Operating Manual

PistenBully 600
600 Polar

From WKU 5 826 MA A L 011021

EN

www.pistenbully.com

PistenBully®

KÄSSBOHRER GELÄNDEFAHRZEUG AG
Kässbohrerstraße 11
D-88471 Laupheim

PRINTED IN GERMANY

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YOUR OPINION IS IMPORTANT TO US.

To ensure that your operating manual is optimum in all ways.

Sender:

Phone No.:

Fax:

To:

Kässbohrer Geländefahrzeug AG

Kässbohrerstraße 11

D-88471 Laupheim

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Quality of translation:

☐ Correctly translated

☐ Mistakes in translation

Comments:

Graphics and photos:

☐ Provide good explanations

☐ More explanatory diagrams required

Comments:

☐ A CD-ROM would be good!

Introduction to the Operating Manual

This operating manual provides information about:

- 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 oddments tray 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!

Direct and imminent danger threatening life and limb unless appropriate precautions are taken.

WARNING!

Potentially highly dangerous situation!
Danger to life and limb unless appropriate precautions are taken.

CAUTION!

Dangerous situation!
Could lead to injury unless appropriate precautions are taken

Important notes!
Possibility of damage to the machine or its immediate surroundings.

This symbol draws attention to practical tips

TECHNICAL CUSTOMER SERVICE AND SPARE PARTS DEPARTMENT

Service worldwide		**Phone, office**
Director of Service (GS)	Mr. Mayer	+49(0)7392/900-101

Technical customer service (TKD)

Head of department TKD	Mr. Strähle	+49(0)7392/900-103
Area Manager TKD	Mr. Kirsamer	+49(0)7392/900-137
Area Manager TKD	Mr. Braun	+49(0)7392/900-105
Area Manager TKD	Mr. Arbogast	+49(0)7392/900-118
Area Manager TKD	Mr. Bohnet	+49(0)7392/900-116
Area Manager TKD	Mr. Dehm	+49(0)7392/900-117
		Fax +49(0)7392/900-100

24 hour emergency service number: Phone +49 171/7124096

Spare Parts department (ETV)

Director, ETV,	Mr. Heim	+49(0)7392/900-107	Fax	+49(0)7392/900-130

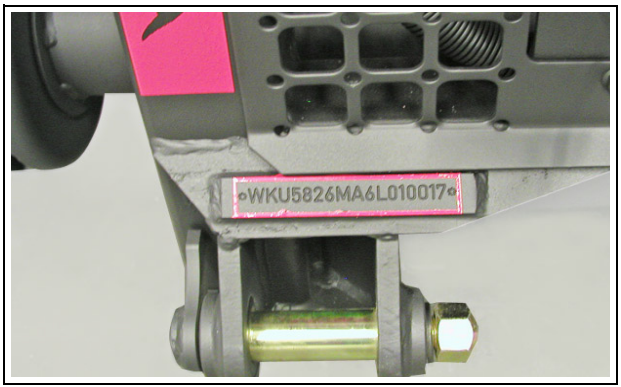
Spare parts distribution (ETV) emergency number: Phone +49 171/3732230

Contact at my national office:

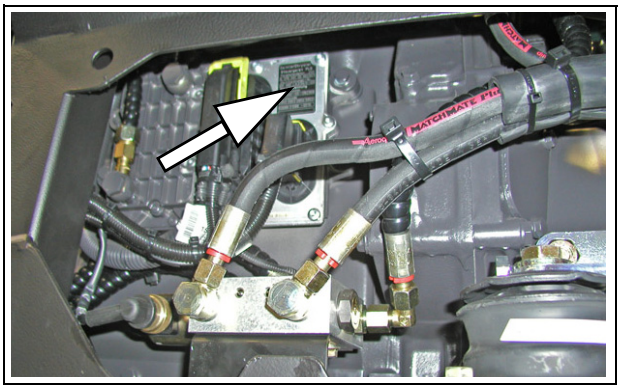
Technical customer service	Name:.....	Telephone number:.....
Spare parts department	Name:.....	Telephone number:.....
Repair mechanic	Name:.....	Telephone number:.....

❍ Always quote the vehicle number when making enquiries and ordering spare parts.
The deployment of service mechanics is controlled centrally by TKD (Technical Service).

VEHICLE AND ENGINE NUMBERS



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



The engine number is stamped on the engine type plate.

This operating manual is for the vehicle
Please insert the appropriate entries

WKU.....

Use of genuine spare parts

In your own interests, please note the following:

We recommend the use of genuine spare parts from Kässbohrer Geländefahrzeug AG and parts for conversion and accessories expressly approved for your type of vehicle. These parts have been subjected to a special test procedure and they have been proven to be reliable, safe and suitable for Kässbohrer off-road vehicles. Despite continuous observation of the market, we are unable to assess these aspects of other products – even products that have been scrutinised by a technical inspector or for which an official approval has been issued – and consequently, we refuse to accept liability for them.

Genuine parts and approved accessories and parts for conversion are available from your Kässbohrer Geländefahrzeug AG service centre. The experts there will provide in-depth advice – including advice on permissible technical modifications – and install the components using the correct procedures.

The use of parts other than genuine spare parts voids your guarantee. We refuse to accept liability for consequential damage resulting from such use.

Kässbohrer Geländefahrzeug AG

TECHNICAL DATA

Dimensions:

Width:	
without tracks	2500 mm
across aluminium tracks	4206 mm
across steel tracks	4206 mm
across AlpinFlex tiller	5500 mm
Height	2,880 mm
Height with cab tilted	3,360 mm
Length	
With tiller and front blade	9,130 mm
Load area	2250 x 1920 mm

Weight:	
Dead weight with aluminium tracks	8,045 kg
Dead weight with steel tracks	8,685 kg
Permissible total weight including auxiliary equipment	12,500 kg
Payload of load area without auxiliary equipment.	1500 kg

Engine:	
Type ... Mercedes Benz	OM 460 LA
Number of cylinders	6
Displacement	12,820 cc
Output, ECE rating ... 295 kW	(400 ECE-HP)
600 Polar ... ECE 360 kW	(490 ECE-HP)
Max. torque ... 1900 Nm / 1300	rpm
600 Polar ... 2200 Nm / 1300	rpm
Oil capacity with filter	42 l
Fuel consumption from	20 l/h
Tank capacity	220 l
Exhaust-emissions standard	EUROMOT III

Brakes:

Wear-free (hydrostatic)

2 multi-plate brakes

Electrical:	
Light-current circuit	24 volts
Generator	28V / 140A
Batteries	2 x 12V / 135 Ah
Cold-start power	600 A
Operating parameters:	
Continuously variable speed	0 - 23 km/h
Spec. ground pressure with aluminium tracks	0.051 kg/cm^2
Spec. ground pressure with steel tracks	0.053 kg/cm^2
Production rate with tiller	96,000 m^2/h
Garage: Suggested garage dimensions	
Length	11,000 mm
Width	6000 mm
Height	3500 mm

Sound power level and vibrations Per EN 15059	
Measured at rated engine speed and maximum fan speed	
Sound pressure level at operator's work-place	79 dB(A)
Radiated sound power level	114 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
Mercedes Benz engine OM 460 LA	MB sheet 228.5 / SAE 10W40 / 5W40 MB sheet 228.51 / + Diesel particulate filter	39.6 litres	at least: every year every 600 hours
MB sheet: www.bevo.mercedes-benz.com	MB sheet 228.3 MB sheet 228.31 / + Diesel particulate filter		at least: every year every 400 hours.
	If an engine oil of a different grade is used for topping up, the maintenance interval is the interval for the lower-grade oil.		
Fuel tank	Diesel fuel to MB sheet 131.0, 132.1, 132.3, 137.0/137.1	220 litres	at least: every year drain condensation.
Fuel filter			every 800 hours
Air filter			at least: every year every 1200 hours
Cooling / heating system	50% drinking water + 50% antifreeze (MB sheet 325.0)	36 litres	at least: every 3 years every 3600 hours
Transfer box	**Poly Alpha Oleofin (PAO)** - CLP HC VG 150 / 220 ISO VG 220 (for summer operation) - API GL4, SAE 75 W 90 (PAO)	2.4 litres	at least: every year every 800 hours at 100 hours (new vehicle)
Wheel drive (planetary gears)	**Poly Alpha Oleofin (PAO)** ISO VG see rating plate	see rating plate	at least: every year every 600 hours at 100 hours (new vehicle)

TABLE OF FLUIDS AND LUBRICANTS

Designation	Grade	Capacity	Interval between changes
Hydraulics Propulsion unit + auxiliary driven machinery see section on hydraulic fluid	HVLP DIN 51524 DEXRON II D / III F ATF Type A suffix A < -30^{0}C -AVIA Synthofluid PE-B 30 (PAO)	47 l tank 100 l total	at least: every year every 1200 hours
Hydraulic oil filter			at 100 hours every 1200 hours
Hydrostatic vehicle drive see section on greases	OKS 250		
Lubricate wheel hubs and swinging arms Greasing	Calcium-saponified grease KP2K-30, DIN 51502 e.g. Aviacal 2 LD		every 400 hours
Other lubrication points see section on greases	Calcium-saponified grease KP2K-30, DIN 51502 e.g. Aviacal 2 LD		every 100 hours
Radius-arm seal	Syntogrease 1 KPE 1K-40, DIN 51502 DIN 51825		at least: after 3 years every 3600 hours
Tillers, spiral-bevel coupling	Avialith 2 F OKS 400 / Molykote BR 2		every 1200 hours
Electrical system Battery terminals	Bosch FT 40V1 grease		
Generator with Stauffer grease cup	Bosch FT 1V34 grease		every 1200 hours
Servo adjustment device for Moog valves	Insulating oil DIN 57370 / VDE 0370		

NOTES

Intended use:

Snow groomers may be operated only as specified in the manufacturer's operating manual.

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

* Preparing slopes for downhill skiing.
* Removing snow from paths.
* Removing snow from parking areas in non-public terrain.
* Vehicular-access routes off-road
* Preparing trails for Nordic skiing.
* Transporting people in the special people-carrier cabin (optional extra).

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

DRIVER

- 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 fulfil the tasks assigned to them.

In particular, they must satisfy the following:

- be at least 18 years old or of the minimum legal age required by national law.
- be physically and mentally suitable.
- be trained in how to drive the snow groomer and have proven their driving ability to the operator.
- be familiar with snow conditions and with the peculiarities of operating equipment in facilities for skiers.
- 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.
- if avalanches pose a threat in the area where snow groomers are to be used, in addition to the aforementioned conditions, drivers must also be instructed about how avalanches are started, the consequences of them and how to behave when there is a risk of avalanches.
- In order to help ensure safe operation, operators must wear appropriate footwear with non-slip soles.

DANGER ZONE FOR PERSONS

- No-one is permitted to enter the snow groomer's immediate danger zone.
- The driver may only operate and drive the snow groomer provided that there is no-one 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.

ENTERING

- 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 on to the track.
  Danger of slipping on the track when entering and exiting 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.
- Fasten the seat belt.
- In order to enter or exit a people-carrier cabin, extend and secure the access ladder.

DRIVING

- Do not leave the vehicle unattended with the diesel engine running.
- Risk of poisoning from exhaust gases.
  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.
- The driver may start and/or move the snow groomer only when seated in the driver's seat, after fastening the seat belt .
- 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 may drive the snow groomer only at a speed at which they main-

tain control at all times. They must adapt the speed to the snow, terrain and visibility conditions and to the characteristics of the snow groomer, with due allowance for the auxiliary equipment fitted.

- Drivers must always restrict the vehicle to a speed at which they can stop within the distance visible. This does not apply to steep slopes where the vehicle cannot be stopped as a result of the angle of the terrain. Drivers may drive on such steep slopes only when certain that they can do so without putting themselves and others at risk.
- Close the doors.
  Failure to comply with this precaution will result in a risk of accident due to doors slamming closed.
- Switch on the rotating beacon
- When driving past people, slow down, keep at a safe distance and always bear in mind that the people may behave unexpectedly.
- Always come to a complete stop before reversing the vehicle.
  Make sure that the area behind the machine is clear.
  The assistance of a second person to give directions is necessary if visibility is poor.
- Avoid crossing slopes at an angle because the PistenBully may slip downhill.
- When a tracked vehicle is being driven, the traction is so great that the vehicle may be driven well beyond the point at which it should start to tilt; if this happens the vehicle might then suddenly tip over.
- Risk of interference with the electronics
  Do not place an active two-way radio device on the console on the terminal.
- Use the parking brake only to keep the vehicle at a standstill.
  The PistenBully will brake sharply to a complete stop if the parking brake is applied while the vehicle is in motion.
- Driving with restraint:
  Reversing with direction-of-travel indicator showing forward
  If the PistenBully comes to a complete stop and the driver turns the drive potentiometer to a scale reading from 0 to -3 and presses the accelerator, the PistenBully will start to move backward. The steering is reversed.

STOPPING / EXITING

- ❍ Park the vehicle where it is clearly visible.
- ❍ Do not apply the parking brake until the vehicle has come to a complete stop.
- ❍ 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.
- ❍ Risk of poisoning from exhaust gases.
  Do not leave the engine running unattended or running in an enclosed space.
- ❍ Lower the front and rear auxiliary driven implements, switch off the tiller, set the direction of travel switch to "neutral".
- ❍ Before exiting the driver's cab
- ❇ Apply the parking brake
- ❇ Switch off the engine
- ❇ Remove the ignition key from the lock.
- ❍ Fully raise the steering-wheel column and the left armrest.
- ❍ Step on to the track.
  Danger of slipping on the track when entering and exiting the driver's cab. Always take a firm grip on the grab handle at the driver's door when exiting the vehicle.
- ❍ Lock the driver's cab.

TERRAIN

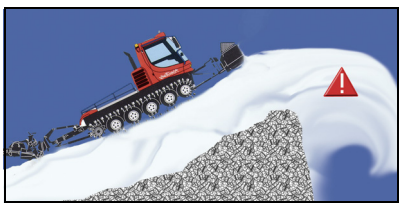
❍ Before using the snow groomer, check that the intended terrain is drivable.

➤ Never attempt right-angle crossover across a public road without first obtaining the permission of the appropriate authority.
Angled or staggered crossover across public roads is permissible when in accordance with an approved routing plan.

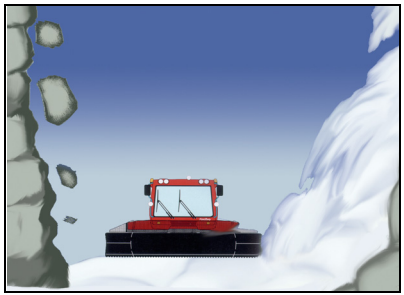
Risk of break-through

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

Snowdrifts



Avalanches
Rockfalls



❍ The driver must be accompanied by a co-driver when driving in areas where the vehicle cannot be seen and when the weather is bad, unless several vehicles are working together as a team. This does not apply if the driver uses a two-way radio to remain in constant contact with someone at the base who can send out a rescue team should an accident occur.

- When using snow groomers at night-time, handheld searchlights must also be used.

DRIVING WITH PASSENGERS

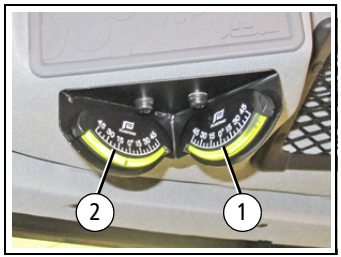
- Only 1 co-driver may sit in the driver's cab.
- From WKU 010800 onward a child's seat is installed. The child's seat can be occupied by only 1 person and is designed for an occupant of a maximum height of 150 cm.
- The co-driver must be seated in the co-driver's seat at all times when the vehicle is in motion.
- When persons travel in the people carrier cabin (optional extra), they must sit in their seats with their safety belts correctly fastened, and hold tight. See also the operating manual for the people-carrier cabin.
- **Do not drive the vehicle with people on:**
  - the load area
  - the auxiliary equipment
  - externally mounted machinery.

