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Dumper

3001

OPERATOR'S MANUAL

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Wacker Neuson Linz 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. Non-metric weights and measurements are approximate.

The cover features the machine with possible optional equipment.

Wacker Neuson Linz GmbH
Flughafenstraße 7
A-4063 Hörsching

Document: OM 3001 us
Order no.: 1000185002
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1 Introduction

1.1 Notices on this Operator's Manual

The Operator's Manual is stored in the storage box behind the operator seat.

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 personnel, but it also serves as a reference for experienced personnel. It helps to avoid hazardous 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 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. Carefully read the Operator's Manual before putting the machine into operation. This Operator's Manual will help to familiarize yourself more easily with the machine, thereby enabling you to use it more safely and efficiently.

Follow chapter "**Safety Instructions**" in particular. 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.
Extensive maintenance and repair work must always be performed by a Wacker Neuson service center. Use only original spare parts for repairs. This ensures operational safety and readiness of your machine, and maintains its value.

- Special equipment and superstructures are not described in this Operator's Manual.
- Wacker Neuson reserves the right to improve the technical standard of our machines without adapting the Operator's Manual.
- Modifying Wacker Neuson products and fitting them with additional equipment and attachments not included in our delivery program requires Wacker Neuson's written authorization, otherwise warranty and product liability for possible damage caused by these modifications shall not be applicable.
- Subject to modifications and printing errors.

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

Abbreviations/symbols

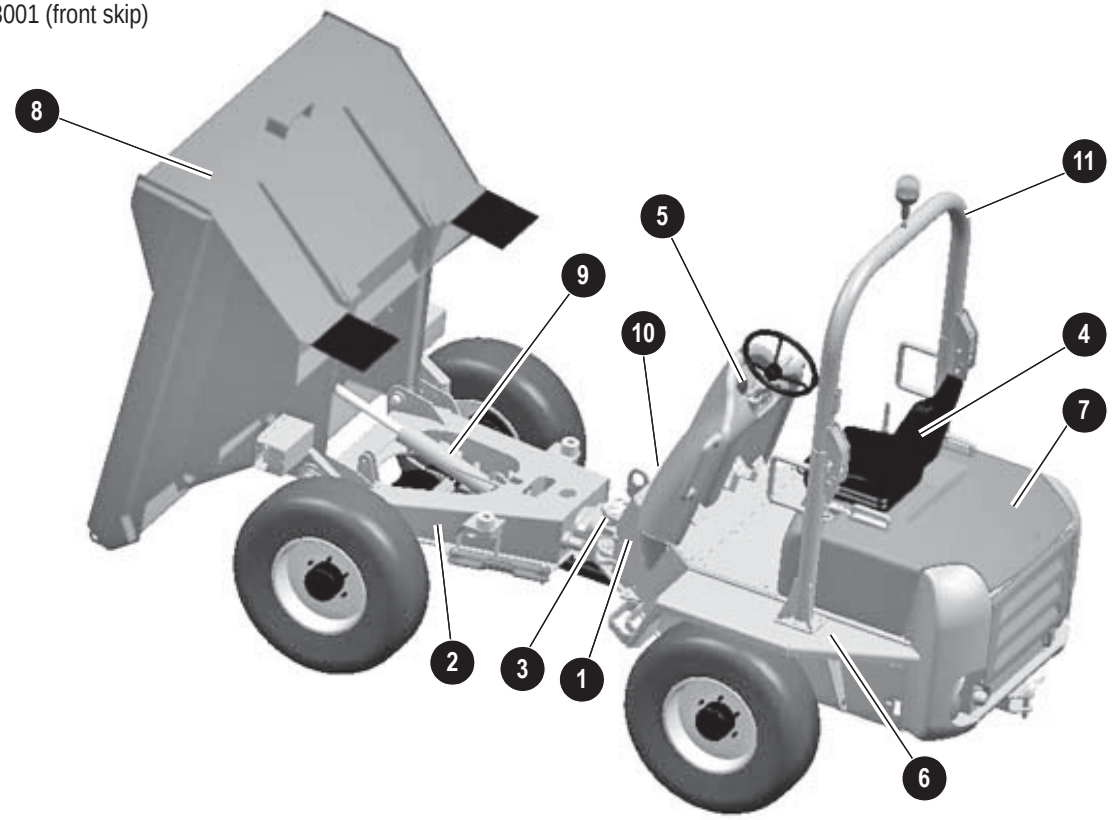
- Identifies a list.
  - Subdivision within lists or an activity. Follow the steps in the recommended order.

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

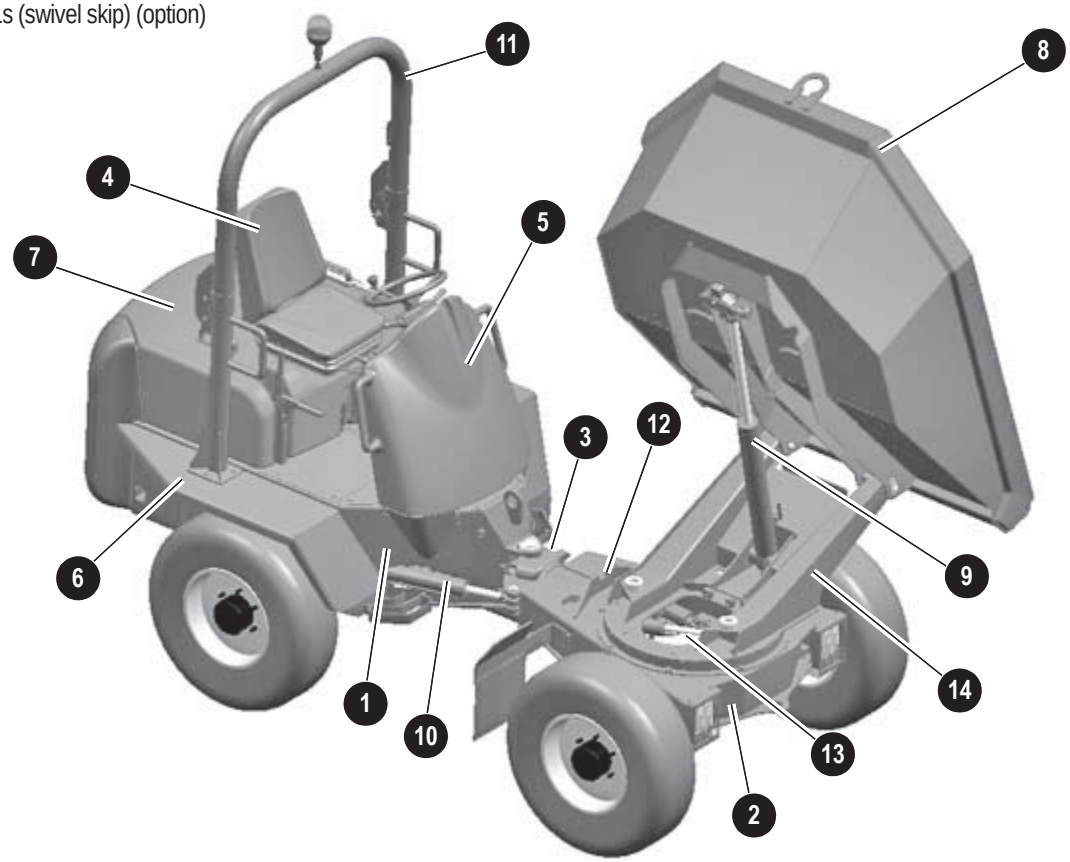
➥ Description of the effects or results of an activity.

1.2 Machine overview

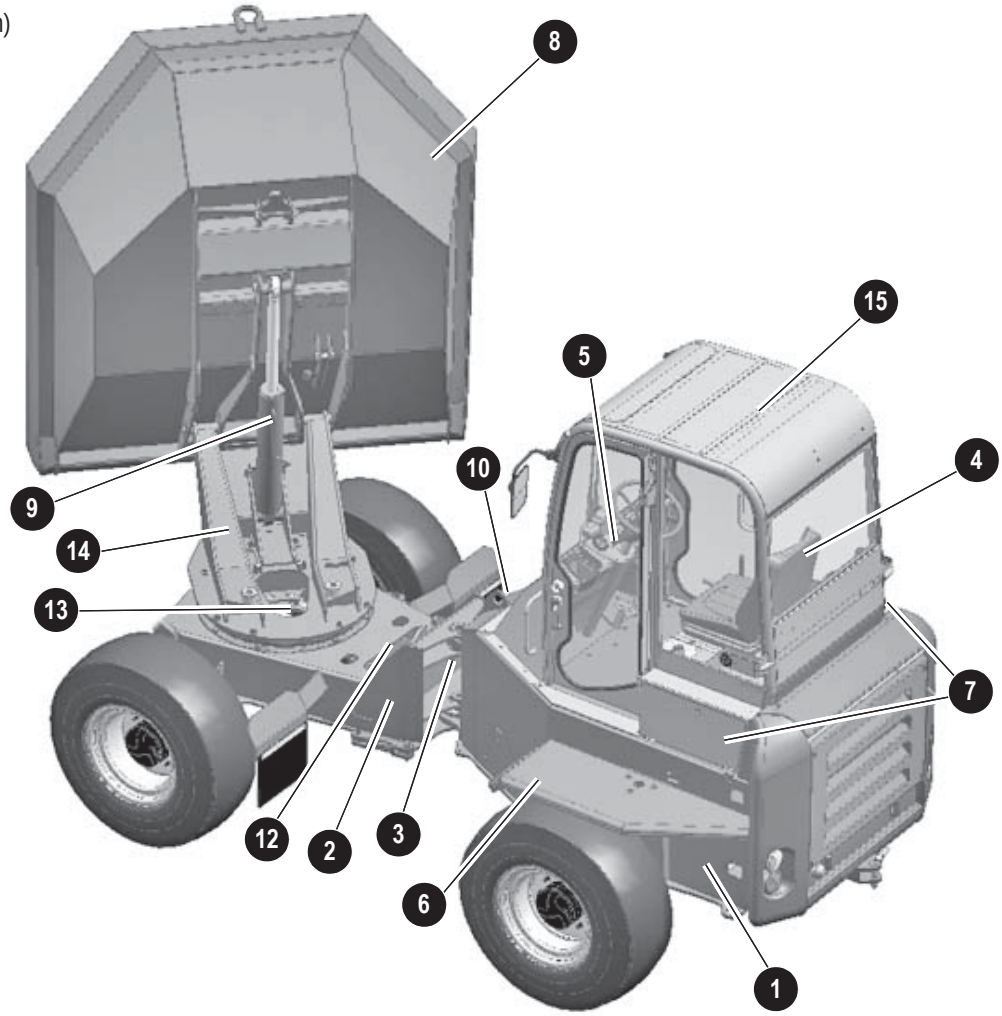
Model 3001 (front skip)



Model 3001s (swivel skip) (option)



Model 3001s cabin (option)



Pos.	Designation
1	Rear chassis
2	Front chassis
3	Articulated joint
4	Seat
5	Control stand
6	Mudguard
7	Engine cover/left and right-hand maintenance access (machine with optional cabin)
8	Skip
9	Tilt hydraulic cylinder
10	Steering hydraulic cylinder
11	Rollbar
12	Swivel center position (option)
13	Slewing hydraulic cylinder (option)
14	Swiveling console (option)
15	Cabin (option)

1.3 Brief description

The model 3001 dumper is a self-propelled work machine.
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 main components of the machine are:

- Rollbar or cabin (option).
- Hydraulic front skip or swivel skip (option).
- Three-cylinder Yanmar or Perkins diesel engine.
- Sturdy steel sheet chassis.

Important

The machine can be equipped with the “Telematic” option (for transmitting operating data, location, etc. via satellite)!

Definition of the term “Protective Structure”

Protective structures are additional elements that protect the operator against hazard. These elements can be installed later on or as standard equipment.

Explanation of abbreviations

TOPS:

Tip Over Protective Structure

ROPS:

Roll Over Protective Structure

FOPS:

Falling Objects Protective Structure

1.4 Mechanical integrity

DANGER

Accident hazard due to modified cabin or protective structures!

Modifications (drilling, for example) weaken the structure and will cause serious injuries or death.

- No drilling, cutting or grinding.
- Do not install any brackets.
- No welding, straightening or bending.
- Replace the complete protective structure if it is damaged, deformed and/or cracked.
- Contact a Wacker Neuson service center in case of doubt.
- Retrofit, assembly and repair work may only be performed by a Wacker Neuson service center.
- Replace self-locking fasteners.

Important

Check the cabin/rollbar and all protective structures once a day for damage.

Important

Protective structures may only be installed or removed by a Wacker Neuson service center.

1.5 Differentiation of protective structures

Important

☞ *Machine operation is only allowed with a correctly installed and intact rollbar (or cabin/option 3001).*

☞ *For additional protection, only use correctly installed and intact Wacker Neuson protective structures that have been released for the machine.*

Rollbar

The rollbar has been specially designed for protection in case of an accident.

- TOPS/ROPS tested rollbar

Cabin (option 3001)

The cabin has been specially designed for protection in case of an accident.

- TOPS/ROPS/FOPS tested cabin.

Definition of FOPS level

Level I:

Protection against small falling objects (bricks, small pieces of concrete, tools, for example) for machines which are used, for example, for repairing roads, landscaping work and for working on other construction sites.

Level II:

Protection against heavy falling objects (trees, pieces of rock, for example) for machines that are used for clearance work, demolition work and forestry work, for example.

Responsibility for machine equipped with protective structures

The decision regarding the necessary protective structures (type and level I or II) must be made by the machine owner and depends on the specific work situation.

The machine owner must observe the national regulations and he must inform the operator on the protective structure to be used in a specific work situation.

1.6 Regulations

Requirements to be met by the operator

Earth moving machines may be operated and serviced only by persons who meet the following requirements:

- 18 years or older
- Physically and mentally suited for this work
- Persons have been instructed in operating and servicing the earth moving machine and have proven their qualifications to the contractor
- Persons are expected to perform work reliably.
- Persons have been appointed by the contractor for operating and servicing the earth moving machine.
- Get informed on and follow the legal regulations of your country.

Earth moving machines on public roads

Earth moving machines may be used on public roads only if:

- They are equipped according to the road traffic regulations of your country.
- Operator has at least good practice.

Follow the points of the – *see chapter 3.8 Check lists* on page 3-15.

Equipment

Safety equipment in compliance with the legal regulations of your country must be on board (for example, warning vest, warning triangle, warning light with design certification, first-aid kit).

Warranty

Warranty claims can be made only if the conditions of warranty have been observed. They are included in the General Conditions of Sales and Delivery for new machines and spare parts sold by the dealers of Wacker Neuson Linz GmbH. Furthermore, all instructions in this Operator's Manual must be observed.

National guidelines

Earth moving machines may be used on public roads only if they are equipped according to the road traffic regulations of your country.

1.7 EC declaration of conformity for all machines delivered before 29 December 2009

EC Declaration of Conformity

according to EC Directive 98/37/EC, 2000/14/EC Appendix 6

Wacker Neuson Linz GmbH
Haidfeldstr. 37
A-4060 Linz-Leonding

declare, under their own responsibility, that the product

Product name	Compact Dumper 3001
Model	3001
Version	3001
Serial no.	- - - - - - - - - - -

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

EC Directive 98/37/EC,
and the requirements of further pertinent EC Directives and standards
.

ISO 3471 and EN 13510	Tested		Administrative unit reported according to Appendix 6
2000/14/EC	information Noise level	dBA	TÜV SÜD Industrie Service GmbH EC no. 0036 Conformity assessement procedure appendix 6
	Measured value	101.4	
	Guaranteed value	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, EN 12100-1, EN 12100-2, ISO 3471, EN 13510;

Place of storage of technical documentation:
Wacker Neuson Linz GmbH
Department: R & D
Haidfeldstr. 37
A-4060 Linz-Leonding

Linz-Leonding, (date) _ _ . _ _ . _ _ _ _

Josef Erlinger/Managing Director
Wacker Neuson Linz GmbH

1.8 EC declaration of conformity for all machines delivered after 29 December 2009(Yanmar 3TNV88-BKNSV)

EC Declaration of Conformity

According to Machine Directive 2006/42/EC, appendix II A

Manufacturer

Wacker Neuson Linz GmbH
Flughafenstr. 7
A-4063 Hörsching

Product

Machine designation:	Compact Dumper
Machine model:	3001
Serial no.:	_____
Output (kW):	24.4 kW
Measured sound power level:	101.4 dB (A)
Guaranteed sound power level:	101 dB (A)

Conformity assessment procedure

Notified body according to Directive 2006/42/EC, appendix XI:
Fachausschüsse Bau und Tiefbau
Prüf- und Zertifizierungsstelle im BG-PRÜFZERT
Landsberger Str. 309
D-80687 Munich
Distinguishing EU number 0515

Notified body according to Directive 2000/14/EC, appendix VI:
TÜV SÜD Industrie Service GmbH
Westendstr. 199
D-80686 Munich

Directives and standards

We hereby declare that this product corresponds to the relevant regulations and requirements of the following Directives and standards:

2006/42/EC (old 98/37 EC), 2004/108/EC (old 89/336/EEC), 2002/44/EC, 2005/88/EC, 2000/14/EC;

DIN EN ISO 12100-1 and 2, DIN EN 474-1 and 5, DIN EN 14121,

DIN EN 3471, EN ISO 3744, EN ISO 3746, DIN EN ISO 3449, DIN EN ISO 13849-2:2012,

Leonding, _____	_____	_____
Place, date	Responsible for documentation	Technical director

1.9 Declaration of conformity for machines without CE mark on type label (Yanmar 3TNV88-BKNSV)

Declaration of conformity

Manufacturer

Wacker Neuson Linz GmbH
Flughafenstr. 7
A-4063 Hörsching

Product

Machine designation:	Compact Dumper
Machine model:	3001
Serial no.:	_____
Output (kW):	24.4 kW
Measured sound power level:	101.4 dB (A)
Guaranteed sound power level:	101 dB (A)

Directives and standards

We hereby declare that this product corresponds to the relevant regulations and requirements of the following Directives and standards:

2006/42/EC (old 98/37 EC), except 1.7.3., 2004/108/EC (old 89/336/EEC), 2002/44/EC, 2005/88/EC, 2000/14/EC;

DIN EN ISO 12100-1 and 2, DIN EN 474-1 (except 7.3.) and 5, DIN EN 14121,

DIN EN 3471, DIN EN 13510, EN ISO 3744, EN ISO 3746, DIN EN ISO 3449

Leonding, _____ _____ _____

Place, date | Responsible for documentation | Technical director

1.10 Type labels and component numbers

Fig. 1: Chassis serial number

Serial number

The serial number is stamped on the front machine chassis on the right.
It is also located on the type label.

Fig. 2: Type label without cabin

Fig. 2: Machine type label with cabin (option)

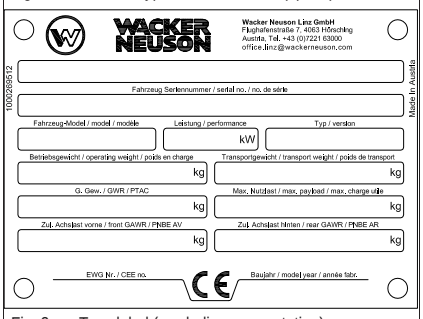


Fig. 2: Type label (symbolic representation)

Type label

Machine with rollbar:

➥ At the right under the operator seat on the engine cover.

Machine with optional cabin:

➥ At the right on the front chassis in the area of the articulated joint.

Type label information

Field below Wacker Neuson logo:	Compact Dumper
Fahrzeug Seriennummer/serial no./no. de série:	Serial number of machine
Fahrzeug Modell/model/modèle:	Machine designation
Leistung/performance:	Engine output
Typ/version:	Machine type
Betriebsgewicht/operating weight/poids en charge:	Operating weight
Transportgewicht/transport weight/poids en transport:	Transport weight
G. Gew./GWR/PTAC:	Gross weight rating (permissible)
Max. Nutzlast/max. payload/max. charge utile:	Maximum payload
Zul. Achslast vorne/front GAWR/PNBE AV:	Front gross axle weight rating
Zul. Achslast hinten/rear GAWR/PNBE AR:	Rear gross axle weight rating

Option

EWG Nr./CEE no.:	EEC check number
Baujahr/model year/année fabr.:	year of construction

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

Fig. 3: Cabin type label

Cabin type label (option)

The type label is located in the cabin on the left-hand side on the B pillar.

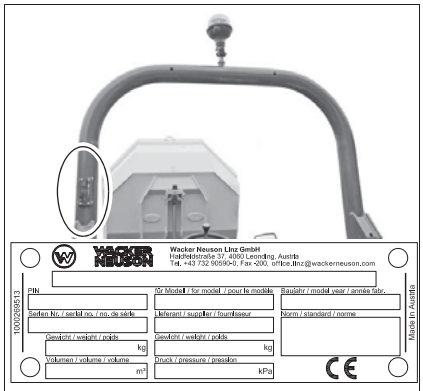


Fig. 4: Rollbar type label

Rollbar type label

The type label is located at the rear left on the rollbar.

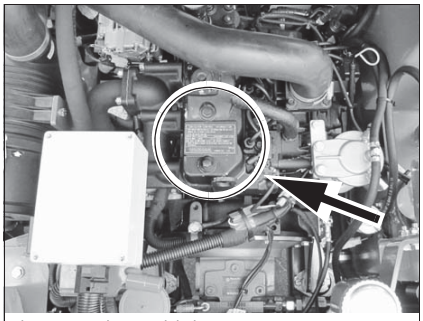


Fig. 5: Engine type label

Engine type label (Yanmar)

The type label (arrow) is located on the valve cover of the engine.

Fig. 6: Engine type label

Engine type label (Perkins)

The type label (arrow) is located on the right of the engine valve cover.

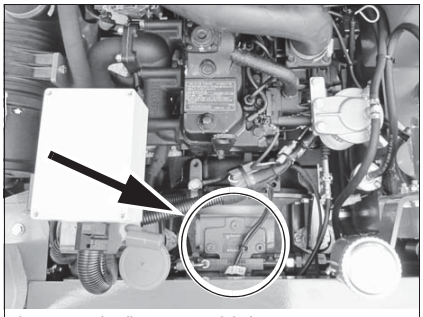


Fig. 7: Hydraulic pump type label

Hydraulic pump type label (cabin option)

The type label (arrow) is located on the hydraulic pump housing.

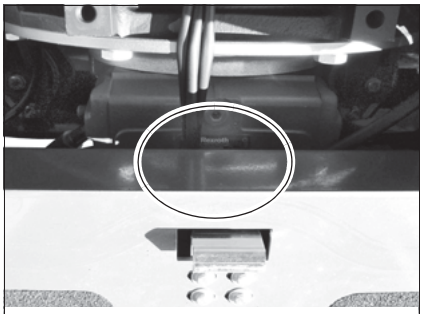


Fig. 8: Hydraulic pump type label

Hydraulic pump type label (rollbar)

The type label is located under the engine cover on the hydraulic pump housing.

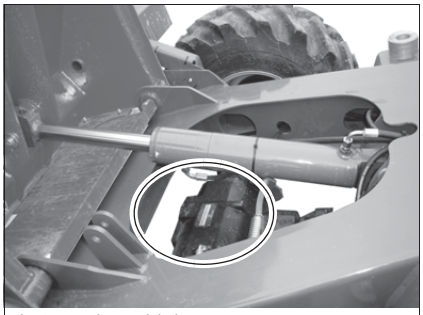


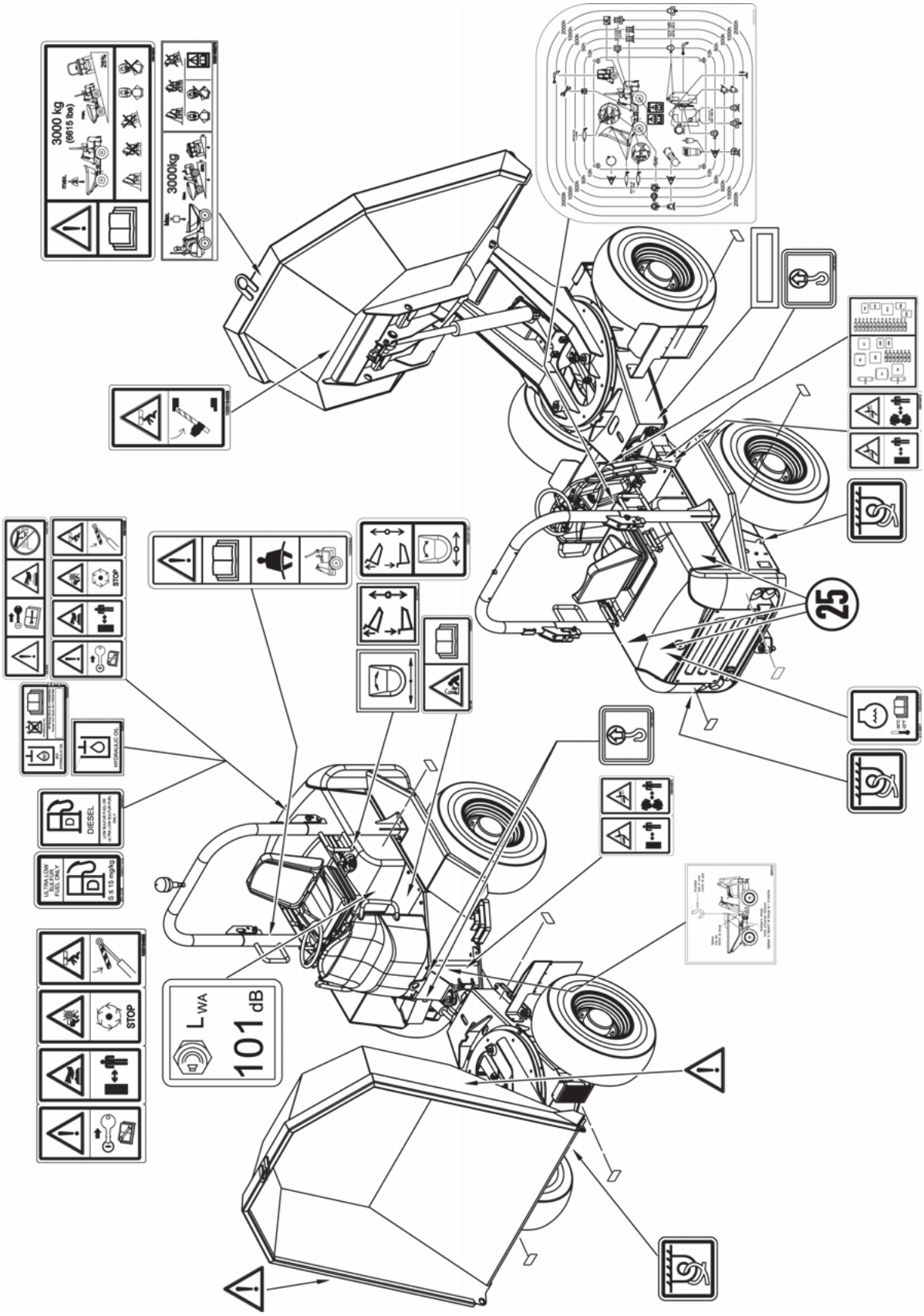
Fig. 9: Axle type label

Axle type label

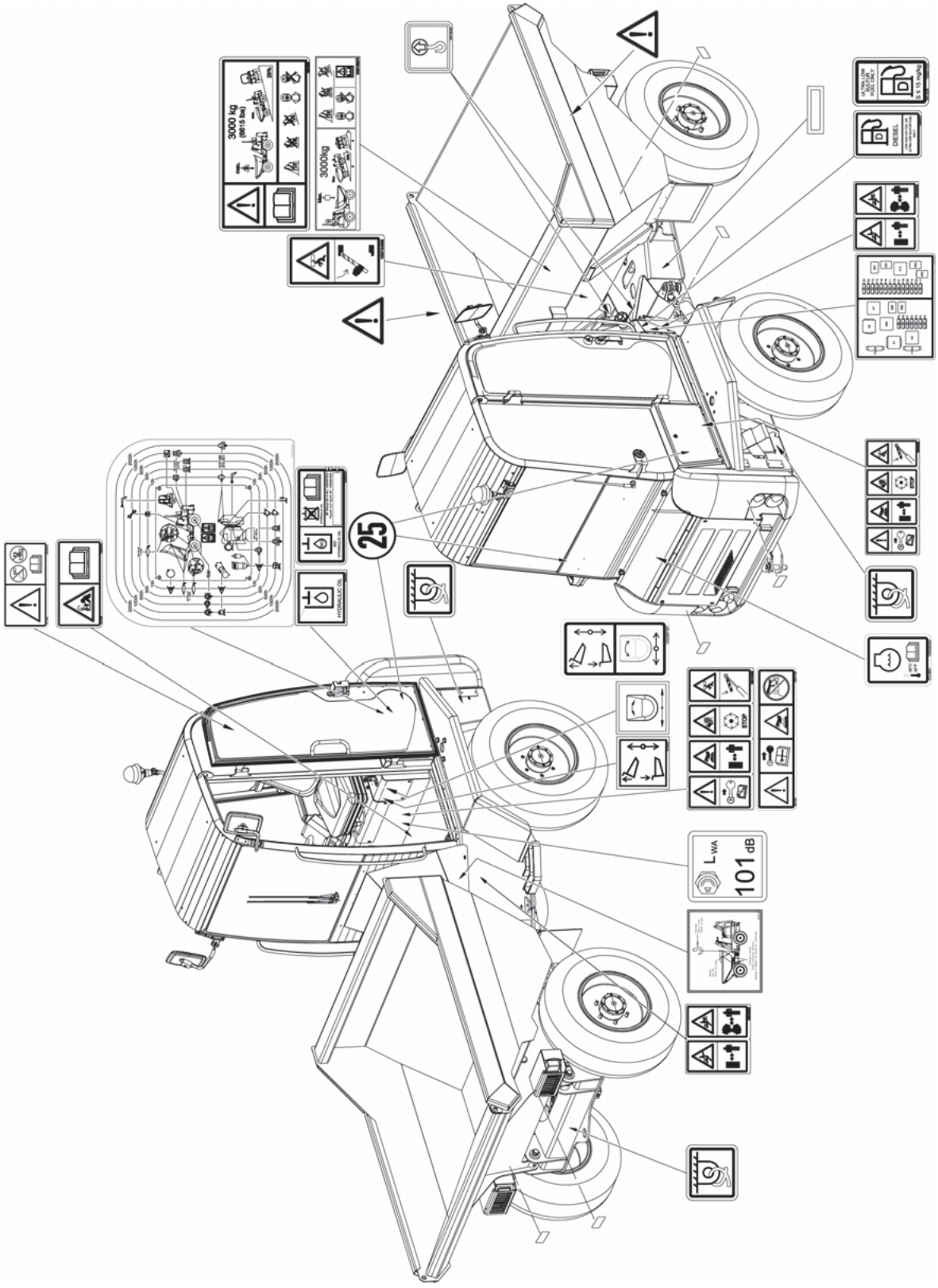
The type label (arrow) is located on the upper side of the axle housing.

1.11 Signs and symbols

Label (machine with rollbar) (overview)



Label (machine with optional cabin) (overview)



The following states signs and symbols that do not contain explanatory text and that are not explained in the following chapters.

Fig. 10:

Meaning (Yanmar)

Add diesel fuel only.

Position

On the filler inlet of the fuel tank.

Fig. 11:

Meaning (Perkins)

Only add diesel fuel with a sulphur content of < 15 mg/kg (= 0.0015 %).

Position

On the filler inlet of the fuel tank.

Fig. 12:

Meaning

Hydraulic oil reservoir. Use hydraulic fluid only.

– *see chapter Adding hydraulic oil* on page 5-27

Position

On the filler inlet of the hydraulic oil reservoir.

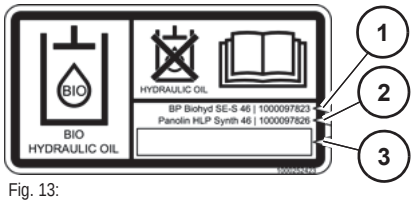


Fig. 13:

Meaning (option)

The tank contains biodegradable hydraulic oil.

This label is notched on the side depending on the biodegradable hydraulic oil used.

1 BP Biohyd SE-S 46

2 Panolin HLP Synth 46

3 Other biodegradable hydraulic oil

Position

On the filler inlet of the hydraulic oil reservoir.

Fig. 14:

Meaning

Locates the lifting point for hoisting the machine with lifting devices (slings, chains, or cables).

– *see chapter 3.30 Lifting the Machine* on page 3-65

Position

On the rear chassis next to the lifting eye.

Fig. 15:

Meaning

Tie down point

The mounting points are used for tying down the machine during loading and transport

– *see chapter 3.32 Tying down the machine* on page 3-69

Position

Beside the lifting eyes at the front and rear chassis.

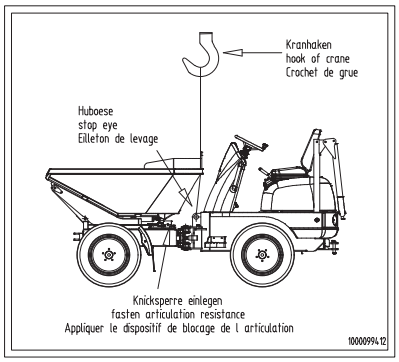


Fig. 16:

Meaning (Yanmar)

This label explains how to crane-handle the machine.

– *see chapter 3.30 Lifting the Machine* on page 3-65

Position

At the left on the front chassis in the area of the articulated joint.

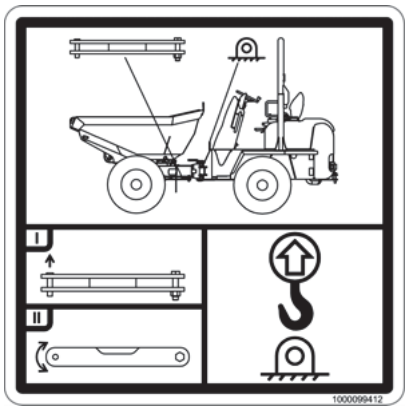


Fig. 17:

Meaning (Perkins)

This label explains how to crane-handle the machine.

– *see chapter 3.30 Lifting the Machine* on page 3-65

Position

At the left on the front chassis in the area of the articulated joint.

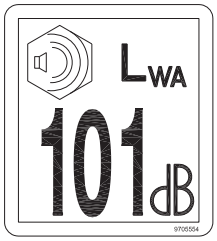


Fig. 18:

Meaning

Indication of noise level produced by the machine.

L_{WA} = sound power level

Other information – *see chapter 6.13 Noise levels (Yanmar)* on page 6-12

Position

On the engine cover.

