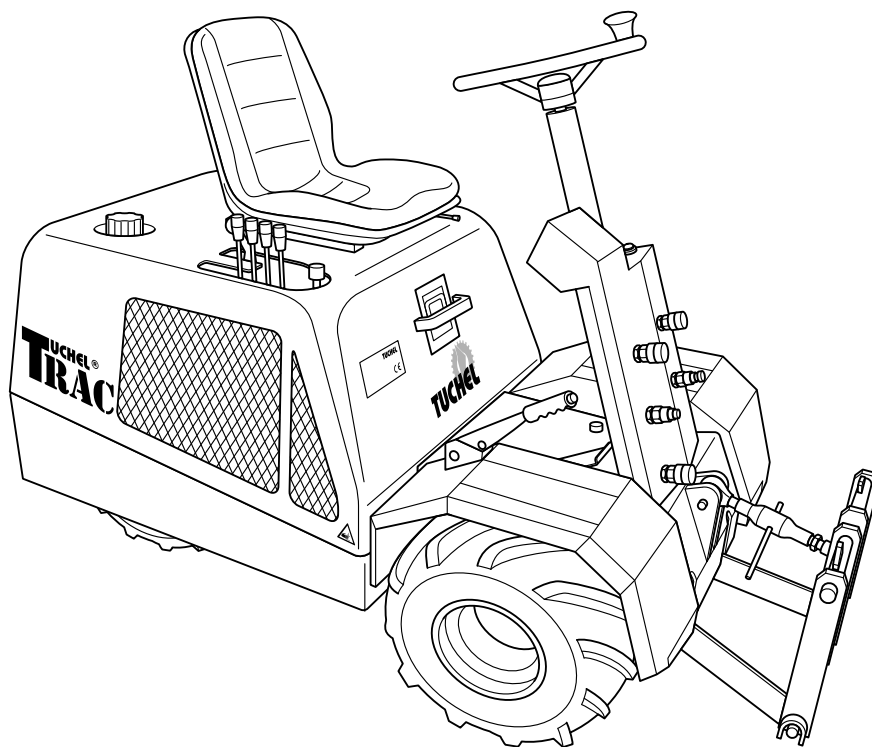




Operating manual



i

This operating manual is only valid in combination with the corresponding operating manual of the combustion engine (diesel = Kubota)

The supplied delivery inspection form is to be filled out completely and returned to the manufacturer.

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Foreword

Dear Customer,

The Tuchel-Trac® product you have purchased has been manufactured to the highest quality standards. In order to eliminate any possibility of damage to persons or property, you must read and observe the respective safety and warning instructions in this manual and on the machine before using or servicing the machine.

Before placing the machine into operation, all machine operators must make themselves familiar with the handling of this machine using this operating manual. The safety regulations are to be strictly adhered to. Adherence to the valid safety regulations for your country is also obligatory.

1 General information about this operating manual

A word about this operating manual

To maintain the safety and utilisability of the machine, a professional operation as well as conscientious care and maintenance are necessary. When you use the machine for its intended purpose, the operating manual at hand will help you to avoid damages to persons and property. The manual takes the necessary legal conditions and guidelines into account and contains important information.

The operating manual is part of the Tichel-Trac® and should be kept with the machine so that it is readily available at any time. If the operating manual becomes soiled or gets lost, a new replacement manual can be requested from Tichel Maschinenbau GmbH at any time. If the machine is sold, the operating manual must be transferred to the new owner.

The owner of the machine bears the responsibility for the following points:

- Every operator must be of at least legal minimum age and physically as well as mentally fit to reliably fulfil the tasks assigned to them.
- Every person who operates or services the machine must have read and understood the operating manual beforehand.
- The machine may only be used for its intended purpose in accordance with regulations.
- The machine may not be improperly modified or altered.

The declaration of conformity of the Tichel Maschinenbau GmbH expires if the owner allows safety-relevant modifications to be performed on the machine. The party performing the modifications must issue a new certificate. If you have questions concerning this, please contact Tichel directly.

Declaration of conformity

The Tichel-Trac® satisfies the "essential health and safety requirements" of the machinery directive 2006/42/EC and is authorised to carry the CE mark.

Furthermore, the harmonised European Norms DIN EN 12100, DIN EN 982, DIN EN 1553 and BGV D 29 were used for the development of the machine. These are documented in the EU declaration of conformity.

Please see the back side of this operating manual for the manufacturer address.



NOTE!

The declaration of conformity is depicted on the following page.

EG-Konformitätserklärung

im Sinne der EG-Richtlinie für Maschinen 2006/42/EG

Der Hersteller:

Tuchel Maschinenbau GmbH
Holsterfeld 15
D-48499 Salzbergen

erklärt hiermit, dass die nachstehend beschriebene Maschine:

Fabrikat: Tuchel-Trac Trio
Typ: 1601
Maschinennummer:

übereinstimmt mit den Bestimmungen folgender EG-Richtlinien:

- Maschinen-Richtlinie 2006/42/EG
- EMV-Richtlinie 2004/108/EG (Elektromagnetische Verträglichkeit)

Angewendete Normen und technische Spezifikationen:

- DIN EN ISO 12100-1:2003
- DIN EN ISO 12100-2:2003
- DIN EN 13857:2008
- DIN EN 349:1993
- DIN EN 982:1996
- DIN EN 1553:1999
- DIN EN 703:2005

Salzbergen, den September
2013

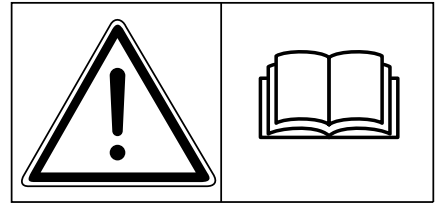


.....
Dieter Beckmann
Geschäftsführer

2 Safety

General safety information

Most accidents are caused by the disregard of the essential safety regulations. In order to prevent accidents and thus eliminate any possibility of damage to persons or property, you must have read and understood the respective safety and warning instructions in this manual and in the manual of the accessory equipment before performing any work.



Intended use

The machine is designed to be used solely for the purpose defined in Chapter "*Description / overview*" (page 25) and the approved components.

Any other use does not comply with the regulations/requirements or intended use. The manufacturer cannot assume liability for any damages resulting from an unintended use. The user/ owner alone bears the risk for this.

Follow the corresponding safety instructions and working steps from this operating manual and the manual of the accessory equipment. These also pertain to the intended use.

Operating the machine on public roads is not allowed.

If necessary, a certificate of exemption must be applied for according to §70 of the StVZO (Road Traffic Licensing Regulations).

Safety instructions in the operating manual

In the operating manual at hand, the following signal words and signs are used to make the safety instructions recognisable as such at a glance:



This is the hazard warning. It warns you about the risk of injury.

- Comply with all activities labelled with the hazard warning in order to prevent injuries or death.



DANGER! – Danger of death

Identifies risks, which can result in severe injuries to health or lead to death if the respective danger warning was not observed or was not observed sufficiently.



WARNING! – Bodily injury

Identifies risks, which can cause physical injury if the respective warning was not observed or was not observed sufficiently.



CAUTION! – Light injuries

Identifies risks that can cause light bodily injury.



This is the caution warning. It warns you about the risk of property damage. It differs from the hazard warning in order to distinguish between property damage and bodily injury.

- Comply with all activities labelled with the caution warning in order to prevent property damage and damage caused to the environment.



ATTENTION! – Property damage

Identifies solely the risk of possible property damage and damage caused to the environment.



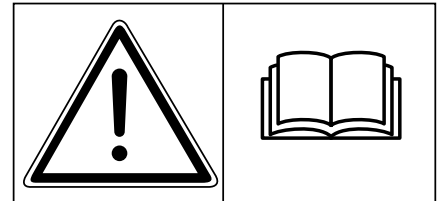
NOTE!

Identifies application tips and useful information.

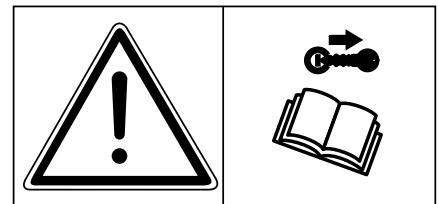
Safety stickers on the machine

Information and symbols directly attached to the machine such as safety labels must be observed without fail. They may not be removed and are to be kept in a completely legible condition.

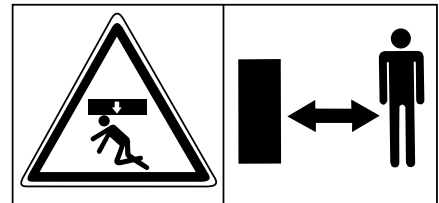
Read and observe the operating manual and safety instructions before placing into operation.



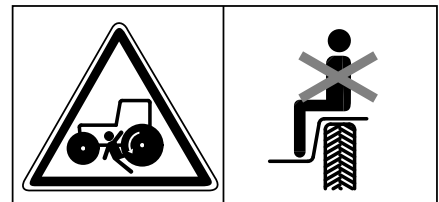
Read and observe the operating manual and safety instructions before performing any maintenance work.



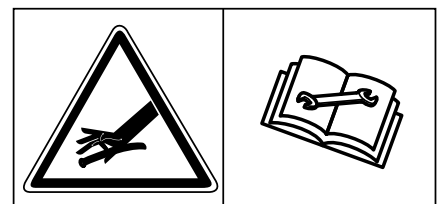
Do not stay in the area of a raised and unsecured load.



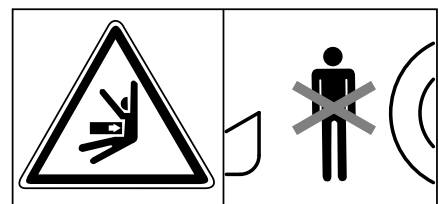
The transporting of passengers is not permitted.



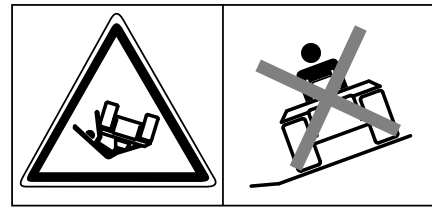
Caution with escaping high pressure fluid. Observe the safety instructions in the operating manual.



Never step in the hazard area between the accessory equipment and the machine.



Avoid hillside situations where the machine can slide off or topple over.



Beware of hot surfaces!

Hot surfaces, such as machine parts, containers or materials but also hot fluids are not always noticeable. If such a safety label is attached to a component, caution is advised. Use suitable personal protective equipment.

Hot surfaces which lie above 45°C and which can thus cause burns (coagulation of protein) are labelled.

What to do: Hot surfaces should not be touched without protective gloves.



Warning injury to hands!

Hand injuries are the most common result of accidents on the job. Attention, keep hands away from areas which have these warning labels!

There is the risk that hands could be crushed, pulled in or otherwise be injured.



There is the risk that hands could be pulled in by rotating fans or otherwise be injured.



Fire, smoking and open flame forbidden!

This figure is used where there is a significant fire hazard due to existing substances (fuels / battery acid).

What to do: No sources of ignition may be brought into or arise the identified areas.

No work that creates ignition sparks may be performed such as welding, grinding, detaching or cutting.

If work must be performed in the identified areas, special safety measures are to be taken prior to performing the work.



Wear hearing protection!

Suitable hearing protection is to be worn when operating the machine. The sound level of the machine measured in dB(A) is specified in chapter "Technical data" (page 23).



Safety regulations

You may only operate or perform maintenance work on the machine if you have been trained accordingly and authorised to do so.

Observe all regulations, measures and safety instructions when operating or performing maintenance work on the machine.

When working together with other persons, discuss and agree to all the hand signals that you are planning to use amongst each other and designate a coordinating person beforehand.

Safety installations

Ensure that all guards and covers are properly attached to the machine.

Make sure that damaged guards and covers are repaired.

Under no circumstances may any safety installations be removed such as e.g. the protective grating on the air filter.

Clothing

You may not wear loose-fitting clothing, jewellery or wear your hair open. These items could get caught in control elements or in moving parts such as fans and cause severe injuries.

Change clothing that is soiled with highly inflammable substances immediately.

Always wear the operationally required protective equipment e.g. hearing protection, protective glasses, safety shoes, dust mask or gloves when operating or performing maintenance work on the machine.

Make sure that no unauthorised person(s) are remaining in the hazard area.

Modifications to the machine

Tuchel Maschinenbau GmbH assumes no liability for modifications that are made without the express permission of the manufacturer.

Tuchel Maschinenbau GmbH assumes no responsibility for injuries or damages caused by unapproved modifications.

Before leaving the machine

Lower the equipment to the ground.

Secure the working hydraulics by means of the neutral position.

Set the hand throttle lever to <turtle>.

Activate the holding brake and turn off the engine.

Always remove the ignition key and close the ignition switch with the locking cap before you leave the driver's seat.

Keep the ignition key in safe custody.

Climbing on and off

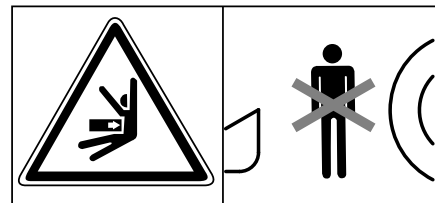
Never jump onto or off of the machine. Never climb onto or leave a running machine.

Always climb onto the machine from the left side. Do not hold onto control levers and do not step on the accelerator pedal.

Protecting against injuries

Never stick body parts between moving parts e.g. between equipment and machine. Never place yourself in an endangered area.

When operating the equipment, the free sizes change which leads to serious injury.



Working with high temperatures

Immediately after operating the machine, engine oil and hydraulic oil are very hot and are under pressure. Wait until the temperature has dropped before performing work on the machine.

Lower the equipment and turn off the engine. Allow the hydraulic oil to cool before you open the engine bonnet. Slowly untwist the screw cap so that the pressure can escape from the tank (radiator).

Observe that the parts in the engine compartment have high surface temperatures (e.g. exhaust system, engine, hoses, ...). Always use suitable personal protective equipment.



Fire prevention and fire-fighting

Fuels and oil are easily inflammable and can cause fires.

Do not come near inflammable materials with an open flame.

Turn off the engine before refuelling and do not smoke.

Perform refuelling or refilling of oil in a sufficiently ventilated location.

Close all screw caps tightly.

