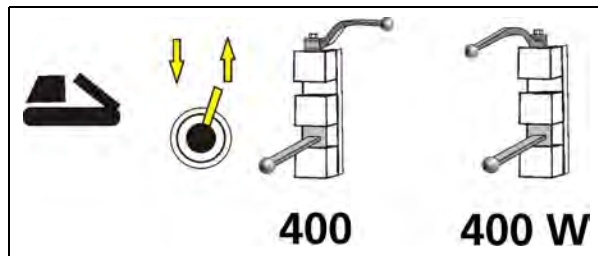
When there is a loss of pressure from the hydraulic system, the load platform falls. Use a support **8 to prevent it lowering.**

- Raise the load platform fully, release the support **8** and swing it out of the way.
- Insert the support into its anchoring position and push it down to fix it in place (see figure 8a).

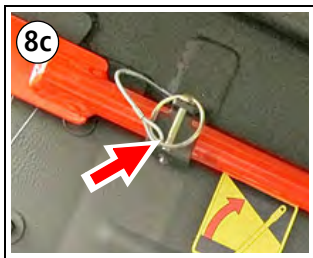


WARNING!

If you knock the support inadvertently, it can fall out of its anchoring position. Lower the load platform until the bolt comes into contact with the guide slot (see figure 8b).

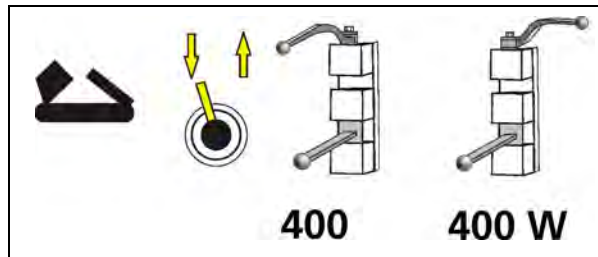


TILTING THE DRIVER'S CAB/LOAD PLATFORM



Lowering the load platform

- Tilt the load platform all the way up.
- Take the support out of its anchored position and insert it in the bracket.
- Secure the support with the retaining ring 8c.
- Lower the load platform (*see the section on lowering the driver's cab*).
- Tighten the toggle screw in the load platform.



Driver's cab and load platform, lowering/tilting

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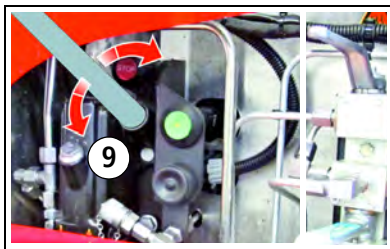
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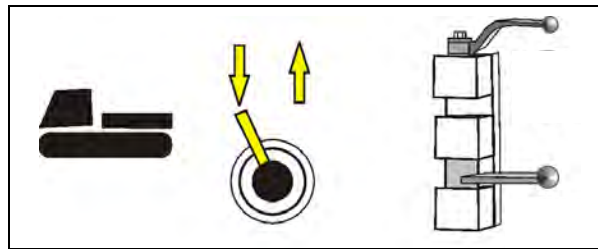
Operation

TILTING THE DRIVER'S CAB/LOAD PLATFORM



Using the manual pump for tilting and lowering

- Switch off the diesel engine.
- Prepare the block ball cock/adjuster valve and the support in the same way as for the corresponding operation with the engine-powered hydraulics.
- Fit the tubular extension (on-board toolkit) on the manual pump **9** and operate the pump.



Operation

- Move the lever of the block ball cock to the appropriate position.
- Note that the rear hydraulics will not operate if the driver's cab locking mechanism is not engaged or the load platform is not fully lowered. The warning symbol for the cab latching mechanism lights up.

OVERVIEW OF ELECTRICS



Overview

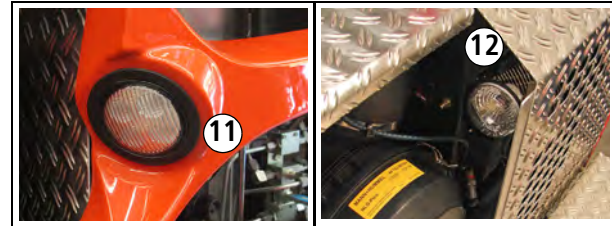
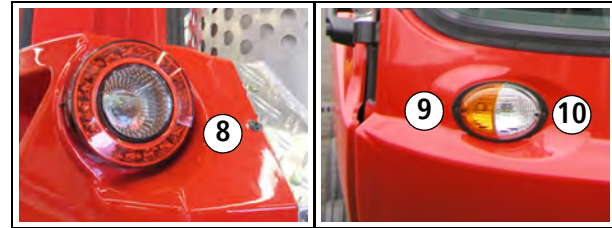
Technical
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Lighting

- Do not touch the glass of halogen bulbs!
(See notes on halogen-xenon bulbs).

- 1 Front searchlight**
- 2 Full-beam headlight/parking light H7**
- 3 Dipped-beam headlight H7**
- 4 Worklight, front** (*xenon optional*)
- 5 Treeline light H3** (*optional*)
- 6 Worklight, rear, H11**(*xenon optional*)

- 7 Rotating beacon**
- 8 LED direction indicator/rear light**
- 9/10 Direction indicator/parking light**
- 11 LED worklight, side**
- 12 Engine compartment lighting**



Halogen-xenon



WARNING!

Risk of eye injury from bright light!
Do not look directly into the bright light.



WARNING!

Dangerous gases! If a xenon bulb breaks in an enclosed space, leave immediately and ventilate the room for at least 20 minutes before re-entering.



Damage to electronic ballast!

Persistent light problems indicated by flickering of the gas-discharge light can result in damage to the electronic circuitry in the ballast.

Switch off immediately if the light flickers.



Risk of breaking the lens!

Do not use liquid to clean the lens while hot.

- Only clean dirty glass when cold.
- Do not use aggressive or abrasive cleaning agents.

Safety instructions for changing xenon bulbs

- Before changing a bulb, always switch off the headlights and isolate them from the power supply.
- Do not probe into the bulb socket.
- The electrical connection between headlight and ballast carries a high voltage: do not break this connection.
- Never operate the ballast without a bulb, as this could cause dangerous arcing at the bulb socket and result in damage.
- Allow the bulb to cool down before you commence work.
- Wear protective goggles and protective gloves when changing bulbs.
- Danger of flying splinters of glass!
The glass body of a xenon bulb is pressurised and can shatter.
- Always hold the bulb by the base.
- Operate xenon bulbs in closed headlights only.



Dispose of the spent xenon bulb as hazardous waste.