- Machine with optional cabin:

  ➥ At the left under the operator seat.

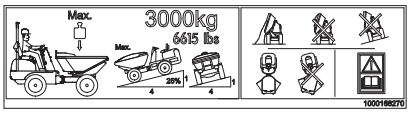


Fig. 19:

Meaning (Yanmar)

This label indicates the maximum authorized angle of inclination for traveling on slopes, whatever the position of the machine.

Position

On the rear edge of the skip.

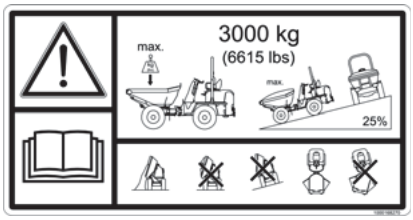


Fig. 20:

Meaning (Perkins)

Read the Operator's Manual to ensure safe machine operation.

Position

On the rear edge of the skip.

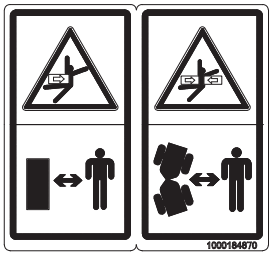


Fig. 21:

Meaning

Indicates that persons other than the operator must keep a safe distance from the machine during operation.

Position

On left and right of the rear chassis.

Fig. 22:

Meaning

Fold down the maintenance Strut before performing work under the skip.

Position

On the rear edge of the skip.

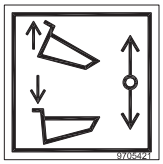


Fig. 23:

Meaning

Skip control mode: tilt in and tilt out.

Position

On the engine cover.

Machine with optional cabin:

➥ On the left beside the operator seat.

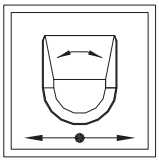


Fig. 24:

Meaning (option) (Yanmar)

Shows how the skip can be swivelled.

Position

On the engine cover.

Machine with optional cabin:

➥ On the left beside the operator seat.

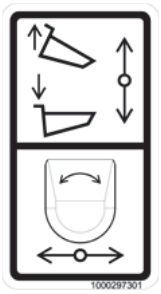


Fig. 25:

Meaning (option)

Shows how the skip can be swivelled and tilted.

Position

On the engine cover.

Machine with optional cabin:

➥ On the left beside the operator seat.

Fig. 26:

Meaning (Yanmar)

Caution! Remove starting key and read the service manual before servicing the machine.
Hot surface! Do not touch. Keep a safe distance from the machine.
Cutting hazard. Cooling fan can cut when rotating. Stop engine before working on the engine or cooling system.
Crushing hazard. Let the safety prop lock into place before performing maintenance work under the engine cover.

Caution: rotating and hot parts. Read the Operator's Manual.

Position

On the engine cover.

Machine with optional cabin:

➥ On the left under the operator seat and inside the right-hand maintenance access.

Fig. 27:

Meaning (Perkins)

Caution! Remove starting key and read the service manual before servicing the machine.

Hot surface! Do not touch. Keep a safe distance from the machine.

Position

On the engine cover.

Machine with optional cabin:

➥ On the left under the operator seat and inside the right-hand maintenance access.

Fig. 28:

Meaning (Perkins)

Explosion hazard due to wrong connection of battery jumper cables.

Position

Under the base plate.

Fig. 29:

Meaning (option if equipped with cabin)

Modifications to the structure (welding, driling, for example), retrofitting and incorrect repairs affect the protective effect of the cabin and will cause serious injury and even death.

Position

A the rear of the operator seat.

Fig. 30: Label version 1

Meaning (option if equipped with rollbar)

Machine operation is only allowed if the rollbar is raised and locked, and if the seat belt is fastened.

Position

On the engine cover.

Fig. 31: Label version 2

Meaning (option if equipped with rollbar)

Machine operation is only allowed if the rollbar is raised and locked, and if the seat belt is fastened.

Position

On the ROPS rollbar on the left in traveling direction.

Fig. 32:

Meaning

This label frames and identifies the serial number stamped onto the machine.

Position

On the front right chassis member of the front chassis.

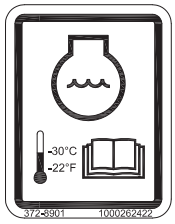


Fig. 33:

Meaning

Bear in mind the correct mixing ratio of the coolant. Read the Operator's Manual.

Position

On the engine radiator under the engine cover.

Machine with optional cabin:

➥ At the rear on the engine radiator under the radiator cover.

Fig. 34:

Meaning

Injury hazard due to swiveling or tilting movement of the skip.

Position

On the left and right of the skip, at the middle of the upper edge.

Fig. 35:

Meaning (option)

This label indicates the maximum authorized speed of 25 kph (15.6 mph).

Position

At the rear and on one side of the engine cover.

Machine with optional cabin:

➥ At the rear of the cabin and on the left and right-hand maintenance access.

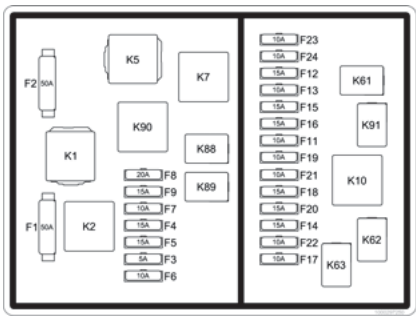


Fig. 36

Meaning (Perkins)

Fuses and relays.

Position

Inside the fuse box.

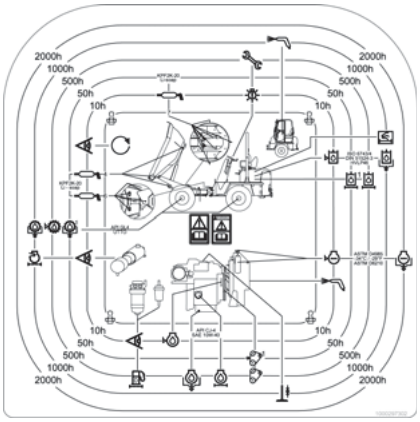


Fig. 37

Meaning (Perkins)

Indication of maintenance intervals.

Position

At the right under the operator seat.

Machine with optional cabin:

➥ On the window on the left in traveling direction.

Fig. 38

Meaning

Reflectors on machine.

Position

On either side of the machine at the rear (red).

On either side on the front chassis (white).

Two on either side on the outside of the machine (yellow).

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

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

Potential consequences of the hazard.

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

WARNING

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

Potential consequences of the hazard.

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

CAUTION

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

Potential consequences of the hazard.

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

NOTICE

NOTICE indicates a situation which, if not avoided, could result in property damage.

Important

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 at risk if environmentally hazardous material, such as waste oil, is not subject to proper use or disposal.

2.2 Warranty

Warranty claims can be brought forward to your Wacker Neuson dealer only. Furthermore, the instructions in this Operator's Manual must be observed.

2.3 Disposal

All fluids, lubricants, material, etc., used on the machine are subject to specific regulations regarding collection and disposal. Dispose of different materials and consumables separately and responsibly in accordance with environmental protection legislation.

Environment

Avoid damage to the environment. Do not allow the oil and oily wastes to get into the ground or stretches of water.

- If the machine is no longer used according to its designated use, ensure that it is decommissioned or put out of operation and disposed of according to applicable regulations.
- Observe all applicable safety regulations during machine disposal.
- Machine disposal must be performed in accordance with state-of-the-art standards that apply at the time of disposal.

2.4 Designated use

1. In accordance with this designated use, the machine may be used ONLY for moving earth, gravel, coarse gravel or ballast and rubble.
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 operator alone will bear the risk.
3. “Designated use“ also includes observing the instructions set forth in the Operator's Manual and observing the maintenance schedule.
4. Machine safety can be negatively affected by performing 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 performing 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 the Operator's Manual before starting, moving, operating, servicing or repairing the machine. Observe the safety instructions.
7. The machine shall not be used for transport jobs on public roads without a specific certification.

8 Do not use a machine without cab (option) in areas with risk of falling objects from above or the front.

2.5 Preparing To Use The Machine

Conditions for use

- The machine has been designed and built in accordance with state-of-the-art standards and the recognized safety regulations. Nevertheless, its use can constitute a risk to life and limb of the user or of third parties, or cause damage to the machine and to other material 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 the Operator's manual.
- The machine must only be used by qualified operators who are fully aware of the risks involved in operating the machine.
- Before putting the machine into operation, inspect the machine for safety in work and road operation.
- Do not start, move or operate a damaged or malfunctioning 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 malfunctioning machine to a safe place for diagnoses and repair.
- The operator/machine 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.

Operator 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 operator/machine owner must regularly ensure that all persons entrusted with operation or maintenance of the machine are working in compliance with the Operator's Manual and are aware of risks and safety factors of the machine.

Preparing for use

- Before starting 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).

Information on visibility

- Before putting the machine into operation, perform a visual check to ensure that there are neither persons nor objects or other sources of risk around the machine.
- When using the machine, check the surroundings constantly in order to identify potential hazards in time.

- Before using the machine, before starting work or during changing operators, ensure that all visual aids (mirrors) work correctly, that they are clean and adjusted in accordance with the instructions in this Operator's Manual. The operator must observe the local regulations.
- Do not make any changes or modifications that impair visibility. Otherwise the machine does not meet the requirements for conformity and licensing.

Modifications and spare parts

- NEVER make any modifications, additions or conversions to the machine and its superstructures (for example, cab, etc.), 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.

2.6 Operator and Technician Qualifications and Basic Responsibilities

Operator/Machine owner responsibility

- Only allow trained and experienced individuals to operate, 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 undercarriage and the steering and brake systems may be performed only by skilled individuals who have been specially trained for such work.
- Work on the hydraulic system of the machine must be performed only by a technician with special knowledge and experience in hydraulic equipment.

2.7 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 travel pedals, mirrors or foot rests and steps.
- Observe all safety, warning, and information signs and labels on the machine.
- Start and operate the machine from the seat only.
- The operator must sit in the seat, fasten and adjust the seat belt and check if all mirrors are adjusted correctly before putting the machine into operation.
- Always adjust the seat position before starting work. Never change the seat position during operating the machine.
- Make sure that all safety devices are properly installed and functional before starting work.

- Before putting the machine/attachment into operation (starting/moving), ensure that no one in the immediate vicinity will be at risk.

Starting and stopping

- Perform starting and stopping 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 – risk of explosions.
- Make sure the brakes, the steering, the travel pedals, the control levers and the signalling and light systems are functional before operating the machine, and also before restarting after an interruption of work.
- Fold up the control lever base before releasing the seat belt in order to avoid unintentional operation.
  - Lower the attachments to the ground.

Job site 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 bearing capacity
  - any necessary barriers separating the job site from public roads
- Always keep at a safe distance from the edges of building pits and slopes.
- Look out for the following during working in buildings or in enclosed areas:
  - height of the ceiling/clearances
  - width of entrances
  - maximum load of ceilings and floors
  - sufficient room ventilation – risk of carbon monoxide poisoning.

- Observe the danger zone. See “Danger zone awareness“.
- Use the rearview mirror to stay aware of job site obstacles and personnel.
- Always use 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 performing work safely.
- Drive slowly in meadows, on leaves or wet steel plates. The machine can slip even if the ground is level.

Danger zone awareness

- The danger zone is the area in which persons are in at risk due to the movements of the machine, work equipment, additional equipment or material.
- The danger zone also includes the area affected by falling material, equipment or constructions debris. The danger area must be extended by 0.5m (20 in) in the immediate vicinity of buildings, scaffolds or other elements of construction.
- Seal off the danger zone 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, move or work uphill or downhill. If traveling across a slope cannot be avoided, bear in mind the tilting limit of the machine. 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, ALWAYS adapt your travel speed to the prevailing ground conditions.
- Never get on or off during machine travel or machine operation, and do not jump off the machine.
- The travel pedals require practice before a operator becomes familiar with the pedal response. Therefore, adjust the travel speed to your abilities and the surroundings.

Special operating notes

Always adapt your travel speed to the road and ground conditions, and to the visibility conditions. Ask for help in navigating difficult passages or obstacles. To avoid tipping the machine, travel appropriately and slowly as conditions dictate. This applies in particular to rough terrain, the edges of trenches, curves and emergency braking. Use only the low speed range when traveling off-road (see the turtle indicator on the instrument panel).

Proceed with extreme care when traveling on slopes.

Make sure the engine cover is closed and locked before starting the machine.

Apply the parking brake when parking the machine. If possible, do not park the machine on slopes. If this cannot be avoided, use wheel chocks, etc. Lower the skip before leaving the machine. Do not use the parking brake as a service brake. The parking brake can be used as an emergency brake in the event of a service brake failure.

Keep the base plate of the skip in a clean condition so that the material is easily tilt out of the skip. Load only material that can be easily tilt out.

Never travel too close to the edges of unsecured pits, precipices, etc. The pressure of the wheels on the ground can cause the edge to give way.

Never tilt out material into trenches where people are working. If the operator cannot see into the trench, he or she must be guided by someone who can see into the trench.

Always make sure the service and parking brake are serviceable before operating.

Carrying passengers

- Do not lift, lower or transport people on the machine or in the attachment.
- 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 to operate the machine 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 or in event of malfunctions, 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

- Before machine travel always check whether the supplementary equipment and the attachments have been safely stowed away or attached.
- Careful when reversing the machine – risk of accidents.
- Persons in the blind spot of the machine cannot seen by the operator.
- Ensure that nobody is within the danger area of the machine when changing the traveling direction.
- Use the rearview mirrors (option) to reverse with the machine.
- 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 skip and tilt it in until the skip opening is in the upward horizontal position as a minimum before traveling on public roads.

Apart from the operator, no other persons are allowed to ride on the machine.

2.8 Special instructions for traveling on public roads

- Machine operation is subject to the applicable legal regulations of your country.
- Safety equipment in compliance with the legal regulations of your country must be on board, e.g. a warning triangle, a first aid kit and a safety vest.
- Also follow the national accident prevention regulations and the following instructions:
- Always adapt your travel speed to the road and ground conditions, machine handling and to the visibility conditions.
- Before traveling on public roads, remove the protective screen from the front window (option).
- Prepare the machine for traveling on public roads
  – see chapter 3.12 Special instructions for driving on public roads on page 3-15.
- Do not switch on roof lights (option) when traveling on public roads.
- Perform a functional check of the lights (headlights, turn indicators etc.).
- Perform a functional check of the brake system.
- Ensure that the machine has no leaks.
- The cab doors (option) must be closed.
- Fasten the seat belt.
- Observe the applicable legal regulations of your country for rotating beacon operation.

2.9 Operator Protection System

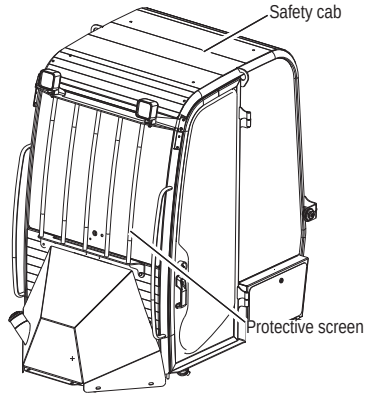


Fig. 39: Cab and protective structures (option)

- The ROPS/FOPS Level II safety cab (option) protects the operator against falling material.
- The protective screen (option) protects the front window against larger objects at the front.

DANGER

Cruhshing hazard by objects falling from above.

Falling object will cause serious or deadly injuries.

- When working in areas with a risk of material falling, a ROPS/FOPS protective structure (e.g. safety cab) must be installed.
- Otherwise machine operation is prohibited.
- Observe the following safety instructions.
- Wear protective equipment (e.g. protective clothing, safety goggles).
- Perform only work that does not require any higher-level protection.

DANGER

Stabbing/puncture/crushing hazard from falling objects (fragments or splinters) projected from front of machine.

Objects will cause serious or deadly injuries.

- When working in areas with a risk install protective screen (option) structure.
- Otherwise machine operation is prohibited.

WARNING

Do not modify the cab.

Failure to follow this precautionary measure can lead to fatal injury or death.

- No drilling, cutting or grinding.
- No welding, straightening or bending.
- Do not mount any brackets.
- Repair work may be performed by a Wacker Neuson dealer only.
- Always replace the complete cab/canopy, FOPS or Front Guard if it is deformed, cracked or otherwise damaged.
- If you are not sure, always contact a Wacker Neuson dealer.

Operation with lowered rollbar

DANGER

Accident hazard. Operation with a lowered rollbar is prohibited.

Failure to follow this precautionary measure will cause fatal injury or death.

- Operation with a lowered rollbar is temporarily allowed depending on the situation (e.g. to reduce the transport height in case of low clearance heights) – but only if the following conditions are fulfilled:
  - Obtain the approval of the competent national authority.
  - Traveling and operating the machine is only allowed on absolutely level ground.
  - Avoid tipping movements of the machine under all circumstances.
  - Working in areas involving a risk of falling objects is prohibited.
  - Fastening the seat belt is prohibited.
  - Wear protective equipment (e.g. protective clothing, safety glasses).

2.10 Trailer operation, transport and towing

Trailers

- Even though the machine is equipped with brackets, it is not a tractor and may not be used as such in difficult terrain.
- If the machine is used on construction sites for towing trailers, weight the skip with 25 % of the payload. However, the towed equipment including the weight in the skip may not exceed the machine's payload.
- Secure the towing pin of the towing gear with a locking pin.
- Counterweights affect handling and the machine's steering capability.
- Use special care during coupling trailers, and couple them with the specially required devices only.
- Always secure trailers against unintentional movement.
- If optional equipment such as a trailer is installed, ensure that all lights and associated indicator lights are installed and functional.

Transport

- The machine must be loaded and transported according to the procedures described within this Operator's Manual.
- The transporting vehicle must have sufficient load capacity and platform size to safety transport the machine. Refer to Chapter *6 Specifications* of this manual to determine the physical characteristic of the machine before loading and transporting.
- Use OSHA-approved straps, chains or cables to securely fastened 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.

- The recommissioning procedure must be strictly in accordance with the Operator's Manual.

Towing

- Tow away the machine in accordance with the Operator's Manual.
- For towing the machine observe the prescribed transport position, admissible speed and itinerary.

2.11 Temperature Range

The machine may only be used between a maximum +45°C (113°F) and minimum -15°C (5°F). Contact your Wacker Neuson dealer if you intend to use the machine in other temperature ranges. Store the machine in a dry place at room temperature (about 15°C, or 59°F). Observing these temperature ranges will help to prolong the machine's service life.

2.12 Safety Guidelines for Maintenance

General maintenance notes

- Operational readiness and the service life of machines are heavily dependent on maintenance.
- It is therefore in the interest of the machine owner to perform the prescribed maintenance work.
- The manufacturer requires the owner to perform maintenance work under all circumstances. Otherwise warranty shall not be given in full.
- 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 service center equipment are capable of performing the tasks prescribed. Do not use malfunctioning 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.
- Recycle scrapped parts and drained fluids according to environmental and hazardous material requirements. To avoid fire and health hazards, dispose of soiled shop towels by approved methods.
- Always retighten any screws, electrical connections, or hose connections that may have been loosened during maintenance and repair.
- Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.

Personal safety measures

- Brief the technician and the operator before beginning special operations, repair work and maintenance work. Appoint a person to supervise the activities.
- Observe the specific safety instructions in the Maintenance section of this Operator's Manual.
- Before taking up work on machine parts risky for life and limb (bruising, cutting), always ensure safe blocking/support of these areas.

- Apply special care when working on the fuel system – increased risk of fire.

- Engine block and muffler 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 – risk of personal injury.

- 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 – risk of explosions.

Preparing for maintenance and repair work

- In any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices, or any work related to maintenance, inspection and repair, observe the starting and stopping procedures set forth in the Operator's Manual, and the information on maintenance work.
- Prior to performing assembly work on the machine, ensure that no movable parts will roll away or start moving.
- If required, secure the maintenance area appropriately.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 performing any maintenance work.
- Perform service, maintenance and repair work ONLY if:
  - Machine is positioned on firm and level ground
  - All hydraulically movable attachments and working equipment have been lowered to the ground
  - Engine is stopped
  - The starting key has been removed
  - Pressure accumulator is empty
  - Machine has been secured against unintentional movement
- Should maintenance or repair be inevitable with the engine running:
  - Lower the skip and apply the parking brake
  - Only work in groups of two
  - Both persons must be authorized for the operation of 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 work manual
  - Always keep a safe distance from all rotating and moving parts, for example, fan blades, V-belt drives, PTO shaft drives, etc.
- Prior to performing service, maintenance and repair work, always attach a warning label, such as “Repair work – do not start machine” to the starter lock or to the control elements as a precautionary measure.
- Prior to performing 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 and repair work beneath a raised machine, attachments or additional equipment ONLY if a safe and secure support has been provided. The use of hydraulic cylinders or jacks as the sole method of support does NOT sufficiently secure raised machines or equipment/attachments.
- Before cleaning the machine with water, steam jet (high-pressure cleaner) or detergents, cover or tape up all openings which – for safety and functional reasons – must be protected against water, steam or detergent penetration. Special care must be taken with the electrical system.

- Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before performing maintenance/repair work. Do not use aggressive detergents. Use lint-free cleaning rags.
- To avoid the risk of accidents, parts and large assemblies being moved for replacement purposes must be carefully attached and secured to lifting gear. Use only suitable lifting gear and suspension systems in a technically perfect state with adequate load-bearing capacity.
  Stay clear of suspended loads.
- Have loads fastened and crane operators instructed by experienced persons only. The person giving the instructions to the operator must be within sight or sound of him.

Performing maintenance and repairs

- After cleaning, remove all covers and tapes applied for that purpose.
- After cleaning, examine all fuel, lubricant and hydraulic oil lines for leaks, chafe marks and damage. Rectify all defects without delay.
- Observe the adjustment, maintenance and inspection activities and intervals set forth in the Operator's Manual, including information on the replacement of parts/partial equipment.
  These activities may be performed only by a Wacker Neuson service center.
- Disconnect the negative terminal of the battery if work needs to be performed on the electrical system.
- Do not allow the machine not be serviced, repaired or test-driven by unauthorized personnel.
- 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.
- Wear a safety harness when performing elevated maintenance work. Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice.
- Do not use the work equipment as lifting platforms for persons.

2.13 Special Hazards

Electrical energy

- Use only original fuses with the specified current rating.
- In case of electrical system malfunctions, stop the machine immediately, disconnect the battery (for example, by using the battery master switch), and perform troubleshooting procedures.
- Work on the electrical system may only be performed by a technician with appropriate training, in accordance with the applicable electrical engineering codes.
- Inspect and check the electric 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 electrical system or when performing welding work.
- Starting the machine with a battery jumper cable can be risky if performed improperly. Observe the safety instructions regarding the battery.

Underground electric lines

- Before starting any work, the machine operator must ensure that there are no lines in the work area.
- If you are not sure, contact the person in charge at the network operator.
- If there are lines, take the following safety measures:
  - Mark the position and path of the lines unambiguously.
  - Fasten, support or secure exposed lines.
  - Safely fasten lines if vibration or shocks to these lines must be avoided.

Overhead electric lines

DANGER

Electrical shock hazard.

Risk of fatal injuries or death due to electric shock.

- When operating the machine, maintain a safe distance from overhead electric lines.
- If work must be performed close to overhead lines, the equipment/attachments must be kept well away from them.

Rated voltage (volt)	Safety distance	
	Meter	Foot
Up to 1000 V	1 m	3.3 '
Over 1 kV to 110 kV	3 m	9.8 '
Over 110 kV to 220 kV	4 m	13.1'
Over 220 kV to 380 kV	5 m	16.4 '
Unknown rated voltage	5 m	16.4 '

- If no sufficient distance can be kept to overhead electric lines, the machine operator must take other safety measures, for instance switching off the current, in agreement with the owner or operator of the lines.
- If an energized line is touched nevertheless:
  - Do not leave the machine.
  - Drive the machine out of the area.
  - Warn others against approaching and touching the machine.
  - Have the live wire de-energized.
  - Do not leave the machine until the line that has been touched or damaged has been safely de-energized.

Gas, dust, steam, smoke

- Operate the machine only on adequately ventilated premises. Before starting internal combustion engines or operating fuel-operated heating systems on enclosed premises, ensure that there is sufficient ventilation. Observe the regulations in force at the respective site.
- Welding, burning and grinding work on the machine may only be performed by a Wacker Neuson dealer.

- Before performing welding, flame-cutting and grinding work, clean the machine and its surroundings from dust and other inflammable substances, and ensure that the premises are adequately ventilated – risk of explosions.
- In areas with special hazards (for example, toxic gases, caustic vapors, toxic environments), carry appropriate protective equipment (breathing filters, protective clothing).

Hydraulics

- Work on the hydraulic equipment of the machine must be performed only by persons having specific technical knowledge and experience in hydraulic systems.
- Check all lines, hoses, fittings, and threaded couplers regularly for leaks and obvious damage. Repair any damage and leaks immediately. Splashed oil can cause injury and fire.
- In accordance with the Operator's Manual for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) to be opened before performing any implementing/repair work.
- Hydraulic and compressed-air lines must be laid and fitted properly. Ensure that no connections are interchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements.

Noise

- Close all doors and windows if practical.
- Removing sound baffles on the machine during operation is prohibited.
- Wear ear protectors. This is especially important when performing hammer operations or 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)).

- Be careful when handling hot consumables – risk of burning.
- When using the machine in contaminated areas, take appropriate measures for the protection of the operator and the machine.

Battery

- When handling the battery observe the specific safety instructions and regulations relevant to accident prevention. Batteries contain caustic sulphuric acid.
- 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.
  - Dispose of the battery immediately.
- A potentially combustible oxygen-hydrogen mixture forms in batteries during normal operation and especially when charging. Always wear gloves and eye protection when working with batteries.

Tracks (Track dumpers)

- Check track tension at regular intervals.
- Repair work on the tracks must be performed by technical personnel or by Wacker Neuson dealers only!

- Damaged or malfunctioning tracks reduce the machine's operational safety. Check the tracks regularly for:
  - Cracks, cuts or other damage.
  - Check track tension at regular intervals.

Tires (Wheel dumpers)

WARNING

Special hazard during reinflation.

Risk of serious injury or death.

- Reinflation of any type or tire/rim assembly that has been operated in a run-flat or underinflated condition (80% or less of recommended pressure), can result in serious injury or death. The tire may be damaged on the inside and can explode while you are adding air. The rim parts may be worn, damaged or dislodged and ca explosively separate.
- NEVER rework, weld, heat, or braze the tire/wheel/rim. Heating the rim of tire/wheel/rim assembly can cause a tire to explode.
- The use of any flammable material during tire servicing is absolutely prohibited. Use of starting fluid, ether, gasoline or any other flammable material to lubricate, seal or seat the beads of a tubeless tire can cause the tire to explode or can cause the explosive separation of the tire/rim assembly.
- NEVER hammer, strike or pry on any type of tire/rim assembly while the tire contains inflation pressure. Do not attempt to seat any part while the tire contains any inflation pressure.

- Repair work, maintenance work and exchange on the tires must be performed by a qualified technician or by a Wacker Neuson service center only.
- Always use specialized tools as recommended by tire suppliers for mounting and demounting of tires.
- Repairable damage must be repaired before placing tire back into service. Tires with unrepairable damage should be destroyed.
- Damaged tires and/or wrong tire pressures reduce the operational safety of the machine. Check the tires regularly:
  - for the prescribed tire pressure and
  - for damage.
- Always clean and inspect rim.
- Never substitute an innertube for a permissible or non-permissible repair.
- Always replace a tire with one having the same rim diameter designation and suffix letters.
- Always use new tubes in new tires.
- Always use radial tubes with radial tires.
- never use a tube in a casing larger or smaller than that for which the tube was designed by the manufacturer.
- Always check to be sure tube is clean before installing in tire.
- Always inspect valve for proper air retention.
- Always use sealing valve caps to prevent loss of air or fluid.
- Do not inflate tires with inflammable gas – risk of explosion.

- Perform regular checks of the wheel nuts for tightness, however after 600 service hours at the latest. Subsequent to changing tires check the wheel nuts after 10 service hours – tighten if necessary.

2.14 Safety Guidelines while using Internal Combustion Engines

WARNING

Special hazard during operation and fueling.

Risk of severe injury or death.

- Read and follow the warning instructions and the safety guidelines below.

Running the engine

When running the engine:

- Keep the area around the muffer and 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.
- 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 exhaust 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 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.
- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near an open flame
- Use suitable mounting points and load-securing devices.
- The recommissioning procedure must be strictly in accordance with the Operator's Manual.

3 Operation

This chapter describes the controls and contains information on the function and handling of the indicator lights and warning lights and controls on the control stand.

The pages stated in the table refer to the description of the controls.

A combination of digits, or a combination of digits and letters (for example 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.

The symbols used in the description have the following meanings:

- Identifies a list.
  - Subdivision within lists or an activity. Follow the steps in the recommended order.

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

➥ Description of the effects or results of an activity.

“Option” is stated whenever controls or other components of the machine are installed as an option.

3.1 Control stand overview

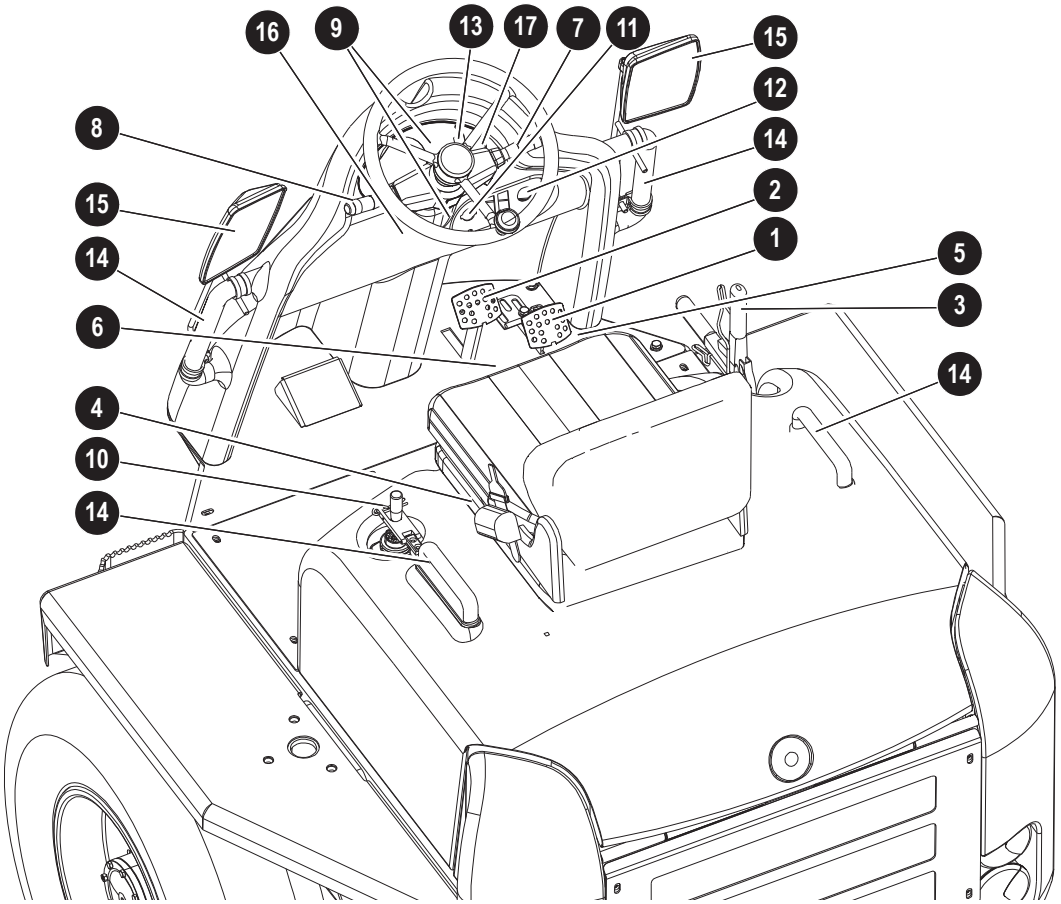


Fig. 40: Rollbar and front chassis not included in this figure for a clearer graphic representation (symbolic representation).