Auxiliary equipment, rear deck railing (optional)

Correct usage

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

- The country-specific regulations must be observe for the transport of people.
- At the beginning of travel, everyone must stand and have a firm grip on the open rear deck railing.
- If the inclinometer indicates more than 30^0 degrees in the longitudinal direction **1** or more than 25^0 degrees in the lateral direction **2**, the operator must refrain from driving any further on the steep terrain for safety reasons when carrying passengers.



Inclinometer

- The rear deck railing 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 railing, hold onto the load platform railing.
- Risk of injury by crushing action!
  When lowering the rear deck railing.

Close the rear deck railing 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 dropping.
- Snow groomers and raised equipment must be secured before maintenance work is started to prevent them from accidentally moving.
- Markings, warning signs and information plates on the PistenBully and auxiliary equipment must not be removed or covered over or made illegible in any other way.
- Compliance with the manufacturer's maintenance instructions is mandatory.
- Faults which could affect safety levels must be rectified immediately.
- Repair welding is an operation that invariably requires extensive safety measures. Please consult your nearest Support Centre.
- Risk of cable fire and short-circuit. Never attempt to jumper or repair fuses or insert replacement fuses with a higher ampere rating than the originals.
- Do not permit fluids or lubricants to come into contact with the skin (wear protective gloves, change wetted clothing).
  Do not inhale or swallow fluids or lubricants (risk of poisoning).
- **Topping up coolant level**.
  Risk of scalding
  The coolant system is pressurised.
  Remedy: Wear protective gloves
- **Tilting the load platform**.
  Risk of injury by crushing:
  If hydraulic pressure is lost the load platform will move downward.
  Secure the support to ensure that the assembly cannot move downward of its own accord.
- **Halogen/xenon light**
  Bright light can injury the eyes. Do not look directly into the bright light.
- ❇ Health hazard due to gas.
  If a xenon bulb breaks in an enclosed space, leave immediately and ventilate the room for at least 20 minutes before re-entering.

❍ **Battery**
Risk of explosion of oxyhydrogen gas
Keep all sources of ignition well away from the battery.

✻ Do not place metal objects on the battery.

✻ Take care when handling battery acid: risk of caustic burns.
Wear protective goggles and protective gloves.

❍ Connect the battery clamps to the battery posts. Make sure that polarity is not reversed.

❍ Do not make a connection between the cable clamps.

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

❍ A mistake in the jump-starting procedure could result in fatality or severe burns due to electric shock.

✻ Do not make a connection between the cable clamps.

✻ Do not connect the jump-start leads to the connections between the two batteries.

MONITORING

❍ Before starting off, the driver must check operation of the safety-relevant components, e.g.:

✻ by testing the brakes.

✻ by switching on the lights.

✻ by function-testing the warning systems.

✻ by checking the controls of the working machinery.

❍ Do not permit fluids or lubricants to come into contact with the skin (wear protective gloves, change wetted clothing).

✻ Do not inhale or swallow fluids or lubricants (risk of poisoning).

❍ Risk of explosion due to build-up of gas in fuel tank.
Keep all possible sources of ignition well clear when the vehicle is being refuelled.

❍ Risk of injury by cutting or crushing action.
At all moving parts.

❍ When the engine is running, keep well clear of rotating parts.

❍ If radios are required to ensure 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 defects to the supervisor and, on vehicle handover, to the replacement driver.

❍ In the event of damage, defects or changes that endanger operational safety, the driver must immediately cease operation of the vehicle.

❍ 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.

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

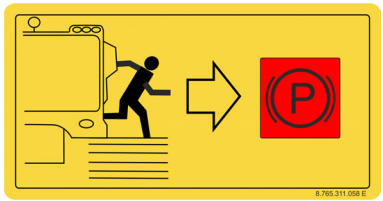
The fire extinguisher is stowed beside the driver's seat.

- Note expiration date.
  Replace used fire extinguishers immediately.

WARNING SIGNS

- Strict compliance with the warning signs on the PistenBully and on auxiliary driven implements is mandatory.
- Make sure that warning signs that are damaged or come loose are replaced immediately.

WARNING SIGN



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

Text:
Attention:
Apply the parking brake before leaving the cockpit.

WARNING SIGN

Location: **Diesel engine**
No. 8.312.085.064

Text:
WARNING!
Do not use start-assist fluids or ether to start the diesel engine (risk of explosion).

WARNING SIGN

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

Text:
Attention:
The fan ring rotates when the diesel engine is running.

SIGN

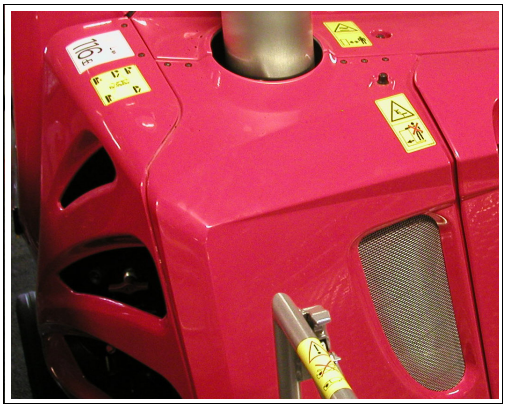
Location: **Driver's cab**
No. 8.762.642.000E

Text:
Read operating manual and safety instructions before startup and comply with both at all times.

SIGN

Location: **Rear bulkhead, driver's cab**

Text:
Child's seat for one occupant up to maximum size of 150 cm.



Sign (No. 8.766.017.000 E)

Text:

Figure representing sound power level.

Sign (No. 8.766.017.000 E)

Text:

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

Warning sign (No. 814.76.00.111.05E)

Text:

Risk of burns caused by the exhaust muffler. Keep clear of hot surfaces.

Sign (No. 8.762.658.000 E)

Text:

Risk of falling.
No-one is permitted to ride on the load platform.

Sign (No. 8.762.750.000 E)

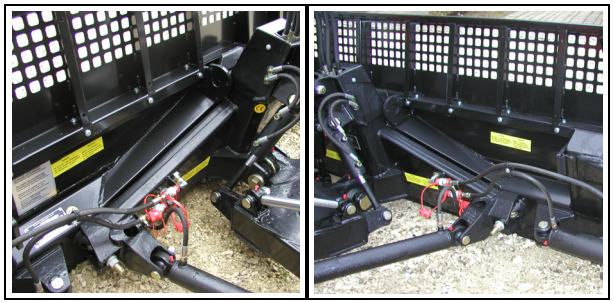
Text:

Danger of falling! No transport of people on the load platform. Opened rear deck railing is for the transport of materials and people.

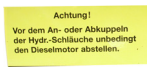
Warning sign

Text:

Rear deck railing open.
Make sure that safety catch of locking lever is engaged.



Warning signs, front blade



Warning sign (No. 8.762.271.053C)

Text:

Attention:
Before connecting or disconnecting the hydraulic hoses, it is essential to shut down the diesel engine.

Warning sign

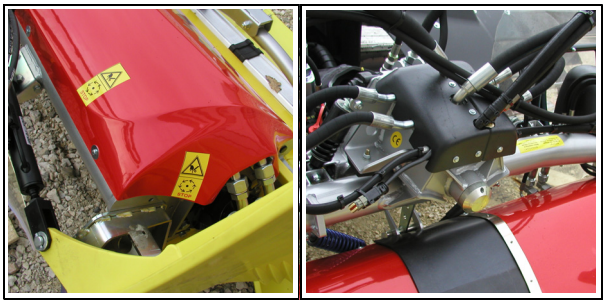
Text:

High-grade, fine-grained structural steel.
Always ensure that welding and straightening work is carried out in strict compliance with the workshop information.

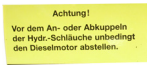
Warning sign (No. 8.762.660.000 E)

Text:

WARNING!
Do not reach into crushing zone while parts there may be moving.



Warning signs, tiller



Warning sign (No. 8.762.271.053C)

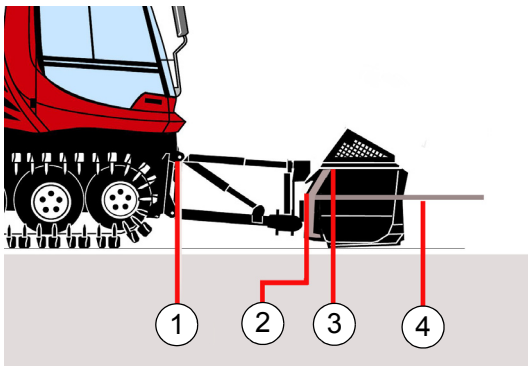
Text:

Attention:
Before connecting or disconnecting the hydraulic hoses, it is essential to shut down the diesel engine.

Warning sign (No. 8.762.660.000 E)

Text:

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



Attachment weights

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

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

2 = Hook plane, quick-change system

3 = End face, front blade centre

4 = Fork, length 400 mm (Park-Blade)

Attachment at pivot point, main frame (1)

❄ Maximum long-term attachment weight 1650 kg.

Attachment at hook plane quick-change system (2)

❄ Maximum long-term attachment weight 1315 kg.

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

❊ Maximum long-term attachment weight
665 kg.

❊ Maximum short-term attachment weight 1100 kg.

Attachment to fork (4), length 400 mm

❊ Maximum short-term attachment weight 1000 kg.

Note: The attachment of excessively heavy weights and machinery with excessively high attachment moments voids the vehicle manufacturer's warranty and excludes liability on the part of the vehicle manufacturer.
The only exceptions to this rule are those items of auxiliary driven machinery for which the vehicle manufacturer has issued approval.

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

❍ 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 suitably low speed only.

❍ The high moment of the attachment restricts the manoeuvrability of the vehicle.

❍ Risk of toppling.
Check the terrain and make sure it is suitable for driving.

❍ The load must not unduly obscure 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 injury by crushing:
when extending / retracting the forks.
Make sure there is no-one in the danger zone.

❍ The transport of persons 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 pivoted all the way out.

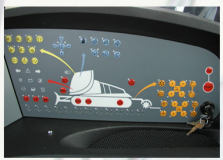
❍ Alterations to the forks are prohibited.

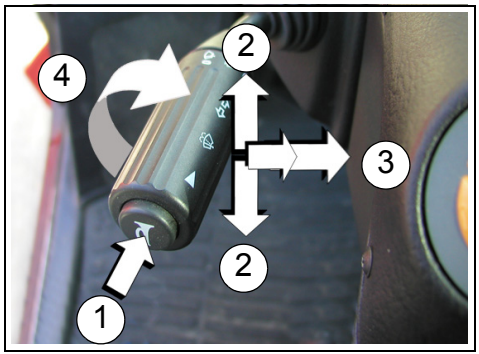
❍ Do not use the forks for pushing or lifting work that involves applying lateral load.

❍ The load must be suitable for lifting with the forks.

❍ Make sure that the weight of the load is evenly distributed across both forks.

NOTES





Multifunction switch

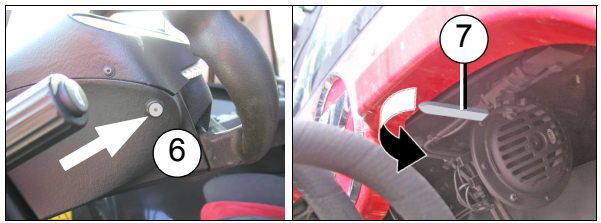
1 Horn
Press button

2 Turn indicators
Self-cancelling: Pus the control stalk past the point of resistance until it engages.

3 High beams and low beams
High beams = Push stalk to right until it locks in position.
Low beams = Push stalk to right again until it locks in position.

4 Wipers
Turn control stalk sleeve:
Stage II = Fast wipe
Stage I = Normal speed
Stage 0 = Off

Intermittent-wipe setting: see the section on Touchscreen - Overview of settings.



6 Pushbutton for wipers

Press to have front wipers execute a single stroke.

Intermittent-wipe setting:

- Switch on the front windscreen wipers.
Indicator for intermittent wipe flashes *(see arrow).*
- Press pushbutton **6**.
The time between wipes increases.
(see "Touchscreen")
Press again: time between wipes decreases.

To save the intermittent-wipe setting:

- Hold down pushbutton **6** for more than 2 seconds.

(See "General setting" in customer's workshop information).

7 Heated windscreen wipers

Swivel stalk **7** in the direction indicated by the arrow.

8 Parking brake

WARNING!

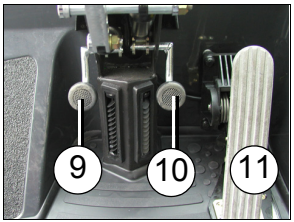
Use the parking brake only to keep the vehicle at a standstill.
The PistenBully will brake sharply to a complete stop if the parking brake is applied while the vehicle is in motion.

- Always apply the parking brake before you park or exit the vehicle. Warning buzzer sounds: Brake not applied and door open!

Applying parking brake:

- Only when the PistenBully is at a complete standstill Move the lever in the direction indicated by the arrow.

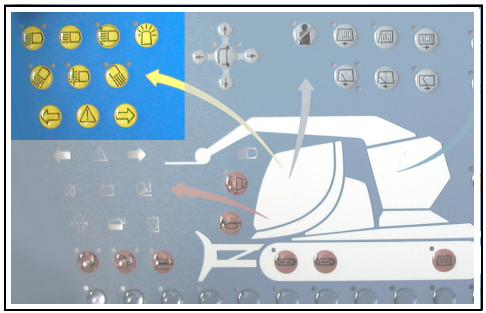
When the parking brake is engaged, the direction-of-travel switch automatically goes to the neutral position.



9 Lock for steering-column adjustment Height adjustment

10 Lock for steering-column adjustment Fore-and-aft adjustment

11 Accelerator



Instrument panel (panel)

Note: Pushbuttons
When the circuit is active, the indicator on the left lights up *(see arrow)*.
2-stage switch left and right indicators light up.
Pressed again = Switch off

Parking lights / driving lights
Pressed once = Parking light
Pressed again = Low-beam headlights

High-beam headlights

Spotlight

Rotating beacon

Front worklights
Pressed once = Xenon lights
Pressed again = Xenon lights / side finders
See the section on xenon lights

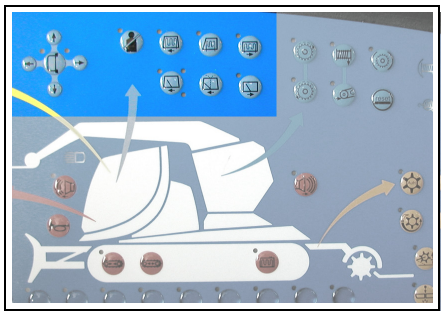
Foglights
(see the section on xenon lights)

Rear worklights
Pressed again = Twin lights

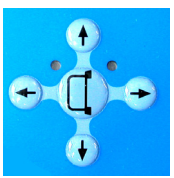
Flashing turn indicators, left

Hazard warning flashers

Flashing turn indicators, right



Pushbutton



Outside-mirror adjuster

Release seat-belt lock, cockpit

If the indicator lights up, the belt monitor is OFF!

Windscreen heating

❍ Clear thick coating of ice or snow from the screen by hand before switching on the windscreen heater. *See customer's workshop information*

Side-window heater and outside-mirror heater

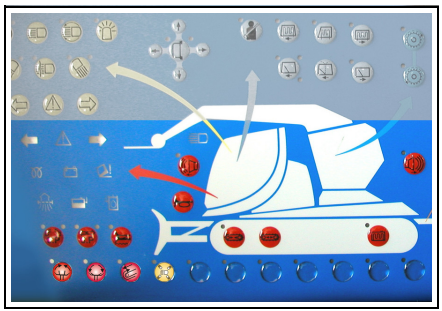
Rear window heater

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.

Windscreen wipers, front
Intermittent wipe / speed 1 / speed 2
Intermittent-wipe setting: see the section on the pushbutton for single-stroke wiping)

Press to have front wipers execute a single stroke.