Electrical connection

- Before connecting, always interrupt the circuit by switching off the battery master switch.
- Use only the factory-installed wiring harness for electrical connection.



Replacing fuses

Fuses are designed to provide protection against excessively high currents in the electrical system.

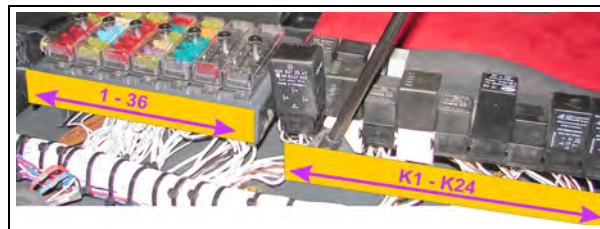
The fuses are underneath the centre console.

Use the grip to lift the centre console until the gas-filled strut latches the console in the fully raised position.



Risk of a cable fire and short circuit!

Never attempt to jumper or repair fuses or insert replacement fuses with a higher ampere rating than the originals.

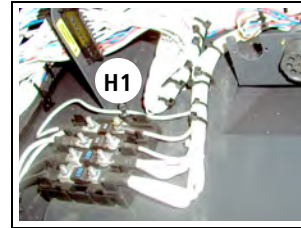


Fuses

1	(10 A)	Full-beam headlight check/full-beam headlight, left
2	(10 A)	Full-beam headlight, right
3	(10 A)	Dipped-beam headlight, sidefinder, left
4	(10 A)	Dipped-beam headlight, sidefinder, right
5	(20 A)	Control panel lighting/parking light/rear light, left
6	(10 A)	Instrument lighting/parking light/rear light, right
7	(20 A)	Worklight, front
8	(20 A)	Worklight, rear
9	(15 A)	Cab heating, left
10	(15 A)	Cab heating, right
11	(25 A)	Drum winch
12	(20 A)	Searchlight, reversing light
13	(10 A)	Front wiper, radio



- | | | |
|-----------|--------|--|
| 14 | (10 A) | Rear wiper/working hydraulics, rear |
| 15 | (10 A) | Steering wheel, reversing alarm |
| 16 | (10 A) | Front tiller blower, Pipe Magician, reversing camera |
| 17 | (10 A) | Instruments, indicator lights |
| 18 | (20 A) | Direction indicator system, horn |
| 19 | (20 A) | Working hydraulics |
| 20 | (3 A) | PSX electronics |
| 21 | (5 A) | Engine electronics |
| 22 | (20 A) | 24/12 V converter, driver's seat |
| 23 | (30 A) | Engine electronics |
| 24 | (10 A) | Terminal |
| 25 | (3 A) | PSX electronics |
| 26 | (30 A) | PSX electronics |
| 27 | (30 A) | Voltage with engine running, mirror heater, side-window heater |
| 28 | (30 A) | Rear-window heater |
| 29 | (20 A) | Drum winch |



- | | | |
|-----------|--------|---|
| 30 | (20 A) | Rotating beacon, clock, interior lighting |
| 31 | (10 A) | Reserve |
| 32 | (20 A) | Xenon worklight |
| 33 | (30 A) | Fuel preheater |
| 34 | (2 A) | Heating controller |
| 35 | (10 A) | Tracker plates |
| 36 | (10 A) | Tracker plate tiller |
| 41 | (10 A) | Exhaust system, isolating relay, fan control unit |
| 42 | (20 A) | Heating supply unit |

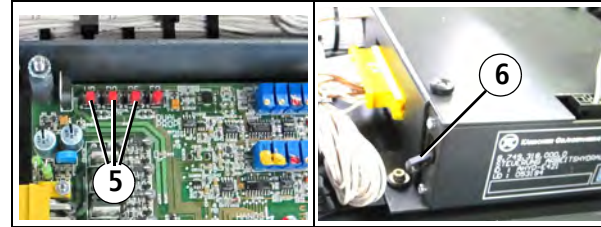
H1 Main fuse

- | | |
|-------|------------------|
| 100 A | 2 x main fuse |
| 80 A | 2 x engine start |

Miniature relay (K)

Miniature relays are not interchangeable.

- 1 Windscreen heater, front
- 2 Ignition ON, terminal 15
- 3 SAT/radio
- 4 Parking light
- 5 Driving light
- 6 Direction indicator system
- 7 Voltage with engine running
- 8 Wipe interval, front
- 9 Wipe interval, rear
- 10 Warning buzzer
- 11 Fuel preheater
- 12 Rear-window heater
- 13 Reversing light
- 14 Cold-start system
- 15 Reversing
- 17-18 Active drum winch
- 20 Heating supply unit
- 21-23 Pipe heating 1 to 3



Emergency operation of working hydraulics

- Switch off the rotary tiller

If the control system fails, the rear auxiliary hydraulics can be raised/lowered by means of emergency buttons **5**.

UP + RE pressed = raise equipment carrier

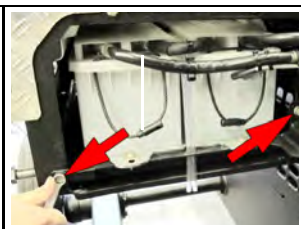
DO + RE pressed = lower equipment carrier

FR = reserve

Power supply = fuse **6** (20 amperes).



Battery cover



Battery carriage

Vehicle battery

The batteries **2 x 12 V 135 Ah** are installed in the upper frame.

- Tilt the driver's cab.
- Loosen the screws and move the cover to the right.
- Loosen both screws. Raise the battery carriage and pull it forward.



The battery must be held in place by the retainer.



WARNING!



Risk of explosion of oxyhydrogen gas!
Keep all sources of ignition well away from the battery.
Do not put any metal parts on the battery.

Topping up the battery fluid



WARNING!



Caution when handling battery acid –
risk of chemical burns!
Wear protective goggles and protective gloves.

- Remove the screw caps.
- Top up the fluid in the cells to the max. mark with distilled water.



Charging the battery



WARNING!



Connect cable clamps!

Make sure that polarity is not reversed. Do not bring the battery clamps into contact with each other.



Make sure the room in which the battery is charged is well ventilated.

Do not place metal objects on top of the battery.

- Connect the battery to the electrical system via the battery isolating switch.

Start-up assistance



WARNING!



If start-up assistance is given incorrectly, there is a risk of fatal electric shocks or burning.

Do not allow the cable clamps to touch each other.



Do not connect the jump-start leads to the connecting bridge between the two batteries.



Voltage spikes can occur when the jump-start cable is disconnected.

Risk of damaging electronic components!

