1000184973 US	1.0
0908	

Wheel loaders

WL 750
WL 850

OPERATOR'S MANUAL

1 0 0 0 1 8 4 9 7 3

Documentation

Title	Order no.
Operator's Manual	1000184973 US

Legend

Edition	Issued
1.0	09/2008

The cover features the machine with possible optional equipment.

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Document: BA 34603_04 US
Order no.: 1000184973 US
Edition: 1.0

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1 Introduction

1.1 Important information on this Operator's Manual

This Operator's Manual contains important information on how to work safely, correctly and economically with the machine. Therefore, it aims not only at new operators, but it also serves as a reference for experienced ones. It helps to avoid dangerous situations and reduce repair costs and downtimes. Furthermore, the reliability and the service life of the machine will be increased by following the instructions in the Operator's Manual. This is why **the Operator's Manual and the service booklet must always be kept at hand in the machine.**

Your own safety, as well as the safety of others, depends to a great extent on how the machine is moved and operated. Therefore, carefully read and understand this Operator's Manual prior to the first drive. The Operator's Manual will help to familiarise yourself more easily with the machine, thereby enabling you to use it more safely and efficiently.

Prior to the first drive, carefully read chapter **"Safey Instructions"** as well, in order to be prepared for possible dangerous situations, as it will be too late for it during operation. As a rule, keep the following in mind:

Careful and prudent working is the best way to avoid accidents!

Operational safety and readiness of the machine do not only depend on your skill, but also on maintenance and servicing of the machine. This is why regular maintenance and service work is absolutely necessary (see service booklet). Always have a technician with appropriate training or an authorized workshop perform the maintenance and repair work which are not included in this Operator's Manual. Insist on using original spare parts when carrying out maintenance and repair work. This ensures operational safety and readiness of your machine, and maintains its value.

Your Wacker-Neuson dealer will be pleased to answer any further questions regarding the machine or the Operator's Manual.

Abbreviations/symbols

☞ *This symbol requires you to perform the activity described*

☞ Subdivision within lists or an activity. Follow the steps in the recommended sequence

- This symbol stands for a list
  - Subdivision within lists or an activity. Follow the steps in the recommended sequence

➥ Description of the effects or results of an activity

"Option" = optional equipment

Stated whenever controls or other components of the machine are installed as an option.

 traveling direction in drawings or figures.

1.2 Machine overview

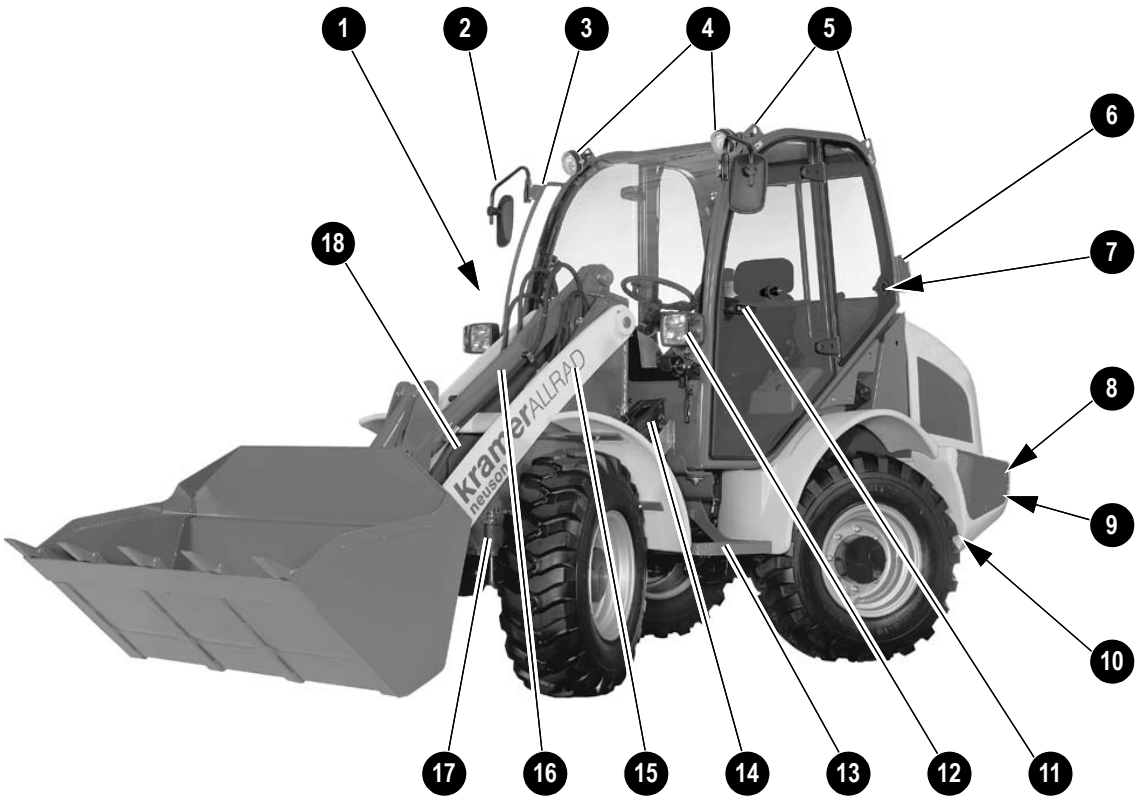

Fig. 1: Machine outside views

Pos.	Description
1	Service flap (fuses, relays, recirculated air filter)
2	Rearview mirror
3	Handle
4	Working lights
5	Eye hook for removing the cab only (May not be used for crane-lifting the machine.)
6	Brake, rear and turn indicator lights
7	Door arrester
8	Towing facility
9	Reflectors

Pos.	Description
10	Rear eye hook for loading/strapping down the machine
11	Door handle
12	Lights with turn indicators
13	Access
14	Wheel chock
15	Loader unit
16	Tilt ram
17	Front eye hook for loading/strapping down the machine
18	Lift ram

1.3 Models and trade names: overview

Wheel loader model	Trade name
346-03	WL 750
346-04	WL 850

1.4 Brief description of the wheel loader

The wheel loader is a self-propelled work machine according to German traffic regulations. Get informed on and follow the legal regulations of your country.

This machine is a versatile and powerful helper for moving earth, gravel and debris on construction sites and elsewhere.

The wide range of attachments accounts for the numerous applications of the machine: as a fork lift, a snow plow, a spreader for grit, salt etc., a sweeper or a tree replanter.

See chapter *Attachments with certified material densities* on page 1-5 for further applications. Retrofit the machine with appropriate safety features when using it in lifting gear operation (see section “Applications with lifting gear” in chapter Safety Instructions).

The main components of the machine are:

- ROPS/FOPS tested closed cab
  Check number: ROPS 04139-CE (cab without protective screen)
  Check number: FOPS 04140-CE (cab with optional protective screen)
- Water-cooled Deutz four-cylinder in-line engine

➥ Exhaust emissions according to EC standard 2004/26 EC

➥ Rubber-mounted engine

- Sturdy steel sheet frame
- Automotive drive, infinitely variable hydrostatic axial-piston gearbox; maximum speed 20 kph / 12.5 mph(30 kph / 18.8 mph option)
- Hydraulic four-wheel power steering with emergency steering features
- Front and rear planetary steering axles, rear axle with oscillation
- Service brake (mechanical and hydrostatic), mechanical disc-type parking brake

Hydrostatic drive

The diesel engine permanently drives a hydraulic pump (variable displacement pump), whose oil flow is sent to a hydraulic motor flanged on the gearbox. The force of the hydraulic motor is transmitted to the rear axle via the transfer gearbox. At the same time, the front axle is driven by the cardan shaft, ensuring permanent 4 wheel drive.

Work hydraulics and 4 wheel steering

The diesel engine also drives the joint gear pump for work hydraulics and hydrostatic 4 wheel steering. The oil flow of this pump depends on the diesel engine rpm only.

When the machine is in operation, the entire diesel engine output can be transmitted to the gear pump for work hydraulics and steering. This is made possible by an inching valve which responds as soon as the service brake is used, reducing or cutting off power input of the drive. Therefore, engine output is fully available for the loader unit by pressing the accelerator pedal and the brake pedal at the same time.

Cooling system

A combined oil/water radiator (for the diesel engine and the hydraulic oil) is located at the rear of the machine.

The indicators on the instrument panel of the machine ensure constant monitoring of the coolant temperature and level, and of the hydraulic oil temperature.

1.5 Fields of application and using the wheel loader with an attachment

The attachments installed determine the intended use of this machine.

Note that not all attachments listed in the table comply with local traffic regulations.

The attachments complying with local traffic regulations and the applicable provisions are listed in the **machine documentation**!

The legislation of your country may require specific permits, certifications, registrations etc. for the use of attachments that are not certified or not listed in the machine documentation!

Get informed on and follow the legal regulations of your country.

Important

The attachments listed below are the only attachments approved for use with this wheel loader. To minimize the risk of equipment damage and unsafe operating characteristics:

- *Do not use any unauthorized attachments.*

Attachments with certified material densities

Possible equipment and authorized material densities.

Description of attachment	Wheel loader	Part no. (model)	Dimensions	Use
Standard bucket - normal material	WL 750	1000102344 1000102345 1000160648[1]	1750 mm (68.89 in) with teeth 1750 mm (68.89 in) without teeth 1750 mm (68.89 in) without teeth	Loosening, picking up, transporting and loading loose or solid material (material density ≤ p = 1.8 t/m³) (material density ≤ p = 112 lbs/ft³)
	WL 850	1000096388 1000096389 1000137538	1850 mm (72.83 in) with teeth 1850 mm (72.83 in) without teeth 1850 mm (72.83 in) without teeth	
Standard bucket - lightweight material[2]	WL 750	1000096389	1850 mm (72.83 in) without teeth	Picking up, transporting and loading very lightweight material (material density ≤ p = 1.3 t/m³) (material density ≤ p= 81 lbs/ft³)
	WL 850	1000096393	2050 mm (80.70 in) without teeth	
Standard bucket - superlightweight material[2]	WL 750	1000096394	2150 mm (84.64 in) without teeth	Picking up, transporting and loading lightweight material (material density ≤ p = 0.9 t/m³) (material density ≤ p = 56 lbs/ft³)
	WL 850	1000096397		
Multipurpose bucket [3]	WL 750	1000113244 1000113492 1000168415	1750 mm (68.89 in) with teeth 1750 mm (68.89 in) without teeth 1750 mm (68.89 in) without teeth	Grading, removing and scraping vegetation, for example; picking up and evenly spreading material; grabbing bulky material; loading trucks (material density ≤ p = 1.8 t/m³) (material density ≤ p = 112 lbs/ft³)
	WL 850	1000050770 1000096400	1850 mm (72.83 in) with teeth 1850 mm (72.83 in) without teeth	
Side swing bucket[2, 3]	WL 750	1000175757	1744 mm (68.66 in) without teeth	As standard bucket, however with benefits for filling and backfilling material (material density ≤ p = 1.8 t/m³) (material density ≤ p = 112 lbs/ft³)
	WL 850	1000176121	1844 mm (72.60 in) without teeth	

Description of attachment	Wheel loader	Part no. (model)	Dimensions	Use
High-tilt bucket[3, 4, 5]	WL 750	1000156433 1000108803	1850 mm (72.83 in) without teeth 1850 mm (72.83 in) without teeth	As standard bucket, with a 80 - 100 cm higher dump height (material density ≤ p = 1.8 t/m³) (material density ≤ p = 112 lbs/ft³)
	WL 850	1000156433 1000154475	1850 mm (72.83 in) without teeth	
Heavy duty bucket with hydraulic clamp[3, 4, 5]	WL 750	1000111090	1850 mm (72.83 in)	Picking up and transporting e.g. bulky recycling material (material density ≤ p = 1.3 t/m³) (material density ≤ p= 81 lbs/ft³)
	WL 850	1000111053	2050 mm (80.70 in)	
Heavy duty forks with hydraulic clamp (silage bucket)[3, 4]	WL 750 WL 850	1000128262	1800 mm (70.86 in)	Picking up and transporting e.g. bulky and fibrous recycling material (e.g. grass, manure, brushwood; material density ≤ p = 1.3 t/m³) (material density ≤ p= 81 lbs/ft³)
Pallet forks[3, 4, 6]	WL 750 WL 850	1000101820 1000101822	1000 mm (39.37 in) 1200 mm (47.24 in)	Picking up and transporting pallets
Pallet forks with foldable fork arms[3, 6, 7]	WL 850	1000147393	1200 mm (47.24 in)	Picking up and transporting pallets
Material pusher[3, 4]	WL 750 WL 850	1000050660	3000 mm (118.11 in)	For moving loose bulk material
Manure forks with grab	WL 750 WL 850	1000178474	1800 mm (70.86 in)	Picking up and transporting e.g. grass, manure, brushwood and straw
Hydraulic round bale clamp	WL 750 WL 850	1000177701	800 - 1800 mm (31.49 - 70.86 in)	Picking up and transporting round bales
Tree replanter[3, 4]	WL 750 346-02	1000100840	–	Digging and transporting nursery trees
Front scarifier[3, 4]	WL 750 WL 850	1000100841	–	Scarifying dense soil, loosening humus soil
Work platform[8]	WL 750 WL 850	1000109953	–	For repair, assembly, disassembly, maintenance and inspection work above ground
Rotary broom	WL 750 WL 850	1000139717	–	Cleaning roads or facilities
Snow plow[2, 3, 4, 9]	WL 750 WL 850	1000142915	–	Winter service

1. Bucket with screwed-on exchangeable blade
2. Only in connection with additional lights order no. 1000105002 and mounting kit order no. 1000137629 when driving on public roads
3. See the Operator's Manual of the attachment for taking the attachment into service and using it
4. Not certified for driving on public roads (individual certification may be possible depending on your country's legislation)
5. Only in connection with restrictor unit order no. 1000114139
6. Only in connection with load diagrams for model WL 750 (order no. 1000138363) and for model WL 850 (order no. 1000143064)
7. Get informed on the legal regulations of your country which may require specific permits, certifications, registrations etc. for use on public roads!
8. Model WL 750: only in connection with assembly 1000169659
   Model WL 850: only in connection with assembly 1000169660
9. Only in connection with rotating beacon order no. 1000133985

Get informed on the legal regulations of your country for further information on mounting attachments

1.6 EC declaration of conformity, model WL 750

kramerALLRAD®

EC Declaration of Conformity

according to EC Directive 98/37/EC, 2000/14/EC

KRAMER-WERKE GmbH
Nussdorfer Str. 50
D-88662 Überlingen

declare, under their own responsibility, that the product

Name of product	KRAMER-Allrad Wheel Loader 750
Model	346
Version	346 03
Serial no.	346 03_ _ _ _
Machine output	45 kW/2300 rpm

to which this declaration refers, corresponds to the pertinent fundamental requirements regarding safety and health of

EC Directive 98/37/EC
EMC Directive 89/336/EC

and the requirements of further pertinent EC Directives and standards.

2000/14/EC appendix VIII	**Sound power level**	dBA
Fachausschuss Tiefbau Prüf- und Zertifizierungsstelle Landsberger Str. 309 D-80687 München	Measured	99.8
	Guaranteed	101

The following standards and/or technical specifications have been used for the proper application of the requirements regarding safety and health stated in the EC Directives:

EN 474-1, EN 474-3, ISO EN 12100-01 and 12100-2,
ISO 3471, EN 13510, EN ISO 3744, EN ISO 3746, ISO 3449

Überlingen, (date)

i. A.
Dipl.-Ing.
M. Mack
Head of Research & Development
KRAMER-WERKE GmbH

1.7 EC declaration of conformity, model WL 850

kramerALLRAD®

EC Declaration of Conformity

according to EC Directive 98/37/EC, 2000/14/EC

KRAMER-WERKE GmbH
Nussdorfer Str. 50
D-88662 Überlingen

declare, under their own responsibility, that the product

Name of product	KRAMER-Allrad Wheel Loader 850
Model	346
Version	346 04
Serial no.	346 04_ _ _ _
Machine output	45 kW/2300 rpm

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Überlingen, (date)

i. A.
Dipl.-Ing.
M. Mack
Head of Research & Development
KRAMER-WERKE GmbH

1.8 Type labels and component numbers

Serial number

Fig. 2: Serial number location

The serial number is stamped on the machine frame **A** (next to the cab attachment, on the right in traveling direction). It is also located on the type label **B**. (Figure 2).

The type label **B** is located on the machine frame, at the front right in traveling direction (on one side of the loader unit bulkhead) (Figure 2).

Type label information

Example:

Machine model:	346
Version:	346 03
Serial no.:	346 03 55
Model year:	2008
Front gross axle weight rating:	3600 kg (7920 lbs.)
Rear gross axle weight rating:	4000 kg (8800 lbs.)
Gross weight rating:	5500 kg (12,100 lbs.)
Output:	45 kW (60.3 SAE hp)

Other information- *see chapter 6 "Specifications*" on page 6-1

Cab certification number

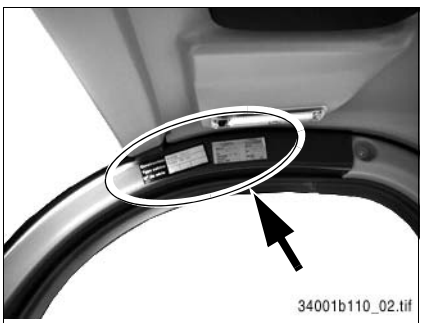


Fig. 3: Cab certification number

The cab certification number(arrow, Fig. 3) is located in the cab, at the top right in traveling direction.

Engine serial number

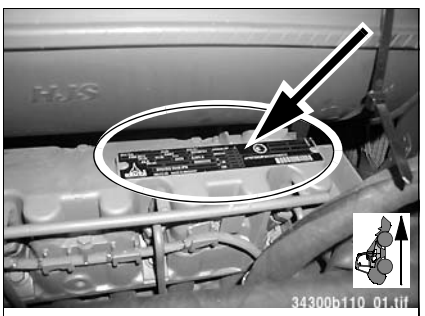


Fig. 4: Diesel engine serial number

The serial number (arrow, Fig. 4) is located on the cylinder-head cover (engine)..

Example: Deutz D2011 L04 W

Hydraulic pump serial number

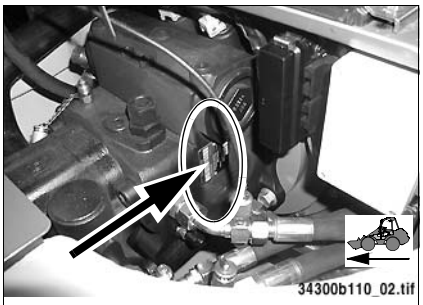


Fig. 5: Hydraulic pump serial number

The type label (arrow) is located on the hydraulic pump housing (next to where the pump is installed on the diesel engine)

Hydraulic motor serial number

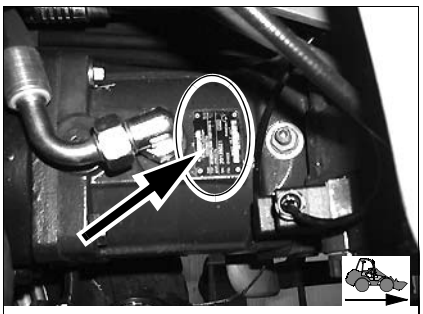


Fig. 6: Hydraulic motor serial number

The type label (arrow) is located on the hydraulic motor, on the right in driving direction.

Rear axle serial number

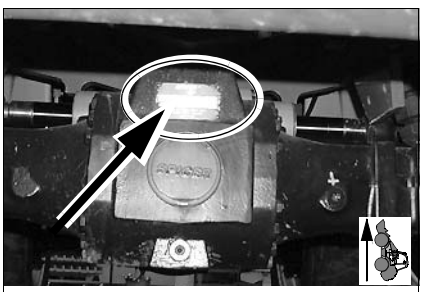


Fig. 7: Rear axle and gearbox serial number

The serial number(arrow, Fig. 7) is located on the upper side of the differential housing, at the rear.

Front axle serial number

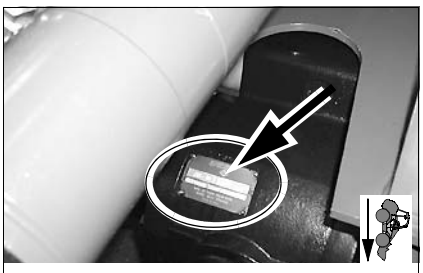
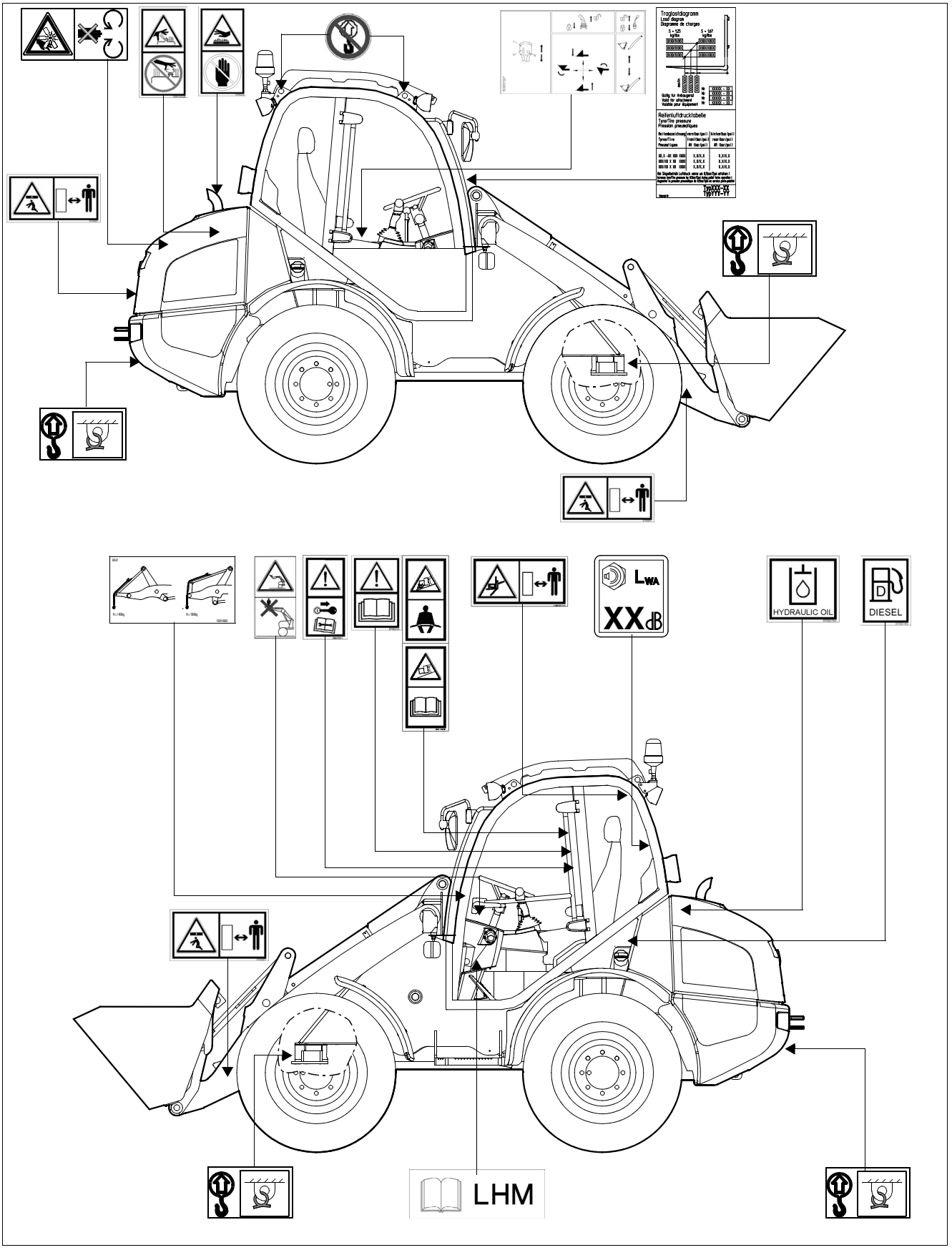


Fig. 8: Front axle serial number

The serial number(arrow, Fig. 8) is located on the upper side of the differential housing, at the front.

1.9 Labels overview



1.10 Signs and symbols

Labels on the outside of the machine

Fig. 9: Eye hook label

Label: cab eye hooks

The eye hooks on the cab are for removing the cab only and may **not** be used for crane handling the machine

- *see chapter 3 "Crane handling the machine*" on page 3-46 for further details.

Location

Cab roof (4x)

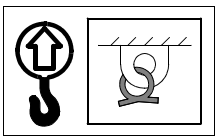


Fig. 10: Label for points used for strapping down the machine

Description

Tie-down points for strapping down the machine.

Tie-down points are for strapping down the machine during loading and transport

- *see chapter 3 "Loading and strapping down the machine*" on page 3-48 for further details.

Location

On the left and right of the machine frame above the front axle attachment, and at the rear underneath the engine

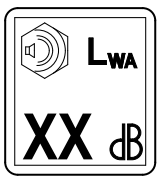


Fig. 11: Noise level label

Description

Noise levels produced by the machine.

L_{WA} = sound power level

Other information - *see chapter 6 "Noise levels*" on page 6-8

Location

Rear window

Fig. 12: Safety alert symbol

Description

Safety alert symbol

This label alerts persons to possible safety hazards in the area where the symbol is located.

Location

At rear of machine.

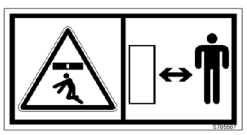


Fig. 13: Keep distance

Description

Crushing hazard label. This label alerts persons standing or working near the machine of an existing safety hazard within the area around the machine. Keep clear of machine!

Location

On the loader unit on the left and right, and at the rear on the engine cover.

Fig. 14: CE mark

Description

The CE mark means that the machine meets the requirements of the Machine Directive and that the conformity procedure has been carried out. The machine meets all the health and safety requirements of the Machine Directive.

Location

On the rear window.

Labels inside the cab

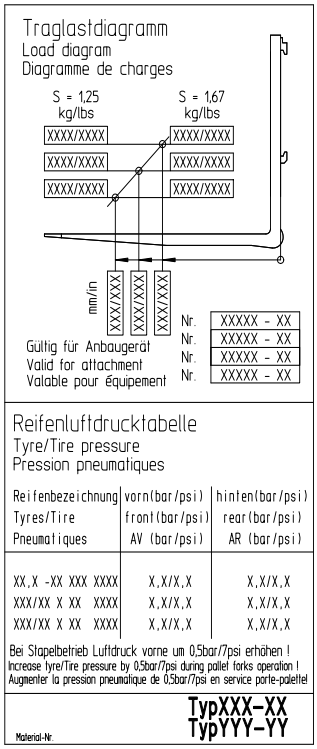


Fig. 15: Load diagram

Description (example)

...when using pallet forks with fork arms:
The framed numbers indicate the maximum authorized load on the fork arms for industrial and off-road applications respectively. The maximum load varies according to the distance from the load center.

Example:

- Off-road operation → S = 1.67 (safety factor)

➥ Load distance = 500 mm (19.68 in)

- The maximum load amounts to e.g. 465 kg (1025.15 lb)!

Tire pressure table

List of authorized types of tires with prescribed tire inflation pressures.

Other information - *see chapter 6 "Tires*" on page 6-7

Location

Inside the cab, on left side of front window

Important

The load diagram is valid only for applications with certified pallet forks.

- *- see Attachments on page 1-5*
- Observe the specific load diagrams of other attachments used, e.g. rotary crane jib!

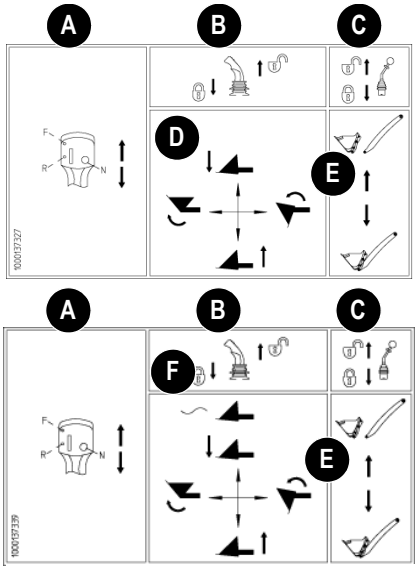


Fig. 16: Label: control lever operation (overview)

Description

Control lever elements (joystick)

- **A** = driving direction: (F) forwards/(R) reverse and (N) neutral position
- **B** = control lever (joystick) unlocked/locked for road travel
- **C** = control lever (3rd control circuit for attachments) unlocked/locked
- **D** = loader unit operation: raise, lower, dump in/out
- **E** = 3rd control circuit operation. Pick up/set down attachment
- **F** = loader unit operation: raise, lower with float position, dump in/out

Location

On the lower right on the side window

Fig. 17: Brake fluid label

Description

Brake fluid label. Use only LHM brake fluids.

➥ *- see chapter 5 "Maintenance of the brake system*" on page 5-20

➥ *- see chapter 5 "Fluids and lubricants*" on page 5-35

Location

On the brake-fluid tank

Fig. 18: Label: Read the Operator's Manual

Description

Attention!

Read and understand the Operator's Manual before starting, operating, adjusting, maintaining, or repairing the machine.

Location

Inside the cab on the right on the pillar

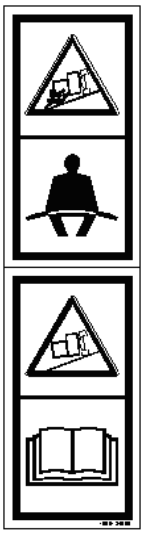


Fig. 19: Operator's seat and fasten seat

Description

- Risk of being thrown from the machine. Operate the machine only from the operator's seat.
- Fasten seat belt when operating the machine.
- Operate within stability limits of machine to avoid tipping over.
- Read the Operator's Manual - *see chapter 3 "Seat belt (lap belt)*" on page 3-42

Location

Inside the cab on the right on the pillar

Fig. 20: Read the operator's manual

Description

Caution! Remove the starter key before working on the machine. Read the Service Manual.

Location

Inside the cab on the right-hand side pillar.

Fig. 21: Prohibiting sign: transport of persons

Description

Warning! No raising or transporting persons in the bucket or on the pallet forks.

Location:

In the cab on the cover plate between the steering wheel and the front window.

.

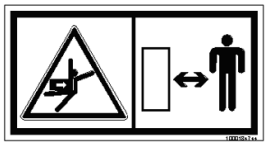


Fig. 22: Safety alert: safety distance to persons

Description

Collision hazard! Bystanders must stay clear of the machine when it is being operated.

Location:

In the cab at the rear above the rear window.

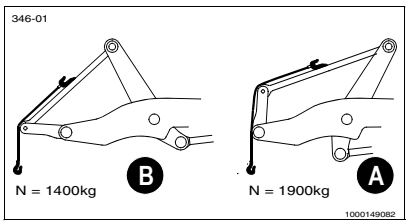


Fig. 23: Load diagram for load hook

Description

Load diagram for load hook (option)

Example: Maximum load for model WL 750

- **A** Extended loader unit and quickhitch tilted in
  ➥ **Max N => 1900 kg (4188.71 lb)**
- **B** Extended loader unit and quickhitch
  ➥ **Max N => 1400 kg (3086.42 lb)**

Location

Inside the cab, on left side of front window

Engine compartment labels

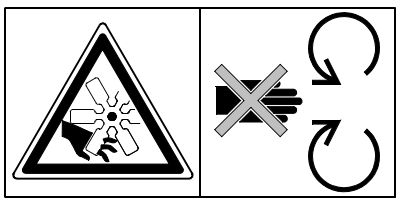


Fig. 24: Shearing hazard

Description

Shearing hazard! Do not touch any moving or turning parts!

Location

In the engine compartment on the right on the sheet-metal separation of the radiator.

Fig. 25: Label: hot fluid (coolant))

Description

Burn hazard!

The tank is hot and under pressure.

Do not open the tank when it is hot.

Carefully and slowly open the cover only after the cooling fluid has cooled down, to allow the pressure to escape.

Location:

In the engine compartment on the right, next to the expansion tank (coolant).

Fig. 26: Label: hot surface

Description

Burn hazard! Do not touch.

Location:

In the engine compartment on the right on the sheet-metal separation of the radiator, next to the muffler.

Fig. 27: Label: filler opening for hydraulic oil

Description

Filler opening for hydraulic oil.

Location:

In the engine compartment on the left next to the engine cover attachment

Fig. 28: Label: filler opening for fuel

Description

Filler opening for diesel fuel.

Location:

On left-hand side of cab, above the filler opening of the fuel tank.

Fig. 29: Label: biodegradable oil

Description

Biodegradable lubricants (biodegradable oil) are used on the machine

➥ *- see chapter 5 "Important information for the use of biodegradable oil*" on page 5-13

Location:

In the engine compartment on the left, on the filler inlet of the hydraulic oil tank.

2 Safety Information

2.1 Safety Symbols Found in this Manual

This is the safety alert symbol. It is used to alert you to potential personal hazards.

- Obey all safety messages that follow this symbol.

DANGER

indicates a hazardous situation which, if not avoided, will result in death or serious injury.

☞ *Obey all safety messages that follow this symbol to avoid injury or death.*

WARNING

indicates a hazardous situation which, if not avoided, could result in death or serious injury.

☞ *Obey all safety messages that follow this symbol to avoid possible injury or death.*

CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

☞ *Obey all safety messages that follow this symbol to avoid possible minor or moderate injury.*

NOTICE

Used without the safety alert symbol. NOTICE indicates a situation which, if not avoided, could result in property damage.

Note: *Contains additional information important to a procedure.*

Important

Identifies an instruction that, when followed, provides for a more efficient and economical use of the machine.

Environment

Failure to observe the instructions identified by this symbol can result in damage to the environment. The environment is endangered if environmentally hazardous material, such as waste oil, is not properly used or disposed of.

2.2 Designated Use

1 In accordance with its designated use, the machine may be used ONLY for moving earth, gravel, coarse gravel or ballast and rubble. It may also be used for working with the attachments approved in the - *see chapter 1 "Brief description of the wheel loader*" on page 1-3.

2 No other applications are designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. The user alone will bear the risk.

3 "Designated use" also includes observing the instructions set forth in this Operator's Manual and observing the maintenance schedule.

4 Machine safety can be negatively affected by carrying out machine modifications without proper authority and by using spare parts, equipment, attachments and optional equipment which have not been checked and released by Wacker Neuson. Wacker Neuson will not be liable for damage resulting from unapproved parts or unauthorized modifications.

5 Wacker Neuson shall not be liable for personal injury and/or damage to property caused by failure to observe the safety instructions on labels and in this Operator's Manual, and by the negligence of the duty to exercise due care when:

- transporting the machine
- operating the machine
- servicing the machine and carrying out maintenance work
- repairing the machine

This is also applicable when special attention has not been drawn to the duty to exercise due care.

6 Read and understand this Operator's Manual before starting up, moving, operating, servicing, or repairing the machine. Observe all safety instructions.

7 The machine shall NOT be used for transport jobs on public roads!

2.3 General Conduct and Safety Instructions

Conditions for use

- The machine has been designed and built in accordance with state-of-the-art standards and recognized safety regulations. Nevertheless, its use can constitute a risk to the user or to third parties, or cause damage to the machine and to other property.
- Read and follow this Operator's Manual and other manuals that accompany the machine.
- The machine must only be used in accordance with its designated use and the instructions set forth in this Operator's Manual.
- The machine must only be used by qualified operators who are fully aware of the risks involved in operating the machine.
- Do not start, move, or operate a damaged or defective machine. Any mechanical dysfunctions, especially those affecting the safety of the machine, must be repaired immediately. Only qualified technicians shall determine how to move a damaged or defective machine to a safe place for diagnosis and repair.
- The user/owner commits himself to operate and keep the machine in serviceable condition and, if necessary or required by law, to require the operating or servicing persons to wear protective clothing and safety equipment.

User training and knowledge

- Always keep this Operator's Manual and other manuals that accompany the machine in their storage compartment provided in the operator station on the machine. Immediately replace an incomplete or illegible Operator's Manual.
- All persons working on or with the machine must read and understand the safety information in this Operator's Manual before beginning work. This applies especially to persons working only occasionally on the machine, such as performing set-up or maintenance tasks.
- Follow, and instruct the operator in, legal and other mandatory regulations relevant to accident prevention and environmental protection.These may include handling hazardous substances, issuing and/or wearing personal protective equipment, or obeying traffic regulations.
- The user/owner must regularly ensure that all persons entrusted with operation or maintenance of the machine are working in compliance with this Operator's Manual and are aware of the risks and safety factors of the machine.

Preparing for use

- Before starting up the machine, ALWAYS inspect the machine to make sure that it is ready for safe work and travel operation.
- Wear close-fitting work clothes that do not hinder movement. Tie back long hair and remove all jewelry (including rings).

Modifications and spare parts

- NEVER make any modifications, additions, or conversions to the machine and its superstructures (for example, cab), or the machine's attachments, without the approval of Wacker Neuson! Such modifications may affect safety and/or machine performance. This also applies to the installation and adjustment of safety devices and valves, as well as to welding work on load-bearing elements.
- Spare parts must comply with the technical requirements specified by Wacker Neuson. Contact your Wacker Neuson dealer for assistance.

2.4 Operator and Technician Qualifications and Basic Responsibilities

User/owner responsibility

- Only allow trained and experienced individuals to drive, maintain, or repair the machine. NEVER let unauthorized or underaged persons operate the machine.
- Clearly and unequivocally define the individual responsibilities of the operator and technician for operation, maintenance, and repair.
- Define the machine operator's responsibilities on the job site and for observing traffic rules. Give the operator the authority to refuse instructions by third parties that are contrary to safety.
- Do not allow persons to be trained or instructed by anyone other than an experienced person. Also, NEVER allow persons taking part in a general training course to work on or with the machine without being supervised by an experienced person.

Repair person qualifications

- Work on the electric system and equipment, on the chassis, and the steering and brake systems may be carried out only by skilled individuals who have been specially trained for such work.
- Work on the hydraulic system of the machine must be carried out only by a technician with special knowledge and experience in hydraulic equipment.

2.5 Safety Instructions Regarding Operation

Preparing for use

- Keep the machine clean. This reduces the risk of fire hazards (such as from combustible materials like rags), and reduces the risk of injury or operational accidents that can be caused by dirt build-up on the drive pedals or foot rests and steps.
- Observe all safety, warning, and informational signs and labels on the machine.
- Start and operate the machine from the seat only.
- The operator must sit in the seat, and fasten and adjust the seat belt before putting the machine into operation.
- Adjust the seat position before starting work so that you are able to press the brake pedal as far as it can go. Never change the seat position when driving or working!
- Make sure that all safety devices are properly installed and functional before starting work.
- Before putting the machine/attachment into operation (startup/moving), make sure that no one in the immediate vicinity will be at risk.

Startup and shutdown

- Perform startup and shutdown procedures according to this Operator's Manual.
- Observe all indicator lights.
- Do not use starting fluid (for example, ether) especially in those cases in which a heater plug (intake air pre-heating) is used at the same time.
- Make sure the brakes, steering, signaling, and light systems are functional before operating the machine, and also before restarting after an interruption of work.
- Before leaving the seat, always secure the machine against unintentional movement and unauthorized use.

Work area awareness

- Familiarize yourself with the surroundings and circumstances of the work site before beginning work. Be aware of:
  - obstacles in the working and traveling area
  - the soil weight-bearing capacity
  - any necessary barriers separating the work site from public roads
- Always keep at a safe distance from the edges of building pits and slopes.
- Look out for the following when working in buildings or in enclosed areas:
  - height of the ceiling/clearances
  - width of entrances
  - maximum load of ceilings and floors
  - sufficient room ventilation—danger of carbon monoxide poisoning!
- Observe the danger area. See “Danger area awareness”.
- Use the rearview mirror to stay aware of work area obstacles and personnel.
- Always switch on the work lights in conditions of poor visibility and after dark. However, make sure that users of public roads will not be temporarily blinded by the work lights.
- Provide additional lighting of the work area if the lights of the machine are not sufficient for carrying out work safely.

Danger area awareness

- The danger area is the area in which persons are in danger due to the movements of the machine, work equipment, additional equipment, or material.
- The danger area also includes the area affected by falling material, equipment, or construction debris. The danger area must be extended by 0.5 m (20 inches) in the immediate vicinity of buildings, scaffolds, or other elements of construction.
- Seal off the danger area if it is not possible to keep a safe distance. Stop work immediately if persons do not leave the danger area in spite of warnings!

Operating the machine

- Never operate the machine if you are standing on the ground.
- Operate the machine ONLY when you are seated and you have fastened your seat belt. Stop the engine before releasing the seat belt.
- During operation on slopes, drive or work uphill or downhill. If traveling across a slope cannot be avoided, bear in mind the tilting limit of the machine. Always keep the attachments/work equipment close to the ground. This also applies to traveling downhill. When traveling or working across a slope, the load must be on the uphill side of the machine.
- On sloping terrain, adapt your travel speed to the prevailing ground conditions.
- Never get on or off a moving machine, and do not jump off the machine.
- Hydrostatic four wheel steering requires practice before a user becomes familiar with the control response. Therefore, adjust the travel speed to your abilities and the surroundings. Select and change the steering mode only when the machine is at a standstill.