Pos.	Designation
1	Accelerator pedal
2	Service brake
3	Parking brake
4	Seat/backrest adjustment lever
5	Lever for horizontal seat adjustment
6	Adjusting wheel for seat weight adjustment
7	Right-hand multifunctional lever
8	Left-hand multifunctional lever
9	Display element
10	Skip control lever
11	Starter
12	Hazard warning switch (option) (Yanmar)
13	Low speed switch (turtle) (Yanmar)
14	Handhold
15	Rearview mirrors (option)
16	Hazard warning switch (option) (Perkins)
17	Pushbutton switch for particulate filter regeneration (option) (Perkins)

3.2 Overview of cabin control stand (option)

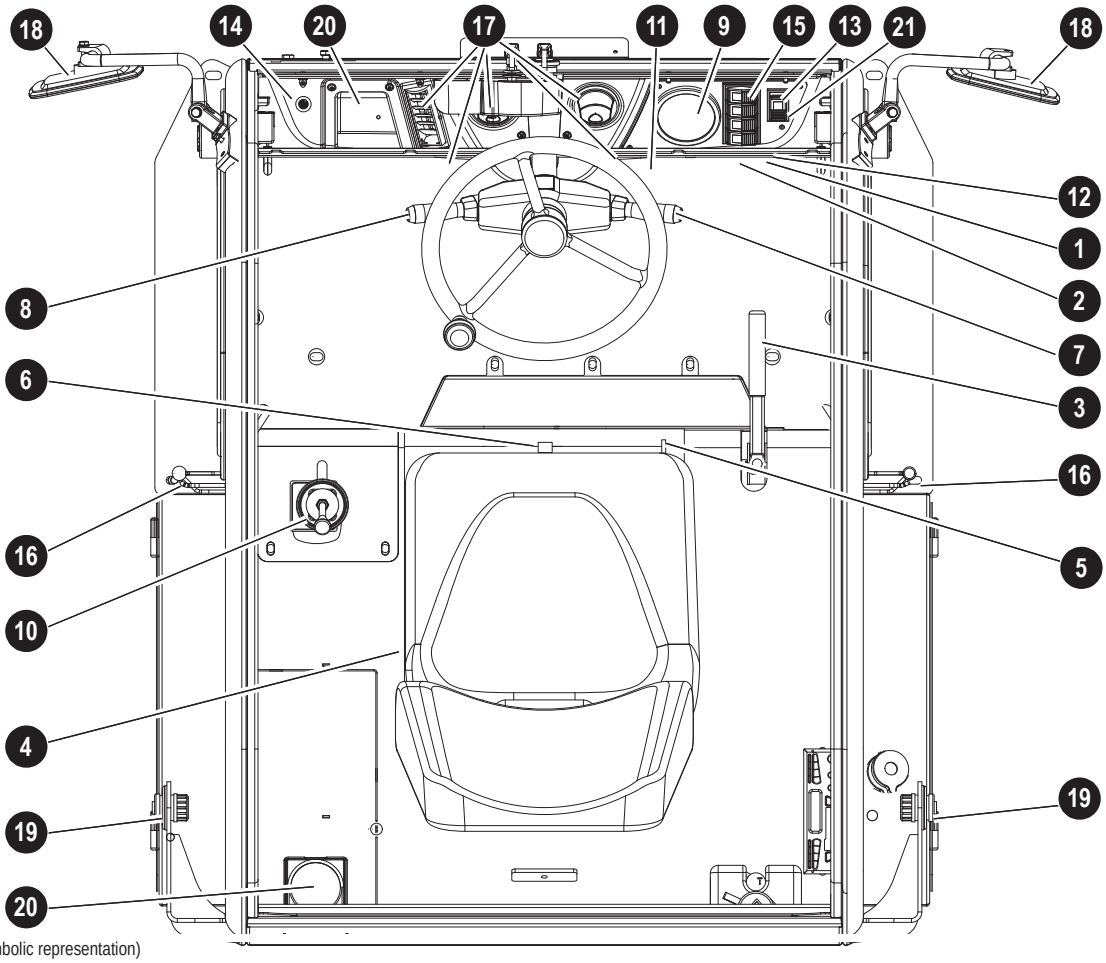
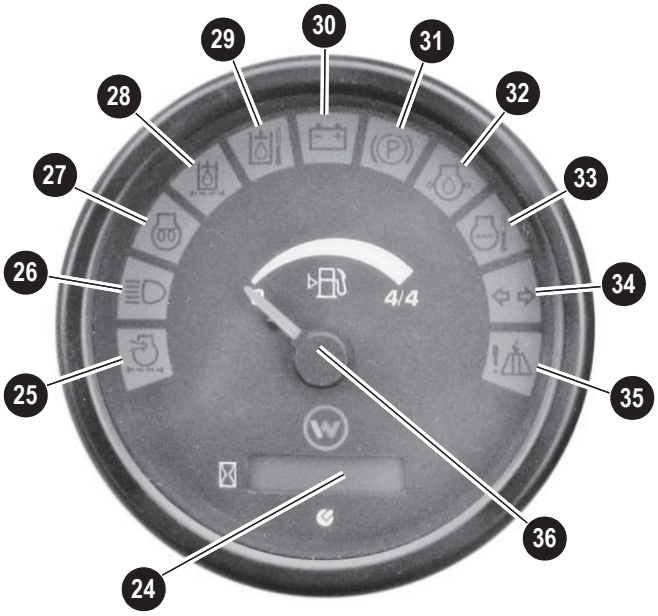
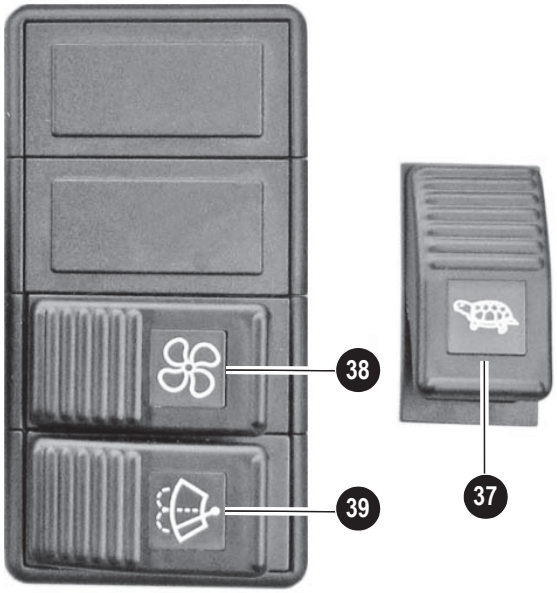


Fig. 41: (symbolic representation)

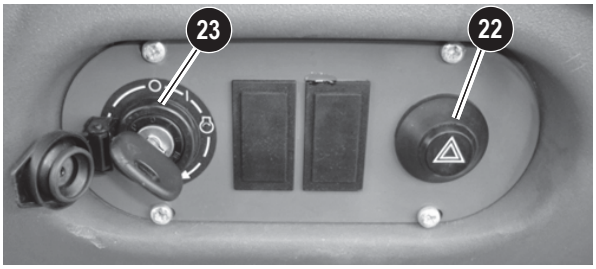
Pos.	Designation
1	Accelerator pedal
2	Service brake
3	Parking brake
4	Seat/backrest adjustment lever
5	Lever for horizontal seat adjustment
6	Adjusting wheel for seat weight adjustment
7	Right-hand multifunctional lever
8	Left-hand multifunctional lever
9	Display element
10	Skip control lever
11	Starter
12	Hazard warning switch (option)
13	Low speed switch (turtle) (Yanmar)
14	Heating/ventilation temperature controller
15	Switch panel
16	Handhold
17	Air vents
18	Rearview mirrors (option)
19	Door arresters
20	Drinks holder, storage compartment
21	Pushbutton switch for particulate filter regeneration (option) (Perkins)

3.3 Instrument panel overview (Yanmar)

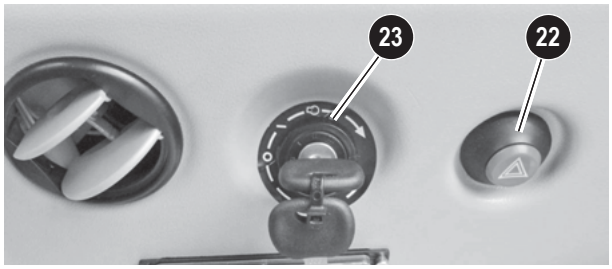




Machine with rollbar



Machine with optional cabin



Pos.	Designation
22	Hazard warning switch (option)
23	Starter
24	Hour meter
25	Not assigned
26	Indicator light (blue) – high beam
27	Indicator light (yellow) – cold starter
28	Indicator light (red) – hydraulic oil filter
29	Not assigned
30	Indicator light (red) – alternator charge function
31	Indicator light (red) – parking brake
32	Indicator light (red) – engine oil pressure
33	Indicator light (red) – coolant temperature
34	Turn indicator light (green)
35	Not assigned
36	Fuel level indicator
37	Low speed switch
38	Heating/ventilation switch (with optional cabin)
39	Wipe/wash switch (with optional cabin)

3.4 Overview of indicator lights and warning lights (Yanmar)

Indicator light (blue) – high beam

Illuminates if high beam is on.

Indicator light (yellow) – cold starter

Illuminates if the key in the starter is in position **2**.

The air in the combustion chamber of the engine is preheated when the key is in this position.

The indicator light goes out as soon as preheating temperature is reached (15 – 20 sec).

Indicator light (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 a Wacker Neuson service center.*

☞ *The indicator light can illuminate briefly if the hydraulic oil is cold, but goes out again once operating temperature is reached.*

Indicator light (red) – alternator charge function

The V-belt is malfunctioning or there is an error in the charging circuit of the alternator if the indicator light illuminates with the engine running. The battery is no longer charged.

NOTICE

The coolant pump no longer runs if the V-belt is faulty. Danger of engine overheating or breakdown.
If the indicator light illuminates with the engine running:

- Stop the engine immediately and
- Have the cause repaired by a Wacker Neuson service center.

Indicator light (red) – parking brake

Illuminates if the parking brake is applied.

In this case:

☞ *Actuate the parking brake lever to release the parking brake.*

Indicator light (red) – engine oil pressure

Illuminates if the engine oil pressure is too low.

In this case:

☞ *Stop the machine.*

☞ *Stop the engine immediately and check the oil level.*

The indicator light illuminates when the ignition is turned on and goes out as soon as the engine runs.

Indicator light (red) – coolant temperature

Illuminates if the coolant temperature is too high.

Stop and park the machine.

WARNING

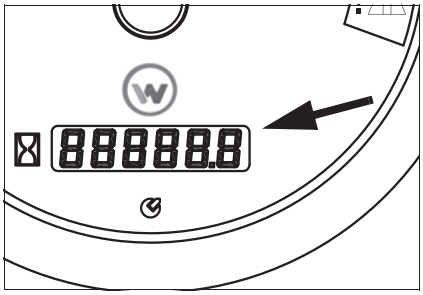
Burn Hazard! The engine coolant is under pressure at high temperature.
Can cause serious injury or death.

- Wear protective gloves and eye protection.
- Let the engine cool down.
- Open the cap to the first notch and release the pressure.

Turn indicator light (green)

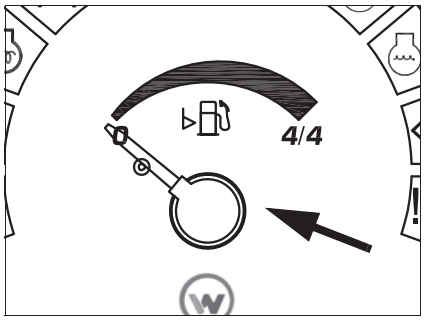
Flashes if the left-hand multifunctional lever is pushed forward or pulled backward, depending on the required direction.

Not assigned



Hour meter

Counts the engine service hours with the engine running.



Fuel level indicator

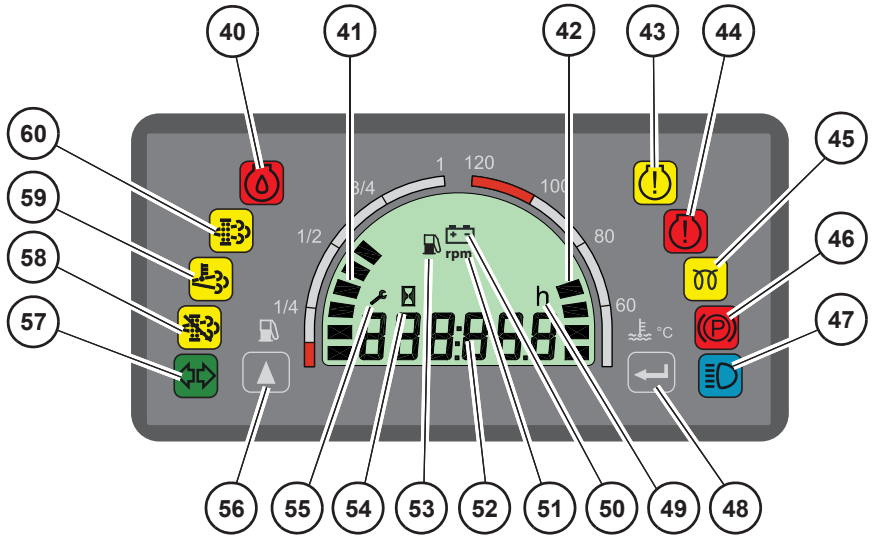
Indicates the remaining amount of fuel in the tank.

- If the fuel level indicator reaches minimum:
  ☞ Refuel immediately.

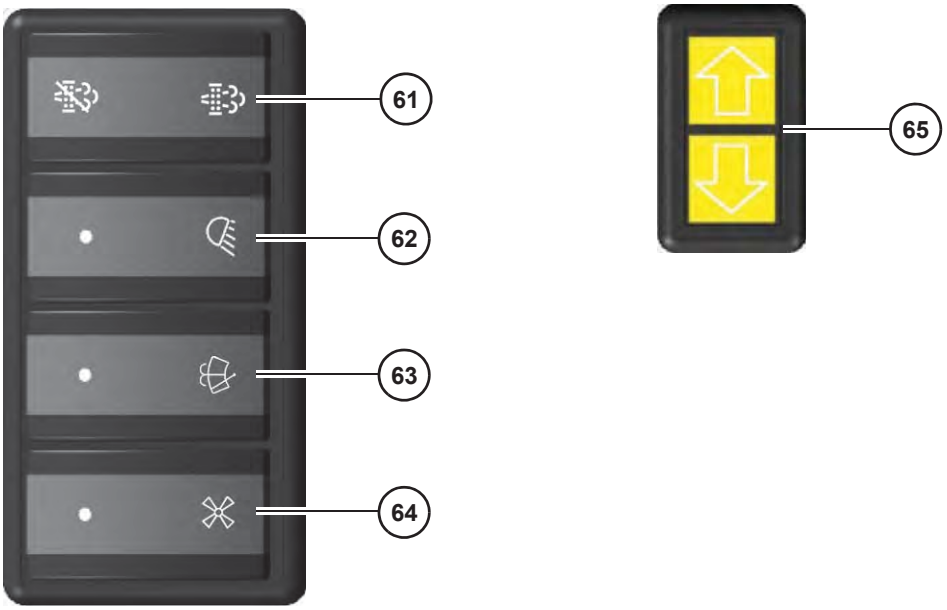
Important

Bleed the fuel system if the fuel tank is run completely empty.

3.5 Overview of display element and switches (Perkins)



Switches (machine with cabin) (option)



Switches (machine with rollbar)

Fig. 42

Designation		See page
40	Engine oil pressure (red)	*3-10*
41	Fuel level indicator	*3-11*
42	Coolant temperature	*3-11*
43	Engine warning light (charge indicator light, hydraulic oil filter, air filter dirt indicator) (yellow)	*3-10*, *3-10*, *3-11*
44	Engine stop (red)	*3-13*, *3-73*
45	Preheating (yellow)	*3-11*
46	Parking brake (red)	*3-11*, *3-26*
47	High beam (blue)	*3-11*, *3-38*
48	For Wacker Neuson service center	--
49	Hours	--
50	Charge indicator light	*3-10*
51	Engine speed	*3-12*
52	Display: hour meter/maintenance meter/engine speed/speed (not assigned)	--
53	Low-fuel warning display	*3-11*
54	Service hours	--
55	Maintenance meter	*3-12*
56	Changeover: hour meter/maintenance meter/engine speed/speed (not assigned)	*3-11*
57	Turn indicators (green)	*3-11*, *3-37*
58	Regeneration disabled (yellow)	*3-74*, *3-73*
59	Exhaust-gas temperature (yellow)	*3-74*
60	Regeneration required (yellow)	*3-74*
61	Regeneration pushbutton switch	*3-74*
62	Roof lights switch (optional with cabin)	*3-40*
63	Wipe/wash switch (optional with cabin)	*3-44*
64	Fan switch (optional with cabin)	*3-43*
65	Indicator light: forward/reverse travel enabled (yellow)	*3-37*

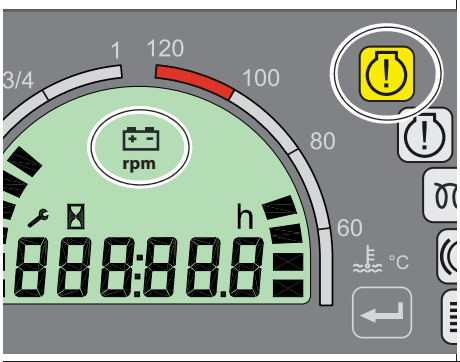
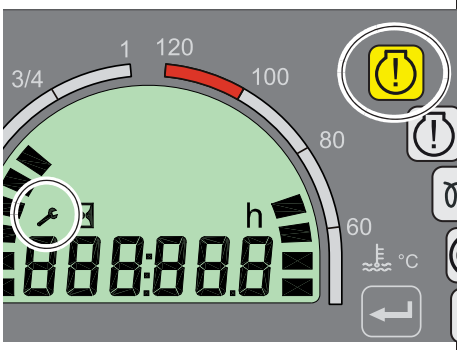
3.6 Overview of indicator lights and warning lights (Perkins)

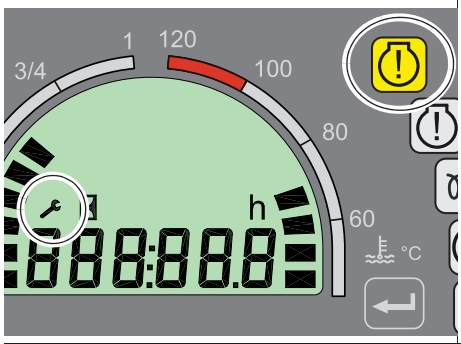
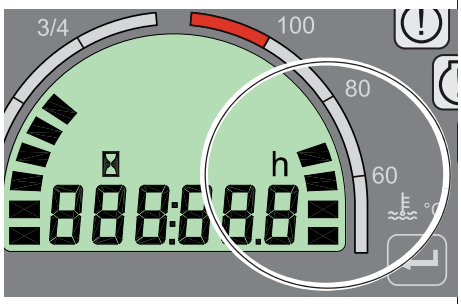
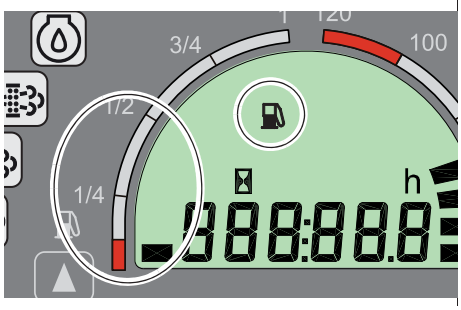
Display element

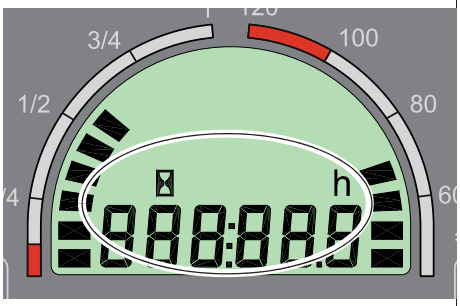
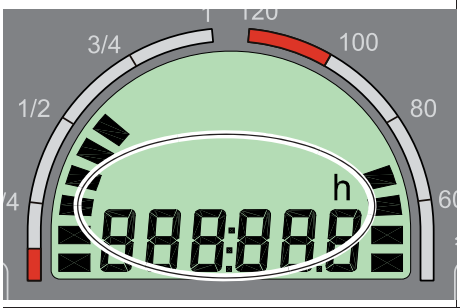
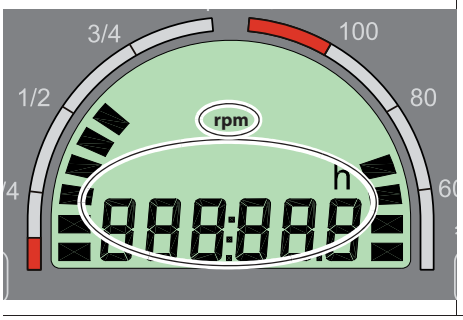
The display element provides information on the operating state and malfunctions.

Important

After switching on starter, the indicator lights are checked during the first 2 seconds. During this time the current reading of the maintenance meter is displayed. Then the service hours are automatically displayed.

Symbol	Designation
	**Engine oil pressure** The indicator lights: engine oil pressure (red), engine warning light (yellow) and engine stop (red) illuminate. • Stop the engine immediately and check the oil level. • If the engine oil level is correct, contact a Wacker Neuson service center. **Note:** The indicator lights illuminate when the starter is turned on and go out as soon as the engine runs. At low temperatures, the red indicator light for the engine oil pressure can illuminate a few seconds after the engine is started.
	**Charge indicator light** This indicator light (yellow) and the symbol illuminate if the electrical system has a malfunction. The battery is no longer or insufficiently charged. **Note:** The indicator light illuminates if a specific value is too low. This indicator light also illuminates if the starting key is turned to position 2. The indicator light goes out after the engine is started. Increase engine speed if the indicator light illuminates. The electrical system works if the indicator light of the electrical system goes out within one minute. Contact a Wacker Neuson service center if the indicator light does not go out.
	**Hydraulic oil filter** The indicator light (yellow) and the wrench symbol illuminate if the hydraulic oil filter has to be replaced. In cold weather the indicator light can illuminate immediately when the engine is started. Warm up the machine at low engine speed and little load. Contact a Wacker Neuson service center if the indicator light does not go out.

Symbol	Designation
	**Air filter dirt indicator light** The indicator light (yellow) and the wrench symbol illuminate if the air filter is dirty and has to be replaced. • Stop and park the machine. • Stop the engine. Check air filter and replace it if necessary. **Important** The indicator light illuminates if the hydraulic oil filter or air filter is dirty.
	**Preheating** The indicator light (yellow) illuminates if the starting key is in position 2. The indicator light goes out after 4 seconds and the engine can be started. (Air is preheated.) Contact a Wacker Neuson service center if the indicator light does not go out.
	**Parking brake** The indicator light (red) illuminates if the parking brake is applied.
	**High beam** The indicator light (blue) illuminates if high beam is switched on.
	**Changeover between hour meter/maintenance meter/engine speed/speed (not assigned)**
	**Turn indicators** The indicator light (green) illuminates when the left or right turn indicators are operated.
	**Coolant temperature** Indicates the current coolant temperature of the engine. The indicator light illuminates if the segments reach the red range. • Let the engine run at idling speed without any load. • Wait until the temperature drops and the indicator light goes out. • Stop the engine. • Check the coolant level.
	**Fuel level indicator** Indicates the remaining amount of fuel in the tank. The tank symbol is displayed in addition when the last segment is reached. • Refuel.

Symbol	Designation
	**Hour meter** Counts the engine service hours with the engine running. The hour meter is used for specifying the maintenance intervals.
	**Maintenance meter (service hours up to next servicing)** The maintenance meter starts at 500.0 hours. It counts down to 0.0 hours. A wrench symbol flashes as soon as the maintenance meter reaches this value. The meter keeps on counting down (−0.1 hours, −0.2 hours, etc.).
	**Engine speed** Indicates the current engine speed.

Engine indicator lights

Engine warning light	Engine stop	Indicator light status	Engine status
 (yellow)	 (red)	After switching on ignition, the indicator lights are checked during the first 2 seconds (yellow and red).	The engine does not run.
 (grey)	 (grey)	No Faults Present.	The engine runs.
 (yellow)	 (grey)	The indicator light (yellow) illuminates during operation. • The battery is no longer or insufficiently charged. • The indicator light illuminates if the air filter is dirty. • The indicator light illuminates if the hydraulic oil filter is dirty.	The engine runs. An error has occurred, or the filters are dirty.
 (yellow)	 (grey)	The indicator light (yellow) flashes during engine operation.	Reduced engine output. Have the error repaired by a Wacker Neuson service center.
 (yellow)	 (red)	The indicator light (yellow) flashes and the indicator light (red) illuminates.	Stop the engine immediately. Serious error. Have the error repaired by a Wacker Neuson service center.

Engine and particulate filter indicator lights

– *see chapter* *Engine and particulate filter indicator lights* on page 3-73

3.7 Putting into operation

Safety instructions

- Use only the footholds and handles to access and leave the machine.
- Never use the controls or movable lines and cables as handles.
- Never get on or off during machine travel or machine operation! Never jump off the machine.
- Operation with a lowered rollbar is prohibited.
- The machine may only be operated from the operator seat and with the seat belt fastened.

Putting the machine into operation for the first time

Important information

- The machine may only be put into operation by authorized personnel – *see chapter 2.6 Operator and Technician Qualifications and Basic Responsibilities* on page 2-4 and – *see chapter 2 Safety Information* on page 2-1 of this Operator's Manual.
- The personnel must have read and understood this Operator's Manual before putting the machine into operation.
- The machine may only be used in technically perfect condition in accordance with its designated use and the instructions set forth in the Operator's Manual, and only by safety-conscious 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 50 operating hours.

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 change engine speed abruptly.
- Avoid abrupt acceleration, braking and changing traveling direction.
- Do not run the engine at high speed for extended periods.
- Avoid using the machine under heavy loads and/or at high speeds.
- Strictly observe the maintenance schedules in the appendix – *see chapter 5.20 Maintenance plan (overview – Yanmar)* on page 5-51.

3.8 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 work listed below is described in greater detail in the following chapters.

If the answer to one of the following questions is NO, first rectify the cause of the fault before the machine can be put into operation.

Start-up checklist

Check the following points before putting the machine into operation or starting the engine:

No.	Question	✔
1	Enough fuel in the tank? (➠ *5-4*)	
2	Coolant level OK? (➠ *5-14*)	
3	Water drained from the fuel filter? (➠ *5-8*)	
4	Engine oil level OK? (➠ *5-10*)	
5	Oil level in hydraulic oil reservoir OK? (➠ *5-26*)	
6	Water level in washer tank OK? (➠ *3-44*)	
7	Lubrication points greased? (➠ *5-46*)	
8	Lights, signals, indicators, warning lights and indicator lights OK?	
9	Tires checked for cracks, cuts etc. ? (➠ *5-31*)	
10	Dirt (for example mud, snow, ice, etc.) removed from all windows, mirrors (option), lights, footholds, pedals and control levers?	
11	Are all mirrors (option) functional and adjusted correctly? (➠ *3-51*) Are other persons required to guide you?	
12	Engine and tank covers safely locked? (➠ *3-53*, *5-5*)	
13	Especially after cleaning, maintenance or repair work: ➥ Rags, tools and other loose objects removed?	
14	Seating position adjusted correctly? (➠ *3-47*)	
15	Rollbar raised and locked? (➠ *3-55*)	
16	Seat belt fastened? (➠ *3-49*)	

Operation checklist

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

No.	Question	✔
1	Indicator lights for engine oil pressure and alternator charge function gone out? (➠ *3-5*)	
2	Indicator light for the engine coolant temperature does not illuminate? (➠ *3-6*)	
3	Accelerator and brake pedals working correctly? (➠ *3-18*, *3-26*)	
4	Anyone in the danger zone of the machine?	

Parking checklist

Check and observe the following points when parking the machine:

No.	Question	✔
1	Skip lowered?	
2	Right-hand multifunctional lever in neutral position?	
3	Parking brake applied?	
4	Starting key removed?	
5	Cabin locked, especially if the machine cannot be supervised?	
When parking on public roads:		
6	Machine adequately secured? Machine secured in addition with a chock to prevent it from rolling away?	
When parking on slopes:		
7	Machine adequately secured? Machine secured in addition with a chock to prevent it from rolling away?	

Road travel accessories (option)

Scope of delivery of road travel accessories:

- Headlights and rear lights
- Turn indicators and clearance lights
- Reversing light and reflectors
- Numberplate console and light
- Wheel chock
- Control lever lock

Backup warning system (option)

The backup warning system sounds when traveling backward.

WARNING

Accident hazard during traveling backward!
Can cause serious injury or death.

- Do not allow anyone to stay in the danger zone.
- Do not rely on the backup warning system under any circumstances.
- If the backup warning system does not sound, stop machine operation immediately and get in touch with a Wacker Neuson service center (observe the relevant national regulations).

3.9 Machine travel

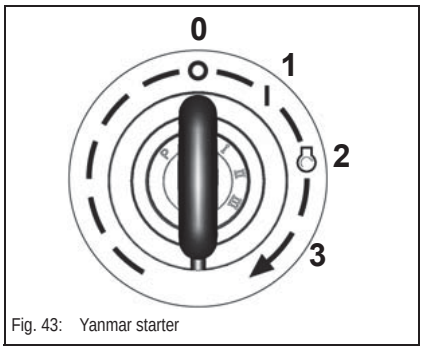


Fig. 43: Yanmar starter

Yanmar

Position	Function	Power consumer
0	Insert or remove the starting key	-
1	ON/travel position	All functions are operational ➥ Indicator lights illuminate ➥ Rotating beacon illuminates (option)
2	Preheats the engine (10 – 15 seconds)	➥ Until the indicator light for the cold starter goes out
3	Starts the engine	➥ Starter is actuated ➥ Indicator lights must go out

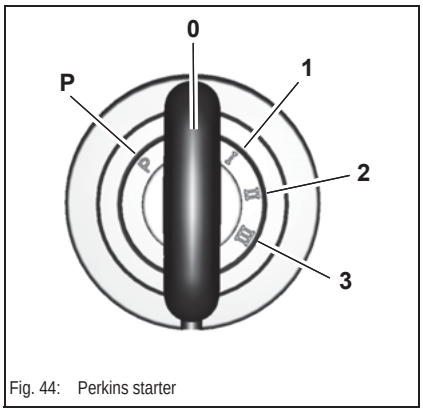


Fig. 44: Perkins starter

Perkins

Position	Function	
P	Park position	Not assigned
0		Insert or remove the starting key
1	Travel position	All electric functions are enabled
2	Preheats the engine	Preheater active
3	Starts the engine	Starter is actuated

Accelerator pedal (Yanmar)

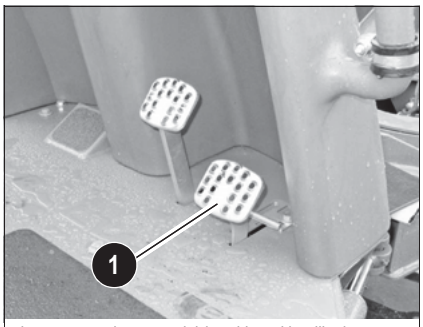


Fig. 45: Accelerator pedal (machine with rollbar)

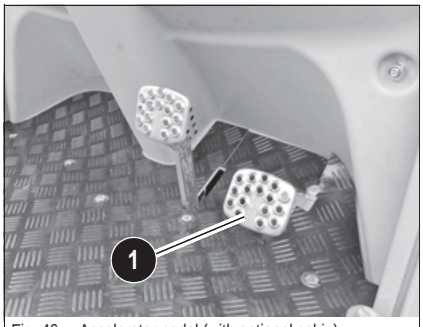


Fig. 46: Accelerator pedal (with optional cabin)

The accelerator pedal **1** controls the engine speed as follows:

- Speed can be set continuously with the accelerator pedal.

☞ Press down the accelerator pedal:

➥ Engine speed rises

☞ Reduce the pressure on the accelerator pedal:

➥ Engine speed is reduced

Accelerator pedal (Perkins)

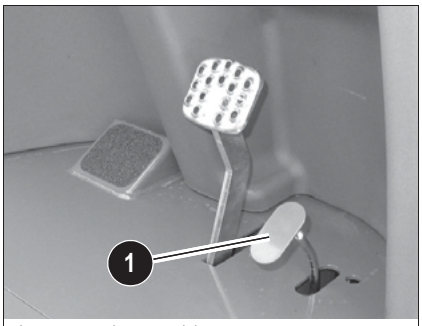


Fig. 47: Accelerator pedal

The accelerator pedal **1** controls the engine speed as follows:

- Speed can be set continuously with the accelerator pedal.

  ☞ Press down the accelerator pedal:

  ➥ Engine speed rises

  ☞ Reduce the pressure on the accelerator pedal:

  ➥ Engine speed is reduced

Before starting the engine

Important

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

Important

Operate the machine only on adequately ventilated premises. Ensure sufficient ventilation on enclosed premises.

☞ *Adjust your seating position – see Seat on page 3-47.*

☞ *Adjust the mirrors (option) – see Mirrors (option) on page 3-51.*

☞ *Fasten your seat belt – see Seat belt on page 3-49.*

- Do not fasten your seat belt if the rollbar is not raised!

Important

Machine operation with the rollbar lowered is prohibited
– see chapter Operation with lowered rollbar on page 2-9.

☞ *Check whether all levers and pedals are in neutral position.*

☞ *Press the accelerator pedal half-way through if the engine is cold.*

☞ *Remove dirt (for example mud, snow, ice, etc.) from all windows (option), mirrors (option), lights, footholds and pedals.*

Starting the engine: general

The starter cannot be actuated if:

- the engine is already running (start repeat interlock).
- the parking brake is not applied.
- the brake pedal is not pressed (Perkins).

Procedure

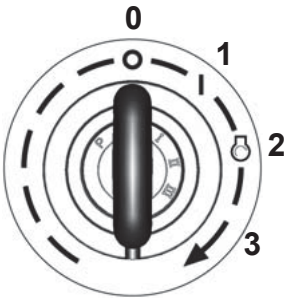


Fig. 48: Yanmar starter

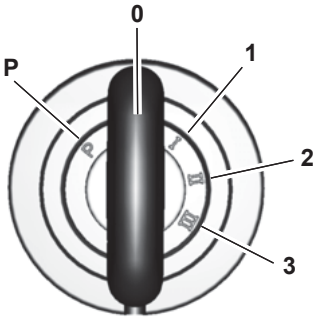


Fig. 49: Perkins starter

Important

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

After you have completed the starting preparations:

☞ *Insert the starting key **23**.*

☞ *Press the brake pedal.*

☞ *Turn the starting key to position "**1**".*

☞ *Check whether all indicator lights illuminate.*

☞ *Have malfunctioning indicator lights immediately replaced by a Wacker Neuson service center.*

☞ *Turn the starting key to position "**2**" and hold it in this position for a max. 15 seconds.*

➥ The intake air is preheated.

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

➥ If the engine does not start after 15 seconds.

☞ Stop starting the engine and try again after 30 seconds.

➥ If the engine still does not start after the second try.

☞ Contact a Wacker Neuson service center for troubleshooting.

- As soon as the engine runs:

☞ *Release the starting key.*

☞ *Check whether all indicator lights have gone out.*

Jump-starting the engine (supply battery)

Safety instructions

- Never jump-start the engine if the battery of the machine is frozen
  ➥ Explosion hazard.
  ☞ Dispose of a frozen battery.
- The machine with the discharged battery must not touch the jump-starting vehicle when connected with jump leads.
  ➥ Risk of sparking.
- The external power source must deliver 12 V; higher supply voltages will damage the electrical system of the vehicles.
- Use only authorized jump leads which conform to the safety requirements and which are in perfect condition.
- The jump lead connected to the positive **+** terminal of the starting battery must never be brought into connection with electrically conductive vehicle parts.
  ➥ Risk of short circuit.
- Route the battery jumper cables so they cannot catch on rotating components in the engine compartment.

Procedure

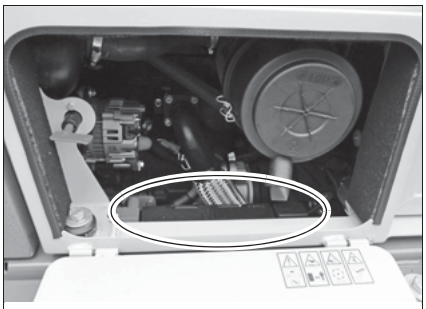


Fig. 50: Maintenance access (with optional cabin)

Important

The battery can be accessed by opening the engine cover, or via the right-hand maintenance access (machine with optional cabin).