Switch on heavy consumers before disconnecting the jump-start cable. (e.g. windscreen heating, seat heating).



Electronic damage!

The use of start-up assistance equipment such as a power booster or power pack is not permitted.

Connecting jump leads

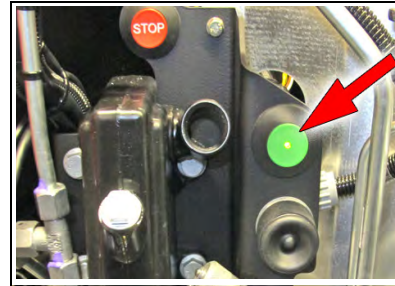
1. From the **+** pole of the PB battery to the **+** pole of the start-up assistance battery (24 V).
 2. From the **-** pole of the PB battery to the **-** pole of the start-up assistance battery (24 V)
- Connect the battery to the electrical system via the battery isolating switch.

Battery isolating switch

The battery isolating switch isolates the battery from the electrical system.

Operate the battery isolating switch:

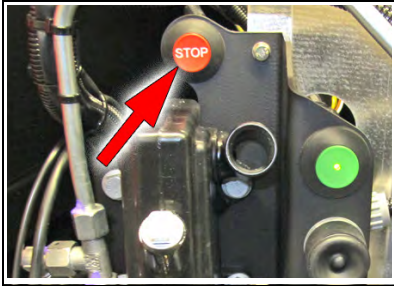
- When there is an electronic fault.
 - To protect the battery during extended downtimes.
- Switch the ignition for the diesel engine OFF
 - The indicator light on the battery isolating switch comes on.
 - Press the battery isolating switch.
 - The indicator light flashes for 5 minutes (cleaning of the AdBlue system).
 - The indicator light goes out:
 - The battery is isolated from the electrical system.



Battery isolating switch

Connecting the battery to the on-board electrics

- Press the battery isolating switch.
- Wait 30 seconds.
- Switch the ignition of the diesel engine on.



Emergency switch

Starting up and driving off

- Press the battery disconnect button.
- Wait 30 seconds.
- Switch on diesel engine.

Battery emergency switch

The battery emergency switch must be operated.

- In the event of a fire in the vehicle
- In an acute situation



Voltage spikes of the electronic circuits!

Only press the battery emergency switch in an emergency if the engine is running.

i No AdBlue system cleaning



NOTES

Instructions for checks and maintenance



WARNING!



Risk of being cut or crushed!
All moving parts constitute a hazard.
When the engine is running, keep at a safe distance from rotating parts.

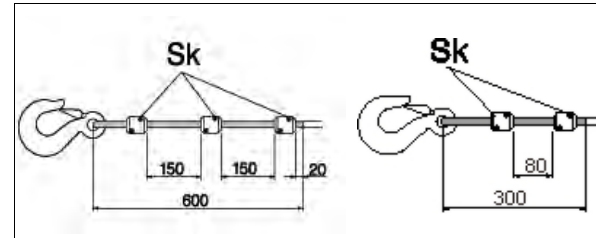
- Always perform the specified checks before starting off.
- Perform all checks with the engine off and the vehicle parked on a horizontal surface.
- Make sure that the oil and coolant levels are always to specification (check at oil dipstick, overflow plug, etc.).

Checks following delivery of new and used vehicles

After the first 5 operating hours check:

- Wheels: Tightening torque 300 Nm.
- Track lock for combination tracks after 5 and 50 operating hours - tightening torque 110 Nm - 5 Nm.

Winch



- 3 wire-rope clamps (SK) tightening torque 25 Nm.
- 2 wire-rope clamps (SK) tightening torque 30 Nm

Topping up fluids and lubricants



WARNING!

Do not permit fluids or lubricants to come into contact with the skin (wear protective gloves, change wet clothing).
Do not inhale or swallow fluids or lubricants (risk of poisoning).



WARNING!



Risk of explosion from gas build-up in the fuel tank!

Keep all possible sources of ignition when clear when the vehicle is being refuelled.



Do not spill fluids or lubricants (they are hazardous to soil and water). Always dispose of these substances in an environmentally compatible manner (comply with local laws).

DAILY CHECKS

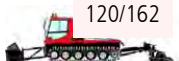


WARNING!

Danger of being run over or crushed due to the mobility of the machine!

The equipment may continue to move if the accelerator pedal does not return to its initial position after it is released.

- Make sure the accelerator pedal moves freely before each travel operation.

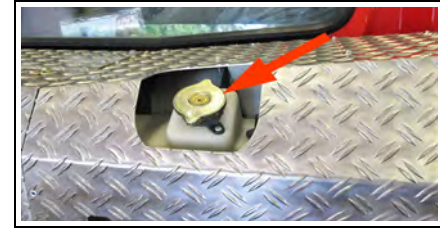


Checking the coolant level

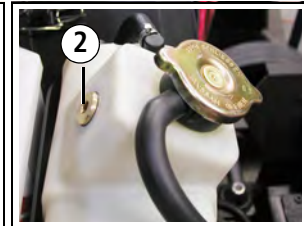
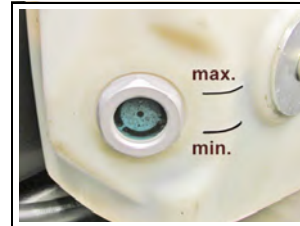


Check the coolant level and top up only when the engine is cold. Loosen the bleed screw **2** when filling with coolant. This will enable the system to fill much more rapidly.

- Check the coolant level in the sight glass of the expansion tank.
The water level must be between the min. and max. marks.
- If a lot of water has to be added, the frost resistance of the coolant must be checked.
- If the expansion tank is already empty, refill with water slowly. Check the water level after 5 minutes.
- Check that the hoses in the cooling and heating systems are tight and not leaking.



Expansion tank



DAILY CHECKS

Checking the engine oil level

- Use the oil dipstick to check the oil level.
- Top up the oil with the engine switched off and the PistenBully standing on level, horizontal ground. The oil level must be between the min. and max. marks on the oil dipstick.



Use only approved engine oil (see fluids and lubricants specifications).

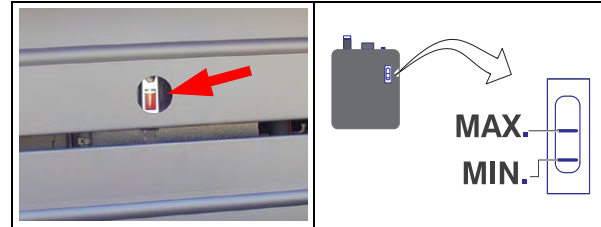


Checking the hydraulic fluid level

- Check the hydraulic fluid level and top up only when warm.
- The fluid level must be between the min. and max. marks.