Carrying passengers

- If a passenger accompanies the operator, he or she must sit on the designated passenger seat to the left of the operator's seat.
- Never install a man basket or a working platform to the machine.

Mechanical integrity

- Take the necessary precautions to make sure the machine is used only when in a safe and serviceable state.
- Operate the machine ONLY if all protective and safety-oriented devices (ROPS, removable safety devices, soundproofing elements, mufflers, etc.) are in place and fully functional.
- Check the machine before entering the cab for visible damage and defects. Report any changes, including changes in the machine's function and response, to your supervisor immediately!
- If the machine is functioning unpredictably, stop the machine immediately, lock it, and report the malfunction to a qualified technician or supervisor. Safety-relevant damage or malfunctions of the machine must be rectified immediately.

Traveling

- When traveling on or in public areas, observe all applicable regulations. Make sure beforehand that the machine is in compliance with these regulations.
- Installed work lights must NOT be used for travel.
- When crossing underpasses, gates, bridges and tunnels, or when passing under overhead lines, make sure the clearance height and width are sufficient to avoid contact.
- Empty the bucket before traveling on public roads.

2.6 Applications with Lifting Gear

General information

- Craning applications are procedures involving raising, transporting and lowering loads with the help of slings and load-securing devices (for example, ropes and chains). In doing so, the help of other persons is necessary to secure and detach the load. This applies, for example, to lifting and lowering pipes, shaft rings or containers.
- The machine may be used for applications with lifting gear ONLY if the prescribed safety devices are in place and functional.

Safety criteria

- When used for craning applications, the machine must meet the following criteria:
  - Proper equipment for slinging and securing the load
  - Proper lift capacity per tables in this Operator's Manual

Conditions for safe operation

- Secure the load to prevent it from falling or slipping. Install an OSHA-approved load hook after removing the bucket or other approved attachment to provide a secure attachment point for the lifting sling, chain, or cable.
- Have loads fastened, and crane operators instructed, by a qualified person competent in craning operation and standard hand signals. The person giving instructions to the operator must be within sight of the operator during load attachment and load disconnection.
- The load shall be kept as close to the surface as practical to accomplish the craning operation. The operator shall gently move the controls and machine to avoid swing or oscillating motion of the load. A tether line is recommended to dampen the tendency of the load to swing or oscillate during the craning operation.
- Machine travel with a raised load must be done very carefully on a level surface, moving very slowly to avoid sudden motion that can cause swinging or oscillating motion of the load.
- The person(s) attaching the load to the machine shall approach the boom only from the side, and only if the operator is in visual contact with them. No one shall approach the machine or attempt to attach the load until the machine has stopped and the operator has signaled for the attachment.

2.7 Trailers and Attachments

General information regarding attachments

- Prior to traveling remove all attachments which cannot be secured in compliance with the legal regulations of your locality.
- The machine operating characteristics including steering vary with different option attachments and counterweights. The operator shall be familiar with the variations and act accordingly.
- Use only approved attachments and connecting hardware.
- Attach and remove attachments carefully to avoid damage and potential injury.
- Confirm that the attachment has been properly and securely attached to the machine according to the instructions. Before using the attachment, the operator shall confirm that the attachment performs correctly in response to control actuation.
- Do not attach the attachment with the engine running and the machine moving.
- Trailer operation with the machine's towing device is not permitted!
- Before putting the machine/attachment into operation (startup/moving), make sure that no one in the immediate vicinity will be at risk.
- Before leaving the seat, always secure the machine against unintentional movement and unauthorized use. Lower the attachments to the ground.

Installation notes

- Couple and uncouple hydraulic hoses/lines (hydraulic quick couplers) only if the engine is stopped and the controls actuated to release the hydraulic pressure remaining in the circuit. Follow the operating instructions for releasing the pressure.
- Operate the machine only if all protective devices for the attachments have been installed and are functional, and if all brake, light, and hydraulic connections have been connected.
- If an optional attachment is installed, make sure that all lights and associated indicator lamps are installed and functional.
- The lock pin of the quick hitch attachment shall be visible at each end of the pin to confirm that the attachment is securely locked in place. The operator shall perform a check operation to confirm the latching integrity before operating at a production pace.
- Crushing and shearing hazard: Make sure that no one is between the attachment and the machine while coupling attachments to the loader unit. Secure the machine and attachments against unintentional movement.

2.8 Transport and Towing

Towing

The machine must be towed, loaded and transported according to the procedures described within this Operator's Manual. See section *3-45*.

Transporting

- The transporting vehicle must have sufficient load capacity and platform size to safely transport the machine. Refer to section 6 of this manual to determine the physical characteristics of the machine before loading and transporting.
- Use OSHA-approved straps, chains or cables to securely fasten the machine to the surface of the transport.
- Use the tie-down points provided on the load surface of the transport.
- Attach the tie-down devices to the machine at the designated tie-down points.
- Confirm that the machine tie-down procedures will prevent sideways, forward, rearward, and upward motion of the machine in the event the transport vehicle is involved in an incident or sudden avoidance maneuver.

2.9 Safety Guidelines for Maintenance

General maintenance notes

- Adhere to prescribed intervals or those specified in this Operator's Manual for routine checks/inspections and maintenance work.
- For inspection and maintenance work, ensure that all tools and workshop equipment are capable of performing the tasks prescribed. Do not use defective or broken tools. Use certified measuring devices that are routinely calibrated for accuracy (torque wrench, pressure gauge, ammeter, etc.).
- Replace hydraulic hoses within stipulated and appropriate intervals even if no safety-relevant defects have been detected.
- Make sure all consumables and replaced parts are disposed of safely and with minimum environmental impact.
- Always tighten any screws, electrical connections, or hose connections that may have become loose during maintenance.
- Upon completion of the maintenance and repair work, immediately refit and check any safety devices removed for set-up or maintenance purposes.

Personal safety measures

- Brief the technician and the operator before beginning maintenance or repair work. Appoint someone to supervise the activities.
- Always work in groups of two when diagnosing a machine problem requiring the engine to be running. Both persons must be trained on the machine—one person must be seated on the seat and maintain visual contact with the other person.
- Observe the specific safety instructions in the maintenance section of this Operator's Manual.
- Always keep a safe distance from all rotating and moving parts, for example, fan blades, V-belt drives, PTO shaft drives, fans, etc.
- Before starting work on the machine, always ensure safe blocking/support.
- Apply special care when working on the fuel system due to the increased danger of fire.
- Engine and exhaust system become very hot during operation and require cool-down time after machine is shut off. Avoid contact with hot parts. Wait for the machine to cool before touching components.
- Retainer pins can fly out or splinter when struck with force. Avoid striking the pins during operation, repair, or maintenance.

Preparing for maintenance and repair work

- Prior to carrying out repair and maintenance work, always attach a warning label such as "Repair work—do not start machine!" to the control elements as a precautionary measure.
- Observe the startup and shutdown procedures set forth in this Operator's Manual. This applies to any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices, or any work related to inspection and maintenance.
- Prior to carrying out assembly work on the machine, stabilize the area under repair and use proper lifting and support devices to change parts weighing more than 9 kg (20 lbs.).
- Perform maintenance work ONLY if:
  - the machine is positioned on firm and level ground
  - the machine is secured against unintentional movement
  - all hydraulically movable attachments and working equipment have been lowered to the ground
  - the engine is stopped
  - the starting key has been removed
  - the pressure accumulator is discharged
- Perform maintenance work beneath a raised machine, attachments or additional equipment ONLY if a safe and secure support has been provided. The use of hydraulic rams or jacks as the sole method of support does NOT sufficiently secure raised machines or equipment/attachments!

Performing maintenance and repairs

- Observe the adjustment, maintenance and inspection activities and intervals set forth in this Operator's Manual, including information on the replacement of parts and subassemblies. These activities must be carried out only by qualified personnel.
- Disconnect the negative battery terminal when working on the electrical system.
- Do not allow the machine to be serviced, repaired, or test-driven by unauthorized personnel.
- Wear a safety harness when performing elevated maintenance work. Keep all handles, steps, handrails, platforms, landings, and ladders free from dirt, snow, and ice.
- Always use specially designed or otherwise safety-oriented ladders and working platforms to perform overhead assembly work. NEVER use machine parts or attachments/superstructures as a climbing aid!
- Do not use the work equipment as lifting platforms for persons.
- In accordance with this Operator's Manual and instructions for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) before carrying out any maintenance work.
- Straightening and welding work on the ROPS is prohibited. ROPS components must be replaced with original Wacker Neuson parts.

2.10 Special Hazards

Battery

- In case of a frozen battery or of an insufficient electrolyte level, do not try starting the machine with battery jumper cables. The battery can burst or explode.
- Batteries contain caustic sulphuric acid. When handling the battery, observe the specific safety instructions and regulations relative to accident prevention.
- A volatile oxyhydrogen mixture forms in batteries during normal operation and especially when charging. Always wear gloves and eye protection when working with batteries.
- Starting the machine with a battery jumper cable can be dangerous if carried out improperly. Observe the safety instructions regarding the battery.

Tires

- Repair work on the tires must be carried out only by trained technical staff or by an authorized workshop.
- Damaged tires and incorrect tire pressure reduce the operational safety of the machine. Check the tires regularly for correct tire pressure and visible damage.
- Explosion hazard: Do not use flammable gases to inflate tires. Use only compressed air.
- Check the tightness of the wheel lug nuts regularly per the Maintenance Plan in this Operator's Manual.

Electric energy

- Use only original fuses with the specified current rating.
- In case of electrical system malfunctions, switch off the machine immediately, disconnect the battery (by using the battery master switch), and perform trouble-shooting procedures.
- When working with the machine, maintain a safe distance from overhead electric lines! If work must be carried out close to overhead lines, the equipment and attachments must be kept well away from them.
- If the machine comes into contact with a live wire:
  - Immediately drive the machine out of the danger area.
  - Warn others against approaching and touching the machine.
  - Do not leave the machine until the line that has been touched or damaged has been safely de-energized!
- Make sure that work on the electric system is carried out only by a technician with appropriate training, in accordance with applicable electrical engineering codes.
- Inspect and check the electrical equipment of the machine at regular intervals. Defects such as loose connections or scorched cables must be repaired immediately.
- Observe the operating voltage of the machine/attachments. The voltages must be compatible (12 volts) and confirm that an appropriate fuse or circuit breaker is incorporated in the system to prevent damage from malfunction or short circuit.
- Always remove the grounding strap from the battery when working on the electric system.

Hydraulics

- Check all lines, hoses, and threaded couplers and fittings regularly for leaks and obvious damage. Repair any damage and leaks immediately. Splashed oil can cause injury and fire!

Noise

- Close all doors and windows if practical.
- Wear ear protection. This is especially important when working in enclosed areas.

MSDS

- When handling oil, grease, and other chemical substances such as battery electrolyte or hydraulic fluid, observe the product-related safety regulations (Material Safety Data Sheet (MSDS)).

2.11 Safety Guidelines while using Internal Combustion Engines

WARNING

Internal combustion engines present special hazards during operation and fueling. Failure to follow the warnings and safety guidelines could result in severe injury or death.

☞ *Read and follow the warning instructions in the engine owner's manual and the safety guidelines below.*

Running the engine

When running the engine:

- Keep the area around exhaust pipe free of flammable materials.
- Check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

When running the engine:

- Engine exhaust CAN KILL YOU IN MINUTES. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell. Never run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided.
- Do not smoke while operating the machine.
- Do not run the engine near open flames.
- Do not touch the engine or muffler while the engine is running or immediately after it has been turned off.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not remove the radiator cap when the engine is running or hot. The radiator fluid is hot and under pressure, and may cause severe burns!

Fueling the engine

When fueling the engine:

- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Replace the fuel tank cap after refueling.

When fueling the engine:

- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near an open flame.

Notes:

3 Operation

3.1 Description of control elements

This chapter describes the controls, and contains information on the function and the handling of the indicators and controls in the cab.

The pages stated in the table refer to the description of the controls.
A combination of digits, or a combination of digits and letters (e.g. 40/**18** or 40/**A**) used for identifying the control elements, means:
fig. no. 40/control element no. 18 or position **A** in fig. no. 40
Figures carry no numbers if they are placed to the left of the text.

Cab overview: see overleaf

You can unfold pages (*3-2* and/or *3-4*) for a better overview.

The symbols used in the description have the following meanings:

- This symbol stands for a list
  - Subdivision within lists or an activity. Follow the steps in the recommended sequence

☞ *This symbol requires you to perform the activity described*

➥ Description of the effects or results of an activity

n. s. = not shown
“Option” = optional equipment
Stated whenever controls or other components of the machine are installed as an option.

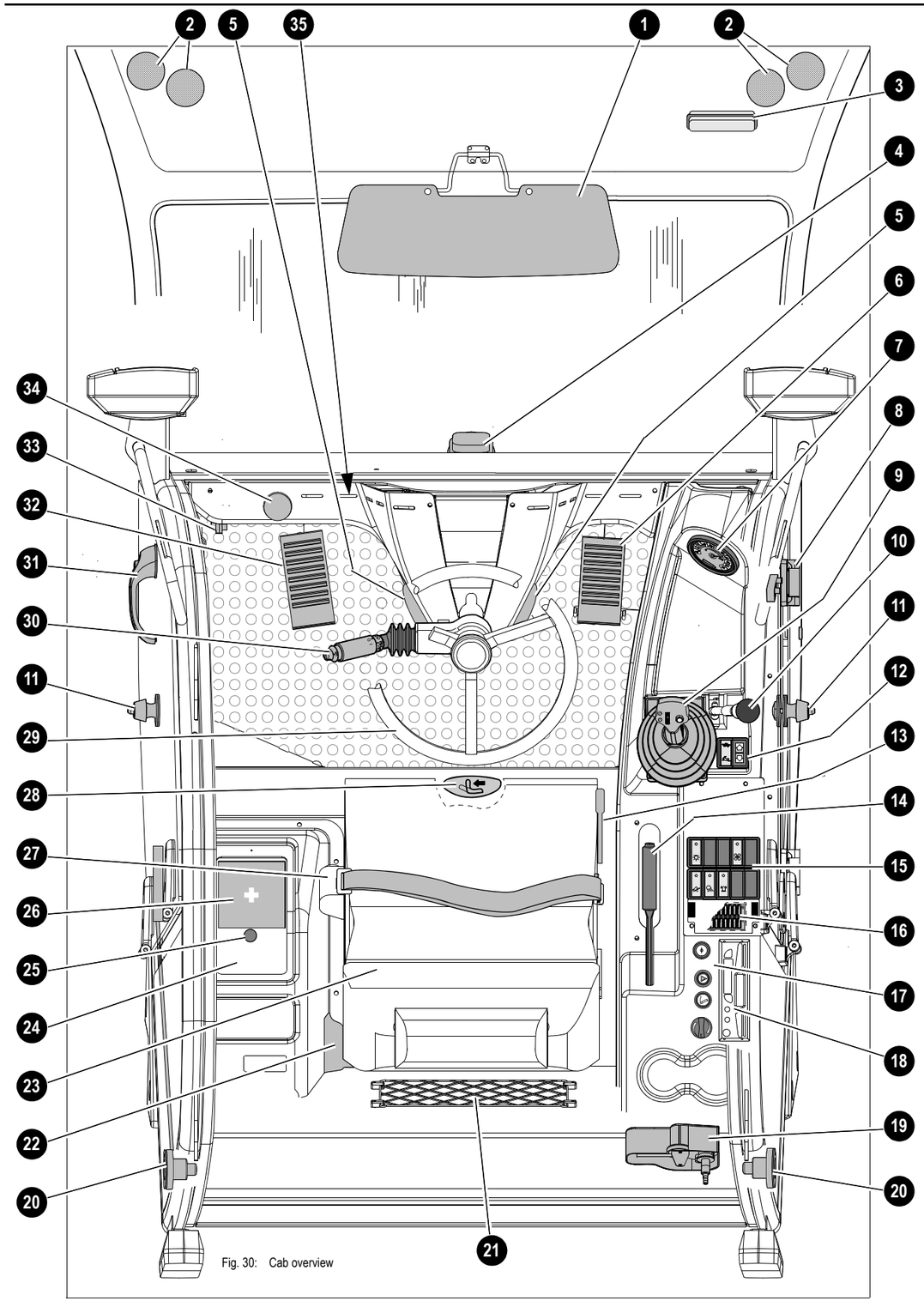


Fig. 30: Cab overview

3.2 Cab overview

Pos.	Description	For more information see page
	Roof console	
1	Sun visor	
2	Air conditioning vent (option)	*3-38*
3	Interior light	*3-35*
	Cab	
4	Wiper motor (front)	*3-39*
5	Leg room air vent	*3-37*
6	Accelerator pedal	*3-25*
7	Instrument panel	*3-14*
8	Side window lock	*3-11*
9	Control lever (joystick)	*3-49*
10	3rd control circuit control lever	*3-49*
11	Arrester - left-hand side cab door/right-hand side window	*3-10*, *3-11*
12	Speed range switch panel	*3-28*
13	Lever - horizontal seat adjustment	*3-41*
14	Parking brake lever	*3-27*
15	Switch panel	
16	Fuse box	*6-5*
17	Instrument panel	
18	Prepared installation for radio (option)	
19	Rear wiper motor	*3-39*
20	Bracket - left-hand side cab door arrester/right-hand side window	*3-10*, *3-11*
21	Storage net for Operator's Manual	
22	Backrest adjustment lever	*3-41*
23	Seat	*3-40*
24	Storage compartment[1]/air conditioning (option)	
25	Air conditioning rotary switch (option)	*3-38*
26	Fixture[1] - first-aid kit	
27	Seat belt	*3-42*
28	Weight adjustment lever	*3-40*
29	Steering wheel	
30	Multifunctional lever	*3-36*
31	Outside door handle	*3-10*
32	(Hydrostatic) service brake/inching pedal	*3-26*
33	Tank - washer system	*3-39*
34	Brake fluid tank	*5-35*
35	Front window defroster vents	*3-37*

1. Not installed if equipped with air conditioning option

Instrument panel overview: see overleaf

Instrument panel overview: see overleaf

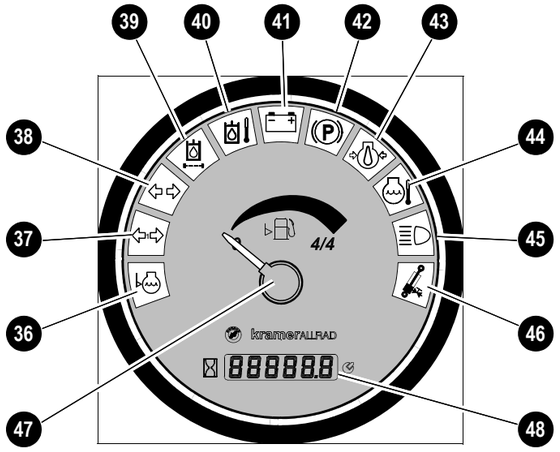


Fig. 31: Instrument panel overview

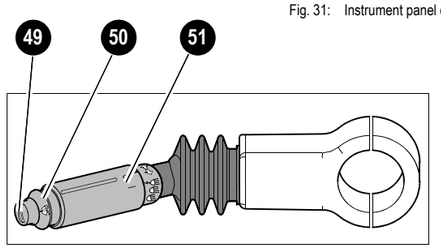


Fig. 32: Multifunctional lever

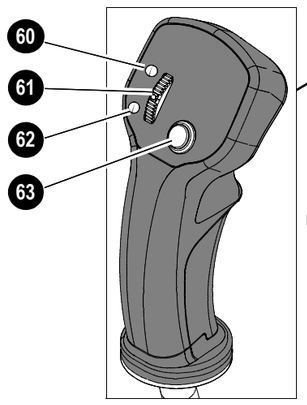


Fig. 33: Control lever (joystick)

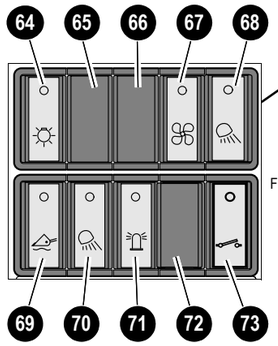


Fig. 34: Switch panel

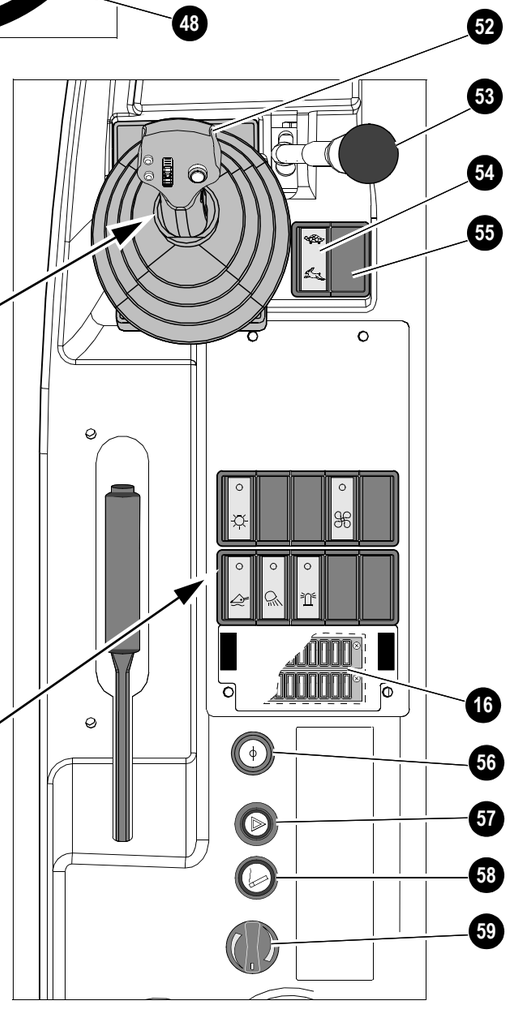


Fig. 35: Left-hand side console: overview

3.3 Instrument panel, multifunctional lever and drive lever: overview

Pos.	Description	For more information see page
	Instrument panel	
36	Indicator (red) - coolant level	*5-7*
37	Indicator (green) - right/left turn indicators for rear attachments	
38	Indicator (green) - right/left turn indicators	*3-36*
39	Indicator (red) - hydraulic oil filter	*5-4*
40	Indicator (red) - hydraulic oil temperature	*5-5*
41	Indicator (red) - alternator charge function	*3-14*
42	Parking brake Indicator (red)	*3-27*
43	Engine oil pressure indicator (red)	*3-14, 5-4*
44	Diesel engine temperature indicator	*3-14, 5-5*
45	Indicator (blue) - high beam	*3-34*
46	Hose burst valve (option) indicator (yellow)[1]	*3-6, 3-29*
47	Fuel level indicator	
48	Hour meter	
	Multifunctional lever	
49	Tip switch - horn	*3-36*
50	Tip switch - front/rear washer system	*3-39*
51	Front window wiper rotary switch	*3-39*
	Switches and control lever (side console)	
52	Loader unit control lever with lock	*3-24*
53	3rd control circuit control lever with lock	*3-24*
54	Speed range selection switch	*3-28*
55	Central lubrication system tip switch (option)	
56	Preheating start switch (engine start)	*3-14*
57	Hazard warning switch	*3-36*
58	Socket/cigarette lighter	
59	Rotary switch - heating (warm/cold)	*3-37*
60	Indicator (green) - forwards driving direction	*3-28*
61	Driving direction selection switch	*3-28*
62	Indicator (green) - reverse driving direction	*3-28*
63	Tip switch - neutral speed range	*3-28*
64	Lights switch	*3-34*
65	Not assigned	
66	Not assigned	
67	Heater fan switch	*3-37*
68	Rear working light tip switch (option)	*3-35*
69	Switch - load stabilizer (option)	*3-29*
70	Switch - working lights	*3-35*
71	Switch - rotating beacon (option)	*3-37*
72	Not assigned	
73	Switch - front socket (option)	*3-32*

1. Hose burst valve is not functional with the load stabilizer switched on (indicator comes on)

3.4 Indicators and warning lights: description

Indicators and warning lights - instrument panel

Unfold pages *3-2* and *3-4* for a better overview!

Indicator (red) - engine oil pressure

Comes on if the engine oil pressure is too low. In this case:

☞ *Stop the machine*

☞ *Switch off the engine immediately and check the oil level (➠ page 5-4)*

The indicator comes on when the starter switch is turned on and goes out as soon as the engine runs.

Temperature indicator - diesel engine

Indicates the engine oil temperature detected by a sensor.

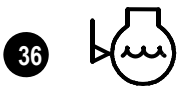
NOTICE

Overheated engine oil will damage the machine. If the engine oil temperature indicator comes on while the engine is running:

☞ *Stop engine immediately*

☞ *Check the engine oil - see chapter 5 "Engine lubrication system" on page 5-4*

☞ *Check the cooling system - see chapter 5 "Engine and hydraulics cooling system" on page 5-5*



Indicator (red) - coolant level

Indicates that the coolant level in the radiator is too low:

☞ *Check the coolant system for leaks, have possible damage repaired by an authorized workshop.*

☞ *Fill up coolant*

Indicator (red) - alternator charge function

The indicator comes on when the starter switch is turned on and goes out as soon as the engine runs.

The V-belt or the charging circuit of the alternator is faulty if the indicator comes on with the engine running. The battery is no longer charged.

Indicator (green) - right/left turn indicators

Flashes intermittently when the turn indicators are used

Indicator (green) - right/left turn indicators on rear attachment

Flashes intermittently when the turn indicators are used and a front or rear attachment is connected electrically.

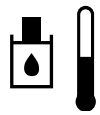
Indicator (blue) - high beam

Comes on if high beam is switched on, or during headlight flashing.

Indicator (red) - parking brake

Comes on when the parking brake is applied.

The electric driving interlock prevents starting the engine with the parking brake applied.

40 

Indicator (red) - hydraulic oil temperature

Comes on if hydraulic oil temperature exceeds 95 °C (203 °F).

NOTICE

Overheated hydraulic oil will damage the machine. If the hydraulic oil temperature indicator comes on while the engine is running:

☞ *Release the pressure on the work and drive hydraulics. To do this:*

☞ *Stop the machine in a suitable place.*

☞ *Move the control lever of the loader unit to neutral.*

☞ *Move the drive lever to neutral.*

☞ *Run the engine at increased rpm until indicator* **40** *goes out.*

39 

Indicator (red) - hydraulic oil filter

Indicates inadmissibly high pressure in the hydraulic return line to the tank. In this case:

☞ *Have the hydraulic oil return filter checked and, if necessary, replaced by an authorized workshop*

36 

Indicator (yellow) - hose burst valve (option)

Indicates that the hose burst valve is switched on. This avoids lowering or dumping out the loader unit without any resistance in the event of a burst hose or line.

➥ *- see "Hose burst valve" safety feature (option)* on page 3-78

3.5 Putting the machine into service for the first time

Safety instructions

- Only use the steps and handles provided when entering and leaving the cab.
- Face the machine as you enter and leave it.
- Never use the controls or movable lines and cables as handles.
- Keep the footholds and the handles clean to ensure a safe hold at all times.
  - Immediately remove dirt, such as oil, grease, earth, snow or ice.
- Never get on or off a moving machine! Do not jump off the machine.
- Refer to the load diagrams for the pallet forks on the loader unit.

Important information

- The machine may be put into service by authorized staff only see Selection and qualification of staff, basic responsibilities on this Operator's Manual .
- The operating staff must have read and understood this Operator's Manual before taking the machine into service.
- The machine may only be used in serviceable condition in accordance with its designated use and the instructions set forth in the Operator's Manual, and only by persons who are fully aware of the risks involved in operating the machine.
- Go through the “Start-up” checklist in the following chapter.

Running-in period

Handle the machine carefully during its first 100 hours of operation.

The future performance and service life of the machine are heavily dependent on the observance of the following recommendations during the running-in period.

- Do not overload the machine, but at the same time do not drive too cautiously either, as the machine will never reach its proper operating temperature.
- Do not run the engine at high rpm for extended periods.
- Increase the load gradually while varying the engine rpm.
- Strictly observe maintenance schedules and perform (or have carried out) the specified maintenance work - *see chapter 5 “Maintenance plan*” on page 5-38.

Check lists

The checklists below are intended to assist you in checking and monitoring the machine before, during and after operation.

These checklists cannot claim to be exhaustive; they are merely intended as an aid for you in fulfilling your duties as a conscientious operator.

The checking and monitoring jobs listed below are described in greater detail in subsequent chapters.

If the answer to one of the following questions is NO, first rectify the cause of the fault before starting or continuing work.

Start-up checklist

Check the following points before taking the machine into service or starting the engine:

No.	Question	✔
1	Enough fuel in the tank? (➠ *5-3*)	
2	Engine oil level OK? (➠ *5-4*)	
3	Oil level in hydraulic tank OK? (➠ *5-14*)	
4	Water level in washer tank OK? (➠ *3-2*)	
5	V-belt condition and tension checked? (➠ *5-11*)	
6	Loader unit lubricated? (➠ *5-17*)	
7	Brake system (including parking brake) OK? (➠ *3-26*)	
8	Tire condition and inflation pressure OK? (➠ *5-21*, *6-7*)	
9	Wheel nuts safely tightened (especially after a wheel change)? (➠ *6-9*)	
10	Lights, signals, indicators, warning lights and indicators OK? (➠ *3-34*, *3-36*, *3-5*)	
11	Windows, mirrors, lights and steps clean?	
12	Attachment on the loader unit safely locked? (➠ *3-52*)	
13	Engine cover safely locked? (➠ *3-12*)	
14	Especially after cleaning, maintenance or repair work: Rags, tools and other loose objects removed?	
15	Approved warning triangle, hazard warning light and first aid kit in the machine?	
16	Seat position and rearview mirror correctly adjusted? (➠ *3-40*)	
17	Seat belt fastened? (➠ *3-42*)	

Operation checklist

After starting the engine and during operation, check and observe the following points:

No.	Question	✔
1	Indicators for engine oil pressure and alternator gone out? (➠ *3-14*)	
2	Braking effect sufficient? (➠ *3-26*)	
3	Temperature indicator for engine coolant in normal range? (➠ *3-5*)	
4	Steering system working properly? (➠ *3-23*)	
5	Anyone dangerously close to the machine? (➠ *2-3*)	
6	3rd control circuit locked? (➠ *3-52*)	
When driving on public roads, particular attention should be paid to the following points:		
7	Bucket and attachments in transport position? (➠ *3-23*)	
8	Transport locks installed? (➠ *3-23*)	
9	Control lever for lift and tilt hydraulics of the loader unit locked with the stop cock? (➠ *3-24*)	
10	Tooth guard fitted to bucket? (➠ *3-69*)	

Parking checklist

Check and observe the following points when parking the machine:

No.	Question	✔
1	Attachments on the loader unit lowered to the ground? (➠ *3-53*)	
2	Parking brake applied? (➠ *3-27*)	
3	Cab locked, especially if the machine cannot be supervised? (➠ *3-10*)	
When parking on public roads:		
4	Machine adequately secured? (➠ *3-33*)	
When parking on slopes:		
5	Machine additionally secured with chocks under the wheels to prevent it from rolling away? (➠ *3-33*)	

3.6 Cab

Locking/unlocking the door

Fig. 36: Outside door opener and lock

Important

Personal injury hazard. An unlatched door can swing free and strike nearby objects or people.

☞ Close the door before and during machine operation or travel.

Opening the door from the outside:

☞ *Press door button **A.***

Locking the door:

☞ *Lock the door with the ignition key (turn to the right).*

Unlocking the door:

☞ *Unlock the door with the ignition key (turn to the left).*

Opening the door from the inside:

☞ *Pull handle **B** up.*

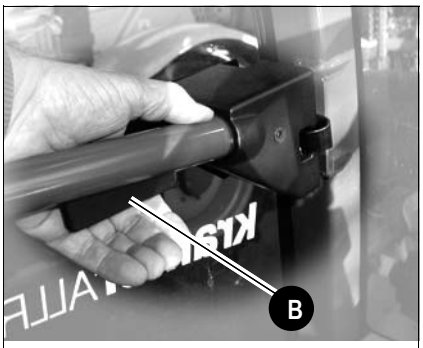


Fig. 37: Inside door opener

Important

Enter and exit from the cab only by means of the door on the left. In case of an emergency the side window on the right may be used as emergency exit.
- *see Right-hand side window emergency exit* on page 3-12

Securing the open door with the door arrester:

☞ *Press the door against bracket **20** of the arrester until it engages with an audible click*

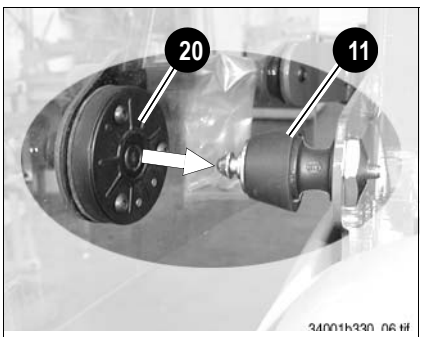


Fig. 38: Securing an open door

Important

Lubricate arrester 11/**20** at regular intervals.

Releasing the door arrester:

The door arrester is located on the left in the cab

☞ *Press lever **B** of the arrester forwards*

➥ The door is released from the lock by spring action

☞ *Close the door*

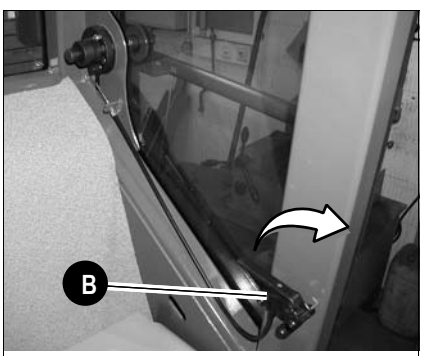


Fig. 39: Unlocking the door arrester

Locking and unlocking the right-hand side cab window

CAUTION

Personal injury hazard. An unlocked side window can swing free and strike nearby objects or people.

☞ *Close the window and move the latch to secure the window against the side of the cab. - see Closing the side window on page 3-11*

☞ *Do not operate the machine with the right side window unlatched.*

☞ *The machine can be operated with the window open to the limit of the stop on the latching lever. - see Locking the open side window on page 3-12*

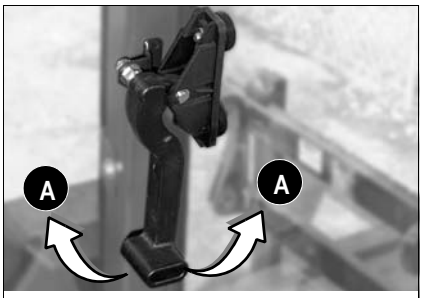


Fig. 40: Locking/unlocking the side window

Closing the side window

☞ *Turn the lever down **A.***

Opening the side window

☞ *Turn the lever up **B.***

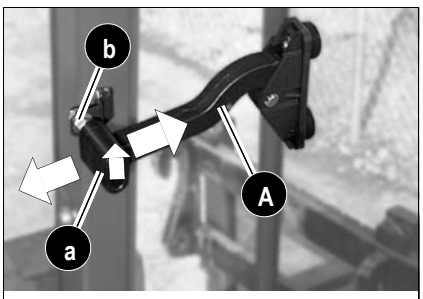


Fig. 41: Opening the side window

Opening the side window

☞ *Turn lever **A** up.*

☞ *Push lever **A** horizontally to the outside.*

☞ *To fasten the window in its final position:*
*Press the end of lever **a** downwards in guide **b.***

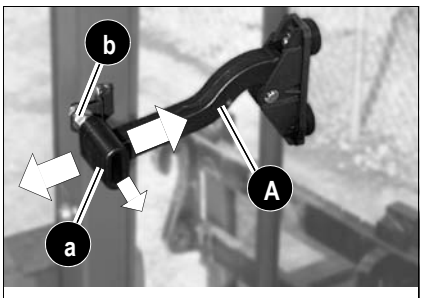


Fig. 42: Fully opening the side window

Fully opening the side window

☞ *Turn lever **A** up.*

☞ *Push lever **A** horizontally to the outside.*

☞ *In order to completely swing the window outwards:*
*Pull the end of lever **a** to the rear out of guide **b.***

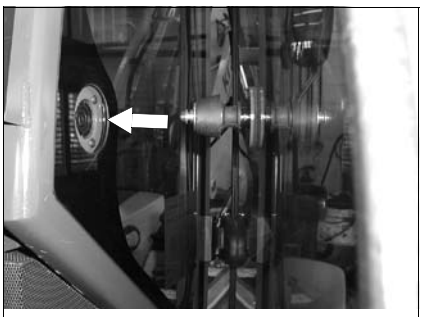


Fig. 43: Locking the side window

Locking the open side window

☞ *Open the side window completely and press it against the arrester*

➥ The side window locks into place and is locked

Important

Lubricate the arrester at regular intervals!

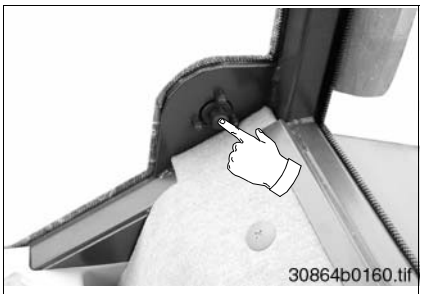


Fig. 44: Unlocking the side window:

Unlocking the open side window

The side window can be unlocked from the inside only

☞ *Press the push button (at the rear right in the cab)*

➥ Side window is released by spring action

☞ *Close the side window with the lever*

3.7 Right-hand side window emergency exit

In case of an emergency, the side window can be used to exit from the cab if the door can no longer be used.

CAUTION

Personal injury hazard. Do not use the side window as a routine exit from the machine. The right side of the machine does not have footholds or handles that ensure a safe access/exit.

☞ *The side window is to be used as an exit only if the access opening is blocked or cannot be opened through normal operating procedures.*

☞ *Before resuming normal service, lock the window lock lever back into place in the guide - see Closing the side window on page 3-11*

3.8 Opening/closing the engine cover

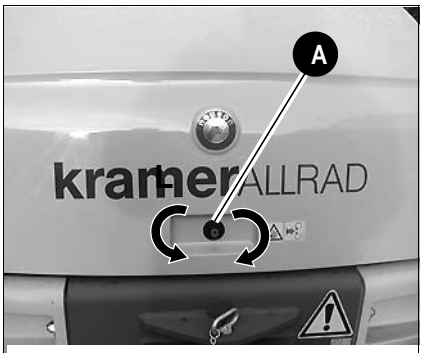


Fig. 45: Engine cover lock

Opening:

☞ *Press lock **A***

☞ *Pull the engine cover upwards*

Closing:

☞ *Firmly press down the engine cover until lock **A** engages with an audible click*

Locking and unlocking:

Lock the engine cover with the key of the preheating start switch.

3.9 Before starting the engine

General instructions on starting the engine

☞ *Run through the "Start-up" checklist 3-8.*

☞ *Switch on the battery master switch - see Battery master switch (option) on page 3-21.*

☞ *Adjust seat position and rearview mirror.*

Important

All controls must be within easy reach. You must be able to move the brake and accelerator pedals to their limit positions!

☞ *Fasten your seat belt*

☞ *Make sure*

- the parking brake is applied - *see Parking brake* on page 3-27
- the control lever for the loader unit is in neutral
  - *see Changing direction (forwards/reverse)* on page 3-28

- The engine will not start unless
  - ➥ the parking brake is applied to the last notch - *see Parking brake* on page 3-27
  - ➥ the drive interlock is enabled (option)
- The starter cannot be activated if the engine already runs
  - ➥ (start repeat interlock)
  - ➥ Do not run the starter for more than 10 seconds
- Wait about 1 minute so the battery can recover before trying again

NOTICE

The engine cannot be started by tow starting the machine, as there is no driving connection between the engine and the gearbox (e.g. cardan shaft) when the engine is switched off.

☞ *- see Getting ready for towing on page 3-44*

Important

When the machine is used for extended periods at outside temperatures below -10 °C (14°F), we recommend retrofitting the machine with an engine preheater ("oil preheater" option)

- *- see Oil and fuel preheater (option)* on page 3-21

Starting the engine

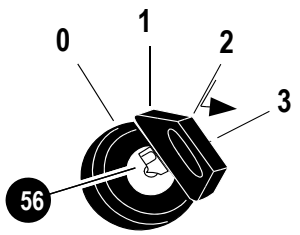


Fig. 46: Preheating/start switch

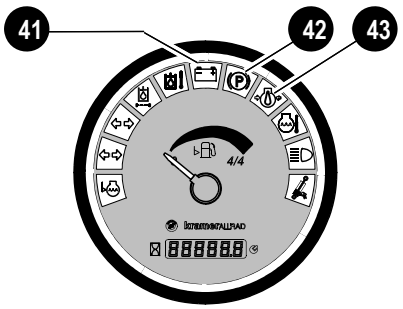


Fig. 47: Instrument panel indicators

After you have completed the starting preparations in accordance with *Before starting the engine* on page 3-13 and *Disabling the drive interlock* on page 3-17:

☞ *Turn the starter key to position "**1**"*

➥ *Starter circuit* ON

☞ *Turn the starter key to position "**2**"*

➥ At normal temperatures, the intake air is preheated about 5 - 10 seconds (up to 0°(32°F)) At low temperatures (below 0°(32°F)), about 15 - 60 seconds

➥ The following indicators must come on:
43 for the engine oil pressure
41 for the alternator charge function
42 if the parking brake has been applied.