Windscreen wipers, rear
Intermittent wipe / speed 1. *Intermittent-wipe setting: see the section on the steering wheel*



Tiller forward operation / counter-rotating
Indicator right ON = Forward operation
Indicator left ON = Counter-rotating

Drive hydraulics for auxiliary driven machinery
front / rear
Indicator right ON = Rear
Indicator left ON = Front

Floating position, front equipment carrier

Extra acoustic warning
(optional equipment)

Acoustic warning

Horn

Tension tracks

Relieve track tension

Before relieving the tension on the tracks, park the vehicle on level ground and secure it so that it cannot roll away. Apply the parking brake.
If the PistenBully is to be out of use for a prolonged period of time, always relieve the tension on the tracks to prevent stretching the track stringers.

Fuel preheating
(Optional equipment)

ParkBlade (*FunPark*)
Pushbutton pressed = Extend
see the section on the front blade and safety instructions for fount-mounted weights

ParkBlade (*FunPark*)
Pushbutton pressed = Retract

Restraint
Activate restraint:
- for slow downhill grooming.
- if the load carried combined with a steep downhill gradient prevent the PistenBully from coming to a standstill.
Restraint by means of propulsion-speed potentiometer settings 0 to -3.

WARNING!

Reversing with direction-of-travel indicator showing forward!
If the PistenBully comes to a complete stop and the driver turns the drive potentiometer to a scale reading from 0 to -3 and presses the accelerator, the PistenBully will start to move backward. The steering is reversed.

❍ Change the direction of travel only by using the direction-of-travel switch.

One-touch lights control ON
Save light-switch settings:
- Press pushbutton
- Use the pushbuttons to switch on the lights of your choice.
- Press pushbutton again (setting is saved).
The next time the diesel engine is restarted, all the lights activated when the setting was saved come on again as soon as the pushbutton is pressed.

Nordic-trail tracker plates
Function toggle:
- Press pushbutton
- green indicator lights up
- **tracker-plate adjustment active**.
- Press pushbutton again
- indicator goes out
- **lift/lower tracker plates is active**
- see the section on the Nordic-trail tracker plates for more information

Active winch
ON / OFF
See the operating instructions for the drum winch.

Warning symbols

Left / right turn indicator repeater
Indicator for hazard warning flashers ON

Intake air preheating ON

Battery charge indicator

❍ If the indicator light comes on while the vehicle is on the move:
- Cease operations
- Ascertain the cause of the problem.

Situational help!
The indicator light comes on when the engine is idling.
Use the accelerator pedal to increase engine speed briefly. The indicator light goes out and the battery is being charged.

Driver's cab tilt-locking device not engaged.

Air-filter monitor

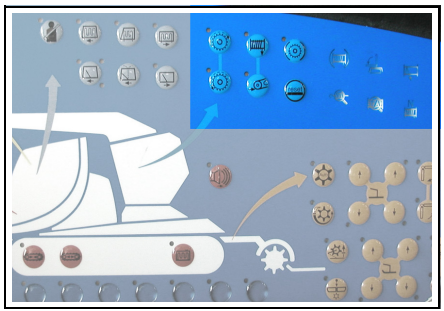
❍ Check / replace air filter

Coolant below the minimum level

❍ If the indicator light comes on while the vehicle is on the move:
- Cease operations
- Ascertain the cause of the problem.

Hydraulic fluid is below the minimum level
- Cease operations
- Ascertain the cause of the problem.

High-beam headlights ON



Pushbutton, drum winch

Note: Pushbuttons
When the circuit is active, the indicator on the left lights up *(see arrow)*.

Turret-gear parking brake
Pressed = Apply brake
Indicator lights up
Warning buzzer sounds intermittently if winch is in operation.
Pressed again = Release brake

Unreel winch cable / winch operation
Top section pressed and held down for at least 2 sec. = Unreel winch cable.
Pressed again = Neutral position

Bottom section pressed = Winch operation ON
Pressed again = Neutral position

Swivel winch boom

Top section pressed and held down = Swivel right

Bottom section pressed and held down = Swivel left

Reset acoustic warning, strand monitor

Active winch

See the operating instructions for the drum winch.

Warning symbols drum winch

Slewing-gear holding brake applied

Winch-boom warning indicator
- Winch boom not locked

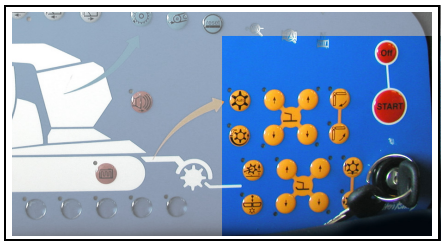
Cable-winder warning indicator
- Maximum usable cable length reached
- Fault in winch-cable winding onto drum.

Winch-cable strand monitor
- Winch cable defective

❍ - Cease operation
- Ascertain the cause of the problem.

The winch-cable strand monitor is not a substitute for visual inspection of the winch cable.

Electronic pulling-force control is OFF
Manual pulling-force control by potentiometer for winch pulling force is ON.



Tiller pushbutton *see the section on the AlpinFlex tiller*

Tiller emergency mode / automatic operation
Switch on emergency tiller control for:
- Attaching / removing tiller
- Raising tiller
- Automatic tiller control fault message

Activating emergency tiller control

❍ Use the joystick and shuttle to operate the tiller. *See the section on the terminal*

Risk of tiller colliding with winch arm. In emergency mode, upward movement of tiller is not restricted.

Note that the depth of the tiller is shown on the display even in emergency mode.

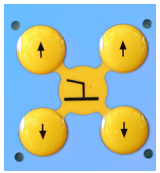
Tiller-boost function
Increased tiller speed max.1600 rpm
See terminal touch fields

Snow-flap position for tiller
Top section pressed = Reduce tiller snow-flap depth

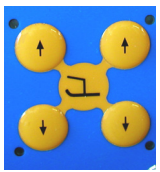
Bottom section pressed = Increase tiller snow-flap depth

Auxiliary driven machinery at rear lifts automatically for reversing
(see the section entitled "Rear-mounted auxiliary driven machinery")

Tiller in rigid position
(FunPark only)



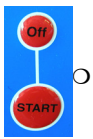
Extend / retract side finishers
Pushbutton, left = Left finisher
Top section pressed and held down = Retract
Bottom section pressed and held down = Extend
Pushbutton, right = Right finisher
Indicators also light up if finishers are controlled by joystick.



Raise / lower tracker plates
Pushbutton, left = Left tracker plate
Top section pressed = Raise
Bottom section pressed = Lower
Pushbutton, right = Right tracker plate

Adjusting tiller depth
Top section pressed and held down = Raise tiller
Bottom section pressed and held down = Lower tiller

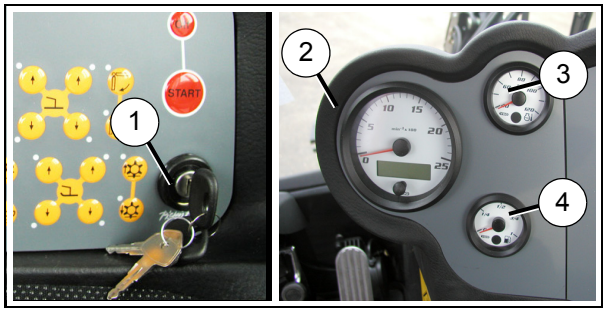
Tiller depth shown on terminal



Diesel engine ON / OFF

○ Ignition key in the 'ready for operation' position.

START = Start the diesel engine
Off = Diesel engine OFF



1 Ignition lock

0 Insert or remove ignition key / shut down engine

I Ready for operation / ignition ON
To start the engine: Press the START button

2 Revolution counter / operating hours

Display: Oil pressure, turbocharger pressure, oil temperature, battery voltage, engine load

3 Coolant temperature, diesel engine

4 Diesel fuel gauge

Steering wheel

5 STOP button

The PistenBully does not have a separate service brake for stopping, it has only 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 sharply to a complete stop.

❍ Hit the STOP switch in the event of sudden danger.

The PistenBully comes to an immediate stop and will not answer to the steering.

❍ Immediately apply the parking brake.

❍ Set the direction switch to the neutral position.

Resuming operation after a stop

❍ Press STOP button **5** and hold it down for at least 5 seconds.

The PistenBully is again ready for operation.

❍ If you switch the diesel engine OFF it is not necessary to press the STOP button again to restart.

6 Display

- Parking brake applied
- Winch ON / OFF
- Alarm indicators: Cable-winder monitor, cable length, strand monitor
- Track tension relieved

Press to have rear wipers execute a single stroke.

Intermittent-wipe setting:

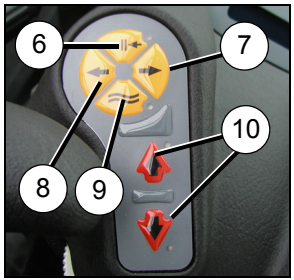
- Switch on the rear windscreen wipers.
Intermittent-wipe indicator light flashes.
- Press pushbutton **W** *see illustration*
The time between wipes increases.
(see "Touchscreen").
Press again: time between wipes decreases.

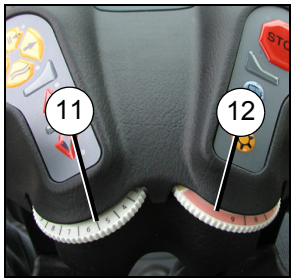
To save the intermittent-wipe setting:

- Hold down pushbutton **W** for more than 2 seconds.

Tiller 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 pushbutton again in order to reactivate the tiller.





6 Keep rear equipment carrier horizontal.

7 Swivel rear equipment carrier horizontally to the right.

8 Swivel rear equipment carrier horizontally to the left.

9 Rear equipment carrier horizontal, in floating position.

10 Direction-of-travel pushbutton

Top section pressed = Forward

Neutral position = Press again

Bottom section pressed = Reversing (with reversing alarm)

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

❍ Use the accelerator pedal to increase engine speed / driving speed.
The PistenBully moves off.

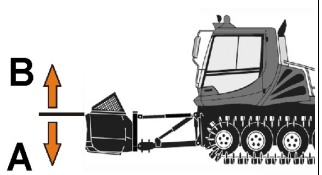
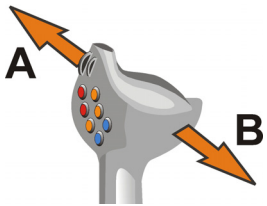
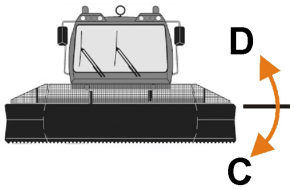
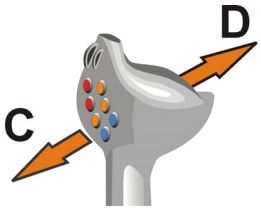
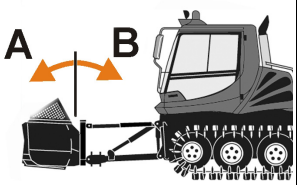
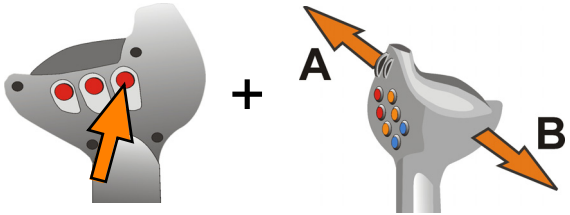
11 Knurled knob for driving speed

The speed at which the vehicle travels depends on engine rpm, on the setting of the potentiometer, and on 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 potentiometer.
See the section on the button for the restraint function for additional information

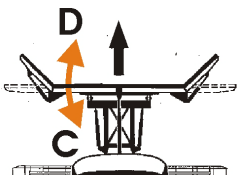
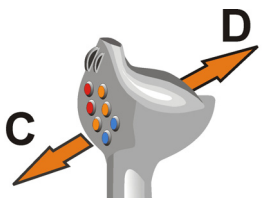
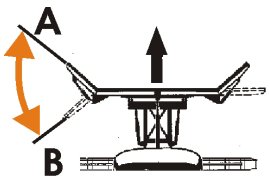
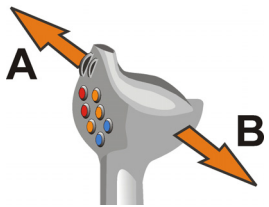
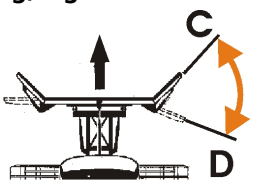
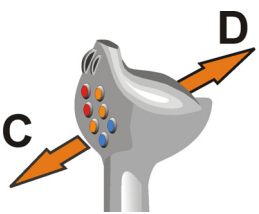
12 Knurled knob for adjusting tiller shaft speed

Turn the potentiometer to adjust tiller shaft speed. Tilling speed is increased / reduced to suit the snow conditions.

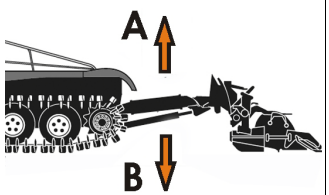
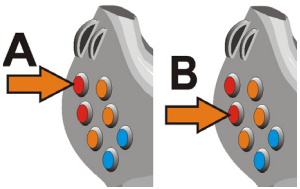
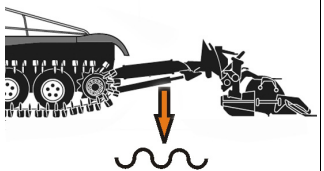
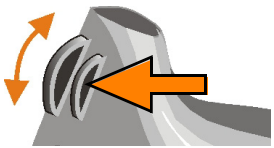
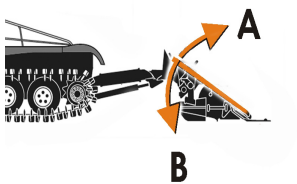
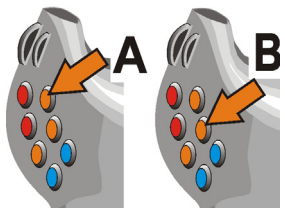
MULTIFUNCTION JOYSTICK

Front blade	Joystick	Pushbutton	Position
Raise - lower 		Floating position 	**A** - Lower **B** - Raise
Tilt 			**C** - Left **D** - Right
Dip / version 1 			**A** - Forward **B** - Back

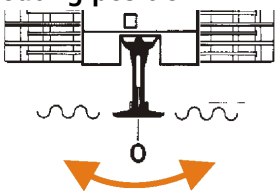
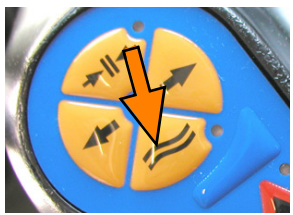
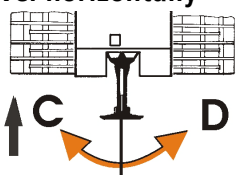
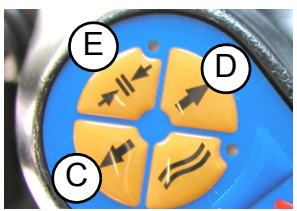
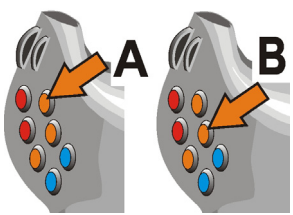
MULTIFUNCTION JOYSTICK

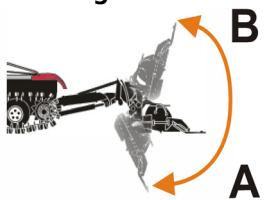
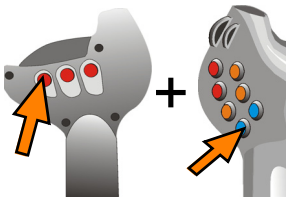
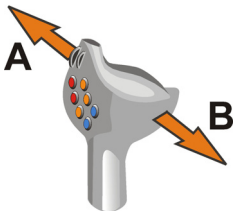
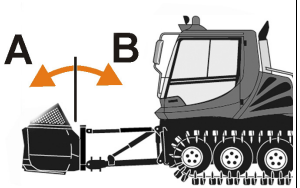
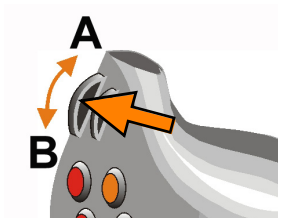
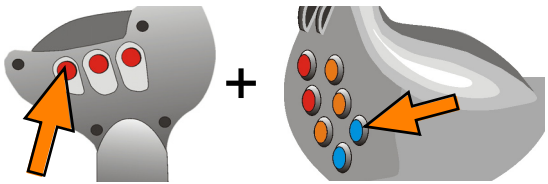
Front blade	Pushbutton	Joystick	Position
Swivel 	 +		**C** - Swivel left. **D** - Swivel right.
Wing, left 	 +		**A** - Move wing in. **B** - Move wing out.
Wing, right 	 +		**C** - Move wing in. **D** - Move wing out.