Use only approved hydraulic fluid (see fluids and lubricants specification).



Intake air valve on the engine compartment air intake

- In powder snow



If you fail to do this, there is a risk that the air filter will ice up and ice particles will damage the blades of the turbocharger.



The air filter symbol lights up as soon as the air filter ices up or has to be replaced.

Checking the electrical system

- Check the lights and flashing indicators and the rotating beacon system; repair or replace components as necessary. Always comply with the instructions for working on the rotating beacon system (high-voltage system).
- Replace defective bulbs and fuses.
- Check the wipers, horn and back-up alarm.



Only operate the PistenBully when the warning and all-round flashlight system is working properly.

Visual inspection

- Carry out a visual inspection of the chains and wheels, and check for tyre damage.
- Visually inspect the fasteners of the auxiliary equipment (locking pins, bolts, nuts).
- Carry out a visual inspection of the hydraulic system (propulsion and auxiliary hydraulics) hydraulic lines, couplings, hoses and working cylinders to check for any leaks and abrasion points.

PistenBully with diesel particulate filter

- Check the exhaust tailpipe for soot deposits.
- Check the fumes emitted during operation.
If the fumes are black, switch the vehicle off and inform the service personnel.

Checking the parking brake

- Make sure there is nobody in the danger zone.
- Start the engine and engage the parking brake: Indicator light comes on.
- Set the direction-of-travel switch or the propulsion lever to "Forward" and briefly accelerate the engine to approx. 2000 rpm.

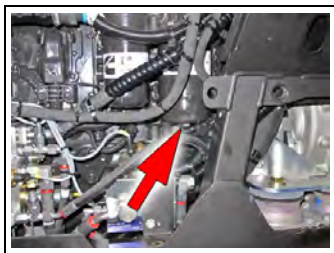
The PistenBully must remain motionless.



Do not operate the vehicle if the parking brake is defective.

- The indicator light in the instrument cluster must go out when the parking brake is released.
- Perform all the daily checks.
- Check the drive belt on the engine (engine fan, alternator); make sure that belt tension is correct and that the belt is free of damage (see the manual supplied by the engine manufacturer).

Fuel/water separator



Outlet valve

- Switch the diesel engine off.
- Turn the outlet valve anti-clockwise by hand for three revolutions. The outlet valve is lowered by around 25 mm, and the draining process begins.
- Collect the fuel/water mixture.



Dispose of the fuel/water mixture in accordance with the applicable regulations for the location.

- Lift the outlet valve and close it by hand.

Track tension

Checking the track tension

- Vehicle parked on horizontal, snow-covered ground.
- No load on vehicle and auxiliary equipment lowered.
- Equalise the track tension by driving backwards and forwards.

The track tension is correct when the upper section of the track can be lifted **approx. 40 – 50 mm** midway along its run.

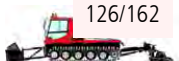
- Check the condition of the track belts, chain belts, track guides and bars, and replace any damaged parts.

Test drive

- Check operation and test all instruments and indicators.
- Check the running gear and engine/transmission unit for abnormal noises.
- Visually inspect for smoke at the exhaust.



Check the air filter element if the exhaust is smoky.



Checking wheels

- Check the wheel fasteners and check tyre pressures.

Tightening torques

TYPE	TENSIONING AXLE	DRIVE AXLE	AIR PRESSURE, DRIVE AXLE
PistenBully 400	300 Nm	300 Nm	7.0 bar

Transfer box

- Tilt the load platform.
- Use the oil dipstick to check the oil level.
- Measurement cap SW 36
Measurement with oil dipstick (not screwed in).
- The oil level must be between the min. and max. marks on the oil dipstick.
- Use only approved oil for transfer boxes
(see fluids and lubricants specifications).



Cap of transfer box

Getting in

- Before entering the cab, complete the daily checks and maintenance tasks.
- Walk right round the vehicle and make sure that the danger zone is clear of people and objects.
- Use the handle **1** on the driver's door to get in.
- Step onto the track.



Risk of slipping on the track when climbing into and out of driver's cab. Always use the handle in order to step onto the track.

In order to help ensure safe operation, drivers must wear appropriate footwear with non-slip soles.

- Press the door lock. The driver's door opens.
Note: When parking on a slope, be particularly careful when opening the door. The door opens suddenly.
- Use the handle **2** on the driver's door.
- Put the armrest **3** up.
- Sit down on the driver's seat.
- Close the door.



- Adjust the seat and the steering wheel to an ergonomically comfortable position. Lower the armrest right down. (In the USA with sticks it is not possible to drive unless the armrest is right down.)
- Fasten the seat belt.
- Visual check: The direction-of-travel switch should be in the neutral position, and the parking brake should be engaged.

Starting the diesel engine



The use of proprietary starting agents (such as Startpilot, for example) is prohibited on account of the risk of explosion.



WARNING!

Risk of inhaling poisonous fumes!

Do not leave the engine running unattended or running in an enclosed space.

Start procedure

- Ignition ON



Depending on the ambient temperature, the intake-air preheating light goes out after approx. 2 seconds (no preheating) or within 30 seconds (maximum preheating time).

When the intake-air preheating light goes out:

- Start the engine.
- Do not depress the accelerator
 - Operate the starter until the engine is turning at 700 rpm
 - Maximum duration of start attempt 30 seconds

Engine refuses to start?

- Immediately repeat the start attempt (do not repeat the preheating procedure). It may take up to 30 seconds to start.

If it is necessary to repeat the reheating procedure:

- Ignition OFF
- Wait 5 - 10 seconds
- Ignition ON

What to do in this situation

The warning light for air-intake preheating may stay lit for up to approx. 3 minutes after the engine starts.



Electronic damage

If the warning light for air-intake preheating lights up during operation:

- Cease operation.
- Proceed with caution to the nearest workshop.
- Disconnect the battery from the on-board electrics.

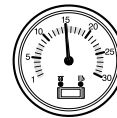
Warming-up phase

Air temperature above 0° C to –20° C



- Allow the diesel engine to idle for approximately 3 minutes.
- Drive with the engine operating in the partial-load range.
- The engine can be operated at full load as of a coolant temperature of + 80° C.

Air temperature below –20° C



- Allow the diesel engine to idle for approximately 6 minutes.
- Drive with the engine operating in the partial-load range.
- The engine can be operated at full load as of a coolant temperature of + 80° C.