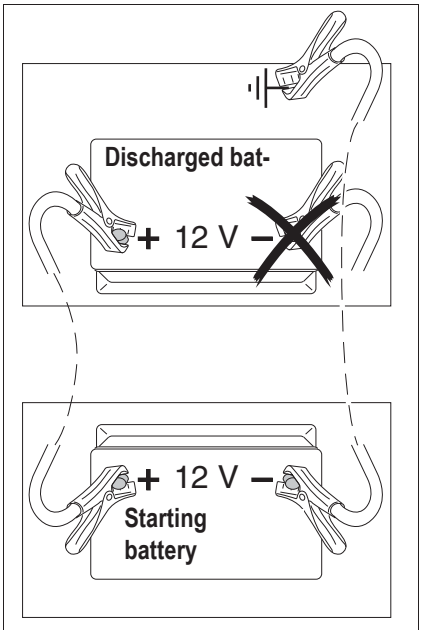


Fig. 51: Starting with a battery jumper cable

☞ *Drive the jump-starting vehicle close enough to the machine with the discharged battery 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 discharged 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 (–) to a solid metal component fimly screwed on the engine block or onto the engine block itself. Do not connect it to the negative terminal of the discharged battery, as otherwise explosive gas emerging from the battery can ignite if sparks are formed.*

☞ *Start the engine of the machine with the discharged 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.*

Starting at low temperatures

☞ *Turn the starting key to position "**1**".*

☞ *Check whether all indicator lights illuminate.*

☞ *Have malfunctioning indicator lights immediately replaced by a Wacker Neuson service center.*

☞ *Turn the starting key to position **2** and hold it in this position for a max. 15 seconds.*

➥ Engine is preheated.

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

➥ If the engine does not start after 15 seconds.

☞ Stop starting the engine and try again after about 30 seconds.

➥ If the engine still does not start after the second try.

☞ Contact a Wacker Neuson service center for troubleshooting.

- As soon as the engine runs:

☞ *Release the starting key.*

☞ Check whether all indicator lights have gone out.

Important

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

When the engine has started

☞ *Check whether all indicator lights have gone out.*

☞ *Let the engine warm up.*

At cold temperatures:

☞ *Increase the engine speed slowly.*

☞ *Do not run the engine at full load until it has reached its operating temperature.*

Engine warm-up

- Once it has started, let the engine warm up at slightly increased idling speed.
- Run the engine without load during the warm-up phase (right-hand multifunctional lever in neutral position).
- During the warm-up phase, check for unusual noise, exhaust color, leaks, malfunctions or damage.
- In case of malfunctions, damage or leaks.

☞ Park and secure the machine, and find out the cause for the damage and have it repaired.

3.10 Preparing for traveling on public roads

- The machine is subject to the applicable legal regulations of your country.
- Also observe the applicable regulations for accident prevention of your country.

Drive position

Fig. 52: Travel position

Checks before traveling on public roads

☞ *Stop the engine*
☞ *Apply the parking brake.*
☞ *Check the operator seat for correct adjustment.*
☞ *Check the road travel accessories (option) for completeness and correct function.*
☞ *Check the light system (option) for correct function.*
☞ *Check the hazard warning system (option) for correct function.*
☞ *Check the mirrors (option) for correct adjustment.*
☞ *Check the condition of the wheel chock (option).*
☞ *Move the traveling direction lever to neutral.*
☞ *Check the brake system for correct function.*
☞ *Check the tires for correct inflation pressure.*
☞ *Set the right-hand multifunctional lever to neutral position.*
☞ *Set the skip to base position.*
☞ *Secure the load adequately.*
- *Remove dirt from the controls and loose material.*
- *Ensure that visibility to the front is sufficient.*

Starting machine travel

DANGER

Accident hazard due to incorrectly adjusted travel lever!
Will cause serious injury or death.
- Set the travel lever to the correct position before starting machine travel.
- Slowly press the accelerator pedal to start machine travel!
- Ensure that the surrounding area is clear.

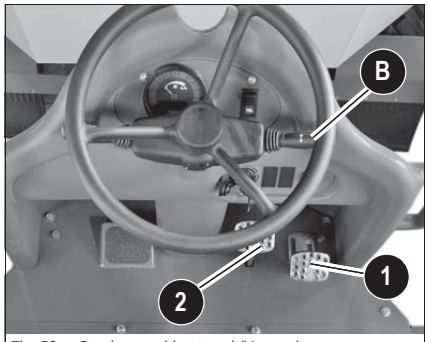


Fig. 53: Starting machine travel (Yanmar)

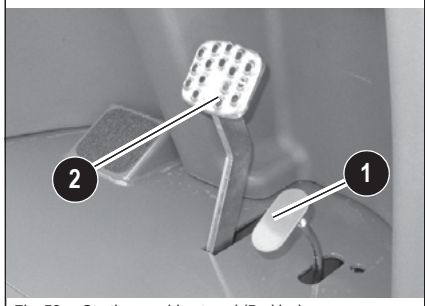


Fig. 53: Starting machine travel (Perkins)

- Start the engine.
- Release the parking brake.
- Select a travel direction with the right-hand multifunctional lever **B**:

☞ *Select the required traveling direction.*

☞ *Start machine travel by pressing accelerator pedal **1**.*

➥ Set the travel speed with accelerator pedal **1** and brake pedal **2**.

- Select another travel direction with the right-hand multifunctional lever **B**:

☞ *Stop the machine.*

☞ *Select the required traveling direction.*

☞ *Start machine travel by pressing accelerator pedal **1**.*

Accelerator pedal

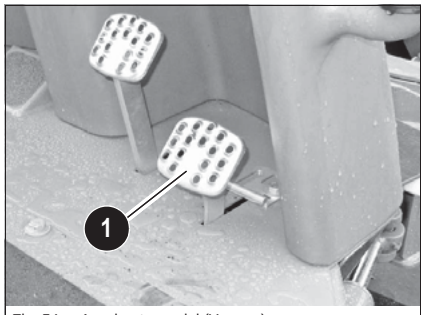


Fig. 54: Accelerator pedal (Yanmar)

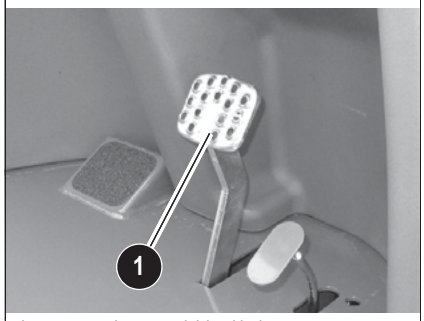


Fig. 54: Accelerator pedal (Perkins)

- Accelerator pedal **1** sets the engine speed.
- During travel operation, the machine is accelerated as speed is increased.
- During skip operation, the skip tilts in or out more rapidly as engine speed is increased.
- The forward or reverse travel speed depends on the position of the accelerator pedal.

Function	
Press the pedal down	Engine speed rises
Reduce the pressure on the pedal	Engine speed is reduced
Release the pedal	Idling speed

Hydraulic service brake

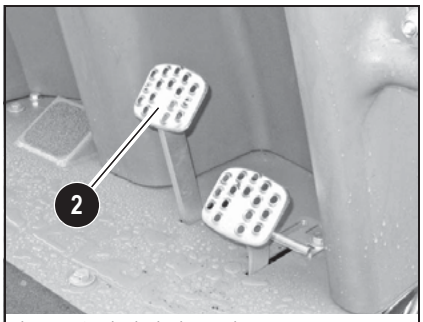


Fig. 55: Service brake (Yanmar)

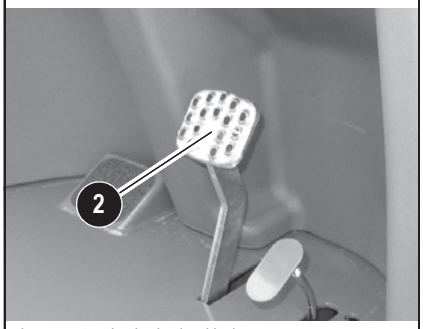


Fig. 55: Service brake (Perkins)

- Hydrostatic automotive drive.
- Hydraulic service brake **2** with fully enclosed wet multdisc brakes in the front axle, braking effect on all four wheels.

Important

Use service brake **2** to slow down the machine as required.

Mechanical parking brake (Yanmar)

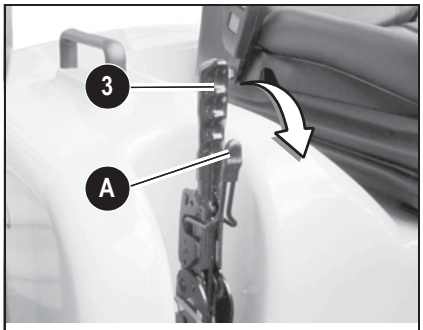


Fig. 56: Parking brake (Yanmar)

The parking brake has a mechanical braking effect on the front axle.

☞ *The parking brake lever **3** is released by unlocking lock **A** and pushing the parking brake lever forward at the same time.*

☞ *The parking brake is applied by pulling the parking brake lever **3** upward.*

Important

- Releasing the parking brake lever by applying too much force can damage the lever.
- Do not use the parking brake as a service brake.

Mechanical parking brake (Perkins)

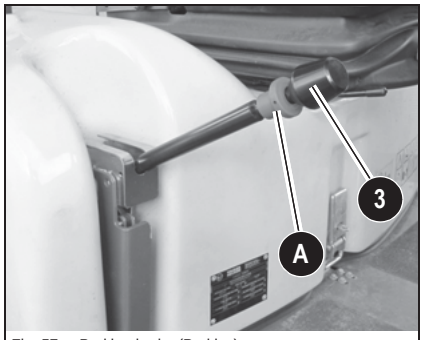


Fig. 57: Parking brake (Perkins)

The parking brake has a mechanical braking effect on the front axle.

☞ *Pull parking brake lever **3** slightly backward, then push lock **A** and parking brake lever **3** forward and release them.*

☞ *The parking brake is applied by pulling the parking brake lever **3** upward.*

Important

- Releasing the parking brake lever by applying too much force can damage the lever.
- Do not use the parking brake as a service brake.

Checking the service and parking brake function

Important

Do not put the machine into operation if a brake test gives a negative result or if there are doubts as to the correct brake function.
Contact a Wacker Neuson service center and have the malfunction rectified.

The following tests are performed to check the brake function on firm, level and horizontal ground. On slopes or in the case of machines with loads, for example, the braking effect of the parking brake may still be insufficient to safely park the machine. If possible, always park the machine without any load and on level ground, and secure it with suitable means (chocks, for example).

Parking brake test

Park the machine on firm, level and horizontal ground. Raise the skip until the front wheels can be fully seen. With the parking brake applied, turn the steering wheel several times to the left and right limits.

➥ The front axle wheels must block when turning the steering wheel.

Service brake test

Start machine travel in the slow speed range and press the brake pedal.

➥ Deceleration must be stronger than when only releasing the accelerator pedal.

Press the brake pedal with maximum force. The brake pedal resistance must remain constant during 30 seconds.

3.11 Operating the machine

General safety instructions

- Never travel up to the edge of a pit from outside – danger of cave-in.
- Do not travel under projecting earth. Stones or the projecting earth can fall onto the machine.
- When working on roofs or similar structures, check the resistance and the structure itself before starting work. The building can collapse, causing serious injury and damage.
- Do not place the machine directly under the workplace during demolition, since debris can break off and fall onto the machine or the building can collapse, causing serious injury or damage.
- Operation of the machine by unauthorized personnel is prohibited.
- The hydraulic system of the machine is still pressurized even when the engine is not running. Release the pressure in the sections of the system and hydraulic lines which are to be opened before starting setup or repair work.
- Before tilting out the skip next to an excavation, secure the machine with suitable wheel chocks or other auxiliary means.
- Always watch the material as you tilt out the skip: ensure that the material is tilt out evenly and does not remain stuck in the skip, otherwise the machine could tip over.
- Do not tilt out the load when working on sloping ground.
- No transporting of persons, animals etc. in the skip.
- Traveling with a tilted-out skip is prohibited.
- Do not perform abrupt, but precise and smooth control movements.
- Do not get off the machine when it is moving.
- Machine operation is only allowed if the rollbar is raised and locked, and if the seat belt is fastened.
- If the machine is equipped with a cabin, operation is only allowed if the cabin is correctly installed and intact, and if the seat belt is fastened.
- Use an external light source in case of poor illumination of the work area. If this is not enough to illuminate the work area sufficiently, stop work and only take it up again if sufficient illumination can be ensured.

3.12 Machine 3001F front skip operation

WARNING

Accident hazard during traveling with a tilted-out skip!

Can cause serious injury or death.

- Traveling with a tilted-out skip is prohibited.
- Material that sticks in the skip may be tilted out only to the front in the straight position of the machine.
- Before tilting out the skip, keep a safe distance from buildings or the edges of building pits.
- Secure the edge of the pit with a wooden beam anchored in the ground.

NOTICE

Lowering the skip too rapidly and knocking it against the chassis can cause damage.

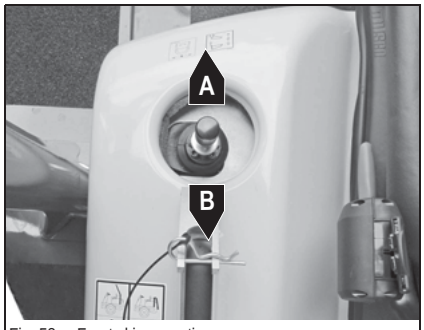


Fig. 58: Front skip operation

The working speed of the skip is set with the travel of the control lever and with the accelerator pedal.

Turn the skip to the required position before tilting out the skip.

Position	Lever	Function
A	Lever pushed forward	Tilts out the skip
B	Lever to the rear	Lowers the skip

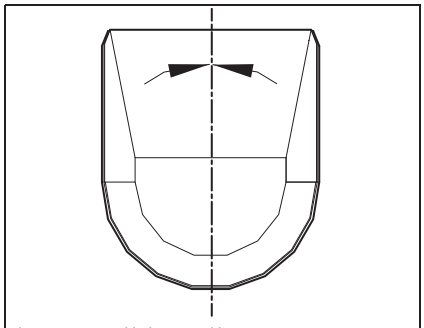


Fig. 59: Front skip base position

Base position

- The base position of the skip is the position in which the skip is in center position.

3.13 Machine 3001S swivel skip (option) operation

WARNING

Accident hazard during traveling with a tilted-out skip!

Can cause serious injury or death.

- Traveling with a tilted-out skip is prohibited.
- Material that sticks in the skip may be tilted out only to the front in the straight position of the machine.
- Before tilting out the skip, keep a safe distance from buildings or the edges of building pits.
- Secure the edge of the pit with a wooden beam anchored in the ground.

NOTICE

Lowering the skip too rapidly and knocking it against the chassis can cause damage.

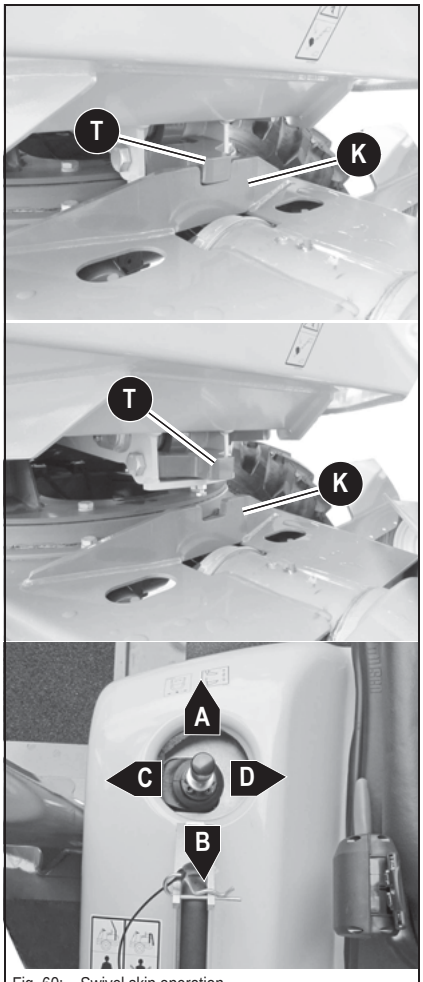


Fig. 60: Swivel skip operation

Set the skip to the required position before tilting out the skip.

Position	Lever	Function
A	Lever forward	Tilts out the skip
B	Lever to the rear	Lowers the skip
C	Lever to the left	Skip swivels to the left
D	Lever to the right	Skip swivels to the right

Swiveling the skip:

- Before swiveling the skip, raise it until swivel lock **T** is raised from lock **K**.
- The skip can then be swivelled.

Base position

- The base position of the skip is the position in which the skip is in center position ancenterd in which swivel lock **T** engages in lock **K**.

Emergency lowering

WARNING

Crushing hazard during lowering the skip!

Can cause serious injury or death.

- Do not allow anyone to stay in the danger zone.

☞ *Only operate the machine from the operator seat with the seat belt fastened.*

☞ *The skip can be lowered if starter is switched off.*

☞ *Pull the lever backward and lower the skip.*

☞ *Return the lever to neutral.*

3.14 Loading the machine

WARNING

Crushing hazard by objects falling from above!

Can cause serious injury or death.

- If the machine is not equipped with a cab, stay clear of the machine during loading.

NOTICE

Incorrect loading causes severe damage to the machine. Ensure that the payload is not exceeded.

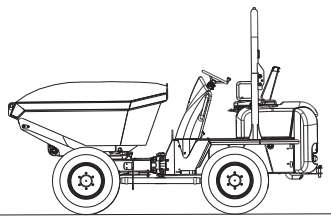


Fig. 61: Loading the machine

Before loading

☞ *Set the right-hand multifunctional lever to neutral position.*

☞ *Set the skip to base position.*

☞ *Apply the parking brake.*

☞ *Stop the engine.*

☞ *Stay clear of the control stand and the danger zone of the machine for safety reasons.*

Once loading is over

☞ *Remove dirt, debris, dust etc. from the control elements.*

☞ *Remove loose material.*

☞ *Ensure that the operator's visibility is not impaired.*

3.15 Working on slopes

Follow these safety instructions carefully when traveling on slopes, in order to avoid accidents.

Specific safety instructions

- Drive on slopes only on firm ground.
- Bear in mind the following instructions when traveling downhill or uphill:
  - ☞ Put the skip in base position.
  - ☞ Perform slow and smooth travel movements.
  - ☞ Avoid sudden travel movements.
  - ☞ Reduce the engine speed.
  - ☞ Do not use high speed.
- When operating the machine, ensure that you can stop safely at all times if the machine starts to skid or if it becomes unstable.
- Avoid turning the skip downhill on slopes.
  - ➥ This could cause the machine to lose its balance and to tip over.
    - Always tilt out the skip uphill.
- Do not travel across slopes steeper than 25 %, otherwise the machine could tip over sideways.
- Do not travel on slopes steeper than 25 %.
- Always travel straight ahead when traveling uphill or downhill. Traveling diagonally or at an angle can cause the machine to tip over.
- Drive slowly in meadows, on leaves or wet steel plates. The machine risks slipping.

Traveling on slopes with a loaded skip

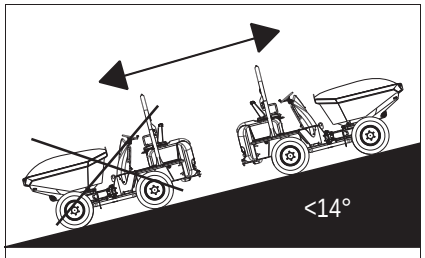


Fig. 62: Traveling on slopes with a loaded skip

Proceed as follows to prevent the machine from tipping over or slipping sideways:

- When traveling on slopes no steeper than 14°, the loaded skip must always face uphill since the heavier part of the machine – in this case the load in the skip – must face uphill to prevent the machine from tipping over.
  - ☞ Travel forward as you travel uphill.
  - ☞ Travel backward as you travel downhill.

NOTICE

Risk of tipping over.

Traveling on slopes with an empty skip

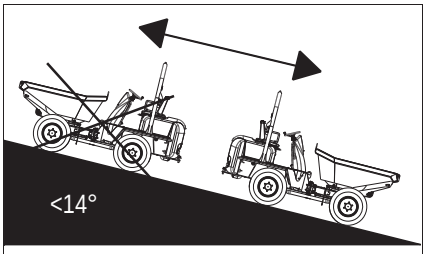


Fig. 63: Traveling on slopes with an empty skip

- When traveling on slopes no steeper than 14°, the empty skip must always face downhill since the heavier part of the machine – in this case the engine – must face uphill to prevent the machine from tipping over.

  ☞ Travel backward as you travel uphill.

  ☞ Travel forward as you travel downhill.

NOTICE

Risk of tipping over.

Traveling across slopes

WARNING

Accident hazard due to tipping over or slipping of machine on slopes!

Can causes serious injury or death.

- Pay special attention to the ground conditions while traveling across slopes.
- Drive across slopes with inclinations up to 14° only when the ground is firm.

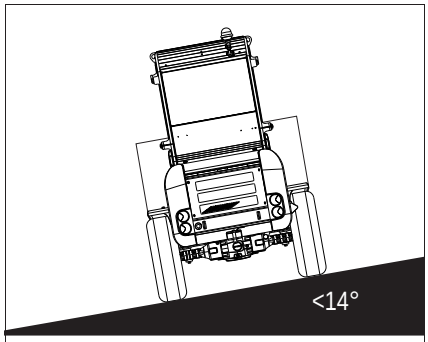


Fig. 64: Maximum lateral inclination

- Do not exceed the maximum lateral inclination of 14°.
- This applies for example to traveling on:
  - Slopes
  - Hollows
  - Obstacles

☞ When traveling across slopes with max. lateral inclinations of 14°, tilt out the skip only uphill for stability reasons.

3.16 Parking the machine

WARNING

Crushing hazard due to machine rolling away under its own weight after parking it!

Can cause serious injury or death.

- Park the machine on firm, level and horizontal ground.
- Secure the wheels accordingly (chocks, for example)
  – *see Wheel chock (option)* on page 3-70.

NOTICE

Never stop the engine under full load, otherwise it can be damaged due to overheating.

- Let the engine briefly run at idling speed with no load before you stop it.

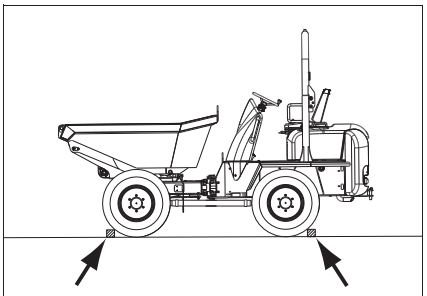


Fig. 65: Stopping and parking the machine

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Set the right-hand multifunctional lever to neutral position.*

☞ *Set the skip to base position.*

☞ *Apply the parking brake.*

☞ *Remove the starting key and carry it with you.*

☞ *Leave the control stand.*

☞ *Close and lock all covers.*

☞ *Park the machine only transversally to a slope.*

☞ Secure the machine with chocks to prevent it from rolling away
– *see Wheel chock (option)* on page 3-70.

Important

Secure the machine against unauthorized operation.

- Remove the starting key and carry it with you.
- Lock the cabin (option).

3.17 Control elements

Right-hand multifunctional lever (Yanmar)

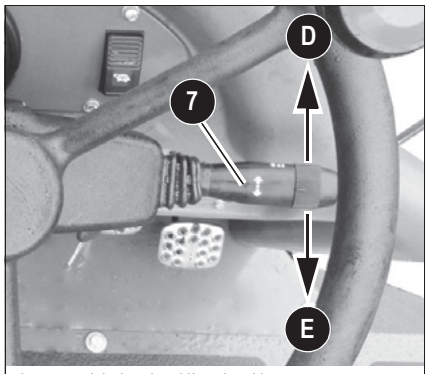


Fig. 66: Right-hand multifunctional lever

The traveling direction can be changed with the right-hand multifunctional lever **7**.

Right-hand multifunctional lever		
	Push lever **7** forward toward **D**	Forward speed is engaged.
	Push lever **7** backward toward **E**	Reverse speed is engaged. An acoustic warning signal (option) sounds during reverse travel.
	No function	
	No function	

Low speed (Yanmar)

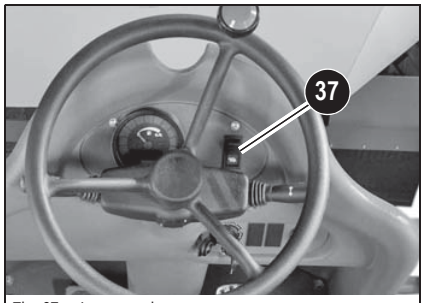


Fig. 67: Low speed

Switch **37** is used for shifting between high and low speed.

Low speed		
ON	Press switch **37** up	Slow speed is enabled The symbol in switch **37** illuminates.
OFF	Press switch **37** down	High speed is enabled The symbol in switch **37** goes out.

Right-hand multifunctional lever (Perkins)

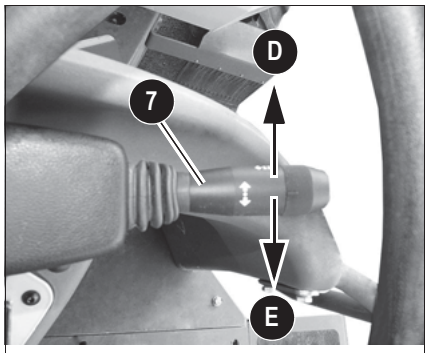


Fig. 68: Right-hand multifunctional lever

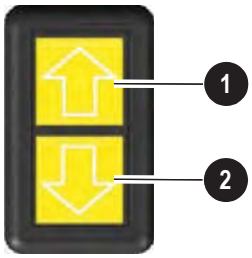


Fig. 68: Forward/reverse travel indicator light

The traveling direction can be changed with the right-hand multifunctional lever **7**.

Right-hand multifunctional lever		
	Push lever **7** forward toward **D**	Forward speed is engaged. The forward travel indicator light **1** illuminates.
	Push lever **7** backward toward **E**	Reverse speed is engaged. The reverse travel indicator light **2** illuminates. An acoustic warning signal (option) sounds during reverse travel.

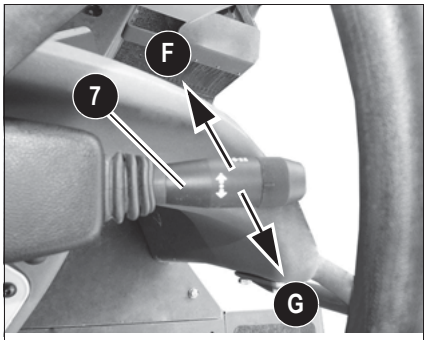


Fig. 69: Right-hand multifunctional lever

The speed can be changed with the right-hand multifunctional lever **7**.

Right-hand multifunctional lever		
	Pull lever **7** upward toward **F**	High speed is selected.
	Push lever **7** downward toward **G**	Low speed is selected. The indicator light illuminates.

Left-hand multifunctional lever

WARNING

Accident hazard. High beam or the headlight flasher can blind motorists on public roads.

Can cause serious injuries or death.

- Use high beam or the headlight flasher only if no one can be blinded.

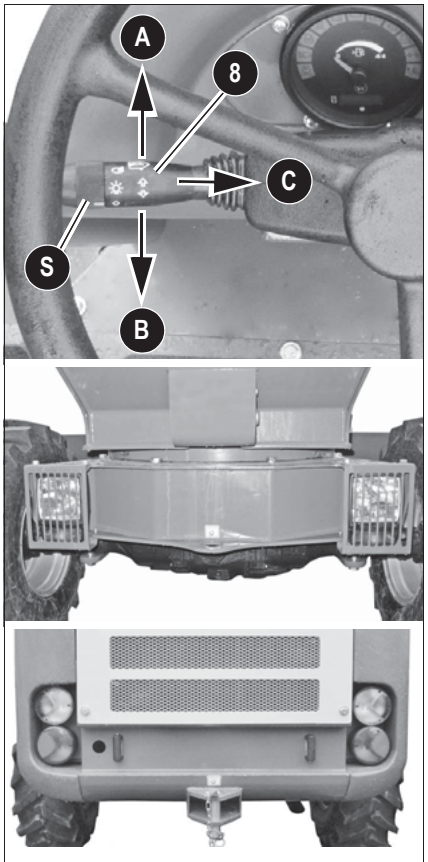


Fig. 70: Left-hand multifunctional lever

Switch on the light system when traveling on public roads and places,
with multifunctional lever **8** and rotary switch **S**

Left-hand multifunctional lever		
	Turn rotary switch **S** to the rear	The lights are switched off.
	Turn rotary switch **S** to the 1st position	The front and rear clearance lights illuminate. The rear numberplate light illuminates. The round display element is illuminated.
	Turn rotary switch **S** to the 2nd position	Low beam illuminates. The round display element is illuminated.
	Press lever **8** down	High beam illuminates. The blue indicator light in the round display element illuminates.
	Pull lever **8** upward and release it	The headlight flasher illuminates. The blue indicator light in the round display element illuminates as long as the lever is in the final position.
	Push lever **8** forward toward **A**	The right-hand turn indicator flashes. The indicator light in the round display element flashes.
	Pull lever **8** backward toward **B**	The left-hand turn indicator flashes. The indicator light in the round display element flashes.
	Push lever **8** to the center toward **C**	The horn sounds

Interior light (option)

Fig. 71: Interior light

Interior light		
ON	Press switch to the left or right	The interior light illuminates.
OFF	Press the switch to the center position	The interior light goes out.

Working lights (option)

WARNING

Accident hazard! Motorists can be blinded by bright lights on the job site.

Can cause serious injuries or death.

- Switch on the working lights only if motorists are not expected to be blinded.
- Stop machine operation if motorists are blinded.
- Only take up work again if sufficient illumination of the job site can be ensured without blinding other motorists.

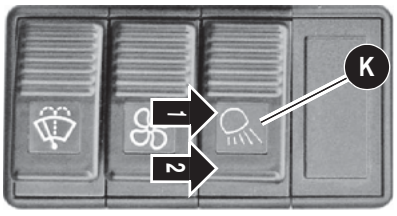


Fig. 72: Front roof lights (Yanmar)

Fig. 72: Front roof lights

Fig. 72: Rear roof lights

Roof lights (Yanmar)		
1st position	Press switch **K** to the 1st position.	The front roof lights illuminate. The indicator light in the switch illuminates.
2nd position	Press switch **K** to the 2nd position.	Both front roof lights, and the rear roof light, illuminate. The indicator light in the switch illuminates.
OFF	Press switch **K** all the way up.	The roof lights are switched off.

Fig. 73: Front roof lights (Perkins)

Fig. 73: Front roof lights

Fig. 73: Rear roof lights

Roof lights (Perkins)		
ON	Press switch **K** down.	The roof lights illuminate. The indicator light in the switch illuminates.
OFF	Press switch **K** all the way up.	The roof lights are switched off.

Hazard warning system (option)

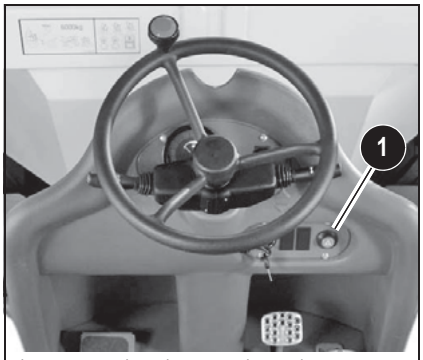


Fig. 74: Hazard warning system (Yanmar)

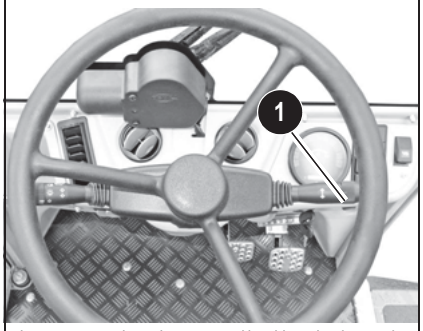


Fig. 74: Hazard warning system with cabin option (Yanmar)

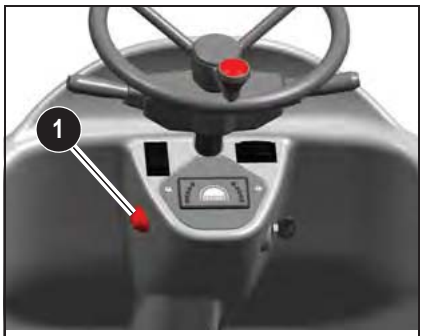


Fig. 75: Hazard warning system (Perkins)

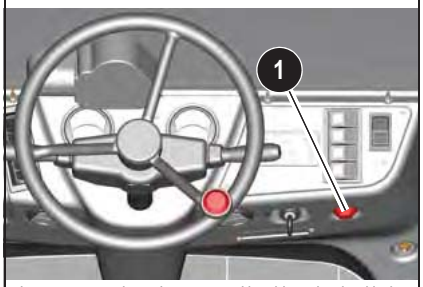


Fig. 75: Hazard warning system with cabin option (Perkins)

Pressing switch **1** switches the hazard warning system on and off.

Hazard warning system		
ON	Press switch **1**	The hazard warning system flashes. The symbol in switch **1** and the turn indicator light in the round display element flash.
OFF	Press switch **1** again	The hazard warning system goes out. The symbol and the indicator light go out.

Important

Switch on the hazard warning system

- in case of a breakdown.
- If part or the whole of the machine protrudes into a road during work.

Rotating beacon (option)

Fig. 76: Rotating beacon on the rollbar

Fig. 76: Rotating beacon on the cabin (option)

The rotating beacon illuminates as soon as starting key **11** is in position **1**.

Important

Observe the legal regulations of your country for operating the rotating beacon.

Cabin heating and ventilation (option)

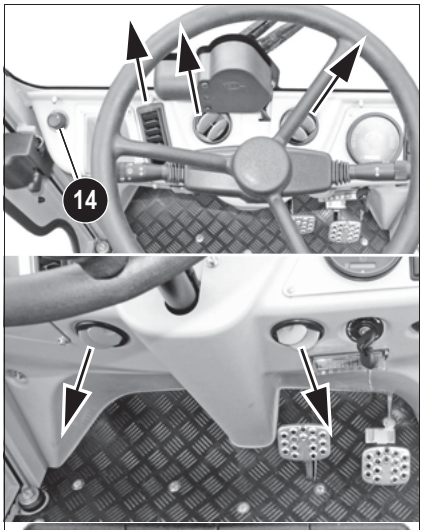


Fig. 77: Cabin heating and ventilation (Yanmar)

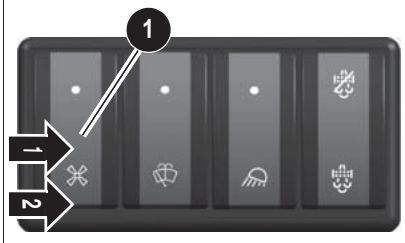


Fig. 77: Cabin heating and ventilation (Perkins)

- The cabin (option) is fitted with five air nozzles. Each nozzle can be opened, closed and directed separately.
- To heat or vent the cabin, turn temperature controller **14** to the required position and open or close the air vents as required.
- Do not place flammable or explosive material or objects near the air vents.
- Air the cabin from time to time.