Check the fuel system and hydraulic system for leaks. Have leaks repaired immediately.

When near highly combustible objects such as straw or hay, there is a risk of fire from flying sparks or high surface temperatures of the exhaust system.

Remove wood chips, straw and other highly combustible objects which can collect in the engine compartment and on the exhaust system. They can cause a fire.

Do not operate the machine near open fire.

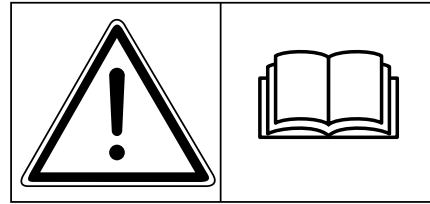


Accessory equipment

Read the accessory equipment operating manual before installing and using additional accessory equipment, and observe the installation and operating manuals completely as well as all safety regulations.

The use of accessory equipment that is not approved by Tuchel Maschinenbau GmbH is not permitted under any circumstances. The use of unapproved accessory equipment affects the safety, the proper operation and the expected useful life of the machine.

Tuchel Maschinenbau GmbH assumes no liability for injuries, accidents or damages that are caused by the use of unapproved accessory equipment.



Battery

Work on the battery may only be performed by specialist repair shops.

Before starting the engine

Safety at work

Before starting the operation, check the working area for dangerous working conditions.

Inspect the surface and condition of the ground at the site and determine the optimal and safe way of working.

Operating in enclosed spaces

The emissions from combustion engines are harmful to health. The machine may only then be operated in enclosed spaces if these have a sufficient technical or natural means of ventilation. Attention! Danger of poisoning.

Operating the machine

Before starting the engine

Start and operate the machine from the seat only.

No other person is permitted to be on the vehicle besides the operator.

Driving in reverse

Ensure that no one stays near or behind the machine or stands in the path of travel.

When driving

Drive slowly when driving on uneven terrain and avoid jerky steering movements and accelerate evenly.

When working

Ensure that no one stays near or behind the machine.

Perform work in the direction of the wind as much as possible to protect yourself from dust and limited visibility.

Avoid jerky starts, turns or stops when equipment is attached to the machine.

High visibility

When working in dark areas, provide additional lighting for the working area.

Stop working when visibility is poor e.g. during fog, rain or snow and wait until the visibility has improved enough to ensure that work can continue safely.

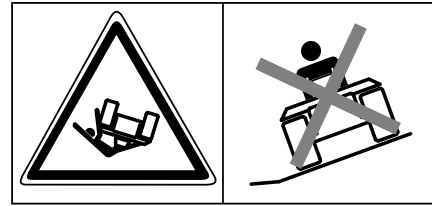
Working on snow or black ice

When working on snow-covered or iced-over ground, there is the risk that the machine can start to skid even on the slightest of inclines. Therefore, drive slowly and avoid jerky starts, turns and stops.

The roadside and objects are no longer clearly recognisable under snow. Therefore use extreme caution when ploughing snow.

Working on loose ground

The ground is much softer after heavy rain. Do not work with the machine too closely to overhangs, precipices and deep ditches. If the ground sinks at such areas, the machine will topple down, tip over and cause severe injuries.



Cornering

Do not perform any steering movements at full driving speed, decelerate the machine first and then drive through the curve slowly in a large radius.

Driving on embankments

Always keep a sufficient distance to ridges or steep slopes and embankments. The machine will slide or tip over on these areas. Refrain from any working method which impairs the vehicle's stability against overturning!

The stability against overturning is always at the (sole) discretion of the operator.

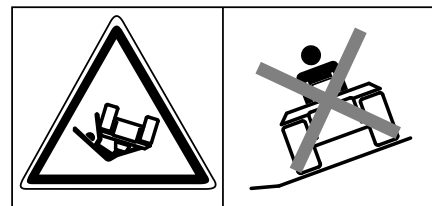
The machine is not suitable for operation on slopes or embankments. Use vehicles which are specifically developed for this purpose. On a slope, a number of factors such as angle of slope, subsurface, mode of operation, accessory equipment etc. can lead to the machine sliding or tipping over.

If the machine is operated in a hillside situation, the operator alone carries the responsibility for the resulting damages to the machine and accidents.

Do not turn on embankments and do not drive the machine across any embankments. Perform this driving manoeuvre on level ground only.

Drive very slowly and carefully and pay attention to the vehicle's tipping point.

Drive only straight uphill or straight downhill on slopes.



Braking

The machine brakes automatically if you release the accelerator pedal.

Use the holding brake only when the vehicle is at a standstill.

Emergency lowering

If the engine or hydraulic system malfunctions, the accessory equipment is lowered to the ground by the operation of the lift / lower control lever.

Turning off of the machine

Turn off the machine on level ground. Lower the equipment to the ground completely.

Turn off the engine, activate the holding brake and always remove the ignition key and close the ignition switch with the locking cap. See also *"Before leaving the machine"*, page 14.

Transporting

Loading and transporting

Always load the machine without accessory equipment attached.

Turn off the engine, activate the holding brake, always remove the key and close the ignition switch with the locking cap.

Use only a fork lift or a wheel loader with stacker equipment (fork prongs) to lift the vehicle onto the loading space.

Adjust the prongs so that the prongs can be positioned sufficiently wide enough apart between front and rear axle, see dimension "X" in the adjacent drawing.

Drive with the prongs underneath the hydraulic tank without damaging the bleed screw (1) of the hydraulic tank in the process.

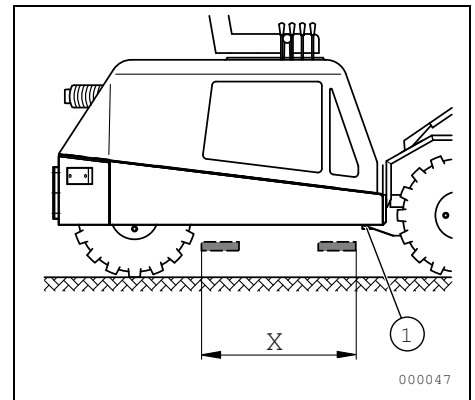
Place suitable cushioning material (rubber mats) underneath.

Secure the machine sufficiently on the prongs.

Follow the transporting instructions from the operating manual of the fork lift or wheel loader manufacturer.

Position the machine correctly onto the transporting vehicle and secure the machine onto the loading space using belts.

An inadequately secured machine can shift during transport and fall from the transporting vehicle. Secure the machine properly.



Safety measures during maintenance

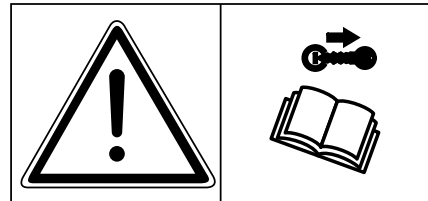
Personnel

You may only perform service or repair work on the machine if you are a qualified specialist or if you have been carefully briefed about the work to be performed by a qualified specialist.

Before performing maintenance work

Before performing the maintenance work, read and observe the operating manual and the safety instruction in particular.

If maintenance work is being performed on the machine, the engine may not be started and operating elements as well may not be activated without prior consultation. This leads to accidents with severe injuries.



Tools

Use appropriate tools only. The use of damaged, poor quality, faulty or makeshift tools will cause injuries.

Safety-relevant parts

The parts are subject to a normal wear and must be replaced at regular intervals even if they are not yet defective.

Safety-relevant parts are:

Fuel system:

- Fuel hose, overflow hose and tank cap

Hydraulic system:

- All hydraulic hoses

Protective grating:

- Fan, ...

Defective parts must be replaced immediately even if the specified time has not yet expired. Hydraulic hoses must be replaced after 6 years including a storage time of max. 2 years.

Before performing the inspection and maintenance

Accessory equipment must be removed before the maintenance.

Park the machine on solid and level ground.

Turn off the engine and activate the holding brake. Remove the ignition key and keep it in safe custody.

During the maintenance

Follow the accompanying operating manual of the combustion engine.

Keeping the machine clean

Always keep the machine clean.

Do not clean the machine with a pressure cleaner.

Never use fuel to rinse off or clean parts.

Replenishing fuel, oil or coolant

Spilled fuel, coolant or oil poses a fire hazard and a risk of slipping. Remove any spilled fluids immediately.

Take the surface temperature into account. See "*Working with high temperatures*", page 15.

Always replenish fuel and oil in a sufficiently ventilated area.

Clean the area around the fill opening before refilling.

Close the fill locations after refilling.

Do not allow oil or fuel to get into the soil or ground water.

Dispose of in an environmentally friendly manner.

High-pressure hoses

You are not allowed to kink, bend or buckle high pressure hoses nor hit against them with hard objects. Do not use piping or hoses with cracks or kinks. They will burst under use.

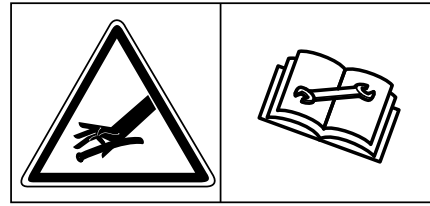
Exposure to high pressure oil

Always remember that the hydraulic system is under high pressure.

You are not permitted to add any oil, drain any oil and also perform any maintenance and inspection work before the accessory equipment has been removed and the lift / lower device has been lowered. In addition, the machine must be parked on solid level ground and the engine must be switched off.

If oil under high pressure leaks out, there is the risk that the oil jet can get into the eyes or penetrate the skin. Therefore, always wear protective glasses and gloves and always use a piece of paper or wood to check for oil leakages.

If you have been struck by a high pressure oil jet, contact a physician immediately and explain the details of the incident.



Fan and V-belt

Always keep a sufficient distance to rotating parts and ensure that nothing can get caught up in them.

Parts that get into the fan can be cut off or flung off.

Do not wear loose-fitting clothing, jewellery, scarves or similar or wear open, long hair that can become caught.

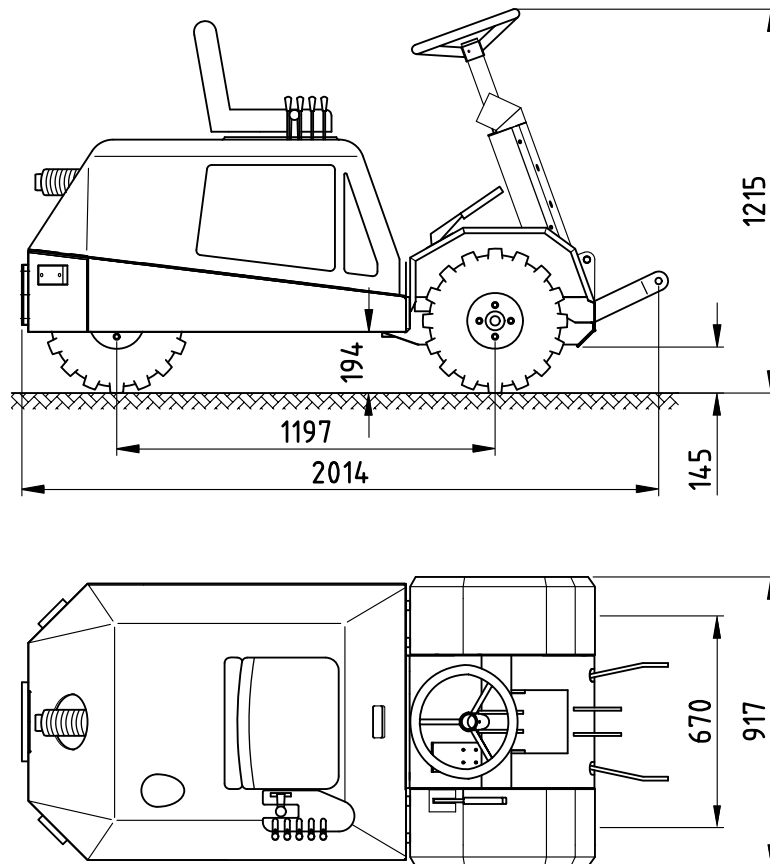
Waste materials

Collect the old oil from the machine in a container. Never let oil flow onto the ground.

Comply with the applicable laws and regulations for the disposal of harmful substances and objects such as oils, fuels and batteries.

3 Technical data

Dimensions



000020

Work values

Turning radius	1457 mm	1830 mm (outer)
Approved axle loads	front: 800 kg	rear: 400 kg
Approved gross vehicle weight	1,200 kg	
Braking system	Mechanical holding brake	
Tyre size / air pressure	18x8.50-8 / 1.50 bar	Tractor tyres
	19x9.50-8 / 1.68 bar	Tyres with grass profile (option)
Speed	2 driving speeds	4.4 km/h and 11.3 km/h
Power train	Hydraulic	All-wheel, 3 wheel motors
Steering system	Hydraulic	
Gradient angle	max. 40%	
Weight	642 kg	

Engine

Diesel engine	Model	Kubota Z602
	Cooling	Water cooling
	Displacement / cylinders	0.599 l/cm ³ / 2 cylinders
	Engine output at 3200 rpm	10.3 kW (14 PS)
	Fuel, tank capacity	Diesel, approx. 14 l

Working hydraulics

Working hydraulics	Working pressure	140 bar
	Displacement volume	25 l/min at 3200 rpm
	Hydraulic oil, tank capacity	65 l
Drive circuits	1x double-acting drive circuit	
	1x leak oil	
	1x double-acting drive circuit (option)	
Lifting power	350 kg at the crosspoint	

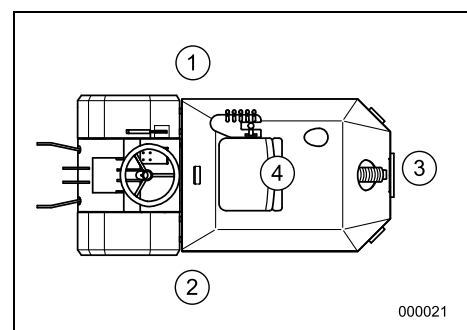
Additional equipment (option)

Towing hitch	Towing capacity 250 kg	Supporting load 50 kg
--------------	------------------------	-----------------------

Noise emission

Noise level at the machine measured in dB(A).

Measuring position	[1]	[2]	[3]	[4]
	1 m distance to the machine.			
Idling	82	82	77	78
Full load	92	94	91	92



4 Description / overview

The Tuchel-Trac® is a mobile working machine that can be fitted with various additional equipment depending on the application.