Instructions for engine break-in

Up to 40 operating hours

- Operate carefully up to max. 3/4 full-load speed

After 40 operating hours

- Gradually work up to full load

Engine speed range

On steep gradients

- Increase engine speed.

Operating in extremely difficult terrain

- Use the potentiometer to reduce driving speed.



The speed of the auxiliary equipment remains unchanged.

Driving

- Switch on the rotating beacon.
- Before driving, always check that there is nobody in the danger zone, in other words in the immediate vicinity of the vehicle or at or on the tracks.
- Press the direction-of-travel switch to the position corresponding to the direction in which you want to travel. An audible signal (back-up alarm) sounds if you set the direction switch to the position to reverse.
Even though the vehicle is fitted with a back-up alarm, you remain under the obligation to check carefully the area behind the vehicle when reversing.
If visibility is poor, an additional person is required to act as a banksman.
- Release the parking brake.
- Depress the accelerator pedal to increase engine rpm to above drive away speed: The PistenBully drives away.

The PistenBully accelerates steplessly to its maximum speed as engine speed increases.

The electronic system monitors the engine speed set by the accelerator pedal during the trip and selects the hydraulic ratio to suit the load. Consequently, the set engine speed remains constant and only the driving speed changes.

i When you turn, bear in mind that the left and right propulsion hydraulics switch to counter-rotation just before full lock is applied to the steering wheel. The PistenBully turns in its own length.

PistenBully with diesel particulate filter

Optimal diesel particulate filter cleaning

- Drive at a low diesel engine speed and a high operating load.
- Avoid long diesel engine idling times.

- Monitor all instruments when driving.

Engine oil pressure

The warning light for the diesel engine comes on during the start procedure and if oil pressure drops.

Engine operating temperature

Gauge showing that temperature is too high?

Determine the cause, for example:

- Gauge in working order
- Not enough coolant in system
- Foreign matter clogging radiator on outside
- Check belt tension
- Check visco fan

Fuel supply

Continually monitor the fuel supply and fill up in good time. This precaution will prevent the fuel supply from failing on a gradient, which would mean the engine stopping inopportunistically.

Diesel fuel tank empty!

The fuel system has taken in air!

- Fill the vehicle with fuel (*see the section on getting out*).

- Switch the ignition ON and wait for around 30 seconds. The auxiliary fuel pump comes on.
- Switch the ignition off and wait for approximately 20 seconds.
- Switch the ignition ON and wait for around 30 seconds.
- Start the engine.

Battery charge indicator

If the battery charge indicator lights up when the engine is running, the alternator is no longer charging the starter batteries. Determine the cause, for example:

- Loose cable connectors
- Alternator dirty
- Drive belt slipping or broken

Hydraulic fluid level warning light

Occasional flashing on descents is not indicative of a fault.

Telltale light for parking brake

If the indicator lamp lights up, check the parking brake.

What to do in this situation

PistenBully slows down on account of lack of propulsive power

- Reduce the speed of the auxiliary equipment using the potentiometer.

Braking - stopping

The hydrostatic drive brakes the vehicle without causing wear. You reduce engine speed by easing the pressure on the accelerator pedal; engine speed lowers and the change in the hydraulic ratio causes the vehicle to slow down.

The PistenBully will come to a stop if engine speed drops below pull-away speed.

A parking brake (spring-loaded brake) operated by a parking-brake lever in the driver's cab acts on the driving wheels.



WARNING!

Use the parking brake only to keep the vehicle at a standstill.

The PistenBully brakes with full force when the parking brake is engaged during operation.

Stopping after use

- Park the vehicle where it is clearly visible.
- Park the vehicle on a firm, level surface.
- Lower front and rear auxiliary equipment,
 - Switch off the tiller.
 - Direction of travel switch in neutral position.
 - Engage the parking brake.
 - Relieve the tension of the track.
- Set engine idle speed to below 800 rpm.



Turbocharger – risk of overheating!

Do not immediately switch off the diesel engine after it has been run at full load. Drive for approx. 2 minutes in the part-load range and then switch off.

- Switch the engine off.
Turn the ignition key to the **0** position.
- Remove ignition key and lock the cab.

Exiting

- Swivel the steering column and armrest right up.
- Be particularly careful when opening the door if the vehicle is parked on a gradient. The door opens suddenly.
- The procedure for exiting the vehicle is the reverse of the entry procedure.



WARNING!



Risk of slipping on the track when climbing into and out of driver's cab.

Always take a firm grip on the handle in order to step off the track.

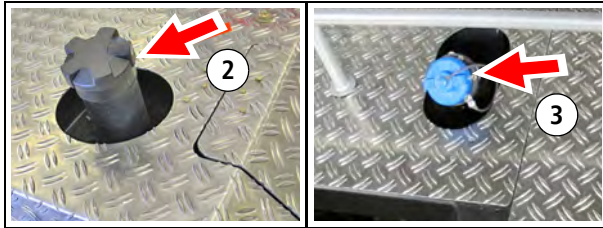


WARNING!



Risk of explosion from gas build-up in the fuel tank!

Keep all possible sources of ignition when clear when the vehicle is being refuelled.



Diesel fuel tank

AdBlue tank

- Immediately on completing the trip, refuel **2** the PistenBully in order to prevent condensate from forming in the tank.
- Then remove as much snow and ice as possible from the tracks, sprockets and wheels to prevent them freezing fast, in order to avoid damage when the machine is restarted.
- Secure raised auxiliary equipment.
- Connect coolant preheating (optional extra).

Filling the AdBlue tank



WARNING!



Risk of chemical burns!

Do not let AdBlue come into contact with your skin.



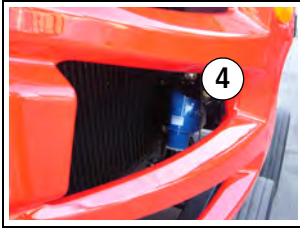
Wear protective gloves, and change any wet clothing.

Do not inhale or swallow fluids or lubricants.

Read the safety instructions in the engine operating manual.

- If **quality defects are indicated**, inform the workshop. If there are incompatible fluids such as diesel fuel, components have to be replaced.
- Use pure AdBlue to DIN 70070.
- Use a plastic container/funnel.
- Use a clean container/funnel. Contamination leads to problems in the SCR system.
- Fill the AdBlue tank **3** (capacity: 40 litres).
- ⓘ The storage temperature is between 0°C and 25°C. The maximum storage duration is one year.

GETTING IN – DRIVING – GETTING OUT



*Parasitic-current
connection*



The **parasitic-current connection 4** 110/220 V allows the coolant system or the hydraulic oil for auxiliary equipment to be heated up by the thermostatically controlled preheating device.