Cabin heating and ventilation		
1st position	Press switch **1** to the 1st position.	Low fan speed.
2nd position	Press switch **1** to the 2nd position.	High fan speed.
OFF	Press switch **1** all the way up.	Fan is switched off.

Important

The best defrosting results for the front window are achieved by opening all nozzles.

- Direct the upper air vents toward the front window.

Wiper/wash system (option)

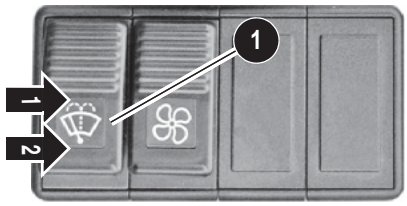


Fig. 78: Wiper/wash system (Yanmar)

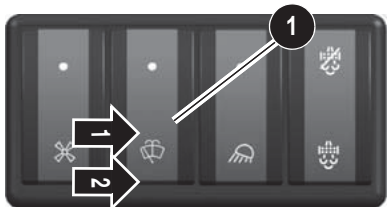


Fig. 78: Wiper/wash system (Perkins)

Wiper/wash system		
1st position	Press switch **1** to the 1st position.	Front wiper is on.
2nd position	Press switch **1** to the 2nd position.	Front wiper is on. Pump sprays washer water on the window.
OFF	Press switch **1** all the way up.	Front wiper returns to base position.

Tank for washer system

The filler inlet of tank **A** is located on the cabin wall at right behind the operator seat.

- Fill with clean tap water only.
- Add a suitable cleaning agent if required.

In winter

- Add antifreeze for washer systems to the clean tap water.
- Refer to the antifreeze instructions for farther information on concentrations.
- The rubber diaphragm in the non-return valve in the housing conglutinates if stored in a dry condition over a longer period of time.

  ☞ In order to restore this valve's function, moisten this non-return valve, dip it briefly in water and then blow air through it.

Important

Do not actuate the washer system if the tank is empty, otherwise this can damage the electric pump.

3.18 Cabin doors (option)

Opening the door from the outside

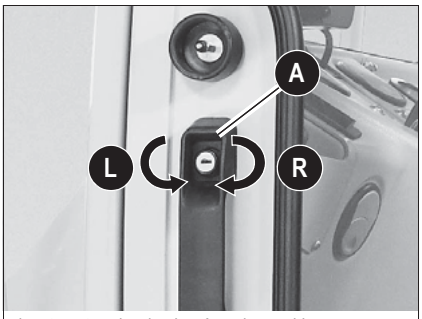


Fig. 79: Opening the door from the outside

☞ *Press door lock **A**.*

Locking the door:

☞ *Turn the starter key in door lock **A** to the left (**L**).*

➥ The door is locked.

Unlocking the door:

☞ *Turn the starter key in door lock **A** to the right (**R**).*

➥ The door is unlocked.

Opening the door from the inside

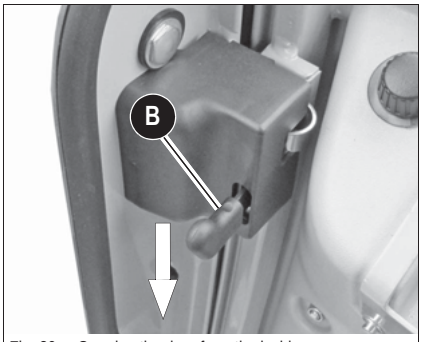


Fig. 80: Opening the door from the inside

☞ *Press lever **B** on the inside on door lock down.*

Securing an open door

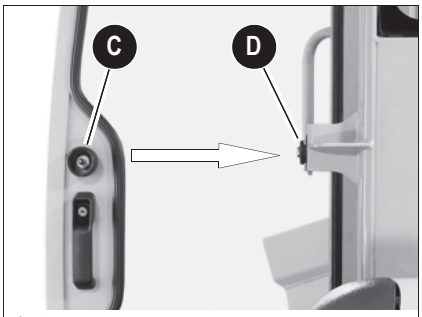


Fig. 81: Door arresters

☞ *Press the door against bracket **C** of arrester **D** with an audible click.*

Releasing the door arrester

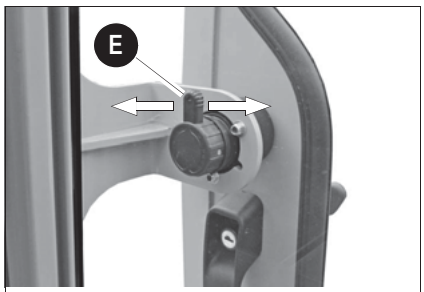


Fig. 82: Releasing the door arrester

☞ *Press lever **E** to the right or left to release the door out of the arrester.*

Entry and exit

CAUTION

Accident hazard! Risk of falling during entering or exiting.

Can cause minor injuries.

- Keep the mandatory climbing aids **A** clean and use them for entering and exiting.
- Face the machine as you enter and leave it.
- Have damaged climbing aids replaced.

Fig. 83: Foothold and handles

Important

When entering or leaving the cabin, the door must be locked in the arrester.
– *see Securing an open door* on page 3-45.

The machine can be accessed from either side.

3.19 Seat

WARNING

Accident hazard. Never change the seat position when traveling or operating.

Can cause serious injury or death.

- Adjust the operator seat only at machine standstill.

NOTICE

Adjusting the backrest can damage the rear window.

- Ensure that the backrest does not touch the rear window as you adjust backrest inclination.
- Select a seat position which will not damage the rear window when operating the machine.

Important

Adjust the operator seat to the operator's weight before putting the machine into operation. Adjust the seat suspension correctly to ensure a high level of ride comfort.

Horizontal adjustment

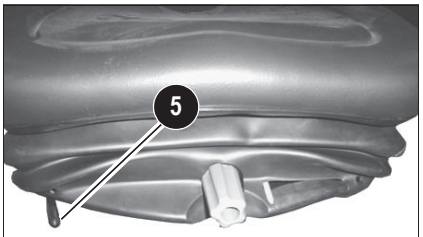


Fig. 84: Horizontal seat adjustment

☞ *Sit down on the operator seat.*

☞ *Pull lever **5** upward and at the same time*

☞ *Move the operator seat forward or backward.*

Backrest adjustment

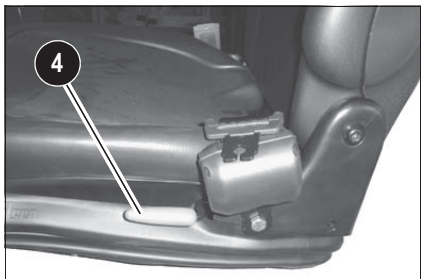


Fig. 85: Backrest adjustment

☞ *Sit down on the operator seat.*

☞ *Pull lever **4** up and at the same time press against the backrest to move it to the required position.*

☞ *Let lever **4** lock into place.*

Weight adjustment

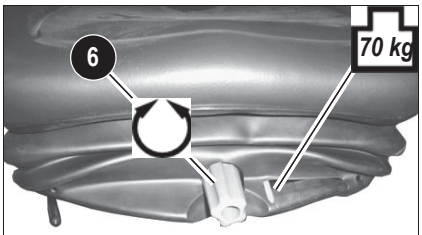


Fig. 86: Weight adjustment

☞ *Sit down on the operator seat.*

- To adjust to a higher weight:

  ☞ Turn adjusting wheel **6** to the right.

- To adjust to a lower weight:

  ☞ Turn adjusting wheel **6** to the left.

  ➥ The specified weight is indicated on a scale by the pointer next to the adjusting wheel.

3.20 Seat belt

DANGER

Personal injury hazard! Do not travel or operate with the seat belt unbuckled.

Will cause serious injuries or death.

- Operating the machine without fastening the seat belt is prohibited under any circumstances.
- Seat belt must not be twisted.
- The seat belt must run over the hips – and not over the stomach - and must always be applied tightly.
- Do not place the seat belt over hard, edged or fragile items (tools, metre rule, glasses, pen) carried inside your clothes.
- Never buckle up 2 persons with one seat belt.
- Check the seat belt condition regularly. Have damaged parts immediately replaced by a Wacker Neuson service center.
- Always keep the seat belt clean, as coarse dirt can impair proper functioning.
- Seat belt buckle must not be obstructed by foreign bodies, otherwise the buckle latch cannot lock into place.

DANGER

Personal injury hazard. After an accident the belt strap is stretched and no longer serviceable. In an accident, the seat belt does not provide adequate protection.

Will cause serious injuries or death.

- Replace the seat belt after an accident.
- Have fastening points and seat fixture checked for bearing capacity.

Seat belt **C** is for the operator's safety during work on construction sites and when traveling on public roads.

Fastening the seat belt

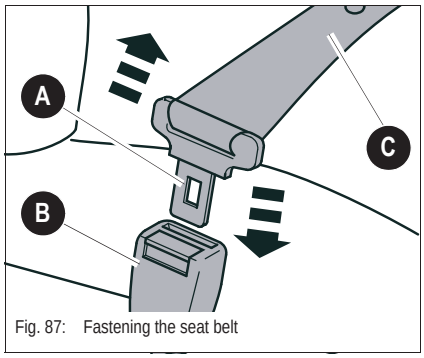


Fig. 87: Fastening the seat belt

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

☞ *Insert buckle latch **A** into buckle **B** with an audible click* (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

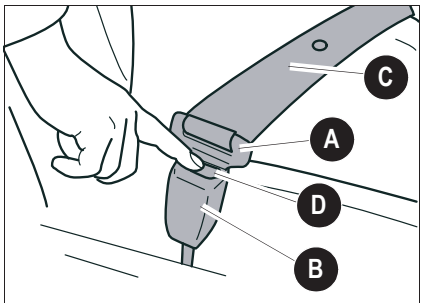


Fig. 88: Unfastening the seat belt

☞ *Hold seat belt **C**.*

☞ *Press red switch **D** on buckle **B**.*

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

☞ *Slowly return seat belt **C** to the retractor.*

3.21 Mirrors (option)

WARNING

Accident hazard. Adjust all mirrors as indicated in the Operator's Manual.

Can cause serious injury or death.

- Use safety-oriented ladders and work platforms for adjustment work on the machine.
- Never use machine parts or attachments/superstructures as a climbing aid.
- Do not adjust the mirrors when operating the machine.
- Immediately replace damaged or broken mirrors.
- Additional equipment or attachments must not impair visibility.
- Curved mirrors enlarge, reduce or distort the field of view. Bear this in mind when adjusting and using such mirrors.

WARNING

Accident hazard. In spite of the visual aids (mirrors), not the entire area around the machine can be seen.

Can cause serious injury or death.

- Follow the safety instructions.
- Check the surroundings constantly.
- Put the machine into operation only if visibility is sufficient (have another person guide you if necessary).

Important

Set the machine to road travel position before adjusting the mirrors – *see* *Drive position* on page 3-24.

Adjusting the outside mirrors on left and right

Important

We recommend having the mirrors adjusted by a second person.

Fig. 89: Outside cabin mirrors (symbolic representation)

Adjust the mirrors in order to:

- Ensure sufficient visibility from the operator seat onto the travel area and job site.
- Ensure maximum visibility to the rear.
- Ensure visibility of the rear edges of the machine in the mirrors.

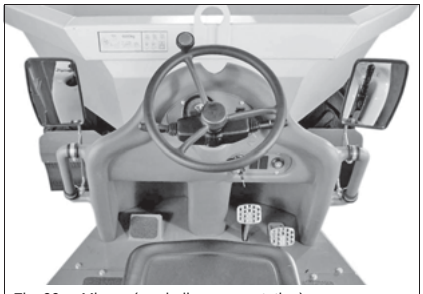


Fig. 90: Mirrors (symbolic representation)

Outside mirrors (machine with rollbar).

Adjusting the rearview mirror in the cabin

Fig. 91: Inside mirror

Adjust the inside mirror so that the travel and operating range can be seen from the operator seat.

3.22 Engine cover

WARNING

Personal injury hazard due to hot and rotating parts!

Can cause serious injury.

- Open the engine cover only at engine standstill.
- Stop the engine and let it cool down.
- Wear protective equipment.

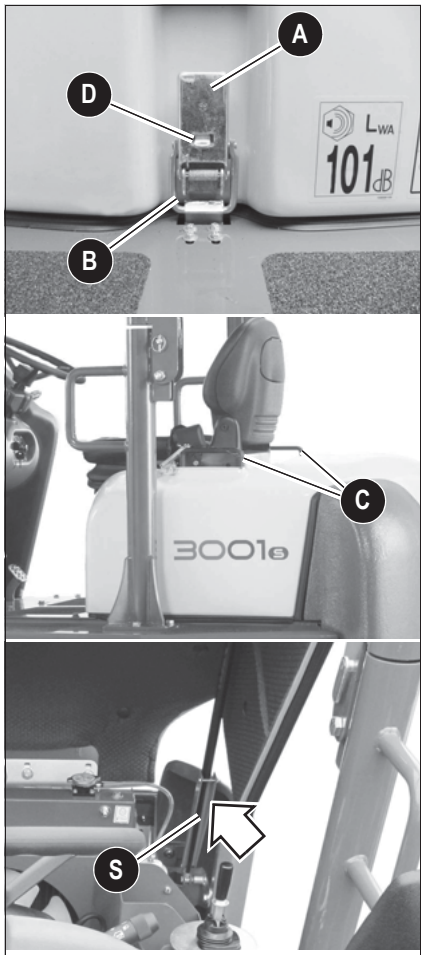


Fig. 92: Engine cover lock

Opening:

☞ *Press buckle **A** of the engine cover to the front and pull shackle **B** to the front at the same time.*

☞ *Pull the engine cover upward with handles **C** until the red safety prop **S** locks into place.*

Closing:

☞ *Press safety prop **S** to the rear.*

☞ *Press down the engine cover.*

☞ *Press buckle **A** forward and hitch shackle **B** into the hook at the same time.*

☞ *Press buckle **A** to the rear.*

Locking and unlocking:

The engine cover can be locked in eyelet **D** with an external lock.

Important

Do not lock the engine cover during machine operation since the emergency switch (battery master switch) is located under the engine cover.

3.23 Maintenance accesses (machine with optional cabin)

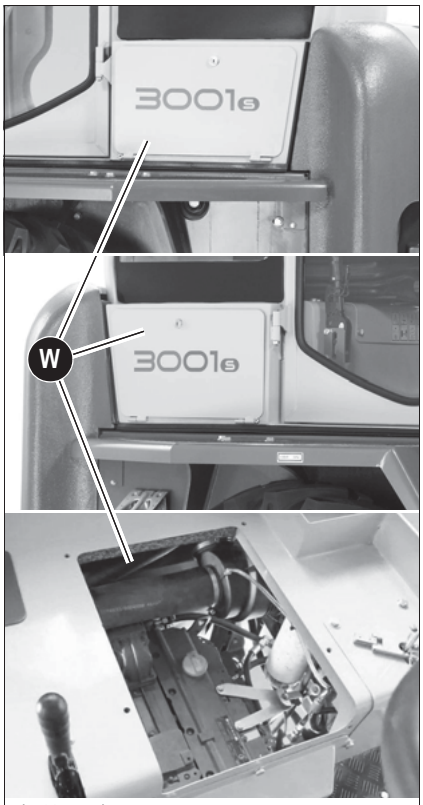


Fig. 93: Maintenance accesses

The maintenance accesses **W** are located outside on the left and right of the cabin, and inside under the operator seat.

3.24 Battery master switch (up to serial number WNCD0305VPAL00283)

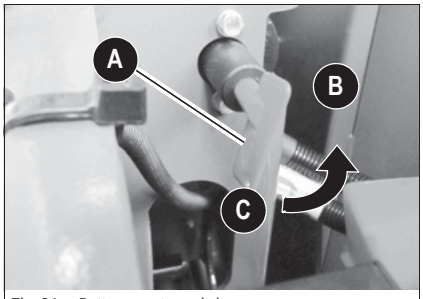


Fig. 94: Battery master switch

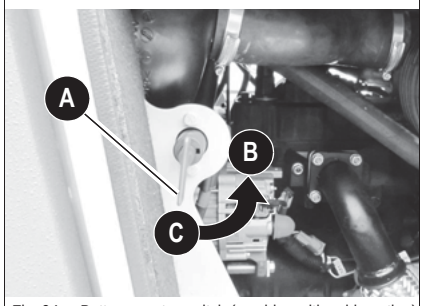


Fig. 94: Battery master switch (machine with cabin option)

The battery master switch is located on the right in the engine compartment.

- Machine with optional cabin:
  ➥ Behind the right-hand maintenance access.

Important

Do not disconnect the battery while the engine is running. The power supply is interrupted directly after the battery, by means of key **A** of the battery master switch.
Actuate the battery master switch:

- Before working on the electrical system.
- As an antitheft precaution.

Interrupting power supply:

☞ *Turn key **A** of the battery master switch to position **B** and remove it.*

Switching on power supply:

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

☞ *Turn the key downward to position **C**.*

3.25 Rollbar

DANGER

Accident hazard. Machine operation with a lowered rollbar or without the rollbar is prohibited.

Will cause serious injury or death.

- Machine operation is only allowed if the rollbar is raised and locked, and if the seat belt is fastened.
- Wear protective equipment (protective clothing, safety glasses, for example).
- Operation with a lowered rollbar is temporarily allowed depending on the situation (e.g. to reduce the transport height in case of low clearance heights) – but only if the following conditions are fulfilled:
  - Obtain the approval of the competent national authority.
  - Traveling and operating the machine is only allowed on absolutely level ground.
  - Avoid tipping movements of the machine under all circumstances.
  - Working in areas involving a risk of falling objects is prohibited.
  - Fastening the seat belt is prohibited.
  - Wear protective equipment (e.g. protective clothing, safety goggles).

WARNING

Personal injury hazard during lowering or raising the rollbar!

Can cause injury.

- Lowering or raising the rollbar must be performed by two persons.

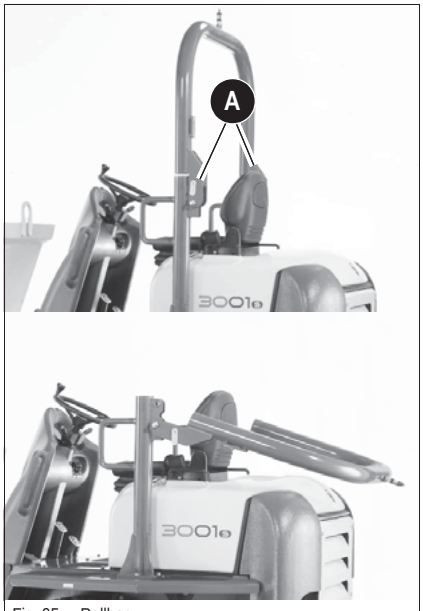


Fig. 95: Rollbar

Lowering the rollbar:

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Remove the split pins from lock pins **A**.*

☞ *Remove lock pins **A**.*

☞ *Slowly and carefully lower the rollbar with the help of a second person.*

Raising the rollbar:

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Slowly and carefully raise the rollbar with the help of a second person.*

☞ *Fasten the rollbar with lock pins **A** and secure it with split pins.*

3.26 Sunshield (option)

Important

Do not remove protection **A** if a sunshield is installed. It prevents the sunshield from hitting the engine cover when the rollbar is lowered.

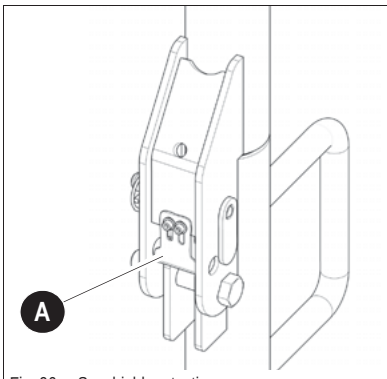


Fig. 96: Sunshield protection

Protection (on left and right of rollbar).

Fig. 97: Sunshield (symbolic representation)

The sunshield protects against intensive sun.

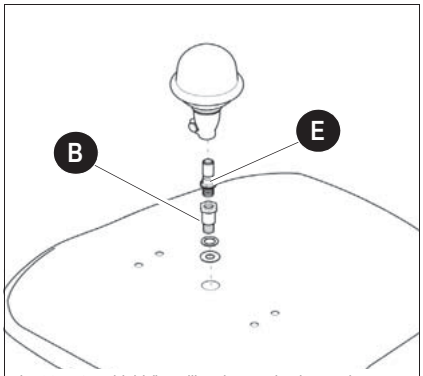


Fig. 98: Sunshield (installing the rotating beacon)

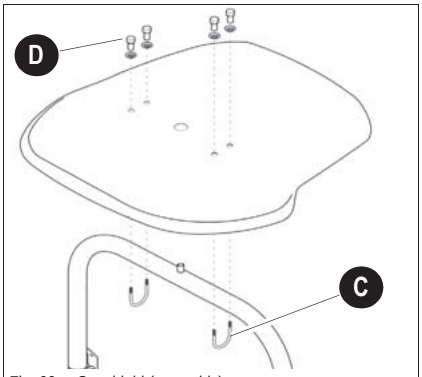


Fig. 99: Sunshield (assembly)

Assembly:

Install the sunshield with at least 2 persons.

1 Remove the rotating beacon.

2 Route the cable for the rotating beacon through the opening in the roof.

3 Insert the assembly brackets **C** through the openings in the roof and tighten screws **D** to 87 Nm (64 ft.lbs).

4 Insert extensions **B** through the openings in the roof and tighten them to 130 Nm (96 ft.lbs) on the rollbar.

5 Tighten bracket **E** on extension **B**.

6 Install the rotating beacon.

3.27 Articulated steering locking bar

DANGER

Personal injury hazard. An unlocked articulated joint can cause unexpected machine movement while the machine is being lifted!

Will cause serious injury or death.

- Support the skip before performing maintenance work.

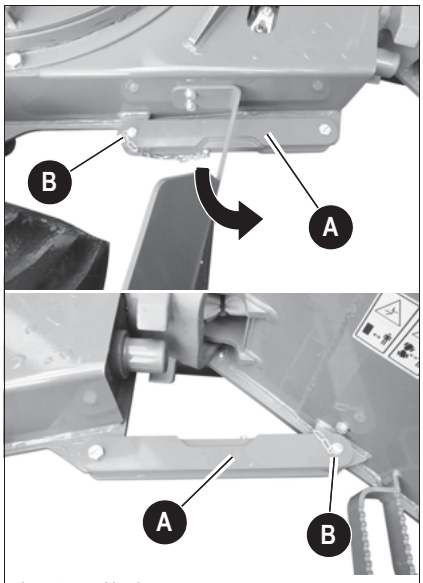


Fig. 100: Locking bar

The locking bar connects the front and rear chassis to prevent steering movements (via the articulated joint) when lifting the machine.

Procedure

☞ *Pull the spring plug out of pin **B** at the bottom.*

☞ *Pull pin **B** out of the guide.*

☞ *Turn the center-pivot prop **A** toward the rear chassis and secure it with pin **B**.*

☞ *Secure the locking bar with the spring plug.*

Important

Fasten the locking bar in its base position again before putting the machine into operation.

3.28 Locking the control lever

CAUTION

Personal injury hazard. An unlocked control lever may cause unintentional actuation of the skip.

Can cause minor injury.

- Lock the control lever for skip operation while traveling.

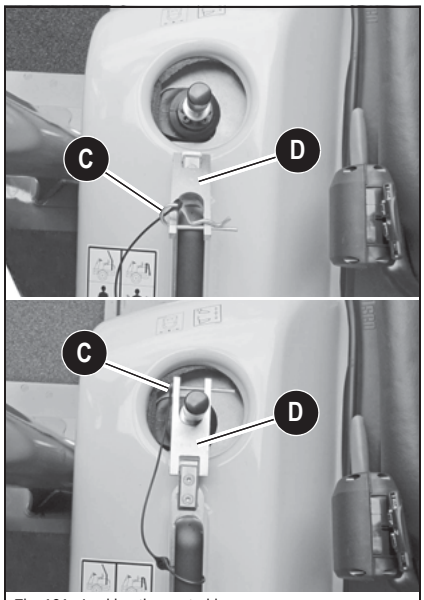


Fig. 101: Locking the control lever

☞ *Pull split pin **C** out of lock **D**.*

☞ *Fold lock **D** to the front.*

☞ *Insert split pin **C** in lock **D**.*

- Unlock in the reverse order.

3.29 Towing the machine

Important

Machines with a gross weight rating of more than 4000 kg (8,818 lbs) must only be towed with a towing bar. Both machines must be certified for road travel when towing on public roads.

Active towing

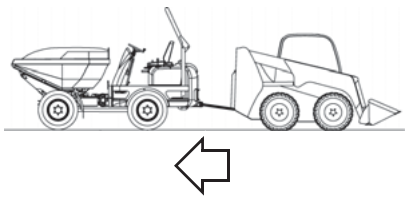


Fig. 102: Active towing (symbolic representation)

The machine tows another machine.

WARNING

Accident hazard during towing away the machine!

Can cause serious injury or death.

- Only tow another machine with a towing bar or cable and towing gear.
- Only use a towing cable if the service brake and steering system of the machine requiring towing are fully functional.
- Agree on the work operations and hand signals.
- Do not allow anyone to stay in the danger zone.
- Wear protective clothes.

NOTICE

Machine damage.

- Do not tow the machine if it is stuck or on a slope. It must then be loaded.
- Only tow a machine if transporting it is not possible.
- Do not tow the machine any farther than required until it can be loaded.
- Only use the equipment provided for towing.
- In the case of the machine requiring towing, follow the instructions in the Operator's Manual of this machine.

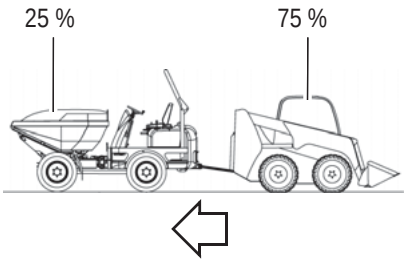


Fig. 103: Towing (symbolic representation)

- A tractor vehicle of the same weight category must be used as a minimum.
- When actively towing another machine, the skip must be filled with a weight of at least 25 % of its payload.
- Therefore, the weight of the machine requiring towing must not be heavier than 75 % of the payload.

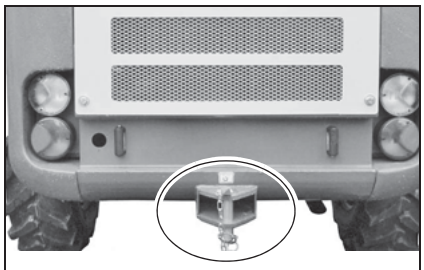


Fig. 104: Towing (symbolic representation)

- Ensure that the machine can be towed safely.
- Use the towing eye hook of the machine.
- Use the pins and the lock.
- Start machine travel and tow away slowly.

Important

The manufacturer's warranty shall not apply to accidents or damage caused by towing.

Passive towing (in an emergency)

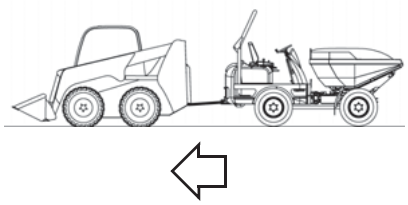


Fig. 105: Passive towing (symbolic representation)

Tow the machine away from the immediate danger zone.

Only tow the machine in an emergency (malfunctioning machine on a level crossing or intersection, for example).

WARNING

Accident hazard! Turning the steering wheel requires greater effort if the diesel engine breaks down.Take this into account especially when towing the machine.

Can cause serious injuries or death.

- Tow the machine away only from the immediate danger zone.
- The machine may only be towed using a towing bar or other suitable towing equipment in connection with suitable towing facilities, such as a towing coupling, hooks or eyes.
- Tow slowly.
- Do not allow anyone to stay in the danger zone.
- The traveling drive is hot during and after towing.
- Wear protective clothes.

NOTICE

Machine damage.

- Do not tow the machine if it is stuck or on a slope. It must then be loaded.
- The hydrostatic drive can be damaged when towing the machine.
- Do not tow the machine any farther than required until it can be loaded.

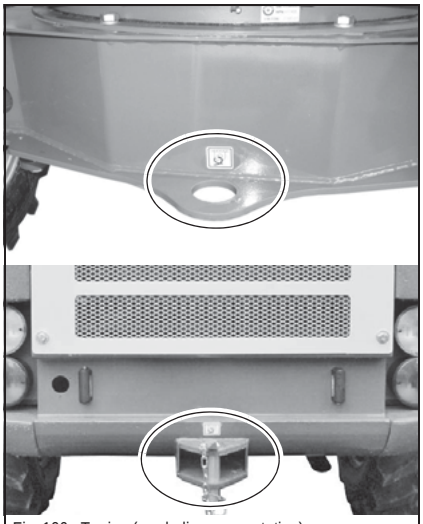


Fig. 106: Towing (symbolic representation)

- Ensure that the machine can be towed safely.
- Use the towing eye hook of the machine.
- Use the pins and the lock.
- Start machine travel and tow away slowly.

Important

The manufacturer's warranty shall not apply to accidents or damage caused by towing.

Passive towing (high-pressure circuit must be open)

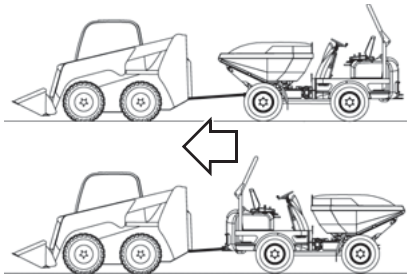


Fig. 107: Passive towing (symbolic representation)

Tow the machine with another vehicle.

Open the high-pressure circuit for this.

After towing the machine, the pressure must be set and the machine put back into operation by a Wacker Neuson service center.

WARNING

Accident hazard! Turning the steering wheel requires greater effort if the diesel engine breaks down.Take this into account especially when towing the machine.

Can cause serious injuries or death.

- The machine may only be towed using a towing bar or other suitable towing equipment in connection with suitable towing facilities, such as a towing coupling, hooks or eyes.
- Tow slowly.
- Do not allow anyone to stay in the danger zone.
- The traveling drive is hot during and after towing.
- Wear protective clothes.

NOTICE

Machine damage.

- Do not tow the machine if it is stuck or on a slope. It must then be loaded.
- The hydrostatic drive can be damaged when towing the machine.
- Do not tow the machine any farther than required until it can be loaded.

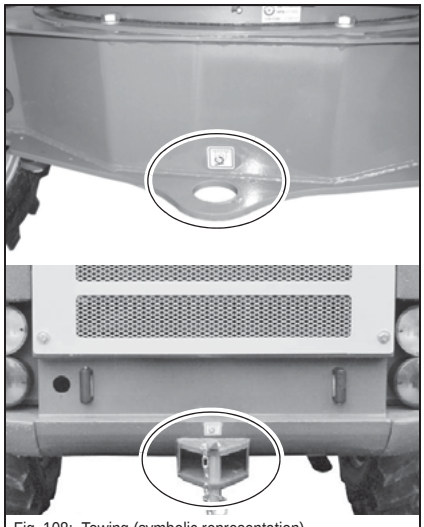


Fig. 108: Towing (symbolic representation)

- Ensure that the machine can be towed safely.
- Use the towing eye hook of the machine.
- Use the pins and the lock.
- Remove the wheel chocks under the machine.
- Start machine travel and tow away slowly.

Important

The manufacturer's warranty shall not apply to accidents or damage caused by towing.

Opening the high-pressure circuit

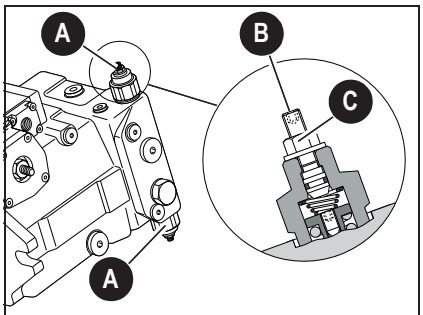


Fig. 109: Opening the high-pressure circuit

There are two HP pressure limiting valves **A** on the pump under the base plate, one on the upper left and the other on lower left.

Procedure

☞ *Stop the engine.*

☞ *Secure the machine to prevent it from rolling away (with wheel chocks, for example).*

☞ *Remove the screws and the base plate.*

☞ *Loosen locknuts **C** on either side with half a revolution to the left.*

☞ *Turn each of the screws **B** to the right with an allen key until you can feel a firmer resistance.*

☞ *Then screw in a farther half revolution to the right.*

NOTICE

Screwing in any farther damages the valve.

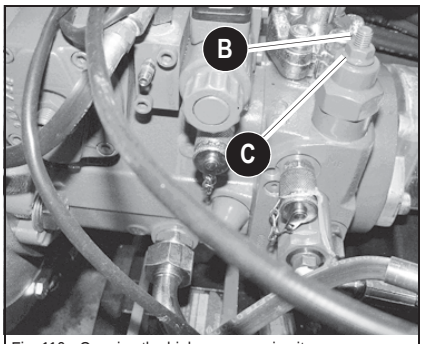


Fig. 110: Opening the high-pressure circuit

☞ *Tighten locknuts **C** on either side to the right to 22 Nm (16 ft.lbs).*

☞ *The manufacturer's warranty shall not apply to accidents or damage caused by towing.*

Important

After towing the machine, the pressure must be set and the machine put back into operation by a Wacker Neuson service center.

3.30 Lifting the Machine

WARNING

Crushing hazard! Incorrect lifting of the machine.

Can cause serious injury or death.

- All equipment (crane, lifting gear, etc.) required for loading must be:
  - certified, suitable and of adequate size
  - positioned and fastened correctly
  - free of damage and wear
  - Necessary recurrent inspections must not be overdue
- Use OSHA rated and approved lifting devices capable lifting the excavator, attachments, options and accumulated debris. Refer to the general weight guidelines in the specification section of this manual.
- Observe all international, national and possible in-house regulations and guidelines on loading.
- Have crane operators guided only by experienced persons that know the required crane signals.
- Do not attempt to lift the excavator with any type of crane including wheel loaders unless the crane operator is qualified to lift loads in craning operations. The crane operator shall be knowledgable of OSHA 1910 craning regulations.
- The person guiding the crane operator must be within sight or sound of him.

WARNING

Accident hazard due to incorrect fastening of lifting gear!

Can cause serious injury or death.