MULTIFUNCTION JOYSTICK

Rear equipment carrier	Joystick	Pushbutton / potentiometer	Position
Raise - lower 			**A** - Raise **B** - Lower Press = Fully lower. Press again = Hold
Floating position 	**1.** 	**2.** 	**1.** Press **2.** Turn clockwise = Relieve Centred (latched position) = Floating position Turn counter-clockwise = Press against snow
Depth setting 	**Standard and winch** 	Just with sideflaps on the tiller 	**A** Top section pressed = Raise tiller **B** Bottom section pressed = Lower tiller Note: Tiller depth shown on touch-screen

MULTIFUNCTION JOYSTICK

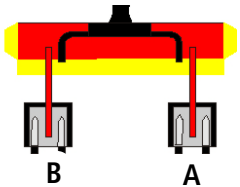
Rear equipment carrier	Joystick	Pushbutton	Position
Floating position 			
Swivel horizontally 	**C** - Swivel left **D** - Swivel right		**E** - Briefly pressed = Rigid position **E**- Briefly pressed again = Centred **E**- Pressed and held down = Equipment carrier centred as long as button is held down.
Side finishers 			**Left finisher A** Press = Fully extend. Press again = Fully retract. **Right finisher B**

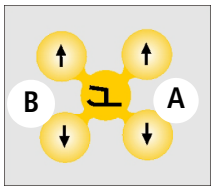
FunPark equipment carrier	Joystick	Pushbutton	Position
Power Angle 			**A** - Retract tiller **B** - Extend tiller Touchscreen shows: Emergency tiller control **Note:** Switch to automatic when finished.
Roll 			**A** - Roll forward **B** - Roll back
Switch on tiller 			**Touch control for tiller ON** Press and hold down = ON

NORDIC-TRAIL TRACKER PLATES (OPTIONAL)

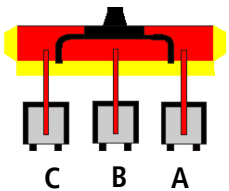
Nordic-trail tracker plates

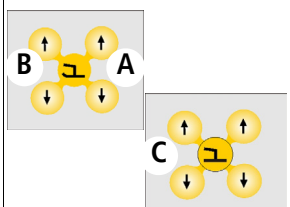
Raise/lower/press into snow



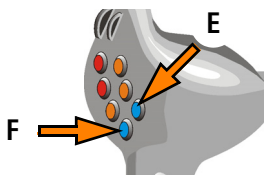


A - Right tracker plate, raise / lower
B - Left tracker plate, raise / lower





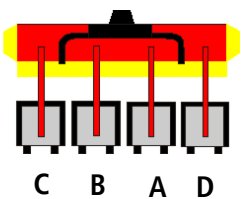
All tracker plates

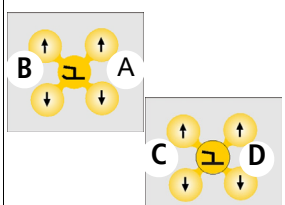


A-C - Tracker plates raise / lower

E - Raise all tracker plates

F - Lower all tracker plates



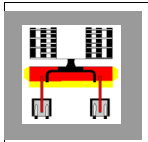


Press into snow

A-D - Tracker plates, raise / lower

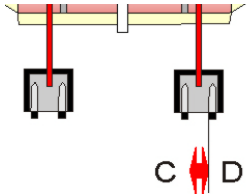
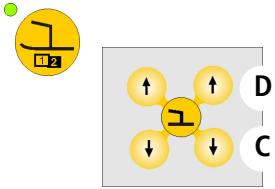
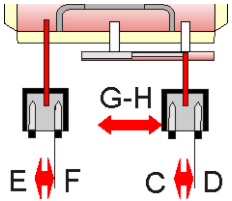
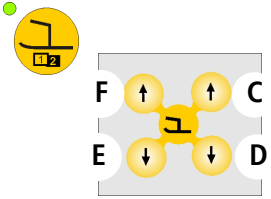
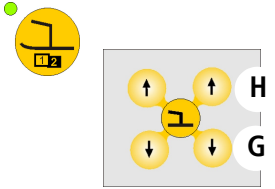
+/- Contact pressure for tracker plates, value 0 - 100 %. *see reading shown on terminal*

NORDIC-TRAIL TRACKER PLATES (OPTIONAL)

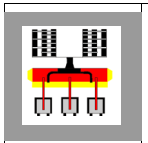


Variant 1 / 2

2x Nordic-trail tracker plates

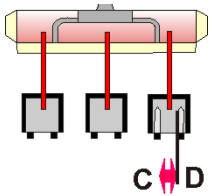
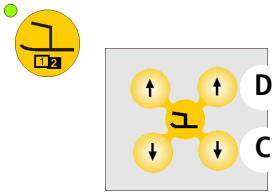
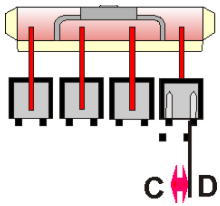
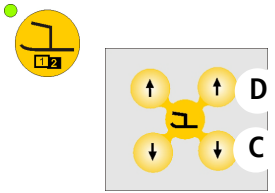
			❍ Function toggle, press - Indicator lights up **C/D** Track spacing
			❍ Function toggle, press - Indicator lights up **C-F** Track spacing **G-H** Distance between tracker plates

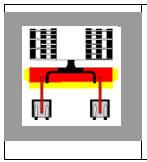
NORDIC-TRAIL TRACKER PLATES (OPTIONAL)



Variant 3 / 4

3 / 4x Nordic-trail tracker plates

			❍ Function toggle, press - Indicator lights up **C/D** Track spacing
			❍ Function toggle, press - Indicator lights up **C/D** Track spacing



Variant 5

2x Nordic-trailer tracker plates with 1 Nordic-trail tracking tiller

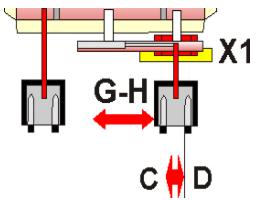
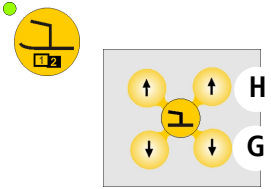
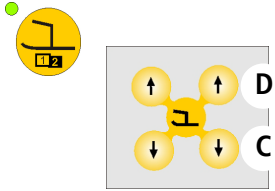
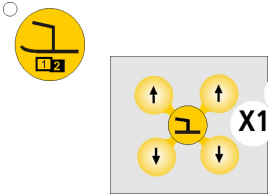
X nordic-trail tracking plate tiller

(Use terminal to select)

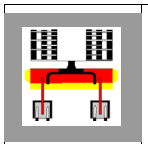
Nordic-trail tracking plate tiller switched off.

Nordic-trail tracking plate tiller is switched off when Nordic-trail tracking plate is raised.

Nordic-trail tracking plate tiller is switched off when tiller is raised.

			❍ Function toggle, - Indicator lights up **C/D** Track spacing **G-H** Distance between tracker plates
			❍ Function toggle, - Indicator OFF **X1** Nordic-trail tracking tiller, raise / lower

NORDIC-TRAIL TRACKER PLATES (OPTIONAL)



Variant 6

2x Nordic-trailer tracker plates with 2 Nordic-trail tracking tillers

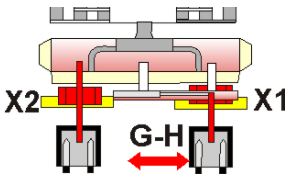
X nordic-trail tracking plate tiller

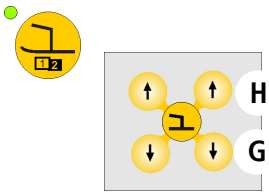
(Use terminal to select)

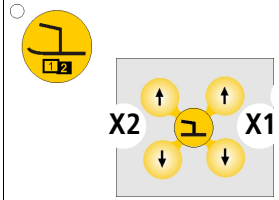
Nordic-trail tracking plate tiller switched off.

Nordic-trail tracking tiller is switched off when Nordic-trail tracking plate is raised.

Nordic-trail tracking plate tiller is switched off when tiller is raised.







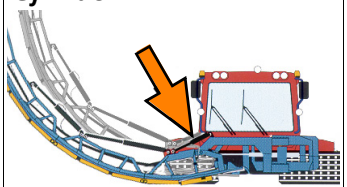
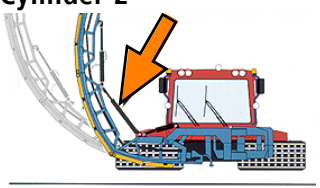
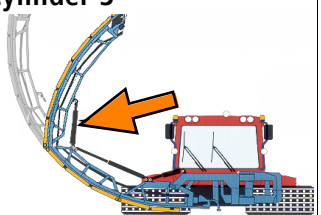
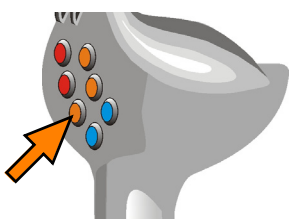
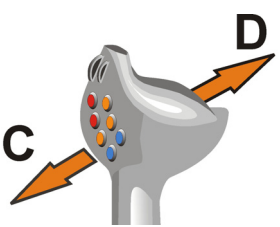
❍ Function toggle,
- Indicator lights up

G-H Distance between tracker plates

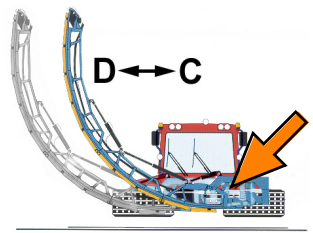
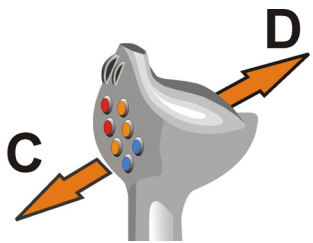
❍ Function toggle,
- Indicator OFF

X1/2 Nordic-trail tracking tiller,

Pipe Magician (optional)

Pipe Magician	Multifunction joystick	Pushbutton	Position
Cylinder 1 	 +		**A** - Extend cylinder **B** - Retract cylinder
Cylinder 2 	 +		**A** - Extend cylinder **B** - Retract cylinder
Cylinder 3 	 +		**C** - Retract cylinder **D** - Extend cylinder

Pipe Magician (optional)

Pipe Magician	Multifunction joystick	Pushbutton	Position
Pusher frame 	 + 		**C** - Retract cylinder **D** - Extend cylinder

See the operating manual for the Pipe Magician.

Stick (Optional)

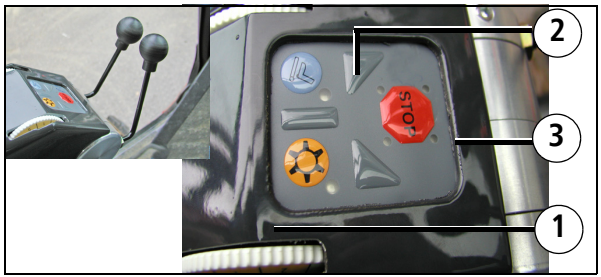
Operation, stick

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 engine rpm, on the setting of the knob, and on 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 has only 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 sharply to a complete stop.

❍ Hit the STOP button in the event of sudden danger.

CAUTION!

The PistenBully brakes sharply to a complete stop!

The PistenBully comes to an immediate stop and will not answer to the steering.

❍ Immediately apply the parking brake.

Restart = Press the STOP button and hold it down for 5 seconds.

3 Knurled knob for adjusting tiller shaft speed

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

4 Pushbutton, 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 pushbutton again in order to reactivate the tiller.

5 Pushbutton for manual throttle control

Use manual throttle control for driving at very low speed and high tilling speed in extremely difficult terrain.

The diesel-engine speed can be adjusted up to max. 1600 rpm.

Activating manual throttle control

- Use the accelerator to bring the engine up to the desired diesel-engine speed.
- Press button **5** and hold it down for at least 3 seconds. The diesel-engine speed remains constant.

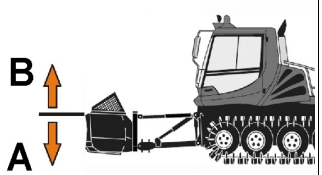
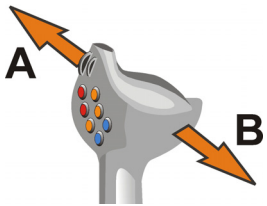
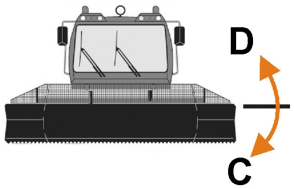
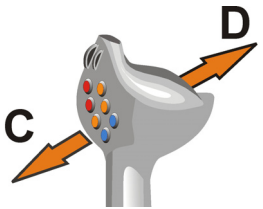
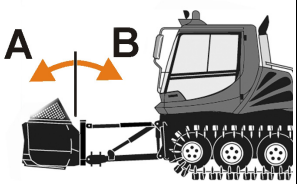
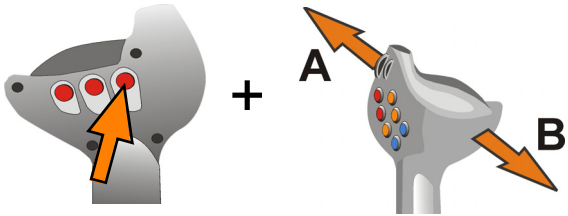
WARNING!

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.