The so-called lower link serves for the attachment of accessory equipment or attachment of the quick-change unit.

The quick-change unit simplifies the attachment of the additional equipment.

The Tuchel-Trac® has a three wheel, all-wheel drive design. The mechanical power of the diesel engine is converted into hydraulic power by a pump. The power is again transferred to the hydro motor of the traction drive, the hydraulic cylinder of the steering and the lower link as well as the drive circuits of the working hydraulics.

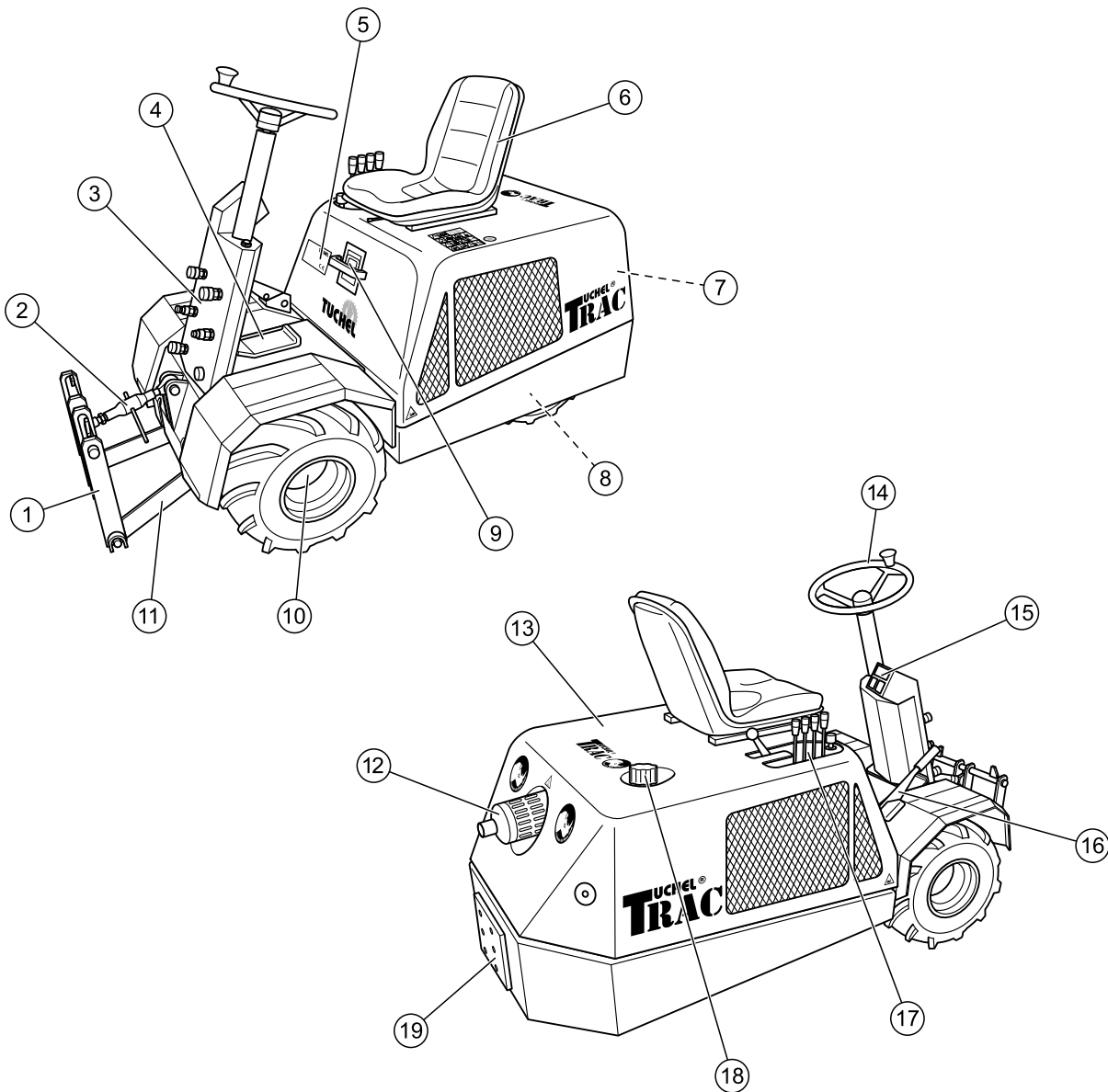
The traction drive and the working hydraulics are connected to the same hydraulic tank.

A safety switch integrated into the driver's seat blocks the hydraulic drive circuit as soon as the driver stands up from the seat.

In order to activate the working hydraulics, a foot contact switch must additionally be activated.

There are two drive positions available. The first drive position is designed for the working application; the second drive position is provided for the normal driving operation. The foot contact switch must also be operated for driving in the second drive position.

General view

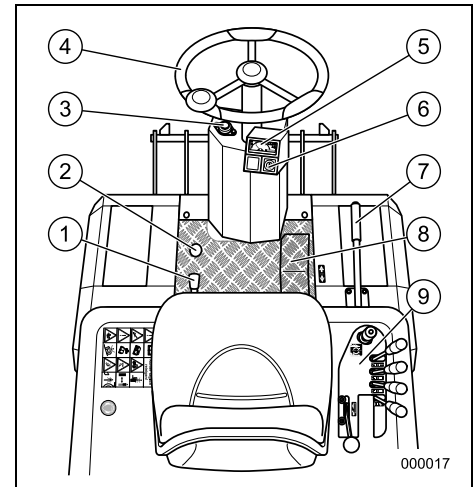


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- | | |
|-----------------------------------|--------------------------------|
| 1 Quick-change unit | 11 Lower link |
| 2 Upper link | 12 Exhaust system |
| 3 Hydraulic connections | 13 Engine bonnet |
| 4 Accelerator pedal | 14 Steering wheel |
| 5 Type plate | 15 Instrument panel |
| 6 Driver's seat | 16 Holding brake |
| 7 Filler neck for hydraulic oil | 17 Control lever |
| 8 Rear wheel (steerable) | 18 Filler neck for diesel fuel |
| 9 Engine bonnet locking mechanism | 19 Holder for rear weights |
| 10 Front wheels | |

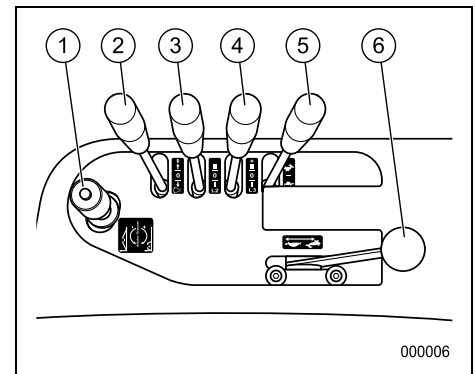
Driver's position

- 1 Seat adjustment lever
- 2 Foot contact switch
(to enable the working hydraulics and the second drive position)
- 3 Horn
- 4 Steering wheel
- 5 Display panel
- 6 Ignition switch
- 7 Holding brake
- 8 Accelerator pedal
- 9 Control lever



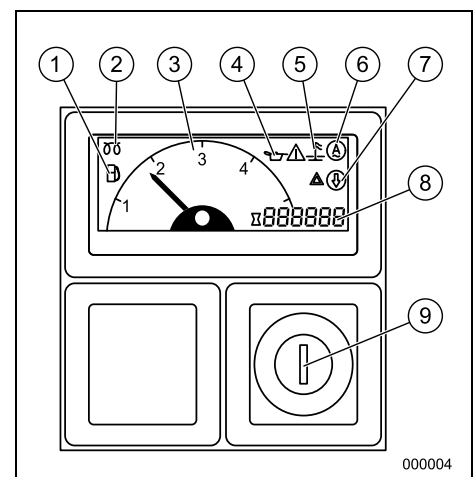
Control lever

- 1 Control valve for pull-away / braking speed
- 2 Lift / lower control lever
- 3 Control lever L2 (option)
- 4 Control lever L3
- 5 Driving speed lever
- 6 Hand throttle lever



Display panel

- 1 Fuel – Warning indicator
- 2 Preheating – Control display
- 3 Tachometer
- 4 Engine oil pressure – Warning indicator
- 5 Coolant temperature – Warning indicator
- 6 Battery – Control display
- 7 Air filter – Warning indicator
- 8 Operating hours counter
- 9 Ignition switch / start switch



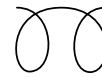
1 Fuel – Warning indicator

The warning indicator must not light up during operation. If the indicator lights up, sufficient fuel must be refilled. The fill amount is specified in chapter "Technical data"; page 24.



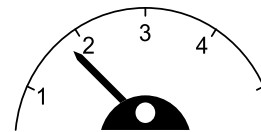
2 Preheating – Control display

The indicator lights up during preheating and goes out after a few seconds. Only then may the engine be started. The indicator only lights up in the "GL" position.



3 Tachometer

The display shows the engine speed in the range from 0 - 5000 rpm.



4 Engine oil pressure – Warning indicator

If the engine oil pressure falls below the permitted value, the indicator lights up and a warning buzzer sounds.



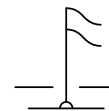
ATTENTION!

Damage to the engine.

- Stop the machine immediately and turn off the engine. Proceed as described in the combustion engine operating manual.

5 Coolant temperature – Warning indicator

The indicator lights up if the coolant temperature of the engine is too high. A warning buzzer also sounds.



ATTENTION!

Damage to the engine.

- Stop the machine immediately and turn off the engine. Proceed as described in the combustion engine operating manual.

6 Battery – Control display

The control display monitors the charging of the battery. Once the engine is running, the display goes out. If the indicator lights up while the engine is running, it indicates that a malfunction is present.

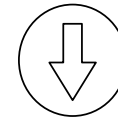
Proceed as described in the combustion engine operating manual.



7 Air filter – Warning indicator

The indicator lights up red if the air filter is contaminated. In this case, the air filter cartridge must be cleaned or replaced.

Proceed as described in the combustion engine operating manual.



8 Operating hours counter

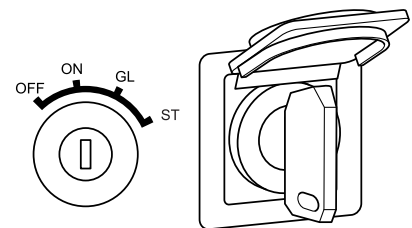
The operating hours counter displays the total operating hours. The operating hours are only counted for running engine only, independently from whether the machine is moving.



9 Ignition switch / start switch

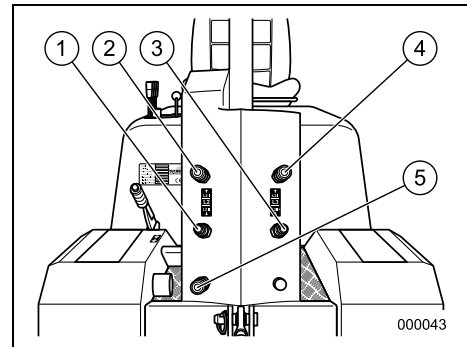
The engine is preheated and started with the start switch. In the "ON" position, the following warning and control indicators are displayed simultaneously:

- Engine oil pressure
- Coolant temperature
- Battery
- Operating hours counter



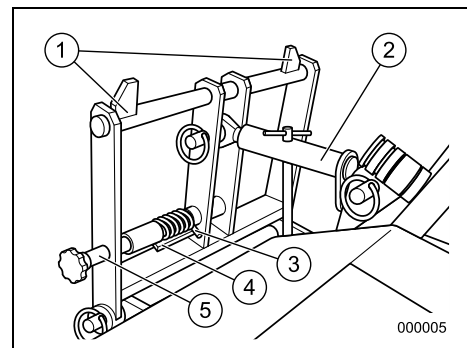
Hydraulic connections

- 1 Connection plug for control lever L2 (flow line II) as option
- 2 Connecting sleeve for control lever L2 (return line I) as option
- 3 Connecting plug for control lever L3 (flow line I+)
- 4 Connecting sleeve for control lever L3 (return line II)
- 5 Connecting sleeve for overflow oil line (free return)



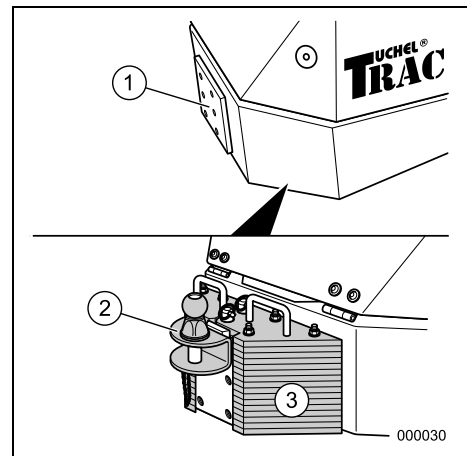
Quick-change unit

- 1 Centring spikes
- 2 Upper link
- 3 Locking pin
- 4 Locking bar
- 5 Locking bolt



Accessories

- 1 Holder for rear weights
- 2 Towing hitch
- 3 Rear weights



Type plate

Model _____

Serial no. _____



Year of manufacture /
 order no. _____

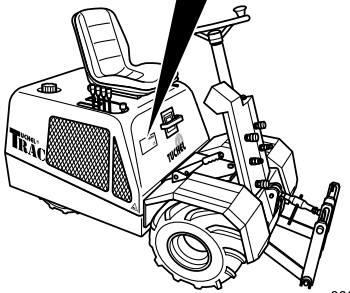
Kerb weight (kg) _____

Enter the machine data here so that the specifications are readily available at any time.

The complete identification marking has the value of a certificate and may not be modified or made irrerecognisable.