- Have only experienced persons attach lifting gear.
- Use only the lifting points provided to this effect and marked accordingly for attaching lifting gear.
- Perform a visual check to ensure that all lifting points are in good condition.
- Use only suitable lifting gear (hooks, shackles, for example) on the machine.
- Do not place the lifting gear over sharp edges.
- Ensure that the lifting gear has the required lengths.

WARNING

Accident hazard due to incorrect loading!

Can cause serious injury or death.

- Wear protective equipment (safety boots, protective gloves, hard hat, etc.).
- Before raising the machine, ensure that:
  - all instructions under “Lifting the machine” have been followed
  - the machine is accessible and not stuck
  - the lifting gear has been attached correctly
  - there is no one in the machine
  - the loading area is sealed off and that there is no one in it
  - the weather conditions make it possible to load the machine safely (wind, visibility, etc.)
- Always stay clear of suspended loads.
- It is essential that you follow the safety instructions at the beginning of this chapter and any other safety instructions relevant in your country.

Loading the machine

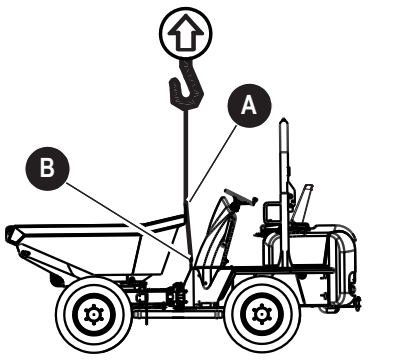


Fig. 111: Craning operation

- Empty the skip and lower it to base position.
- Park the machine on firm, level and horizontal ground.
- Lock the control lever – *see Locking the control lever* on page 3-59.
- Stop the engine.
- Remove the starting key and carry it with you.
- Machine with optional cabin:
  - ☞ Remove all loose objects from inside the machine.
  - ☞ Close the doors.
  - ☞ Leave the cabin.
- Close and lock all covers.
- The rollbar can be lowered to reduce the transport height – *see Rollbar* on page 3-55.
- Put the center-pivot prop in place – *see Articulated steering locking bar* on page 3-58.
- Use suitable lifting gear, chains etc.
- Make the lifting gear pass through bracket **A** on the edge of the skip and fasten it on lifting eye **B** on the chassis.
- Slowly raise the machine until there is no more contact with the ground.
- Wait until the machine does not swing any more and is completely steady.
- If the balance and the condition and position of the lifting gear is correct, slowly raise the machine to the required height and load it.

Loading machines with special skips (option)

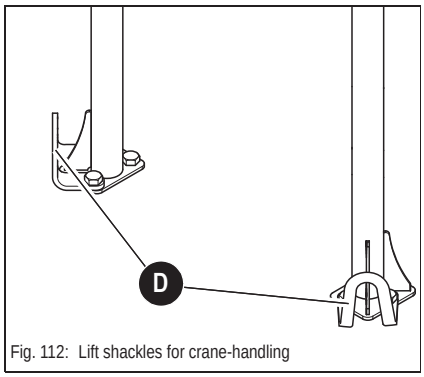


Fig. 112: Lift shackles for crane-handling

- Empty the skip and lower it to base position.
- Park the machine on firm, level and horizontal ground.
- Lock the control lever – *see Locking the control lever* on page 3-59.
- Stop the engine.
- Remove the starting key and carry it with you.
- Close and lock all covers.
- The rollbar can be lowered to reduce the transport height – *see Rollbar* on page 3-55.
- Put the center-pivot prop in place – *see Articulated steering locking bar* on page 3-58.
- Fasten lifting gear **E** at lifting eye **F** and on both lift shackles **D**.

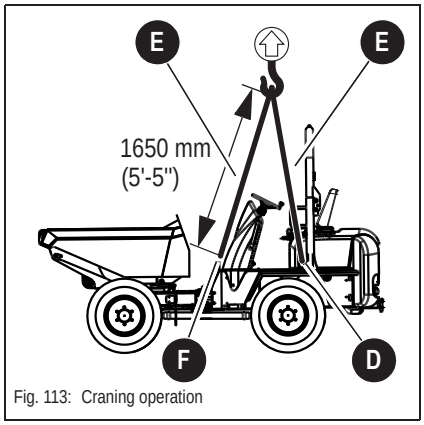


Fig. 113: Craning operation

- Use suitable lifting gear, chains etc. **E** and position them vertically over the steering wheel as shown in the drawing.
- Ensure a minimum length of 1650 mm (5'-5").
- Slowly raise the machine until there is no more contact with the ground.
- Wait until the machine does not swing any more and is completely steady.
- If the balance and the condition and position of the lifting gear is correct, slowly raise the machine to the required height and load it.

3.31 Loading and transporting the machine

Safety instructions

- The transport vehicle must be of adequate size – refer to *Chapter 6 "Specifications"* for the machine's dimensions and weights.
- Remove any mud, snow or ice from the tires so that the machine can safely travel onto the ramps.
- Secure the machine against unintentional movement
  – see Parking the machine on page 3-36.

WARNING

Accident hazard. The machine must be loaded and transported properly.

Can cause serious injury or death.

- Read the safety instructions at the beginning of this chapter and follow any other safety instructions relevant in your country!

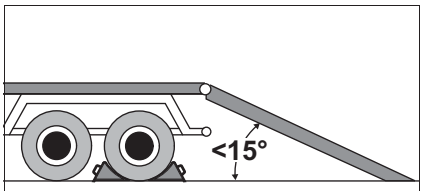


Fig. 114: Access ramps

☞ *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 15°. Use access ramps with an antiskid surface only.
- Ensure that the loading area is clear and access to it is not obstructed – by superstructures, for example.
- Ensure that the ramps and the tires of the machine are free of oil, grease and ice.
- Start the engine of the machine.
- Lower the skip of the machine.
- Carefully travel the machine backward onto the middle of the transport vehicle.
- Stop and park the machine.

Important

The manufacturer's warranty shall not apply to accidents or damage caused by loading or transporting the machine.

3.32 Tying down the machine

WARNING

Personal injury hazard. The machine must be loaded and transported properly.

Can cause serious injury or death.

- It is essential that you read the safety instructions at the beginning of this chapter and follow any other safety instructions relevant in your country!

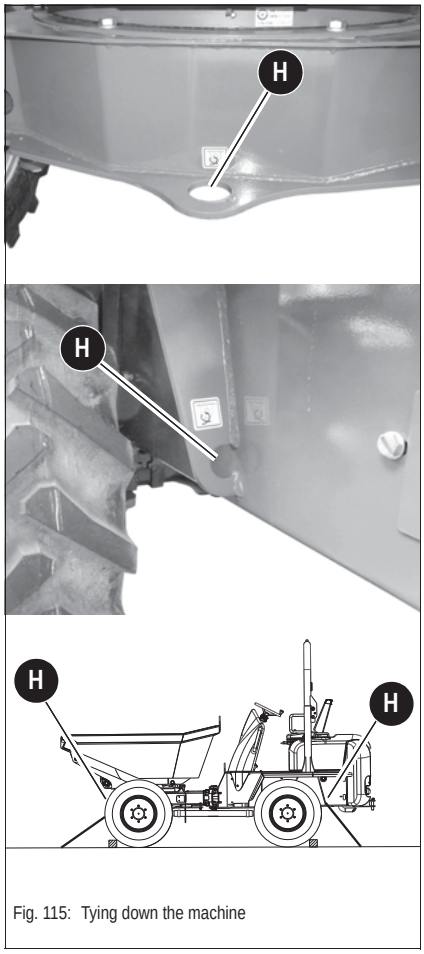


Fig. 115: Tying down the machine

- Ensure that the authorized maximum height is not exceeded.
- Ensure that the operator of the transport vehicle knows the overall height, width and weight of his transport vehicle (incl. the machine to be transported) before departure, as well as the legal transport regulations of the country or countries where transport is to take place.
- Secure all wheels of the machine at the front, rear and at the sides.
- Firmly tie down the machine at the eye hooks **H** onto the platform, with ratchet straps or chains of adequate size.
  - At the front of the machine and
  - on either side of the machine

Important

Use edge protectors to avoid damage both to the machine and to the belts, ropes or chains.

3.33 Wheel chock (option)

Important

Store the wheel chock only in the brackets provided for this purpose.

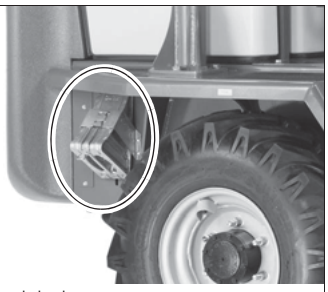


Fig. 116: Wheel chock

The wheel chock is located on the rear right chassis under the mudguard.

3.34 Socket (option)

Fig. 117: Socket

A 7-pole socket for additional lights is located at the rear of the machine.

3.35 Diesel particulate filter (Perkins)

The machine is equipped with a diesel particulate filter.

The soot produced by burning diesel fuel is collected and burned in the diesel particulate filter at regular intervals. This process is called regeneration.

Regeneration can last 30 minutes. However, regeneration can last more than 30 minutes if it is disabled manually several times.

Regeneration is only performed if the engine is at operating temperature.

Automatic regeneration

Automatic regeneration is performed if the contamination in the diesel particulate filter reaches a specific level.

The machine can be operated as usual during regeneration.

Disabling regeneration increases the contamination level in the particulate filter.

Manual regeneration

Manual regeneration can only be performed if indicator light **1** illuminates (the contamination in the diesel particulate filter has reached a specific level).

The machine can be operated as usual during regeneration.

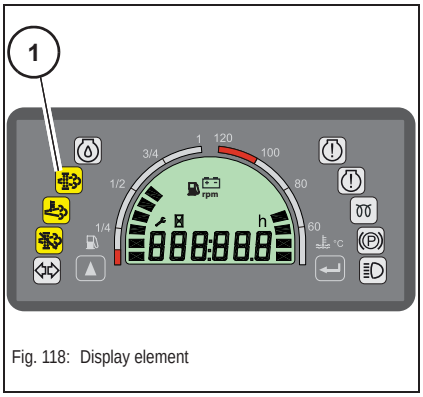


Fig. 118: Display element

WARNING

Burn hazard at the exhaust system!

Can cause serious injuries or death.

- The exhaust-gas temperature can reach about 600 °C at the exhaust system. Keep a safe distance from the exhaust system.

NOTICE

Possible fire at the exhaust system.

- There must be no easily flammable or combustible material in the direct vicinity of the exhaust system, in particular near the end pipe.
- Disable automatic regeneration in the vicinity of easily flammable material.
- If the regeneration pushbutton switch is in position **B** and if indicator light **1** illuminates, or if the regeneration pushbutton switch is pressed to position **C**, travel the machine out of the danger zone and into a safe area.

NOTICE

Possible damage to the engine.

- Stop the engine if the red “Engine Stop” indicator light illuminates.
- Only used clean diesel fuel according to the engine/machine fluids and lubricants (biodiesel is prohibited).

Important

The soot load is the contamination level in the diesel particulate filter. Among other things, this level depends on the load on the diesel engine:

- High engine load = few deposits.
- Low engine load = more deposits.

Important

We recommend not to influence the automatic regeneration system. Should disabling or interrupting regeneration be necessary, perform it again as soon as possible.
This increases the service life of the diesel particulate filter and avoids unscheduled stops at the service center.
Despite regeneration at regular intervals, the diesel particulate filter must be regularly replaced by a new one since the soot and ash particles cannot be completely removed for technical reasons.

Important

The diesel particulate filter must be cleaned by a Wacker Neuson service center every 3000 service hours.

Engine and particulate filter indicator lights

Engine warning light	Engine stop	Exhaust-gas temperature	Regeneration required	Regeneration disabled	Description
 (yellow)	 (red)	 (yellow)	 (yellow)	 (yellow)	After switching on ignition, the indicator lights are checked during the first 2 seconds (yellow and red).
 (grey)	 (grey)	 (grey)	 (grey)	 (grey)	No faults present.
 (grey)	 (grey)	 (grey)	 (yellow)	 (yellow)	The indicator light (yellow) illuminates if the soot load reaches a specific value. Regeneration is performed soon (except if regeneration is disabled).
 (grey)	 (grey)	 (yellow)	 (yellow)	 (grey)	Both indicator lights (yellow) illuminate during active regeneration. An increased exhaust-gas temperature is possible.
 (grey)	 (grey)	 (yellow)	 (grey)	 (grey)	The indicator light (yellow) illuminates once regeneration is over. An increased exhaust-gas temperature is possible. The system cools down.
 (grey)	 (grey)	 (grey)	 (grey)	 (yellow)	The indicator light (yellow) illuminates. Regeneration is disabled by the operator.
 (yellow)	 (grey)	 (grey)	 (yellow)	 (grey)	The engine warning light (yellow) flashes, and indicator light “Regeneration required ” (yellow) illuminates if the soot load reaches a specific value. The soot load reduces the engine output. Regeneration is required.
 (yellow)	 (red)	 (grey)	 (yellow)	 (grey)	The engine warning light (yellow) flashes, the indicator light “Engine stop” (red) illuminates and indicator light “Regeneration required ” (yellow) illuminates if the soot load reaches a specific value. The soot load reduces the engine output. Drive the machine out of the area with flammable material. Stop the engine immediately. Have the error repaired by a Wacker Neuson service center.

Three indicator lights indicate the regeneration status.

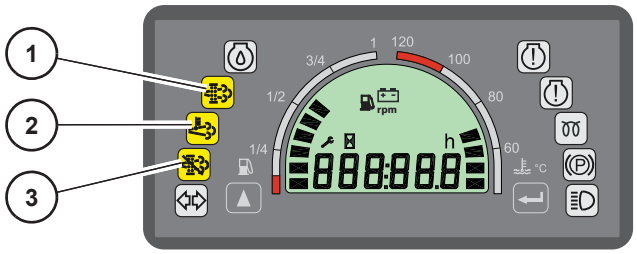


Fig. 119: Display element

1 **Regeneration required (yellow)**
This indicator light illuminates if the contamination level reaches a specific value.

2 **Exhaust-gas temperature (yellow)**
This indicator light illuminates during regeneration at increased exhaust-gas temperature. It goes out once regeneration is over and the system has cooled down.

3 **Regeneration disabled (yellow)**
This indicator light illuminates if the pushbutton switch is pressed to position **A**.

Regeneration pushbutton switch

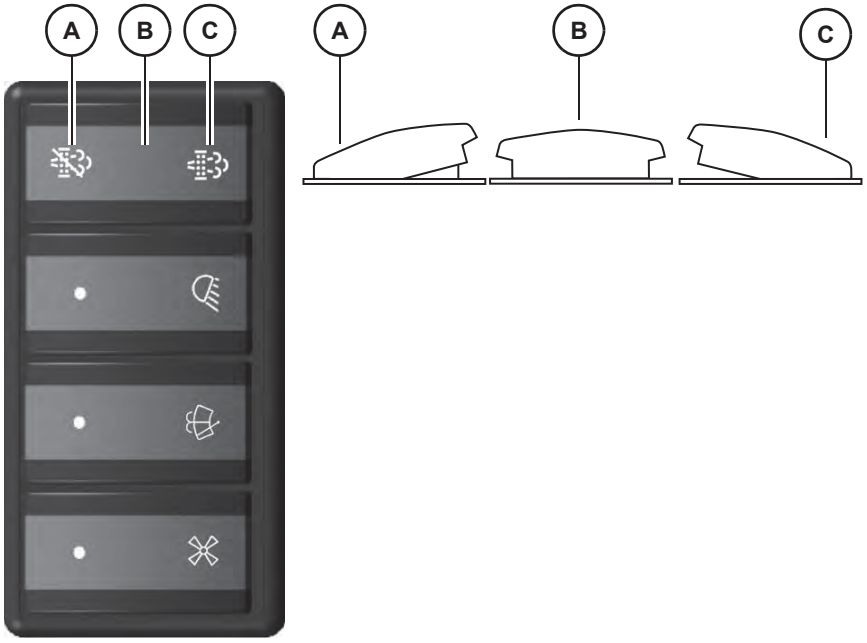


Fig. 120: Regeneration pushbutton switch

A = disable/interrupt regeneration

Pushbutton switch position **A** has two functions:

- Disabling automatic regeneration
- Interrupting regeneration

Disabling automatic regeneration

The indicator light “Regeneration disabled” (yellow) **3** illuminates.

Automatic regeneration **B** can be enabled again by pressing the pushbutton switch to position **C** for more than 3 seconds.

After starting the engine again, automatic regeneration is active in position **B** and indicator light **3** does not illuminate.

Interrupting regeneration

Pressing pushbutton switch in position **A** for more than 3 seconds disables automatic regeneration.

After starting the engine again, automatic regeneration is active in position **B** and indicator light **1** illuminates. The engine starts regeneration as soon as the operating temperature is reached.

B = automatic regeneration (middle position)

Regeneration is automatically performed.

C = enable regeneration

Press and hold the pushbutton switch for more than 10 seconds. Regeneration is started manually as soon as the engine reaches operating temperature. Indicator light **2** illuminates.

4 Troubleshooting

The information given in this chapter is provided for maintenance personnel, for fast and reliable detection of malfunctions and their appropriate repair.

Repairs must only be performed by authorized personnel.

4.1 Engine trouble

Problem	Possible causes	See
Engine does not start or is not easy to start	Wrong SAE grade of engine lubrication oil	*5-43*
	Fuel grade does not comply with specifications	*5-43*
	Malfunctioning or discharged battery	*5-36*
	Loose or oxidized cable connections in starter circuit	
	Malfunctioning starter, or pinion does not engage	
	Wrong valve clearance	
	Malfunctioning fuel injector	
	Malfunctioning cutoff solenoid	
	Malfunctioning fuse	*6-8*
Engine starts, but does not run smoothly or faultless	Fuel grade does not comply with specifications	*5-43*
	Dirty fuel filter	
	Wrong valve clearance	
	Injection line leaks	
	Malfunctioning fuel injector	
Engine overheats. Temperature warning system responds	Oil pressure too low/too high	*5-10*
	Dirty air filter	*5-20*
	Dirty radiator fins	*5-13*
	Coolant level too low	*5-14*
	Cooling system leaks	
	Resistance in cooling system too high, flow capacity too low	
	Malfunctioning fan, torn or loose V-belt	*5-24*
	Malfunctioning fuel injector	
Insufficient engine output	Oil level too high	*5-10*
	Fuel grade does not comply with specifications	*5-43*
	Dirty air filter	*5-20*
	Malfunctioning air filter maintenance switch or gauge	*5-20*
	Wrong valve clearance	
	Injection line leaks	
	Malfunctioning fuel injector	
Engine does not run on all cylinders	Malfunctioning fuel injection pump	
	Injection line leaks	
	Malfunctioning fuel injector	
Insufficient or no engine oil pressure	Oil level too low	*5-10*
	Machine inclination too high	
	Wrong SAE grade of engine lubrication oil	*5-43*

Problem		Possible causes	See
Engine oil consumption too high		Oil level too high/wrong oil	5-10
		Worn oil scraper ring	
		Machine inclination too high	
		Wrong SAE grade of engine lubrication oil	5-10
Engine smoke	Blue	Oil level too high/wrong oil	5-10
		Machine inclination too high	
	White[1]	Engine starting temperature too low	
		Fuel grade does not comply with specifications	5-43
		Wrong valve clearance	
		Malfunctioning fuel injector	
		Malfunctioning cylinder head	
	Black[2]	Dirty air filter	5-20
		Wrong valve clearance	
		Malfunctioning fuel injector	

1. A small amount of white exhaust gas after starting a cold engine is normal.
2. A small amount of black exhaust gas when starting the engine or during load shifts (additional start quantity) is normal

Indicator lights (Yanmar)

– see chapter 3.4 *Overview of indicator lights and warning lights (Yanmar)* on page 3-5

Problem	Possible causes	Troubleshooting
Engine oil pressure indicator light illuminates during operation	Oil pressure too low	Stop the engine immediately, check the oil level and add oil if necessary
		If oil level is OK, malfunctioning oil pump Contact a service center
Temperature indicator illuminates or acoustic signal sounds	Oil level too low	Add oil
	Coolant level too low	Add coolant
	Dirty radiator	Clean the radiator
	Fan blades turn too slowly	Retighten the V-belt
	Dirty air filter	Clean the air filter
Alternator charge function indicator light illuminates during operation	Alternator does not charge correctly	Retighten the V-belt Contact a service center

Problem	Possible causes	Troubleshooting
Machine does not work, or with reduced output	Not enough hydraulic oil	Add hydraulic oil
	Hydraulic oil not warm yet	Run the engine warm
	Not enough engine output	Let the engine run warm
	Damaged coupling or pump	Contact a service center
	Pressure limiting valves set too low	Contact a service center
	Damaged hydraulic hydraulic cylinders	Contact a service center
	Damaged control valves	Contact a service center
Hydraulic cylinder is lowered too fast	Dirty or malfunctioning seals	Contact a service center
	Heavy wear on spools	Contact a service center
	Damaged secondary cartridge	Contact a service center
Hydraulic lines overheat	Clogged hydraulic oil filter	Clean or replace the filter

Indicator lights (Perkins)

– *see chapter 3.6 Overview of indicator lights and warning lights (Perkins)* on page 3-10

Seals, hoses

Problem	Possible causes	Troubleshooting
Oil, fuel spots under the engine	Loose hose connection	Tighten the hose
	Damaged seal or hoses	Replace the seals and hoses, check the oil level and fill up oil if necessary Contact a service center
Oil loss in hydraulic system	Loose hose fittings	Retighten the hose fittings, check the hydraulic oil level and add oil if necessary
	Damaged seals, hoses or pipe lines	Replace the seals, hoses or pipe lines, contact a Wacker Neuson service center

Undercarriage

Problem	Possible causes	Troubleshooting
Not possible to travel	Foreign bodies	Remove foreign bodies
	Malfunctioning gearbox	Contact a service center

5 Maintenance

5.1 Introduction

Operational readiness and the service life of machines are heavily dependent on maintenance.
It is therefore in the interest of the machine owner to perform the mandatory maintenance work.
Bear in mind the following points before performing service and maintenance work:

- Chapter 2 “SAFETY INSTRUCTIONS” of this Operator’s Manual.

Perform the prescribed inspections and rectify any disorders immediately before putting the machine into operation, or have them rectified by a Wacker Neuson service center.
Secure open (engine) covers appropriately.
Do not open (engine) covers on slopes or in strong wind.

When using compressed air, dirt and debris can be blown into your face. Therefore, wear safety glasses, protective masks and clothing when using compressed air.

5.2 Safety-relevant parts

Service and maintenance work must be performed by a specifically trained person.

All other maintenance work that is not indicated in this Operator’s Manual must be performed only by the trained and qualified personnel of a Wacker Neuson service center.

The following maintenance plans indicate the maintenance work to be performed.

This is necessary to ensure optimal functioning.

– *see chapter 5.20 Maintenance plan (overview – Yanmar)* on page 5-51.

Immediately repair or replace parts that are already damaged or not working properly before they are due for replacement.

Important

Safety-relevant parts may only be repaired or replaced by a Wacker Neuson dealer or a Wacker Neuson service center.

Parts	Interval
Hydraulic hoses	Replace hydraulic hoses every 6 years from the date of manufacture, even if they do not seem to be damaged.
Seat belt	No replacement necessary. Replace the seat belt after an accident.

5.3 Maintenance strut

WARNING

Crushing hazard. An improperly supported skip can fall unexpectedly during maintenance work.

Can cause serious injury or death.

- Mount the red maintenance strut before you perform maintenance work with the skip raised.

WARNING

Crushing hazard during lowering the skip!

Can cause serious injury or death.

- Slowly and carefully lower the skip.

Front skip

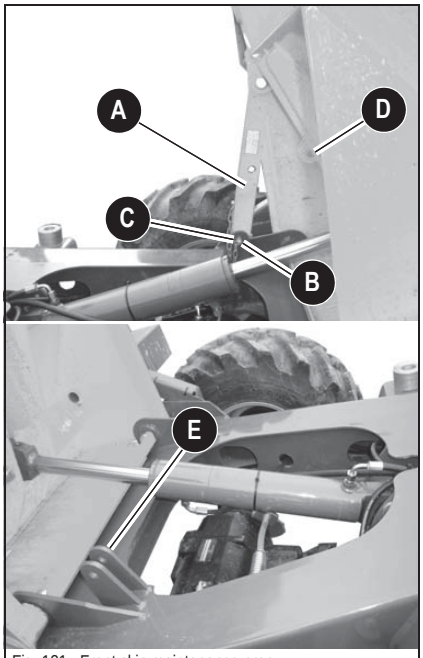


Fig. 121: Front skip maintenance prop

Installing the maintenance strut

☞ *Raise the skip.*

☞ *Remove spring plug **B** from pin **C**.*

☞ *Remove pin **C** from guide **D**.*

☞ *Lower the skip until the holes of guide **E** and the holes of maintenance prop **A** are aligned.*

☞ *Insert pin **C** in guide **E**.*

☞ *Secure pin **C** with spring plug **B**.*

- Install the maintenance prop back onto the skip, in the reverse order, if it is no longer needed.

Swivel skip

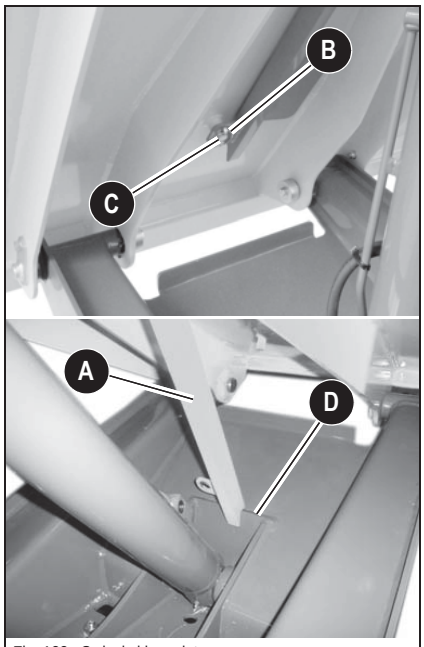


Fig. 122: Swivel skip maintenance prop

Installing the maintenance strut

☞ *Raise the skip.*

☞ *Pull safety pin **B** out of pin **C**.*

☞ *Lower the skip until maintenance prop **A** rests on swiveling console **D**.*

- Install the maintenance prop back onto the skip, in the reverse order, if it is no longer needed.

5.4 Fuel system

WARNING

Fire hazard when handling fuel!

Can cause serious injury or death.

- Before refuelling, stop the engine and remove the starting key.
- Never perform work on the fuel system in the vicinity of open flames or sparks.
- Do not refuel in closed rooms.
- No smoking, no fire.
- Do not smoke when working on the fuel system or when refueling.
- Wipe away fuel spills immediately.
- 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.

Important

Don't allow the fuel tank and fuel lines to completely empty while operating the machine. Otherwise, air is drawn into the fuel system. This requires bleeding the fuel system – *see Bleeding the fuel system* on page 5-7.

Important

Add the tank with the correct fuel type at the end of each working day. This prevents condensation water from forming in the fuel tank over night. Do not fill the tank completely but leave some space for the fuel to expand.

Bear in mind the following important points when refueling:

- Avoid refueling with cans in order to avoid dirt in the fuel.
- When refueling the machine without a fuel-filling pump, use safety-oriented ladders and work platforms.
- Never use machine parts or attachments/superstructures as a climbing aid.

Refueling

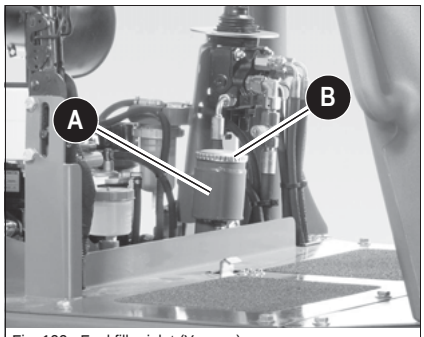


Fig. 123: Fuel filler inlet (Yanmar)

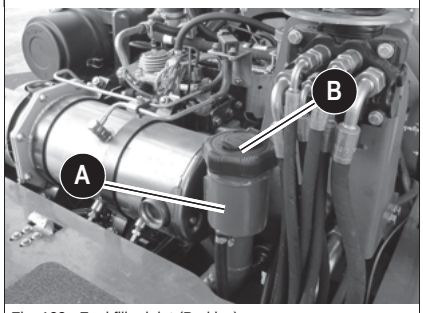


Fig. 123: Fuel filler inlet (Perkins)

Filler inlet **A** for the fuel tank is located under the engine cover, on the left in traveling direction.

☞ *Before refueling, stop the engine and remove the starting key.*

☞ *Unscrew and remove filler cap **B**.*

☞ *Refuel.*

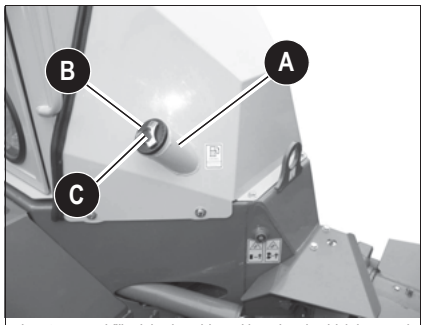


Fig. 124: Fuel filler inlet (machine with optional cabin) (Yanmar)

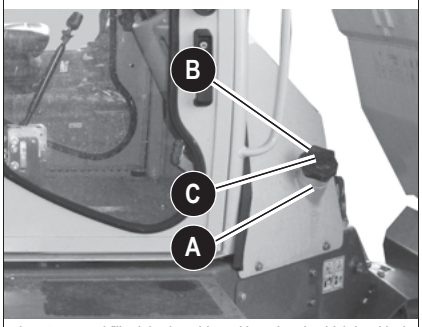


Fig. 124: Fuel filler inlet (machine with optional cabin) (Perkins)

☞ *Screw in filler cap **B**.*

Machine with optional cabin:

☞ Unlock lock **C** on filler inlet **A** with the starting key.

☞ Refuel.

☞ Screw in and lock filler cap **B**.

Environment

Use a suitable container to collect the fuel as it drains and dispose of it in an environmentally friendly manner.

Stationary fuel pumps

General

If possible, refuel only from stationary fuel pumps. Fuel from barrels or cans is usually dirty.

Even the smallest particles of dirt can cause:

- Increased engine wear.
- Malfunctions in the fuel system and
- Reduced effectiveness of the fuel filters.

Refueling from barrels

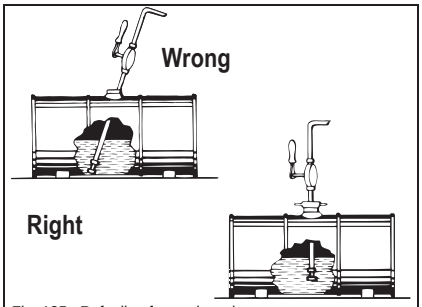


Fig. 125: Refueling from a barrel

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 screen.
- Immerse the suction pipe opening 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.

Bleeding the fuel system

WARNING

Burn hazard due to diesel fuel! Diesel fuel gives off inflammable vapours.
Can result in serious burns or death.

- Work on the fuel system may be performed only in an absolutely clean environment.
- Bleed the fuel system only if the engine is cold.
- Filter elements and drained fuel must be disposed of correctly.
- Always wear protective equipment and safety glasses when working with fuel.
- Do not smoke, avoid fire and open flames.

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.

Bleeding the fuel system:

☞ *Remove the starting key.*

☞ *Fill up the fuel tank.*

☞ *Turn the starting key to the first position.*

☞ *Wait about 5 minutes while the fuel system bleeds itself automatically.*

☞ *Start the engine.*

If the engine runs smoothly for a while and then stops, or if it does not run smoothly:

☞ *Stop the engine.*

☞ *Remove the starting key.*

☞ *Bleed the fuel system again as described above.*

☞ *Check for leaks after starting the engine.*

☞ *Have this checked by authorized personnel if necessary.*

Yanmar fuel prefilter with water separator (Yanmar)

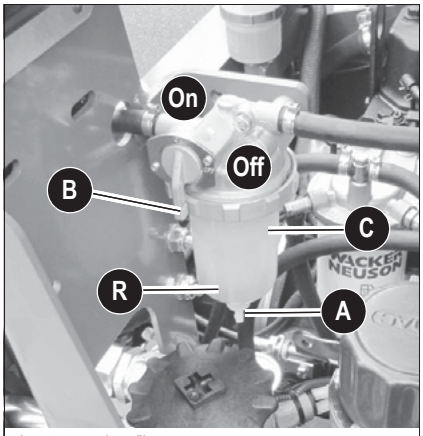


Fig. 126: Fuel prefilter

Draining the fuel/water mixture

- If the red indicator ring **R** rises to position **C**.

☞ *Stop the engine.*

☞ *Remove the starting key and carry it with you.*

☞ *Open the engine cover.*

- Machine with optional cabin:

  ☞ Open the left-hand maintenance access.

☞ *Turn ball-type cock **B** to the **OFF** mark.*

➥ Fuel supply is interrupted.

☞ *Place a suitable container under the fuel prefilter to collect the fuel/water mixture as it drains.*

☞ *Unscrew thread **A**.*

➥ Fuel/water mixture drains.

➥ Wait until the indicator ring returns to the bottom of the water separator.

☞ *Screw thread **A** back on again.*

☞ *Turn ball-type cock **B** to the **ON** mark.*

➥ Fuel supply is open again.

☞ *Close the engine cover.*

- Machine with optional cabin:

  ☞ Close the left-hand maintenance access.

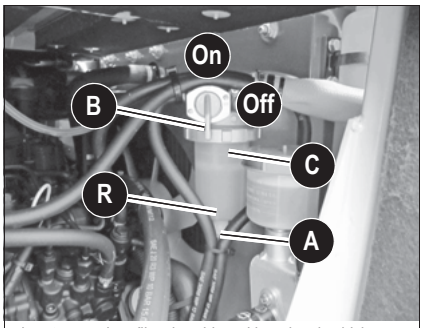


Fig. 127: Fuel prefilter (machine with optional cabin):

Environment

Collect the fuel/water mixture as it drains with a suitable container and dispose of it in an environmentally friendly manner.

Fuel filter with water separator (Perkins)

The water separator is located at the rear right of the engine compartment.

If the machine is equipped with a cabin, the water separator is located under the maintenance access on the left.

Checking the fuel filter

Empty the fuel filter if the fuel/water mixture reaches position **A**.