☞ *Press accelerator pedal 30/**6** through about 1/4 of its travel.*

☞ *Turn the starter key to position "**3**" and hold it in this position until the engine starts.*

☞ *Release the starter key.*

NOTICE

In order to avoid damage to the engine and the exhaust turbocharger due to insufficient lube oil supply, operate the engine as follows as you start it:

☞ *Do **not** run the cold engine at high idle.*

☞ *Let the engine warm up at low idle (for about 30 seconds).*

☞ *Do **not** switch off the engine from high idle.*

☞ *Let the engine run at idling speed for about 2 minutes.*

☞ *When the engine runs smoothly, check that indicators **43 and 41** have gone out.*

☞ *Do not operate the machine with defective indicators.*

Important

In general, a battery delivers less energy in cold conditions. Therefore, make sure the battery is always well charged.

3.10 Drive interlock with code input (option)

Keyboard for entering codes: overview

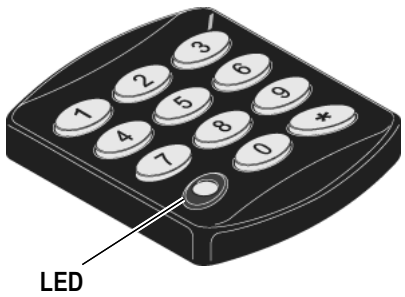


Fig. 48: Drive interlock (code input option)

The drive interlock is enabled or disabled with “personal” codes entered via the keypad. Two codes are available:

- The existing unchangeable six-digit **main code** for disabling the drive interlock, for entering a personal code or for changing the personal code.
- The four, five or six-digit **personal code** is used for disabling the drive interlock and is entered by the driver.

Important

We recommend using the personal code for disabling the system.

☞ *Keep the main code in a safe place.*

The keypad consists of:

- 10 numeric key for entering the codes.
- A (*) key for confirming the code that has been entered.
- An LED (red indicator).
- An internal acoustic signal for signalling specific procedures

  ➥ Example: a signal sounds to confirm a key has been pressed

The keypad comes on:

- When pressing any key.
- The keypad flashes to indicate specific system statuses.

Entering/changing the personal code

In order to enter or change the personal code:

☞ *Disable the drive interlock by entering the main code (6 digits) and pressing the **(*)** key.*

☞ *Turn the starter key to position "Ignition **ON**".*

☞ *The LED comes on for 2 seconds.*

☞ *Enter the 4, 5 or 6-digit new personal code and confirm with the (*) key within 20 seconds after the LED has gone out .*

☞ *Enter the new personal code again and confirm it with the **(*)** key after a short flashing of the LED.*

➥ Confirmation: LED flashes twice briefly, then comes on for 2 seconds.

☞ *Turn the starter key to the OFF position and remove it as soon as the LED goes out.*

➥ The new personal code is now set and can be used for disabling the drive interlock.

Important

The personal code must be entered correctly twice consecutively otherwise an error is indicated by means of a single flashing of the LED:

☞ *Codes consisting of 3 and less, or of more than 6 digits are ignored by the system*

☞ *Simple codes (with identical or consecutive digits, e.g. 1, 2, 3, 4) are rejected by the system with four short acoustic signals*

☞ *Entering a new personal codes replaces the previous code. A code can be changed any time if the main code is known*

Enabling the drive interlock

☞ *Switch off the engine and remove the starter key*

➥ The drive interlock is automatically enabled

➥ Flashing LED (on the keypad)

Disabling the drive interlock

☞ *Enter the personal code or main code (6 digits).*

☞ *Press the **(*)*** key.

➥ Confirmation: 2 long acoustic signals and long LED flashing

➥ LED OFF = drive interlock is disabled

➥ Diesel engine can be started

The diesel engine will not start if a wrong code has been entered

➥ Confirmation: 4 short acoustic signals, flashing LED = wrong code

➥ Re-enter the code

☞ *Turn the starter key and switch on the engine before the LED flashes again (30 seconds)*

Important

Entering the wrong code four times consecutively will lock the keypad for 5 minutes. No codes can be entered during this time.

☞ *If the wrong code has been entered, wait until 5 minutes have passed and enter the correct code.*

☞ *The keypad does not come on as long as it is blocked. It comes on briefly every 4 seconds and an acoustic signal sounds*

☞ *Press the **(*)** key after every code*

☞ *The LED comes on briefly when turning the starter key to the engine start position*

Taking the drive interlock out of service

We recommend taking the drive interlock out of service if the machine has to stay in a workshop, for instance, or if the machine does not require any protection. This avoids having to communicate the code.

1 Disable the system by entering the personal or main code and by confirming with the **(*)** key.

2 Turn the starter key to position “ON” as soon as the LED goes out.

3 The LED comes on for 2 seconds.

4 As soon as the LED goes out, press the **(*)** key for about 2 seconds until a short acoustic signal, followed by two further signals, sounds (within 20 seconds after the LED has gone out).

5 The LED now flashes very slowly, and the keypad is disabled.

6 Turn the starter key to the OFF position and remove it.

7 The engine can be started without entering the code. The system is out of service even if electric power is interrupted.

Important

With the system out of service,

☞ *the LED flashes slowly even if the ignition key is in position ON*

☞ *Entering the personal or main code does not have the effect of putting the system back into service again (the acoustic signals for confirmation are still given). See the following procedure (“Putting the drive interlock back into service again”) to leave the out-of-service status again.*

Putting the drive interlock back into service again

☞ *Press the* **(*)** *key for 2 seconds (starter key in position OFF) until two short acoustic signals are given for confirmation.*

➥ The system is enabled again. The code must be entered to start the engine.

Interruption of drive interlock power

If the drive interlock was **enabled** before electric power was interrupted, short acoustic signals are given upon switching on the keypad (similar to those that are given when entering the wrong code four times). In this case, wait until the acoustic signals are no longer given. Then disable the drive interlock with the personal or main code.

The LED still does not come on if the drive interlock was **disabled**. The engine can be started before the LED starts flashing again.

If the drive interlock was out of service, this status remains unchanged and the LED flashes slowly.

Drive interlock maintenance

The MED 310.1T drive interlock does not require any maintenance.

Protect the keypad and the control unit from heat and humidity.

3.11 Key-based drive interlock (option)

Key-based drive interlock: scope of delivery

The drive interlock is integrated in the starter lock and can be enabled only with the blue starter keys!

Scope of delivery:

- Drive interlock installed in the machine.
- 2 x blue keys (coded).
- 1 x red master key (for training the blue keys).

Coding (“training”) new ignition keys

New personal keys are coded with the master key (red). This is why it must be carefully stored outside the machine.

Important

Each drive interlock has only one master key!

☞ *The drive interlock must be replaced if the master key is lost.*

- The master is only used for coding new keys, and cannot be used for disabling the drive interlock.
- Coding is carried out by inserting the master key in the starter lock and by turning it to position '1' for a maximum 5 seconds. After the master key has been returned to position '0' and removed, you have 15 seconds for inserting a key that requires coding. It must be inserted in the starter lock and turned to position '1' in order to be registered as a valid key.
- Coding is automatically stopped if no key requiring coding is detected within 15 seconds.
- Several keys requiring coding can be inserted one after another in the starter lock.
- Each key must remain at least 1 second in position '1'.
- Coding can be carried out for a maximum 10 keys.

Enabling (locking) the drive interlock

☞ *Apply the parking brake*

➥ *- see Parking brake* on page 3-27

☞ *Switch off the engine*

☞ *Remove the starter key (blue)*

➥ The drive interlock is enabled in 30 seconds

Important

The drive interlock remains disabled if the starter key (blue) is **not** removed from the starter lock!

Disabling (releasing) the drive interlock

Start and switch off the engine exactly as described on page 3-14 *"Starting the engine"*.

☞ *The system is enabled 5 seconds after the starter key is inserted in the starter lock*

☞ *Start the engine - see Starting the engine on page 3-14*

➥ The drive interlock is disabled as long as the engine runs

Deleting coded keys

Deleting coded keys is necessary whenever a coded key is lost

- All coded keys are deleted during deletion
- After deletion has been carried out, all existing keys can be recoded
- Deletion is carried out by inserting the master key in the starter lock and by turning it to position '1' for a minimum 20 seconds.
- All coded keys are then deleted, and all existing keys can be recoded
- The master key code is not deleted during deletion

Security functions

The drive interlock remains enabled for 15 minutes and does not accept any valid keys if more than 5 keys with different invalid codes are inserted and turned in the starter lock within 1 minute. This function avoids 'finding' the correct key by chance by trying different keys. It is only available if the control valve relay is connected in addition with terminal 30. The drive interlock remains enabled for 15 minutes and does not accept any valid keys if several invalid keys have been detected without having set the starter lock to position '0'. Valid keys are accepted only after 15 minutes and after the position '0' of the starter lock has been detected. This avoids testing keys without actuating the mechanical starter lock, e.g. by moving the starter lock to position '1' by force.

Interruptions of the supply line or other control lines do not disable the drive interlock or delete data (e.g. data codes). All important data is saved in a non-volatile memory.

3.12 Battery master switch (option)

Interrupting power supply

The battery master switch is located in the engine compartment next to the battery.

☞ *Turn and remove the key of the battery master switch (notched position).*

Switching on power supply:

☞ *Insert the key in the battery master switch.*

☞ *Turn the key to the notched position.*

3.13 Oil and fuel preheater (option)

This equipment is for cold-starting at temperatures below -5 °C (23°F).

Oil preheater operation

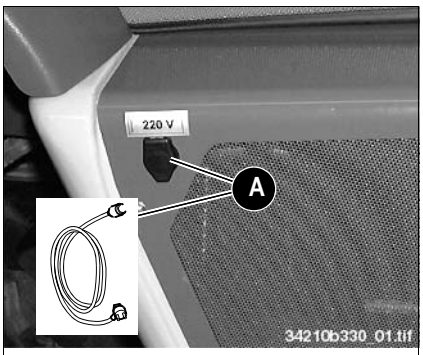


Fig. 49: Oil preheater

The engine and hydraulic oil is heated by means of heating elements with a capacity of 750 W in the engine oil pan and in the hydraulic oil tank, according to the gravity principle (warm oil rises and is replaced by cold oil). The oil can only be thoroughly warmed up to service temperature if the oil preheater is connected over a longer period of time - preferably over night.

☞ *Connect the oil preheater as follows:*

- Park the machine near a 220 V socket.
- First connect special cable **A** with machine socket **B**, then
- Insert the plug into the 220 V socket

☞ *Before starting the engine:*

- Remove the plug from the 220 V socket.
- Unplug special cable **A** from machine socket **B.**
- Close the engine cover.

Fuel preheater operation

The fuel preheater prevents paraffin crystals forming, which otherwise clog the fuel filter at low temperatures.

A temperature switch automatically switches on a heating element in the fuel line between the tank and the fuel prefilter when ignition is switched on at temperatures below + 10 °C (50°F).

3.14 Jump-starting the engine (external battery)

Safety instructions regarding external starting aids

WARNING

Explosion hazard. A frozen battery may explode during a jump-starting operation.

☞ *Do not jump-start the engine if the battery is frozen.*

☞ *Dispose of the frozen battery in accordance with local environmental regulations.*

☞ *Replace the battery.*

WARNING

Possibility of equipment damage or injury from improper jump-starting.

☞ *Make sure the jumper cables are rated for 12V and the maximum CCA rating of the battery.*

☞ *The cable clamping ends shall be colored red for positive post connectors, and black for the negative post connectors.*

☞ *To avoid sparking, the excavator must not touch the jump-starting vehicle when connected with jumper cables.*

☞ *Use a **12V** source, either in the form of another battery or a charger equipped for jump-starting. Using higher or lower voltage sources can damage the electrical system and potentially cause injury.*

☞ *To avoid short circuits, the jumper cable connected to the positive **+** terminal of the starting battery must never be brought into contact with electrically conductive vehicle parts.*

☞ *Route the jumper cables so they do not become entangled in rotating components in the engine compartment.*

Providing external starting aid

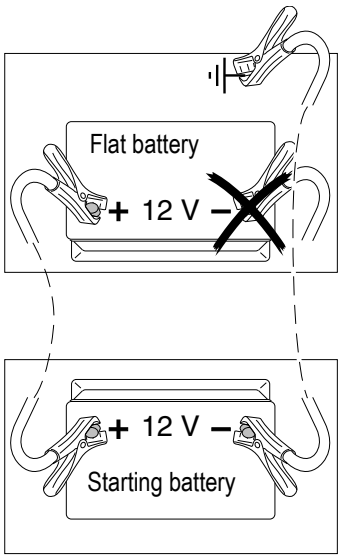


Fig. 50: Starting aid with jump leads

☞ *Drive the jump-starting vehicle close enough to the loader so that the jump leads can reach to connect the two batteries*

☞ *Let the engine of the jump-starting vehicle run*

☞ *First connect one end of the red jump lead (**+**) to the **+ terminal** of the flat battery, then connect the other end to the **+** terminal of the starting battery*

☞ *Connect one end of the black jump lead (**-**) to the - **terminal** of the starting battery*

☞ *Connect the other end of the black jump lead (**-**) onto a solid metal component fimly mounted on the engine block or onto the engine block itself. Do not connect it to the negative terminal of the flat battery, as otherwise explosive gas emerging from the battery may ignite if sparks are formed!*

☞ *Start the engine of the machine with the flat battery*

Once the engine has started:

☞ *With the engine running, disconnect both jump leads in exactly the reverse order (first remove the **- terminal**, then the **+ terminal**) - this prevents sparking in the vicinity of the battery!*

3.15 Before moving off

Specific instructions regarding driving on public roads

The machine is subject to the

- Applicable legal regulations of your country
- and to the requirements specified in the machine documentation.
- Only the equipment items (attachments) listed in the operating license or in the machine papers are admissible for driving on public roads! (- *see chapter 1 "Attachments with certified material densities*" on page 1-5).
- In addition, bear in mind the mandatory regulations relevant to accident prevention

☞ *Perform a functional check of:*
- *Brakes*
- *Steering*
- *Lights*

☞ *Empty the bucket (- see Loader unit operation: overview on page 3-49).*

☞ *Tilt back the bucket **B** .*

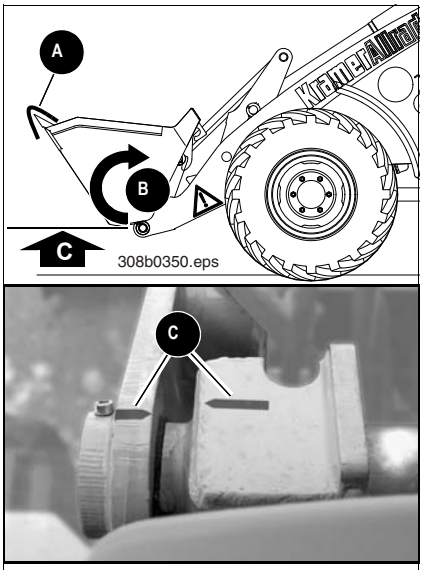


Fig. 51: Driving on public roads

WARNING

Personal injury hazard. Unprotected blades or teeth on the bucket can cut or crush.

☞ *Cover the blade or teeth of the bucket across their entire width with the tooth guard **A** provided*

☞ *Use a suitable means of transport to move or transport buckets/attachments which have not been authorized for transport on public roads*

☞ *- see chapter 1 "Attachments with certified material densities" on page 1-5*

☞ *Raise the loader unit so that both red marks* **D** *on the lift frame and the bulkhead are aligned*

Important

Ground clearance for transport **C** in connection with the standard bucket and standard tires is **about 250 mm.**

Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads

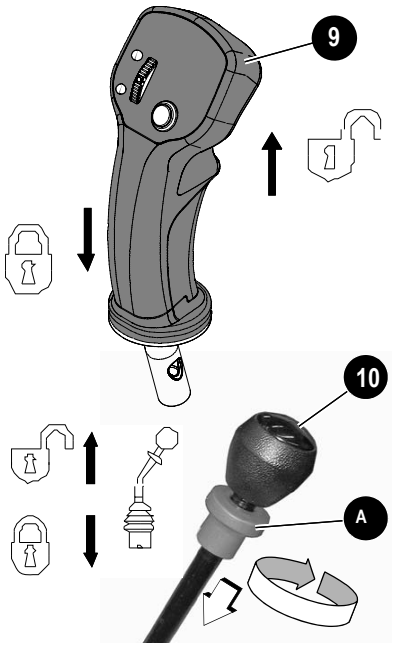


Fig. 52: Lock for control levers

Important

Possible loss of machine control. Unsecured control levers **9** (joystick) and **10** (3rd control circuit) can be moved unintentionally, causing accidental machine movement. To lock the control levers in place:

☞ *Push control lever* **9** *down vertically in neutral position*

☞ *The control lever is locked in this position and can no longer be moved*

☞ *Unscrew lock sleeve* **A** *of control lever* **10** *clockwise until it is pulled down by spring action*

☞ *Let control lever* **10** *engage in center position*

❴ The control lever is locked in this position and can no longer be moved

3.16 Steering system

Checking the steering system

Important

Power steering is only active when the engine is running. The machine can still be steered if the diesel engine or the pump drive breaks down; however, steering will require more effort.

☞ *Adapt towing speed to the altered steering characteristics.*

☞ *Use a towing bar.*

❴ *- see Towing the machine* on page 3-44

☞ *Functional check: move the steering wheel back and forth with the engine running*

Synchronous wheel position

If the wheels on both axles do not run in the same track, proceed as follows:

WARNING

An unsynchronized steering system may cause the machine to operate unpredictably when traveling on public roads.

☞ *Synchronise the steering system as described before driving on public roads*

☞ *At low drive speed, slowly turn the steering wheel to the **left and right** as far as it will go and try turning it even further in the end position for a few seconds (as for cornering)*

☞ *Turn the steering wheel rapidly back to straight-ahead position*

☞ *Contact your Wacker-Neuson dealer if this does not synchronise the wheels*

3.17 Differential lock

Switching the differential lock on and off

Important

The differential lock neutralises the compensating effect of the differential, i.e. traction is distributed evenly to the front and rear wheels.

- Both the front and the rear axle of the machine are fitted with a self-locking differential.
- The lock value is 45 % for each axle. The differential is locked automatically and cannot be switched on or off by the driver!

3.18 Accelerator pedal

Speed control with the accelerator pedal

Accelerator pedal 30/**6** controls the drive speed as follows:

- Press down the accelerator pedal ➥ Drive speed is increased
- Slowly release the accelerator pedal ➥ Drive speed is reduced
- Completely release the accelerator ➥ Hydrostatic braking

Important

Speed depends on the speed range selected with the switch.

- *- see Selecting a speed range* on page 3-28

3.19 Brake/inching pedal

Specific instructions regarding brake/inching pedal actuation

The brake/inching valve is located on the left in the machine

Important

Brake lights at the rear of the machine will not illuminate unless the inching pedal is depressed to activate the brake system. Hydraulic braking alone will not illuminate the brake lights.

☞ *Make sure that people in the work area, especially those following the machine, are aware that the brake lights do not illuminate when hydraulic braking is being used.*

Braking with the brake/inching pedal

WARNING

Possibility of uncontrolled machine movement. The machine may not stop or hold position on a slope without additional force on the brake/inching pedal. This braking action is in addition to the automatic hydraulic braking action achieved by releasing the pedal.

☞ *Press brake/inching pedal 30/**32** down with force until the braking effect is felt*

☞ *Before moving off, press brake/inching pedal 30/**32** down to check whether*

- After a maximum of half the pedal travel there is a firm resistance to be felt
- The brake lights come on

☞ *Look in the rearview mirror before moving off*

☞ *Press the brake/inching pedal down with force at slow speed and check the brake effect*

Inching with the brake/inching pedal

☞ *Press brake/inching pedal 30/**32** down* **slightly**

➥ In the inching range of the brake pedal (pedal pressed lightly), the pedal can be used like a car's clutch. The drive system is no longer supplied with hydraulic oil which means that the entire engine output is available to the work hydraulics and that the loader unit can be raised more quickly.

NOTICE

When traveling downhill, use the brake pedal to support the hydraulic braking action from the drive train. This avoids damage (excessive rpm) to the drive and/or the diesel engine.

☞ *Reduce engine rpm: remove your foot from the accelerator pedal*

☞ *Reduce your drive speed with the service brake*

3.20 Parking brake

General instructions regarding the parking brake

Important

A starting interlock prevents the machine from starting even with the parking brake slightly applied.
Selecting the driving direction with switch 35/**54** is not possible unless parking brake **14** is released completely. Applying the parking brake automatically cancels the selection of forwards/reverse driving direction (drive) and activates neutral.

Applying the parking brake

Important

When operating the machine, apply parking brake **14** only in an emergency if the service brakes fail to slow the machine.

☞ *Be aware that the brake lights will not come on when the parking brake is applied.*

☞ *In normal operation only use brake/inching pedal* 30/**32** *as a service brake*

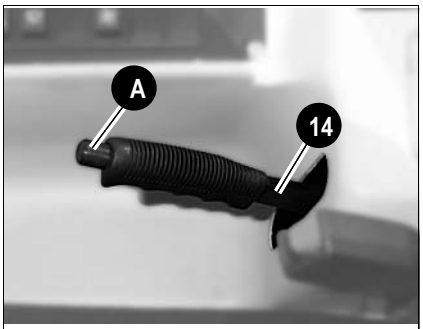


Fig. 53: Applying and releasing the parking brake

Preventing the machine from rolling away

☞ *Pull lever* **14** *up to* **the last notch**

➥ Indicator 31/**43** on the instrument panel comes on.

➥ The engine can be started.

➥ Selection of forwards/reverse driving direction (drive) is automatically cancelled and neutral activated.

☞ *Secure the machine with wheel chocks*

➥ *- see Stopping/parking the machine* on page 3-33

Releasing the parking brake

☞ *Pull lever* **14** *up slightly.*

☞ *Press button* ***A.***

☞ *Move lever* **14** *down as far as it will go.*

➥ Indicator 31/**43** on the instrument panel goes out.

3.21 Driving the machine

Selecting a speed range

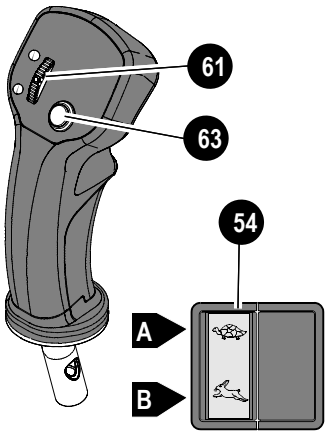


Fig. 54: Switch for speed range selection

The machine has 2 speed ranges.

☞ *Set driving direction to neutral with tip switch **63** on the joystick*

☞ *Press switch **54** to the required speed range*

Symbol	Meaning	Recommended
	Work range **A** ➥ 0 - 6 kph (20 kph) Work range **A** ➥ 0 - 8 kph (30 kph option)	Used for work involving short loading cycles, i.e. a rapid succession of loading and unloading operations, e.g. onto a truck, and for work requiring precise speed adjustment, e.g. rotary broom applications.
	Drive range **B** = 0 - 20 kph	For long-haul travel
	Speed range **B** = 0 - 30 kph (option)	

Important

The machine can be moved only after releasing parking brake *30/**14*** completely.

☞ *Release parking brake 30/**14***

☞ *Select the driving direction with switch **61** on the control lever*

➥ See table “Driving forwards/backwards”

☞ *Gradually press accelerator pedal 30/**6***

➥ Machine moves off

☞ *Test the brakes at low speed*

Changing direction (forwards/reverse)

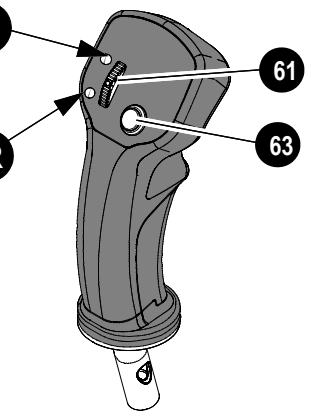


Fig. 55: Selecting the driving direction

CAUTION

Possibility of unexpected machine movement. Changing direction at high speed and full throttle causes the machine to brake abruptly.

☞ *Slow the machine to walking pace before changing direction*

☞ *Reduce engine revs: remove your foot from the accelerator pedal*

☞ *Slow the machine to walking pace*

☞ *Select a new driving direction with switch **61**:*

Function	Operation	Effect
Forwards	☞ *Press switch **61** forwards **F***	➥ Indicator **F** comes on
Reverse	☞ *Press switch **61** backwards **R***	➥ Indicator **R** comes on
Neutral	☞ *Press tip switch **63***	➥ Indicator goes out

3.22 Load stabilizer (option)

General instructions regarding the load stabilizer function

The load stabilizer cushions and dampens the movements of the loader unit. It avoids unstable oscillating movements of the loader and increases drive comfort and safety!
Switching the load stabilizer on or off during work depends on the individual situation.

Important

In order not to impair the load stabilizer function in transport position of the loader unit, do not retract the tilt ram to the limit!

- Briefly reduce the pressure on the tilt ram limit

WARNING

Tip over hazard. When traveling at higher speeds, the machine may become unstable if the load stabilizer is not switched on.

☞ *Always switch on the load stabilizer when traveling at higher speeds.*

☞ *Always switch on the load stabilizer when driving on public roads*

- *- see Switching the load stabilizer on and off on page 3-30*

Important

Load stabilizer affects hose burst valve operation. Switching on the load stabilizer automatically switches off the hose burst valve (load holding control valve). In the event of a burst hose or pipe, this valve acts as a safety feature that prevents the loader unit from being lowered or dumped without being braked.

☞ *Be aware that the hose burst valve is automatically switched off when the load stabilizer is switched on.*

☞ *- see "Hose burst valve" safety feature (option) on page 3-78*

Switching the load stabilizer on and off

Important

The loader unit yields easily with the load stabilizer switched on, making it difficult to perform any precise lifting movements. The lifting capacity of the loader unit is only about 90 % of the rated force!

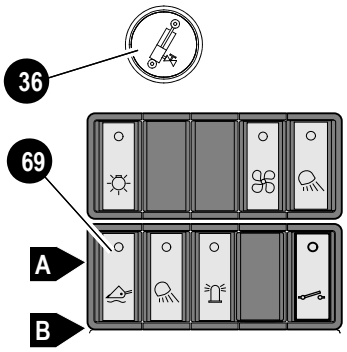


Fig. 56: Switch for load stabilizer (option)

The switch is located on the right in the side console

	Function	Work operation
OFF (A)	☞ *Press switch **69** to position **A*** ➥ Indicator ***36*** on the instrument panel goes out ➥ The load stabilizer is switched off ➥ The hose burst valve (option) is switched on	In general for heavy-duty work, e.g. picking up excavated material
ON (B)	☞ *Press switch **69** to position **B*** ➥ Indicator ***36*** on the instrument panel comes on ➥ Load stabilizer is switched on ➥ The hose burst valve (option) is switched off	For driving on public roads, for lighter work with the loader unit and for light off-road transport

3.23 Backup warning system (option)

Backup warning system feature

WARNING

Personal injury hazard. The backup warning system should not be relied upon exclusively to notify others when backing up the machine.

☞ *Make sure nobody is within the danger area of the machine when changing the traveling direction.*

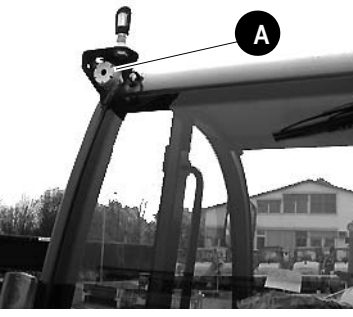


Fig. 57: Backup warning system (option)

Important

In certain countries, a backup warning system is mandatory. The backup warning system consists of a signal transmitter **A**, fitted on the inside of the cover over the towing device. The signal transmitter generates an acoustic signal when shifting into reverse. The acoustic level is about 103 dB (A) at a distance of 1 m and at a frequency of 2800 Hz.

3.24 Manual throttle (option)

Setting the drive speed with the manual throttle

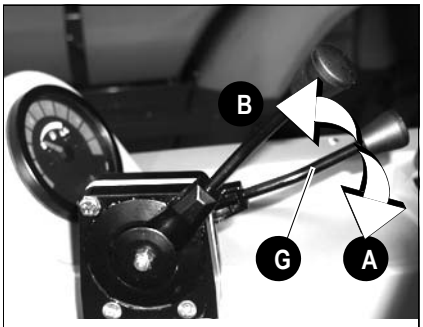


Fig. 58: Manual throttle (option)

The manual throttle is located on the right of the side console

WARNING

Possibility of unexpected machine movement. Do not actuate the manual throttle lever G when traveling on public roads.

☞ *Use the manual throttle **G** during work operation only!*

☞ *Before* traveling *on public roads:*

- *Move the manual throttle lever **G** to idling speed position **A***
- *Set the engine rpm with the accelerator pedal only*

Function

Permanent setting of engine rpm for work operation

Position	Engine rpm
A	Idling speed = minimum rpm
B	Full throttle = maximum rpm

Important

This function is especially useful for operating hydraulic attachments which need a continuous supply of hydraulic oil. Drive speed must be set with the brake/inching pedal or with the low-speed control (option).

3.25 Low-speed control (option)

Setting the drive speed with the low-speed control

The control lever is located on the right of the side console

Wheel loader speed can be set more precisely and independently of the engine rpm with control lever **H**.

This function corresponds to inching with the brake/inching pedal.
Maximum speed depends on the speed range selected.

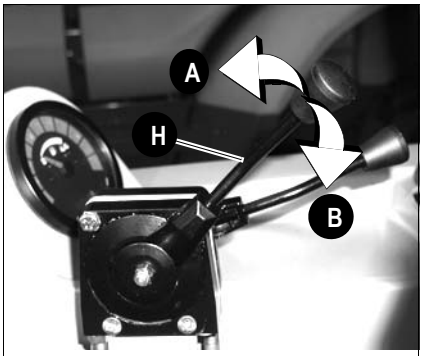


Fig. 59: Low-speed control (option)

☞ *Select the driving direction*

➥ *- see Changing direction (forwards/reverse)* on page 3-28

☞ *Select a speed range*

➥ *- see Selecting a speed range* on page 3-28

☞ *Set constant engine revs with the accelerator pedal or the manual throttle (option)*

☞ *Select the required drive speed*

➥ Move control lever **H** towards **A**

☞ *Stop the wheel loader*

➥ Move control lever **H** to limit **B**

Position	Drive speed
A	Maximum speed
B	Machine at a standstill

3.26 Electric connection - front socket (option)

Taking the front socket into operation

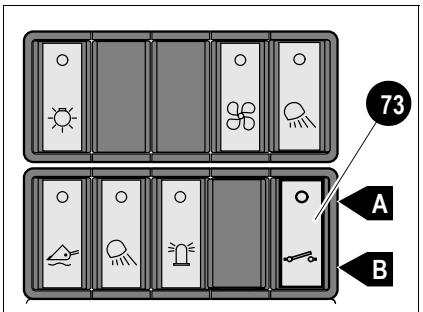


Fig. 60: Backup warning system (option)

The machine can be equipped with a 4 pole front socket. Switch **73** on the right on the instrument panel switches electric power supply on or off for electrically operated attachments such as a spray water pump for a rotary broom.

Power supply for front attachments (option)		
ON	☞ *Press switch **73** to position **B***	➥ Power supply at the socket is switched on ➥ Indicator in switch comes on
OFF	☞ *Press switch **73** to position **A***	➥ Power supply is switched OFF ➥ Indicator goes out

3.27 Location of fire extinguisher (option)

Fig. 61: Fire extinguisher (option)

The fire extinguisher is **not** included in the machine's standard equipment (option).

☞ *If a fire extinguisher is retrofitted according to DIN-EN 3, then this must be carried out by an authorized workshop.*

☞ *Located on the rear wall, to the left of the seat (see fig.).*

3.28 Taking the machine out of operation

Stopping/parking the machine

WARNING

Possibility of inadvertent machine movement. To avoid unintentional movement of the machine once it has been parked:

☞ *Use the parking brake to park the machine safely and to prevent it rolling away! - see Parking brake on page 3-27*

☞ *Additionally secure the machine by placing chocks under the downhill sides of the wheels!*

☞ *Reduce engine rpm: remove your foot from the accelerator pedal*

☞ *Stop the machine with service brake 30/**14***

☞ *Move the machine to neutral with tip switch 33/**63** on the joystick*

☞ *Apply the parking brake - see Parking brake on page 3-27*

☞ *Lower the loader unit. To do this:*

- Push control lever (joystick) 30/**9** forwards out of neutral
- Place the bucket on the ground so that the edge is flat with the ground. To do this: push control lever 30/**9** to the left or right - *see Loader unit operation: overview* on page 3-49

☞ *Switch off the engine (- see Starting the engine on page 3-14*)

After operation at full power:

☞ *Allow the engine to run on for a while so that the temperature can stabilise*

☞ *Switch off the engine. To do this:*

- Turn the starter key to "**0**" and remove it

☞ *Lock the doors after leaving the cab*

On slopes:

☞ *Additionally secure the machine by placing chocks under the downhill sides of the wheels!*

3.29 Machine lights

Machine lights operation

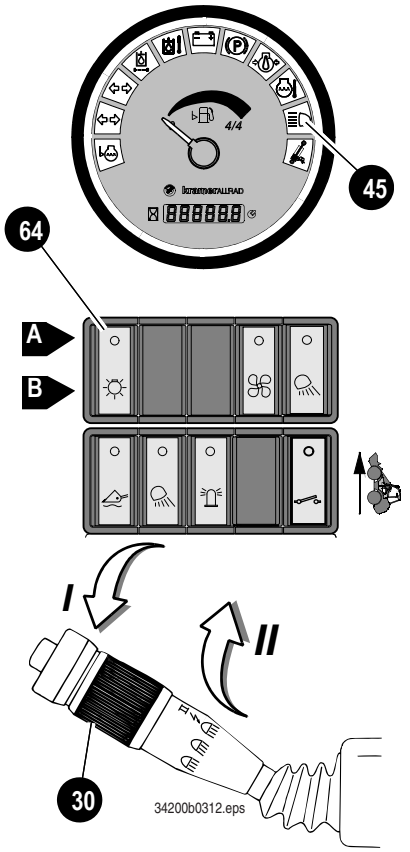


Fig. 62: Light system

The switch panel for the light system is located on the left on the instrument panel

Parking lights		
ON	☞ *Press switch **64** to the **1st position B***	➥ Indicator in switch comes on
OFF	☞ *Press switch **64** down to **position A***	➥ Indicator in switch goes out

Low beam		
ON	☞ *Press switch **64** to the **2nd position B*** ☞ *Move lever **30** to position **II***	➥ Indicator in switch comes on
OFF	☞ *Press switch **64** down to **position A***	➥ Indicator in switch goes out

Important

Only the side marker lights stay lit if the ignition is switched off (with low beam switched on) - key in preheating start switch 35/**56** in position **0**!

High beam		
ON	☞ *Press switch **64** to the **2nd position B*** ☞ *Move lever **30** to position **I***	➥ Indicator (blue) **45** on the instrument panel comes on
OFF	☞ *Move lever **30** to position **II***	➥ Indicator (blue) **45** on the instrument panel goes on ➥ Low beam comes on

Headlight flasher		
ON	☞ *Briefly pull lever **30** fully up (beyond position II)*	➥ Indicator (blue) **45** on the instrument panel comes on

Working lights operation

WARNING

Traffic accident hazard. The working lights can temporarily blind motorists on public roads.

☞ *Do not switch on the working lights when traveling on public roads.*

☞ *When operating the machine, only switch the working lights on when there is no possibility of blinding passing motorists.*

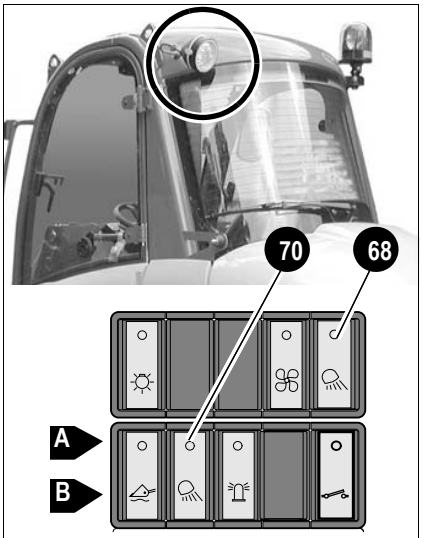


Fig. 63: Switch for working lights

Front and/or rear working lights (option)		
ON	☞ *Press switch **70** to position **B***	➥ Indicator in switch comes on
OFF	☞ *Press switch **70** to position **A***	➥ Indicator in switch goes out

2 front working lights (option)		
ON	☞ *Press switch **70** to position **B***	➥ Indicator in switch comes on
OFF	☞ *Press switch **70** to position **A***	➥ Indicator in switch goes out

2 rear working lights (option)		
ON	☞ *Press tip switch **68** briefly*	➥ Indicator in tip switch comes on
OFF	☞ *Press tip switch **68** briefly*	➥ Indicator in tip switch goes out

Interior light operation

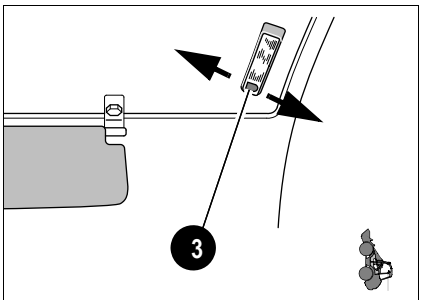


Fig. 64: Switch for interior light

Interior light	
ON	☞ *Press switch **3** to the left or right*
OFF	☞ *Move switch **3** to center position*

3.30 Signalling system

Turn indicator operation

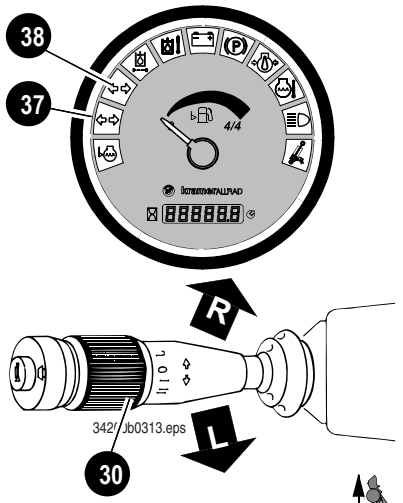


Fig. 65: Turn indicators

Turn indicators		
RIGHT	☞ *Push lever **30** forwards **R***	➥ Indicator **38** flashes
LEFT	☞ *Pull lever **30** to the rear **L***	➥ Indicator **38** flashes

➥ Indicator **37** flashes during trailer operation

NOTICE

If the indicator light **38** flashes rapidly, this indicates that one of the turn signal lights is not illuminating.

☞ *With the turn signal activated, inspect both the front and rear turn signals to determine which is not working.*

☞ *Replace all burned-out bulbs.*

☞ *If bulb replacement fails to resolve the problem, contact your dealer to diagnose and repair the turn signal system malfunction.*

Hazard warning system operation

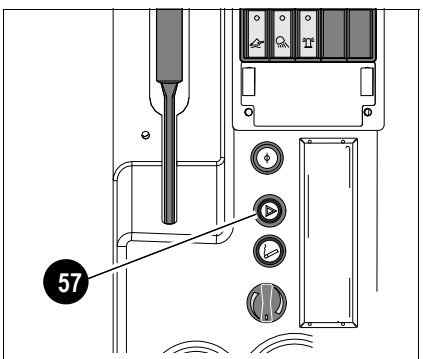


Fig. 66: Switch for hazard warning system

Hazard warning system		
ON	☞ *Press switch for hazard warning system **57** to notched position*	➥ The indicator in the switch and indicator **38** on the instrument panel flashes
OFF	☞ *Release switch for hazard warning system **57** from notched position by applying slight pressure*	➥ The indicator in the switch and indicator **38** on the instrument panel goes out

3.31 Rotating beacon (option)

Rotating beacon operation

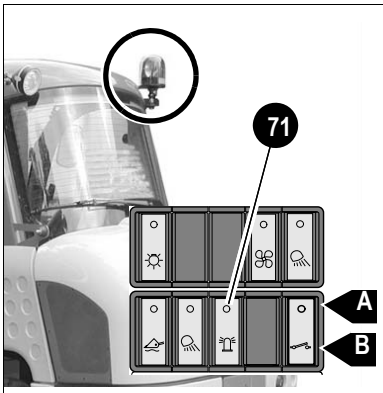


Fig. 67: Switch for rotating beacon

Rotating beacon (option)		
ON	☞ *Press switch **71** to position **B***	➥ Indicator in switch comes on
OFF	☞ *Press switch **71** to position **A***	➥ Indicator in switch goes out

Important

Legal regulations of your country may require you not to switch on the rotating beacon on public roads unless the road is within the machine's working range and the machine represents an obstruction to the normal flow of traffic when the machine is in work operation.
Get informed on and follow the legal regulations of your country.