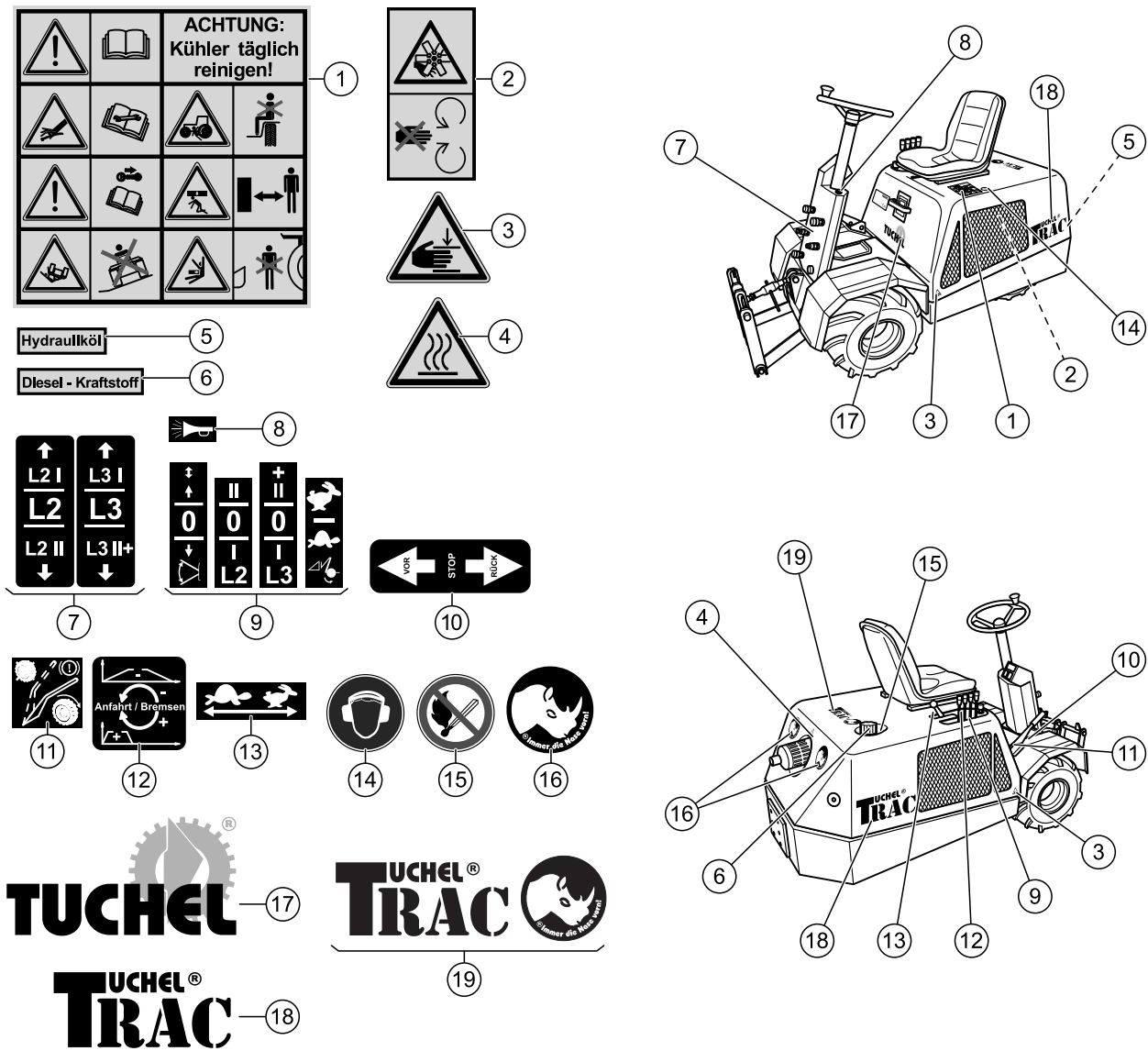
The identification marking must be replaced if it is damaged or has faults.

Modell	_____	 TUCHEL MASCHINENBAU GmbH <small>Waldenstraße 15 • D-98699 Salsbergen Tel. +49 (0) 5971 9675-4 • Fax 9675-30 www.tuchel.com • service@tuchel.com</small>
Serien-Nr.	_____	
Baujahr / Auftrags-Nr.	_____	
Leergewicht (kg)	_____	
Zul. Gesamtgewicht (kg)	1200	
Zul. Achlasten vorne (kg)	800	 Made in Germany
Zul. Achlasten hinten (kg)	400	



000019

Identification marking locations



- 1 Warning stickers (group stickers)
- 2 "Fan" warning sticker
- 3 "Crushing risk" warning sticker
- 4 "Hot surface" warning sticker
- 5 "Hydraulic oil" sticker
- 6 "Diesel fuel" sticker
- 7 "Hydraulic connections" symbols
- 8 "Horn signal" symbol
- 9 "Control levers" symbols
- 10 "Direction of motion" symbol
- 11 "Holding brake" symbol
- 12 "Pull-away/brake" symbol
- 13 "Hand throttle" symbol
- 14 "Hearing protection" mandatory sign
- 15 "Open fire" prohibition sign
- 16 "Immer die Nase vorn" logo
- 17 "Tuchel" manufacturer nameplate
- 18 "TuchelTrac" manufacturer nameplate
- 19 "TuchelTrac logo" manufacturer nameplate

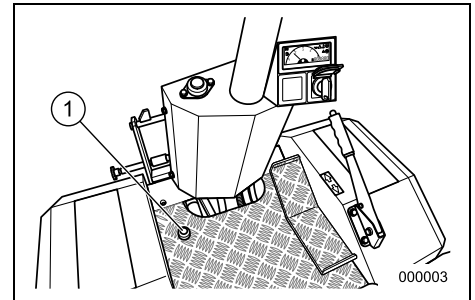
000018

5 Operation

Foot contact switch

The drive circuits of the working hydraulics are disabled by a safety valve and are only enabled by operating the foot contact switch (1). The foot contact switch must also be operated if the machine is to be driven in the second drive position.

1. Operate the foot contact switch (1) in order to activate the working hydraulics or the second drive position.



Lift / lower control lever



NOTE!

The terms "outwards" and "inwards" are used as follows for the description of the lever operation:

Outwards = The lever is moved outwards, away from the driver's seat.

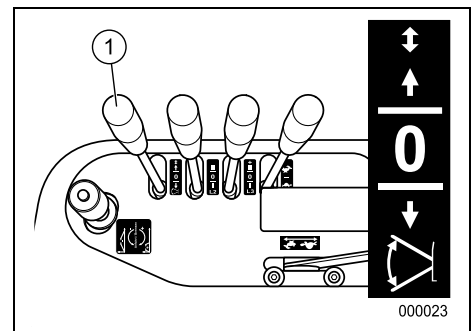
Inwards = The lever is moved inwards, towards the driver's seat.

The lift / lower control lever (1) is used to raise or lower the accessory equipment.

Do not move the lever jerkily.

1. Operate the lever (1) over the notch outwards.
The accessory equipment lowers. The lever remains in this indexed position or floating position. The accessory equipment follows the contour of the ground.
If the lever is not pressed outwards until the indexed position, it goes back to the "0" position automatically.
2. Move the lever (1) to "0" to cancel the floating position.
3. Press the lever inwards.
The accessory equipment is raised. The position does not have a locking function.

Always lower the accessory equipment to the ground before you remove yourself from the machine.



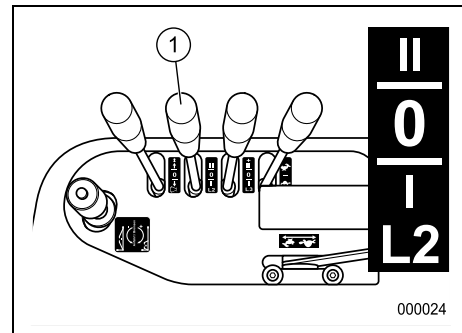
000023

Control lever L2 (option)

The hydraulic circuit L2 from the accessory equipment is activated with the control lever L2 (1).

Do not move the lever jerkily.

1. Press the lever (1) outwards in position "II".
The hydraulic oil flows through the accessory equipment as long as you press the lever.
2. Press the lever (1) inwards in position "I".
The hydraulic oil flows in the opposite direction through the accessory equipment as long as you press the lever.



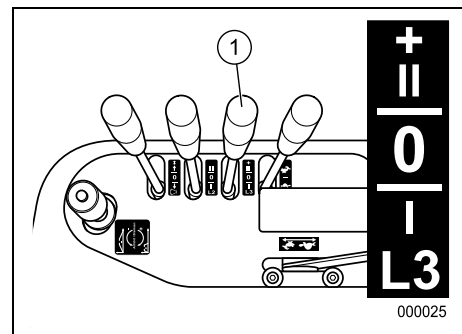
The hydraulic circuit does not have a lag protection i. e. in position "0" the oil does not flow back, e.g. for inclination of a snow plough blade or a road sweeper.

Control lever L3

The hydraulic circuit L3 from the accessory equipment is activated with the control lever L3 (1).

Do not move the lever jerkily.

1. Press the lever (1) outwards over the notch in position "II+".
The lever stays in the indexed position. The flow line of the hydraulic circuit is free and the hydraulic oil flows through the accessory equipment (e.g. for the operation of a road sweeper).
If the lever is not pressed outwards until the indexed position, it goes back to the "0" position automatically.
2. Press the lever (1) inwards in position "I".
The hydraulic oil flows in the opposite direction through the accessory equipment. The position does not have a locking function.



Driving speed lever

You can switch between two driving speeds / drive positions using lever (1):

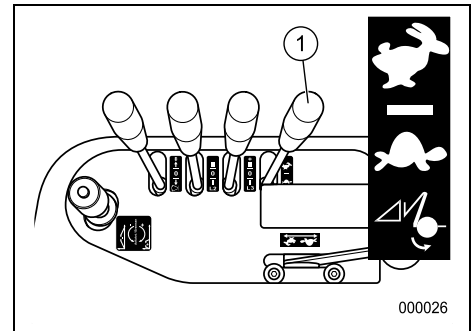
- Drive position 1 <turtle> = slow
- Drive position 2 <rabbit> = fast

1. Press the lever (1) inwards to position <turtle>. This drive position is designed for the working application.

Never switch to the second drive position during the working application. The second drive position is not designed for working applications.

You are not allowed to operate any other control levers while in the <rabbit> position.

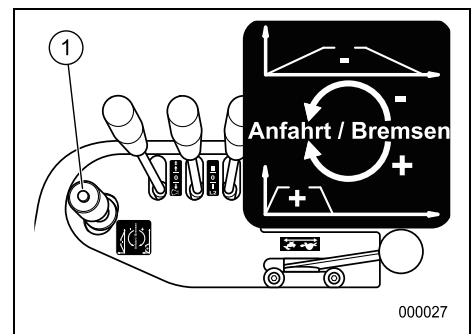
2. Press the lever (1) outwards to position <rabbit> in order to increase the final speed when driving without working application.



Control valve for pull-away / braking speed

The driving behaviour during pull-away and braking is set using the control valve (1) and thus also influences the pull-away and braking speed.

1. Turn the control valve anti-clockwise (-). The machine slows down and slowly comes to a standstill.
2. Set the driving behaviour according to your own discretion for your particular working application.



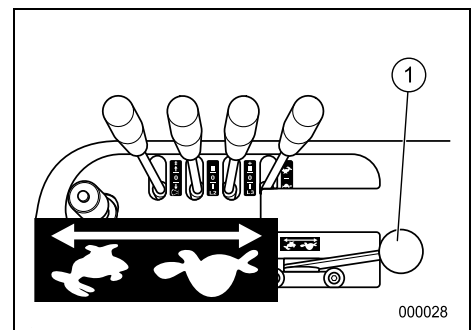
For an uphill climb or an inclination:

1. Turn the control valve completely closed in a clockwise (+) direction.
2. Once the machine is again level, turn the control valve open anti-clockwise (-).

Hand throttle lever

The engine speed is preset using the hand throttle lever (1).

1. Press the lever backwards to position <turtle>. The engine speed is lowered.
2. Press the lever forwards to position <rabbit>. The engine speed is increased.



6 Operation

Placing into operation

Before placing the machine into operation, every operator must have carefully read and understood the available operating manual as well as the operating manuals for the combustion engine and the accessory equipment.



WARNING!

Damage or defects to the machine or to the accessory equipment can lead to accidents.

- If defects are found during the following test, the machine may not be operated until it has been properly repaired.
- The machine may only be operated in a technically sound state and for its intended purpose in accordance with regulations.



ATTENTION!

Damage to the machine through excessive loads.

- Observe the maximum axle load limits.

Break-in time

The following guidelines apply during the first 50 operating hours:



ATTENTION!

Damage to the machine.

- During the first 50 hours of operation, 70% of the full load may not be exceeded.
- Choose a gentle driving and working method. However, do not break-in the machine too timidly since otherwise an unfavourable operating temperature is reached.
- Do not use the engine continuously at the highest speed.
- Increase the load at alternating speeds.
- Comply with the maintenance schedule.

Checks before placing into operation

Check for yourself that the machine and accessory equipment is safe to operate.

- Visual walkabout inspection of the machine:
 - No outer components may be broken or deformed.
 - No operating fluids may leak from the area below the machine.
 - The hydraulic system may not exhibit any damages or leakages. Damaged hoses must be replaced.
 - Accessory equipment must be attached properly and function according to its separate operating manual. Is the accessory equipment securely interlocked?
 - Are the stepping surfaces clean?
 - The tyres may not be damaged or worn out.
- Checking the fill levels:
 - Is the tyre pressure correct?
 - Is there sufficient fuel in the tank?
 - Is the engine oil level correct?
 - Is the oil level in the hydraulic oil reservoir correct?
- Is the engine bonnet locked?

Settings before starting

Adjusting the driver's seat

1. Ensure that the engine bonnet is locked.
2. Climb onto the machine from the left side as seen in the direction of travel.
3. Use the stepping surfaces provided.
4. Sit down on the driver's seat.
5. Adjust the driver's seat as follows:
 - Seat yourself back far enough so that your back is against the backrest.
 - With your back leaning against the backrest, you must be able to operate the full range of the accelerator pedal (2) in all directions and turn the steering wheel in its full range in all directions.
 - You must be able to securely reach and operate all operating elements.

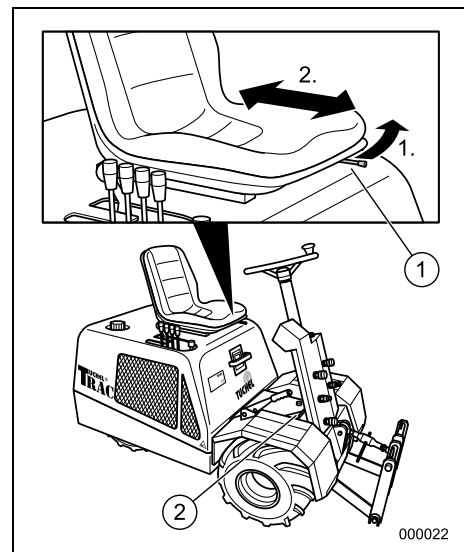


WARNING!