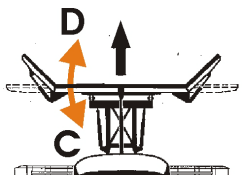
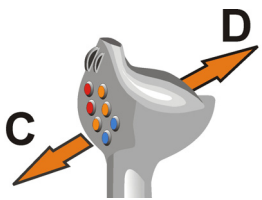
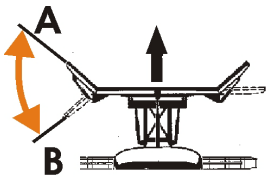
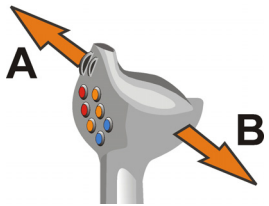
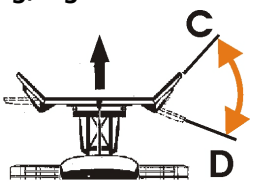
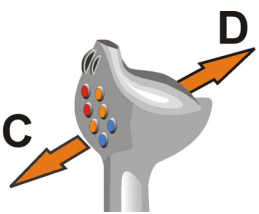
Reducing diesel-engine speed / driving speed

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

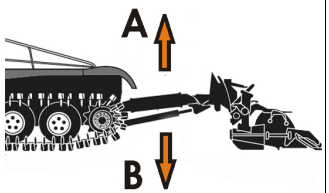
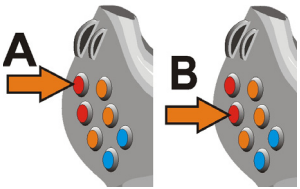
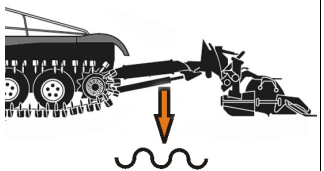
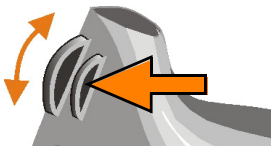
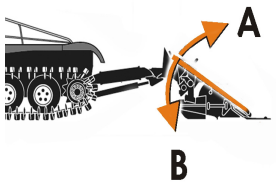
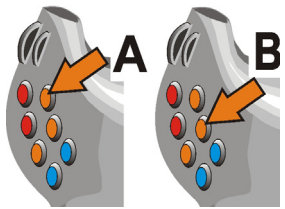
STICK

Front blade	Joystick	Pushbutton	Position
Raise - lower 		Floating position 	**A** - Lower **B** - Raise
Tilt 			**C** - Left **D** - Right
Dip / version 1 			**A** - Forward **B** - Back

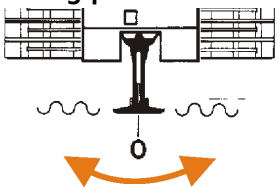
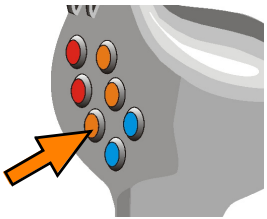
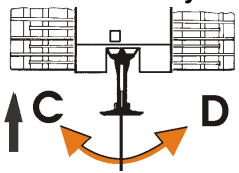
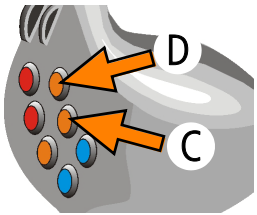
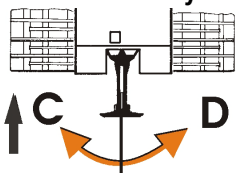
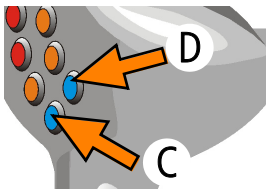
STICK

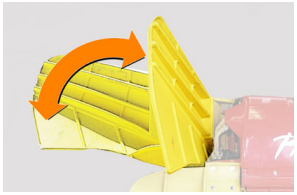
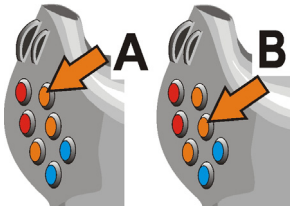
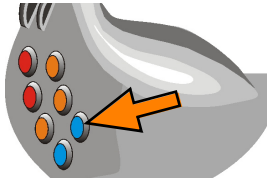
Front blade	Joystick	Pushbutton	Position
Swivel 	 +		**C** - Swivel left. **D** - Swivel right.
Wing, left 	 +		**A** - Move wing in. **B** - Move wing out.
Wing, right 	 +		**C** - Move wing in. **D** - Move wing out.

STICK

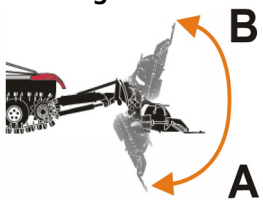
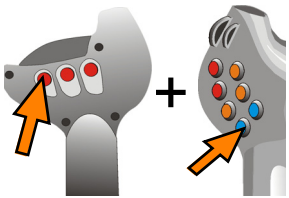
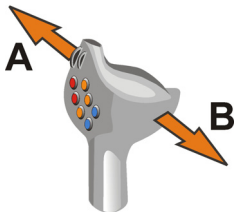
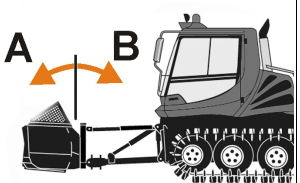
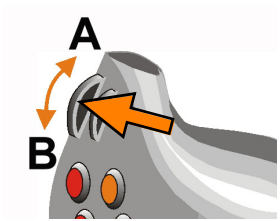
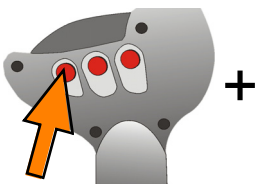
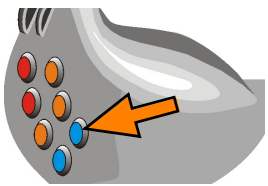
Rear equipment carrier	Joystick	Pushbutton / potentiometer	Position
Raise - lower 			**A** - Raise **B** - Lower Press = Fully lower. Press again = Hold
Floating position 	**1.** 	**2.** 	**1.** Press **2.** Turn clockwise = Relieve Centred (latched position) = Floating position Turn counter-clockwise = Press against snow
Depth setting 	**Standard and winch** 	Only press closed in case a tiller with side finisher. 	**A** Top section pressed = Raise tiller **B** Bottom section pressed = Lower tiller Note: Tiller depth shown on touch-screen

STICK

Rear equipment carrier	Multifunction joystick	Pushbutton	Position
Floating position 			**Long press =** Centring **Short press =** Rigid position **Press again=** Floating position
Swivel horizontally 		**Note:** **Function only with a tiller without side finisher lift / lower** *(USA version).*	**C -**Pivot tiller to left **D** - Pivot tiller to right
Swivel horizontally 		**Note:** **Function only with a tiller <u>with</u> side finisher lift / lower.**	**C -**Pivot tiller to left **D** - Pivot tiller to right

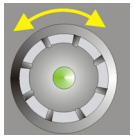
Rear equipment carrier	Joystick	Pushbutton	Position
Side finishers 			**Left finisher A** Press = Fully extend. Press again = Fully retract. **Right finisher B**
			**Active winch** ON / OFF

STICK /FUNPARK (OPTIONAL)

FunPark equipment carrier	Joystick	Pushbutton	Position
Power Angle 			**A** - Retract tiller **B** - Extend tiller Touchscreen shows: Emergency tiller control **Note:** Switch to automatic when finished.
Roll 			**A** - Roll forward **B** - Roll back
Switch on tiller 	 		**Touch control for tiller ON** Press and hold down = ON

Terminal Control Centre

The **TCC Terminal Control Centre** is an operating unit for the touchscreen in the cockpit. The TCC provides a convenient way of operating the touchscreen while seated. Direct input via the touchscreen itself is not affected, so the two modes can be used in parallel.



Shuttle

Change current setting.
Turn clockwise: Increase value
Turn counter-clockwise: Reduce value.

Change from one selection field to another

- in the active window.

Confirm a preselection

Preselection is for the shuttle, the menu selector and the program navigator.

- Abort a function / input.

- Go up to the next menu level.

Pushbutton for Home and Favourites page.

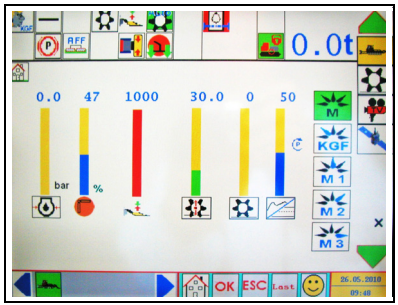
Press again to toggle between Home and Favourites page.

Menu selector

Selects the menu in the active program.

Program navigator (not used at this time)

Function software selection:
- Vehicle
- Navigation
- Operational-data logging
- Service
- Manuals



Start page / Overview

Note: Use only a commercially available glass cleaner to clean the terminal.

❍ **Touch-sensitive fields:**
Touching activates function selection

SnowSat, *option*
seperate operatin manual

Go to first page

OK

Confirm a function

ESC

Step back one level

Last

Go to last page

Not used

Factory default

Touch-sensitive field: Touching the field will step through the levels "Persons 1 to 3" and "KGF". Always check that the setting is correct before pulling away from rest.

Person 1 to 3

Custom settings for joystick and panel functions.

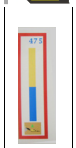
Only Kässbohrer Service has authority to enter the code.

Bar graph

Engine oil pressure

Snow-flap adjustment, tiller
See the section entitled "Multiflex tiller"

Tiller contact pressure



Note:
Red surround indicates that function is "Lower rear equipment carrier".

Tiller depth

Tiller speed

Adjusting slope contour

Contact pressure, tracker plates
Use shuttle to adjust

Tiller Surface control switch

The tiller switch only appears in the terminal when a AlpinFlex Tiller or a MultiFlex Tiller is attached.

M = Manual mode, via potis and buttons

KGF = Not adjustable default values, this mode should be alright for approx. 80% of the snow conditions.

M 1 = Adjustable values

M 2 = Adjustable values

M 3 = Adjustable values

❍ The values for M1, M2 and M3 are adjustable on the tiller screen, *see page 12*.

Start page / indicators

Parking brake applied

Also:

Braking-air check, parking brake

Release pressure has dropped below 120 bar

Parking brake not applied

Front snow blower mounted

Magician mounted

Direction of travel neutral

Direction of travel forward

Direction of travel reverse

Alpinflex installed

Tiller 2000 mounted

Multiflex tiller mounted

Drum winch ON

Active Drum winsch ON

Tiller at standstill

Tiller ON

Tiller running

Rear equipment carrier rigid

Lower rear equipment carrier

Raise rear equipment carrier

Flap, right lifted

Flap, left lowerd

Both flaps lifted

Rear equipment carrier horizontal in position

rigid

centred

right

left

Floating position

TERMINAL

Emergency tiller control

Tiller control, automatic

Intake air preheating ON
See the section on the diesel engine

Air-filter monitor
Check the air filter and replace if necessary.

Air filter
Air intake, fresh air (cold air)

Air filter
Air intake, engine compartment (warm air)

High-priority fault.
Cease operation.
See the section on the terminal fault codes

Medium-priority fault.
See the section on the terminal fault codes

Coolant below the minimum level
Cease operation.- Rectify cause.
Top up coolant to specified level *See the section on checks*

WARNING!

Risk of scalding:
The coolant system is pressurised.
Remedy: Wear protective gloves.

Superstructure lock closed

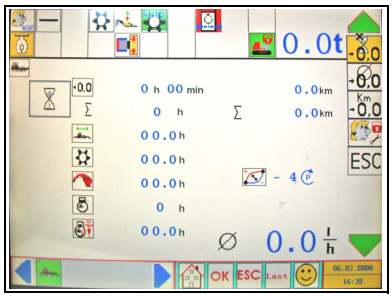
Superstructure lock open

Filter in hydraulic-fluid tank clogged.
If the warning light comes on at operating temperature:
- Cease operation.
- Change the filter.

Temperature of hydraulic fluid too high.

Speed reading

Vehicle data



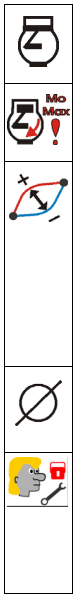
+0,0 **Daily operating hours**

Σ **Total operating hours**

Driving hours

Tiller operating hours

Winch operating hours



Diesel-engine operating hours

Diesel engine over-revved.

Steering sensitivity

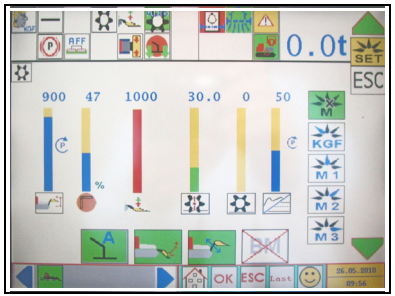
Use shuttle to adjust the setting

Diesel consumption

Extended options

Code required for access to enablement level, access restricted to trained workshop personnel.

Tiller page



Tiller speed

Tiller depth

Tiller contact pressure

Adjusting slope contour *(not available for Parallel equipment carrier)*
Use shuttle to adjust

Slope contour
0 = Cap
30 = Follow
60 = Retain unchanged
100 = Heighten

Tilting tiller in raised position

Advantages:

- Better view toward the rear
- Tiller's centre of gravity is closer to the vehicle.
- Useful for bulldozing work

Adjusting:

Raise the carrier

Use shuttle to adjust the tiller setting

Snow-flap adjustment, tiller
See the section entitled "AlpinFlex tiller"

Touch-sensitive fields

Touch to activate function selection

Lift out tiller
Advantages:
When the control is set to lift out tiller, the finisher is the last element to lose contact with the snow when the tiller is lifted. The slope contour tails off smoothly (no wall of snow left behind).

Tiller rigid
Tiller and finishers are lifted at the same time.

Swing damping ON
Swing caused by driving over broken terrain is damped at the equipment carrier.

Swing damping is ON when the engine is restarted.

Automatically retract side finishers.

No automatic retraction.

Nordic-trail tracking plate tiller switched off.

Nordic-trail tracking plate tiller is switched off when Nordic-trail tracking plate is raised.

Nordic-trail tracking tiller is switched off when tiller is raised.

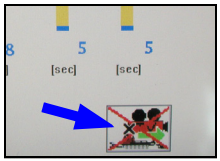
Boost function ON
Tiller speed max. 1600 rpm

Boost function OFF
Tiller speed max. 1300 rpm

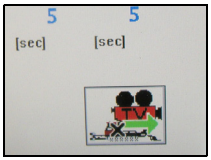
Rear Camera

Optional extra

- Camera view for reversing switched off by means of touchscreen *(see arrow)*.



- Touch symbol *see arrow*
- Camera view for reversing switched on by means of touchscreen.



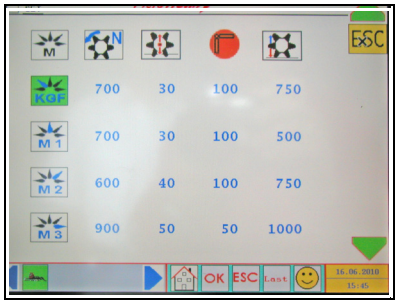
- Even though the vehicle is fitted with this system, you remain under the obligation to check carefully the area behind the vehicle when reversing.

Tiller adjustments

(not available for Parallel equipment carrier)

M1, M2 and M3 are adjustable for:

- The different conditions (new snow-, wet-snow or hard conditions)
- For different drivers

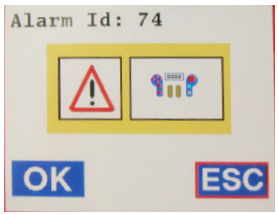


Suggested values for different conditions:

Snow type	Tiller speed	Tiller depth	Snow flap	Contact pressure	Tiller control
KGF	700	50	100*	750	60
M1 Fresh-fallen snow	700	50	100*	500	60
M2 Wet snow	600	60	100*	750	60
M3 Compacted snow	900	70	50	1000	60

Tiller flap **100** = Flap completly open

Fault-code displays

Category	Display	Action
Medium-priority fault. Warning buzzer sounds: 10 sec. ON and 0.5 sec. OFF **- Display shows ATTENTION** **- Yellow warning symbol** **- Restriction possible** **Check fault code:** **Press OK**. **To acknowledge a fault**: Press the **ESC** key **Repeated message:** If you ignore a message indicating a fault that would result in damage to the vehicle.		

Category
Low-priority fault
Warning buzzer sounds: 0.5 sec. ON and 1.5 sec. OFF
- Display shows !W
- Green warning symbol
- Minor restriction possible

Category
High-priority fault.
Warning buzzer sounds: Continuous tone
- Display shows STOP
- Red warning symbol
- Cease operation.