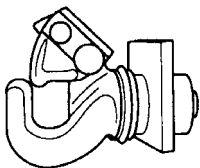


1 - 2 hours of preheating prior to starting does not improve cold starting.

Undertake preheating immediately after parking the vehicle.

- Use only cables that comply with the applicable regulations in the country of use.

Towing away / towing hitch



Towing the PistenBully

- Only trained, qualified persons are permitted to operate the emergency release of the parking brake.
- Towing a PistenBully is an operation requiring comprehensive safety measures. Please contact the nearest service support centre.



Attachment weights, towing hitch

Permissible towed weight

- Max. towed weight 3,000 kg.



Risk of collision between the towed load and the track!
Do not swivel the equipment carrier.



The towed load must be secured to ensure that it cannot skew beyond the maximum permissible off-centre angle on descents or when inclines are crossed.



NOTES

i The section with driving tips and information only provides an overview. It certainly does not provide comprehensive information about the handling of the PistenBully.

i Quantity is not as important as quality and economy.

Low fuel consumption

- **Diesel engine rpm** green zone on rev. counter. Max. torque 1519 Nm at 1500 rpm.
- **Adjust tiller shaft speed** to suit snow conditions by turning **the** potentiometer.
- **Adjust the tiller depth** steplessly using the relevant control and indicator to suit the snow conditions. Set the depth so that the tiller removes only as much snow as is absolutely necessary.
- **Variably adjust the downforce of the tiller comb by means of the joystick and potentiometer. Use the lowest down-force setting** that is compatible with snow conditions

Snow as a medium

Snow forms from water droplets in the atmosphere at temperatures of at least -4°C .

Ice crystals in widely varying shapes form:

Hailstones are snow crystals enlarged by the adhesion of ice; they are usually spherical or tapered in shape.

Hoarfrost or rime forms from water vapour or precipitation on chilled objects (fences, bushes, surface of snow).

White frost develops when the wind carries chilled droplets of water onto solid objects.

Fresh snow initially forms an airy structure of loosely intermeshed snowflakes.

The original shapes soon disappear, however, and the individual flakes are no longer recognisable only a few days after falling.

Over and above these changes, which take place naturally and cannot be influenced (they are caused by wind pressure, freezing and evaporation producing a loss in volume, whereas differences in the temperature of the air trapped close to the ground and the external air tend to produce an increase in volume), it is important to bear the following in mind:

Always work so as to cause as little damage as possible to the snow. The aggressive action of auxiliary equipment such as a tiller damages the snow crystals; these damaged crystals have lost their ability to mesh as a loose blanket, tending instead to ball and form gritty snow (often at entrances to garages, approaches to lifts, bottlenecks).

Preparing fresh-fallen snow

Fresh-fallen/powdery snow consists of crystals that are loosely attached to each other and which therefore trap a great deal of air. The process of preparation inevitably expels some of this air and packs the crystals more tightly together. This gives the surface layer of snow the ability to bear weight.

Bumpy runs

The friction of skis over the surface causes some of the crystals to melt and form a film of water, and this produces sheets of ice and the softer spots beside them.

Over a period of time skiers break down the topmost layer – humps and hollows form and the run becomes bumpy.

Preparing slopes like this is a process in which old snow is mixed with relatively fresh-fallen snow (snow crystals) and this produces a durable surface.

If outdoor temperatures are correspondingly low, the snow freezes and forms lumps. **When this happens, the only way of making a ski run look good is to work with a tiller mounted on the rear of the vehicle.**

The teeth of the tiller break the lumps down into gritty snow, which fills the hollows in the surface of the run; the finisher shapes the surface and a water film forms to hold the grains of gritty snow together. Breaking down the lumpy snow also damages the ice crystals, so they lose a considerable proportion of their ability to cohere. This is the reason why only gritty snow, not powdery snow, can be produced from ice.



A durable ski slope can be formed only by mixing this material with fresh-fallen snow or with unused old snow from deeper levels.

Iced slopes/sheets of ice

Do not break up an iced slope unless the ice is of adequate thickness or fresh snow falls. The gritty snow produced by breaking up the ice needs fresh-fallen snow to cohere, or else it will cohere with water - and this will again cause ice to form. Consequently, it is advisable only to roughen the surface of the ice to make the slope skiable. Sheets of ice on slopes that are otherwise in good condition can be broken up and mixed with crystals from deeper in the snow.



The more frequently the ice is turned and the crystals damaged, the less will be their ability to cohere.

Wet snow/slushy snow

The relatively large amounts of moisture and the formation of a film of water on the finisher can produce a relatively hard surface, which inexperienced skiers in particular find difficult. In order to counteract this effect, Kässbohrer has developed a bolt mechanism for tilting the rear-mounted tiller comb. In combination with special finishers, this machine can change the uniform surface structure and produce a "powdery-snow" effect.

Extremely slushy snow in spring

It is advisable to use the side wings, because the tiller can produce edge walls as it passes through the snow. We also offer an extra-wide side wing for more efficiency when used in combination with the rear frame steering – this also means that the machine can prepare on one side at a time.

If a satisfactory run cannot be prepared in **slushy snow**, it might be advisable to wait two or three hours to allow the temperatures to change. Work on preparing slopes at higher altitudes can proceed in the interim.



Allow the snow to set-up, so that crystals can form.

Climbing ability

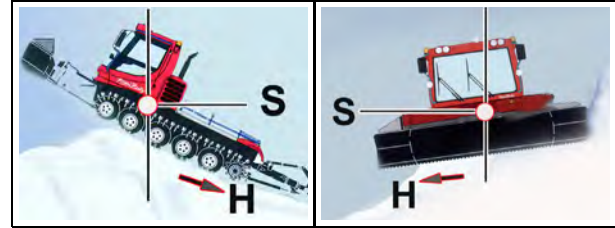
The climbing ability of the PistenBully depends on the limit of adhesion of the snow. The machine's centre of gravity is another factor influencing climbing ability. It is important for the driver to ensure that as much of the surface area of the tracks as possible is in contact with the ground, as otherwise there is a risk of the vehicle toppling. The limits are heavily dependent on the way in which the vehicle is used, on load, on the prevailing conditions, and on the skill and ability of the driver.

S = Centre of gravity

H = Downgrade force



Each situation must be assessed with care. Never assume that it is safe to operate in a certain area at any given time merely because a vehicle was in the area in question beforehand.



Inexperienced drivers, in particular, should familiarise themselves with the vehicle and equipment before undertaking operations in difficult terrain.