Risk of accident by unintended operation e.g. of the accelerator pedal.

- Do not adjust the driver's seat while driving.

6. Pull the lever (1) outwards.
7. Slide the seat forwards or backwards to the correct seating position.
8. Release the lever and ensure that the seat is engaged.



Starting the engine

Starting conditions

- The control levers of the working hydraulics must be in the null position and may not be engaged.
- The lever for driving speed must be set to <turtle>.
- The driver must be sitting on the driver's seat with back against the backrest so that the seat switch is activated.



DANGER!

Exhaust gases are poisonous.

- Never start the engine in an enclosed space or poorly ventilated room.

Starting procedure

1. Activate the holding brake (1).
2. Set the hand throttle lever (2) to <turtle>.
3. Turn the ignition key to position "GL" and wait until the preheating indicator has gone out.
4. Turn the ignition key to position "ST" to start the engine and immediately release as soon as the engine has started up.



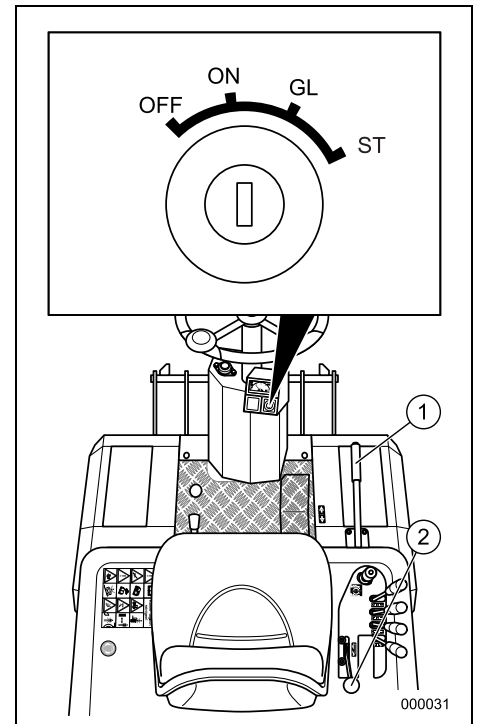
ATTENTION!

Damage to the machine.

- Never operate the starter longer than 15 seconds. If the engine does not start up during this time, wait at least two minutes before attempting to start it again. If the engine does not start up after two attempts, refer to "Troubleshooting"; page 69.
- Never turn the ignition key to start while the engine is running.
- During the first 50 hours of operation, 70% of the full load may not be exceeded.
- The machine may not be towed away if the engine does not start up.

5. Let the engine turn in neutral without load for approx. two minutes.
 6. Set the hand throttle lever (2) between <turtle> and <rabbit>.
- The warming-up time is increased for colder outside temperatures. The required warming-up times are listed in the adjacent table.

✓ The machine is ready for operation.



Outside temperature	Warming-up time
over 0° C	5 minutes
0° C to -10° C	10 minutes
-10° C to -20° C	20 minutes
below -20° C	No longer start the engine

Driving

The following points must be checked for correct functioning after starting up the engine:

- Is the steering functioning properly?



WARNING!

Risk of accident. If the hydraulic system malfunctions, the steering becomes hard.

- The machine may not be operated with defective steering.

- Does the horn work?

Safety regulations when driving

- You must have a sufficient overview of the path of travel and be satisfied that the path of travel is free and unobstructed.
- Always keep a safe braking distance to people.
- Practice handling the machine on a spacious and flat area without obstacles and with an unrestricted view.
- Always adapt your driving style to the situation and do not be tempted to enter into a safety risk.
- When using accessory equipment, special conditions apply, see *"Installing the accessory equipment", page 44*.
- Refrain from any working method which affects the standard safety of the machine.

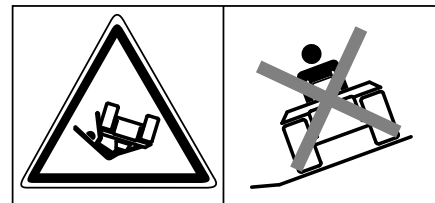


DANGER!

Toppling risk when driving on inclinations.

- Always keep a sufficient distance to ditches or steep slopes and embankments.
- Never turn while on inclinations or embankments.
- Drive only straight uphill or straight downhill on slopes.

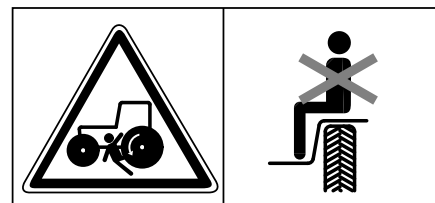
If the machine is operated in a hillside situation or on slopes and inclinations, the operator alone carries the responsibility for the resulting damages to the machine and bodily injury.



DANGER!

Risk of accident through careless behaviour.

- Do not climb onto the machine while it is moving.
- The transporting of passengers is not permitted.
- In no case are you to jump off from the moving machine.



Driving forwards

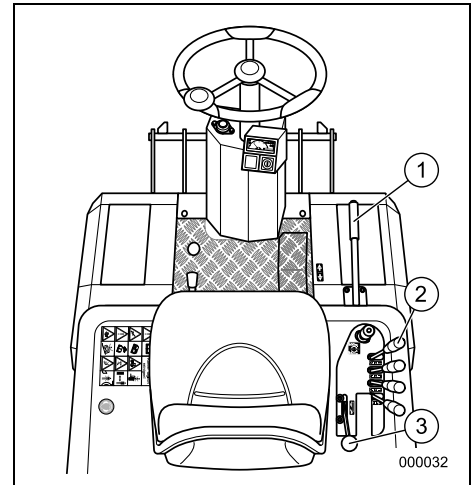
1. Press the lift / lower control lever (2) inwards to raise the lower link from the ground.
2. Release the holding brake (1).
3. Move the hand throttle lever (3) to <rabbit> to increase the engine speed.



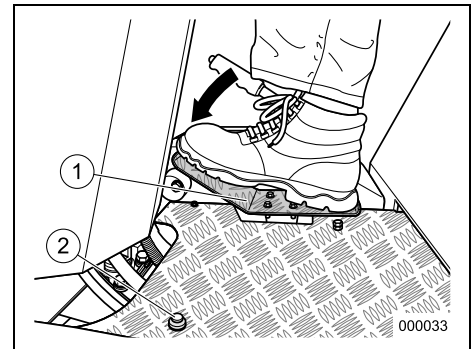
NOTE!

Ensure that the engine speed is adapted to the working method to increase the service life of the engine.

When possible, use the drive position <rabbit> and drive with a speed between the 75% – 100% range.



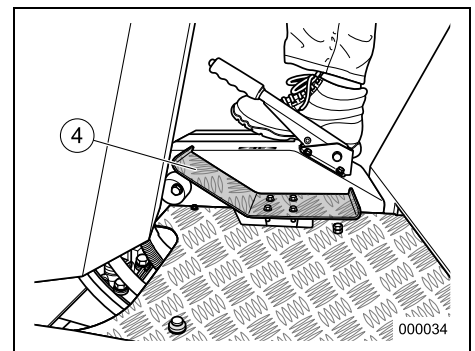
4. Operate the foot contact switch (2) to activate the second drive position.
 5. Press the accelerator pedal (1) forwards slightly.
- ✓ The machine moves forwards.



Braking

There is no separate service brake. The machine brakes automatically as soon as the accelerator pedal is in the neutral position.

1. Release your foot from the accelerator pedal (1).
- ✓ The machine is braked.



ATTENTION!

Damage to the machine.

- Do not press the accelerator pedal backwards to the position for driving in reverse in order to brake. The machine must always be at standstill before the driving direction can be changed.
- Use the holding brake only when the vehicle is at a standstill.

Driving in reverse



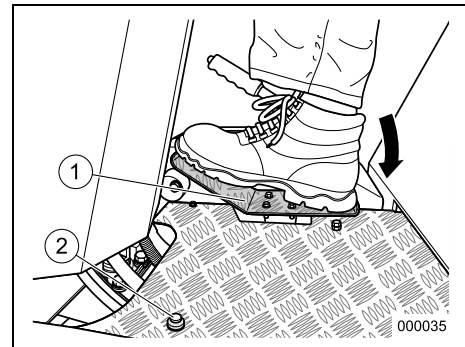
ATTENTION!

Damage to the machine.

- Do not press the accelerator pedal backwards to the position for driving in reverse while driving forwards.
- The machine must always be at standstill before the driving direction can be changed.

After the machine has come to a standstill:

1. Where necessary, operate the foot contact switch (2) to activate the second drive position.
 2. Press the accelerator pedal (1) backwards slightly.
- ✓ The machine moves backwards.

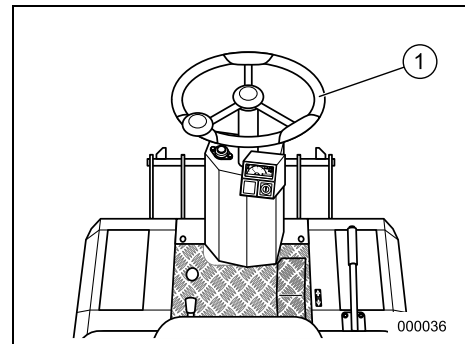


Steering and turning

The steering forces change if accessory equipment and rear weights are attached.

1. Steer the machine by turning the steering wheel (1).

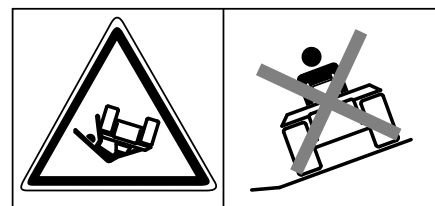
The turning radius is specified in chapter *"Technical data"*; page 23.



DANGER!

Toppling risk when driving on inclinations.

- Never turn while on inclinations or embankments.
- Drive only straight uphill or straight downhill on slopes.
- Perform steering manoeuvres on level ground.



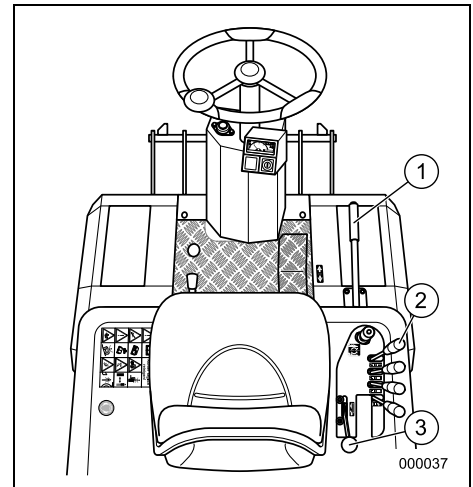
Turning off the engine.

1. Park the machine on level and solid ground at a clean and dry location.
2. Press the lift / lower control lever (2) outwards to lower the accessory equipment to the ground.
3. Move the hand throttle lever (3) to <turtle> to reduce the engine speed.
4. Activate the holding brake (1).
5. Place all operating levers of the working hydraulics in the null position.



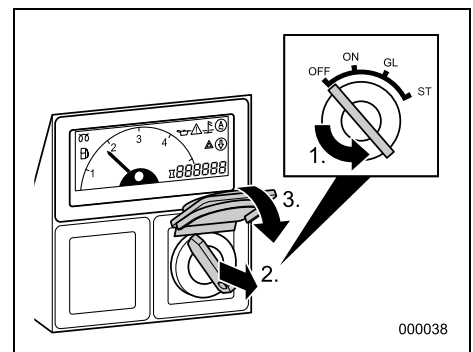
NOTE!

Do not turn off the engine abruptly after heavy loading. Allow the engine to run for about a minute to increase the service life of the engine.



Safekeeping of the ignition key

1. Turn the ignition key to the left to the "OFF" position.
 2. Remove the ignition key.
 3. Close the locking cap of the ignition switch.
 4. Keep the ignition key in safe custody.
- ✓ The machine is secured against unauthorised starting.



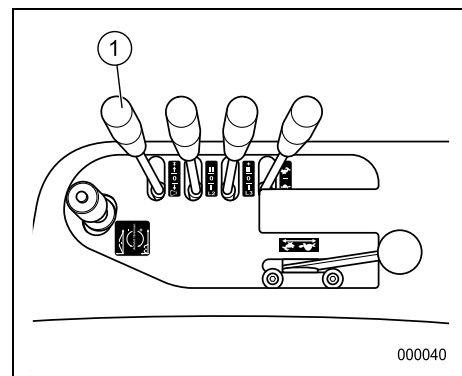
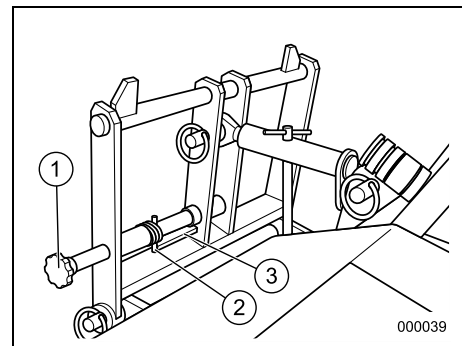
Working with accessory equipment

Safety regulations when working with accessory equipment

- Only accessory equipment from Tichel Maschinenbau GmbH and accessories approved by us may be used. If you have questions, please contact your specialist dealer.
- When attaching accessory equipment, the instructions in the operating manual of the accessory equipment must be observed.
- The machine and the accessory equipment must be on a level and solid ground.
- The approved axle load limit as well as the permitted gross vehicle weight may not be exceeded.
- Observe the machine's centre of mass. The centre of mass changes when using different accessory equipment.
- Before attaching accessory equipment, the quick-release couplings must be depressurised.
- After the installation check the functioning of the accessory equipment before placing into operation for the first time
- Ensure that the accessory equipment is always in a secure position and that the holding brake is engaged before leaving the machine.

Installing the accessory equipment

1. Activate the holding brake.
2. Unlock the quick-change unit:
 - Pull the locking shaft (1) on the handle outwards.
 - Turn the locking shaft so that the locking pin (2) hooks in behind the locking bar (3).
3. Start the engine.
4. Release the holding brake.
5. Drive the machine close to the accessory equipment.
6. Operate the lift / lower control lever (1) to lower the accessory equipment to the ground far enough so that it fits underneath the holder of the accessory equipment.