3.32 Cab heating and ventilation

Heating and ventilation system operation

Important

The machine heater can be set to 2 operating modes:

- Ventilation, fresh air
- Heating
- The air flow is directed to the front window via defroster vent (fig. 30/**35**), and to the leg room via both vents (30/**5**). The legroom vents can be closed and adjusted separately

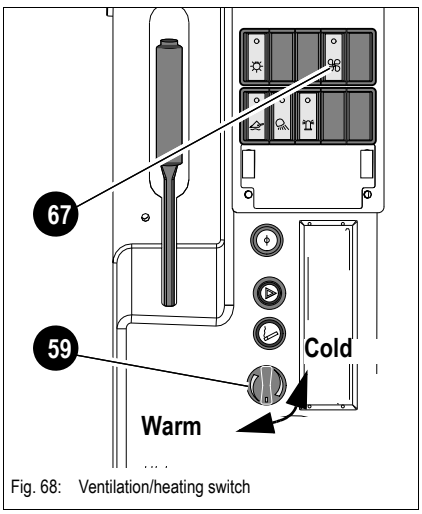


Fig. 68: Ventilation/heating switch

The ventilation switch **67** and the rotary switch **59** for the heating is located on the right on the side console.

Ventilation (fresh air)		
1st speed	☞ *Press switch **67/A** down one step*	➥ Fan runs in **1st speed**
2nd speed	☞ *Press switch **67/A** down two steps*	➥ Fan runs in **2nd speed**
OFF	☞ *Press switch **67/A** completely down*	➥ Fan **OFF**

Heating	
☞ *Turn rotary switch **59*** to the **left**	**Cold**
☞ *Turn rotary switch **59*** to the **right**	**Warm**

3.33 Air conditioning (option)

Air conditioning operation

Fig. 69: Air conditioning rotary switch

During the hot season, the air conditioning system supplies cool and dehumidified air to the cab via the vent nozzles in the cab roof.

Important

Close the door and the windows to achieve best air conditioning results.

The rotary switch for the air conditioning system is located on the left next to the seat

Air conditioning operation	Cooling
Turn rotary switch **25** to range **1**	**Low**
Turn rotary switch **25** to range **2**	**Medium**
Turn rotary switch **25** to range **3**	**High**
Turn rotary switch **25** to range **0**	**OFF**

Important

The heating and ventilation system can be used in addition to the air conditioning!

- *- see Heating and ventilation system operation* on page 3-37

NOTICE

In order to avoid functional errors and possible loss of the refrigerant:

☞ *Run the air conditioning system once a month.*

☞ *This prevents the seals in the compressor from drying and becoming brittle*

☞ *Check V-belt tension and clean the condenser.*

☞ *- see chapter 5 "Air conditioning (option): maintenance" on page 5-24*

☞ *The air conditioning system must be repaired, serviced and filled with a refrigerant only by a qualified technician.*

3.34 Washer system

Washer system operation

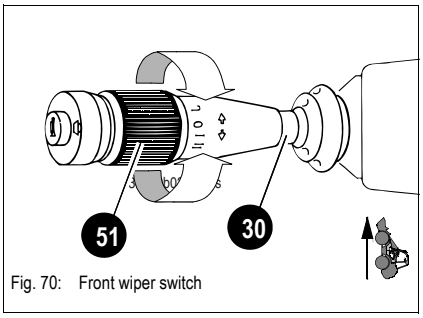


Fig. 70: Front wiper switch

Front window wiper		
OFF	☞ *Turn rotary switch **51** on lever **30** to position **0***	➥ Front wiper is on
ON	☞ *Turn rotary switch **51** on lever **30** to position **1***	➥ Front wiper returns to base position

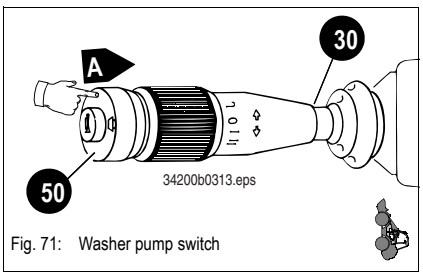


Fig. 71: Washer pump switch

Washer pump for front and rear window	
ON	☞ *Press and hold tip switch **50** on lever **30 (A)***
OFF	☞ *Release tip switch **50***

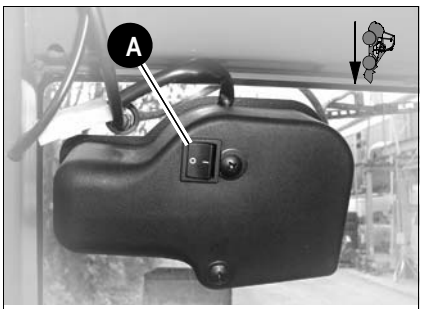


Fig. 72: Rear wiper switch

Rear wiper		
ON	☞ *Press switch **A /1***	➥ Rear wiper is on
OFF	☞ *Press switch **A /0***	➥ Rear wiper returns to base position

Tank for washer system

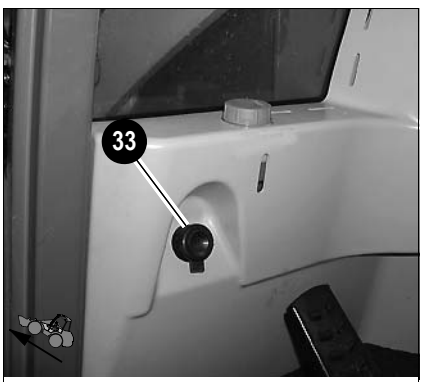


Fig. 73: Tank for washer system

Tank filler inlet **33** is located on the left in the front cover (steering system)

Important

Fill the tank with a windshield washer solution for best results. This will provide a cleaning solvent as well as freeze protection in colder weather.

- Using water is not recommended. In colder weather, water will freeze and cause system damage and malfunctions.

3.35 Seat

Seat adjustment: overview

Always adjust the seat to your individual needs. This will help avoid or minimize physical disorders related to bad posture

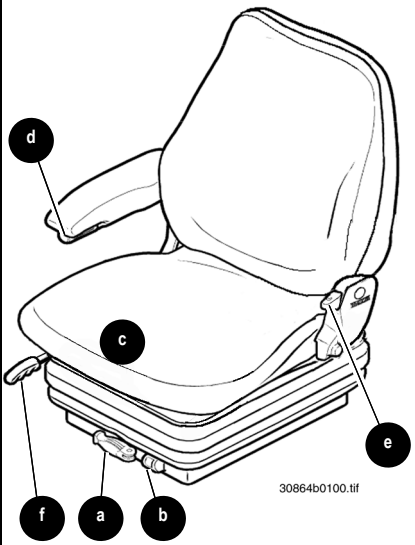


Fig. 74: Seat adjustment

CAUTION

Possible loss of machine control while adjusting the seat.

☞ *Do not adjust the seat position during machine operation or travel.*

☞ *Adjust the seat before operating the machine.*

☞ *After adjusting the seat, confirm that the seat is firmly latched in the desired position.*

☞ *Do not operate a machine with a malfunctioning or defective seat latch—repair or replace the latch before operating the machine.*

The seat can be set to the following positions:

- **b =** weight adjustment **a** with weight indication
- **c =** height adjustment
- **d =** armrest inclination
- **e =** backrest adjustment (depending on version)
- **f =** horizontal adjustment

Weight adjustment

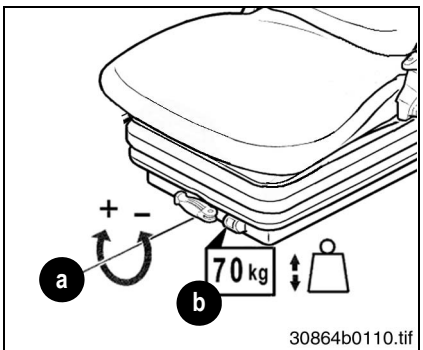


Fig. 75: Weight adjustment

Important

Adjust and match the seat suspension to the weight of the operator to ensure a comfortable position. Properly adjusting the seat suspension will eliminate excessive motion and maximize shock absorption.

- Use lever **a** to adjust the seat suspension to the operator's weight. The weight indicator **b** shows the set operator weight [kg].

☞ *Sit down on the seat.*

To adjust to a increase in weight:

☞ *Turn lever **a** clockwise.*

➥ Read the weight off indication **b.**

To adjust to a decrease in weight:

☞ *Turn lever **a** counterclockwise.*

➥ Read the weight off indication **b.**

Height adjustment

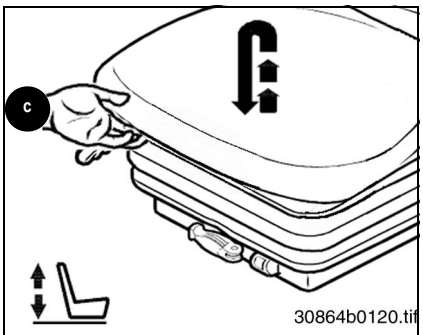


Fig. 76: Height adjustment

Up:

☞ *Raise seat as required until it engages with an audible click.*

Down:

☞ *Raise seat as far as possible, after this lower seat to bottom position.*

Backrest adjustment

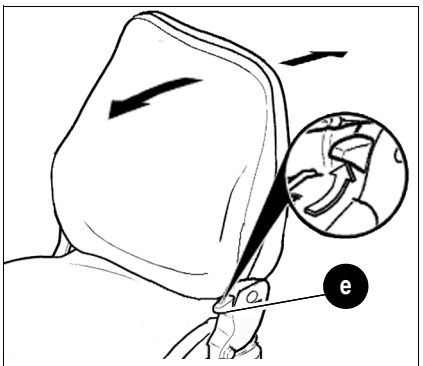


Fig. 77: Backrest adjustment

☞ *Sit down on the seat.*

☞ *Pull lever **e** up and at the same time.*

☞ *Lean back to push the backrest into the required position.*

☞ *Allow lever **e** to engage.*

Horizontal adjustment

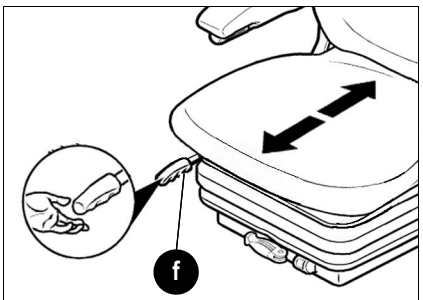


Fig. 78: Horizontal seat adjustment with control lever

☞ *Sit down on the seat.*

☞ *Pull lever **f** up and at the same time.*

☞ *Move the seat forwards or backwards.*

☞ *Allow lever **f** to engage in required position.*

Armrest adjustment

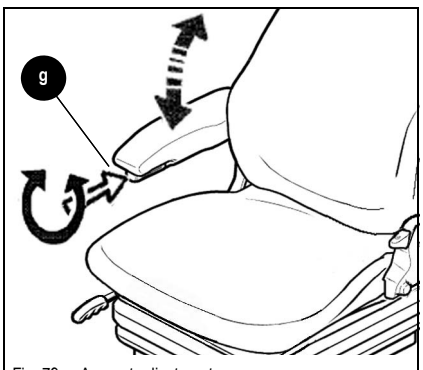


Fig. 79: Armrest adjustment

The armrest can be folded back as required. Adjust the armrest as follows:

Up:

☞ *Turn handwheel **g** clockwise as required.*

Down:

☞ *Turn handwheel **g** counterclockwise as required.*

3.36 Seat belt (lap belt)

Specific instructions regarding the seat belt

WARNING

Personal injury hazard. The seat belt provides positive support in the operator seat during operation and travel and keeps the operator located within the comfort zone for control operation. The seat belt also reduces the risk of injury in the event a tipping incident occurs during use.

☞ *Always buckle up before operating or working with the machine.*

☞ *Do not twist the seat belt during fastening or use.*

☞ *Seat belt must run over the hips – not over the stomach – and must always be worn firmly fastened.*

☞ *Do not place the seat belt over hard, edged or fragile items (tools, steel rule, glasses, pen) carried inside your clothes.*

☞ *Never buckle up 2 persons with one seat belt.*

☞ *Check seat belts each time the operator uses the machine. Have damaged parts immediately replaced by an authorized service center before using the machine.*

☞ *Always keep the seat belt and buckle clean, as dirt and debris can cause the buckle to malfunction and accelerate internal webbing abrasion in the belt.*

☞ *Seat belt buckle must not be obstructed by foreign bodies (paper or similar); otherwise the buckle latch cannot lock into place!*

WARNING

Personal injury hazard. The seat belt strap will be stretched after an accident and is no longer serviceable.The seat belt will NOT provide adequate protection in the future!

☞ *Replace the seat belt after an accident.*

☞ *Have fastening points and seat fixture examined for damage or failure. Repair or replace if damaged.*

Fastening the seat belt

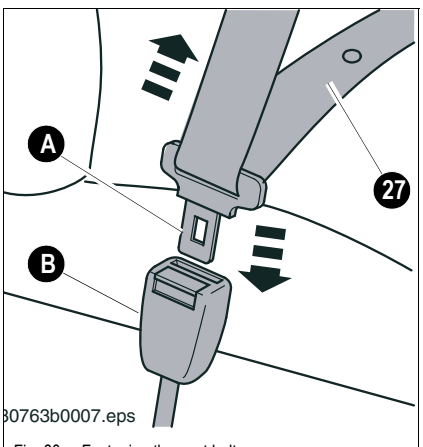


Fig. 80: Fastening the seat belt

The seat belt is for the driver's safety during work on construction sites and during road travel.

Fasten seat belt **27** as follows before moving off:

☞ *Hold the belt at buckle latch **A** and run it slowly and steadily over the hips to buckle **B**.*

☞ *Insert buckle latch **A** into buckle **B** until it engages audibly* **(pull test).**

☞ *Tighten the seat belt by pulling at its end.*

➥ The seat belt must always be tightly in place over the hips!

Unfastening the seat belt

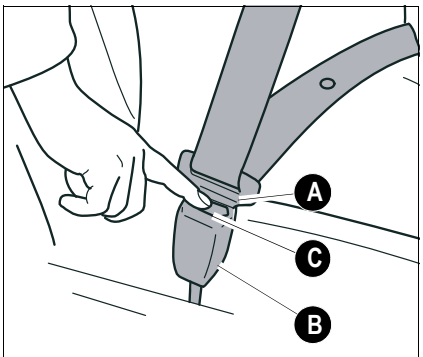


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Fig. 81: Unfastening the seat belt

Unfasten the seat belt as follows:

☞ *Hold the seat belt.*

☞ *Press red button **C** on buckle **B.***

➥ Latch **A** is released from buckle **B** by spring action.

☞ *Slowly return the seat belt to the retractor (option).*

Longer/shorter lap belt adjustment

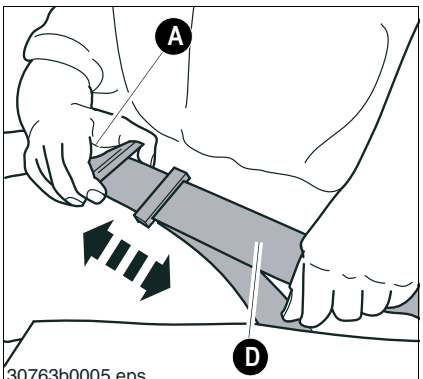

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Fig. 82: Longer/shorter seat belt adjustment

☞ *Lengthen the lap belt as follows:*

- Hold buckle latch **A** at a right angle to the seat belt and pull the seat belt to the required length.

☞ *To shorten the lap belt, just pull the free end **D** of the belt.*

Important

When pulled slowly, the automatic seat belt offers full freedom of movement. It locks however during abrupt braking.
The automatic seat belt may also lock when passing through potholes or uneven terrain.

3.37 Towing the machine

Safety instructions for towing the machine

If the diesel engine and/or the hydraulic drive breaks down, the machine can be towed under the following conditions.

- ·A tow bar and suitable accessories are used.
- ·No one is near the tow bar and towing accessories while towing is taking place.
- ·The towing speed is held to 3–4 kph (1–2 mph) or slower.
- ·The towing vehicle is of adequate size.
- ·The HP pressure relief valves are opened.

Getting ready for towing

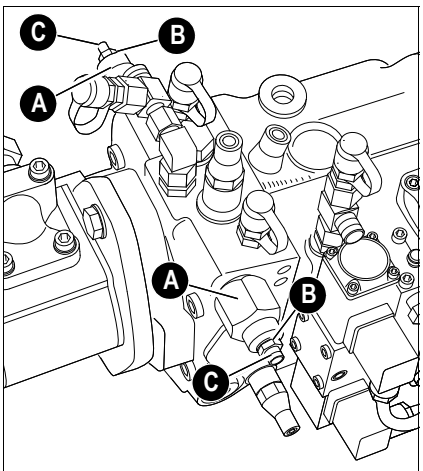


Fig. 83: 20 kph hydraulic pump

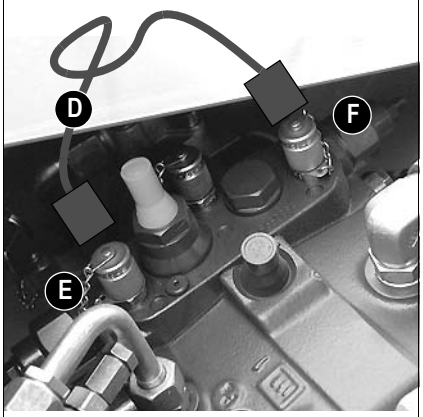


Fig. 84: 30 kph hydraulic pump (option)

Disabling the variable displacement drive pump

NOTICE

The hydrostatic power train can be damaged when towing the machine.

☞ *Tow away the machine from the danger area only after you have opened the HP pressure relief valves*

☞ Tow the machine out of the danger area only at walking pace and only over short distances.

☞ *Switch off the engine and remove the starter key*

Variable displacement drive pump (20 kph (12 mph))

☞ *Switch over the HP pressure relief valves **A** on the variable displacement pump. To do this:*

- Slacken hexagon lock nuts **B** on both HP valves **A.**
- Screw in hexagon socket head screws **C** on both HP valves **A** until they are flush with lock nuts **B.**
- Secure hexagon socket head screws **C** on both HP valves **A** with lock nuts **B.**

Variable displacement drive pump 30 kph (18 mph) (option)

☞ *Mount hose **D** between test ports **E** and **F.***

➥ The hose is included in the tool kit.

☞ *If possible, run the diesel engine at idling speed when towing the machine.*

Towing

WARNING

Improperly towing the machine can cause equipment damage and possible injury to people in the area.

☞ *The towing vehicle must have enough tractive power and be fitted with a safe brake system.*

☞ *Only tow the machine with a towing bar.*

- See chapter *Specifications* on page 6-1 for the machine's dimensions and weights!

☞ Use eye hooks for towing the machine- *see chapter 1 "Machine overview" on page 1-2*

☞ *If possible, run the engine at idling speed when towing the machine*

- *Turning the steering wheel requires greater effort if the diesel engine and the brakes break down.*

☞ *Tow away the machine from the danger area only after you have opened the HP pressure relief valves on the variable displacement pump.*

- Tow the machine out of the danger area only at walking pace and only over short distances.

Once towing is over

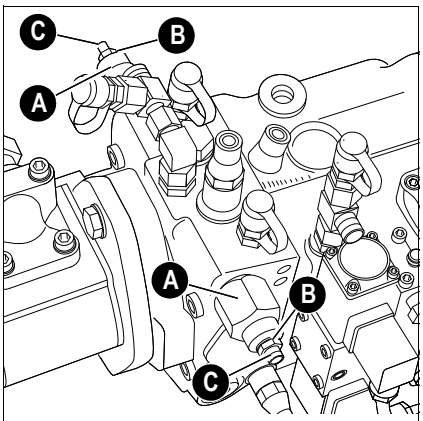


Fig. 83: 20 kph hydraulic pump

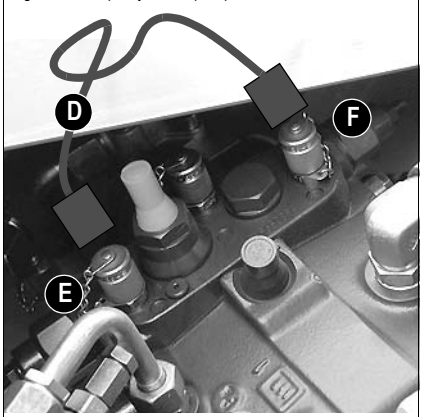


Fig. 84: 30 kph hydraulic pump (option)

Enabling the variable displacement drive pump (20 kph (12 mph))

☞ *Switch over the HP pressure relief valves **A** on the variable displacement pump. To do this:*

- Slacken hexagon lock nuts **B** on both HP valves **A**
- Unscrew hexagon socket screws **C** on both HP valves **A** as far as they will go and secure them with locknuts **B**

Enabling the variable displacement drive pump (30 kph (18 mph) option)

☞ *Remove hose **D** between test ports **E** and **F**, and close the ports with caps*

➥ Store the hose in the tool box

3.38 Crane handling the machine

Safety instructions regarding crane handling

- The crane and the lifting gear must have suitable dimensions
  ➥ on page 6-1 *"Specifications"*, and particularly *6.11 Weights* and *6.18 Wheel loader dimensions with bucket (model WL 850)*
- Crane handling requires lifting gear of four equal lengths
- Secure the machine against unintentional movement!

WARNING

Crushing hazard.

☞ *Do not lift the machine with someone in the operator seat/station or on the machine.*

☞ *Secure the machine against unintentional movement.*

☞ *Persons responsible for attaching the lifting devices to the machine shall be experienced with crane operations and hand signals.The crane operator shall maintain sight of the personnel attaching, guiding, and unhooking the machine.*

☞ *Use OSHA-rated and approved lifting devices capable of lifting the machine, attachments, options and accumulated debris. Refer to the general weight guidelines in the specification section of this manual.*

☞ *Load the machine only with the standard bucket empty and in transport position. - see chapter 1 "Attachments with certified material densities" on page 1-5*

☞ *Stay clear of suspended loads!*

☞ *Do not attempt to lift the machine with any type of crane including wheel loaders unless the crane operator is qualified to lift loads in craning operations.*

Crane handling the machine

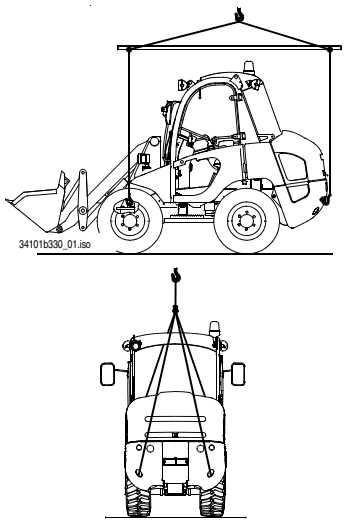


Fig. 83: Crane handling

☞ *Load the machine as follows:*

- Mount and safely lock the standard bucket - *see Equipping the machine with a standard bucket* on page 3-52
- Dump out the standard bucket
- Set the drive to neutral - *see Changing direction (forwards/reverse)* on page 3-28
- Tilt in the standard bucket and lower it to transport position - *see Specific instructions regarding driving on public roads* on page 3-23
- Apply the parking brake - *see Applying the parking brake* on page 3-27
- Switch off the engine and remove the starter key
- Do not allow anyone to stay in the cab, and close the doors and the engine cover
- Fasten the loader at the 4 points provided with sufficiently dimensioned lifting gear - *see chapter 1 "Machine overview*" on page 1-2

WARNING

Personal injury hazard. Do not use the eye hooks on the cab for loading the machine.

☞ *Lift the machine by using only the designated lifting points.*

- Carefully raise the machine

3.39 Loading and transporting the machine on a transport vehicle

General safety instructions

- The transport vehicle must be of adequate size - see chapter *"Weights" on page 6-7* for the dimensions and weights of the machine!
- Remove any mud, snow or ice from the tires so that the machine can be safely driven onto the ramps
- Secure the machine against unintentional movement!
- When placing the load on the platform, make sure the load is at the lowest possible position and that the center of gravity of the load is in the center line of the vehicle if possible (load distribution plan).
- Do not exceed the gross weight rating and the gross axle weight rating when loading and transporting the machine.
- Make sure the load does not fall short of the minimum axle load of the steering axle, otherwise the steering behavior of the vehicle is seriously affected.
- Place partial loads so as to ensure an even load on all axles.
- Store or secure the load with suitable auxiliary means so that it cannot slip, slide, roll, tip over or fall, or cause the vehicle to tip over under usual transport conditions.
- Usual transport conditions are conditions in the which the brakes are slammed on, evasive maneuvers are carried out with the vehicle or in which uneven roadways are driven on. Auxiliary means are e.g. anti-slip bases and linings, load-securing straps and chains, clamping beams, protective paddings, nets, edge protectors, etc.
- Depending on the load, adapt your drive speed to the road and traffic conditions and to the handling of the transport vehicle.
- Always use the existing lashing points when using belts and chains - *see chapter 1 "Machine overview*" on page 1-2.

Loading and strapping down the machine

WARNING

Possibility of injury or equipment damage from improper loading and transporting.

☞ *Read the safety instructions at the beginning of this chapter.*

☞ *Follow any other local safety regulations regarding loading and transporting the machine.*

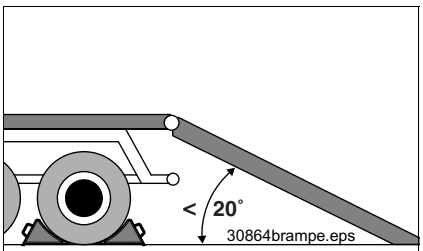


Fig. 84: Access ramps

☞ *Load as follows:*

- Secure the transport vehicle with chocks to prevent it from rolling.
- Place the access ramps at the smallest possible angle. Do not exceed an **angle of 20°**. Use access ramps with an antiskid surface only.
- Make sure the loading area is clear and access to it is not obstructed - e.g. by superstructures.
- Make sure the access ramps and the wheels of the machine are free of oil, grease and ice.
- Start the engine of the machine.
- Raise the bucket enough so that it will not touch the access ramps.
- Carefully drive the loader onto the middle of the transport vehicle.
- Set the drive to neutral - *see Changing direction (forwards/reverse)* on page 3-28.
- Lower the bucket to the loading area.
- Switch off the engine.
- Apply the parking brake - *see Applying the parking brake* on page 3-27.
- Remove the starter key.
- Do not allow anyone to stay in the cab, and close the doors and the engine cover.

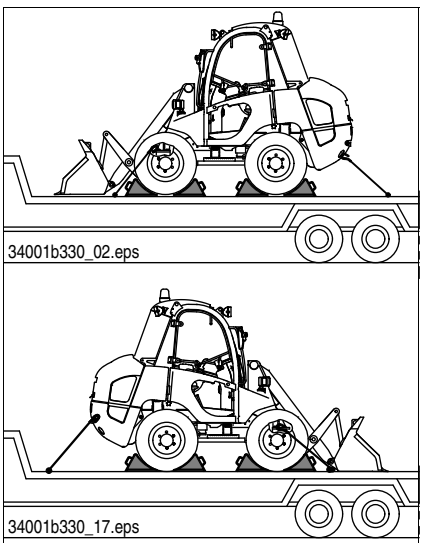


Fig. 85: Strapping down the loader

☞ *Strap down the machine as follows:*

- Make sure the authorized maximum height is not exceeded.
- Secure all tires of the wheel loader with chocks in front of, behind and at the sides of each wheel.
- Firmly strap down the machine at the eye hooks - *see chapter 1 "Machine overview"* on page 1-2 - with sufficiently dimensioned belts or chains onto the platform.
- Before transporting the machine through heavy rain: close the outlet of the exhaust silencer with a simple cap or suitable adhesive tape.
- Make sure the driver of the transport vehicle knows the overall height, width and weight of his vehicle (including the loader) before moving off, and the legal transport regulations of the country or countries in which transport will take place!

3.40 Loader unit operation: overview

Operating the lift and tilt ram control levers

CAUTION

Possible loss of machine control. Unsecured control lever **9** (joystick) can be moved unintentionally while traveling on roads, causing accidental machine movement.

☞ *Secure control lever 9 (joystick) before traveling.*

- *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads on page 3-24*

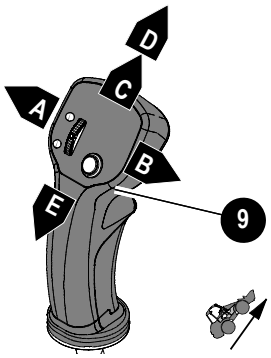


Fig. 86: Control lever for loader unit

Position	Lever	Function
A	☞ *To the left*	➥ Tilts in the attachment
B	☞ *To the right*	➥ Dumps out the attachment
C	☞ *Forwards*	➥ Lowers the loader unit
D	☞ *Fully forwards*	➥ Lowers the loader unit to float position
E	☞ *Backwards*	➥ Raises the loader unit

Important

As an option the control valve can be fitted with a float position. This is beneficial when working with a rotary broom or snowplows and for grading in reverse.

Operation: control lever for 3rd control circuit

Important

Possibility of unintentional machine movement. Operating the 3rd control circuit **10** unlocks the quickhitch.
When working with attachments without hydraulic functions.

☞ *Secure control lever **10** (3rd control circuit) when working with an attachment*

- *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24

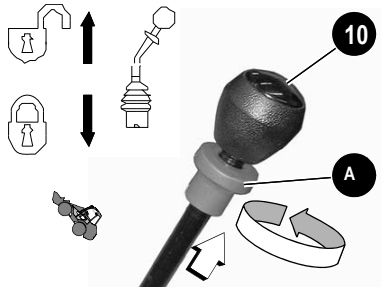


Fig. 87: Unlocking the 3rd control circuit

☞ *Unlock control lever **10 permanently** . To do this:*

- Pull lock sleeve **A** upwards and
- Turn it counterclockwise into the thread.

☞ *Unlock control lever **10 briefly** . To do this:*

- Pull lock sleeve **A** upwards and hold it.

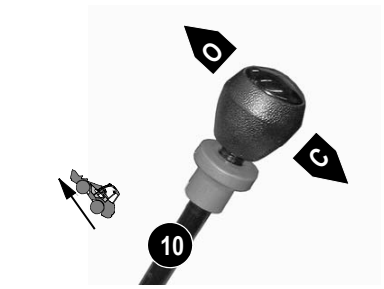


Fig. 88: Operation of 3rd control circuit

☞ *Push the control lever forwards **O***

➥ The attachment on the quickhitch is unlocked.

Attachments with hydraulic functions

➥ E.g. closes the multipurpose bucket.

☞ *Pull the control lever backwards **C***

➥ The attachment on the quickhitch is locked.

Attachments with hydraulic functions

➥ E.g. opens the multipurpose bucket.

Operation of 3rd control circuit in continuous operation

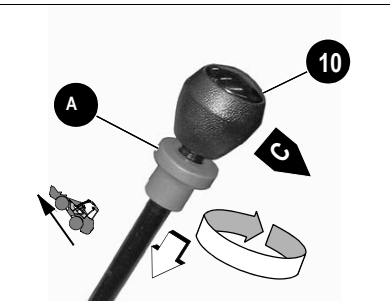


Fig. 89: Continuous operation of 3rd control circuit

Important

Continuous operation of the 3rd control circuit is beneficial when using attachments with additional hydraulic functions, or when operating hydraulic motors (e.g. rotary broom) or attachments with separate control valves.

Continuous operation of the 3rd control circuit is carried out with the control lever

☞ *Pull control lever **10** backwards **C***

☞ *Unscrew lock sleeve **A** clockwise out of the thread until it is pulled down by spring action and*

☞ *Engage control lever **10** in position **C***

➥ The control lever is locked in this position and can no longer be moved

3.41 Lowering the loader unit with the engine switched off

Lower the loader unit as follows:

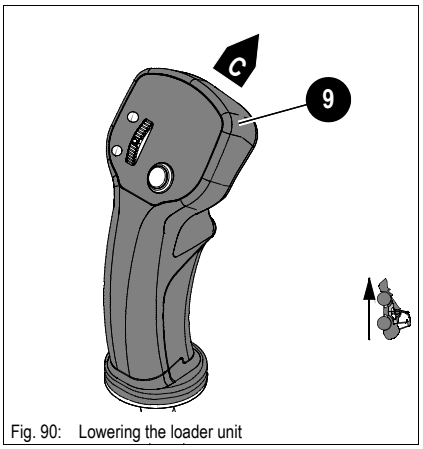


Fig. 90: Lowering the loader unit

☞ *Make sure no-one is dangerously close to the machine.*

☞ *Apply the parking brake.*

☞ *Carefully push and hold control lever **10** forwards **C.***

➥ Until the loader unit is completely lowered.

☞ *Set control lever **10** back to neutral position and secure it.*

➥ *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24.

3.42 Pressure relief on the quick couplers and the quickhitch

Release the pressure as follows

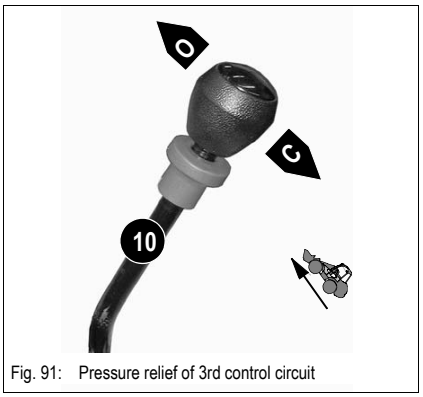


Fig. 91: Pressure relief of 3rd control circuit

Important

The hydraulic system of the machine is still pressurized even when the engine is not running! The hydraulic quick couplers can be released, however they cannot be re-attached because the pressure in the hydraulic lines has not been released. Therefore:

- Release the pressure in the sections of the system and hydraulic lines which are to be opened before starting setup or repair work, e.g. fitting/ removing an attachment!

☞ *Apply the parking brake*

➥ *- see Parking brake* on page 3-27.

☞ *Unlock the 3rd control circuit.*

➥ *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24

☞ *Switch off the engine.*

☞ *Move control lever **10** back and forth several times **O/C.***

3.43 Equipping the machine with a standard bucket

Fitting a standard bucket onto the quickhitch

If you are fitting or removing attachments with their own hydraulic functions - e.g. high-tilt or side swing bucket - you must follow the special information given in the Operator's Manual of the attachment.

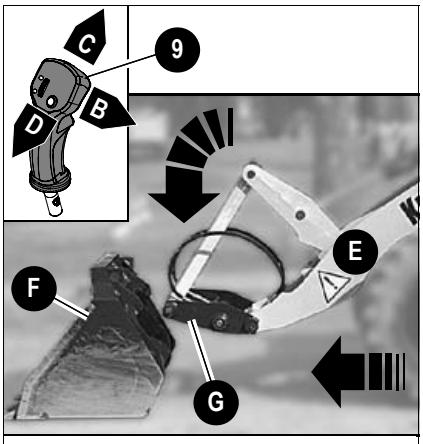


Fig. 92: Driving up to the attachment

WARNING

Personal injury hazard. An unlocked bucket can slip or fall unexpectedly.

☞ *Before starting work, make sure the attachment is safely locked onto the quickhitch by means of the lock ram. You must be able to see the lock pins on either side of the mounting holes on the attachment!*

☞ *- see Fitting a standard bucket onto the quickhitch on page 3-52*

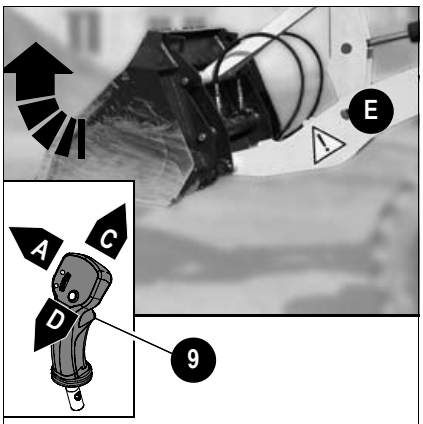


Fig. 93: Raising the attachment

Re-equip as follows:

☞ *Approach the machine to the attachment.*

☞ *Lower loader unit **E**. To do this:*
*Push control lever **9** forwards **C** and*

☞ *Tilt the quickhitch forwards. To do this:*
*Push control lever **9** to the right **B.***

☞ *Adjust the height of pin shanks **G** of the quickhitch so that they are under catch hooks **F** of the attachment.*

☞ *Drive the machine forwards until pin shanks **G** of the quickhitch are directly beneath catch hooks **F** of the attachment.*

☞ *Raise loader unit **E** until pin shanks **G** engage in catch hooks **F** of the attachment. To do this:*
*Pull control lever **9** backwards **D** and*

☞ *Fully tilt in the quickhitch. To do this:*
*Push control lever **9** to the left **A.***

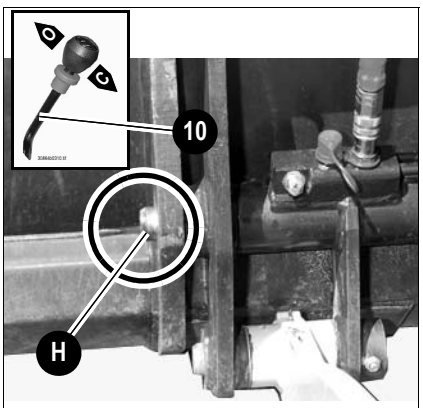


Fig. 94: Locking the attachment

Locking/securing the attachment

Secure the attachment with lock pins **H** of the quickhitch. To do this:

☞ *Pull control lever **10** backwards **C.***

➥ *- see Operation: control lever for 3rd control circuit* on page 3-50

➥ Lock pin **H** engages in the mounting bores of the attachment.

➥ Make sure the attachment is safely locked with lock pins **H.**

☞ *Lock the 3rd control circuit:*

➥ *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24.

Removing a standard bucket from the quickhitch

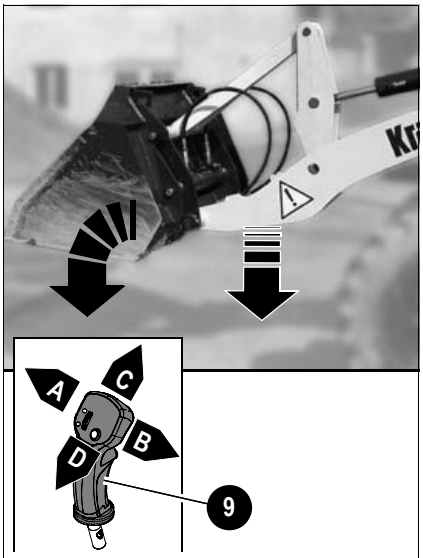


Fig. 95: Lowering and dumping out the attachment

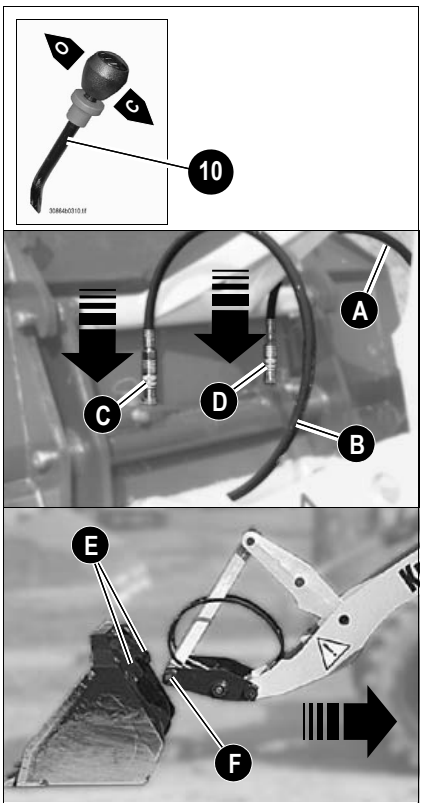


Fig. 96: Changing over hydraulic connections - setting down an attachment

WARNING

Personal injury hazard. Improperly removed attachments can fall over, crush, or cut.

☞ *Place the removed attachment on level ground so that it will not fall over.*

☞ *Position the attachment so that it will not tip over once it is unlocked*

Take the attachment off the quickhitch as follows:

☞ *Operate the machine with the empty attachment up to the drop-off position.*

☞ *Lower the loader unit until the tool/attachment is about 5 - 10 cm above the ground (horizontally). To do this:*

☞ *Slightly push control lever **9** forwards **C** and dump out to the right **B.***

☞ *Unlock control lever **10** for the 3rd control circuit:*

➥ *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24

In addition, with attachments with hydraulic functions:

☞ *Switch off the engine.*

➥ Turn the starter key to position 1 (ON).

☞ *Apply the parking brake.*

☞ *Unlock control lever **10** for the 3rd control circuit:*

➥ *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24

☞ *Release the pressure on the quick couplers.*

➥ *- see Pressure relief on the quick couplers and the quickhitch* on page 3-51

☞ ***Change over** the quick couplers on the lock ram:*

- Connect flexible line **A** onto plug **D** of the quickhitch.
- Connect flexible line **B** onto plug **C** of the quickhitch.
- Remove electric connections if necessary.

☞ *Start the engine.*

☞ *Tilt the quickhitch slightly forwards. To do this:*

- Push control lever fig. 95/**9** to the right **B.**

☞ *Lower the loader unit. To do this:*

➥ Push control lever fig. 95/**9** forwards **C.**

As soon as the pin shanks of quickhitch ***F** are beneath the catch hooks of attachment **E**:*

☞ *Release the parking brake*

☞ *Operate the machine in reverse, away from the attachment.*

3.44 Working with the standard bucket

Fields of application of the standard bucket

The standard bucket is mainly used for digging earth, and for loosening, picking up, transporting and loading loose or solid materials.

➥ - *see Fields of application and using the wheel loader with an attachment* on page 1-5

The machine may be used for applications with lifting gear only if the prescribed safety devices are in place and functional.
These are e.g.:

- Safe possibilities of slinging and securing lifting gear (load hook)- *see chapter 2 "Applications with lifting gear*" on page 2-8
- Load diagram!