Driving with the PistenBully



The basic rule is: Do not use the vehicle until the snow is deep enough to prevent damage to the underlying vegetation.

The objective in preparing a ski-slope is to achieve visually excellent slope quality:

Build up supplies of snow in good time at critical points, so that reserves will be available to make up for the snow removed from the slope.

Holes and snow heaped up by movement and by manoeuvring must be smoothed out with as little delay as possible.

If speed is excessive, the tracks will throw snow out sideways and over the auxiliary equipment onto the prepared surface. Regularly remove snow from the load platform. Otherwise, the increase in weight will result in higher fuel consumption.

Always operate the vehicle within the economical rpm range (marked in green on the revolution counter).

The driving speed is controlled electronically depending on the engine speed.

Driving: uphill

Always study upgrades and look for the easiest route; do not start at the steepest point. Frequently, it is better to detour to the highest point of a slope via an alternative route and then work from the top down to prepare the first part of the run. Whenever possible, negotiate slopes by following the line of fall and by keeping steering movements to a minimum.

Do not overrev the engine: use only as much power as is necessary; note the level of traction. Over revving will cause the tracks to slip, with the result that the vehicle will dig into the snow. If the tracks start to dig in stop immediately and try a different line.



Digging in ruins the ski-slope and destroys the surface beneath the snow.

Turning

In order to avoid damaging the surface of the ski-slope, you must turn at or beyond the edge of the prepared slope. You should, of course, use areas that are free of vegetation (forestry plantations and the like) for this purpose.

- Always keep the front-mounted and rear-mounted auxiliary equipment raised when turning.

Turning with counter-rotating tracks

You can turn the vehicle in its own length by counter-rotating the tracks. This causes the vehicle to dig in to some extent, so you should manoeuvre in this way only when the snow is of adequate depth. It is advisable to employ this method of turning in exceptional situations only. Turning with counter-rotating tracks places very high strains on the rubber belts and the track cleats.

Driving: uphill

Always maintain a moderate speed on downgrades. This precaution will enable you to ensure that the engine does not overrev, the vehicle does not drift out of control, and the snow is not dragged downhill by the action of the tracks. Use the speed potentiometer to reduce the speed of descent.

Restrict your steering movements to a minimum. Make sure that both tracks are turning.

Reduce speed as you crest rises, in order to ensure that you have the vehicle under control as it tips forward. This will prevent the front blade from digging in and the tracks from losing traction.

Invariably, do not negotiate a downgrade unless you are sure that:

- the adhesion of the snow is adequate.
- your run out at the bottom of the slope is adequate and safe.
- there are no skiers in the danger zone.

If the PistenBully starts slipping on a downgrade and drifts at an angle to left or right (vehicle's longitudinal axis drifts off the line of fall), you must immediately apply opposite lock (turning the steering wheel to the right or left, as applicable), counter-rotating the tracks if necessary, in order to bring the vehicle's longitudinal axis back onto the line of fall. Briefly increase engine speed in the process.

You can counteract slippage along the line of fall by reversing the tiller shaft's direction of rotation and carefully employing the front blade to re-stabilise the vehicle.

Preparing the ski-slope

When preparing a slope, always make sure that the side finishers overlap onto the prepared surface, in order to ensure a smooth transition from one pass to the next.

Notes on depth of tiller

The tiller has to be set to the correct depth in order to achieve:

- A visually attractive ski-slope.
- Retain the firmness of the slope's substructure.
- Operate within the most economical range.
- Apply least load to the PistenBully and the tiller.

Effects of incorrectly set tiller depth:

- Tiller shaft depth too high: Tiller quality output is negligible.
- Slope is not contoured in areas of hard snow.
- Tiller shaft depth too low: Insufficient snow processing, so the snow is forced out of the tiller at the side and forms an edge wall.
- The snow crystals' ability to cohere and the quality of the slope's substructure are impaired.

- More power input necessary – less economical.

Counter-rotating tiller shaft:

A PistenBully with electronic tiller control enables you to set the tiller shaft to rotate either forward (standard direction of rotation) or backward.



It can be helpful to have the tiller counter-rotate, for example as an additional brake in very steep terrain.

Errors in operation and counter measures

Summarised countermeasures

Edge walls forming on left and right:

- Speed of shaft rotation too high.
- Tiller depth set too low.
- Downforce setting selected instead of floating setting.
- Cylinder of carrier plate out of adjustment.
- Tiller shafts not rotating.
- Side finishers retracted.

Visual appearance of prepared slope not satisfactory:

- Tiller set too high (depth adjustment).
- Speed of rotation too low.
- Ball handle not locked in position (floating position).
- Vehicle travelling too fast.
- No smooth surface with the front blade (tiller is on a hump).

Vehicle comes almost to a stop:

- Tiller depth too low.
- Speed of shaft rotation too high.
- Cylinder of carrier plate significantly out of adjustment.
- Tiller shafts are counter-rotating.
- Tiller shafts stopped – clogged, jammed, frozen.

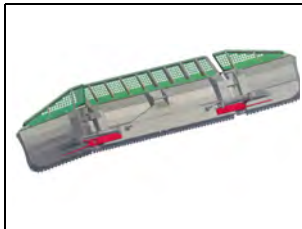
Severe vibrations perceptible in vehicle when the tiller is switched on:

- Shaft imbalanced, tooth missing – have repairs carried out by specialists.
- Frozen with snow – remove.
- Imbalance means vibration – screws work loose, bearings are damaged – have the imbalance rectified.



NOTES

FRONT BLADE



Intended use

- Use of the front blade on steep slopes covered with fresh-fallen snow.
- Smoothing heavily worn ski slopes.
- Smoothing bumpy ski slopes.
- Making a location line.



Material wear due to load!

During pushing work (i.e. when pushing snow with the front blade), fully raise rear carrier plate.

A front blade is essential for modern ski-slope upkeep and preparation. It is ideal for smoothing bumpy runs and pushing snow clear. The front blade is also very useful for working uphill through fresh-fallen snow and it can be used as a brake to prevent the vehicle from slipping. Consequently, it is advisable to leave the front blade installed at all times.

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Smoothing bumpy ski slopes

The best method of smoothing low bumps or waves is to use the front blade in what is known as the "floating" position. This means that the front blade applies only its own weight to the surface, without being pushed downward by the hydraulics.

The blade's angle of attack is set by means of the roll cylinder. Exercise great care when setting the roll cylinder, because if the angle of attack is too steep the front blade will tend to dig into the snow.

Approach large bumps with the blade at approximately half height and the float function switched off, so that the blade will push the snow forward off the bump and into the hollow on the other side. In this case, too, it is best to use the roll cylinder to adjust the depth of cut, instead of raising and lowering the front blade. This is the most dependable way of smoothing out the slope.