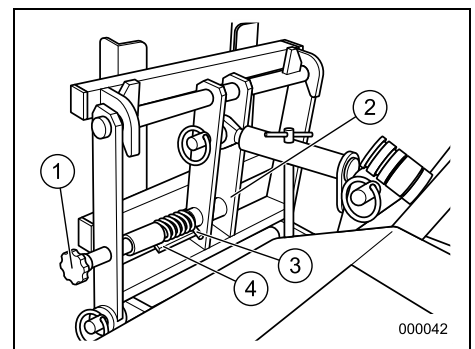
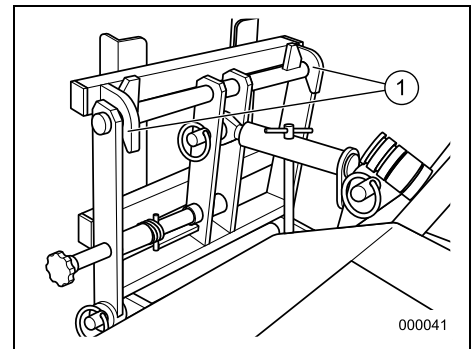
7. Drive the machine close enough to the accessory equipment until the quick-change unit is correctly positioned under the holding hook (1) of the accessory equipment
8. Operate the lift / lower control lever so that the accessory equipment hooks in and raises slightly from the ground.
9. Activate the holding brake.
10. Turn off the engine and remove the ignition key.
11. Move all operating levers of the working hydraulics to both sides repeatedly.

The hydraulic system is decompressed.

12. Lock the quick-change unit:

- Pull the locking shaft (1) on the handle outwards.
- Turn the locking shaft so that the locking pin (3) is no longer pushing against the locking bar (4).

The locking shaft locks into place in the outer support (2) and secures the accessory equipment.



WARNING!

Unsecured accessory equipment can fall down and cause serious accidents.

- Ensure that the holder is secured.

13. Connect the hydraulic hoses from the accessory equipment to the quick-release couplings of the machine according to the identification marking "L2" and "L3".

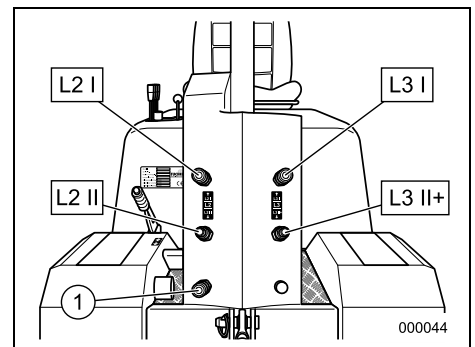
Drive circuit "L2"



NOTE!

Use the overflow oil line if the hydraulic oil is to only flow in one direction through the accessory equipment (e.g. with a free turning road sweeper, rotary mulching mower, auger feeder). In this way, the hydraulic oil flows back directly into the machine and does not heat up.

The overflow oil line connection (1) replaces the connection "L2 I".



Drive circuit "L3"



NOTE!

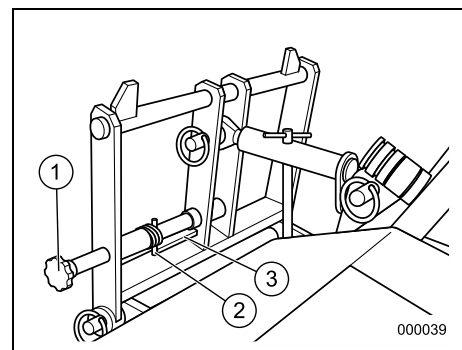
When using a road sweeper, please check to make sure that the connection "L3 II+" is used as flow line.

14. If present, shift the support legs from the accessory equipment upwards and secure these.
15. Start the engine.
16. Release the holding brake.
17. Before starting work, check the functioning of all hydraulic drive circuits and the functions of the accessory equipment as described in the accessory equipment operating manual.

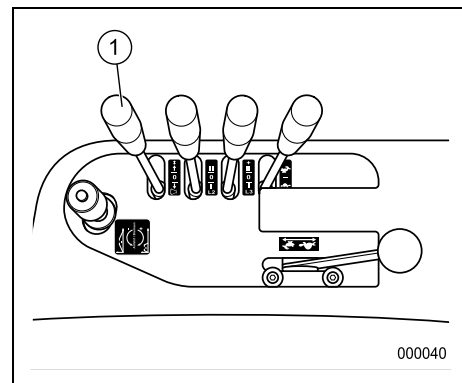
✓ The accessory equipment is ready for operation.

Removing the accessory equipment

1. Activate the holding brake.
2. Turn off the engine and remove the ignition key.
3. Move all operating levers of the working hydraulics to both sides repeatedly.
The hydraulic system is decompressed.
4. If present, shift the support legs from the accessory equipment downwards to the ground and secure these.
5. Disconnect the hydraulic hoses from the quick-release couplings.
6. Seal the quick-release couplings with dust caps.
7. Place the ends of the hydraulic hoses over the accessory equipment.
8. Unlock the quick-change unit:
 - Pull the locking shaft (1) on the handle outwards.
 - Turn the locking shaft so that the locking pin (2) hooks behind the locking bar (3).
9. Start the engine.
10. Release the holding brake.



11. Operate the lift / lower control lever (1) to lower the quick-change unit to the ground far enough so that the accessory equipment unhooks.



WARNING!

On uneven and loose ground, accessory equipment can tip over and cause serious accidents.

- Make sure that the accessory equipment is standing firmly.

12. Ensure that path of travel behind the vehicle is free.
 13. Drive the machine backwards away from the accessory equipment.
- ✓ The accessory equipment is disconnected from the machine.

Placing out of operation

Turning off of the machine safely

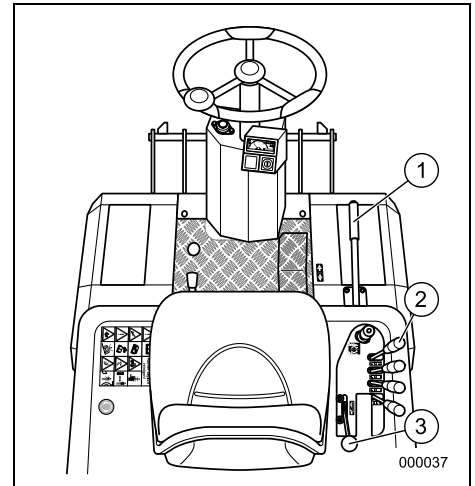


WARNING!

On uneven ground or on inclines, the machine can roll away and cause serious accidents.

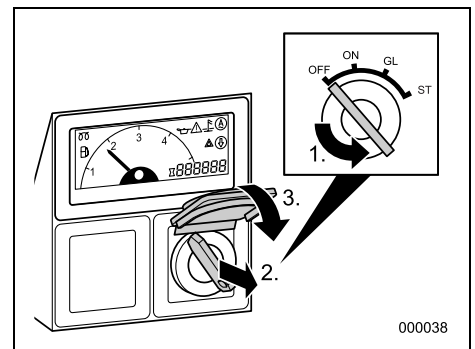
- Park the machine on level and solid ground.

1. Activate the holding brake (1).
2. Press the lift / lower control lever (2) outwards to lower the quick-change unit or the accessory equipment to the ground.



Safekeeping of the ignition key

1. Turn the ignition key to the left to the "OFF" position.
 2. Remove the ignition key.
 3. Close the locking cap of the ignition switch.
 4. Keep the ignition key in safe custody.
- ✓ The machine is secured against unauthorised starting.



Storing the machine over longer periods of time



NOTE!

Observe the information and instructions in the separate operating manual of the combustion engine.

The following measures must be carried out if the machine is to be placed out of service over a longer period of time:

Before placing out of service

- Thoroughly clean the entire machine including the engine compartment and allow the machine to dry, see chapter "*Maintenance*".
- Park the machine in a dry, clean and frost-free location.
We suggest that you also cover the machine with a tarp to protect it against dust.
- Fill up the fuel tank.
- Grease the machine.
- Change the engine and hydraulic oil.

While out of service

- Start the engine and let it run once a month.
- Drive the machine over a short distance so that the moving parts are covered with a new film of oil.
- Charge the battery.

After placing out of service

- Check the oil levels and top them up if needed.
- Grease the machine.

7 Maintenance

This chapter contains the scheduled maintenance that is to be performed by qualified personnel or the operator.

Perform the maintenance work described according to the time intervals in the maintenance schedule and enter the maintenance work performed in the subchapter "*Service*"; starting on page 65.

Safeguards

- Observe the applicable regulations when handling fuels. This also applies to the storage and disposal.
- Fuels are highly inflammable. Smoking, fire and open flame are forbidden when handling fuels.
- Fuels and their vapours can be harmful to skin, eyes and mucous membranes. Avoid direct contact.
- Observe the applicable provisions and safety regulations for the respective lubricant and consumable item.
 - Wear suitable protective clothing.
- All safety information from chapter "*Safety*" must be taken into account and applied.
- The industrial safety and accident prevention regulations of the relevant Employers' Liability Insurance Association are binding.

Safety-relevant parts

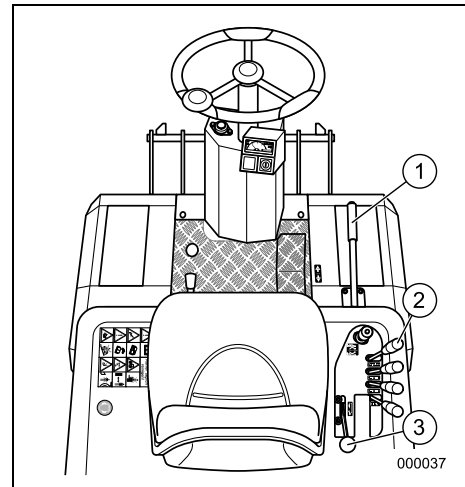
- Damaged safety-relevant parts cause accidents. Replace damaged parts immediately.

Safety-relevant parts include the following parts in particular:

 - Complete engine bonnet with locking mechanism
 - Hydraulic components (hoses, fittings, valves, levers, cylinders)
 - Components that are described in the operating manual of the combustion engine.
- The safety-relevant parts must be checked regularly by a specialist repair shop and replaced.

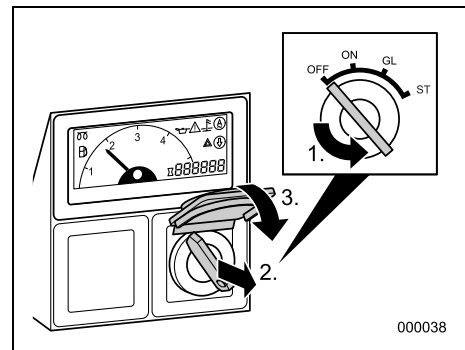
General information on maintenance

1. Park the machine on level and solid ground.
2. Operate the lift / lower control lever (2) to lower the quick-change unit or the accessory equipment to the ground.
3. Activate the holding brake (1).
4. Place all operating levers of the working hydraulics in the null position.



Safekeeping of the ignition key

1. Turn the ignition key to the left to the "OFF" position.
 2. Remove the ignition key.
 3. Close the locking cap of the ignition switch.
 4. Keep the ignition key in safe custody.
- ✓ The machine is secured against unauthorised starting.



Battery

- Maintenance work may only be performed by qualified personnel.

Engine

- The maintenance work is described in the provided operating manual of the combustion engine.

V-belt

- The maintenance work is described in the provided operating manual of the combustion engine.
- Maintenance work may only be performed by qualified personnel.

Engine compartment

The engine bonnet may only be opened with the engine turned off. In addition, the holding brake must be activated and the ignition key removed.



WARNING!

Risk of scalding from hot components.

- Allow the machine to cool down or wear protective gloves.

Opening the engine bonnet

1. Pull on the locking mechanism (1) of the engine bonnet.
2. Swing the engine bonnet upwards.

The engine bonnet is held open by two gas-filled struts.

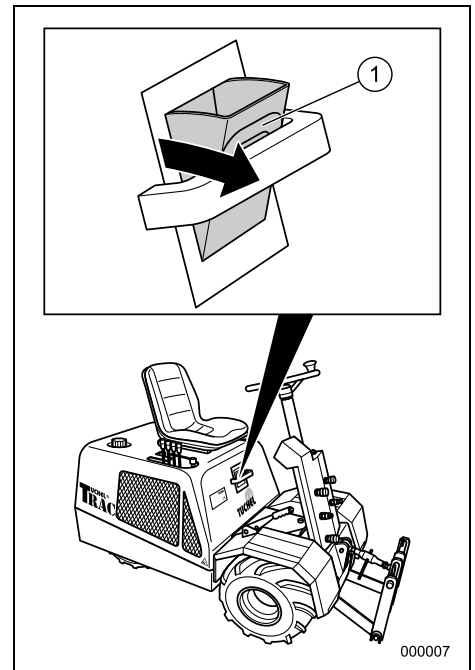
Closing the engine bonnet



CAUTION!

Crushing risk.

- When closing the engine bonnet, be sure that nothing is between the engine bonnet and the chassis.



1. Close the engine bonnet.
2. Allow the locking mechanism (1) to latch.

Lubricants and operating materials

- Before draining the operating materials or changing the filter, wait until the engine has cooled down to approx. 60° C.
- Do not drain oils when they are cold.
- For engine-related maintenance, please refer to the operating manual of the combustion engine.
- If necessary, secure the machine with suitable supports.
- Never work underneath an inadequately supported machine.

Lubricants that are not listed in the following table are listed in the operating manual of the combustion engine.

	Lubricants and operating fluids	BI code designation	Quality classes	Temperature ranges	Viscosity classes	Fill volumes in litres approx.
Traction drive Hydraulics	Hydraulic oil HYD	HYD 0530 HYD 1030 HYD 1540	HVLP HVLP D	15° to 20° C -20° to 30° C -15° to 45° C	ISO VG 46 ISO VG 68 ISO VG 100	60
Lubricating nipple	Multi-purpose lithium soap based grease	MPG-A	KP2N-20	–	NLGI 2	–
Fuel tank	Diesel	See operating manual of the combustion engine.				10

Wearing parts / replacement parts

- Use only original replacement parts. The use of replacement parts from other manufacturers is not permitted.
- The use of unapproved replacement parts nullifies the liability for the resulting consequences. Original replacement parts serve to protect your safety.
- Please provide the following information when ordering replacement parts:
 - Type designation
 - Serial no.
 - Year of manufacture of the machine
- Wear parts of the engine are listed in the operating manual or the replacement parts list of the combustion engine. Please provide the following information when ordering replacement parts:
 - Engine type
 - Engine no.