Safety instructions for working with the bucket

- Never drive up to the edge of a pit from outside.
- Never undermine the foundations of walls.
- Operation of the machine by unauthorized staff is prohibited!
- When working with the machine, look out for high-voltage cables, underground cables, gas and water pipes!
- When using lifting gear such as pallet forks, comply with the load diagrams valid for this machine
- Get informed on the legal regulations of your country which may prohibit driving on public roads with a full bucket!
- Also observe the footnotes/instructions - *see Fields of application and using the wheel loader with an attachment* on page 1-5
- In addition, bear in mind the mandatory regulations relevant to accident prevention.
- If your machine is equipped with a load stabilizer (option)

WARNING

Personal injury hazard. An unlocked bucket can slip or fall unexpectedly.

☞ *Before starting work, make sure the attachment is safely locked onto the quickhitch by means of the lock ram. You must be able to see the lock pins on either side of the mounting holes on the attachment!*

☞ - *see Fitting a standard bucket onto the quickhitch on page 3-52*

Practical hints for digging

- Exits from pits must be outside the digging line and as level as possible
- Dig by removing adjacent strips if possible
- Make sure you can drive forwards when driving out of the digging area with a fully loaded bucket
- Whenever possible, drive in reverse when transporting a full bucket down a steep slope

Tilt position of the bucket

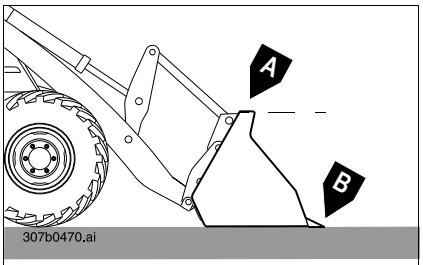


Fig. 97: Tilt position of the bucket

Important

Angle of mark **A** = angle of blade **B**

Transport position of the bucket

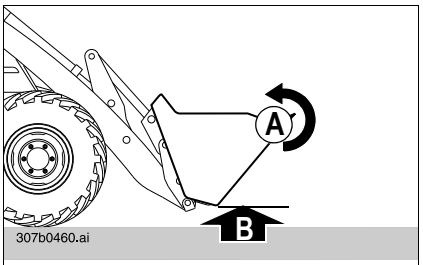


Fig. 98: Transport position of the bucket

Important

The bucket is in transport position if

- Bucket is tilted in completely **A** and
- Marks on the loader unit and the machine frame are lined up **C**
- The distance of the bucket to the ground **B** is about **250 mm** with standard tires.

NOTICE

In order to avoid damage to the machine or tires, do **not** move the machine with the bucket fully tilted out

☞ *Lower the attachment to transport position and tilt it in*

Transporting with a full bucket

Fig. 99: Marks on loader unit and machine frame

WARNING

Tip-over hazard. Transporting a full bucket in the raised position can cause the machine to tip while traveling across slopes or while cornering.

☞ *Travel with the empty or loaded bucket in the lowest practical position to keep the center of gravity low and avoid the risk of tipping the machines on slopes or while cornering.*

☞ *Tilt the bucket fully in.*

☞ *Raise the loader unit to transport position.*

Important

Tax and safety regulations in your country may prohibit the transport of material when driving on public roads. Get informed on and follow the legal regulations of your country.

Loading loose material

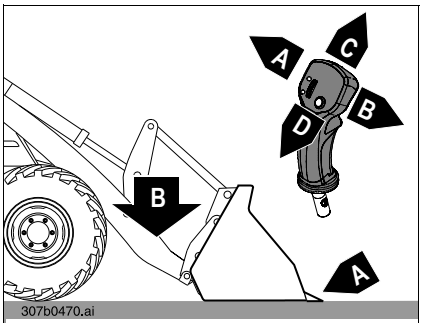


Fig. 100: Horizontal lowering of the loader unit

☞ *Align the blade parallel with the ground **A***
- see Tilt position of the bucket on page 3-55

☞ *Lower the loader unit to the ground **B**. To do this:*
*Push the control lever forwards **C.***

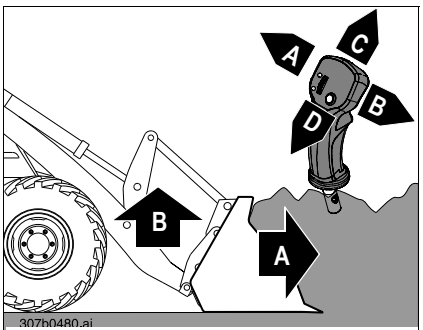


Fig. 101: Driving into the material

☞ *Drive forwards into the material **A.***

When the engine revs decrease due to too much material:

☞ *Slightly raise the loader unit **B**. To do this:*
*Pull the control lever backwards **D.***

Loading if the material is hard to penetrate

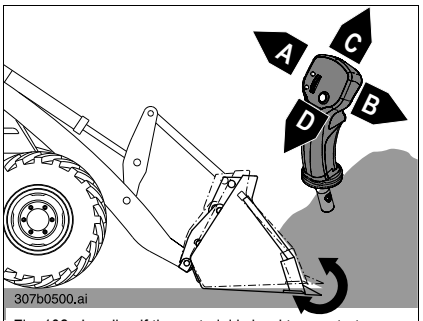


Fig. 102: Loading if the material is hard to penetrate

☞ *Proceed as for loading loose material, but in addition:*

☞ *Tilt the bucket in and out slightly. To do this: move the control lever to the left and right* ***A and B.***

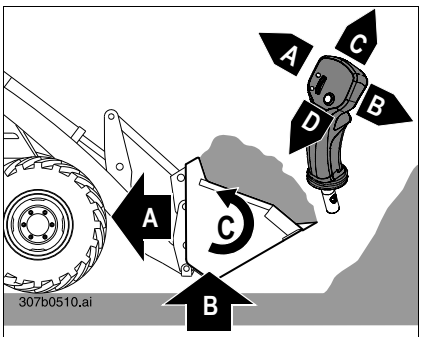


Fig. 103: Tilting in the bucket

Ending loading:

☞ *Tilt in the bucket* ***C****. To do this*:
Push the control lever to the left ***A.***

☞ *Reduce engine rpm.*

☞ *Reverse out of the material* **A.**

☞ *Raise the bucket to transport position* **B.**

Removing material/digging in soft soil

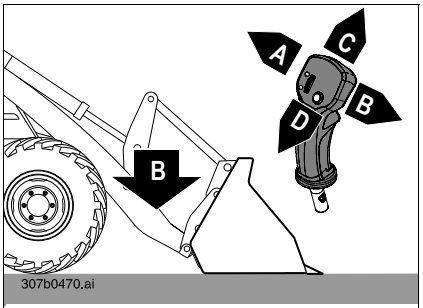


Fig. 104: Lowering the loader unit horizontal to the ground

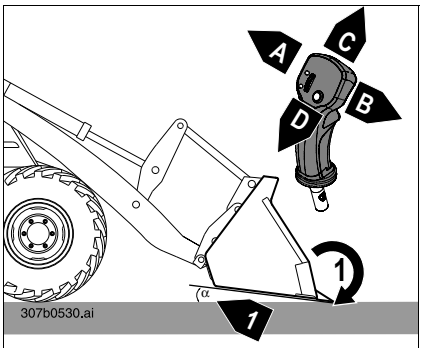


Fig. 105: Adjusting the digging angle

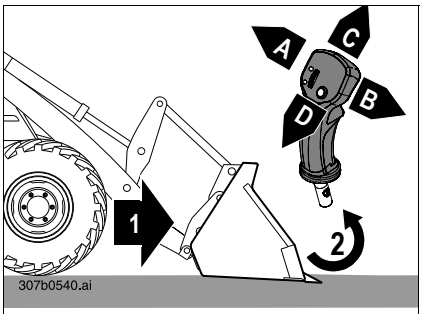


Fig. 106: Removing an even layer

CAUTION

Collapse hazard. If foundations or walls are undermined, the foundation vertical wall can collapse.

☞ *Do not undermine foundations or walls.*

☞ *Place the bucket horizontally on the ground **B**. To do this:*
*Push the control lever forwards **C.***

☞ *Adjust the digging angle α **1**. To do this:*
*Push the control lever to the right **B.***

☞ *Drive the machine forwards **1.***

Once the bucket has penetrated the soil:

☞ *Adjust the digging angle α slightly flatter **2**. To do this:*
*Push the control lever to the left **A**, so that*

- Layer being removed is as even as possible and
- Wheel spin is reduced

☞ *Proceed as for loading loose material.*

Removing material/digging in hard soil

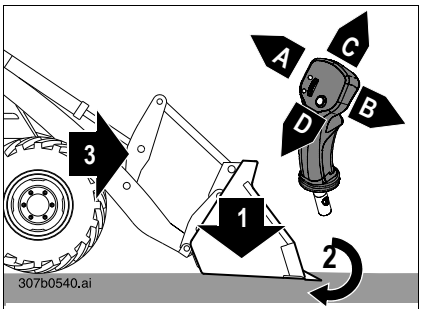


Fig. 107: Removing hard soil

☞ *Lower the bucket horizontally to the ground **1**. To do this:*
*Push the control lever forwards **C.***

☞ *Adjust the digging angle α flatter **2** than for digging in soft soil. To do this:*
*Push the control lever to the left **A.***

☞ *Drive the machine forwards **3** and*

☞ *Press the bucket downward slightly. To do this:*
*Slightly push the control lever forwards **C.***

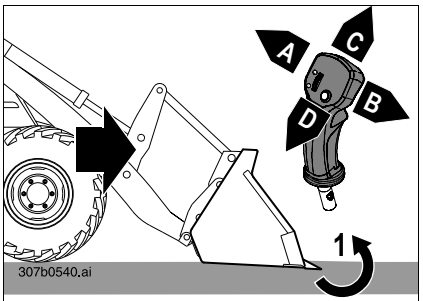


Fig. 108: Adjusting the digging angle flatter

Once the bucket has penetrated the soil:

☞ *Adjust the digging angle α slightly flatter **1**. To do this:*
*Push the control lever to the left **A**, so that*

- Layer being removed is as even as possible and
- Wheel spin is reduced

☞ *Push control lever to the left **A**, or*
*move it alternately to the left and right **A and B** to loosen the material.*

☞ *Proceed as for loading material hard to penetrate.*

Loading heaped material (non-compacted material)

WARNING

Collapse hazard. Digging under heaped material can cause it to collapse.

☞ *Do not undermine heaped material.*

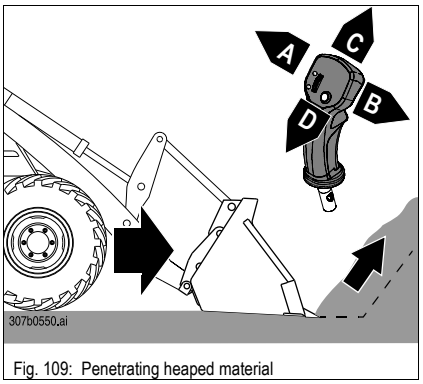


Fig. 109: Penetrating heaped material

☞ *Set the blade parallel to the ground. To do this:*
*Push the control lever to the left or right **A and B.***

☞ *Lower the loader unit horizontally to the ground. To do this:*
*Push the control lever forwards **C***

☞ *Drive forwards.*

After penetrating the heaped material:

☞ *Smoothly raise the loader unit and*

☞ *Keep the bucket level.*

When the loader unit cannot be raised further:

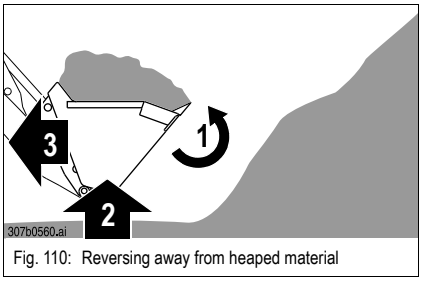


Fig. 110: Reversing away from heaped material

☞ *Tilt in the bucket **1.***

☞ *Raise the loader unit **2.***

☞ *Reverse out of the material **3.***

☞ *Lower the loader unit to transport position.*

Loading heaped material (compacted material)

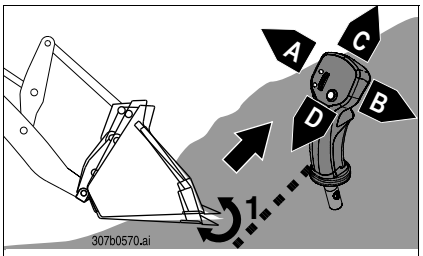


Fig. 111: Heaped compacted material

☞ *Proceed as for non-compacted material, however when raising the loader unit through the heaped material:*

☞ *Tilt the bucket slightly in and out (**1**). To do this:*
*Move the control lever alternately to the left and right (**A and B**)*

➥ Material is loosened.

Grading

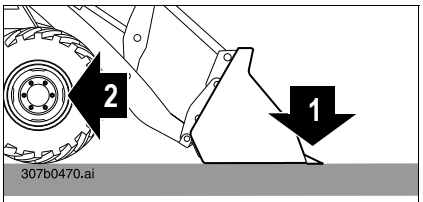


Fig. 112: Grading

After having finished removing/loading the material:

☞ *Lower the loader unit horizontally to the ground (**1**).*

☞ *Reverse across the surface to be graded (**2**).*

Practical recommendations for loading vehicles

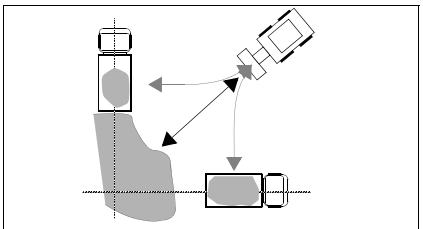


Fig. 113: Loading vehicles

When loading vehicles, we recommend taking the following into account:

- If possible, the truck and the working direction of the loader should form an angle of 45°
- Only raise the full bucket to the dump height when you are driving in a straight line towards the truck.
- If possible dump with the wind behind you to keep the dust away from your eyes, air filters and fans!

Freeing the machine

If your machine gets stuck in the ground:

☞ *Dump out the bucket until the blade is vertical above the ground.*

☞ *Lower the loader unit all the way.*

☞ *Gradually tilt in the bucket.*

➥ The machine is pushed backwards

☞ *Operate the machine in reverse (slowly).*

☞ *Repeat this procedure until the wheels reach firm ground.*

☞ *Once on firm ground, operate the machine in reverse away from the area.*

3.45 Fitting a multipurpose bucket

Attaching the multipurpose bucket to the quickhitch

☞ *Fit the multipurpose bucket*

➥ *- see Fitting a standard bucket onto the quickhitch* on page 3-52

☞ *Make sure both lock pins of the lock ram are safely locked in the attachment!*

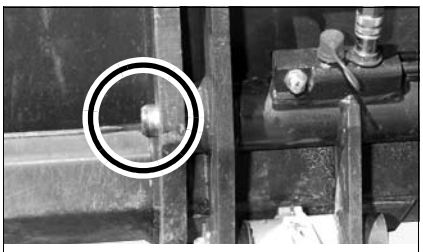


Fig. 114: Checking the lock pins

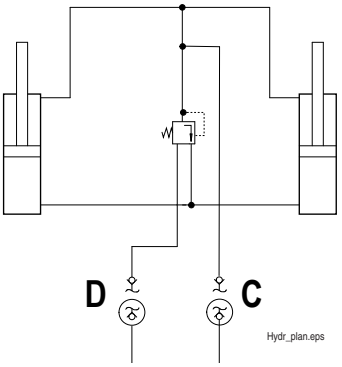
WARNING

Personal injury hazard. Unlocked quickhitch attachments can fall, crush, or cut.

☞ *Before starting work, make sure the attachment is safely locked onto the quickhitch by means of the lock ram. You must be able to see the lock pins on either side of the bores on the attachment.*

☞ *Make sure the lock pins of the quickhitch are fully extended before coupling the hydraulic lines of the additional control circuit to the attachment.*

Hydraulic connections on the multipurpose bucket: overview



Hydraulic connection	Function
C Pressurized	Opens the multipurpose bucket
D Pressurized	Closes the multipurpose bucket

Connecting hydraulic lines to the machine

Important

The hydraulic system of the machine is still pressurized even when the engine is not running! The hydraulic quick couplers can be released, however, they cannot be re-attached because the pressure in the hydraulic lines has not been released. Therefore:

- Release the pressure in the sections of the system and hydraulic lines which are to be opened before starting setup or repair work, e.g. fitting/ removing an attachment!

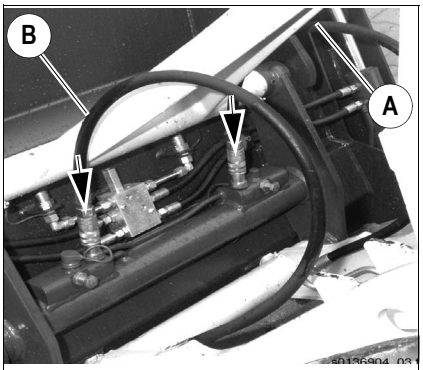


Fig. 115: Removing the hydraulic connection from the quick-

☞ *Switch off the engine.*

☞ *Apply the parking brake*

☞ *Release the pressure in the hydraulic lines.*

➥ *- see Pressure relief on the quick couplers and the quickhitch* on page 3-51

☞ *Remove hydraulic lines **A** and **B** from the quickhitch.*

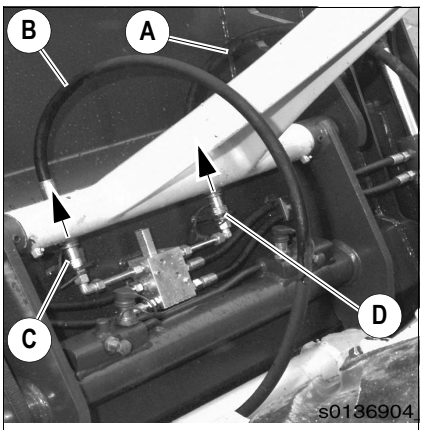


Fig. 116: Connecting hydraulic multipurpose bucket lines

☞ *Connect hydraulic lines **A** and **B** to the hydraulic connections **C** and **D** of the attachment.*

Important

Make sure the quick couplers are properly connected - never connect the hydraulic lines crosswise, otherwise the attachment functions are inverted and the hydraulic lines squeezed by dumping out and tilting in the attachment (- *see Working with the multipurpose bucket* on page 3-64).

☞ *Functional check:*

- Make sure the hydraulic lines cannot be squeezed within the entire moving range of the attachment

Removing the multipurpose bucket from the quickhitch

WARNING

Personal injury hazard. Improperly removed attachments can fall over, crush, or cut.

☞ *Place the removed attachment on level ground so that it will not fall over.*

☞ *Position the attachment so that it will not tip or swing unexpectedly once it is unlocked.*

Important

If the attachment is placed in direct sunlight after having been taken off, the oil in the hydraulic rams will warm up. This leads to a pressure increase in the hydraulic rams that will make it difficult to attach the hydraulic lines to the hydraulic connections.
To avoid this problem, we recommend removing the attachment as follows:

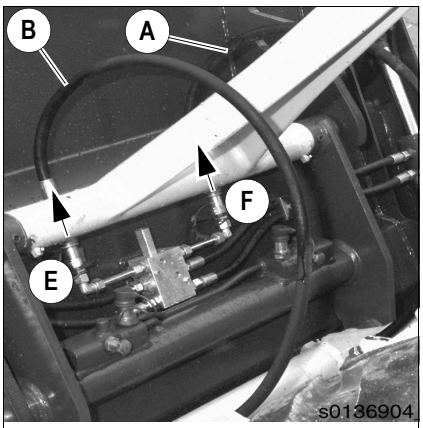


Fig. 117: Removing hydraulic multipurpose bucket connections

☞ *Tilt in the multipurpose bucket completely*

☞ *Close the multipurpose bucket to a gap of about 20 cm (7.9 in.)*

☞ *Unlock the multipurpose bucket.*

➥ *- see Hydraulic connections on the multipurpose bucket: overview* on page 3-61

☞ *Switch off the engine.*

☞ *Apply the parking brake.*

☞ *Release the pressure in the hydraulic lines.*

➥ *- see Pressure relief on the quick couplers and the quickhitch* on page 3-51

➥ Multipurpose bucket closes without pressure.

☞ *Remove hydraulic lines **A** and **B** from quick couplers **E** and **F** on the multipurpose bucket.*

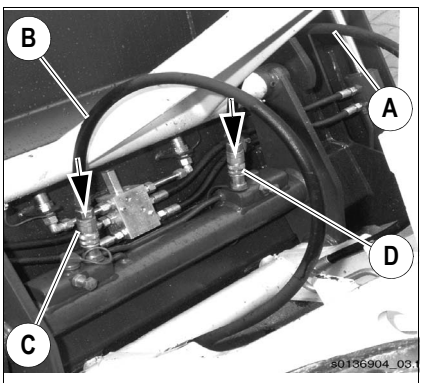


Fig. 118: Connecting hydraulic quickhitch lines

☞ *Connect hydraulic lines **A** and **B** onto quick couplers **C** and **D** of the quickhitch.*

Important

Make sure the quick couplers are properly connected - never connect the hydraulic lines crosswise, otherwise the functions of the quickhitch ram are inverted.

After connecting the hydraulic ram of the quickhitch - as described above:

☞ *Slightly dump out the multipurpose bucket to a horizontal position*

☞ *Set down the multipurpose bucket*

➥ *- see Removing a standard bucket from the quickhitch* on page 3-53

3.46 Working with the multipurpose bucket

WARNING

Personal injury hazard. Unlocked quickhitch attachments can fall, crush, or cut.

☞ *Before starting work, make sure the attachment is safely locked onto the quickhitch by means of the lock ram. You must be able to see the lock pins on either side of the bores on the attachment.*

☞ *Make sure the lock pins of the quickhitch are fully extended before coupling the hydraulic lines of the additional control circuit to the attachment.*

☞ *- see Locking/securing the attachment on page 3-52*

NOTICE

In order to avoid damage to the machine or tires, do **not** move the machine with the bucket fully tilted out.

☞ *Lower the attachment to transport position and tilt it in*

Driving on public roads with the multipurpose bucket

Important

Some local regulations prohibit traveling on public roads if the distance between the front edge of the bucket and the center of the steering wheel is over 3500 mm (138 in.) in transport position. Get informed on and follow the legal regulations of your locality.

☞ *Empty the multipurpose bucket.*

☞ *Tilt in the multipurpose bucket (base position).*

☞ *Switch off the engine.*

☞ *Apply the parking brake.*

☞ *Release the pressure on the quick couplers.*

➥ *- see Pressure relief on the quick couplers and the quickhitch* on page 3-51

☞ *Uncouple the hydraulic lines from the multipurpose bucket and connect them to the quickhitch.*

➥ *- see Removing the multipurpose bucket from the quickhitch* on page 3-63

☞ *Hitch the multipurpose bucket in transport position.*

➥ *- see Specific instructions regarding driving on public roads* on page 3-23

☞ *Mount removable parts on the machine (front-edge protection, light strip or additional clearance lights - if necessary, and if fitted on the machine depending on the legal regulations of your country)*

☞ *Secure the control lever (joystick).*

➥ *- see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24

Grading and scraping

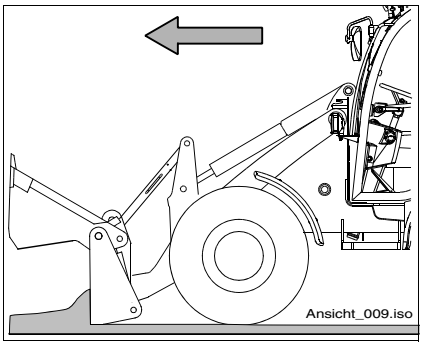
WARNING

Tip-over hazard. Transporting full buckets in the raised position can cause the machine to tip while traveling across slopes or while cornering.

☞ *Travel with the empty or loaded bucket in the lowest practical position to keep the center of gravity low and avoid the risk of tipping the machines on slopes or while cornering.*

☞ *Tilt the bucket fully in.*

☞ *Raise the loader unit to transport position.*

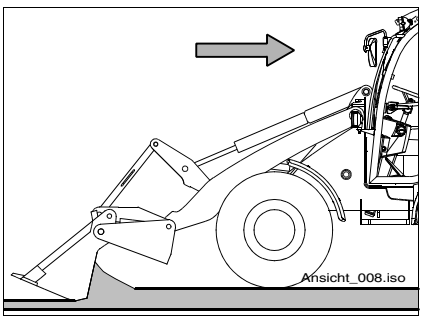


Grading

☞ *Fold up the front half of the bucket.*

☞ *Set the depth of the layer you want to remove with the lift hydraulics.*

☞ *Set the angle of the rear cutting edge.*



Drawing material backwards

☞ *Dump out the multipurpose bucket.*

☞ *Raise the bucket with the lift hydraulics.*

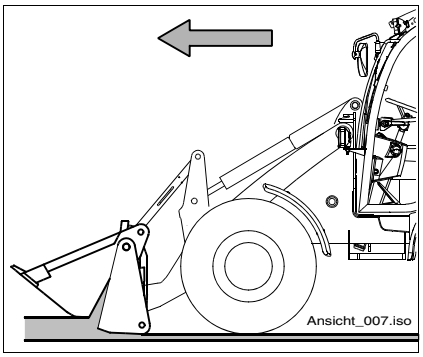
☞ *Fold up the front half of the bucket.*

☞ *Lower the multipurpose bucket to the ground.*

☞ *Set the angle of the bucket.*

☞ *Surfaces are graded or scraped when driving in reverse.*

Stripping in thin layers (scraper)



☞ *Set a flat digging angle.*

☞ *Fold up the front half of the bucket by about 10 to 15 cm (4 to 5.9 in).*

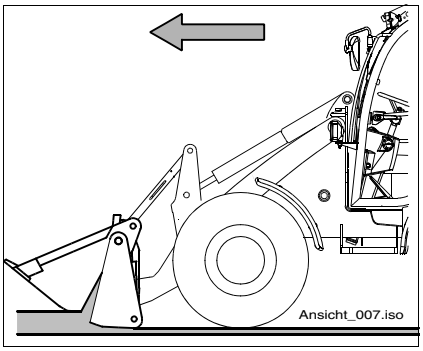
☞ *Move off the machine.*

➥ The material rolls into the bucket and is picked up at the same time

Important

This position allows to strip e.g. grass turf down to a thickness of about 8 cm (3.2 in).

Spreading material in thin layers



☞ *Set the rear cutting edge parallel to the ground.*

☞ *Open the bucket until the required quantity of material is emptied onto the ground.*

☞ *Slowly, start driving (travel operation) the machine.*

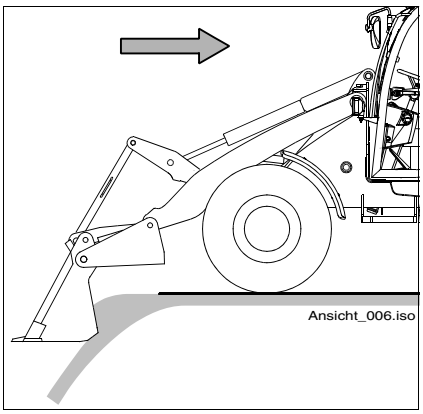
☞ *Lower the multipurpose bucket to the ground.*

➥ The rear cutting edge grades the material as it is emptied by opening the front half of the bucket.

Important

This position allows to spread material without driving on the lower layer with the machine (e.g. applying the first bituminous base onto sensitive antifrost layers, applying granulated material onto plastic coatings).

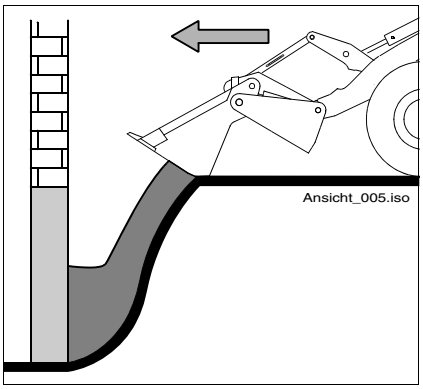
Pulling out material from slopes



Important

This position allows to pull material out of slopes or roadside ditches with maximum safety and to spread it as required.

Moving material with longer reach

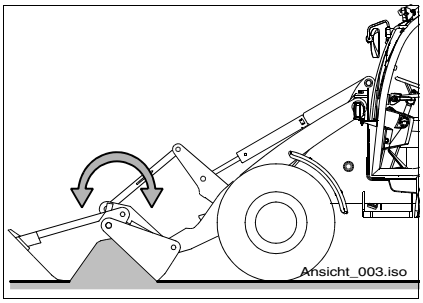


Important

This position allows to move material without damaging slopes or structures.

➥ Backfilling with maximum safety and without damaging slopes.

Picking up remaining material completely



Important

Both bucket halves must touch the ground so that all the material is picked up.

☞ *Open the front half of the bucket (multipurpose bucket).*

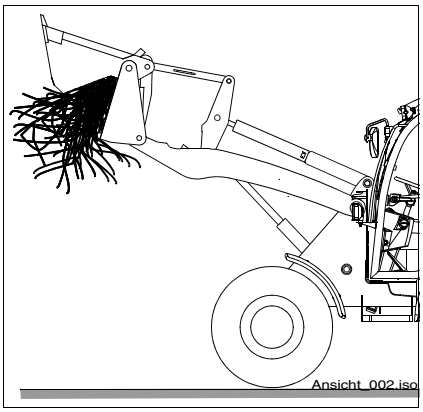
☞ *Dump out the bucket.*

☞ *Lower the bucket to the ground. Make sure both bucket halves touch the ground.*

☞ *Close and tilt in the multipurpose bucket at the same time.*

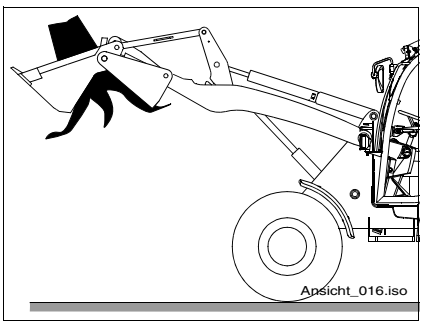
☞ *Raise the bucket with the lift hydraulics.*

Grabbing bulky material



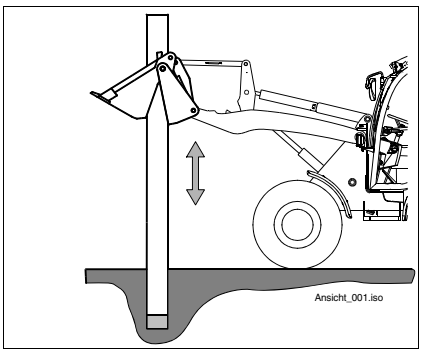
➥ The multipurpose bucket allows to safely grab, pick up and transport building timber, reinforcement bars, packaging bands, wire etc.

Grabbing large objects



➥ The multipurpose bucket allows to safely grab, pick up and transport large objects.

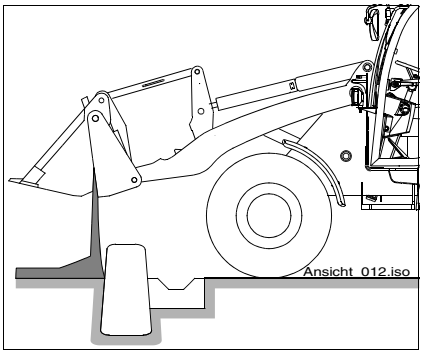
Pulling out and setting posts



☞ *Open the multipurpose bucket and lower it over the post. Close the bucket to grip the post firmly.*

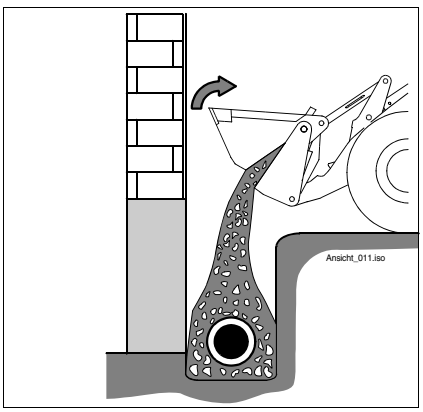
☞ *Loosen the post with careful up-and-down movements.*

Precise unloading



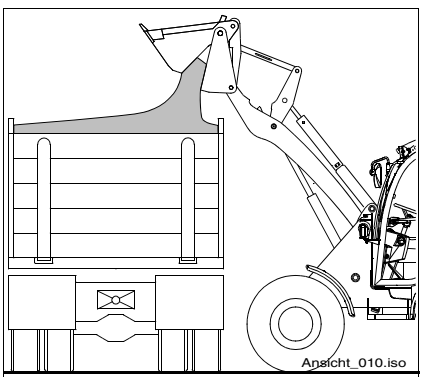
➥ Precise dosing and placement of pourable material.

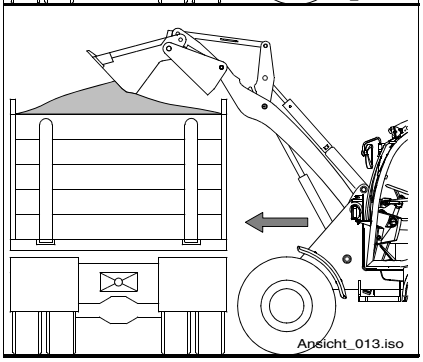
Backfilling round gravel into drainage ditches



➥ Bucket teeth move back from the wall as the bucket opens.

Unloading from the bottom of the bucket for increased dump heights





➥ Increases the dump height by at least 55 cm (21.5 in)(depending on bucket size), as compared to dumping with a standard bucket.

Important

Smaller dump reach is compensated by pushing the material with the open multipurpose bucket as shown.

3.47 Fitting pallet forks

Fitting an attachment onto the quickhitch

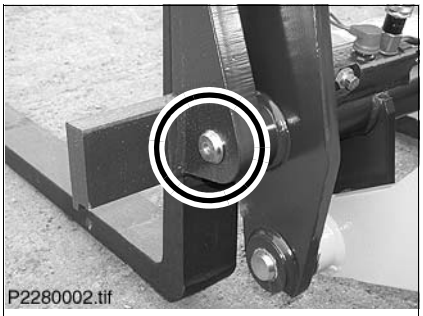


Fig. 119: Checking the lock pins

WARNING

Personal injury hazard. Unlocked quickhitch attachments can fall, crush, or cut.

☞ *Before starting work, make sure the attachment is safely locked onto the quickhitch by means of the lock ram. You must be able to see the lock pins on either side of the bores on the attachment.*

☞ *Make sure the lock pins of the quickhitch are fully extended before coupling the hydraulic lines of the additional control circuit to the attachment.*

☞ *Pick up the attachment*

➥ *- see Locking/securing the attachment* on page 3-52

☞ *Make sure both pins of the lock ram are safely locked into place in the attachment -* ***you must be able to see the lock pin on either side of the mounting holes on the attachment!***

Removing the pallet forks from the quickhitch

WARNING

Personal injury hazard. Improperly removed attachments can fall over, crush, or cut.

☞ *Place the removed attachment on level ground so that it will not fall over.*

☞ *Position the attachment so that it will not tip or swing unexpectedly once it is unlocked.*

☞ *- see Removing a standard bucket from the quickhitch on page 3-53*

Driving on public roads with the pallet forks

WARNING

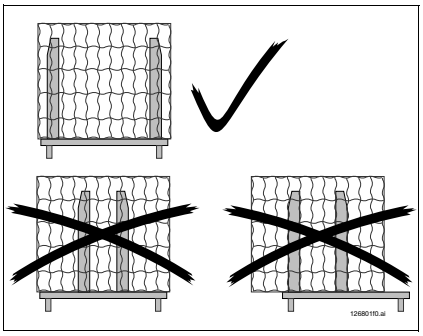
Personal injury or traffic hazard. Pallet forks carried loose in a bucket fitted onto the machine can fall out of the bucket onto the road and into the path of traffic.

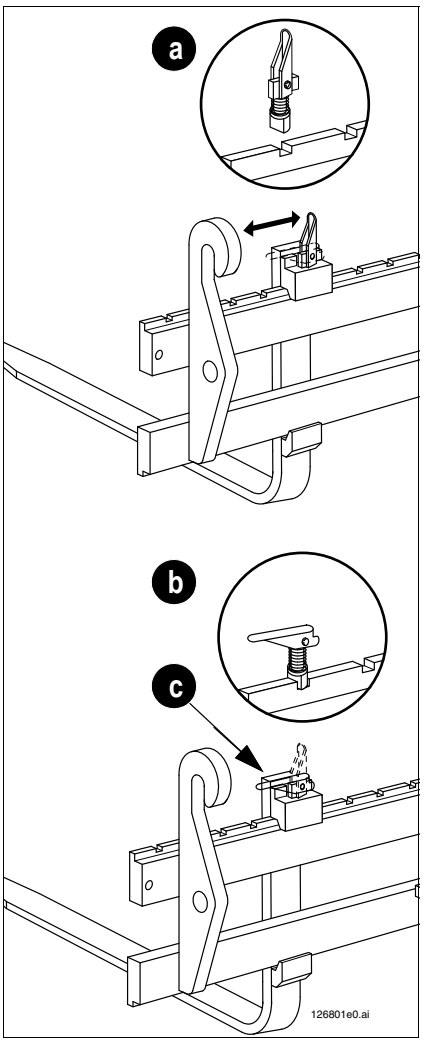
☞ *Do not transport pallet forks in the bucket.*

☞ *- see Specific instructions regarding driving on public roads on page 3-23*

Get informed on and follow the legal regulations of your country!

Adjusting the fork arms





Important

Unsecured fork arms can slide or slip sideways, causing the load to drop or become unstable.

☞ *Before using the pallet forks with or without load, check whether both locking levers on the fork arms are folded down. This correctly locks the safety pins of the fork arms in the notches on the fork frame, and prevents the fork arms from slipping or sliding sideways.*

When the fork arms are moved under the load, they must have the largest possible spacing between them, or be introduced at the positions or in the fixtures provided.

The fork arms must always be evenly aligned with the fork frame.

To achieve this, the spacing of the fork arms can be adjusted as follows:

☞ *Set the locking lever to the vertical position **a.***

➥ The fork arms can be moved on the fork frame.

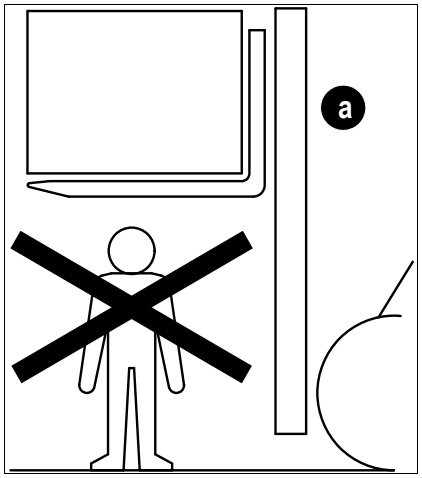
☞ *Slide the fork arms to the required distance until the safety pin engages in a slot on the fork frame.*

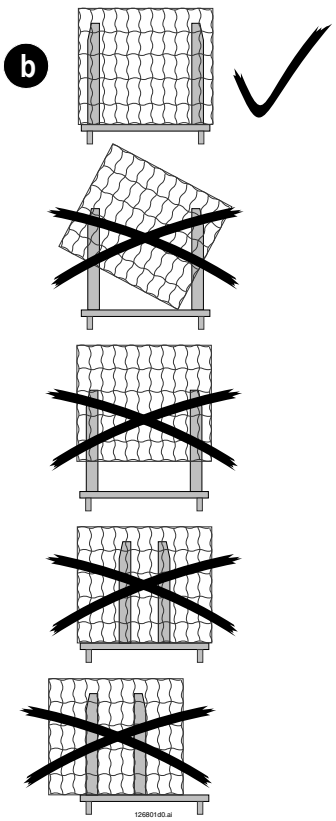
☞ *Fold down the locking lever again, position **b.***

➥ The upper edge of the locking lever must be flush with the edge **c**.

3.48 Working with the pallet forks

General safety instructions





- Follow the special instructions in the Operator's Manual of the attachment!
- Approach the material as closely as possible!
- Always approach the material with the machine wheels in straight-ahead position!
- Always load on firm and level ground with sufficient load-bearing capacity only (for a fully loaded machine)!
- Never raise a load with only one fork arm!
- Maintain a distance of a minimum 6 m (19.7 ft.) between the loader unit/load and overhead lines!
- Before starting work, make sure the fork arms on the fork frame are safely locked!
- Never operate the loader unit and the attachments at higher machine speed!
- Never leave the machine with the load raised!
- Always transport the load close to the ground!
- Make sure only authorized persons handle and work with the attachment
- Do not transport persons in the attachment
- Crushing Hazard. Stay clear of suspended loads!
  This is the meaning of fig. **a**. It is affixed on the left and right of the loader unit lift frame
- Never use the controls or movable lines and cables as handles
- Never use bent, cracked or otherwise damaged fork arms/pallet forks!
- Do not drive on public roads with an attachment fitted on the machine!
- Move the fork arms all the way through under the pallets, as far as they will go, so that the load is picked up the nearest possible to the fork frame!
- Move under the load with the straight fork arms as far apart as possible and at an equal distance to the left and right side of the load **b**!
- Lock the adjustable fork arms with the locking lever before moving the machine with loaded or unloaded pallet forks, to prevent the fork arms from moving (slipping, sliding) sideways!
- Loads must only be set down on a suitable base with sufficient stability and load-bearing capacity
- Do not stack or set down in higher places loads which are not properly packaged or which have shifted, or load units with damaged pallets/stacking containers
- Always tilt the attachment slightly in (towards the machine) for transport!
- Lower the bucket the nearest possible to the ground for transport. Observe minimum ground clearance!
- Drive slowly with a raised load, especially in off-road applications, to avoid strong swinging movements of the load!