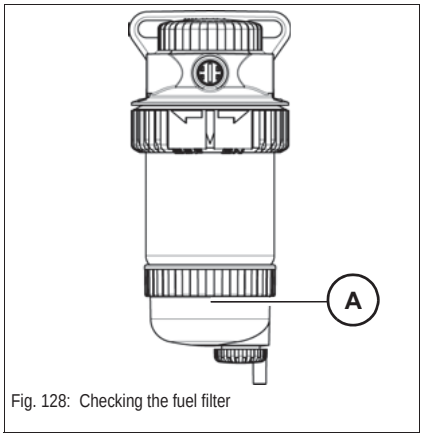


Fig. 128: Checking the fuel filter

Emptying the fuel filter

Important

The fuel system can be bled automatically even if the engine is at operating temperature.

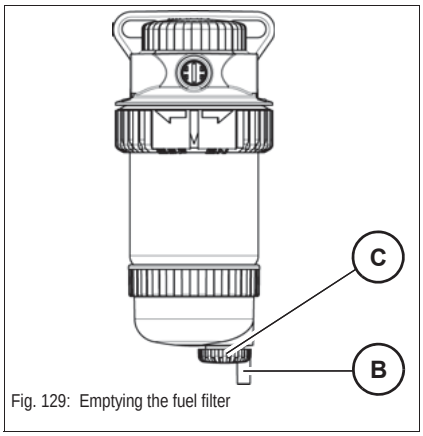


Fig. 129: Emptying the fuel filter

☞ *Stop the engine.*
☞ *Remove the starting key and carry it with you.*
☞ *Open the engine cover.*
☞ *Prepare a suitable container for collecting the fuel/water mixture.*
☞ *Connect a drain hose to port **B**. Place the hose into a container on the ground.*
☞ *Open screw **C**.*
☞ *Collect the fuel/water mixture in a suitable container.*
☞ *Close screw **C**.*
☞ *Remove the hose.*
☞ *Close and lock the engine cover.*

Important

Use a suitable container to collect engine/machine fluids as they flow out and dispose of them in an environmentally friendly manner.

5.5 Engine lubrication system

NOTICE

Possible engine damage or power loss due to improper oil management. If the engine oil level is too low or if an oil change is overdue, this can cause engine damage or loss of power.

- Check the oil level once a day.
  We recommend checking it before starting the engine. After stopping a warm engine, wait at least 5 minutes before checking.
- Have the oil changed by a Wacker Neuson service center
  – *see chapter 5.20 Maintenance plan (overview – Yanmar)* on page 5-51

Environment

Use a suitable container to collect engine/machine fluids as they flow out and dispose of them in an environmentally friendly manner.

Checking the engine oil level (Yanmar)

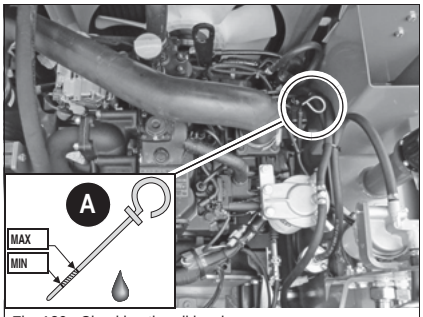


Fig. 130: Checking the oil level

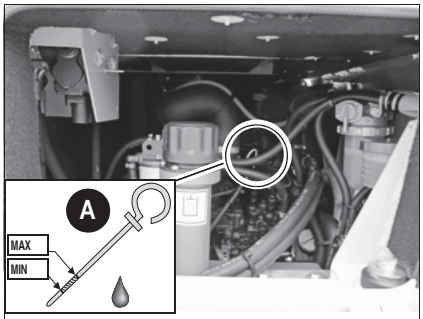


Fig. 131: Oil level check (machine with optional cabin)

☞ *Park the machine on firm, level and horizontal ground.*
☞ *Stop the engine.*
☞ *Remove the starting key and carry it with you.*
☞ *Let the engine cool down.*
☞ *Open the engine cover.*
- Machine with optional cabin:
  ☞ Open the left-hand maintenance access.

☞ *Clean the area around the oil dipstick with a lint-free cloth.*
☞ *Pull out oil dipstick **A**.*
☞ *Clean it with a lint-free cloth.*
☞ *Push oil dipstick **A** back in as far as possible.*
☞ *Withdraw it and read off the oil level.*

Important

The oil level must be between the MAX and MIN marks. However if necessary, fill up oil at the latest when the oil reaches the MIN mark on the oil dipstick.

☞ *Close the engine cover.*
- Machine with optional cabin:
  ☞ Close the left-hand maintenance access.

Checking the engine oil level (Perkins)

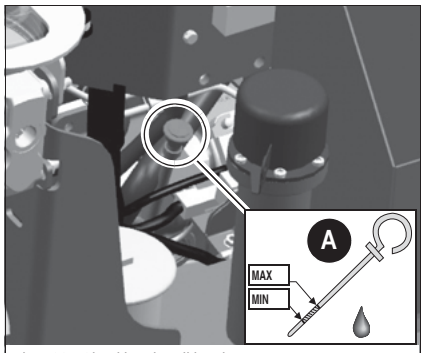


Fig. 132: Checking the oil level

☞ *Park the machine on firm, level and horizontal ground.*
☞ *Stop the engine.*
☞ *Remove the starting key and carry it with you.*
☞ *Let the engine cool down.*
☞ *Open the engine cover.*
- Machine with optional cabin:
  ☞ Open the left-hand maintenance access.

☞ *Clean the area around the oil dipstick with a lint-free cloth.*
☞ *Pull out oil dipstick **A**.*
☞ *Clean it with a lint-free cloth.*
☞ *Push oil dipstick **A** back in as far as possible.*
☞ *Withdraw it and read off the oil level.*

Important

The oil level must be between the MAX and MIN marks. However if necessary, fill up oil at the latest when the oil reaches the MIN mark on the oil dipstick.

☞ *Close the engine cover.*
- Machine with optional cabin:
  ☞ Close the left-hand maintenance access.

Adding engine oil

NOTICE

Adding the engine oil too fast via filler inlet **B** can cause engine damage.
Too much or incorrect engine oil can cause engine damage!

- Do not add engine oil above the MAX mark of oil dipstick
- Use only the specified engine oil
- Add the engine oil slowly so it can go down without entering the intake system.

Environment

Use a suitable container to collect the engine oil as it drains and dispose of it in an environmentally friendly manner.

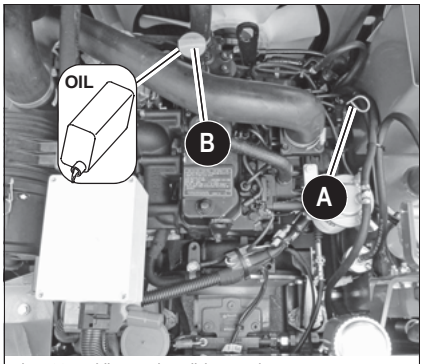


Fig. 133: Adding engine oil (Yanmar)

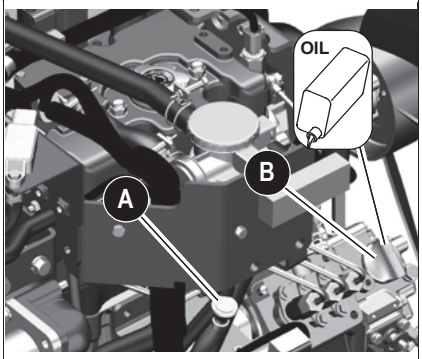


Fig. 133: Adding engine oil (Perkins)

☞ *Open the engine cover.*

- Machine with optional cabin:
  ☞ Open the left-hand maintenance access.

☞ *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 about 3 minutes until all the oil has run into the oil sump.*

☞ *Check the oil level.*

☞ *Add oil if necessary and check the oil level again.*

☞ *Close filler cap **B**.*

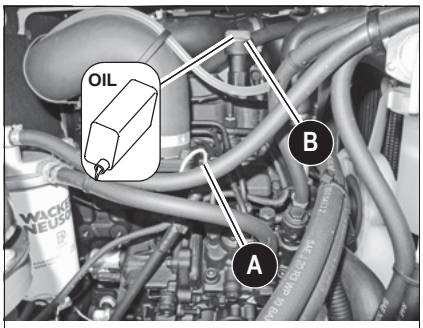


Fig. 134: Adding engine oil (machine with optional cabin) (Yanmar)

☞ *Push oil dipstick **A** back in as far as possible.*

☞ *Completely remove all oil spills.*

☞ *Close the engine cover.*

- Machine with optional cabin:
  ☞ Close the left-hand maintenance access.

5.6 Engine and hydraulics cooling system

The oil/water radiator is located in the engine compartment, behind the engine. It cools the engine, and the hydraulic oil of the travel and operating hydraulics.

The expansion tank for the coolant is located in the engine compartment next to the toolbox.

Specific safety instructions

- Dirt on the radiator fins reduces the radiator's heat dissipation capacity.
  To avoid this:
  - ☞ Clean the outside of the radiator at regular intervals. Use oil-free compressed air (2 bar/29 psi max.) to clean. Maintain a certain distance from the radiator to avoid damage to the radiator fins. 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 appendix for the intervals.
  - ☞ If coolant must be added frequently, check the cooling system for leaks and/or contact a Wacker Neuson service center.
  - ☞ Never add 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 stopping 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 – *see chapter 6.10 Coolant compound table* on page 6-5.
  - ☞ Do not use radiator cleaning compounds if an antifreeze compound has been added to the coolant – otherwise this causes sludge to form that can damage the engine.
- Once you have filled the expansion tank:
  - ☞ Test run the engine.
  - ☞ Stop the engine.
  - ☞ Let the engine cool down.
  - ☞ Check the coolant level again.

Environment

Use a suitable container to collect the coolant as it drains and dispose of it in an environmentally friendly manner.

Checking the coolant level/adding coolant

WARNING

Burn hazard. The engine coolant is under pressure at high temperature!

Can cause serious injury or death.

- Wait at least 15 minutes after stopping the engine.
- Wear protective gloves and clothing.
- Open filler cap ***B*** to the first notch and release the pressure.
- Confirm that the coolant temperature is sufficiently low so you can touch the radiator plug with your hands.

CAUTION

Hazardous material! Antifreeze is flammable and poisonous.

Can cause minor injury.

- Keep away from flames.
- Wash skin immediately to remove coolant mixture from the skin to avoid irritaion.
- Wash eyes immediately if coolant comes in contact with the eye. Seek medical attention immediately.
- Store coolant concentrate and mixtures in a secure space to prevent unauthorized contact.
- Do not store or use coolant or coolant mixtures near open flames including smoking materials.
- Dispose of used coolant through approved methods for recycling. Do not dispose of coolant or mixtures in sewers, toilets or dumping on the ground.

NOTICE

Do not mix the coolant with other coolants.

- Only use the coolant recommended by Wacker Neuson
– see chapter 6.10 Coolant compound table on page 6-5.

Important

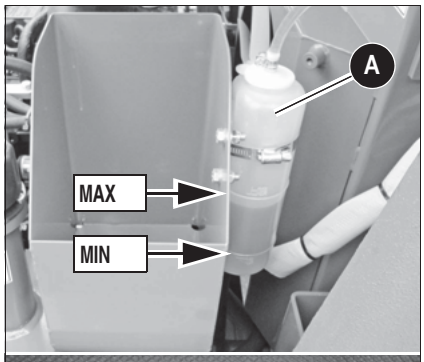
Check the coolant level once a day.
We recommend checking it before starting the engine.

☞ *Check the coolant level on the coolant tank and radiator filler inlet.*

Important

Check the antifreeze every year before the cold season sets in.

Checking the coolant level



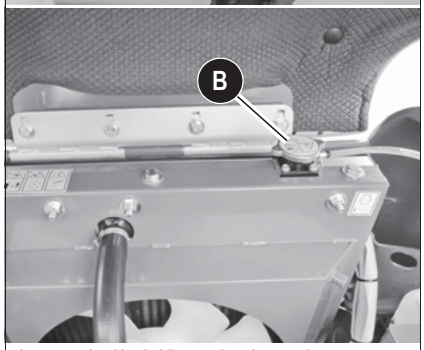


Fig. 135: Checking/adding coolant (Yanmar)

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Stop the engine.*

☞ *Remove the starting key and carry it with you.*

☞ *Let the engine and the coolant cool down.*

☞ *Open the engine cover.*

- Machine with optional cabin:

  ☞ Loosen the screws on cover **C**.

  ☞ Raise cover **C**.

☞ *Check the coolant level on the transparent coolant tank **A** and at the filler inlet **B** of the radiator.*

☞ *If the coolant level is below the **MIN (LOW)** mark or if there is no coolant at the radiator filler inlet **B**:*

  ☞ Add coolant.

☞ *Close the engine cover.*

- Machine with optional cabin:

  ☞ Install cover **C**.

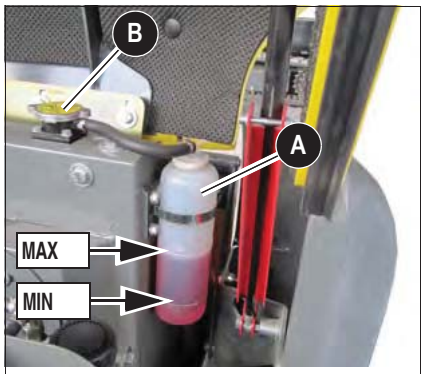


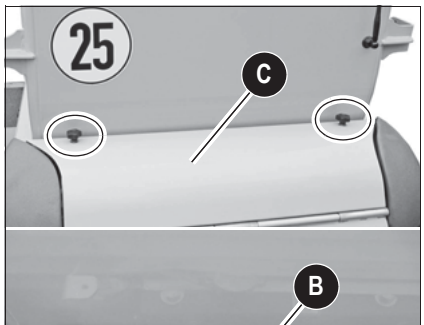
Fig. 136: Checking/adding coolant (Perkins)

Adding coolant

After the engine has cooled down:

☞ *Release overpressure in the radiator.*

  ☞ Carefully open cap **B** of the radiator to the first notch and fully release the pressure.



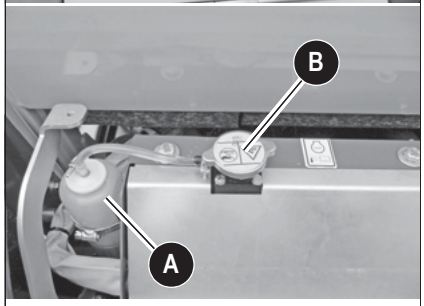


Fig. 137: Checking/filling up coolant (machine with optional cabin)

☞ *Open radiator filler cap **B**.*

☞ *Add coolant up to the lower edge of the filler inlet **B** (radiator).*

☞ *Close radiator filler cap **B**.*

☞ *Start the engine and let it warm up for about 5 – 10 minutes.*

☞ *Stop the engine.*

☞ *Remove the starting key and carry it with you.*

☞ *Let the engine cool down.*

☞ *Check the coolant level again.*

  ➥ The cooolant level on reservoir **A** must be between the **MIN (LOW)** and **MAX (FULL)** marks.

☞ *If necessary, add coolant and repeat the procedure until the coolant level remains constant.*

☞ *Close the engine cover.*

- Machine with optional cabin:

  ☞ Install cover **C**.

Cleaning the radiator

CAUTION

Burn hazard during performing maintenance on the radiator!

Can cause minor injuries.

- Stop the engine and let it cool down.
- Wear protective equipment.

NOTICE

Damage to diesel engine and hydraulic system due to dirt on the radiator.

- Check and if necessary clean the radiator once a day.
- In dusty or dirty work conditions, clean more frequently than indicated in the maintenance plans

NOTICE

Damage to radiator fins during cleaning.

- Keep a safe distance from the radiator during cleaning.
- Use oil-free compressed air (2 bar/29 psi max.) to clean.

Radiator **A** and the hydraulic oil cooler **B** are located under the rear panel.

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Stop the engine.*

☞ *Remove the starting key and carry it with you.*

☞ *Let the engine and the coolant cool down.*

☞ *Unscrew the four screws to remove rear panel* **C**.

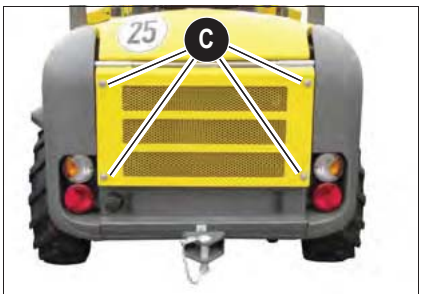


Fig. 138: Rear chassis, rear panel

☞ *Remove dust and other foreign bodies from the fins with compressed air.*

☞ *Install the rear panel.*

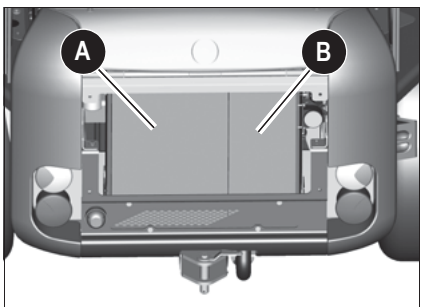


Fig. 139: Rear panel removed

5.7 Axle mounting

Front axle

WARNING

Accident hazard. Always park the machine on firm ground.

Can cause serious injury or death.

- Secure the machine to prevent it from rolling away.

Important

Retighten the axle fastening screws every 50 service hours.

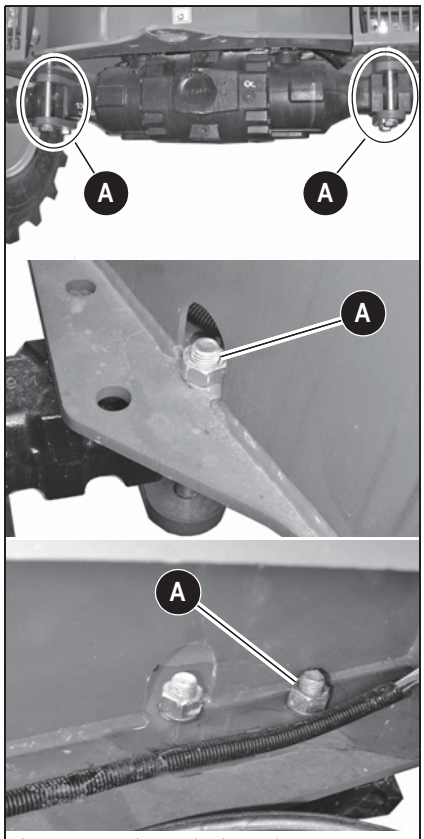


Fig. 140: Front axle mounting (Yanmar)

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Secure the machine to prevent it from rolling away.*

☞ *Retighten all **4** fastening screws **A**.*

➥ Tightening torque: 490 Nm (360 ft lbs).

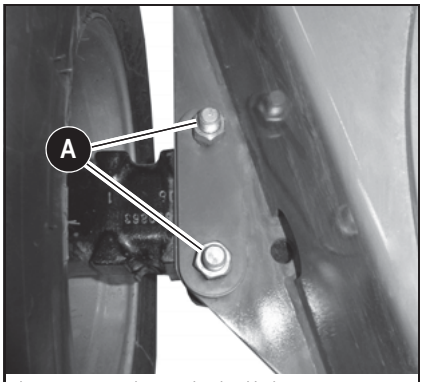


Fig. 141: Front axle mounting (Perkins)

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Secure the machine to prevent it from rolling away.*

☞ *Retighten all **4** fastening screws **A**.*

➥ Tightening torque: 490 Nm (360 ft lbs).

Rear axle

WARNING

Accident hazard. Always park the machine on firm ground.

Can cause serious injury or death.

- Secure the machine to prevent it from rolling away.

Important

Retighten the axle fastening screws every 50 service hours.

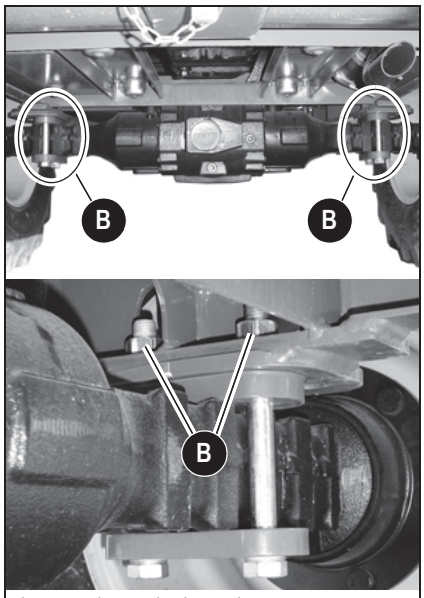


Fig. 142: Axle mounting (Yanmar)

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Secure the machine to prevent it from rolling away.*

☞ *Retighten all **4** fastening screws **B**.*

➥ Tightening torque: 490 Nm (360 ft lbs).

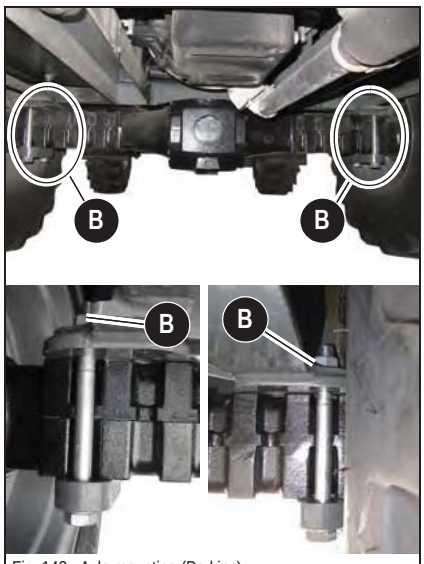


Fig. 143: Axle mounting (Perkins)

☞ *Park the machine on firm, level and horizontal ground.*

☞ *Secure the machine to prevent it from rolling away.*

☞ *Retighten all **4** fastening screws **B**.*

➥ Tightening torque: 490 Nm (360 ft lbs).

5.8 Air filter

NOTICE

The filter cartridge will be damaged if it is washed or brushed out.

Bear in mind the following to avoid premature engine wear.

- Do not clean the filter cartridge.
- Replace the filter cartridge when the indicator light illuminates.
- Never reuse a damaged filter cartridge.
- Ensure cleanliness when replacing the filter cartridge.

Dirt indicator (Yanmar)

Dirt indicator **A** on the air filter housing monitors the air filters.

The air filters must be replaced:

- If the dirt indicator **A** indicates dirt.
- According to the maintenance plan.

The dirt indicator is located on the air filter housing under the engine cover.

Machine with cabin (option): behind the right-hand maintenance access.

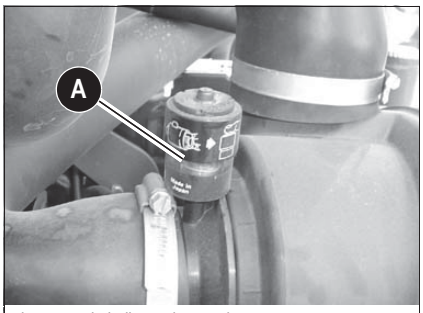


Fig. 144: Dirt indicator (Yanmar)

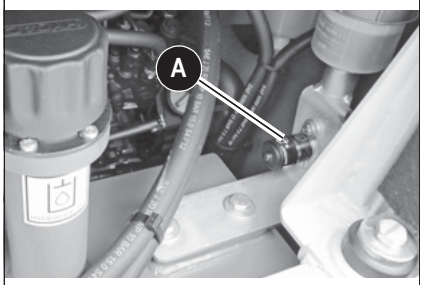


Fig. 144: Dirt indicator (machine with optional cabin) (Yanmar)

NOTICE

Filter cartridges degrade prematurely when in service in acidic air for longer periods of time. This risk is present, for example, in acid production facilities, steel and aluminium mills, chemical plants and other nonferrous-metal plants and in environments with increased dust development.

- Check and if necessary, replace the air filters every 50 service hours at the latest.

General instructions for air filter maintenance:

- Store filters in their original packaging and in a dry place.

☞ *Do not knock the air filters against other objects as you install them.*

☞ *Check air filters, air filter attachments and air intake hoses for damage, and immediately repair or replace if necessary.*

☞ *Check the screws at the induction manifold and the clamps for tightness.*

Air filter dirt indicator light (Perkins)

If the air filter is dirty, the yellow indicator light illuminates and the wrench symbol flashes.

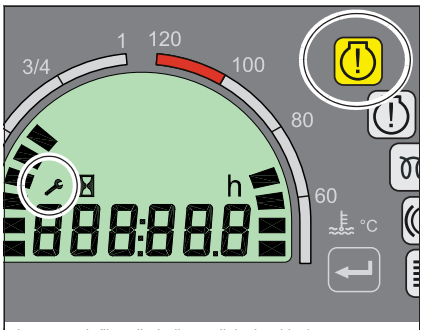


Fig. 145: Air filter dirt indicator light (Perkins)

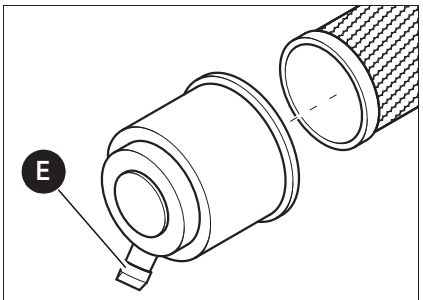


Fig. 146: Dust valve

Discharge slot of dust valve

☞ *Check the function of the discharge slot of the dust valve **E**, clean it and replace it if necessary.*

☞ Squeeze the end of the dust valve **E**.

☞ *Close the engine cover or the maintenance access.*

Replacing the filters

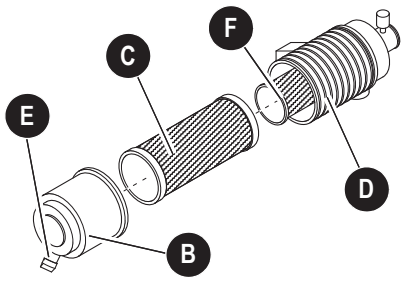


Fig. 147: Replacing the air filter

Replacing the outside air filter

☞ *Stop the engine.*

☞ *Remove the starting key and carry it with you.*

☞ *Let the engine cool down.*

☞ *Open the engine cover.*

- Machine with optional cabin:

  ☞ Open the right-hand maintenance access.

☞ *Remove dirt and dust from the filter housing and the area around it.*

☞ *Fold the bow clips on lower housing section **B** to the outside.*

☞ *Remove the lower housing section **B**.*

☞ *Carefully remove the outside air filter **C** with slightly turning movements.*

☞ *Ensure that all dirt (dust) inside the upper and lower housing sections (**D** and **B**), including dust valve **E**, has been removed.*

  ☞ Clean the parts with a clean lint-free cloth, do not use compressed air.

☞ *Check the outside air filter for damage, only install intact air filters.*

☞ *Carefully insert the new outside air filter **C** in the upper housing section **D**.*

☞ *Position lower housing section **B** (ensure that it is properly seated).*

☞ *Close the bow clips.*

Replacing the inside air filter

☞ *Remove outside air filter **C** as described above to access inside air filter **F**.*

☞ *Carefully extract inside air filter **F**.*

  ☞ Cover the air supply at the end of the filter with a clean lint-free cloth to prevent dust from entering the engine.

☞ *Ensure that all dirt (dust) inside the upper and lower housing sections **D** and **B**, including dust valve **E**, has been removed.*

  ☞ Clean the parts with a clean lint-free cloth, do not use compressed air.

  ☞ Remove the cloth from the air supply.

☞ *Check the inside air filter for damage, only install intact air filters.*

☞ *Carefully insert the new inside air filter **F** in the upper housing section **D**.*

☞ *Carefully insert the outside air filter **C** in the upper housing section **D**.*

☞ *Position lower housing section **B** (ensure that it is properly seated).*

☞ *Close the bow clips.*

☞ *Close the engine cover.*

- Machine with optional cabin:

  ☞ Close the right-hand maintenance access.

Important

Ensure that dust valve **E** shows downward once it is installed.

Checking the engine air intake (Perkins)

NOTICE

In order to avoid engine damage:

- Check once a day for cleanliness before putting the machine into operation.

Fig. 148: Engine air intake

☞ *Stop the engine.*

☞ *Remove the starting key and carry it with you.*

☞ *Let the engine cool down.*

☞ *Open the engine cover.*

- Machine with optional cabin:

  ☞ Open the right-hand maintenance access.

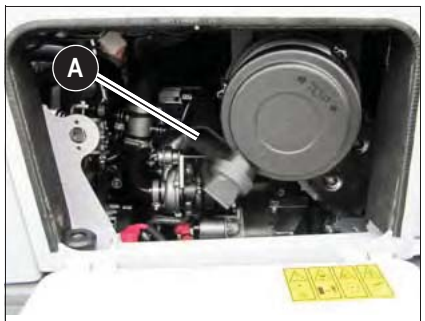


Fig. 149: Engine air intake (machine with cabin)

☞ *Check and, if necessary, clean air intake **A**.*

☞ *Close and lock the engine cover.*

- Machine with optional cabin:

  ☞ Close the right-hand maintenance access.

5.9 V-belt

V-belt tension may be checked and the V-belt retightened by a Wacker Neuson service center only.

5.10 Hydraulic system

Specific safety instructions

- Release the pressure in all lines carrying hydraulic oil prior to any maintenance and repair work. To do this:
  - Lower all hydraulically controlled attachments.
  - Move all control levers of the hydraulic control valves several times.
- Hydraulic oil escaping under high pressure can penetrate the skin and cause serious injury. Therefore always consult a doctor immediately, even in the case of minor wounds – 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 can cause damage to the hydraulic pump.
- Oil or fuel flowing out of high pressure lines can cause fire or malfunctions, and serious injury or damage to property. Interrupt work immediately if slack nuts or damaged hoses and lines are detected.

  ☞ Contact a Wacker Neuson dealer immediately.
- Have the respective line replaced if one of the following problems is detected:

  ☞ Damaged or leaky hydraulic seals.

  ☞ Worn or torn shells or uncovered reinforcement branches.

  ☞ Expanded shells in several positions.

  ☞ Entangled or crushed movable parts.

  ☞ Foreign bodies jammed or stuck in protective layers.

NOTICE

Contaminated hydraulic oil, lack of oil or wrong hydraulic oil can cause of severe damage to the hydraulic system!

- Take care to avoid dirt when working.
- Always add hydraulic oil using the filling screen.
- Only use authorized oils of the same type
  – *see chapter 5.18 Fluids and lubricants (Perkins)* on page 5-43
- Always add hydraulic oil before the level gets too low
  – *see Adding hydraulic oil* on page 5-27
- If the hydraulic system is filled with biodegradable oil, then use only biodegradable oil of the same type for filling up – observe the sticker on the hydraulic oil reservoir.
- Contact customer service if the hydraulic system filter is dirty and contains metal chippings. Otherwise, follow-on damage can 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.

Checking the hydraulic oil level

NOTICE

Damage to hydraulic system due to incorrect hydraulic oil level.

- Check the hydraulic oil level each time the machine is put into operation or once a day.

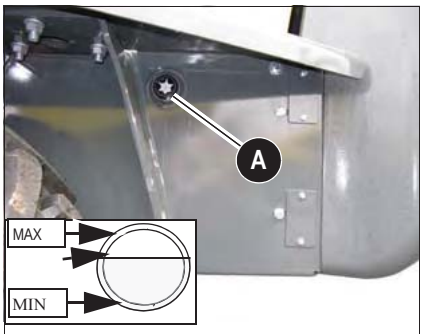


Fig. 150: Oil level indicator on the hydraulic oil reservoir

☞ *Place the machine on firm, level and horizontal ground.*

☞ *Retract all hydraulic cylinders.*

☞ Fully lower the skip.

☞ *Stop the engine.*

☞ *Sight glass **A** is located under the left-hand mudguard.*

☞ *Check the oil level on sight glass **A**.*

- The oil level must be about 1 cm (0.39 in) over the center, between positions **MIN** and **MAX**, as shown by the arrows in fig. 150.

  ➥ The **MIN** level is marked by the lower joint.

  ➥ The **MAX** level is marked by the upper joint.

- If the oil level is lower:

  ☞ Add hydraulic oil.

The oil level varies according to the machine's operating temperature:

Machine condition	Temperature	Oil level
Before putting into operation	Between 10 and 30 °C (between 50 and 86 °F)	**MIN** mark
Normal operation	Between 50 and 90 °C (between 122 and 194 °F)	**MAX** mark

Adding hydraulic oil

WARNING

High pressure hydraulic oil ejection hazard! Removing the filler plug can cause oil to escape.

Can cause serious injury or death.

- Carefully unscrew the plug to slowly reduce the pressure inside the tank.
- Wear protective equipment. If oil contacts the eye flush immediately with clean water and seek medical treatment.

NOTICE

Do not add hydraulic oil unless the engine is stopped. Otherwise, hydraulic oil will overflow at the filler opening on the hydraulic reservoir.

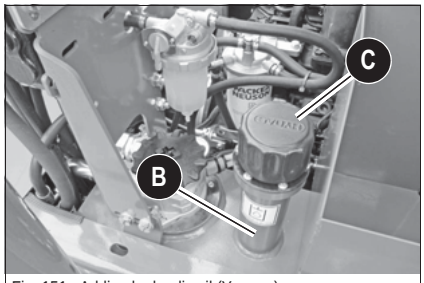


Fig. 151: Adding hydraulic oil (Yanmar)

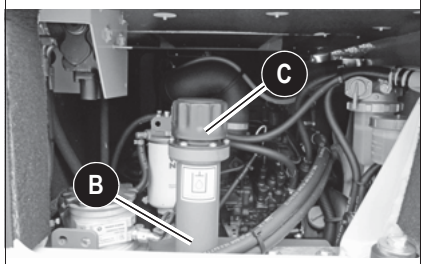


Fig. 151: Filling up hydraulic oil (machine with optional cabin) (Yanmar)

☞ *Park the machine on firm, level and horizontal ground.*
☞ *Retract all hydraulic cylinders.*
☞ *Stop the engine.*
☞ *Open the engine cover.*
- Machine with optional cabin:
  ☞ Open the left-hand maintenance access.

☞ *Clean the area around filler inlet **B** with a cloth.*
☞ *Open filler plug **C**.*
- With the filter insert in place:
  ☞ Add hydraulic oil.

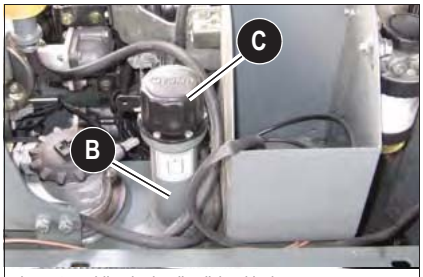


Fig. 152: Adding hydraulic oil (Perkins)

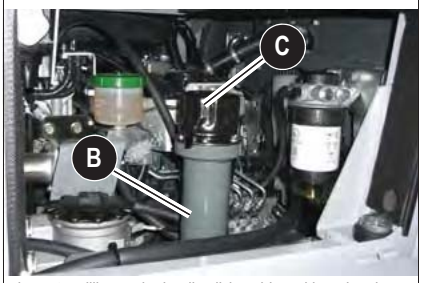


Fig. 152: Filling up hydraulic oil (machine with optional cabin) (Perkins)

☞ *Check the hydraulic oil level on sight glass **A**.*

☞ *Add if necessary and check again.*

☞ *Firmly close filler plug **C**.*

☞ *Close the engine cover.*

- Machine with optional cabin:
  - Close the left-hand maintenance access.