Key to fault codes

3,2,001

Subassembly

1 = Engine
2 = Vehicle control
3 = Tiller
4 = Winch control
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

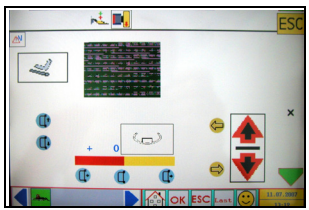
001 = Serial number, fault code

Fault	Meaning
2,1,030	Steering potentiometer
2,1,036	Forward / reverse button
2,1,070	Servo output, forward, left
2,1,071	Servo output, reverse, left
2,1,072	Servo output, reverse, right
2,1,073	Servo output, forward, right
6,1,021	Buffer fault PSX
10,1,015	Valve, tiller depth
10,1,016	Valve regulator, tiller depth
10,1,017	Valve current regulator PV9
10,1,018	Valve A, tiller depth
10,1,019	Valve B, tiller depth
10,1,020	No valve data
1,2,040	Pedal value / engine setpoint
1,2,044 to 1,2,068	Engine

Fault	Meaning
1,2,074	Constant choke
2,2,031	Steering potentiometer, control tolerance
2,2,032	Inch potentiometer
2,2,033	Inch potentiometer, control tolerance
3,2,001	Length measuring system, lifting cylinder
3,2,002	Length measuring system, tiller-depth cylinder
3,2,005	Tiller-depth sensor for lifting defective
3,2,006	Tiller-depth sensor for lowering defective
3,2,007	Tiller-depth sensor defective
3,2,024	Tiller ON/OFF switch
3,2,034	Tiller speed potentiometer
3,2,035	Tiller potentiometer values, control tolerance
3,2,075	Valve 3rd pump (tiller)
4,2,038	Winch speed-range detection
4,2,069	Winch detection

Fault	Meaning
7,2,043	No engine data available on CAN
10,2,013	Proportional control, tiller depth
1,3,004	No engine data
3,3,003	Tiller-depth indicator defective
3,3,008	Button for automatic/manual control of tiller defective
6,3,022	No data from display
10,3,012	Proportional control valve PV9
10,3,014	Proportional control, tiller depth
10,3,023	Switch, tiller joystick
14,3,041	Signal, Multiflex tiller
14,3,042	Signal, enable tiller
16,3,037	Front-equipment detection

Emergency mode, drive electronics

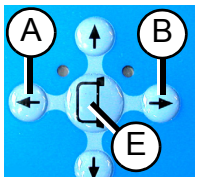


If the drive electronics fail the following functions are no longer active:
- Steering potentiometer
- Accelerator pedal
- Direction-of-travel switch

❍ **Fault-code displays**
To acknowledge a fault: Press the ESC key.

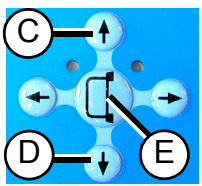
❍ If the vehicle is in emergency mode, drive it no further than to the nearest workshop.
Reduced driving speed if steering potentiometer / accelerator pedal develops a fault.
The hazard warning lights are in operation if the vehicle is in emergency mode.

Emergency mode, vehicle steering



Use outside-mirror controls to adjust
Steering:
A = Steer left
B = Steer right
E = Neutral position

Emergency mode, driving speed



Use outside-mirror controls to adjust
Speed:
C = Increase
D = Reduce
E = Neutral / engine idle speed

Emergency mode, direction of travel

Direction of travel forward

Neutral position

Direction of travel reverse

Manually adjusting blower output

❍ Start the diesel engine.

❍ Press button.

Blower setting:
OFF - AUTO - 1 - 2 - 3 - 4 - 5 - 6 - 7
Use the pushbuttons to select.

Selecting temperature readout in °C / °F

❍ Ignition ON.

❍ Press the button to confirm.

❍ Press the button to select °C / °F.

❍ Simultaneously press both buttons.

The setting for temperature readout is saved.

❍ Simultaneously press both buttons.

Display: CODE

❍ CODE = Press the button three times.

❍ Press the button until the display shows 16

Inside-temperature readout

❍ Press the button until the LED is OFF.

Outside-temperature readout

❍ Press the button until the LED is ON.

Reading is displayed automatically when the engine starts.

Blower and heating to maximum

❍ Press button.
"dEF" appears in the display.

Adjusting automatic heater and blower control

❍ Start the diesel engine.

Adjusting the target interior temperature

❍ Press button.
The target interior temperature appears in the display. (interior temperature with blower - AUTO).

Situational help
The display shows the blower's discharge temperature.

❍ Briefly press both buttons.

The target interior temperature appears in the display.

Entering target interior temperature

Increase

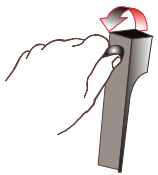
Decrease

❍ Set the blower to AUTO.

Automatic heater and blower control is active.
If the target interior temperature you select is lower than the outdoor temperature the fan will generally run at maximum speed, because there is no air-conditioning system installed.

Remote control, open/close doors

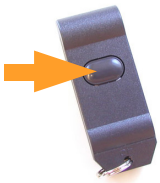
Precondition for use



❍ Manually unlock both doors.

The remote control is ready for use.

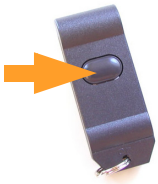
Closing the central locking system



❍ Press the button once

The turn indicators flash once and the interior lighting comes on as confirmation.

Opening the central locking system



❍ Press the button again.

The turn indicators flash twice and the interior lighting comes on as confirmation.
The doors re-lock if a door is not opened within approximately 60 seconds.

Functional description:

1 Head-restraint cushion
Height and angle are adjustable.

2 Knob
For adjusting the side wings for optimum lateral support.

3 Knob
For stepless adjustment of backrest rake.

4 3-stop lever
For limiting float to
- 150 mm travel
- 90 mm travel
- 75 mm travel (no-float position)

5 Knob
For stepless adjustment of the seat cushion through 8°.

6 Stepless height adjustment

7 Horizontal fore-and-aft adjustment
By locking rails on both sides.

9 Knob for adjusting side wings
For adjusting the side wings for optimum lateral support.

10 Stepless adjustment of seat depth
From 495 to 570 mm by knob.

11 Strap

12 Lumbar support
With height adjustment, electrically operated.

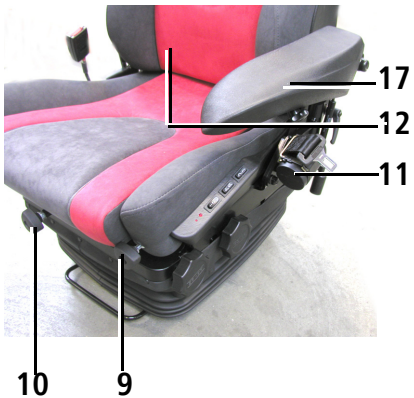
13 Rocker switch for curvature

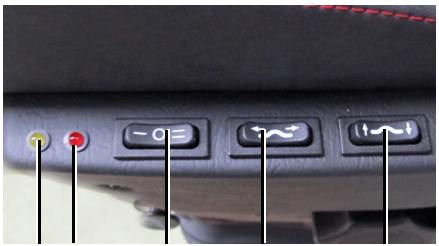
14 Rocker switch for curvature

15 Switch for two-stage control
Heating for seat cushion and backrest

16 Indicator lights for heating
Yellow = 1st stage
Red = 2nd stage

17 Armrest holder
Armrest, left, heated





Use

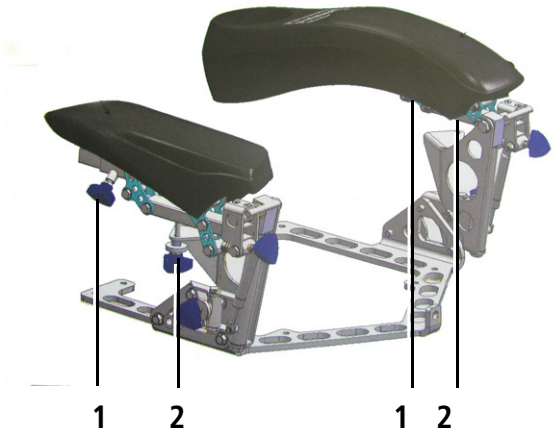
Turn knob (5) clockwise or counter-clockwise to adjust the angle of the seat cushion steplessly through 8°.

The angle of seat tilt is correct when the pedals can be operated without the seat applying excessive pressure to the underside of the thighs.
Lumbar support with electrically operated adjustment for curvature and height (12).
Use rocker switch (13) to adjust curvature.
Use rocker switch (14) to adjust height.

Heating for **seat cushion and backrest**
Use switch (15) to select either of the two heating stages.

- Both indicator lights ON = Heater at full power
- Only one indicator light ON = Heater at reduced power.

Armrest, left, heated, with holder (17)
The angle of tilt of the armrest can be adjusted by means of a knurled screw on the underside.
The armrest holder can be moved 30 mm forward or to the rear.
When the vehicle is laid up for the summer, set the seat to the no-float position to take the strain off the spring. The side wings of the seat are adjustable by mechanical elements. Consequently, do not sit on the wings.

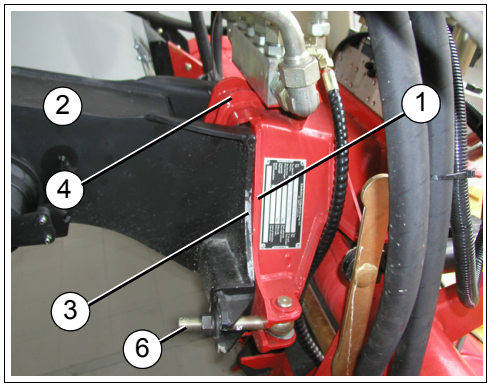


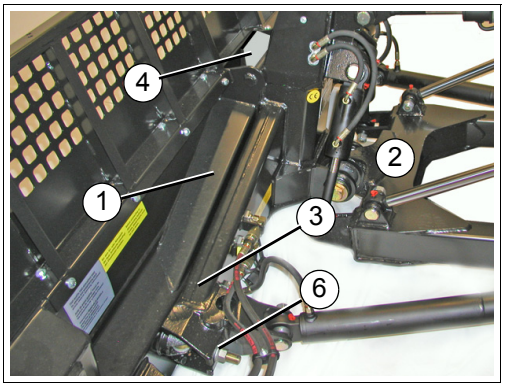
Adjusting armrest

1 **Fore-and-aft adjustment**

2 **Rake-angle adjustment**

NOTES





INSTALLING AUXILIARY DRIVEN IMPLEMENTS

❍ Clear all ice and snow off the adapter plate **1** and centring head of the auxiliary driven implement.

WARNING!

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

❍ Lower carrier plate or blade frame 2.

❍ Tilt adapter plate **3**.

❍ Drive the PistenBully up to the equipment.

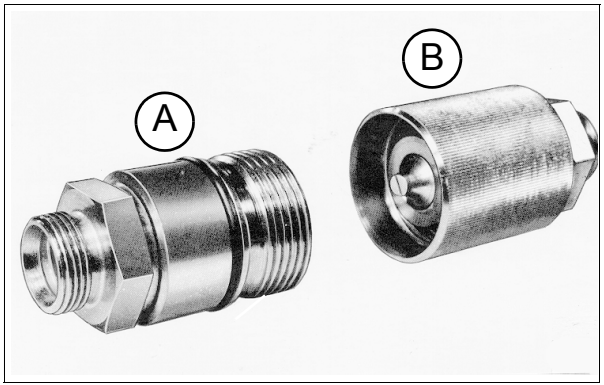
❍ Apply the parking brake.

❍ Slowly raise the carrier plate or pusher frame **2**. Adapter plate **3** engages hooks **4**, mating plate **1** seats itself against the adapter plate and simultaneously centres itself with the two centring wedges on the adapter plate**.**

Raise the carrier plate or pusher frame just far enough to enable the equipment to seat against the adapter plate. If the centring wedges do not slip under the adapter plate, a few sharp jerks will juggle the auxiliary driven equipment into the correct position.

- Switch off engine
- Swing eyebolts **6** inward and tighten the nuts (tightening torque 250 Nm).
- After approx. 10 minutes operation, recheck the nuts and make sure they are correctly tightened.

Remove the rear-mounted auxiliary implement before prolonged periods of dozing work.

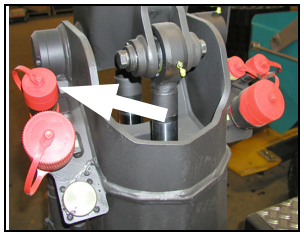


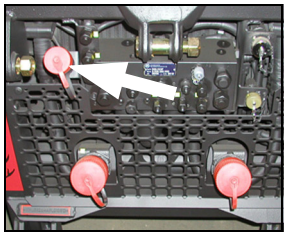
Connecting hydraulics

The threaded **high-pressure couplings** are for connecting and disconnecting hydraulic hoses.
Check valves that enable or disable flow, as applicable, are actuated automatically in the coupling process.

A = Vehicle end

B = Device end





Before connecting or disconnecting the hoses for auxiliary driven implement, always:

- Switch off the engine.
- Apply the parking brake.

❍ Switch the ignition for the diesel engine ON and actuate the appropriate functions to depressurise the hydraulic lines.

❍ Ignition for diesel engine OFF

When making the connections, always make sure that both parts of the couplings are perfectly clean.

❍ Connect the leak-off oil line first *see illustration, arrow.* This will enable excess pressure in the system to escape.

❍ Connect the hydraulic hoses, making sure that the numbers match and that the hydraulic couplings are correctly seated. Use suitable tools to tighten the hydraulic couplings.

❍ Connect the electrical plug of the auxiliary driven implement to the socket of the PistenBully and make sure it is correctly engaged. The plug completes the electrical circuit, so that the controller can recognise the auxiliary driven implement.

❍ Function-test the auxiliary driven implement.

WARNING!

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

❍ Check the driven implement for fluid leaks and, if necessary, have the equipment repaired by trained, qualified persons.

Removing the auxiliary driven implement

❍ Lower the driven implement, 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 driven implement from the sun if it is to be out of use for a prolonged period of time.

OPERATION OF AUXILIARY DRIVEN IMPLEMENT

Precondition for operation of the drive hydraulics

- 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 implement must be in the socket (socket E). Failure to comply with this precaution will mean that the electronically controlled speed reduction function is not available.
- The diesel engine must be revving at a speed at least equal to the pullaway speed of 800 rpm.

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

- If there is a leak in the drive hydraulics always switch off the diesel engine and have the fault rectified.

Tiller - forward operation / counter-rotating

Tiller forward operation / counter-rotating
Indicator right ON = Forward operation
Indicator left ON = 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 auxiliary driven machinery for reversing

Activate automatic lift.

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.
- Equipment carrier is centred.
- Equipment carrier lifts the auxiliary driven machinery 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.

If the direction of travel is "**forward**", the following hydraulic circuits are activated at the same time:

- The equipment carrier is automatically lowered.
- If the floating position was selected beforehand, it is automatically reselected.
- If a tiller is installed, it restarts when it is lowered to less than 0.5 m above the surface of the slope.
- The equipment carrier remains locked in the centred position.

OPENING THE REAR DECK RAILING

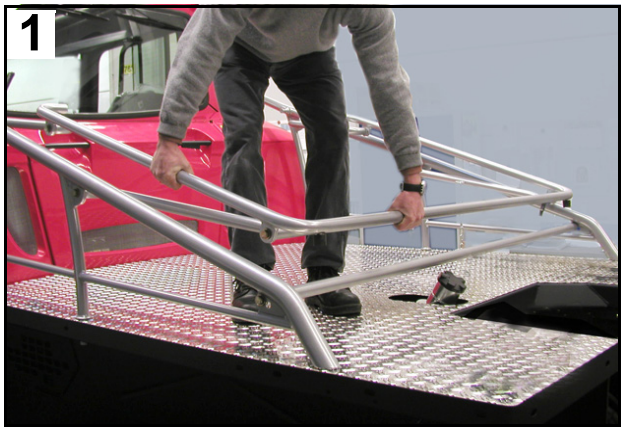
CAUTION!

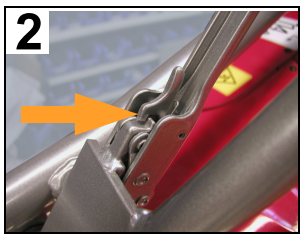
Danger of slipping on the track and on the load platform.
When stepping up to or down from the rear deck railing, always keep a firm grip on the railing of the load platform.