	Article no.	Article	Supplement
1	00.IP.00023	Oil filter cartridge	
2	00.IP.00020	V-belt	
3	00.IP.00028	Air filter element	
4	00.IP.00027	Fuel filter	
5	00.ER.00025	Suction filter element	Drive valve
6	00.ER.00026	Suction filter element	Working hydraulics
7	00.IP.00029	Water separator with supporting head	
8	–	Hydraulic oil	See page 51.
9	–	Engine oil	See operating manual of the combustion engine
10	–	Fuse	See page 64.
11	00.KC.00036	Sticker	Black-white / multi-colour
12	00.KC.00037	Sticker	Black-yellow

Maintenance / service intervals

- The maintenance intervals are guideline values.
- For heavy duty use, a shortened maintenance interval is recommended.



NOTE!

The maintenance intervals for the combustion engine are not listed here. Please refer to the accompanying operating manual of the combustion engine.

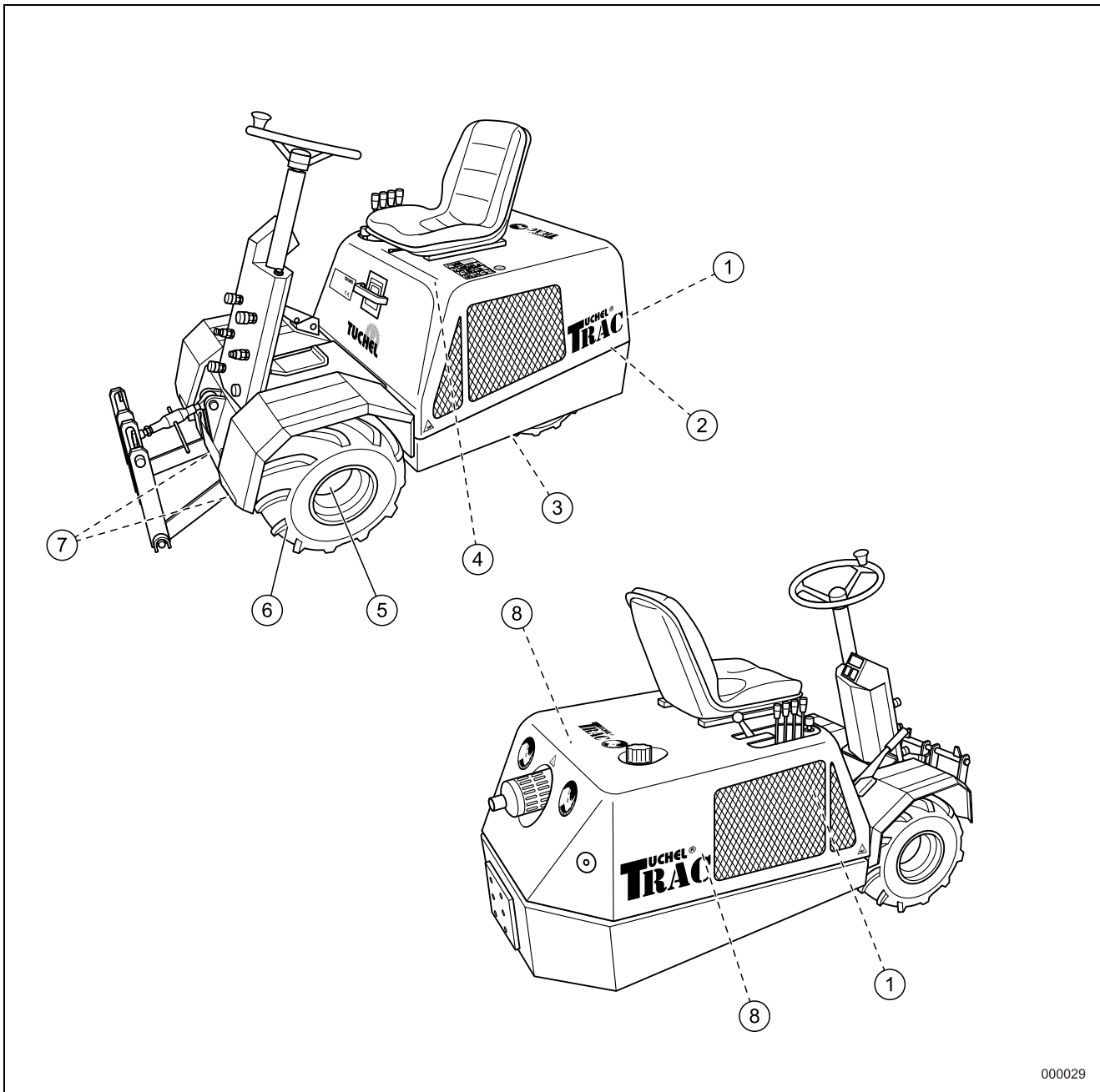
The intervals are classified according to the following types:

Service / inspection after	
Operating hours	Type
50 (weekly) *	A
every 250	B
1000 (yearly) *	C

* Whichever occurs first.

The inspection intervals **A** must be performed weekly or after 50 operating hours. You do not require a certification from a specialist repair shop for inspection "A".

Maintenance overview



000029



Important!

All maintenance work labelled with the adjacent symbol may only be performed by qualified personnel.

The maintenance for the combustion engine is not listed here. Please refer to the accompanying operating manual of the combustion engine.

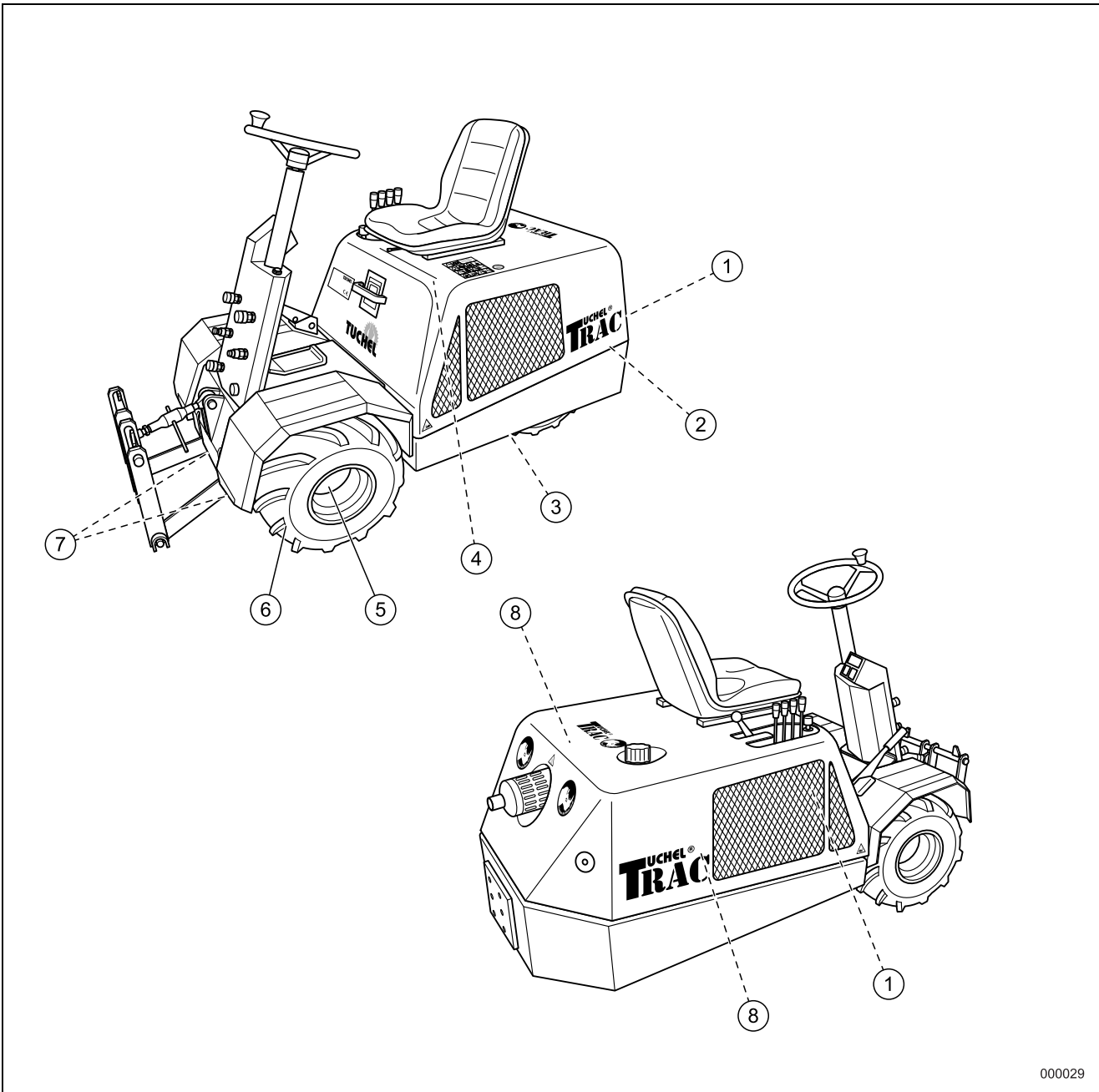
10-hour maintenance / daily

Check point	Maintenance work	Pos.	Page
Air filter	Cleaning. Replace immediately if the lamp in the display panel lights up. See operating manual of the combustion engine.	–	–
Hydraulic oil	Check oil fill level.	2	61
Hydraulic tank			
Hydraulic hose line	Visual inspection / leak-tightness check	–	–
Hydraulic connections	Repair by specialist repair shop only.		
Fuel tank			
Tyres	Visual inspection for damage. Check profile depth and air pressure.	6	59
Wheel nuts	Check daily during the first week. Thereafter, check for tightness every 50 operating hours and retighten if necessary.	5	60
Engine bonnet, steps, mounting bolts	Check for tightness and retighten if necessary.	–	–
Wheel house, mounting bolts			
Wheel house/step, accelerator pedal, operating levers	For heavy soiling, clean in-between the operation.	–	–
Radiator for engine coolant (radiator cooling fins)	Free the fins of dirt.	–	58

50-hour maintenance / weekly

► Interval: Type A

Check point	Maintenance work	Pos.	Page
Hydraulic filter	First replacement after 50 operating hours, thereafter every 250 operating hours.	8	62
Hydraulic oil	First replacement after 50 operating hours, thereafter every 1000 operating hours. Check oil fill level after test run.	2	63
Steering cylinder and steering knuckle	Grease each lubricating point front and rear.	1	60
Lower link	Grease the two lubricating points.	7	60
Tyres	For heavy soiling, clean immediately after the operation.	–	–
Wheel nuts	Check for tightness and retighten if necessary.	5	60
Engine bonnet, filler necks	For heavy soiling, clean immediately after the operation.	–	–



000029




Important!





All maintenance work labelled with the adjacent symbol may only be performed by qualified personnel.

The maintenance for the combustion engine is not listed here. Please refer to the accompanying operating manual of the combustion engine.

250-hour maintenance ▶ Interval: Type B

Check point	Maintenance work	Pos.	Page
Hydraulic filter	Replace.	8	62
Air filter	 Replace. See operating manual of the combustion engine.	–	–

1000-hour maintenance / yearly ▶ Interval: Type C

Check point	Maintenance work	Pos.	Page
Hydraulic oil	Replace. Check oil fill level after test run.	2	63
Hydraulic tank			
Hydraulic hose lines			
Hydraulic connections	 Leak-tightness check. Seek out a specialist repair shop.	–	–
Fuel tank			

Maintenance as needed

Check point	Maintenance work	Pos.	Page
Fuse	Replace.	4	64

10-hour maintenance / daily

Cleaning the machine

1. Park the machine securely. Please refer to "General information on maintenance"; page 50.



WARNING!

Risk of fire when using highly inflammable cleaning agents.

- Do not use any combustible fluids for cleaning work.



ATTENTION!

Damage to components.

- Do not direct the vapour stream or jet of water directly onto the radiator, ventilation slots and the display panel.

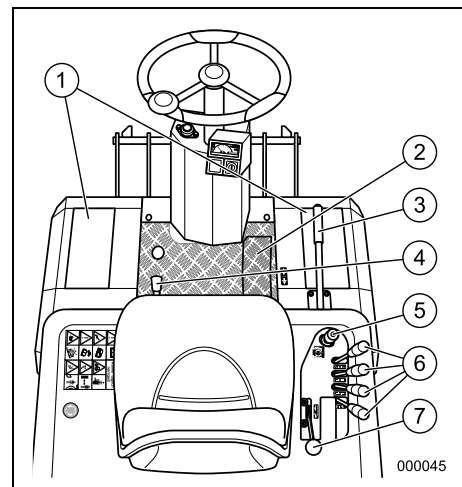


ATTENTION!

Damage to the electrical system. Risk of short circuit.

- Do not allow water to reach electrical components.

2. Clean the outside of the machine using a cloth and use water-soluble cleaning agents and water.
3. Clean the following locations in particular:
 - Stepping surfaces (1)
 - Accelerator pedal (2)
 - Operating levers / elements (3 to 7)

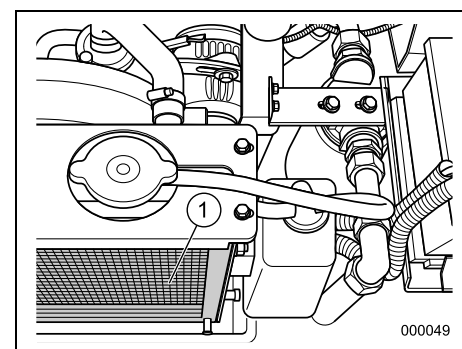


WARNING!

Risk of injury when working with compressed air. When blowing out compressed air, dispersed particles can cause eye injuries.

- Wear protective glasses and a dust mask.
- Never aim the air jet at people.

4. Clean the cooling fins (1) of the radiator with compressed air.



Tyres



ATTENTION!

Incorrect tyre pressure leads to premature wear of the tyres and affects the performance of the machine.

- Check the tyres for correct pressure.