- When driving or working across a slope, the load must be on the uphill side of the machine/attachment. Drive the machine backwards on sloping terrain to prevent the load from falling off and the machine from tilting forwards when braking.
- When transporting large bulk loads drive the machine backwards for improved visibility.
- Observe the load-bearing capacity of bridges, basement ceilings, vaults etc., before moving the machine on them!
- Bear in mind the clearances of underpasses, tunnels, gates etc. before driving through or under them!
- Do not overload the attachment or the machine, observe the load diagram!
- Set down loads only in places where they will stand safely without tilting, falling down or sliding.
- Observe the load-bearing capacity of the set-down area (e.g. truck platforms, storage area in high-bay warehouses etc.)
- Load the loading area of vehicles or trailers evenly and distribute the load evenly on the axles.
- Stack loads only up to the authorized maximum pallet height.
- Do not set down loads too near to slopes, construction pits etc.
- Set down loads only in the areas provided for within the construction site. Affix appropriate marks to loads which have been set down, especially in the area of public and private traffic.
- Do not set down loads in transit or escape routes, and not in front of safety facilities or works equipment which must be accessible at any time.

Brief instructions for fork arms

The following brief instructions are based on the “Guidelines for testing and repairing fork arms” (© by VETTER Umformtechnik GmbH):

- Use fork arms only according to their designated use.
- Do not exceed the load center and the load-bearing capacity.
- Always keep fork arms clean.
- Load both fork arms evenly.
- Do not use standard fork arms as reverse forks.
- Do not push, pull or shove the fork arms, or move them in at a slanting angle (danger of damaging them due to lateral forces).
- Do not pull off loads, or allow them to fall onto the fork arms.
- Strap down loads, if necessary, to avoid loosing them.
- Do not raise with the tilt ram (tilt device).
- Bear in mind the limits of application for the fork lift, and its Operator's Manuals.
- Perform frequent visual checks.
- Have regular checks carried out according to the Operator's Manual and the legal regulations of your country.
- Do not modify the fork arms, or attach any additional device.
- Only the manufacturer is authorized to perform repair work on the fork arms.
- No transport of persons on the fork arms.
- No transport of molten material.
- No cable-laying work allowed.
- Observe the legal regulations of your country when driving on public roads.
- The operator/driver must check at regular intervals:
  - Lock: functional check
  - Hooks: visual check for cracks and deformations
  - Bend: visual check for indents, nicks and cracks
  - Bend and blade: do not use any longer if worn over 10 %
  - Blade and tip: check for deformations
- In case of damage or if you are unsure:
  immediately stop using the fork arms!

Specific safety instructions for picking up loads with the pallet forks

- Always lock the control lever for the 3rd control circuit when working with the pallet forks - *see Locking the control lever (joystick) and the 3rd control circuit (attachments) when driving on roads* on page 3-24!
- Always follow the Pallet forks load diagram. Never exceed maximum load!
- Follow the special instructions in the Operator's Manual of the pallet forks!
- Approach the material as closely as possible!
- Always approach the material with the machine wheels in straight-ahead position!
- Always load on firm and level ground with sufficient load-bearing capacity only (for a fully loaded machine)!
- Never raise a load with only one fork arm!
- Maintain a distance of a minimum 6 m (236 in.)between the loader unit/load and overhead lines!
- Before starting work, make sure the fork arms on the fork frame are safely locked!
- Never operate the loader unit and the attachments at higher machine speed!
- Never leave the machine with the load raised!
- Always transport the load close to the ground!

Pallet forks load diagram

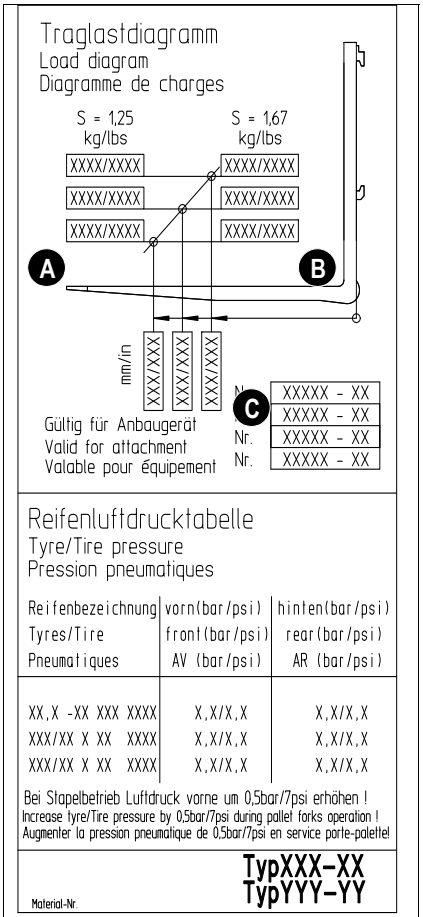


Fig. 120: Load diagram

The load diagram is located in the cab (front window) of the machine, values are calculated for the respective machine model
(- *see chapter 1 "Attachments with certified material densities*" on page 1-5). Do not exceed the maximum loads stated, otherwise machine stability is no longer ensured.

The framed row of numbers **A** on the left states the maximum load for applications on level ground (stability s = 1.25).

The framed row of numbers **B** on the right states the maximum load for off-road applications (stability s = 1.67).

The maximum load is a function of the distance (load distance) of the load center to the fork frame **C** (lower row of figures).

Take this into account also when using fork arm extensions!

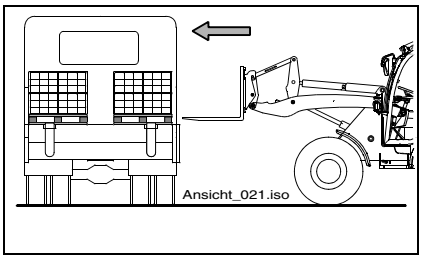
Example:

Off-road → safety factor **S = 1.67** (framed row of figures on the right **B**)

Load distance = 600 mm (23 in.)(vertical center line).

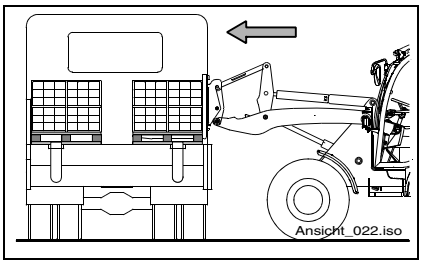
The maximum load **C** amounts to **xxxx**! (Intersection of the middle vertical line with the slanting line (load curve))

Picking up loads with the pallet forks



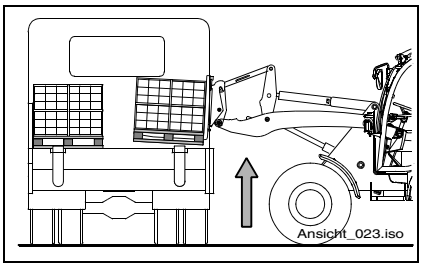
☞ *Move the wheel loader up to the load so that the pallet forks or the fork arms are at a right angle to the load.*

➥ The fork arms must be the furthest possible apart, and at an equal distance to the left and right side of the load.



☞ *Drive the wheel loader forwards and move the fork arms as far as possible underneath the pallet.*

➥ The load must fit close to the fork frame.



☞ *Carefully raise the load and*

☞ *Tilt in the load slightly backwards.*

NOTICE

Do not exceed the loader's output limit.

☞ *Observe the load diagram! Affixed at the rear of the loader unit bulkhead - see Pallet forks load diagram on page 3-74.*

Transporting loads with the pallet forks

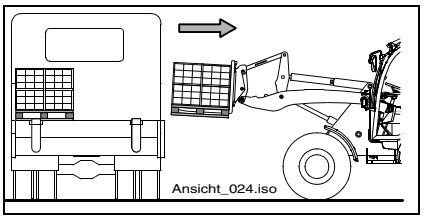
WARNING

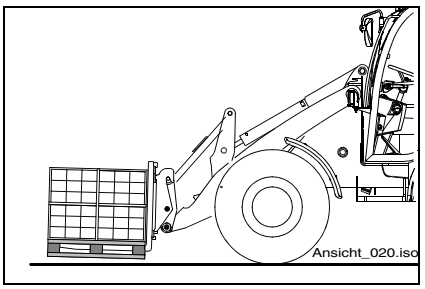
Tip-over hazard. When transporting loads with the pallet forks raised, the load can fall down or the machine can tilt.

☞ *Particularly when turning or traveling on slopes, make sure that the center of gravity is in the lowest possible position.*

☞ *To avoid accidents:*

- Tilt the pallet forks slightly backwards.
- Lower the pallet forks to transport position and only raise them, if necessary, just before setting down the load.
- Do not raise the load over people.
- Do not park the machine with a raised load.
- Avoid any operation that might be a risk to machine stability.





☞ *Move the load only when it is safely placed on the fork arms*

☞ *Move the machine only if you have sufficient visibility.*
Start, turn and stop smoothly.
Concentrate on your work, avoid distractions!

☞ *Lower/raise loads to transport position before moving and transporting them (ground clearance - see Transport position of the bucket on page 3-55).*
If necessary, increase ground clearance for off-road applications.

☞ *Always tilt the pallet forks slightly in (towards the machine) for transport!*

☞ *Always drive slowly, especially in off-road applications, to avoid strong swinging movements of the load!*

☞ *When driving or working across a slope, the load must be on the uphill side of the machine/attachment. Drive the machine backwards on sloping terrain to prevent the load from falling off and the machine from tilting forwards when braking.*

☞ *When transporting large bulk loads drive the machine backwards for improved visibility.*

3.49 Working with a load hook (option)

Shaft rings, containers, pipes etc., can be transported with a load hook and suitable lifting gear (belts, cables, chains).

WARNING

Personal injury hazard. Improper use of the load hook can cause the load to slip or fall.

☞ *When working with a load hook, keep in mind the following precautionary measures:*

- Follow the instructions given in chapter Safety Instructions "*Applications with lifting gear* on page 2-8"
- Bear in mind the load diagram on the front window
- Pick up and place loads on firm and level ground only
- Wear safety gloves
- Make sure the ratchet safely engages in the hook as you hook up the lifting gear (belts, cables, chains)
- Do not use damaged lifting gear
- Check out the load diagram again before raising a load
- Adapt your speed to the load as you move it near to the ground
- Persons guiding the load must stay in visual contact with the machine operator
- Do not transport loads on public roads

Fig. 121: Load hook

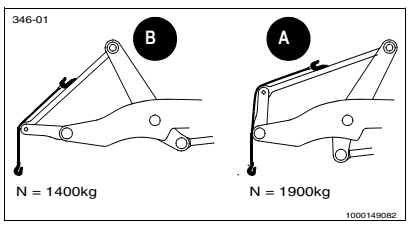


Fig. 121: Load diagram

☞ *Hook up the lifting gear in the mounts (eyelets, shackles) provided for transporting the load*

☞ *Carefully raise the load and transport it near the ground*

➥ Do not exceed the load capacity

➥ See load diagram **A** in the cab (front window)

Load diagram for load hook

Example: wheel loader model WL 850

- **A** Extended loader unit and quickhitch tilted in
  ➥ **Max N => 1700 kg (3748 lbs.)**
- **B** Extended loader unit and quickhitch
  ➥ **Max N => 1350 kg (2976 lbs.)**

NOTICE

In order to avoid damage to the lifting gear and to the machine,

☞ *Remove the attachment (bucket, pallet forks etc.) from the quickhitch*

☞ *Safely hook up the lifting gear (belts, cables, chains etc.) across the quickhitch in the load hook*

☞ *Never place the lifting gear over sharp edges*

3.50 “Hose burst valve” safety feature (option)

Important

The “Hose burst valve” safety feature prevents the loader unit from being lowered or dumped out without being braked, in the event of a bursting hose or pipe - *see chapter 2 “Applications with lifting gear*” on page 2-8.

Important

Switching on the load stabilizer automatically switches off the hose burst valve!

☞ *Switch off the load stabilizer to make sure the the hose burst valve works correctly!*

☞ *- see Load stabilizer (option) on page 3-29*

WARNING

Equipment damage and personal injury hazard. A burst hose or pipe will damage the machine and reduce operator control.

☞ *The “Hose burst valve” safety feature will activate as soon as a hose or a pipe bursts.*

☞ *Have damage to the hydraulic system and to the hose burst valve immediately repaired and checked by a qualified technician.*

In the event of a burst hose, proceed as follows:

☞ *Stop the machine immediately*

☞ *If possible:*

- ☞ Carefully lower the loader unit to transport position
- ☞ Drive the machine out of the work area with the loader unit lowered

☞ *Apply the parking brake*

☞ *Switch off the engine*

☞ *Remove the starter key and lock the cab*

☞ *Secure the machine and the attachment*

Environment

Collect the spilled hydraulic oil in a suitable container.

☞ *Dispose of drained hydraulic oil by an ecologically safe method*

☞ *Always contact the relevant authorities or commercial establishments in charge of oil disposal before disposing of biodegradable oil.*

☞ *Have the hose burst valve immediately repaired by an authorized workshop*

4 Troubleshooting

The information given in this chapter is provided for maintenance staff, for fast and reliable detection of malfunctions and their appropriate repair.

Repairs must be carried out by authorized staff.

4.1 Engine trouble

Problem	Possible causes	See
Engine does not start or is not easy to start	Parking brake not applied	*3-27*
	Drive lever not in neutral	*3-28*
	Engine starting temperature too low	
	Wrong SAE grade of engine lubrication oil	*5-35*
	Fuel grade does not comply with specifications	*5-3*
	Bleed the fuel system	*5-3*
	Defective or flat battery	*5-28*
	Loose or oxidised cable connections in starter circuit	
	Defective starter, or pinion does not engage	
	Wrong valve tip clearance	
	Defective fuel injector	
Engine starts, but does not run smoothly or faultless	Fuel grade does not comply with specifications	*5-3*
	Bleed the fuel system	*5-3*
	Wrong valve tip clearance	
	Injection line leaks	
	Defective fuel injector	
Engine overheats. Temperature warning system responds	Oil level too low	*5-4*
	Oil level too high	*5-4*
	Dirty air filter	*5-10*
	Defective air filter maintenance switch or gauge	*5-10*
	Dirty oil radiator fins	
	Defective fan, torn or loose V-belt	*5-11*
	Resistance in cooling system too high, flow capacity too low	
	Defective fuel injector	

Problem		Possible causes	See
Insufficient engine output		Oil level too high	*5-4*
		Fuel grade does not comply with specifications	*5-3*
		Bleed the fuel system	*5-3*
		Dirty air filter	*5-10*
		Defective air filter maintenance switch or gauge	*5-10*
		Wrong valve clearance	
		Injection line leaks	
		Defective fuel injector	
Engine does not run on all cylinders		Injection line leaks	
		Defective fuel injector	
		Bleed the fuel system	*5-3*
Insufficient or no engine oil pressure		Oil level too low	*5-4*
		Engine inclination too high	
		Wrong SAE grade of engine lubrication oil	*5-35*
Engine oil consumption too high		Oil level too high	*5-4*
		Engine inclination too high	
Engine smoke	Blue	Oil level too high	*5-4*
		Engine inclination too high	
	White	Engine starting temperature too low	
		Fuel grade does not comply with specifications	*5-3*
		Wrong valve clearance	
		Defective fuel injector	
	Black	Dirty air filter	*5-10*
		Defective air filter maintenance switch or gauge	*5-10*
		Wrong valve clearance	
		Defective fuel injector	

5 Maintenance

5.1 Important information on maintenance and service work

Operational readiness and the service life of your wheel loader are heavily dependent on maintenance.

WARNING

Crushing hazard. An unsecured or improperly supported loader unit may drop unintentionally.

☞ *Do not perform assembly and maintenance work if the loader unit is raised and not secured.*

☞ *Secure the loader unit with an appropriate prop or support to prevent it from being lowered unintentionally.*

☞ *Follow the safety instructions provided in chapter 2 “SAFETY INSTRUCTIONS” of this Operator's Manual.*

☞ *Also follow the specific instructions provided in the Operator's Manuals of the attachments.*

NOTICE

Daily and weekly service and maintenance work must be performed by a specifically trained operator.
All other maintenance work must be performed only by the trained and qualified staff of your Wacker-Neuson sales partner.

☞ *- see Maintenance plan on page 5-38*

5.2 Fuel system

General safety instructions for refueling

- Extreme caution is essential when handling fuel - high risk of fire!
- Never perform work on the fuel system in the vicinity of naked flames or sparks!
- Do not smoke when working on the fuel system or when refueling!
- Before refueling, switch off the engine and remove the starter key!
- Do not refuel in closed rooms!

Environment

Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner! Keep the machine clean to reduce the risk of fire and wipe away fuel spills immediately!

Diesel fuel specification

Use only high-grade fuels

Grade	Cetane number	Use
No. 2-D according to EN 590 (EU) No. 2-D ASTM D975-94 (USA)	Min. 45	For normal outside temperatures
No. 1-D according to EN 590 (EU) No. 1-D ASTM D975 -94 (USA)		For outside temperatures below 4 °C (39°F) or for operation above 1500 m (4921 feet) altitude

Stationary fuel pumps

General

Only refuel from stationary fuel pumps. Fuel from barrels or cans is usually contaminated. Even the smallest particles of dirt can cause.

- Increased engine wear.
- Malfunctions in the fuel system and
- Reduced effectiveness of the fuel filters.

Refuelling from barrels

If refueling from barrels cannot be avoided, note the following points:

- Barrels must neither be rolled nor tilted before refueling.
- Protect the suction pipe opening of the barrel pump with a fine-mesh strainer.
- Immerse it down to a max. 15 cm (5.9 in.) above the floor of the barrel.
- Only fill the tank using refueling aids (funnels or filler pipes) with integral microfilter.
- Keep all refueling containers clean at all times.

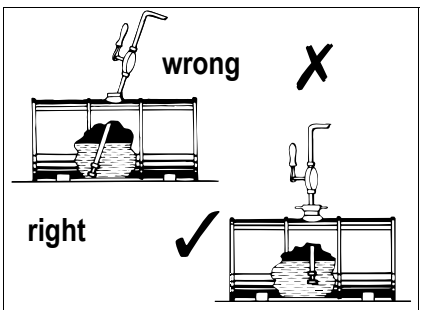


Fig. 122: Refuelling from a barrel

Refueling

Fig. 123: Fuel filler inlet

The filler inlet of the fuel tank is located on the left-hand side of the machine

WARNING

Fire and fume inhalation hazards.

☞ *Do not refuel in closed rooms.*

☞ *Never perform maintenance or repair work on the fuel system in the vicinity of open flames or sparks.*

☞ *Never smoke when working on the fuel system or when refueling.*

☞ *Before refueling, stop the engine and remove the starting key.*

☞ *Wipe up any fuel spills immediately.*

☞ *Remove spilled fuel from the machine components and surfaces before use to reduce the risk of fire.*

Bleeding the fuel system

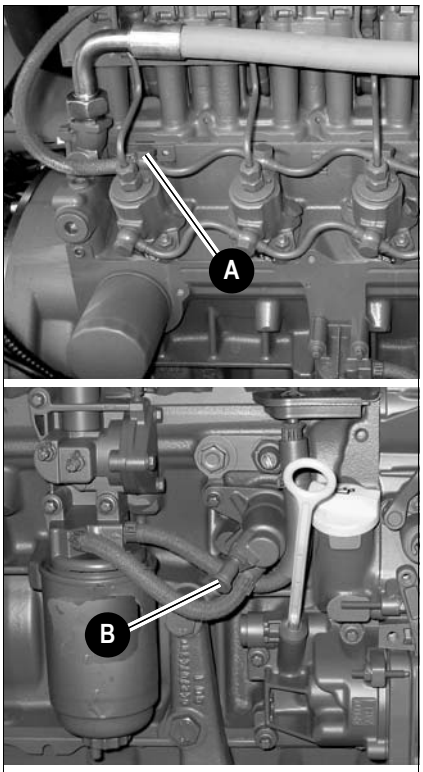


Fig. 124: Bleeding the fuel system

WARNING

Fire and burn hazard. Draining fuel may ignite if it comes into contact with hot engine parts or the exhaust system. Hot fuel may cause burns.

☞ *Always wear protective equipment and safety glasses when working with fuel.*

☞ *Never bleed the fuel system if the engine is hot.*

Environment

Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner!

Bleed the fuel system in the following cases:

- After removing and fitting the fuel filter, prefilter or the fuel lines back on again.
- After running the fuel tank empty.
- After running the engine again, after it has been out of service for a longer period of time.

☞ *Bleed the fuel system as follows:*

- Place the container under the engine.
- Fill the fuel tank.
- Slacken bleed screw **A** on the injection pump by a few turns.
- Press button **B** on the fuel pump with your hand (pumping movement) until the fuel comes out free of air from the slackened bleed screw.
- Tighten bleed screw **A.**
- Start the engine.

If the engine runs smoothly for a while, and then stops; or if it does not run smoothly:

- Switch off the engine.
- Check once again if there is any air in the fuel system.
- Bleed the fuel system again as described above.

Have this checked by authorized staff if necessary.

5.3 Engine lubrication system

CAUTION

Burn hazard. Engine and exhaust components become very hot during operation.

☞ *Wait at least 10 minutes after stopping the engine.*

☞ *Wear protective glasses, gloves, and clothing.*

Checking the oil level once a day

NOTICE

Possibility of equipment damage. If the engine oil level is too low or if an oil change is overdue, this can cause engine damage or loss of power.

☞ *Have the oil changed by an authorized service facility.*

☞ *- see Maintenance plan on page 5-38*

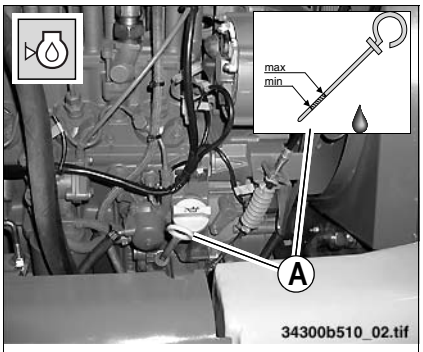


Fig. 125: Checking the oil level

☞ *Park the machine on level ground*

☞ *Switch off the engine!*

➥ *- see chapter 3 "Stopping/parking the machine"* on page 3-33

☞ *Apply the parking brake*

☞ *Open the engine cover*

☞ *Pull out oil dipstick* **A**

- Wipe it with a lint-free cloth
- Push it back in as far as possible
- Withdraw it and read off the oil level

☞ *However if necessary, add the oil at the latest when the oil reaches the MIN mark on the oil dipstick* ***A*** *- see Add engine oil on page 5-4*

Add engine oil

NOTICE

Possibility of engine damage from too much oil or
incorrect engine oil.

☞ *Do not add engine oil above the MAX mark of oil dipstick 126/A.*

☞ *Use only the specified engine oil - see Fluids and lubricants on page 5-35*

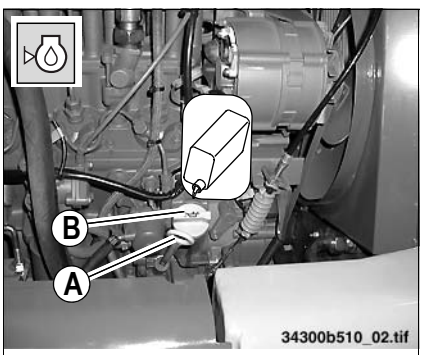


Fig. 126: Oil dipstick and oil filler cap

☞ *Clean the area around oil filler cap* ***B*** *with a lint-free cloth*

☞ *Open filler cap* ***B***

☞ *Raise oil dipstick* ***A*** *slightly to allow any trapped air to escape*

☞ *Add engine oil*

➥ Wait a moment until all the oil has run into the oil sump

☞ *Check the oil level with oil dipstick* ***A***

➥ *- see* on page 5-4

☞ *Add if necessary and check the oil level again*

☞ *Close filler cap* ***B***

☞ *Push oil dipstick* ***A*** *back in as far as possible*

☞ *Completely remove all oil spills from the engine*

5.4 Engine and hydraulics cooling system

The combined oil/water radiator cools the diesel engine and the hydraulic oil of the drive and work hydraulics.

The coolant expansion tank is located at the rear on the radiator.

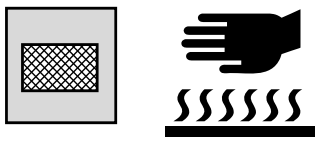
Checking / filling up coolant

- Dirt on the radiator fins reduces the radiator's heat dissipation capacity! To avoid this:
  - ☞ Clean the outside of the radiator at regular intervals. Refer to the maintenance plans in the appendix for the cleaning intervals
  - ☞ In dusty or dirty work conditions, clean more frequently than indicated in the maintenance plans
- An insufficient coolant level reduces the heat dissipation capacity as well and can lead to engine damage! Therefore:
  - ☞ Check the coolant level at regular intervals. Refer to the maintenance plans in the maintenance section for the intervals
  - ☞ If coolant must be added frequently, check the cooling system for leaks and/or contact your dealer!
  - ☞ Never fill in cold water/coolant if the engine is warm!
  - ☞ After filling the expansion tank, make a test run with the engine and check the coolant level again after switching off the engine
- The use of the wrong coolant can destroy the engine and the radiator. Therefore:
  - ☞ Add enough antifreeze compound to the coolant - but never more than 50 %. If possible use brand-name antifreeze compounds with anticorrosion additives
  - ☞ Observe the coolant compound table in the *Coolant compound table* on page 6-8
  - ☞ Do not use radiator cleaning compounds if an antifreeze compound has been added to the coolant - otherwise this causes sludge to form, which can damage the engine

Environment

Use a suitable container to collect the coolant as it drains and dispose of it in an environmentally friendly manner!

Cleaning the radiator fins of the oil/water radiator



WARNING

Burn hazard. The coolant in the system is hot under normal operating conditions and under about 1 bar (15 psi) pressure. Engine and exhaust components become very hot during operation.

☞ *Never open the coolant tank or drain coolant if the engine is hot.*

☞ *Wait at least 15 minutes after stopping the engine.*

☞ *Wear protective glasses, gloves and clothing.*

Fig. 127: Cleaning the oil cooler

☞ *Park the wheel loader on level ground*

☞ *Lower the loader unit fully*

☞ *Apply the parking brake with the switch on the instrument panel*

☞ *Switch off the engine and let it cool down*

☞ *Move the starter key*

☞ *Open the engine cover*

☞ *Clean the radiator fins by blowing compressed air outwards from the engine side*

NOTICE

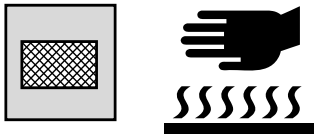
Dirt on the radiator fins reduces the radiator's heat dissipation capacity and can cause damage to the engine and the hydraulic system!

☞ *In order to ensure the radiator's optimal cooling capacity, clean the radiator fins with a compressed air gun. Take care not to damage the fins while cleaning them.*

☞ *Check the radiator* ***once a day*** for dirt and clean it if necessary

☞ *Clean the radiator more frequently in dusty or dirty work conditions*

Checking the coolant level



WARNING

Burn hazard. The coolant in the system is hot under normal operating conditions and under about 1 bar (15 psi) pressure.

☞ *Never open the coolant tank or drain coolant if the engine is hot.*

☞ *Wait at least 15 minutes after stopping the engine.*

☞ *Wear protective glasses, gloves and clothing.*

☞ *Always actuate the safety valve first on the filler cap of the expansion tank. To do this, open the cap to the first notch and release the pressure.*

Important

Check the coolant level every **10 service hours** or once a day.
Check before starting the engine.

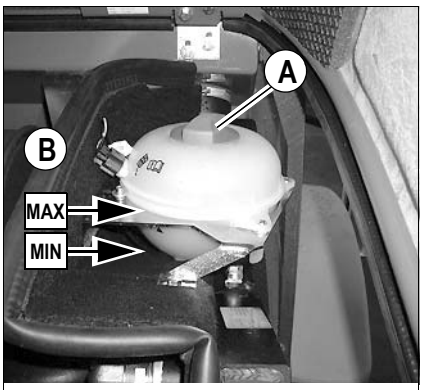


Fig. 128: Expansion tank for coolant

☞ *Check the coolant level as follows*

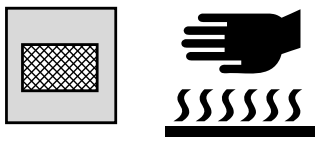
- Park the machine on level ground
- Lower the loader unit fully
- Apply the parking brake
- Switch off the engine
- Remove the starter key
- Open the engine cover
- Check the coolant level in the expansion tank **A**

If the coolant level is below the **MIN** mark **B** of the expansion tank:

- Fill up coolant to the **MAX** mark **B**

☞ *Check the coolant quality (antifreeze) with suitable testing equipment (antifreeze tester) - see Fluids and lubricants on page 5-35*

Filling up coolant



WARNING

Burn hazard. The coolant in the system is hot under normal operating conditions and under about 1 bar (15 psi) pressure.

☞ *Never open the coolant tank or drain coolant if the engine is hot.*

☞ *Wait at least 15 minutes after stopping the engine.*

☞ *Wear protective glasses, gloves and clothing.*

☞ *Always actuate the safety valve first on the filler cap of the expansion tank. To do this, open the cap to the first notch and release the pressure.*

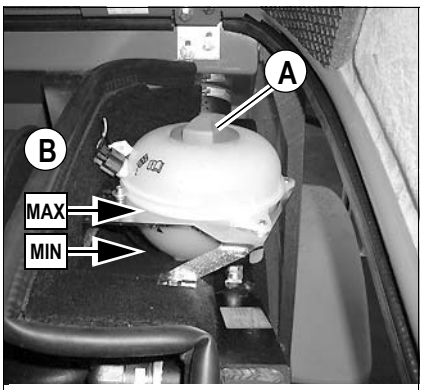


Fig. 129: Filling up coolant in the expansion tank

☞ *Fill up coolant as follows*

- Park the machine on level ground
- Lower the loader unit
- Apply the parking brake
- Switch off the engine and remove the starter key
- Allow the engine/cooling system to cool down

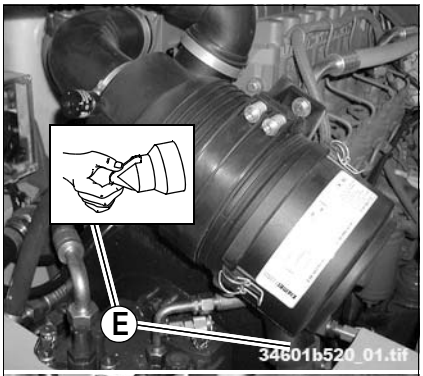
☞ *Release the overpressure in the coolant expansion tank. To do this:*

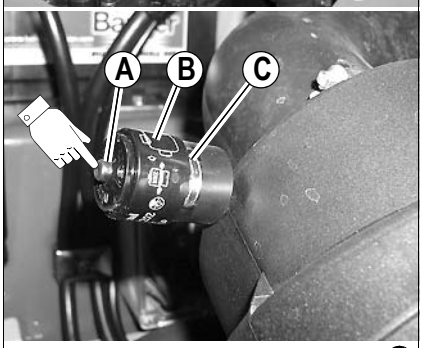
- Open cap **A** to the first notch and release the pressure
- Open filler cap **A** fully
- Fill up coolant to the **MAX** mark **B**
- Use brand-name antifreeze compounds with anticorrosion additives - *see Fluids and lubricants* on page 5-35
- Close filler cap **A**
- Start and warm up the engine, as you do so:
- Open the heating circuit fully
- Switch off the engine
- Check the cooling system and the heating water circuit for leaks
- If necessary, have leaks immediately repaired by an authorized workshop
- Check the coolant level again

☞ If necessary, add coolant and repeat the procedure until reaching the correct coolant level

5.5 Air filter

Checking the air filter for dirt





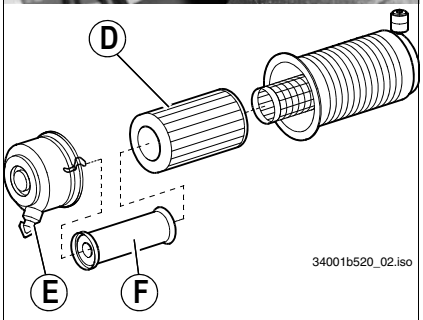


Fig. 130: Air filter with safety cartridge

NOTICE

Maintenance display **B** on the filter housing monitors the filter cartridge. The dust is removed by squeezing discharge slot **E** of the dust valve. Keep in mind the following to avoid premature engine wear:

☞ *Do not wash, brush or clean the filter cartridge with compressed air*

☞ *Replace the filter cartridge when the indicator comes on*

☞ *Never reuse a damaged filter cartridge*

☞ *Ensure cleanliness when replacing the filter cartridge!*

☞ *Checking the dust valve* **E**

- Switch off the engine and remove the starter key.
- Prevent the machine from rolling away - *see chapter 3 "Stopping/parking the machine*" on page 3-33
- Squeeze the discharge slot of dust valve **E.**
- Remove hardened dust by compressing the upper area of the valve.
- Clean the discharge slot if necessary.

☞ *Filter cartridge* D *must be replaced if:*

- If the **red** mark **C** in maintenance display **B** is visible.
- At the latest after 1500 service hours (once a year).

➥ *- see Replacing the air filter cartridge* on page 5-10

Important

For **applications in dusty environment**, the air filter is fitted with an extra safety cartridge **F** (standard). Do not clean the safety cartridge. Replace the safety cartridge every third time maintenance work is carried out!

NOTICE

Filter cartridge degradation. Filter cartridges degrade prematurely in environments with acidic air, such as acid production facilities, steel and aluminum mills, chemical plants, and other non-ferrous metal plants.

☞ *Replace filter cartridge **D** and safety cartridge **F** after no more than 500 service hours.*

☞ *- see Replacing the air filter cartridge on page 5-10*

Replacing the air filter cartridge

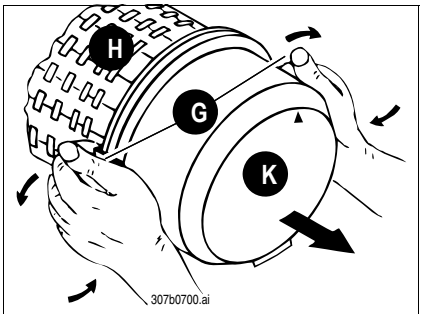


Fig. 131: Removing the lower housing section

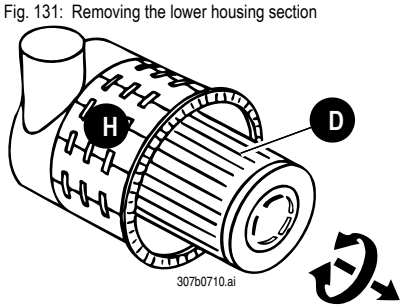


Fig. 132: Removing the filter element

☞ *Change the filter cartridge as follows:*

- Switch off the engine and remove the starter key.
- Prevent the machine from rolling away - *see chapter 3 "Stopping/parking the machine*" on page 3-33
- Open the engine cover
- Fold both bow hooks **G** to the outside, off the notch of the upper housing section **H**
- Remove the lower housing section **K**
- Carefully remove filter cartridge **D** with slightly turning movements
- In addition, every 3rd time the filter is replaced, carefully remove the safety cartridge fig. 130/**F** with slightly turning movements

NOTICE

Keep in mind the following to avoid premature engine wear:

☞ ***Make sure** all contamination (dust) inside the upper and lower housing sections has been removed.*

☞ *Carefully insert new safety cartridge 130/**F** into the upper housing section **H.***

☞ *Carefully insert new filter cartridge **D** into the upper housing section **H.***

☞ *Clean the dust valve fig. 130/**E.***

☞ *Position lower housing section **K** (make sure it is properly seated).*

☞ *Fold and close both bow hooks **G** on the notch of the upper housing section **H.***

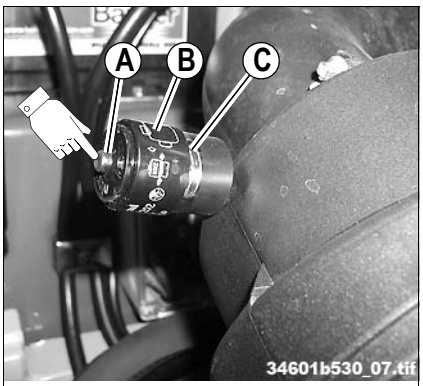


Fig. 133: Air filter with maintenance display

☞ *After replacing the filter:*

- Reset the red mark **C** in the inspection window of indicator **B.**
- Press reset button **A.**

5.6 V-belt

Checking V-belt tension

WARNING

Crushing, cutting, or burn hazards.

☞ *Stop the engine and permit a cool down time. Wait until the engine is comfortable to touch.*

☞ *Only check, retighten, or replace the V-belt when the engine is stopped.*

☞ *Disconnect the battery or the battery master switch before proceeding with work on the V-belt.*

NOTICE

Cracked and stretched V-belts cause engine damage

☞ *Replace the V-belt every 2 years at the latest*

☞ *Have the V-belt replaced by an authorized workshop*

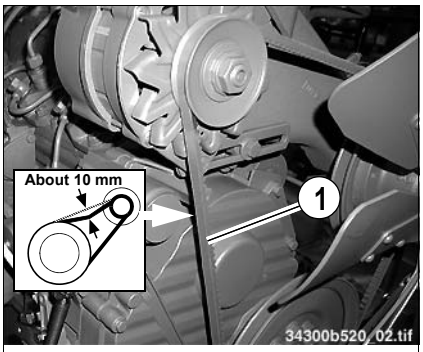


Fig. 134: Checking V-belt tension

Check the V-belt once a day or every 10 service hours, and retighten if necessary!

Retighten new V-belts after about 15 minutes of running time.

Check as follows:

☞ *Switch off the engine.*

☞ *Prevent the machine from rolling away and remove the starter key.*

➥ *- see chapter 3 "Stopping/parking the machine"* on page 3-33.

☞ *Carefully inspect V-belt **1** for damage.*

☞ *If the V-belt is damaged:*

➥ Have the V-belt replaced by authorized staff.

☞ *Press with your thumb to check whether the V-belt can be deflected between the pulleys by no more than **about 10*** mm (19 in).

☞ *Retighten the V-belt if necessary.*

Retightening the V-belt

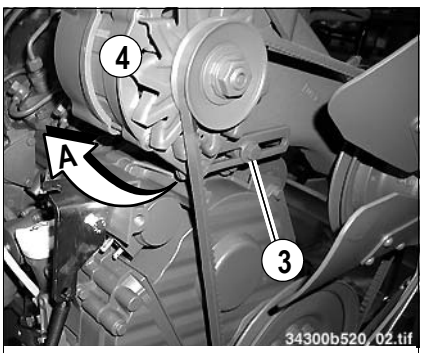


Fig. 135: Retightening the V-belt

Retighten as follows:

☞ *Switch off the engine.*

☞ *Prevent the machine from rolling away and remove the starter key.*

➥ *- see chapter 3 "Stopping/parking the machine"* on page 3-33.

☞ *Slacken fastening* screws ***3*** of alternator **4.**

☞ *Use a suitable tool to push the alternator in the direction of arrow* **A** *until the correct V-belt tension is obtained (fig. 134).*

☞ *Keep the alternator in this position, and at the same time retighten fastening screws **3.***

☞ *Start the engine.*

☞ *Check V-belt tension (fig. 134) after about 15 minutes.*

5.7 Hydraulic system

Specific safety instructions regarding the hydraulic system

WARNING

Pressurized hydraulic oil hazard. Hydraulic oil escaping under high pressure can catch fire, damage property, penetrate the skin and cause severe burns and injuries.

☞ *Do not operate the machine with leaking or damaged hydraulic system components.*

☞ *Use a piece of cardboard to diagnose the source of hydraulic leaks.*

☞ *Hydraulic oil can be hot and can cause serious burns if contact is made with skin. If contact occurs with hot oil, seek immediate medical attention and treatment for the burn.*

☞ *Wear safety glasses/goggles to avoid eye contact. If oil contacts the eye flush immediately with clean water and seek emergency medical treatment.*

☞ *Seek immediate medical attention if oil penetrates the skin. Oil can cause serious infections.*

- Release the pressure in all lines carrying hydraulic oil prior to any maintenance and repair work. To do this:
  - Lower all hydraulically controlled attachments to the ground and switch off the engine
  - Move all control levers of the hydraulic control valves several times
- Apply the parking brake to prevent the machine from rolling away before you perform service and maintenance work
- Hydraulic oil escaping under high pressure can penetrate the skin and cause serious injuries. Always consult a doctor immediately even if the wound seems insignificant - otherwise serious infections could set in!
- If the hydraulic oil in the sight glass is cloudy, this indicates that water or air has penetrated the hydraulic system. This may cause damage to the hydraulic pump!