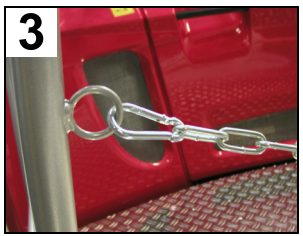
- Raise the hinged rear deck railing.

For designated holding points for raising the railing, see *(Fig. 1)*.

- Push both locking levers all the way up *(Figure 2)*.
- The safety catch on the locking lever must engage.
- Close both safety chains *(Figure 3)*.
- Always comply with the instructions for carrying passengers in the section entitled "Safety instructions".







CLOSING THE DECK RAILING

❍ Press the safety catch and open the locking lever *(Figure 5)*.

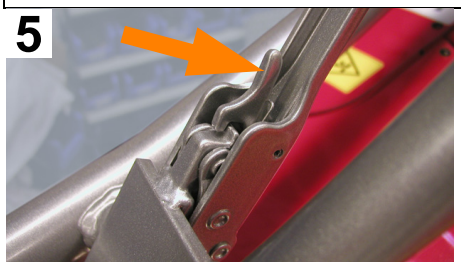
CAUTION!

Risk of injury by crushing:
when lowering the rear deck railing.
Take a firm grip at the designated points *(see Figure 1)* and swing the deck railing into position.

❍ Fully lower the rear deck railing.

4

5



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.
- Apply the parking brake.

- Switch off the tiller drive.
- Direction of travel switch in neutral position.
- Lower the front-mounted and rear-mounted auxiliary driven implements.

Failure to comply with this precaution will result in the risk of collision between the load platform or the driver's cab and the auxiliary driven implement.

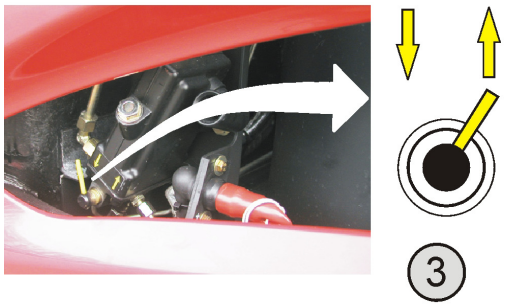
- Exiting the driver#s cab

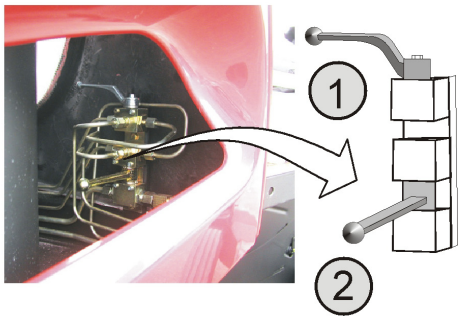
CAUTION!

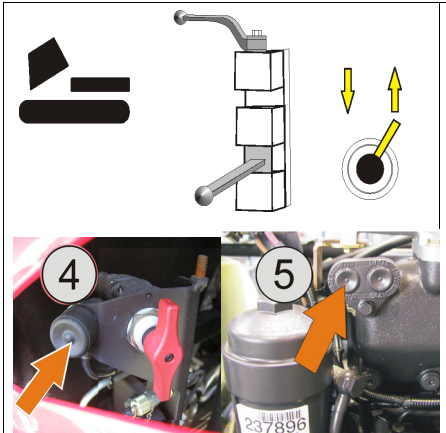
Close the doors.
Failure to comply with this precaution will result in a risk of accident due to doors slamming closed.

WARNING!

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





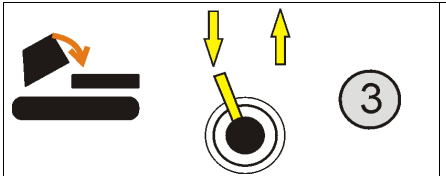


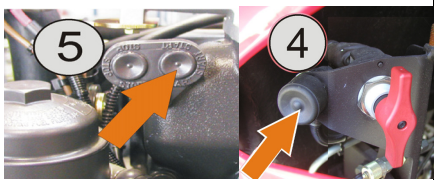
Tilting the driver's cab

- Move the levers of block ball cock **1** and **2** to the appropriate positions.
- Move adjuster valve **3** to the appropriate position.
- Press 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**.

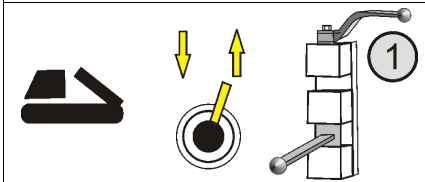


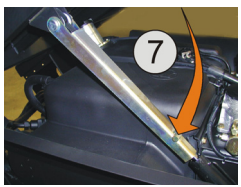


Lowering the driver's cab

- Move adjuster valve **3** to the appropriate position.
- Start the diesel engine by pressing button **5.**
- Press button **4**.
  The driver's cab will lower. The warning light for the cab latching mechanism goes out.

You can interrupt this movement by releasing the button.





Tilting the load platform

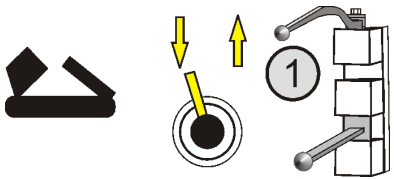
- Move the lever of block ball cock **1** to the appropriate position.
- The rest of the procedure is as described in the section on tilting the driver's cab.
- Release and pivot down support **7** on the piston rod.

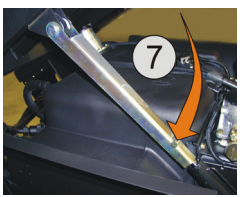
WARNING!

Risk of injury by crushing:
If hydraulic pressure is lost the load platform will move downward! Secure the support to ensure that the platform cannot move downward of its own accord.

Lowering the load platform

- Pivot support **7** up until it latches in position in the spring clip.
- The rest of the procedure is as described in the section on lowering the driver's cab.





Tilting the driver's cab / load platform

- Move the lever of block ball cock **1** to the appropriate position.
- The rest of the procedure is as described in the section on tilting the driver's cab.
- Release and pivot down support **7** on the piston rod.

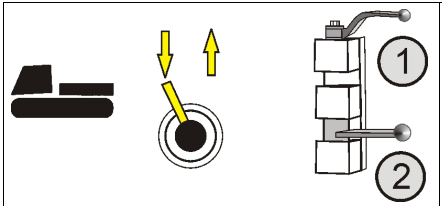
WARNING!

Risk of injury by crushing:
If hydraulic pressure is lost the load platform will move downward!
Secure the support to ensure that the platform cannot move downward of its own accord.

Lowering driver's cab / load platform

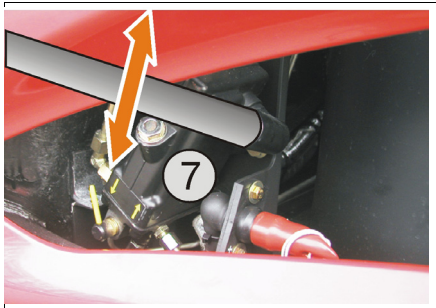
- Pivot support **7** up until it latches in position in the spring clip.
- The rest of the procedure is as described in the section on lowering the driver's cab.

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.



Driving the vehicle

❍ Move the levers of block ball cock **1** and **2** to the appropriate positions.



Using the manual pump for tilting and lowering

❍ Switch off the diesel engine.

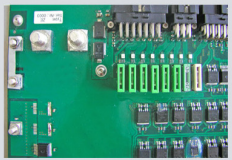
❍ Prepare the block ball cock / adjuster valve and the support in the same way as for the corresponding operation with the engine-powered hydraulics.

❍ Fit tubular extension (toolkit) on manual pump **7** and operate the pump.

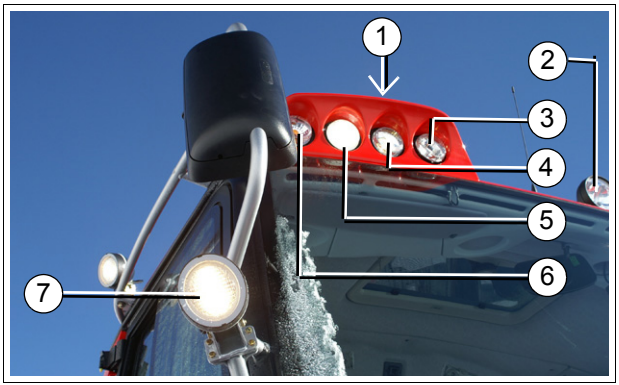
CAUTION!

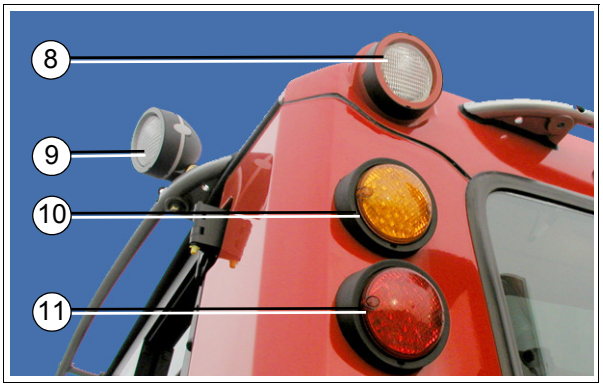
Risk of crushing by the rear-deck railing frame
Keep well clear when lowering the load platform / rear-deck railing.

Notes



ELECTRICS





Lights

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

1 Rotary beacon

2 Front searchlight

3 High-beam headlight / parking light H7 *(xenon optional)*

4 Low-beam headlight H7 *(xenon optional)*

5 Xenon worklight

6 Turn indicator

7 Worklight, front *(xenon optional)*

8 Worklight, rear *(xenon optional)*

9 Worklight, side *(xenon optional)*

10 Turn indicator

11 Rear light

Halogen - xenon

WARNING!

Bright light could injure eyes.
Do not look directly into the bright light.

WARNING!

Health hazard due to gas.
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.

- Clean the glass lens if dirty, but only when the lens is cold.
- Do not use aggressive or abrasive cleaning agents.

Safety instructions for changing xenon bulbs

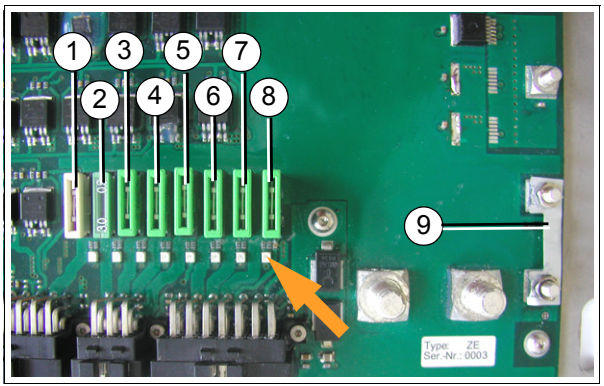
- Before changing a bulb, always switch off the headlights and isolate them from the power supply.
- Do not probe into the bulb socket.
- The electrical connection between headlight and ballast carries a high voltage: do not break this connection.
- Never operate the ballast without a bulb, as this could 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 behind the co-driver's seat.

❍ Remove the screws and lift off the cover.

WARNING!

Risk of cable fire and short-circuit.
Never attempt to jumper or repair fuses or insert replacement fuses with a higher ampere rating than the originals.

1 **Winch control** (25 A)
2 **Hydraulics 1** (30 A)
3 **Hydraulics 2** (30 A)
4 **Hydraulics 3** (30 A)
5 **Valves** (30 A)
6 **ECU 1** (30 A)
7 **ECU 2** (30 A)
8 **ECU 3** (30 A)
9 **Starter relay**

If a fuse blows the corresponding LED lights up *(see arrow)*.

Vehicle battery

The **two 12 V, 135 Ah** batteries are mounted on the upper frame.

Checking electrolyte levels

- ❍ Tilt the driver's cab.
- ❍ 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 place metal objects on the battery.

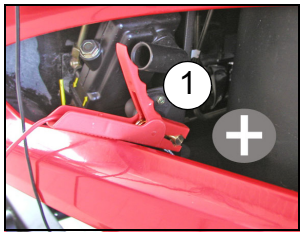
Topping up battery fluid

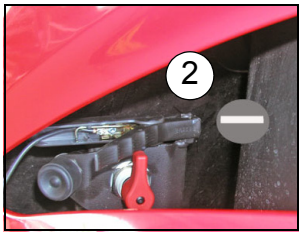
WARNING!

Take care when handling battery acid
Risk of caustic 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 the battery clamps to the battery posts.
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 on-board electrical system by activating the battery master switch.

Jump starting

WARNING!

A mistake in the jump-starting procedure could result in fatality or severe burns due to electric shock.
<u>Do not</u> make a connection between the cable terminals.
<u>Do not</u> connect the jump-start leads to the connections between the two batteries.

Valtage peaks during disconnecting the external current cables. Risk of damaging electronic control units!
Before disconnecting the jumper cables of the vehicle, switch on other electric loads (e.g. window heater / seat heater.

Risk of damaging electronic control units!
Do not attempt to start the engine using power boosters or power packs to boost the battery or as a substitute for the battery.

Connecting jump leads *(see illustration)*

1. From **+ pole** clamp **1** to **+ pole** of donor battery (24 V).
2. From **– pole** clamp **2** to **– pole** of donor battery (24 V)

❍ Connect the battery to the on-board electrical system by activating the battery master switch.

Battery master switch

Switch off the battery master switch:

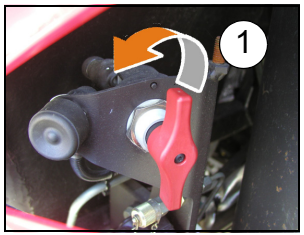
- if the electronics are defective.
- to help prevent the battery from discharging during a prolonged storage.

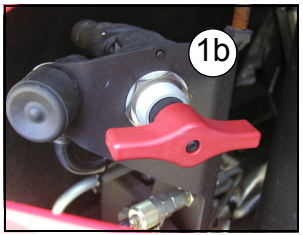
The battery master switch provides a means of isolating the battery from the vehicle's on-board electrics.

Voltage peaks:
While the engine is running, do not switch off the battery master switch except in an emergency.

Data loss in the digital propulsion and tiller-control electronics.
Before disconnecting the battery from the vehicle's on-board electrics:
- Switch off the ignition.
- Wait 30 seconds.
- Then operate the battery master switch.

Battery master switch





Disconnecting battery from on-board electrics

- Turn battery master switch **1** in the direction indicated by the arrow.

The battery is now isolated from the vehicle's on-board electrics (**1b**).

Connecting battery to on-board electrics

- Operate the battery master switch.
- Wait 30 seconds.
- Switch on the ignition.

NOTES

INSTRUCTIONS FOR CHECKS AND MAINTENANCE

WARNING!

Risk of injury by cutting or crushing action.
At all moving parts.
When the engine is running, keep well clear of 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.).
- **New vehicle:**
  Check security of wheels after the first 5 operating hours. Tightening torque 300 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).

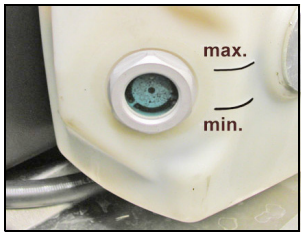
WARNING!

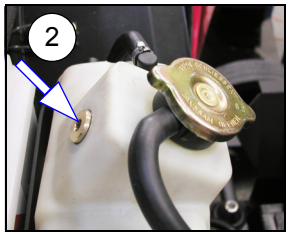
Risk of explosion due to build-up of gas in fuel tank.
Keep all possible sources of ignition when clear when the vehicle is being refuelled.

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).

CHECKING COOLANT LEVEL

- Check the coolant level and top up only when the engine is cold. Slacken bleed screw **2** when topping up the 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.
- Check the antifreeze of the coolant, (see the section on fluids and lubricants).
- Check that the hoses in the cooling and heating systems are tight and not leaking.