The ideal configuration is to have a leader snow roller mounted in front of the blade, as this will enable the equipment to adjust automatically to compensate for surface irregularities.

Overview

Technical
data

Safety

Use

Checks

Operation

Making a location line

It is best here to drive across the slope at the top and create a flat location line with the blade swung out to the side.

It is advisable to start with no more than a small amount of snow, picking up more and more snow as you proceed along the line. This should enable you to complete the full length in a single run.

The snow you push out on the downhill side inevitably widens your location line, increasing the margin of safety.

Use of the front blade on steep slopes covered with fresh-fallen snow

When you prepare fresh-fallen snow you need the front blade not only to push the snow, but also to distribute the weight and apply pressure to the surface of the snow. You can use the front blade to help the vehicle climb steep slopes by stopping just before the PistenBully digs in, and reversing with the front blade lowered. This will smooth out the step. When you approach the slope again with the front blade raised, you get several metres further. This is the way to negotiate difficult slopes.

Smoothing heavily worn ski slopes

One consequence of modern skiing techniques is that the skiers carry the snow progressively further down the slope, finally depositing it toward the bottom of the slope. The objective, therefore, is to restore the snow to as uniform a depth as possible over the entire length of the slope. This entails pushing the snow back up the slope from the bottom. If necessary, winch the PistenBully into position.

Swivel the front blade to an angle at which the snow can slide along it toward the inside. If you are using a 12-way front blade you can set the wings to an angle that best suits this method of handling the snow. The front blade can be adjusted in a number of ways to the position that best suits the terrain. The end result is efficient transportation of the snow to the parts of the slope where it is needed.

Less experienced drivers in particular should bear in mind that transporting large amounts of snow quickly is not always the way to achieve the best results. The driver has to assess the terrain and decide whether it would be advisable to push snow downhill, or whether this might result in even more snow being lost.

A well-prepared slope is free of heaps of snow, does not have walls along the edges, and is contoured so as to be attractive to the eye.



The forks can be damaged if loaded at the side!
The forks must not be used for pushing or lifting work at the side.

ParkBlade

Intended use

- The ParkBlade is designed for constructing and maintaining fun parks and boarder crosses.

The forks can be used to transport fun park obstacles such as the fun box and rails.



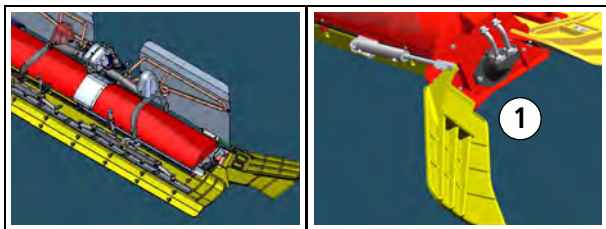
WARNING!

Risk of being crushed!

It can be dangerous when the forks are extended/retracted.

Make sure there is nobody in the danger zone.

ALPINFLEX TILLER



The AlpinFlex tiller has been evolved as an even more versatile and practical snow handler.

It can tilt to angles up to 20°, so it adapts to the natural contours of the terrain.

The two-part tiller features separate three-point mounts that enable each section to follow the contours, so the finished pass resembles a naturally formed slope.

Both tiller shafts are driven by a hydraulic motor, and they are linked with each other by a constant velocity joint shaft in order to ensure the same revolutions and torque in both shafts.

The specially designed tiller shafts and finishers ensure

optimum snow distribution, with the result that the finished run has attractive, end-to-end contouring irrespective of the operating conditions.

Side finishers *(optional)*

The hydraulically operated side finisher **1** makes it easier to overlap the prepared surface and prevents there from being any unevenness in the piste.

Setting the Alpinflex tiller to the rigid position

If you want to produce a flat (not following the contours of the terrain), you can set the Alpinflex tiller to the rigid position.



Tiller in rigid position (FunPark)

Top section pressed: Tiller unlocked

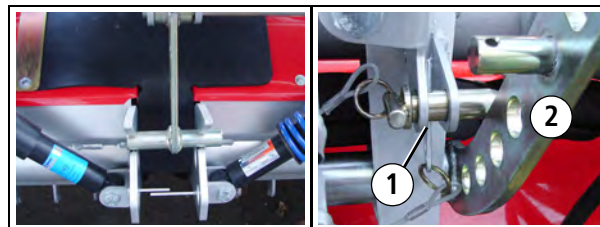
Bottom section pressed: Tiller in rigid position

Hydraulic actuation for "set to rigid" (FunPark)

- Set down the Alpinflex tiller on a firm, level surface.
- Press the **Tiller, set to rigid** button until the hydraulic cylinder is fully extended.

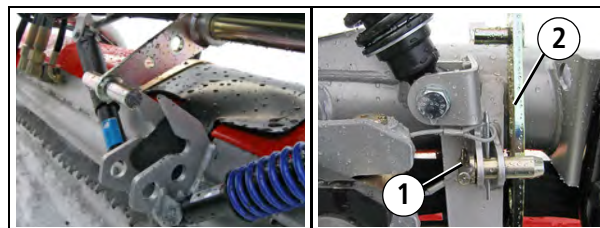
Cancelling "set to rigid" (unlock)

- Set down the Alpinflex tiller on a firm, level surface.
- Press the button until the hydraulic cylinder is fully retracted.



Manual actuation for "set to rigid" (standard)

- Lock **1** and adjusting lever **2** in position.
Secure the lock with the pin.



Cancelling the "set to rigid" function

- Open the lock and put the adjusting lever **2** in position.
Close the lock **1** and secure with the pin.

Snow-flap adjustment for tiller

The snow-flap adjuster enables you to vary the snow path through the tiller by means of buttons.

Snow flap **retracted**:

With the snow flap set to this position when the vehicle is used on an ice-covered slope, for example, chunks of ice will be forced to pass the tiller shaft several times and this will help ensure optimum processing.



Snow-flap adjustment for tiller

Pressed = Extend/retract snow flap

What to do in this situation

Snow flaps extended to different settings?

Remedy: Press and hold down the button for 1 - 2 minutes. The cylinders are equalised.

- When **ascending**, always set the tiller shaft to forward operation and use a suitable working speed until the ski slope has been prepared to specification.



An attempt to operate the tiller at too high a speed will divert too much output power from the engine, with the result that the engine will not be able to develop enough power to propel the PistenBully.

- When **driving downhill** on extremely steep slopes, you can counter-rotate the tiller shaft to stabilise the PistenBully.

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