  ☞ Contact your Wacker-Neuson dealer immediately

NOTICE

Possible equipment damage. Contaminated hydraulic oil, lack of oil, or the wrong hydraulic oil can severely damage the hydraulic system.

☞ *Take care to avoid contamination when working!*

☞ *Always fill in hydraulic oil using the filling screen!*
- see Filling up hydraulic oil on page 5-14

☞ *Only use authorized oils of the same type - see Fluids and lubricants on page 5-35*

☞ *Always fill in hydraulic oil before the level gets too low*

☞ *If the hydraulic system is filled with biodegradable oil, then only use biodegradable oil of the same type for filling up - observe the sticker on the hydraulic oil tank!*

☞ *Contact customer service if the hydraulic system filter is contaminated with metal chippings. Otherwise, follow-on damage may result!*

Environment

Collect drained hydraulic oil and biodegradable oil in a suitable container! Dispose of drained oil and used filters by an ecologically safe method. Always contact the relevant authorities or commercial establishments in charge of oil disposal before disposing of biodegradable oil.

Monitoring the hydraulic oil return filter

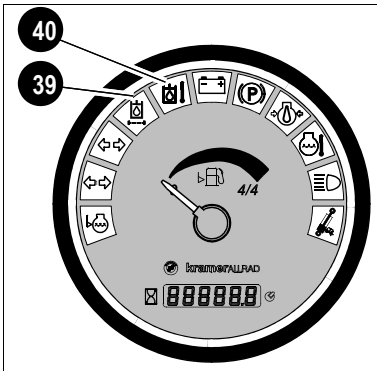


Fig. 136: Preheating start switch

On the instrument panel, the red indicator **39** monitors return pressure and the return filter, and indicator **40** monitors oil temperature.

The filter element must be replaced by an authorized workshop:

☞ *If indicator* **39** *comes on*

➥ The return pressure in the filter is too high or,

☞ *If indicator* **40** *comes on*

➥ The hydraulic oil temperature is too high

☞ *At the latest after 1500 service hours (once a year).*

Indicator **39** on the instrument panel can come on in cold weather immediately after starting the engine. This is caused by increased oil viscosity. In this case:

☞ *Set engine revs so that indicator **39*** on the instrument panel *goes out.*

☞ *Bear in mind the instructions concerning warmup - see chapter 3 "Starting the engine" on page 3-14.*

Important information for the use of biodegradable oil

- Use only the biodegradable hydraulic fluids which have been tested and approved by Wacker-Neuson dealer - *see Fluids and lubricants* on page 5-35. Always contact Wacker-Neuson dealer for the use of other products which have not been recommended. In addition, ask the oil supplier for a written declaration of guarantee. This guarantee is applicable to damage occurring on the hydraulic components, which can be proved to be due to the hydraulic fluid.
- Use only biodegradable oil of the same type for filling up. In order to avoid misunderstandings, a label providing clear information is located on the hydraulic oil tank (next to the filler inlet) regarding the type of oil currently used! Replace missing labels!
  The joint use of two different biodegradable oils can affect the quality of one of the oil types. Therefore, make sure the remaining amount of initial hydraulic fluid in the hydraulic system does not exceed 8 % when changing biodegradable oil (manufacturer indications).
- Do not fill up with mineral oil - the content of mineral oil should not exceed 2 % in order to avoid foaming problems and to ensure biological degradability.
- When running the machine with biodegradable oil, the same oil and filter replacement intervals are valid as for mineral oil - see maintenance plans.
- Have the condensation water in the hydraulic oil tank drained by an authorized workshop every 500 service hours, in any case before the cold season. The water content must not exceed 0.1 % by weight.
- The instructions in this Operator's Manual concerning environmental protection are also valid for the use of biodegradable oil.
- If additional hydraulic attachments are mounted or operated, use the same type of biodegradable oil for these attachments to avoid mixtures in the hydraulic system.
  Subsequent change from mineral oil to biodegradable oil must be carried out by an authorized workshop or by your Wacker-Neuson dealer.

Checking the hydraulic oil level

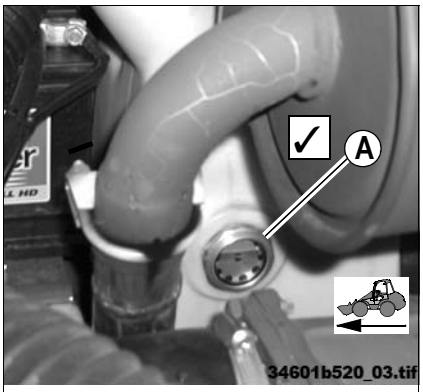


Fig. 137: Oil level sight glass on the hydraulic oil tank

☞ *Proceed as follows:*

- Park the machine on level ground.
- Retract all hydraulic rams.
- Switch off the engine.
- Apply the parking brake.
- Open the engine cover.
- Check the hydraulic oil level in sight glass **A.**

☞ *If the oil level is visible in the lower half of the oil level sight glass.*

➥ OK

☞ *If the oil level is not visible in the oil level sight glass (not enough oil).*

➥ Fill up the hydraulic oil.

NOTICE

Any excess quantity of hydraulic oil in the tank escapes via the breather as soon as the temperature rises! If the oil level is no longer visible in the upper half of the oil level sight glass.

☞ *Drain the hydraulic oil.*

Filling up hydraulic oil

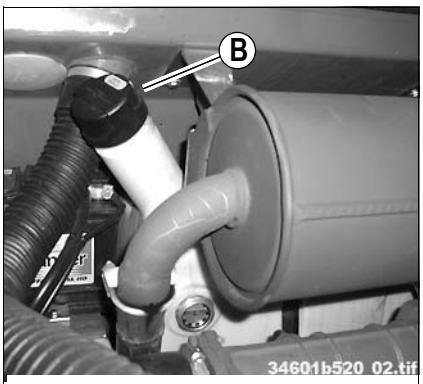


Fig. 138: Filler cap for hydraulic oil tank

Do not fill up the hydraulic oil unless the engine is switched off. Otherwise, hydraulic oil will run out of the filler opening on the hydraulic tank.

☞ *Fill up as follows:*

- Park the machine on level ground.
- Retract all hydraulic rams.
- Switch off the engine.
- Apply the parking brake.
- Open the engine cover.
- Clean the area around the filler and breather filter **B** with a cloth.
- Place a container to collect the oil as it drains.
- Open breather filter **B** by hand.

☞ *With the filter insert in place.*

- Add hydraulic oil.
- Check the hydraulic oil level in the oil level sight glass (fig. 137/**A**).
- Add hydraulic oil if necessary and check again.
- Firmly close breather filter **B** by hand.

5.8 Checking hydraulic pressure lines

Specific safety instructions regarding pressure line checks

WARNING

Pressurized hydraulic oil hazard. Hydraulic oil escaping under high pressure can catch fire, damage property, penetrate the skin and cause severe burns and injuries.

- ☞ *Do not operate the machine with leaking or damaged hydraulic system components.*
- ☞ *Use a piece of cardboard, paper, or wood to diagnose the source of hydraulic leaks. Never use an unprotected light bulb or open flame.*
- ☞ *Hydraulic oil can be hot and can cause serious burns if contact is made with skin. If contact occurs with hot oil, seek immediate medical attention and treatment for the burn.*
- ☞ *Wear safety glasses/goggles to avoid eye contact. If oil contacts the eye flush immediately with clean water and seek emergency medical treatment.*
- ☞ *Retighten leaking threaded fittings and hose connections only when the system is not under pressure. Release the pressure before working on pressurized lines.*
- ☞ *Never weld or solder damaged or leaking pressure lines and threaded connections. Replace damaged parts with new ones.*
- ☞ *Never search for leaks with your bare hands, but wear protective gloves.*
- ☞ *Have damaged hydraulic lines replaced by an authorized Wacker-Neuson service technician.*

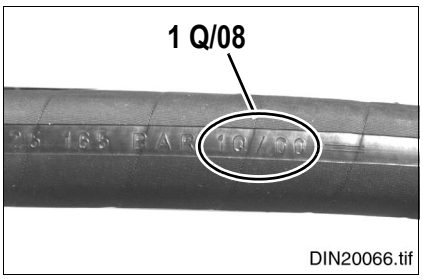
- Leaks and damaged pressure lines must be immediately repaired or replaced by an authorized workshop or after-sales staff.
  This not only increases the operating safety of your machine but also helps to protect the environment.
- Replace hydraulic hoses every 6 years from the date of manufacture, even if they do not seem to be damaged.

In this respect, we recommend that you observe all the relevant safety regulations for hydraulic lines, as well as the safety regulations regarding accident prevention and occupational health and safety in your country. Also observe DIN 20066, part 5.

The date of manufacture (month or quarter and year) is indicated on the flexible line.

Example:

The indication "**1 Q/08**" means manufactured in the 1st quarter of 2008.



5.9 Lubrication work

Lubricate all lubrication points mentioned below with lithium-saponified brand-name grease - *see Fluids and lubricants* on page 5-35

Lubricating the rear axle oscillation-type bearing

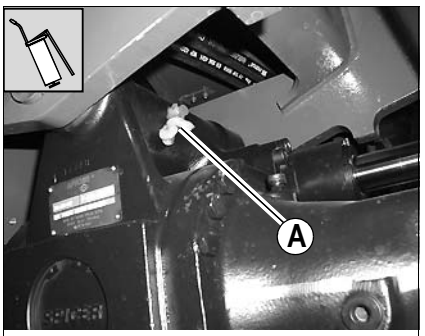


Fig. 139: Grease nipples for oscillation-type bearing

Important

The machine has an oscillation-type rear axle. Grease the bearing at the latest after every **50 service hours** or once a week.

☞ *Lubricate grease nipple **A** of the oscillation-type bearing*

Lubricating the front and rear axle planetary drive steering joint bearings

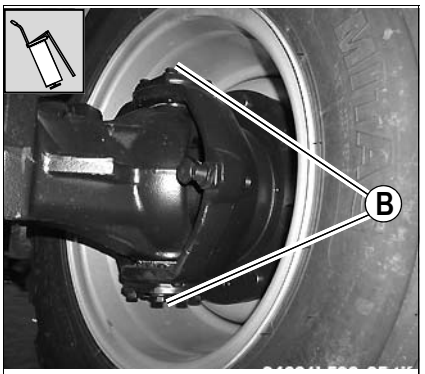


Fig. 140: Grease nipples on planetary drive bearings

☞ *Lubricate grease nipples **B** (2x) on each planetary drive steering joint bearing **every 50 service hours** or once a week*

Lubricating the pivots on the loader unit

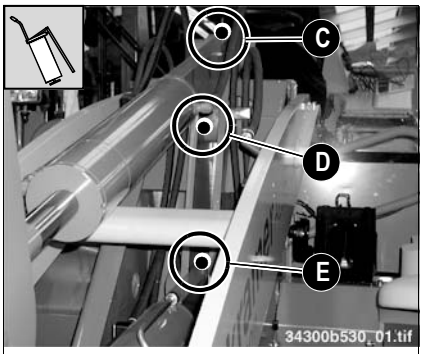


Fig. 141: Lubrication points on frame

Lubricate the following lubrication points on the loader unit of the machine:

☞ *Lubricate grease nipple **C** on the tilt ram bearing on the frame with grease **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).*

☞ *Lubricate grease nipple **D** on the loader unit bearing **every 10 service hours** (or once a day). Lubricate more frequently when in heavy-duty operation.*

☞ *Lubricate grease nipple **E** on the lift ram bearing on the frame **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).*

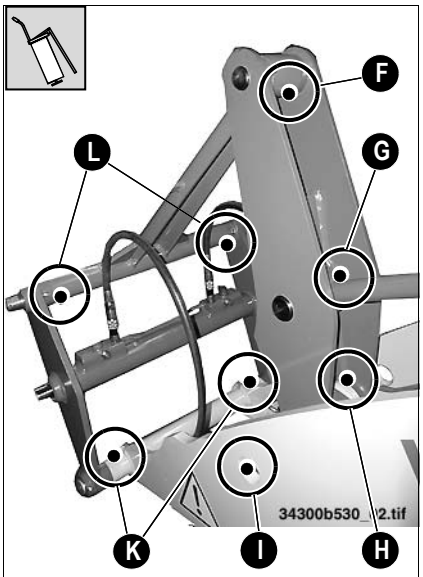


Fig. 142: Lubrication points for lift and tilt ram bearings

☞ *Lubricate grease nipple **F** on the tilt rod bearing **every 10 service hours** (or once a day). Lubricate more frequently when in heavy-duty operation.*

☞ *Lubricate grease nipple **G** on the tilt ram bearing **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).*

☞ *Lubricate grease nipple **H** on the lift ram bearing **every 50 service hours** (or once a week). Lubricate more frequently when in heavy-duty operation (once a day).*

☞ *Lubricate grease nipple **I** on the tilt lever bearing **every 10 service hours** (or once a day). Lubricate more frequently when in heavy-duty operation.*

☞ *Lubricate grease nipples **K** on the quickhitch bearing **every 10 service hours** (or once a day). Lubricate more frequently when in heavy-duty operation.*

☞ *Lubricate grease nipples **L** on the tilt lever bearing **every 10 service hours** (or once a day). Lubricate more frequently when in heavy-duty operation.*

5.10 Lubricating with the central lubrication system (option)

General functional description of the central lubrication system

The central lubrication system allows you to lubricate all lubrication points of the wheel loader in one single step.

- The yellow LED or the green indicator in the cab (option) comes on for 1.5 seconds upon switching on ignition to indicate functional readiness of the controls (switch-on check). It stays lit during the entire lubrication procedure.
- The integrated electronic control unit has a data memory for saving the times that have been set or that have elapsed. The time is taken and saved if ignition is switched off during lubrication or during a break. The remaining lubrication time or break time is read from the memory upon switching ignition on again, and lubrication is resumed where it was interrupted.

Time control

Break and lubrication times can be set with the time-dependent control of the central lubrication system. Break times are the periods between two lubrication times - *see Setting the lubrication and break times* on page 5-19.

Tip switch for intermediate lubrication

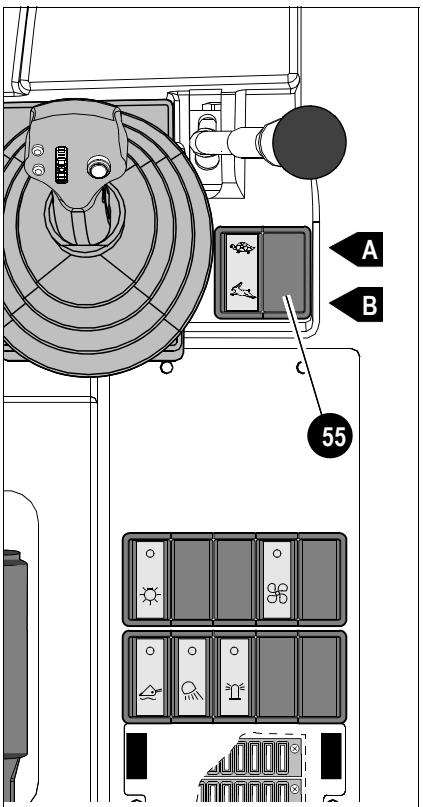


Fig. 143: Switch for hazard warning system

☞ *Press the tip switch to position **B** .*

➥ The machine is being lubricated.

➥ Lubrication time is controlled by means of the integrated controls in the lubrication system - *see Setting the lubrication and break times* on page 5-19.

☞ *Release the tip switch .*

➥ Lubrication is stopped.

Important

Pressing the tip switch starts intermediate lubrication at any given time if starter circuit is switched on. This also serves as a functional check. The pump then immediately starts with a lubrication cycle. The lubrication or break time that has elapsed so far or that has been saved is reset and starts over again. A lubrication system malfunction can also be reset by pressing the tip switch, and the pump restarts lubrication.

Setting the lubrication and break times

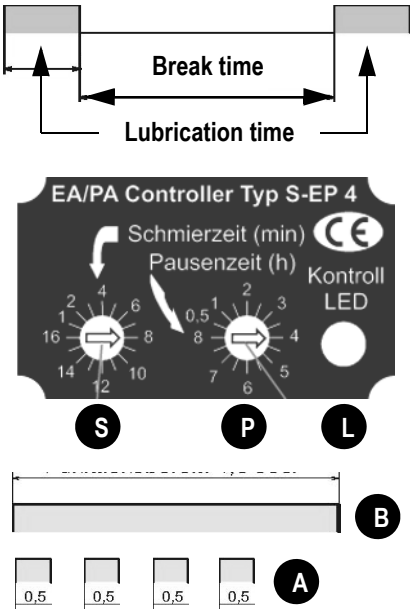


Fig. 144: Setting the lubrication times

Break times and lubrication times are set with the notched switches **S and P** in the window of the controls.

☞ *Remove the red frame on the protective motor housing of the pump with a flat screwdriver to set the time.*

☞ *Slacken the four cross-slotted screws and remove the transparent cover.*

☞ *Set the break time **P** and the lubrication time **S** with a flat screwdriver.*

Lubrication times (S):

➥ 1 to 16 minutes (16 notches, each 1 minute)

➥ 2 to 32 minutes (16 notches, each 2 minutes)

Break time (P):

➥ 0.5 to 8 h (16 notches, each 0.5 h)

Yellow LED (L)

➥ **(B)** lubrication system in operation

➥ **(A)** lubrication under progress: 0.5 seconds LED ON/0.5 seconds LED OFF.

☞ *Install the transparent cover (window) once the settings are carried out.*

NOTICE

Possibility of equipment damage. Water can penetrate into the controls and damage them if the transparent cover is not fitted and closed correctly.

☞ *Make sure that the transparent cover is fitted and closed correctly after setting the lubrication and break times.*

Filling the central lubrication system

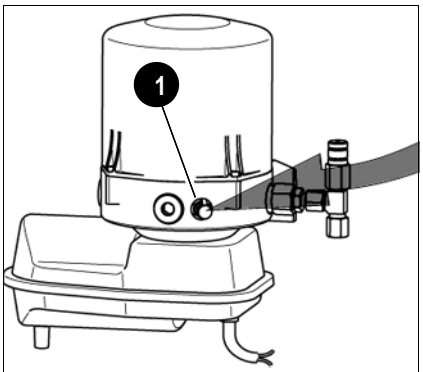


Fig. 145: Filling the central lubrication system

The lubrication system is filled via conical grease nipple **1** or a fill coupling with a manual or pneumatic grease gun.

NOTICE

Incompatible greases can damage the lubrication system and the lubrication points.

☞ *Use only commercially available greases up to NLGI-Kl. 2.*

☞ *- see Fluids and lubricants on page 5-35*

5.11 Maintenance of the brake system

Specific safety instructions regarding the brake system

Brakes are crucial to safety. Incorrect work may cause brake failure.

Therefore all maintenance and repair work on the brakes must be carried out by trained staff. An exception to this is the following work which must be carried out by the driver of the machine:

☞ *Daily check of the level in the brake fluid tank!*

☞ *Daily check of the brake lines*

☞ *Damaged brake lines or hoses must immediately be replaced by an authorized service center.*

Checking/filling up the brake fluid level

The brake fluid tank is located at the front left in the cab (next to the brake/inching pedal)

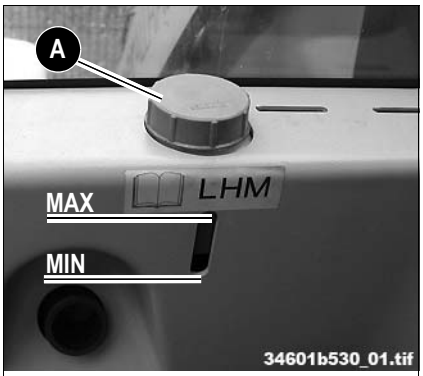


Fig. 146: Checking the brake fluid level in the tank

Important

Risk of reduced brake effectiveness or malfunction. An incorrect brake fluid grade or an insufficient brake fluid level may impair the operation of the brake system.

☞ *Fill up brake fluid up to the upper edge of the sightglass.*

☞ *The brake fluid **must** comply with the SAE specification - see Fluids and lubricants on page 5-35*

☞ *The brake fluid **must** be replaced every 2 years by an authorized service center.*

☞ *If the brake system loses too much brake fluid, have the brake system checked and repaired by an authorized service center.*

If the level is below the upper edge of the sight glass:

☞ *Clean the area around the opening with a clean cloth.*

☞ *Open tank cover* **A.**

☞ *Fill up brake fluid up to the upper edge of the sight glass **MAX.***

☞ *Close tank cover* **A.**

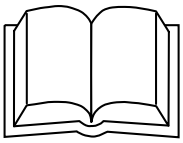
5.12 Tires

Daily tire checks

WARNING

Personal injury hazard from improperly repaired tires or rims.

☞ *All repair work on tires and rims may only be performed by an authorized service center.*



Important

Regular inspections of the tires

- Improves operating safety
- Increases the service life of the tires
- Reduces machine downtimes
- Refer to the table in chapter “Specifications” on page *6-7* for the authorized tire types and the correct tire pressures. Machines are also delivered ex works with a tire table sticker on the front window or on the loader unit bulkhead.

☞ *Check tire pressure - see chapter 6 “Tires” on page 6-7*

☞ *Check tires and rims for damage (cracks, ageing etc.) - also on the inside*

☞ *Remove foreign bodies from the tire tread*

☞ *Remove traces of oil and grease from the tires*

Wheel change

WARNING

Personal injury hazard. Use of wrong tires or wheels can increase the possibility of traffic or work site accidents.

☞ *Use only wheels and tires authorized for your machine - see chapter 6 "Tires" on page 6-7*

☞ *Check the wheel nuts for tightness after every wheel or tire change - see chapter 6 "Tightening torques, conversion tables" on page 6-9*

NOTICE

The wheels are heavy and can damage the threads on the wheel studs if they are handled incorrectly.

☞ *Use suitable assembly tools, such as covering sleeves for the studs and a jack capable of handling the load.*

Removing the wheels

☞ *Proceed as follows:*

- Park the machine on level and firm ground and prevent it from rolling away - *see chapter 3 "Stopping/parking the machine"* on page 3-33.
- Slightly loosen the wheel nuts of the wheel you want to remove.
- Place a jack under the axle beam, making sure it is standing firmly.
- Raise the side of the axle from which you want to remove the wheel.
- Check the machine is standing firmly.
- Completely remove the wheel nuts.
- Remove the wheel.

Fitting the wheels

☞ *Proceed as follows:*

- Place the wheel onto the wheel studs.
- Tighten all wheel nuts part-way.
- Lower the raised axle.
- Tighten the wheel nuts to the prescribed tightening torque - *see chapter 6 "Specific tightening torques"* on page 6-9.

5.13 Heating and ventilation system maintenance

General instructions regarding the heating system

The heating system of the machine is equipped with a fine-dust filter (EU4, option) which must be cleaned at regular intervals and replaced every 500 service hours by a new one if necessary.

➥ - *see Maintenance plan* on page 5-38

The fine-dust filter is located behind the maintenance flap on the right on the outside of the cab.

Cleaning the dust filter of the heating system

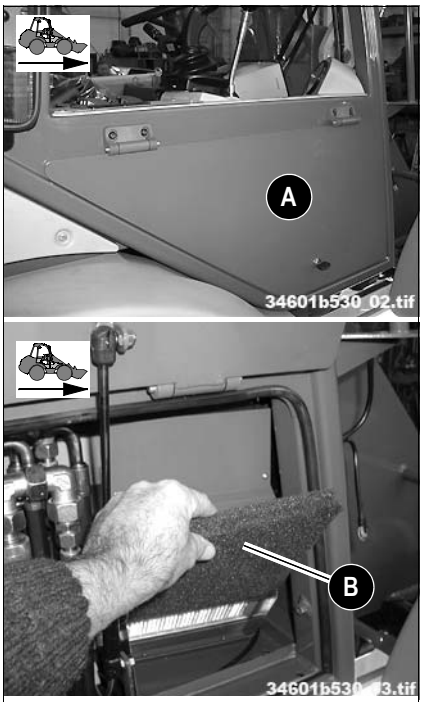


Fig. 147: Replacing the dust filter of the heating system

A fine-dust filter cleans the air taken in by the heater. The volume of warm air flowing out of the air vents decreases as filter contamination increases.

Clean the filter as follows:

☞ *Open maintenance flap **A.***

☞ *Remove dust filter **B.***

☞ *Clean dust filter **B** with compressed air, or replace it every 500 service hours by a new one.*

☞ *Close maintenance flap **A.***

5.14 Air conditioning (option): maintenance

General instructions regarding the air conditioning system

For your own safety, please bear the following instructions in mind:

- Maintenance and repair work may only be carried out by trained staff or by an authorized workshop.
- Be careful when carrying out maintenance and repair work - sharp-edged fins on the condensor and the heat exchanger can cut.
- Wear protective equipment (protective gloves and goggles) during maintenance and repair work.
- Do not perform maintenance work unless the heating and air conditioning systems are switched off.
- Bear in mind the pertinent regulations relevant to accident prevention, other generally acknowledged regulations regarding safety and occupational medicine.

CAUTION

Burn hazard. Lines and hoses containing refrigerants and cooling fluids are under pressure and can be hot.

☞ *Avoid touching parts containing refrigerants.*

☞ *Switch off the air conditioning during checks and when performing maintenance work.*

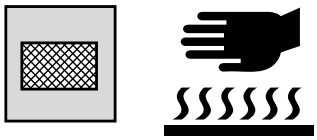
WARNING

Explosion hazard. Gases within the closed air conditioning system can explode during soldering and welding work.

☞ *Have repair work performed by an authorized service center with trained technicians only.*

Daily functional and visual checks of the air conditioning

The driver must perform visual checks once a day



WARNING

Burn hazard. The engine and radiator become very hot during operation and must be allowed to cool before maintenance work is performed.

☞ *Do not perform any maintenance work for at least 15 minutes after stopping the engine.*

☞ *Never open the coolant tank or drain coolant if the engine is hot.*

☞ *Wear protective glasses, gloves and clothing.*

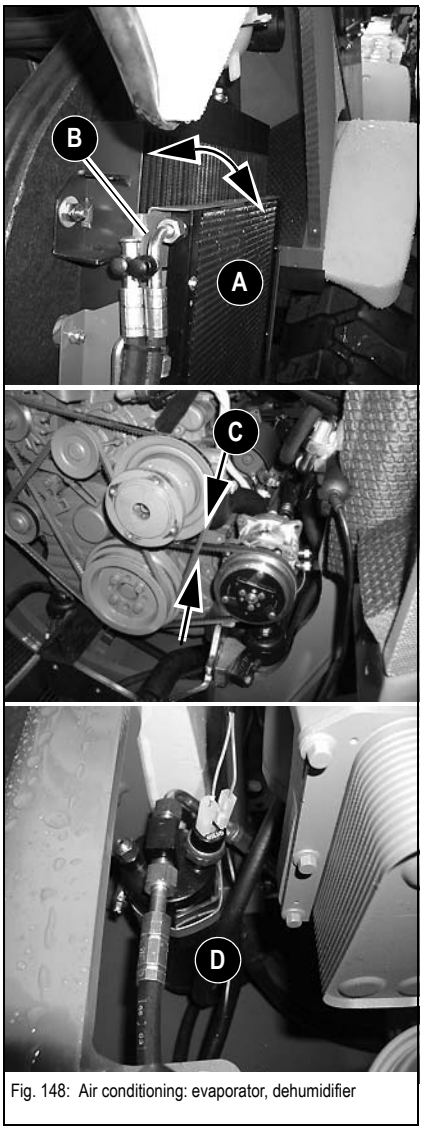


Fig. 148: Air conditioning: evaporator, dehumidifier

☞ *Switch off the engine.*

☞ *Apply the parking brake.*

☞ *Switch off the engine and remove the starter key.*

☞ *Check for damage of the refrigerating and heating lines.*

☞ *Check the hoses for tightness, leaks and chafing.*

☞ *Check the electric connections for correct condition and tightness.*

☞ *Clean the dirty condenser **A.***

- Remove fastening screws **B.**
- Fold away condenser **A.**

☞ *Clean the condenser with compressed air or with a water jet (do not use high-pressure cleaners).*

NOTICE

Do not damage the fins as you clean the condenser!

☞ *Mount condenser **A** once cleaning is over*

☞ *Check V-belt tension **C** and if necessary, retighten the V-belt*

➥ Press with your thumb to check whether the V-belt can be deflected between the pulleys by no more than **about 10** mm (0.4 in) (arrow).

➥ Have the V-belt replaced or retightened by an authorized workshop only.

NOTICE

The air conditioning system **must** be checked and serviced **twice a year** by trained staff in an authorized workshop!

☞ *Replace dehumidifier **D** every 2 years!*

5.15 Electric system

Specific safety instructions regarding the electric system

WARNING

Explosion hazard. Batteries can explode or cause chemical burns. A battery contains sulfuric acid and emits explosive gases when heavily discharged.

☞ *Do not smoke or use an open flame near the battery.*

☞ *Do not handle the battery recklessly, causing acid to leak or spill.*

☞ *Do not add circuits or electrical accessories that exceed the system capacity.*

☞ *Do not connect a circuit without a correctly-rated fuse or circuit breaker.*

NOTICE

Possible equipment damage from improper battery connections.

☞ *When connecting the battery leads, make sure the poles +/– are not inverted, otherwise sensitive electric components will be damaged.*

☞ *Use only 12V power sources. Higher voltages will damage the electric components.*

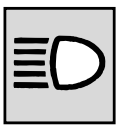
☞ *Do not interrupt voltage-carrying circuits at the battery terminals because of the danger of sparking.*

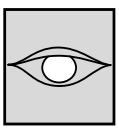
☞ *To prevent short circuits, never place tools or other conductive articles on the battery.*

☞ *Disconnect the negative (–) battery terminal from the battery before starting repair work on the electric system.*

☞ *Dispose of used batteries properly.*

Service and maintenance work at regular intervals





Before driving the machine

☞ *Check every time before driving the machine:*

- Is the light system OK?
- Is the signalling and warning system OK?

Every week

☞ *Check once a week:*

- Electric fuses
  - see chapter 6 "Fuse box" on page 6-5
- Cable and earth connections.
- Charge condition of battery - *see Checking the battery* on page 5-28.
- Condition of battery terminals.

Cables, bulbs and fuses

Always observe the following instructions:

- Defective components of the electric system must always be replaced by an authorized expert. Bulbs and fuses may be changed by unqualified persons.
- When carrying out maintenance work on the electric system, pay particular attention to ensuring good contact in leads and fuses.
- Blown fuses indicate overloading or short circuits. The electric system must therefore be checked before installing the new fuse.
- Only use fuses with the specified load capacity (amperage) - *see chapter 6 "Fuse box" on page 6-5*.

Alternator

Always observe the following instructions:

- Only test run the engine with the battery connected.
- When connecting the battery, make sure the poles (+/-) are not inverted
- Always disconnect the battery before carrying out welding work or connecting a quick battery charger.
- Replace defective charge indicators immediately.

Checking the battery

WARNING

Battery acid hazard. The battery contains highly caustic sulphuric acid. This acid must not be allowed to come into contact with the skin, the eyes, clothing, or the machine.

☞ *When recharging and/or working near the battery, always wear goggles and protective clothing with long sleeves.*

☞ *If acid is spilled, thoroughly rinse affected skin immediately with clean water and seek medical attention immediately.*

WARNING

Battery explosion hazard. Lead acid batteries can generate a potentially explosive hydrogen and oxygen mixture. Batteries can explode or rupture during jump starting, particularly if the electrolyte is low or has been frozen.

☞ *Avoid open flames and sparks in the vicinity of the battery. Do not smoke.*

☞ *Before jump starting, take the battery to the dealer for appraisal by a qualified technician.*

☞ *Replace a dead battery with a new one equivalent to the original.*

☞ *Always disconnect the negative terminal (–) from the battery before starting repair work on the electric system.*

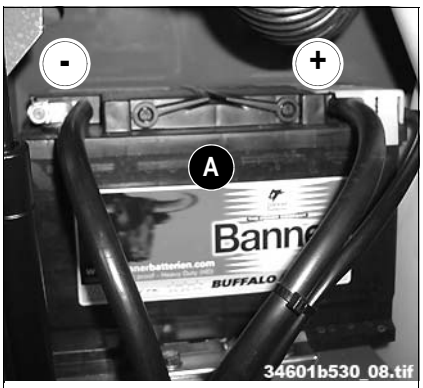


Fig. 149: Battery

Battery **A** is located in the engine compartment, on the left next to the hydraulic oil tank. The battery is low in maintenance and no fluid needs to be refilled under normal operating conditions. However have the battery checked at regular intervals.

Always follow the specific battery safety instructions!

Important

As an option, the machine can be fitted with a battery master switch - *see chapter 3 "Battery master switch (option)*" on page 3-21.

5.16 General cleaning and maintenance work

Specific safety instructions regarding cleaning

Cleaning the machine is divided into 3 separate areas:

- Inside the cab
- Exterior of the machine
- Engine compartment

The wrong choice of cleaning equipment and agents can impair the operating safety of the machine on the one hand, and on the other undermine the health of the persons in charge of cleaning the machine. Therefore always observe the following instructions.

When using washing solvents

- Ensure adequate room ventilation
- Wear suitable protective clothing
- Do not use flammable liquids, such as petrol or diesel

When using compressed air

- Work carefully
- Wear goggles and protective clothing
- Do not aim the compressed air at the skin or at other people
- Do not use compressed air for cleaning your clothing

When using a high-pressure cleaner or steam jet

- Electric components and damping material must be covered and not directly exposed to the jet
- Cover the vent filter on the hydraulic oil tank and the filler caps for fuel, hydraulic oil etc.
- Protect the following components from moisture:
  - Engine
  - Electric components such as the alternator etc.
  - Control devices and seals
  - Air intake filters etc.

When using volatile and flammable anticorrosion agents and sprays

- Ensure adequate room ventilation
- Do not use unprotected lights or naked flames
- Do not smoke!

Cleaning inside the cab

NOTICE

Possibility of equipment damage. Water under high pressure can penetrate into the electric system, cause short circuits, damage seals, and disable the controls.

☞ *Do not use high-pressure cleaners, steam jets or high-pressure water to clean inside the cab.*

We recommend using the following aids to clean the cab:

- Broom
- Vacuum cleaner
- Damp cloth
- Bristle brush
- Water with mild soap solution

Cleaning the seat belt

- Clean the seat belt (which remains fitted in the machine) only with a mild soap solution; do not use chemical agents as they may destroy the fabric!

CAUTION

Personal injury hazard. Dirt and water accumulating on the seat belt and in the winding mechanism may eventually deteriorate these components and impair winding.

☞ *Keep the seat belt and winding mechanism clean.*

☞ *Only wind the seat belt when it is dry.*

Cleaning the exterior of the machine

The following articles are generally suitable:

- High-pressure cleaner
- Steam jet

Cleaning the engine compartment

CAUTION

Cutting, crushing, or burn hazards.

☞ *Stop the engine before cleaning.*

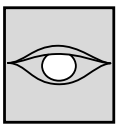
NOTICE

Possibility of sensor damage. Water or steam jet cleaners can penetrate sensitive electronic components, leading to sensor failure and possible engine damage.

☞ *Allow the machine to cool completely before cleaning the engine with a water or steam jet.*

☞ *Do not point the jet directly at electric sensors such as the oil pressure switch.*

Checking screw connections



All screw connections must be checked regularly, even if they are not listed in the maintenance plans.

Tighten loose connections immediately. Refer to chapter “Specifications” for the tightening torques.

Checking pivots and hinges

All mechanical pivot points on the machine (e.g. door hinges, joints) and fittings (e.g. door arresters) must be lubricated regularly, even if they are not listed in the lubrication plan.

5.17 Maintenance of attachments and of the work equipment

Important

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments.
Observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments

5.18 Maintenance work “Aggressive Media” (option)

Your machine is specially protected against corrosion for work in aggressive media (e.g. a saline environment).

However, this anticorrosion protection is affected by external factors e.g. dirt, cleaning etc. This is why it only has ongoing effect if checked at regular intervals and renewed or reapplied as required.

If no anticorrosion protection is applied to your machine, for instance for work in a saline environment, we recommend retrofitting your machine with the “Aggressive Media” option by your sales partner.

Anticorrosion protection applied in the factory

The following anticorrosive wax has been used in the factory:

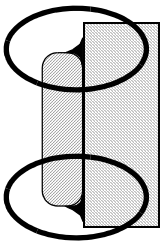
Designation: ANTICORIT BW 366 or U.S. Protect T

Manufacturer: FUCHS MINERALOELWERKE GmbH/Mannheim (Germany)

Complies with specification: TI 8030-015/K 19

MIL-C-16 173 C - grade 4

Components coated with anticorrosive wax

Component	Remarks
All electric plug-and-socket, earthing and crimp connections	**Before applying the wax:** • Apply contact spray to contact surfaces and connect the plug and socket connections again • Apply a particularly thick anticorrosion layer to the connecting parts of the fuel level transmitter
All parts of the machine, e.g. Axles, gearbox, trim panels, servicing lids, loader unit, quickhitch	**Except:** • Piston rods (chromium layer) • Cab, cab bearings • Engine cover, engine mounting • Air filter • Counterweight • Fastening surfaces for mounting parts on frame • Radiator and insulating mats • Mudguards, rubber and plastic parts • Light elements
Flange surfaces 	**E.g. axles, engine and cab bearing:** • Seal gaps with anticorrosion wax after assembly

Measures for maintaining anticorrosive protection

Safety instructions

- When handling chemical substances of any kind, such as solvents, wax etc., observe the specific product-related safety regulations (safety data sheet)!
- When using volatile and easily flammable anticorrosive agents and solvents:
- Ensure adequate room ventilation!
- Do not use unprotected lights or naked flames!
- Do not smoke!
- Corrosion on electric connections or components can lead to dangerous operating malfunctions. Therefore check the electric functions of the machine with special care. Immediately take the machine out of service if you detect any defects and have defects rectified immediately.
- Perform work on the electric system only with the battery disconnected and the engine switched off!

Cleaning

- If the machine is used in corrosive environment over a longer period of time, we recommend removing the floor mat in the cab to avoid collecting corrosive humidity.
- Thoroughly clean machines that are taken out of service over a longer period of time.
- Clean the machine at least once a week. In particular, remove corrosive deposits (such as salt crusts) as fast as possible.
- Clean the machine with cold running water preferably.

NOTICE

Possibility of anticorrosive protection breakdown. Wax coating can be damaged by aggressive cleaning procedures.

☞ *If cleaning the machine with a bristle brush, a steam jet, or a high-pressure cleaner, check the wax coating very carefully and have it renewed or reapplied as required.*

☞ *If you replace components, check whether they are classified as in Components coated with anticorrosive wax on page 5-32 and whether they are subject to special treatment before assembly.*

Applying the protective anticorrosion coating

Bear in mind the following instructions as you apply the anticorrosive wax:

NOTICE

Carefully cover all fastening surfaces and **elements to which the anticorrosive protection may not be applied** - *see Components coated with anticorrosive wax* on page 5-32

- **ANTICORIT BW 366** or **U.S. Protect T** can be applied with a brush, by means of immersion or with all commercially available spray guns.
- **ANTICORIT BW 366** or **U.S. Protect T** protective coating can be removed with fuel, **RENOCLEAN E/K , FUCHS MULTICLEAN** or **Gunk® Purple Degreaser** as required.
- **ANTICORIT BW 366** or **U.S. Protect T** spots are difficult to remove on clothing.
- Affix a “Wet paint!” or a similar sign to newly coated machines.

Treatment of oxidized surfaces

If in spite of all precautionary measures some components should be affected by corrosion (oxidized), proceed as follows depending on the affected component:

Electric connections

☞ *Remove the remaining protective wax in the oxidised area with fuel,* **RENOCLEAN E/K , FUCHS MULTICLEAN** *or* **Gunk® Purple Degreaser**

☞ *Treat all affected parts with an oxide solvent, such as* **KONTAKT 60** *or* **Gunk® Electronic Cleaner**

☞ *Rinse the area with e.g.* **KONTAKT WL** *or* **CRC HF Contact Cleaner**

☞ *Treat the contact surfaces of the connection with e.g.* **KONTAKTSPRAY WD 40** *or* **Liquid Wrench® Super Lubricant**

☞ *Establish the connection*

☞ *Apply/spray anticorrosion wax onto the electric connection from all sides*

Sheet-metal parts

☞ *Remove the remaining protective wax in the oxidised area with fuel,* **RENOCLEAN E/K , FUCHS MULTICLEAN** or **Gunk® Purple Degreaser**.