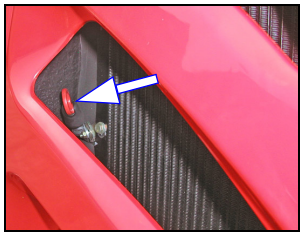


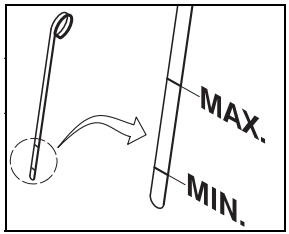


CHECKING ENGINE OIL LEVEL

- Use the dipstick to check the engine oil level.
- Top up the oil with the engine stopped and the Pisten-Bully 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).

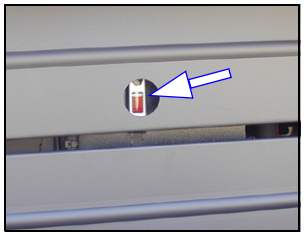


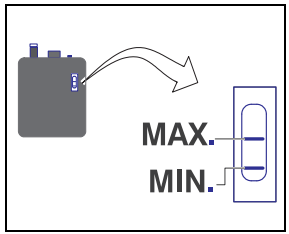


CHECKING HYDRAULIC FLUID LEVEL

- 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).





CHECKING 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.
- Never operate the PistenBully if the warning lights and rotating beacon system are not fully functional..

VISUAL INSPECTION

- Visually inspect the tracks and sprockets, check for tyre damage.
- Visually inspect the fasteners of the auxiliary driven implements (locking pins, bolts, nuts).
- Visually inspect the hydraulic system (drive hydraulics and hydraulics for auxiliary driven implement), hydraulic lines, connectors, hoses, hydraulic cylinders for leaks and chafing.

CHECKING PARKING BRAKE

- Make sure there is no-one in the danger zone.
- Start the engine – Apply 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.

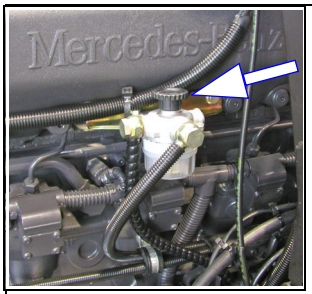
WEEKLY CHECKS

- 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).

CHECKING FUEL PREFILTER

- Replace the filter element if it is very dirty or damaged. Screw open filter housing , remove the filter element and clean it in clean diesel fuel, using a soft brush.
- Check the sealing ring for the filter housing; replace if necessary.
- Slip the filter element into the filter housing and reinstall the housing. Tightening torque 10 Nm.

Make sure that the sealing ring is correctly seated.



Dispose of used filters and fuel residues in accordance with the locally applicable environmental-protection and safety regulations.

TRACK TENSION

Checking track tension:

- Vehicle parked on horizontal, snow-covered ground.
- No load on vehicle and auxiliary driven implements lowered.
- After equalising track tension by driving backwards and forwards.

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 stringers, track lacings, tyre guides and backing plates, replace damaged components.

TEST DRIVE

❍ Check operation and test all instruments and indicators.

❍ Check 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

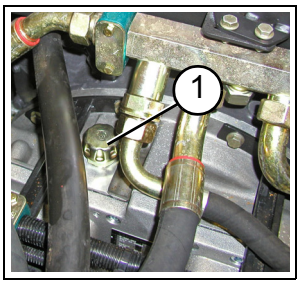
❍ Check the wheel fasteners and check tyre pressures.

Tightening torques

TYPE	TENSIONING AXLE	DRIVE AXLE	AIR PRESSURE, DRIVE AXLE
PistenBully 600	300 Nm	300 Nm	7.0 bar

TRANSFER CASE

- Tilt the load platform.
- Use the dipstick to check the engine oil level.
- Brass cap **1** w/f 36; measure with oil dipstick set on (screw threads not engaged).
- The oil level must be between the min. and max. marks on the oil dipstick.
- Use only approved oil for transfer cases (see fluids and lubricants specifications).



ENTERING

- 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 persons and objects.
- Always take a firm grip on grab handle **1** of the driver's door when entering the vehicle.
- Step onto the track.

CAUTION!

Danger of slipping on the track when entering and exiting the driver's cab.
Always take a firm grip on the handle in order to step onto the track.

- In order to help ensure safe operation, operators must wear appropriate footwear with non-slip soles.
- Press the door lock. The driver's door opens.

CAUTION!

When parking on a slope, be particularly careful when opening the door. The door opens suddenly.

- Always take a firm grip on grab handle **2** of the driver's door.

- Fully raise armrest **3**.
- Take a grip on steering wheel **4** and swing yourself into the driver's seat
- Close the door.
- Adjust the seat and the steering wheel to an ergonomically comfortable position.Total lowering of the armrest (machines with sticks, version USA- out of operation when armrest is not lowered totally).
- Fasten the seat belt.
- Visual check:
  Direction-of-travel switch in "Neutral" position, parking brake applied.

STARTING THE DIESEL ENGINE

WARNING!

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

WARNING!

Risk of poisoning from exhaust gases.
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). Duration of start attempt, max. 30 seconds

If it is necessary to repeat the reheating procedure:

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

Situational help

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

Damage to electronics
If the warning light for intake-air preheating comes on during operation:
- Cease operations
- Proceed to the nearest workshop
- Switch off the battery master switch.

WARMING-UP PHASE

Air temperature above 0° C to –20° C

- Allow the diesel engine to idle for approximately 3 minutes.
- Pull away 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.
- Pull away 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 driven machinery remains unchanged.

DRIVING

- Switch on the rotating beacon.

WARNING!

Before driving away, always check that there is no-one 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.
  Make sure that the area behind the machine is clear.
  The assistance of a second person to give directions is necessary if visibility is poor.
- Release parking brake.
- Use the accelerator to increase engine speed beyond pull-away rpm: The PistenBully begins to move.

The PistenBully accelerates steplessly to its maximum speed as engine speed increases.
When the vehicle is moving, the electronics monitor the engine speed set in response to movements of the accelerator pedal and adjust the hydraulic ratio in accordance with load, so that engine speed remains constant and only the speed of the vehicle changes.

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.

- Observe all instruments when driving.
- If the engine comes to a stop for whatever reason, immediately apply the parking brake.

Engine oil pressure

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

Engine operating temperature

If the reading is too high, determine the cause, for example:
- Gauge in correct working order.
- Not enough coolant in system.
- Outside of radiator dirty.
- Check V-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 inopportunely.

Battery charge indicator

If the battery charge indicator lights up when the engine is running, the alternator is no longer charging the starter batteries. Ascertain the cause of the problem, e.g.:
- Loose wiring connections
- Alternator dirty
- 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.

PistenBully slows down on account of lack of propulsive power

❍ Switch the tiller to forward rotation.

❍ Use the potentiometer to reduce the speed of the auxiliary.

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 sprockets.

WARNING!

Use the parking brake only to keep the vehicle at a standstill.
The PistenBully will brake sharply to a complete stop if the parking brake is applied while the vehicle is in motion.

- In the event of sudden danger, hit the STOP switch.

STOPPING AFTER USE

- Park the vehicle where it is clearly visible.
- Park the vehicle on a firm, level surface.
- Lower front and rear auxiliary implements,
  - Switch off the tiller.
  - Direction of travel switch in neutral position.
  - Apply 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.

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

EXITING / REFUELLING

- Fully raise the steering-wheel column and the armrest.
- The procedure for exiting the vehicle is the reverse of the entry procedure.

CAUTION!

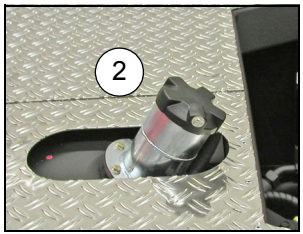
Danger of slipping on the track when entering and exiting the driver's cab.
Always take a firm grip on the handle in order to step off the track.

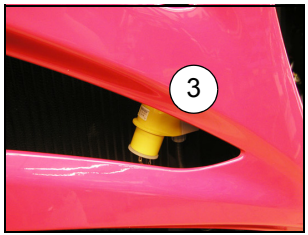
- Refuel **2** the PistenBully immediately after operation, in order to prevent condensation forming in the tank.

WARNING!

Risk of explosion of due to formation of gas. Keep all possible sources of ignition when clear when the vehicle is being refuelled with diesel fuel.

- 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.





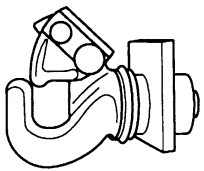
- Connect coolant preheating (optional extra).

110/220 V adapter **3** provides a means of preheating the coolant system with the thermostatically controlled preheater, or of preheating the hydraulic fluid with a heater available as an optional extra.

1 - 2 hours of preheating prior to starting does not improve cold starting.
Undertake preheating immediately after parking the vehicle.

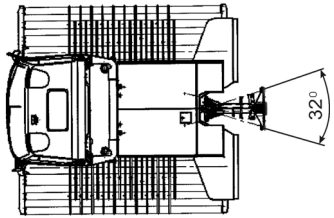
- Use only cables that comply with the applicable regulations in the country of use.

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 extensive safety measures. Please consult your nearest Service Support Centre.



Attachment weights, towing hitch

Permissible towed weight

- Max. towed weight 3000 kg.
- Max. off-centre angle for descents 16^0 to left or right.

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

The section entitled "Driving tips and information" is intended merely as an overview and is not under any circumstances to be considered in itself as providing adequate familiarisation with the driving characteristics of the PistenBully.

Quantity is not as important as quality and economy.

LOW FUEL CONSUMPTION

- **Diesel engine rpm** green zone on rev. counter. Max. torque 2000 Nm at 1200 rpm.
- **Adjust tiller shaft speed** to suit snow conditions **by turning the** potentiometer.
- **Steplessly adjust tiller depth** to suit snow conditions **by observing the gauge and using the pushbutton controls.** 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

MEDIUM SNOW

In the atmosphere, snow forms from water droplets 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-fallen 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 driven implements 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 well 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.

i 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.

i 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

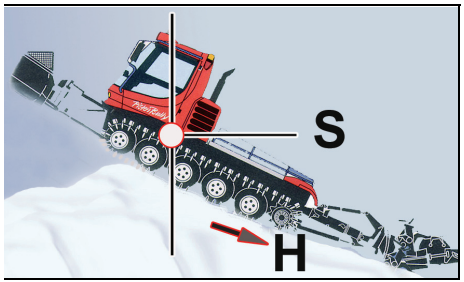
It is advisable to use the side wings, because the tiller can produce edge walls as it passes through the snow. Kässbohrer also offers an extra-wide side wing for more efficiency when used in combination with the rear frame steering– this also means that the machine can prepare on one side at a time.

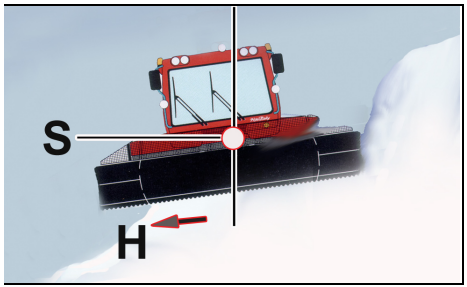
If a satisfactory run cannot be prepared in **slushy snow**, is might be advisable to wait two or three hours to allow the temperatures to change. Work on preparing slopes at higher altitudes can proceed in the interim.

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 mounted implement onto the prepared surface.

Regularly remove snow from the load platform. Otherwise, the increase in weight will result in higher fuel consumption.

Always keep the engine revving in the most economical rpm range (indicated by the green zone on the tachometer).

The drive electronics adjust driving speed to suit engine rpm.

Driving: on upgrades

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. Overrevving 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.

i 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 driven implements 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: on downgrades

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 too high: Tiller cannot bite into the snow.
- Slope is not contoured in areas of hard snow.
- Tiller shaft too low: Insufficient snow throughput, 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 depth set too high (depth setting).
- 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).

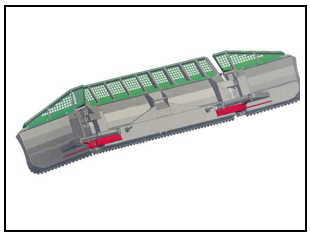
Vehicle comes almost to a stop:

- 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



Correct usage:

- 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 dozing 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 dozing 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.

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.

Making a location line

The best way of doing this is to approach the downslope at an angle from above and, with the pusher blade swivelled to one side, doze a flat location line in the snow.
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.

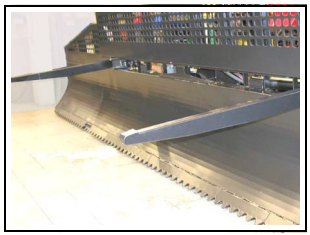
Use of the front blade on steep slopes covered with fresh-fallen snow

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. Raise the front blade and drive forward a few meters before repeating the procedure; this is one way of climbing 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.
Pivot 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.



ParkBlade
Fork damage caused by side load!
The forks must not be moved / raised sidewise!

ParkBlade

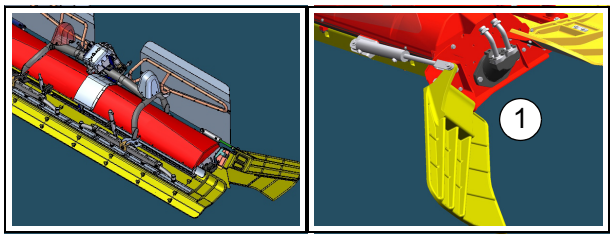
Correct usage:

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

Funpark obstacles such as funboxes and rails can be transported on the forks.

WARNING!

Risk of injury by crushing:
when extending / retracting the forks.
Make sure there is no-one in the danger zone.



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

It can tilt to angles up to 20^0, 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.

The two tiller shafts are driven by a hydraulic motor and are coupled by a synchronising universal shaft, in order to ensure that both shafts operate at the same speed and the same torque.

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)*

Side finisher **1** has hydraulic tilt control, facilitating overlap with the prepared part of the run and helping prevent surface irregularities on the slope..

Setting the Alpinflex tiller to the rigid position

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

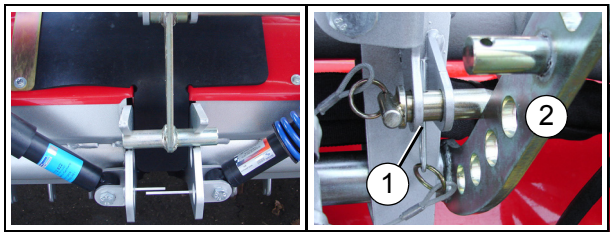
Tiller in rigid position
(FunPark)

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.

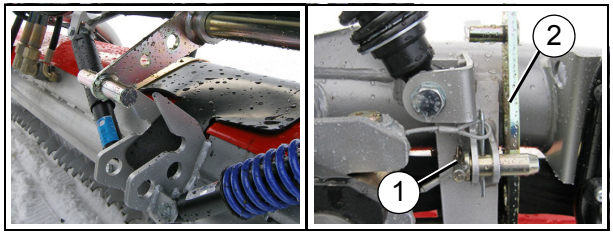
Cancelling "set to rigid" (unlock)

- ❍ 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)

- ❍ Pin **1** and adjusting lever **2** in position.
  Insert the retainer to secure the pin.



Cancelling the "set to rigid" function

- ❍ Pull the pin and set adjusting lever **2** to position.

Snow-flap adjuster for tiller

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

Increasing snow-flap depth

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 adjuster for tiller

Top section pressed = Reduce tiller snow-flap depth

Bottom section pressed = Increase tiller snow-flap depth

Situational help
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 **descending** extremely steep gradients, the tiller shaft can be set to counter-rotate so as to help stabilise the PistenBully.

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KÄSSBOHRER GELÄNDEFAHRZEUG AG

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