1. Check the tyre pressure under the following conditions:

- On cold tyres before starting work
- Without accessory equipment
- Without rear weights
- Without trailer

The tyre pressure is specified in chapter "*Technical data*";
page 23.

2. Check the tyres for damage or foreign objects.

- If necessary, remove the foreign object from the tyre profile.
- Damaged tyres must be replaced by a specialist dealer.

50-hour maintenance / weekly

Wheel nuts



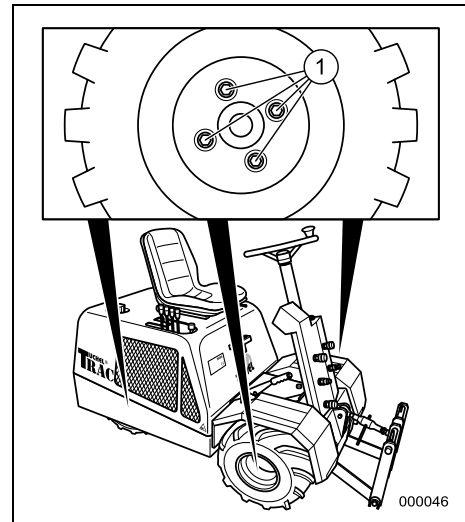
WARNING!

Loose wheel nuts can cause accidents.

- Check the wheel nuts regularly for tightness.

1. Check the wheel nuts (1) for tightness and tighten the wheel nuts using a torque wrench to 70 Nm an.

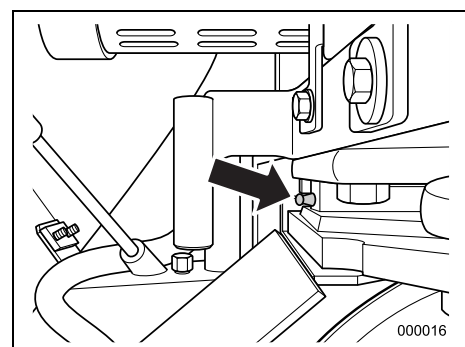
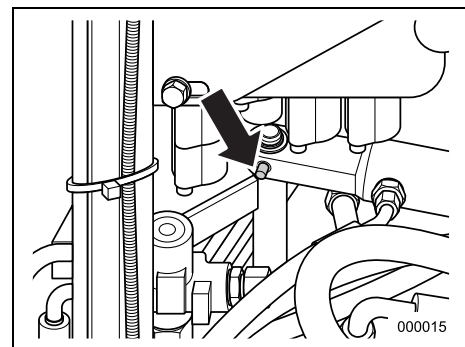
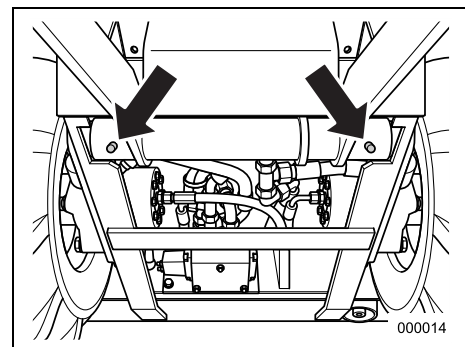
- Daily in the first week
- Thereafter every 50 operating hours or weekly



Lubricating points

1. Lubricate the following points with grease according to the table "Lubricants and operating materials"; page 51.

- Lower link
- Steering cylinder
- Steering knuckle (steerable rear wheel)



Checking the hydraulic oil fill level

1. Park the machine securely. Please refer to "General information on maintenance"; page 50.
2. Open the engine bonnet.

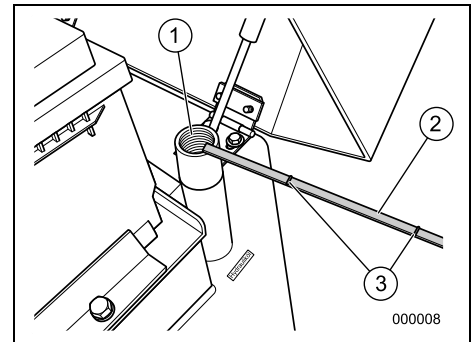


WARNING!

Risk of scalding from hot components.

- Allow the machine to cool down or wear protective gloves.

3. Unscrew the oil dip stick (2).
4. Wipe off the oil dip stick with a lint-free cloth.
5. Screw the oil dip stick into the filler neck (1) and then unscrew and take it out again.
6. Check the oil fill level.
The oil fill level must lie between the markings (3).
7. If the oil fill level does not reach the specified level, replenish the hydraulic oil in the filler neck according to the table "Lubricants and operating materials"; page 51.



NOTE!

Use a funnel for refilling.

8. After filling, check the oil level again.
9. Screw the oil dip stick into the filler neck.
10. Carefully wipe up any spilled oil and dispose of it in an environmentally friendly manner.



NOTE!

The first hydraulic oil change must occur after 50 operating hours, thereafter every 1000 operating hours, see page 63.

250-hour maintenance

Changing the hydraulic filter

1. Park the machine securely. Please refer to "*General information on maintenance*"; page 50.
2. Open the engine bonnet.



WARNING!

Risk of scalding from hot oil.

- Allow the machine to cool down or wear protective gloves.



ATTENTION!

Environmental damage from leaking oil.

- Collect leaking oil and dispose of the oil and the filter cartridge in an environmentally friendly manner.

There are two hydraulic filters located under the engine bonnet. These are to be replaced in the same way:

Pos. 1 = short filter cartridge

Pos. 2 = long filter cartridge

3. Loosen the filter cartridge (1) or (2) using a filter wrench and unscrew the filter cartridge.
4. Free the oil filter holder sealing surface of dirt.
5. Oil the rubber gasket of the new filter cartridge slightly.
6. Screw on the filter cartridge by hand until the gasket sits.

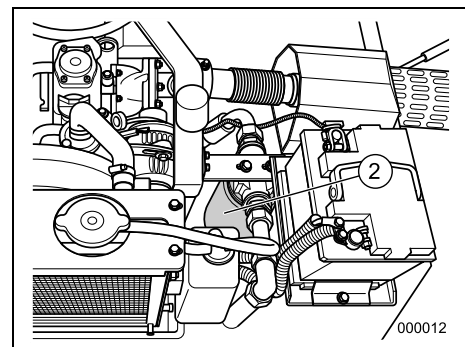
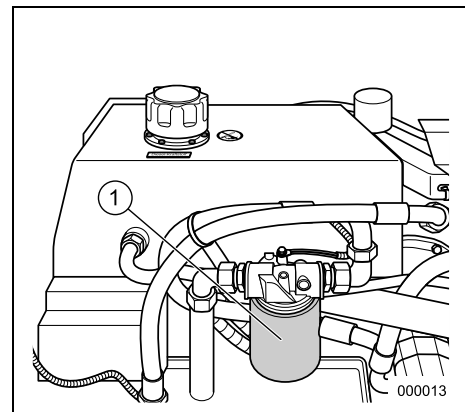


ATTENTION!

Tightening the filter too much can strip the threads or damage the filter gasket.

- Turn the filter by hand as described below.

7. Tighten the filter cartridge with a half turn more.
8. Then check the filter cartridge for leak-tightness.
9. Check the hydraulic oil level after a test drive, see page 61.



1000-hour maintenance / yearly

Changing the hydraulic oil

1. Park the machine securely. Please refer to "General information on maintenance"; page 50.
2. Open the engine bonnet.



WARNING!

Risk of scalding from hot oil.

- Allow the machine to cool down or wear protective gloves.

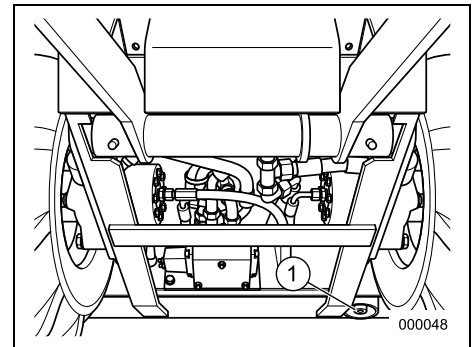


ATTENTION!

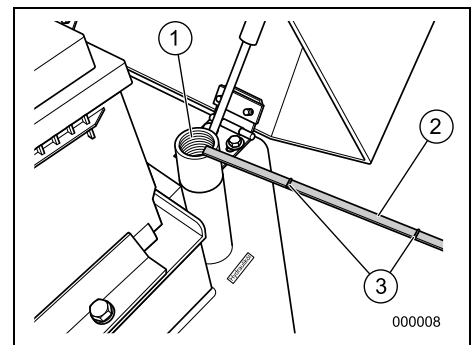
Environmental damage from leaking oil.

- Collect leaking oil and dispose of the oil and the filter cartridge in an environmentally friendly manner.

3. Open the filler neck by unscrewing the oil dip stick (2, fig. below).
4. Place a collecting tank (min. 70 l) below the drain of the hydraulic oil tank.
5. Unscrew the drain bolt (1) and let the old oil drain into the collecting tank.
6. Screw in the drain bolt (1) with a new sealing gasket again and tighten it firmly.
7. Change the hydraulic filter as described on page 62.



8. Fill with new hydraulic oil into the filler neck (1) according to the table "Lubricants and operating materials"; page 51.
9. Check the oil fill level after a test drive.
The oil fill level must lie between the markings (3).



Maintenance as needed

Changing the fuse



ATTENTION!

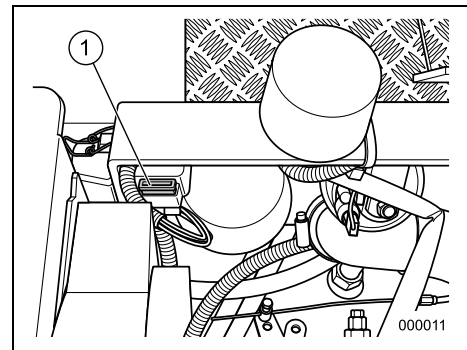
The functioning of the machine is not assured if unapproved components are used.

- Use only original replacement parts.

1. Open the engine bonnet.
2. Replace the defective fuse (1) with a new original fuse from Hella.

Order no.: 8JS 711 687-002

3. Close the engine bonnet.



Service

The machine left our production facility after a careful final inspection and testing to ensure your enjoyment of your machine from the very first day.

You have received your machine from your specialist dealer today. We confirm your delivery date here.

_____ Date _____ Signature, Date Specialist Dealer

Transfer:	Operating hours: Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)

Transfer:	Operating hours: Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)

Transfer:	Operating hours: Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)

Transfer:	Operating hours: Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)

Maintenance

Transfer:	Operating hours:	Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)	

Transfer:	Operating hours:	Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)	

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Date _____	_____ Signature / Company stamp (performance of the maintenance)	

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Date _____	_____ Signature / Company stamp (performance of the maintenance)	

Maintenance

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Date _____	_____ Signature / Company stamp (performance of the maintenance)	

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Date _____	_____ Signature / Company stamp (performance of the maintenance)	

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Date _____	_____ Signature / Company stamp (performance of the maintenance)	

Transfer:	Operating hours:	Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)	

Transfer:	Operating hours:	Inspection B [] C []
Date _____	_____ Signature / Company stamp (performance of the maintenance)	

8 Troubleshooting

Malfunctions that are not listed below must be remedied in every case by the relevant dealer.



ATTENTION!

Damage to the machine.

- The machine may not be towed away if the engine does not start up.

Engine

Malfunction	Cause	Remedy
1. Engine does not start.	Operating levers of the working hydraulics are in the indexed position.	Move the operating levers of the working hydraulics to the null position.
	Fuel tank empty.	Refill with fuel (diesel).
	Battery defective / flat.	Seek out a specialist repair shop.
2. Engine stops.	Switch was activated.	Check that no parts are located on the switch.
	Fuel tank empty.	Refill with fuel (diesel).
3. Starter only turns the engine slowly.	Charge of the battery is insufficient.	Charge the battery
	Starter defective.	Seek out a specialist repair shop.

Brake

Malfunction	Cause	Remedy
1. Insufficient braking power.	Hydraulic system defective.	Seek out a specialist repair shop.
	Control valve set incorrectly.	Adjust the control valve setting.
2. Holding brake	Holding brake lever in the incorrect position.	Move the lever.

Traction drive

Malfunction	Cause	Remedy
1. The machine does not move.	Holding brake lever in the incorrect position.	Move the lever.
	Accelerator pedal blocked.	Remove object in the area of the pedal.
	Accelerator not functioning.	Seek out a specialist repair shop.
	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.
2. Machine only moves slowly and does not produce full power.	Hydraulic motor of the drive gears defective.	Seek out a specialist repair shop.
	Hydraulic pump defective.	Seek out a specialist repair shop.
	Control valve defective.	Seek out a specialist repair shop.
	Hydraulic filter contaminated.	Replace hydraulic filter.
	Control valve set incorrectly.	Adjust the control valve setting.
	Accelerator pedal blocked.	Remove object in the area of the pedal.
3. The machine moves jerkily.	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.
	Hydraulic malfunction.	Seek out a specialist repair shop.
4. Hydraulic oil overheated.	Operating time too long.	Turn off the machine and allow the hydraulic oil to cool down.
	Hydraulic filter contaminated.	Replace hydraulic filter.
	Oil level in the hydraulic tank too high or too low.	Correct the oil level in the hydraulic tank or seek out a specialist repair shop.
5. Abnormal noises.	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.

Working hydraulics

Malfunction	Cause	Remedy
1. Lifting capacity / operating pressure too low.	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.
	Pressure control valve has triggered.	Seek out a specialist repair shop.
2. Lifting capacity too slow.	Filter cartridge of the hydraulic oil filter contaminated.	Replace hydraulic filter.
3. Air bubbles in the hydraulic oil.	Wrong quality of hydraulic oil.	Change the hydraulic oil and fill with required hydraulic oil.
	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.
4. Cylinders move jerkily.	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.
5. Cylinders move jerkily.	Oil level in the hydraulic tank too low.	Replenish hydraulic oil.
6. Operating levers of the working hydraulics not functioning.	Driver not seated on the seat.	The driver must be seated on the seat.
	Fuse defective.	Replace fuse.
	Seat switch defective.	Seek out a specialist repair shop.
	Hydraulic manifold defective.	Seek out a specialist repair shop.
	Foot contact switch defective.	Seek out a specialist repair shop.

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