☞ *Remove all remaining corrosion and paint coating from the affected area down to the bare material, otherwise the paint coating will not adhere properly!*

☞ *Clean the affected part with a cleaning solvent*

☞ *Apply a 2-component prime coating to the affected area and then a 2-component paint coating*

☞ *Preserve the area with anticorrosion wax*

5.19 Fluids and lubricants

Component/ application	Engine/ machine fluid	SAE grade Specification	Season/ temperature	Capacities[1]
Diesel engine	Engine oil with oil filter[2]	SAE 10W; EO10[3]	Below -5 °C (23 °F)	About 10.5 l (2.77 gal)
		SAE 20W20; EO20[3]	-10 to +10 °C (14 to +50 °F)	
		SAE 30; EO30[3]	5 to 30 °C (169 to 1014 °F)	
		HD-C 10W-40; EO1040B[3]	Year-round	
		HD-C 15W-40; EO1540B[3]		
Gearbox	Gearbox oil[4]	85 W 90 API GL5 or SAE 90 LS (hypoid gear oil)	Year-round	0.8 l (0.21 gal)
Front and rear axle differentials				4.0 l (1.05 gal)
Planetary drives - left and right, front and rear axles				0.9 l (0.23 gal) each
Hydraulic oil tank	Engine oil[2]	SAE 5 W/30	Up to -25°C (-13 °F)	About 50 l (13.21 gal)
		SAE 5 W/40; EO 0540B[3]		
		SAE 10 W/40; EO 0540B[3]	Up to -15 °C (5 °F)	
		SAE 15 W/40; EO 1540B[3]	Up to -10 °C (14 °F)	
	Hydraulic oil[5]	HVLPD 46 (HYD0530[3]) 200 Hydraulic	Year-round	
	Biodegradable oil	AVILUB Syntofluid 46		
		PANOLIN HLP Synth 46 404 Biodegradeable Hydraulic 32/46		
Grease nipples, loader unit/ axles	Multipurpose grease	Lithium-saponified brand-name grease MPG-A[3]	Year-round	As required
Battery terminals	Acid-proof grease	SP-B[3] Mobilux EP2	Year-round	As required
Aggressive media (option)	Anticorrosion protection	Anticorit BW 366[6]	Year-round	As required
Mounting of pins, shafts	Special grease	Optimoly paste “TA” White-Paste	Year-round	As required
Fuel tank	Diesel fuel[7]	Grade no. 2-D	Over 4 °C (135,2 °F)	About 60 l (15.85 gal)
		Grade no. 1-D	Below 4 °C (135,2 °F)	
Brake system	Brake fluid[8]	Agip LHM Super/Shell LHM	Year-round	–
Engine cooling	Antifreeze[9,10,11]	MS Frostschutz HAVOLINE XLC	Year-round -31 °C (-23.8 °F)	Water (45 %) 5.2 l (1.37 gal) Antifreeze (55 %) 4.3 l (1.13 gal)
Washer system	Cleaning agent[10]	Water + antifreeze	Year-round -20 °C (-4 °F)	Water (67 %) 1.3 l (0.34 gal) Antifreeze (33 %) 0.7 l (0.18 gal)

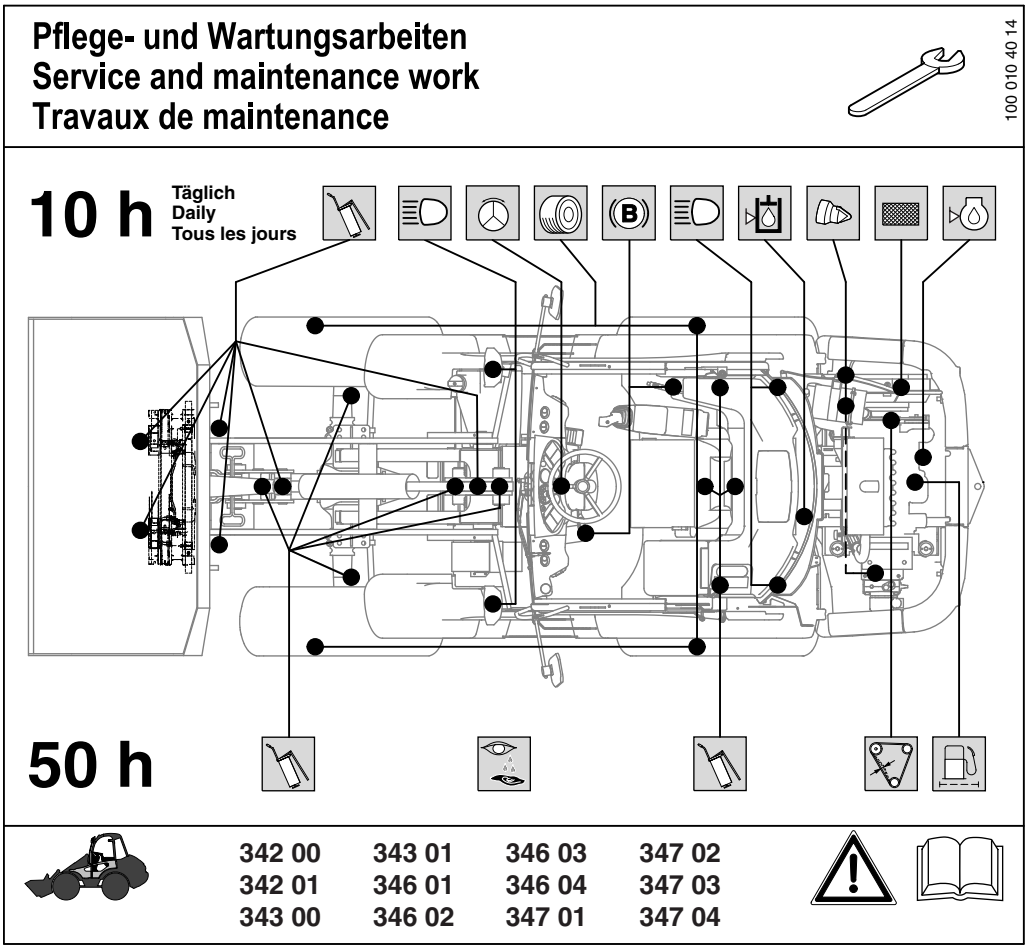
1. The capacities indicated are approximative values; the oil level check alone is relevant for the correct oil level
2. MIL-L-2104C; API CD/CE/CH4; CCMC-D4
3. Abbreviation for lubricants (Hauptverband der Deutschen Bauindustrie e. V. - German construction engineering association)
4. MIL-L-2105B; API-GL5
5. DIN 51 524
6. TI 8030-015/K 19/MIL-C-16 173 C-Grade 4
7. DIN EN 590 (EU) / ASTM D975-94 (USA)
8. Standard: B 71 2710
9. SeeCoolant compound table on page 6-8
10. See manufacturer's indications on the packaging and bear in mind the antifreeze compound table
11. Replace the coolant every 2 years!

5.20 Explanation of symbols on the maintenance label

Symbol	Explanation
	Attention!
	Before starting maintenance work, read the “Maintenance” chapter in the Operator's Manual!
	Perform a functional check of the light system!
	Check tires for damage, pressure and tread depth!
	Perform a functional check and synchronize the steering system!
	Perform a functional check of the brake system!
	Check hydraulic oil level. Fill up if necessary!
	Check engine oil level. Fill up if necessary!
	Compress the dust valve.
	Check radiator for engine coolant and hydraulic oil for contamination. Clean if necessary!
	Check condition and initial tension of V-belt. Retighten or replace if necessary!
	Leakage check: Check for tightness, leaks and chafing: pipes, flexible lines and screw connections. Rectify if necessary!
	Leakage check: Check the fuel/water separator. Drain water if necessary!
	Lubrication service: Lubricate the assemblies concerned!

5.21 Maintenance label

Location: inside the cab on the rear window



5.22 Maintenance plan

Work description

For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.

	Maintenance plan/service hours (s/h)					
	Delivery inspection	Maintenance work (once a day)	"A" every 50 s/h once a week	1st Inspection[1] at 100 s/h	"B" every 500 s/h[2] 2nd Inspection	"C" every 1500 s/h once a year
Oil and filter changes ( ):						
Perform the following oil and filter changes (check oil levels after test run):						
• Engine oil				●	●	●
• Engine oil filter				●	●	●
• Fuel filter, fuel prefilter				●	●	●
• Air filter insert [3,4] replace safety cartridge every 3rd time the air filter insert is replaced					●	●
• Gearbox oil in front and rear axle differentials and in rear axle gearbox				●		●
• Gearbox oil in front and rear axle planetary drives (left and right)				●		●
• Hydraulic oil[5]						●
• Microfilter (line filter in drive)				●		●
• Hydraulic oil filter insert				●		●
• Hydraulic oil tank breather filter [4]						●
• Heating: fine-dust filter[6]					●	●
Inspection work ( ):						
Check the following material. Refill if necessary:						
• Engine oil	●	●	●			
• Hydraulic oil	●	●	●	●	●	●
• Engine coolant [7](also check antifreeze in autumn/winter and at temperatures below 4 °C!)	●			●	●	●
• Gearbox oil in front and rear axle differentials and in rear axle gearbox	●			●	●	●
• Gearbox oil in front and rear axle planetary steering joint drives (left and right)	●			●	●	●
• Brake fluid[8]	●	●	●	●	●	●
• Check radiator for engine and hydraulic oil for contamination. Clean if necessary[9]		●	●	●	●	●
• When using biodegradable oil: drain the condensation water in the hydraulic oil tank [5]					●	●
• Clean dust valve on air filter housing [3]	●	●	●	●	●	●
• V-belt: check condition and pre-tension. Retighten or replace if necessary[10]	●	●	●	●	●	●
• Check the fuel/water separator. Drain water if necessary			●	●	●	●
• Clean filter insert on fuel pump, replace if necessary			●	●	●	●
• Check valve tip clearance (engine timing). Set if necessary				●		

5.22 Maintenance plan

Work description

For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.

	Maintenance plan/service hours (s/h)					
	Delivery inspection	Maintenance work (once a day)	"A" every 50 s/h once a week	1st Inspection[1] at 100 s/h	"B" every 500 s/h[2] 2nd Inspection	"C" every 1500 s/h once a year
Other inspection work ( ):						
• Battery: check charge condition					●	●
• Heating: clean the fine-dust filter			●			
• Check and set service and parking brake pads. Replace if necessary				●	●	●
• Tire check (damage, air pressure, tread depth)	●	●	●	●	●	●
• Aggressive media (option): check anticorrosion protection, renew if necessary[11]		●		●	●	●
Check screws and nuts or screw connections for tightness on the following assemblies/components. Retighten if necessary						
• Engine and engine bearing				●	●	●
• Steering system				●	●	●
• Hydraulic system				●	●	●
• Loader unit (pin locking)				●	●	●
• Axle mounting, axle suspension				●	●	●
• Counterweight (attachment)				●	●	●
• Fastening screws of cardan shafts				●	●	●
• Fastening screws of cab				●	●	●
• Wheel nuts	●			●	●	●
Electric system: check electric and earth connections, chafing on wiring harness, battery terminals	●			●	●	●
Lubrication service ( ):[12]						
Lubricate the following assemblies/components:						
• Hinges, joints and fittings (e.g. door arrester)		●	●	●	●	●
• Rear axle oscillating bearing	●		●	●	●	●
• Front and rear axle planetary drive steering joint bearings	●		●	●	●	●
• Loader unit - *see Lubricating the pivots on the loader unit* on page 5-17						
• Lift frame bearing	●	●	●	●	●	●
• Tilt rod bearing	●	●	●	●	●	●
• Tilt lever bearing	●	●	●	●	●	●
• Lift ram bearing	●		●	●	●	●
• Tilt ram bearing	●		●	●	●	●
• Quickhitch: bearing on lift frame	●	●	●	●	●	●

5.22 Maintenance plan

Work description

For service and maintenance work on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.

	Maintenance plan/service hours (s/h)					
	Delivery inspection	Maintenance work (once a day)	"A" every 50 s/h once a week	1st Inspection[1] at 100 s/h	"B" every 500 s/h[2] 2nd Inspection	"C" every 1500 s/h once a year
Functional check ( ):						
Check the function of the following assemblies/components. Rectify if necessary:						
• Service and parking brake	●	●	●	●	●	●
• Steering system	●	●	●	●	●	●
• Lights and electric system	●	●	●	●	●	●
• Air conditioning (option)	●	●	●	●	●	●
Leakage check ( ):						
Check for tightness, leaks and chafing: pipes, flexible lines and screw connections of the following assemblies and components. Rectify if necessary:						
• Air intake line (air filter - engine)	●	●	●	●	●	●
• Engine lubrication (engine - filter)	●	●	●	●	●	●
• Fuel lines[13]	●	●	●	●	●	●
• Cooling system (engine - hydraulic oil)	●	●	●	●	●	●
• Steering system (flexible lines and rams)	●	●	●	●	●	●
• Hydraulic system/loader unit (flexible lines[14] and rams)	●	●	●	●	●	●
• Brake system (flexible lines and cylinders)	●	●	●	●	●	●
• Air conditioning flexible lines (option)	●	●	●	●	●	●

1. Work to be carried out once after the first 100 s/h. This work must be carried out by an authorized workshop for warranty claims to be acknowledged.
2. Work after the first 500 s/h (2nd Inspection) must be carried out by an authorized workshop for warranty claims to be acknowledged
3. Replace filter insert as indicated by the indicator on the air filter housing, however at least every 12 months or 1500 s/h.
4. When working in an acidic environment, replace the filter every 300 s/h!
5. When using biodegradable oil: drain the condensation water in the hydraulic oil tank every 500 s/h, in any case before the cold season.
6. Depending on operation and dust conditions, it may be necessary to replace the fine-dust filter more frequently
7. Replace the engine coolant every other year!
8. Replace every 2 years
9. Depending on operation and dust conditions, it may be necessary to clean the radiator more frequently
10. Replace the toothed belt every 3000 s/h or after 5 years at the latest (toothed belt must be replaced by authorized staff)
11. See maintenance instructions for aggressive media, order no. 1000108296
12. Lubricate attachment according to manufacturer's instructions!
13. Replace flexible fuel leak oil lines every 2 years
14. Replace flexible lines every 6 years (UVV, DIN 20066 part 5)

6 Specifications

6.1 Models and trade names: overview

Wheel loader model	Trade name
346-03	WL 750
346-04	WL 850

6.2 Frame

Sturdy steel sheet frame, rubber-mounted engine

6.3 Engine

Engine	Wheel loader models WL 750 / WL 850
Product	Deutz diesel engine
Type	D 2011 L04 W
Design	In line
No. of cylinders	4
Displacement	3620 cm³ (221.2 in³)
Bore and stroke	96 x 125 mm (3.78 x 4.92 in)
Compression ratio	1:19
Output (as per ISO 14396)	45 kW (61 hp) at 2300 rpm
Max. torque	210 Nm (155 ft.lbs.) at 1700 rpm
Minimum idling speed	900 rpm
Specific minimum fuel consumption	220 g/kWh (7.74 oz/kWh)
Fuel injection system	Direct fuel injection
Firing order	1-3-4-2
Starting aid	Glow plug
Max. inclined position (engine no longer supplied with oil):	30° in all directions **Observe the tilting limit of the machine!** **(20° laterally)**
Oil pressure	3.0 - 4.5 bar (43 - 64 psi) at 2300 rpm
Exhaust emissions according to EC standard	2004/26 EC

6.4 Power train

Variable displacement pump

Variable displacement pump	Wheel loader models WL 750 / WL 850
Design	Automotive, infinitely variable hydrostatic axial-piston gearbox
Displacement **20 kph (12.4 mph)**	0 - 45 cm³/rev (0 - 2.75 in³/rev)
Displacement **30 kph (18.6 mph) option**	0 - 56 cm³/rev (0 - 3.42 in³/rev)
Max. operating pressure	340 bar (4859 PSI)
Starting revs	1250 - 1300 rpm at 50 bar (715 PSI) HP
Droop	$2150^{\pm 50}$ rpm at 250 bar (3573 PSI) HP

Boost pump

Boost pump	Wheel loader models WL 750 / WL 850
Design	Internal gear pump
Displacement	11.6 cm³/rev (0,71 in³/rev)
Charging/boost pressure	30 bar (429PSI) at 1500 rpm
Control	Speed-sensitive, hydraulic displacement adjustment with pressure cutoff
Driving direction	Electrohydraulic control
Inching	Inching valve

Variable displacement motor

Variable displacement motor	Wheel loader models WL 750 / WL 850
Design	Axial piston motor (swash plate design)
Capacity	20.6 to 80.7 cm³/rev (1.26 to 4.92 in³/rev)
Drive speed	1st speed range: 0 - 6 kph (0 - 3.7 mph), forwards and reverse 2nd speed range: 0 - 20 kph (0 - 12.4 mph), forwards and reverse
Pushing power	34.5 kN (25,427 ft.lbs.)

6.5 Axles

Front axle	Wheel loader models WL 750 / WL 850
Design	Planetary steering and drive axle, rigid screw connection with frame
Differential lock	Self-locking differential 45 %
King-pin inclination	0°
Camber	0°
Steering angle	40°
Toe-in	0 mm (0 in)
Track width	1400 mm (55.12 in)
Rear axle	**Wheel loader models WL 750 / WL 850**
Design	Oscillating planetary steering and drive axle
Differential lock	Self-locking differential 45 %
King-pin inclination	0°
Camber	0°
Total oscillation angle[1]	+/- 11°
Steering angle	40°
Toe-in	0 mm (0 in)
Track width	1400 mm (55.12 in)

1. Model 346-01 with tires 12.5-18
   Model 346-02 with tires 12.5-20

6.6 Brakes

Service brake

Service brake	Wheel loader models WL 750 / WL 850
Design	Foot-operated hydraulic disc brake
Location	Front axle input
Effect	On both axles via cardan shaft
Brake fluid	*- see chapter 5 "Fluids and lubricants*" on page 5-35

Parking brake

Parking brake	Wheel loader models WL 750 / WL 850
Design	Manual mechanical disc brake
Location	Front axle input

6.7 Steering system

Steering system	Wheel loader model WL 750	Wheel loader model WL 850
Design	Hydrostatic 4 wheel steering with emergency steering features	
Steering mode	4 wheel steering	
Assemblies	Hydraulic pump, steering unit with priority valve, steering rams with automatic synchronisation in left and right final positions	
Max. pressure of hydraulic lines	175 - 180 bar (2500 - 2572 PSI)	
Hydraulic pump (gear pump)	Displacement 22.5 cm³/rev (1.37 in³/rev)	Displacement 32 cm³/rev (1.96 in³/rev)
Maximum steering angle	±40°	

6.8 Work hydraulics

Hydraulic pump, control valve, lift and tilt rams

Description	Wheel loader model WL 750	Wheel loader model WL 850
Hydraulic pump	Gear pump	
Displacement	22.5 cm³/rev (1.37 in³/rev)	32 cm³/rev (1.96 in³/rev)
	50 l/min (13.21 gal/min) at 2300 rpm	71 l/min (18.76 gal/min) at 2300 rpm
Control valve	3 sections (control circuits)	
Control lever (joystick)	Four-way lever - control of lift and tilt rams with mechanical lock against unintentional actuation, with electric control for driving direction and neutral position	
3rd control circuit control lever	Operation - quickhitch or hydraulic attachments with mechanical fuse against unintentional actuation	
Max. service pressure	210 bar (3000 PSI)	
Secondary protection tilt ram	Rod side 240 bar (3430 PSI) Base side 120 bar (1715 PSI)	
Secondary protection lift ram	Base side 300 bar (4287 PSI)	
Filter	Suction reflux filter	

6.9 Electric system

Electric units

Electric system	
Alternator	14 V/95 A
Starter	12 V/2.3 kW
Battery	12 V/88 Ah

Fuse box

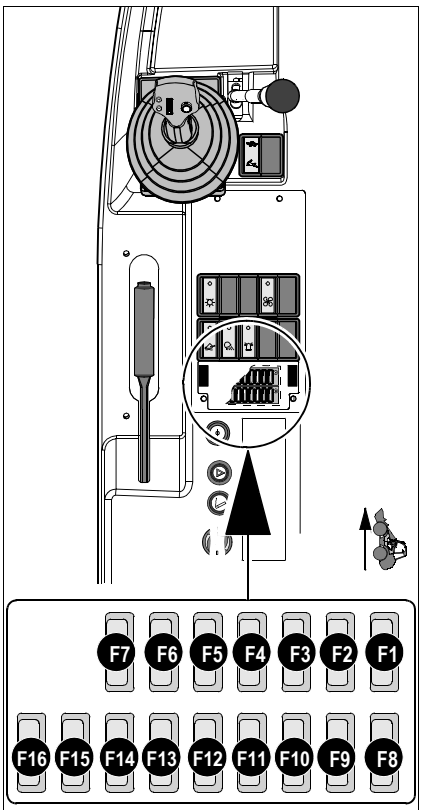


Fig. 150: Fuse box

No.	Rated current	Protected circuit
F1	7.5	High beam (left)
F2	7.5	High beam (right)
F3	5	Left side marker and rear lights, front socket
F4	5	**Switch assignment**: front/rear working lights, front attachments (option), rotating beacon (option) **Switch lights**: lights, heating S5, load stabilizer S8, 3rd control circuit Right side marker and rear lights, front socket (option)
F5	7.5	High current relay - preheating and starting, high current relay, interior light, relays - minus compensation, preheating indicator, hazard warning light
F6	25	Cigarette lighter, rotating beacon (option), front/rear working light
F7	25	All lights
F8	7.5	Low beam (left)
F9	7.5	Low beam (right)
F10	5	Switching relay - front attachment (option), instrument panel, cut-off solenoid, sensor (coolant level indication)
F11	15	Washer pump, rear wiper, relays - wiper, front wiper, horn
F12	7.5	Solenoid valve 1st/2nd speed range, load stabilizer
F13	7.5	Relays - forwards/reverse, solenoid valve - forwards/reverse, backup warning system
F14	20	Front attachment (option), heating fan
F15	7.5	Relay - turn indicators, brake lights, solenoid valve (exhaust gas recirculation)
F16	5	Radio (option)

Main fuse box with relays

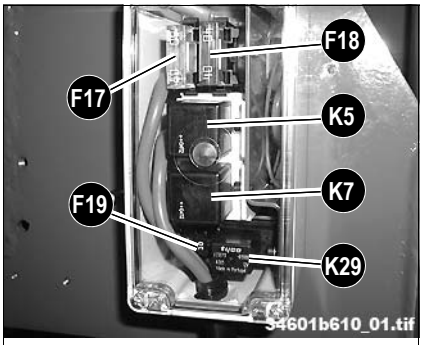


Fig. 151: Main fuse box

The main fuse box with the power relays and the preheating time control unit is located in the engine compartment on the left underneath the battery

.

Fuse no.	Rated current (A)	Protected circuit
F17	80 A	Main fuse (machine)
F18	40 A	Preheating (air-intake preheating)
F19	10 A	Minus compensation

Relay no.	Protected circuit
K5	Preheating: power relay
K7	Start: starter relay
K29	Minus compensation

Switching relays

The switching relays are located underneath the switch panel on the right in the side console.

(accessed via the maintenance flap on the right on the outside of the cab)

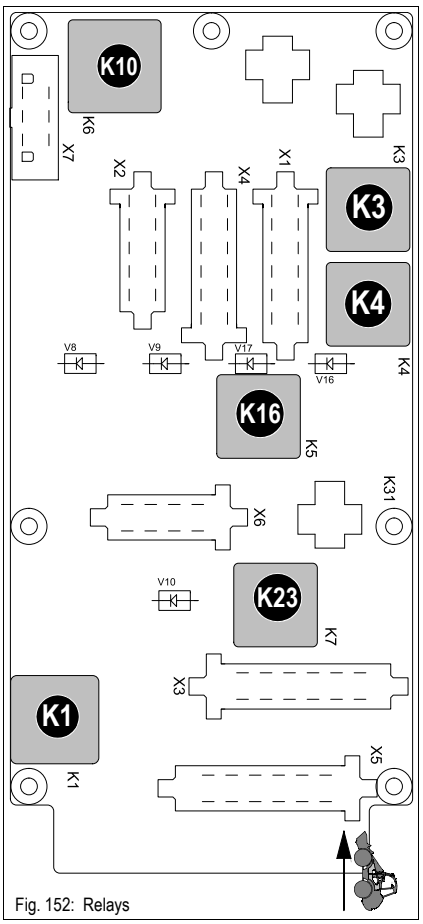


Fig. 152: Relays

Switching relay no.	Protected circuit
K1	High current relay
K3	Reverse driving switching relay
K4	Forwards driving switching relay
K10	Switching relay - turn indicators
K16	Switching relay - front socket (option)
K23	Wiper switching relay

6.10 Tires

Tires for wheel loader model WL 750

Tire size	Tire pressure[1]		Wheel rims	
	Front	Rear	Wheel rim	Wheel offset
12.5-18 MPT 04 10 PR 128B	2.3 (33 PSI)	2.0 (29 PSI)	11 x 18	0 mm (0 in)
340/80 R18 XMCL	2.5 (36 PSI)	2.0 (29 PSI)		
335/80 R18 XZLS 151 A2				
365/70 R18 SPT9 132B				
365/70 R18 EM01 132B				
375/70 R 20 MPT AC70G			11 x 20	

1. Increase front tire pressure by 0.5 bar (7.15 PSI) during pallet forks operation!

Tires for wheel loader model WL 850

Tire size	Tire pressure[1]		Wheel rims	
	Front	Rear	Wheel rim	Wheel offset
12.5-20 MPT 04 10 PR	2.5 (36 PSI)	2.0 (29 PSI)	11 x 20	0 mm (0 in)
335/80 R20 SPT9 136B				
375/70 R20 MPT AC70G 132B				
335/80 R20 MPT81				
365/70 R18 EM SPT9 132B			11 x 18	
365/70 R18 EM-01 135 B				
405/70 R18 EM01 141B	3.0 (43 PSI)	2.5 (36 PSI)	13 x 18	
405/70 R18 EM SPT9				

1. Increase front tire pressure by 0.5 bar (7 PSI) during pallet forks operation!

6.11 Weights

Weight	Wheel loader model WL 750	Wheel loader model WL 850
Kerb weight[1]	4200 kg (9260 lb)	4500 kg (9920 lb)
Gross weight rating	5500 kg (12125 lb)	6000 kg (13228 lb)
Front axle weight rating	3600 kg (7937 lb)	4000 kg (8819 lb)
Rear axle weight rating		
Max. authorized load for towing facility	None	

1. With standard bucket, driver and full fuel tank

6.12 Noise levels

Sound power level, wheel loader models WL 750/WL 850	dB(A)
Measured value	99.8
Guaranteed value	101
Noise level in the cab	78

Important

Measurement of sound power level according to EC Directive 2000/14 EC.
Noise level at the driver's ear measured according to EC Directives 84/532/EEC,
89/514/EEC and 95/27/EEC. Measurements carried out on asphalted surface.

6.13 Vibration

Vibration	
Effective acceleration value for the upper extremities of the body	< 2.5 $\frac{m}{s^2}$ (< 8.2 feet/s²)
Effective acceleration value for the body	< 0.5 $\frac{m}{s^2}$ (< 1.64 feet/s²)

6.14 Coolant compound table

Outside temperature	Water[1]	Antifreeze[2]
Up to °C (°F)	% by volume	% by volume
4°C (39°F)	99	–
-10°C (14°F)	79	20
-20°C (-4°F)	65	34
-25°C (-13°F)	59	40
-30°C (-22°F)	55	45
- 42°C (-43°F)	**50**	**50**

1. Water quality at 20 °C (-4°F)= 6.5 - 8.5 ph/overall hardness 3 - 20 °dGH
2. SeeFluids and lubricants on page 5-35

6.15 Tightening torques, conversion tables

General tightening torques

Screw dimensions	Tightening torques in Nm[1] (ft.lbs.)		
	8.8	10.9	12.9
M4	3 Nm (2.2 ft.lbs.)	4 Nm (2.9 ft.lbs.)	5 Nm (3.7 ft.lbs.)
M5	5.5 Nm (4.1 ft.lbs.)	8 Nm (5.9 ft.lbs.)	10 Nm (7.4 ft.lbs.)
M6	10 Nm (7.4 ft.lbs.)	14 Nm (10.3 ft.lbs.)	16 Nm (11.8 ft.lbs.)
M8	23 Nm (17 ft.lbs.)	34 Nm (25 ft.lbs.)	40 Nm (29.5 ft.lbs.)
M10	46 Nm (33.9 ft.lbs.)	67 Nm (49.4 ft.lbs.)	79 Nm (58.2 ft.lbs.)
M12	79 Nm (58.2 ft.lbs.)	115 Nm (84.8 ft.lbs.)	135 Nm (99.5 ft.lbs.)
M14	125 Nm (92.1 ft.lbs.)	185 Nm (136 ft.lbs.)	220 Nm (162 ft.lbs.)
M16	195 Nm (144 ft.lbs.)	290 Nm (214 ft.lbs.)	340 Nm (250 ft.lbs.)
M18	280 Nm (206 ft.lbs.)	400 Nm (295 ft.lbs.)	470 Nm (346 ft.lbs.)
M20	395 Nm (291 ft.lbs.)	560 Nm (413 ft.lbs.)	660 Nm (486 ft.lbs.)
M22	540 Nm (398 ft.lbs.)	760 Nm (560 ft.lbs.)	890 Nm (656 ft.lbs.)
M24	680 Nm (501 ft.lbs.)	970 Nm (715 ft.lbs.)	1150 Nm (848 ft.lbs.)
M27	1000 Nm (737 ft.lbs.)	1450 Nm (1069 ft.lbs.)	1700 Nm (1253 ft.lbs.)
M30	1350 Nm (995 ft.lbs.)	1950 Nm (1437 ft.lbs.)	2300 Nm (1695 ft.lbs.)

1. These values are valid for screws with untreated, non-lubricated surfaces

Specific tightening torques

Description	Tightening torque
Wheel nut	$390^{\pm 10}$ Nm ($287.6^{\pm 7}$ ft.lbs.)
Track-rod end (steering ram)	$280^{\pm 10}$ Nm ($206.5^{\pm 7}$ ft.lbs.)
Piston rod (steering ram/track rod)	$260^{\pm 10}$ Nm ($191.8^{\pm 7}$ ft.lbs.)

Conversion table: DIN standard - USA standard

All indications made without engagement.

Volume
1 litre = 2.1 pts (pints)
1 litre = 1.06 qts (quarts)
1 litre = 0.26 gals (gallons)
1 cm³ (cubic zentimeter) = 0.0611 cu in (cubic inches)
Lengths
1 mm (millimetre) = 0.03937 in (inches)
1 m (metre) = 3.281 feet
1 m (metre) = 1.0936 yards
1 km (kilometre) = 0.622 miles
Masses (weights)
1 kp/cm² (kilopond/cm²) = 2.2 lbs
1 kg (kilogram) = 2.205 lbs (pounds)
1 g (gram) = 0.035 oz (ounces)
Torques
1 Nm (Newton metre) = 0.737 ft/lbs (foot-pounds)
1 Nm (Newton metre) = 0.102 kp/cm² (kilopond/cm²)
1 Nm (Newton metre) = 0.102 mkg (metre/kilogram)
Pressure
1 kp/cm² (kilopond/cm²) = 14.22 psi
1 bar = 14.29 psi
Force
1 N (Newton) = 0.225 lbs (pounds)
1 PS (horse power) = 0.735 kW (kilowatt)
1 kW (kilowatt) = 1.36 PS(horse power)

6.16 Payloads

Loader unit with bucket

Bucket [1, 2]	Wheel loader model WL 750	Wheel loader model WL 850
Bucket capacity	0.75 m³ (2.46 ft³) according to ISO	0.85 m³ (2.79 ft³) according to ISO
Tipping load	3000 kg (6614 lbs.)	3200 kg (7055 lbs.)
Payload	1350 kg (2976 lbs.)	1530 kg (3373 lbs.)
Breakout force (lift ram)	31 kN (22847 ft.lbs.)	40 kN (29480 ft.lbs.)
Breakout force (tilt ram)	29 kN (21373 ft.lbs.)	35 kN (25795 ft.lbs.)
Scraping depth	50 mm (1.97 in)	60 mm (2.36 in)

1. Model WL 750 with tires 12.5-18
   Model WL 850 with tires 12.5-20
2. Model WL 750 with standard bucket 1000102344
   Model WL 850 with standard bucket 1000096388

Loader unit with pallet forks

500 mm (19.69 in) load distance	Wheel loader model WL 750	Wheel loader model WL 850
Payload, **safety factor 1.25**	1900 kg (4189 lbs.)	2000 kg (4409 lbs.)
Payload, **safety factor 1.67**	1430 kg (3153 lbs.)	1500 kg (3307 lbs.)
Transport position: movable payload at **safety factor 1.25**	2300 kg (5070 lbs.)	2350 kg (5181 lbs.)
Transport position: movable payload at **safety factor 1.67**	1700 kg (3748 lbs.)	1700 kg (3748 lbs.)
Lift height	2800 mm (110.2 in)	3000 mm (118.1 in)

Loader unit with pallet forks (foldable fork arms option)

500 mm load distance	Wheel loader model WL 750	Wheel loader model WL 850
Payload, **safety factor 1.25**	1900 kg (4189 lbs.)	2000 kg (4409 lbs.)
Payload, **safety factor 1.67**	1430 kg (3153 lbs.)	1500 kg (3307 lbs.)
Transport position: movable payload at **safety factor 1.25**	2300 kg (5070 lbs.)	2350 kg (5181 lbs.)
Transport position: movable payload at **safety factor 1.67**	1700 kg (3748 lbs.)	1700 kg (3748 lbs.)
Lift height	2800 mm (110.2 in)	3000 mm (118.1 in)

Loader unit with load hook (option)

Payload[1]	Wheel loader model WL 750	Wheel loader model WL 850
Payload with extended loader unit and quickhitch tilted in	1900 kg (4189 lbs.)	1700 kg (3748 lbs.)
Payload with extended loader unit and quickhitch	1400 kg (3086 lbs.)	1350 kg (2976 lbs.)

1. Payloads apply *with* lifting gear (chains, cables, suspension devices)

6.17 Wheel loader dimensions with bucket (model WL 750)

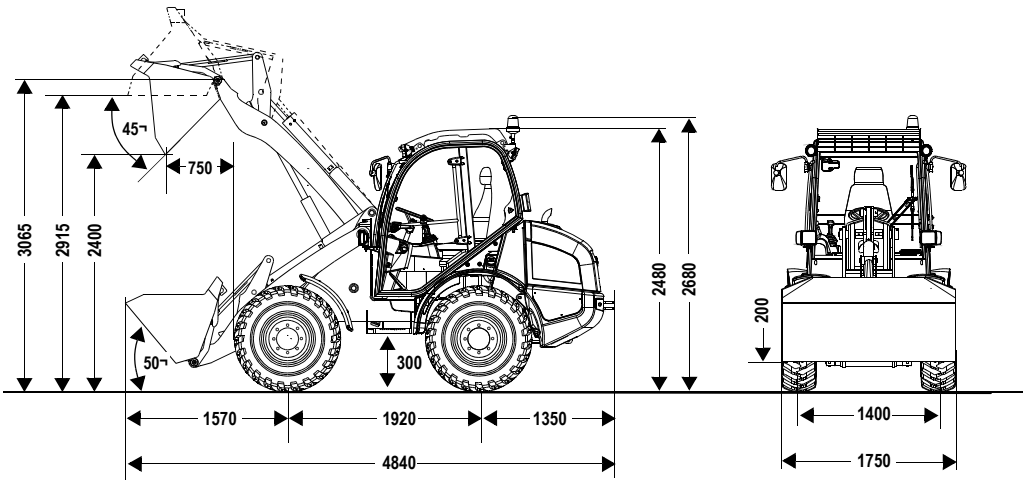


Fig. 153: Machine dimensions model WL 750

Dimensions	
Overall length[1]	4840 mm (190.55 in)
Overall height [2]	2480 mm (97.64 in)
Overall height with rotating beacon [2]	2680 mm (105.51 in)
Overall width without bucket[3]	1720 mm (67.72 in)
Overall width[1]	1750 mm (68.90 in)
Ground clearance in transport position of loader unit	200 mm (7.87 in)
Ground clearance [2] below rear axle gearbox	300 mm (11.81 in)
Pin height	3065 mm (120.67 in)
Load-over height	2915 mm (114.76 in)
Dump height	2400 mm (94.49 in)
Dump reach	750 mm (29.52 in)
Dump-in angle	50 °
Dump-out angle	45 °
Track width, front/rear	1400 mm (55.11 in)
Wheelbase (front/rear axles)	1920 mm (75.59 in)
Turning radius[4]	2550 mm (100.39 in)

1. With standard bucket order no. 1000102344
2. With tires 12.5-18
3. With outside mirrors folded in
4. Measured at outer edge of wheel

6.18 Wheel loader dimensions with bucket (model WL 850)

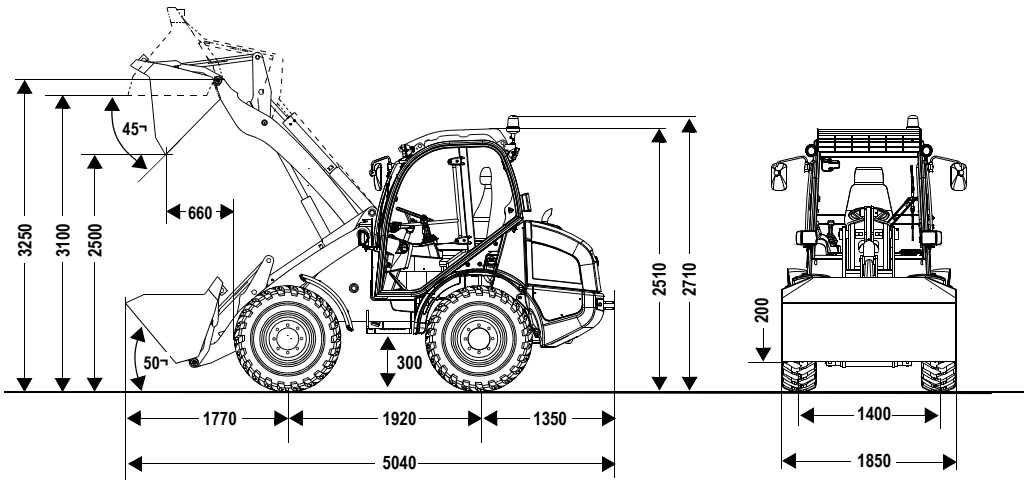


Fig. 154: Machine dimensions model WL 850

Dimensions	
Overall length[1]	5040 mm (198.42 in)
Overall height [2]	2510 mm (98.82 in)
Overall height with rotating beacon [2]	2710 mm (106.69 in)
Overall width without bucket[3]	1720 mm (67.72 in)
Overall width[1]	1850 mm (72.83 in)
Ground clearance in transport position of loader unit	200 mm (7.87 in)
Ground clearance [2] below rear axle gearbox	300 mm (11.81 in)
Pin height	3250 mm (127.95 in)
Load-over height	3100 mm (122.05 in)
Dump height	2500 mm (98.42 in)
Dump reach	660 mm (25.98 in)
Dump-in angle	50 °
Dump-out angle	45 °
Track width, front/rear	1400 mm (55.11 in)
Wheelbase (front/rear axles)	1920 mm (75.59 in)
Turning radius[4]	2550 mm (100.39 in)

1. With standard bucket order no. 1000096388
2. With tires 12.5-20
3. With outside mirrors folded in
4. Measured at outer edge of wheel

6.19 Wheel loader dimensions with pallet forks (models WL 750 / WL 850)

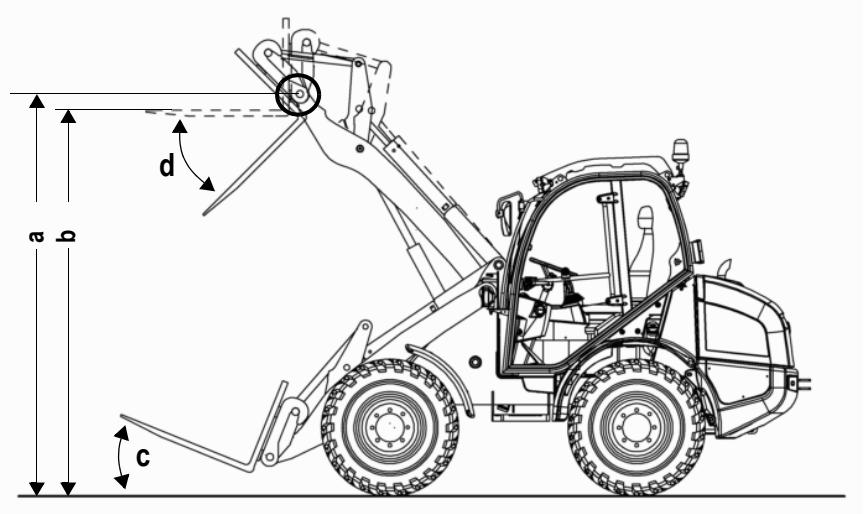


Fig. 155: Machine dimensions with pallet forks

Wheel loader model		WL 750	WL 850
a	Pin height	3065 mm[1] (120.67 in[1])	3250 mm[2] (127.59 in[2])
b	Pallet height	2800 mm[1] (110.24 in[1])	3000 mm[2] (118.11 in[2])
c	Dump-in angle in transport position[3]	17°	
d	Dump-out angle[3]	85°	

1. With tires 12.5-18
2. With tires 12.5-20
3. With pallet forks order no. 1000101820 (1000 mm)(39.37 in)

Other dimensions

➥ - *see Wheel loader dimensions with bucket (model WL 750)* on page 6-13

➥ - *see Wheel loader dimensions with bucket (model WL 850)* on page 6-14

KRAMER-WERKE GmbH keep abreast of the latest technical developments and constantly improve their products. For this reason, we may from time to time need to make changes to diagrams and descriptions in this documentation which do not reflect products which have already been delivered and which will not be implemented on these machines.

Technical data, dimensions and weights are given as an indication only. Responsibility for errors or omissions not accepted.

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