Wear indicator light of hydraulic oil filter insert

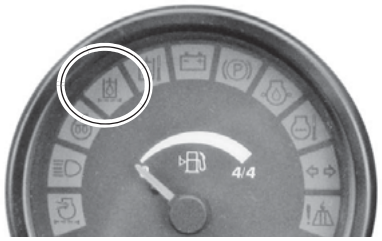


Fig. 153: Wear indicator light (Yanmar)

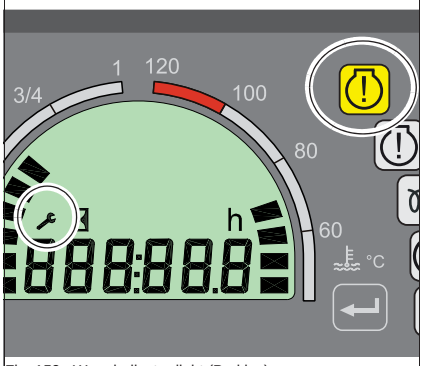


Fig. 153: Wear indicator light (Perkins)

An indicator light monitors the hydraulic oil filter:

- Red indicator light (Yanmar)
- The yellow indicator light and the wrench symbol flash (Perkins)

Replace the filter insert:

- If the indicator light illuminates when the hydraulic oil is at operating temperature.
- As indicated in the maintenance plan.

In cold weather the indicator light can illuminate immediately when the engine is started. This is caused by increased oil viscosity.

In this case:

- Warm up the machine at low engine speed and little load.
- Contact a Wacker Neuson service center if the indicator light does not go out.

Information on the use of biodegradable oil

- Use only the biodegradable hydraulic fluids which have been tested and approved by Wacker Neuson. Contact a Wacker Neuson dealer for the use of other products that 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 that can be proved to be due to the hydraulic fluid.
- Use only biodegradable oil of the same type for adding oil. In order to avoid misunderstandings, a label providing clear information is located on the hydraulic oil reservoir (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, ensure that the remaining amount of initial hydraulic fluid in the hydraulic system does not exceed 8 % when changing biodegradable oil (manufacturer indications).
- Do not add 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 chapter Maintenance plan (Perkins)* on page 5-55 and – *see chapter 5.20 Maintenance plan (overview – Yanmar)* on page 5-51
- Always have the condensation water in the hydraulic oil reservoir drained by a Wacker Neuson service center before the cold season. The water content may 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 installed 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 performed by a Wacker Neuson service center.

Checking hydraulic pressure lines

Specific safety instructions

DANGER

High pressure hydraulic oil ejection hazard. Hydraulic oil escaping under high pressure can catch fire, damage property, penetrate the skin and cause severe burns.

Will cause serious injury or death.

- Always consult a doctor immediately, even if the wound seems insignificant – otherwise serious infections could set in.
- Always observe the following instructions:
  - Retighten leaking screwed fittings and hose connections only when the system is not under pressure; i.e. release the pressure before working on pressurized lines.
  - Never weld or solder damaged or leaking pressure lines and threaded fittings. Replace damaged parts with new ones.
  - Never search for leaks with your bare hands, but wear protective gloves.
  - Use paper or wood to check for minor leaks. Never use an unprotected light or open flame.
  - Have damaged flexible lines replaced by Wacker Neuson service centers only.

- Leaks and damaged pressure lines must be immediately repaired or replaced by a Wacker Neuson service center.
  - This not only increases the operating safety of the 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.

Environment

Ensure environmentally compatible disposal.

- 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 article number is marked on the clamping section, and the date of manufacture is indicated on the hose of each hose connection.

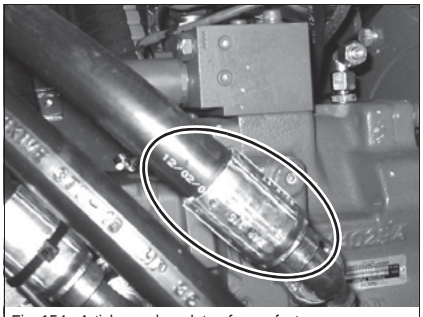


Fig. 154: Article number, date of manufacture

5.11 Tires

Fig. 155: Tires

Tire wear can vary according to work and ground conditions.

WARNING

Accident hazard due to improper tire repairs!

Can cause serious injury or death.

- All repair work on tires and rims may only be performed by Wacker Neuson service centers.

WARNING

Special hazard during reinflation.

Risk of severe injury or death.

- Observe the safety information – *see chapter Tires (Wheel dumpers)* on page 2-15.

Important

Checking the tires at regular intervals increases operational safety and the service life of the tires, and reduces machine downtimes. Please refer to *Chapter 6 "Specifications"* for the authorized tire types and the correct tire pressures.

Important

Replace tires with new ones after 6 years (irrespective of wear) and dispose of them correctly. After this period, the rubber no longer has its full capability due to various chemical and physical processes.

☞ *We recommend checking the tires for wear and the wheel nuts for tightness once a day.*

☞ *Park the machine on firm, level and horizontal ground to check and perform maintenance.*

Inspection work

☞ *Perform the following maintenance work once a day:*

- Visual check of the tire condition,.
- Check the tire pressure.
- Tire and rim (outside and inside) for damage.
- Check for wear.
- Remove foreign bodies from the tire tread.
- Remove traces of oil and grease from the tires.
- Check the tread depth.

Changing wheels

DANGER

Crushing hazard. Raise the machine only with suitable tools to provide adequate safety for work that has to be performed under a raised machine.

Will cause of serious injury or death.

- Do not allow anyone to stay in the danger zone.
- Stop the machine on firm, level and horizontal ground.
- Do not damage any parts of the machine as you support it.

CAUTION

Accident hazard. Use only wheels and tires that are authorized for the machine.

Can cause minor injuries.

– *see chapter 6 Specifications* on page 6-1.

Removing

☞ *Park the machine on firm, level and horizontal ground and prevent it from rolling away.*

☞ Use the chock to prevent the machine from rolling away.

☞ *Loosen the wheel nuts of the wheel you want to remove.*

☞ *Place a jack under the axle body, making sure it is standing firmly.*

☞ *Apply the parking brake.*

☞ *Raise the side of the axle from which you want to remove the wheel.*

☞ *Check the machine is standing firmly.*

☞ *Secure the machine with trestles in appropriate places.*

NOTICE

Trestles must be positioned so as to avoid machine damage.

☞ *Completely remove the wheel nuts.*

☞ *Remove the wheel.*

Installing

☞ *Place the wheel onto the wheel studs.*

➥ Bear in mind the correct direction of rotation.

☞ *Tighten the wheel nuts.*

☞ Tighten the opposite wheel nut alternately.

☞ *Remove the trestles.*

☞ *Lower the raised axle.*

☞ *Tighten the wheel nuts to the specified torque of 210 Nm (155 ft. lbs).*

☞ Tighten the opposite wheel nut alternately.

Important

After changing wheels, check the wheel nuts after 10 service hours for tightness. Retighten the wheel nuts if necessary.

5.12 Brake system

Important

Only use hydraulic oil for adding
– *see chapter 5.18 Fluids and lubricants (Perkins)* on page 5-43.

Important

Before adding hydraulic oil, first check the machine for possible leaks. Only then can hydraulic oil be added.

☞ *If leaks are detected: contact a Wacker Neuson service center and have the error repaired.*

Fig. 156: Brake system

Fig. 156: Brake system of machine with cabin (Yanmar)

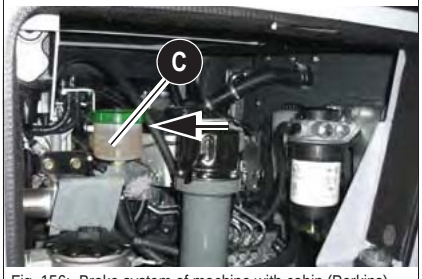


Fig. 156: Brake system of machine with cabin (Perkins)

☞ *Park the machine on firm, level and horizontal ground and prevent it from rolling away.*
☞ *Stop the engine.*
☞ *Remove the starting key and carry it with you.*
☞ *Open the engine cover.*
☞ *Open the maintenance access (machine equipped with optional cabin).*
☞ *Open cover **C**.*
☞ *Add hydraulic oil.*
☞ *Check the hydraulic oil level up to the mark.*
☞ *Add if necessary and check again.*
☞ *Firmly close cover **C**.*
☞ *Close and screw the maintenance access (machine equipped with optional cabin).*
☞ *Close and lock the engine cover.*

5.13 Electrical system

Specific safety instructions

Maintenance and repair work on the electrical system may be performed only by trained technical personnel or Wacker Neuson service centers!

- Malfunctioning components of the electrical system must be replaced by a Wacker Neuson service center.
- Light bulbs and fuses may be replaced by the operator.

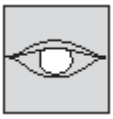
Alternator

- Start the engine only if the battery is connected.
- When connecting the battery, ensure that the poles are not inverted.
- Have a malfunctioning charge indicator light immediately replaced.

Service and maintenance work at regular intervals

Checks before machine travel or when changing operators

- Is the light system OK?
- Do the lights and the signalling and warning system work?



Every week

- Electric fuses.
- Cable and earth connections.
- Battery charge condition.
- Condition of battery terminals.

Fuses and relays

- Blown fuses indicate overloading or short circuits. Have the electrical system checked by a Wacker Neuson service center.
- Only use fuses with the specified load capacity (amperage).

Battery charge condition

May only be checked by a Wacker Neuson service center.

Charging the battery

May only be checked by a Wacker Neuson service center.

Replacing the battery

The battery is located under the operator seat.

The battery is “maintenance-free”. However have the battery checked at regular intervals to ensure that the electrolyte level is between the MIN and MAX marks.

Checking the battery requires it to be removed and must be performed by a Wacker Neuson service center.

Always follow the specific battery safety instructions.

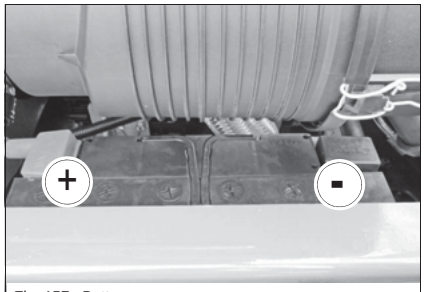


Fig. 157: Battery

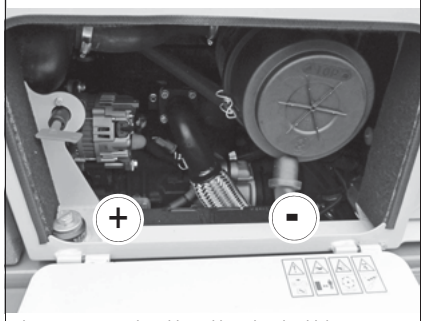


Fig. 157: Battery (machine with optional cabin)

The battery is located on the right under the engine cover.

Machine with optional cabin:

➥ Behind the right-hand maintenance access.

1 Stop and park the machine. Stop the engine. See “Preparing lubrication”.

2 Remove the battery cover (see chapter “Maintenance accesses”).

3 Remove mount **A**.

4 First remove the black battery lead from the negative terminal (−), then the red battery lead from the positive terminal (+).

5 Replace the battery.

6 First install the battery lead on the positive terminal (+), then the one on the negative terminal (-).

7 Install mount **A**.

8 Install the battery cover.

Battery

WARNING

Injury hazard due to malfunctioning batteries!

Can cause serious injury or death.

- Do not smoke, avoid fire and open flames.
- Do not place any tools on the battery.
- Wear protective gloves and safety glasses.
- Do not attempt to jump-start the machine if the battery is frozen or if the acid level is low.
- Always disconnect the earthing lead of the battery before starting repair work on the electrical system.

NOTICE

Damage to electrical components or the engine electronics.

- When connecting the battery leads, ensure that the poles are not inverted.
- Never place tools or other conductive articles on the battery – risk of short circuit.
- Do not interrupt voltage-carrying circuits at the battery terminals because of the risk of sparking.
- Do not disconnect the battery while the engine is running.

Environment

Dispose of old batteries in an environmentally friendly manner.

5.14 General maintenance work

Cleaning

Cleaning the machine is divided into 3 separate areas:

- Exterior of the machine.
- Engine compartment.
- Inside the cabin (option).

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.

General instructions for all areas of the machine

Cleaning with washing solvents

- Ensure adequate room ventilation.
- Wear suitable protective clothing.
- Do not use flammable liquids, such as gas or diesel.

Cleaning with compressed air

- Work carefully.
- Wear safety glasses 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.

Cleaning with a high-pressure cleaner or steam jet

- Cover electric parts.
- Do not directly expose electrical components and damping material to the jet.
- Cover the vent filter on the hydraulic oil reservoir and the filler caps for fuel, hydraulic oil etc.
- Protect the following components from moisture:
  - Electrical components such as the alternator etc.
  - Control devices and seals.
  - Air intake filters etc.

Cleaning with volatile and easily flammable anticorrosion agents and sprays:

- Ensure adequate room ventilation.
- Do not use unprotected lights or open flames.
- Do not smoke.

Exterior of the machine

NOTICE

Cleaning the machine can cause engine damage.

- Protect the engine against humidity.
- Follow the recommendations below to properly clean the machine and the engine.

The following articles are generally suitable:

- High-pressure cleaner
- Steam jet

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 can destroy the fabric.

Inside the cabin

NOTICE

Never use high-pressure cleaners, steam jets or high-pressure water to clean inside the cabin. Water under high pressure can:

- penetrate into the electrical system and cause short circuits and
- damage seals and disable the controls.

We recommend using the following aids to clean the cabin:

- Broom.
- Vacuum cleaner.
- Damp cloth.
- Brush.
- Water with mild soap solution.

Engine compartment

WARNING

Injury hazard during working on a running engine!

Can cause serious injury or death.

- Stop the engine before performing maintenance work.
- Remove the starting key and carry it with you.

NOTICE

The humidity penetrating any such sensors causes them to fail and leads to engine damage. When cleaning the engine with a water or steam jet:

- The engine must be cold.
- Do not point the jet directly at electric sensors such as the oil pressure switch.

Threaded fittings and attachments

All threaded fittings must be checked regularly for tightness, even if they are not listed in the maintenance schedules.

☞ *Engine fastening screws.*

☞ *Axle fastening screws.*

☞ *Fastening screws on the hydraulic system.*

☞ *Line and pin fastenings on the attachment.*

☞ *Retighten loose connections immediately. Contact a Wacker Neuson service center if necessary.*

Pivots and hinges

All mechanical pivot points on the machine (door hinges, joints, for example) and fittings (door arresters, for example) must be lubricated regularly, even if they are not listed in the lubrication plan.

5.15 Preparatory work before taking out of service

The measures indicated below refer to putting the machine out of operation for 30 days or longer.

- Park the machine
  – see chapter 3.16 *Parking the machine* on page 3-36.
- Check whether oil or other fluids leak from the machine.
- Clean the engine with a high-pressure cleaner in a suitable place
  – see *General maintenance work* on page 5-37.
- Carefully clean and dry the entire machine.
- Spray an anticorrosion agent onto bare metal parts of the machine (piston rods of hydraulic cylinders, for example).
- Apply grease to all lubrication points.
- Fill the fuel tank completely.
- Change engine oil.
- Check and if necessary add hydraulic oil and coolant.
- Store the machine indoors if possible.
- If the machine is stored outdoors, place it on a wooden base and cover it with a watertight tarp to protect it against humidity.
- Remove the battery and store it in a safe place. Have the battery charged and battery maintenance performed by a Wacker Neuson service center at regular intervals.
- Interrupt fuel supply (turn the ball-type cock on the fuel prefilter to OFF).
  Only possible with a Yanmar engine.
- Close the exhaust pipe and the air intake opening of the air filter system.

5.16 Maintenance if the machine is out of service for a longer period of time

The following measures must be taken if the machine is out of service for more than 30 days.

Putting into operation again (Yanmar)

- Remove anticorrosion agent from the piston rods.
- Install or connect the battery.
- Remove the seals from the exhaust pipe and the air filter intake.
- Check the condition of the air filter element and replace the element if necessary.
- Check the dust valve.
- Open fuel supply (turn the ball-type cock on the fuel prefilter to ON).
- Turn the ignition to position 1 for 2 minutes (to supply the engine with fuel).
- Check whether oil or other fluids leak from the machine.
- Lubricate the machine according to the lubrication plan.
- Check and if necessary add engine oil, hydraulic oil, coolant and fuel in the units and tanks.
- If the machine was out of service for over 6 months, change the oil in the gearbox, engine, etc. and the hydraulic oil reservoir.
- Also replace hydraulic oil filters (return and breather filters) if the machine has been out of service for over 6 months.
- Remove the starting key and fuse F2 in the fuse box.
- Let the engine run 15 seconds.
- Wait 15 seconds.
- Let the engine run 15 seconds again.
- Remove the starting key, put fuse F2 back in.
- Start the diesel engine.
- Let the engine run at idling speed at least 15 minutes without load.
- Check the oil levels in all units and add oil if necessary.
- Start the machine and ensure that each function and all warnings work correctly before putting the machine back into operation.

Putting into operation again (Perkins)

- Remove anticorrosion agent from the piston rods.
- Install or connect the battery.
- Remove the seals from the exhaust pipe and the air filter intake.
- Check the condition of the air filter element and replace the element if necessary.
- Check the dust valve.
- Turn the ignition to position 1 for 2 minutes (to supply the engine with fuel).
- Check whether oil or other fluids leak from the machine.
- Lubricate the machine according to the lubrication plan.
- Check and if necessary add engine oil, hydraulic oil, coolant and fuel in the units and tanks.
- If the machine was out of service for over 6 months, change the oil in the gearbox, engine, etc. and the hydraulic oil reservoir.
- Also replace hydraulic oil filters (return and breather filters) if the machine has been out of service for over 6 months.
- Operate the starting key only briefly so that the engine does not start.
- Wait at least 30 seconds.
- Operate the starting key only briefly so that the engine does not start. Repeat this procedure five times and wait at least 30 seconds in between.
- Wait at least 30 seconds.
- Start the engine.
- Let the engine run at idling speed at least 15 minutes without load.
- Check the oil levels in all units and add oil if necessary.
- Start the machine and ensure that each function and all warnings work correctly before putting the machine back into operation.

5.17 Fluids and lubricants (Yanmar)

Component/application	Fluid/lubricant	Specification	Season/temperature	Capacity[1]
Diesel engine	Engine oil[2]	SAE10W40	–20 °C (−4 °F) +40 °C (+104 °F)	5.25 l (1.4 gal)
Brake system	Hydraulic oil	HVLP 46[3]	Year-round	1.5 l (0.4 gal)
Hydraulic system	Hydraulic oil	HVLP 46[4]	Year-round[5]	48 l (12.7 gal)
		HV 46[6]		
	Biodegradable oil[7]	HLP Synth 46		
		BIOHYD SE-S 46		
Grease nipples	Multipurpose grease	KPF 2 K-20[8]	Year-round	As required
Battery terminals	Acid-proof grease [9]	FINA Marson L2	Year-round	As required
Fuel tank [10]	Diesel fuel [11]	ASTM D975-94: 1D, 2D (USA)	Depending on outside temperatures Summer or winter diesel fuel	45 l (11.9 gal)
		EN 590		
		ISO 8217 DMX (International)		
		BS 2869-A1, A2 (GB)		
		JIS K2204		
		KSM-2610		
		GB252		
	Biodiesel	EN 14214		
		ASTM D-6751		
Engine cooling system	Coolant	Soft water + antifreeze SF D12 Plus (ASTM D4985)	Year-round	7.50 l (2 gal)
Washer system	Cleaning agent	Glass cleaner and antifreeze	Year-round	1.2 l (0.31 gal)

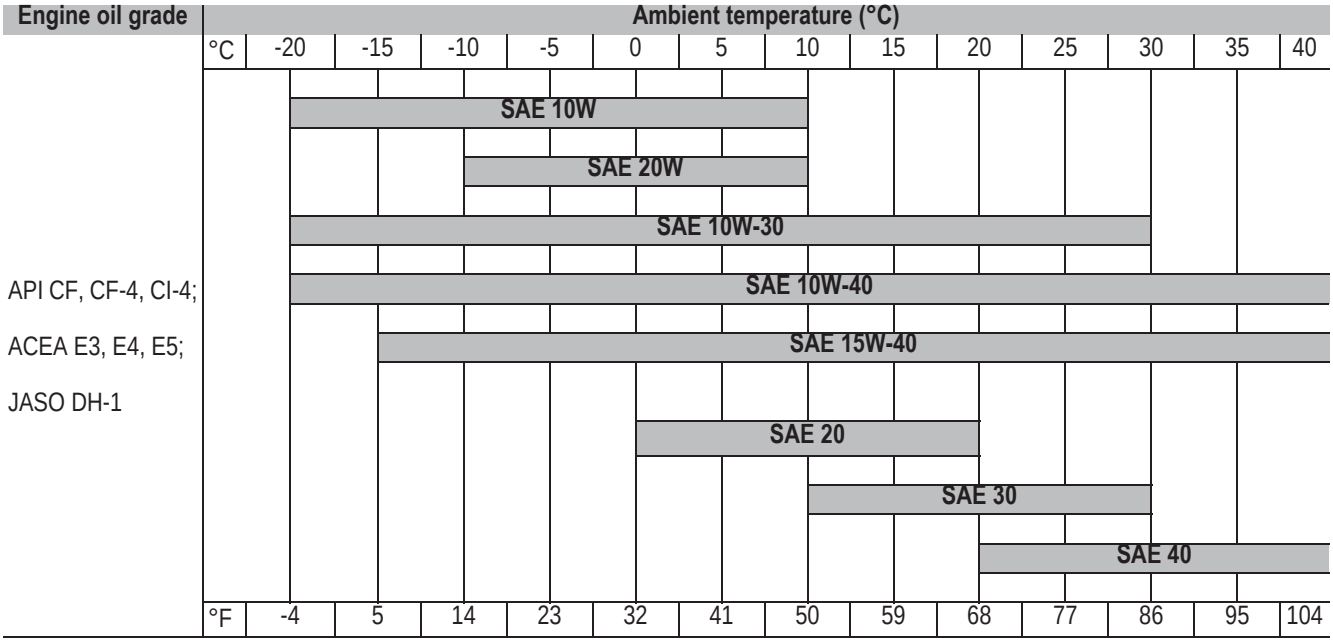
1. The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level. Capacities indicated are no system fills.
2. According to DIN 51511 (API CF, CF-4, CI-4; ACEA E3, E4, E5; JASO DH-1).
3. According to DIN 51524 section 3, ISO-VG 46.
4. According to DIN 51524 section 3, ISO-VG 46.
5. Depending on local conditions – see *Hydraulics oil grade* on page 5-45.
6. According to ISO 6743/4.
7. Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES
8. KPF 2 K-20 according to DIN 51502 lithium-saponified grease.
9. Standard acid-proof grease NGLI category 2.
10. Sulphur content below 0.05 %, cetane number over 45
11. In countries where level IIIA (or higher) or Tier IV (or higher) exhaust emission regulations apply provisionally, use diesel fuels with a maximum sulphur content of 0.0015 % (= 15 mg/kg).

5.18 Fluids and lubricants (Perkins)

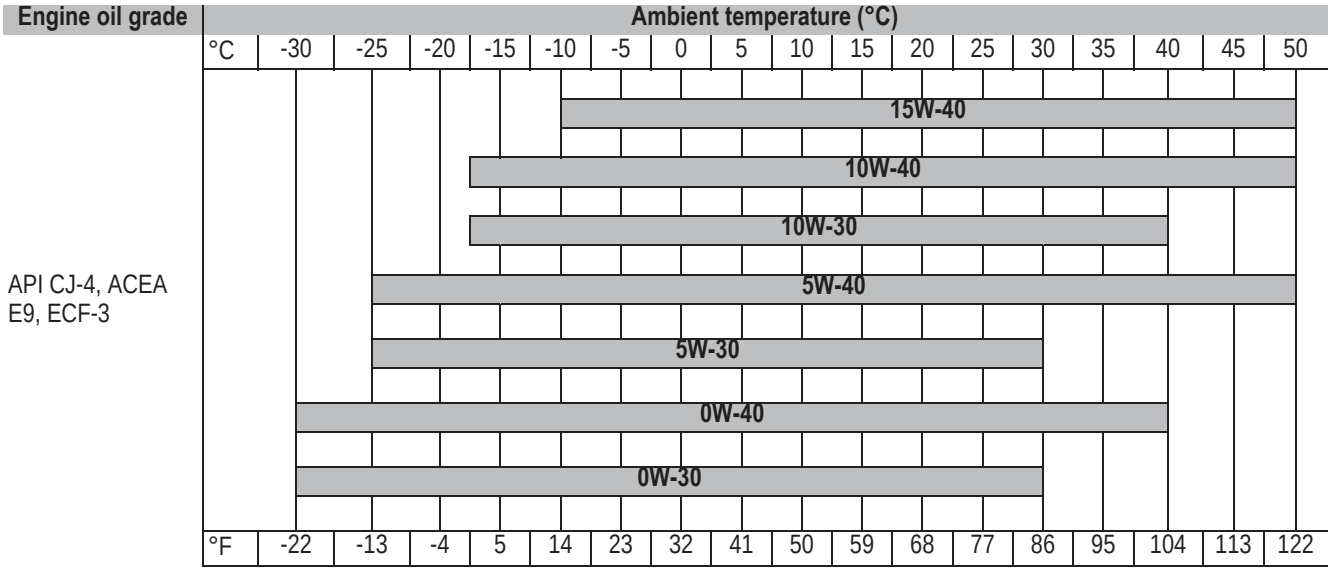
Component/application	Fluid/lubricant	Specification	Season/temperature	Capacity[1]
Diesel engine	Engine oil[2]	SAE10W40	−18 °C (−0.4 °F) +50 °C (+122 °F)	Max. 6 l (1.6 gal) Max. 4.5 l (1.2 gal)
Brake system	Hydraulic oil	HVLP 46[3]	Year-round	1.5 l (0.4 gal)
Hydraulic system	Hydraulic oil	HVLP 46[4]	Year-round[5]	48 l (12.7 gal)
		HV 46[6]		
	Biodegradable oil[7]	HLP Synth 46		
		BIOHYD SE-S 46		
Grease nipples	Multipurpose grease	KPF 2 K-20[8]	Year-round	As required
Battery terminals	Acid-proof grease [9]	FINA Marson L2	Year-round	As required
Fuel tank	Diesel fuel	ASTM D975 grade 2D S15[10]	Depending on outside temperatures Summer or winter diesel fuel	45 l (11.9 gal)
		EN 590[11]		
		BS 2869:2010 class A2[12]		
Engine cooling system	Coolant	Soft water + antifreeze ASTM D6210	Year-round	7.50 l (2 gal)
Washer system	Cleaning agent	Water + antifreeze	Year-round	1.2 l (0.31 gal)

1. The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level. Capacities indicated are no system fills.
2. According to DIN 51511 (API CJ-4, ACEA E9, ECF-3) – *see* *Oil grades for the diesel engine, depending on temperature (Perkins)* on page 5-44
3. According to DIN 51524 section 3, ISO-VG 46.
4. According to DIN 51524 section 3, ISO-VG 46.
5. Depending on local conditions – *see* *Hydraulics oil grade* on page 5-45.
6. According to ISO 6743/4.
7. Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES
8. KPF 2 K-20 according to DIN 51502 lithium-saponified grease.
9. Standard acid-proof grease NGLI category 2.
10. With a sulphur content of less than 0.0015 % (15 mg/kg)
11. With a sulphur content of less than 0.001 % (10 mg/kg)
12. With a sulphur content of less than 0.001 % (10 mg/kg)

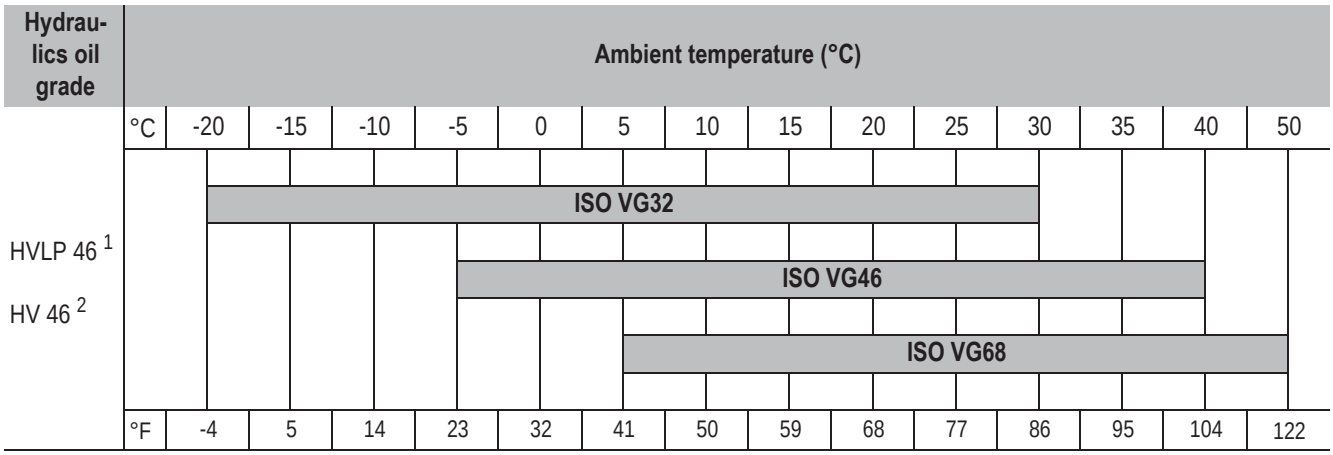
Oil grades for the diesel engine, depending on temperature (Yanmar)



Oil grades for the diesel engine, depending on temperature (Perkins)



Oil grades for the hydraulic system, depending on temperature



1. According to DIN 51524 section 3, ISO-VG 46.
2. According to ISO 6743/4.

Additional oil change and filter replacement (hydraulic system)

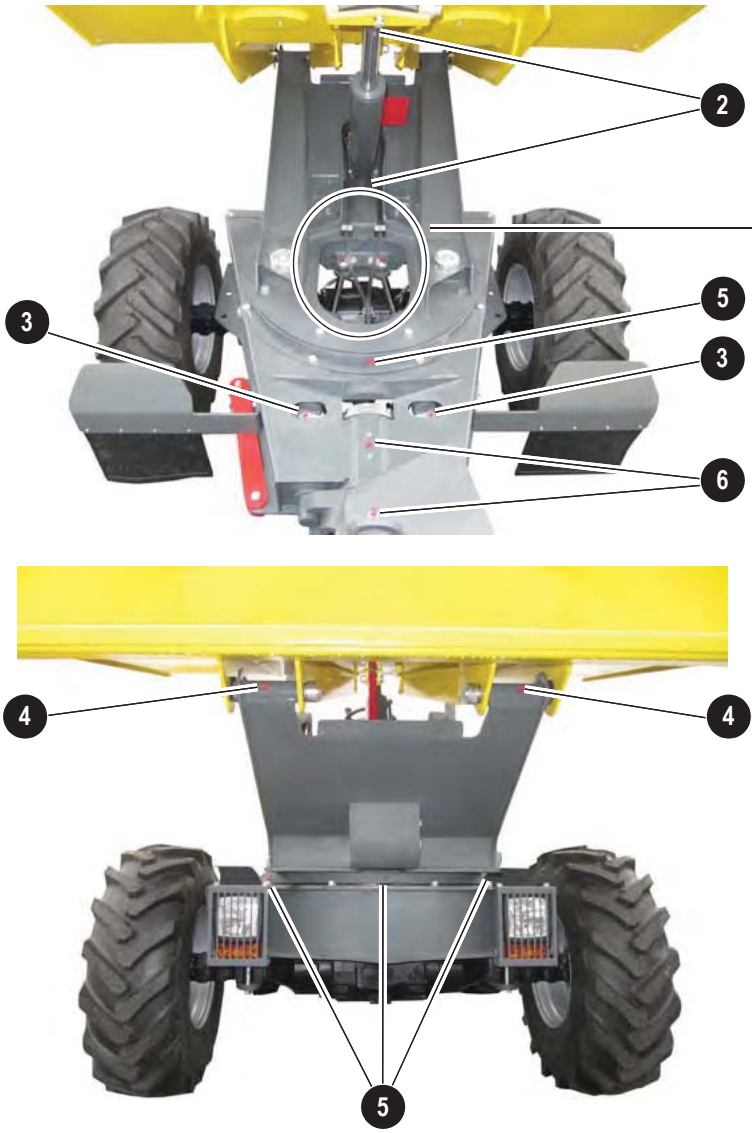
NOTICE

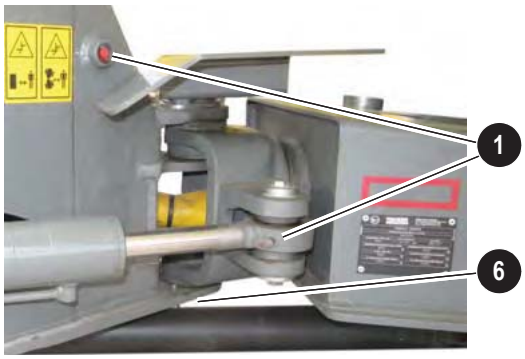
An additional oil change and filter replacement can be required depending on how the machine is used.
Failure to observe these replacement intervals can cause damage to hydraulic components.

5.19 Overview of lubrication points

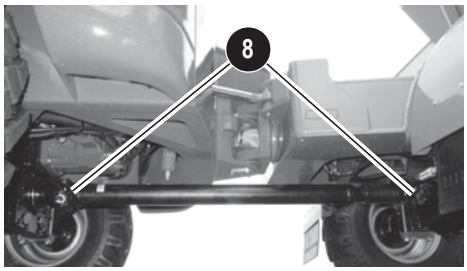
Lower the red maintenance prop before you perform maintenance work with the skip tilted out – *see chapter 5.3 Maintenance strut* on page 5-2.

Lubrication plan for swivel skip (option)





Steering hydraulic cylinder and articulated joint – shown from the right

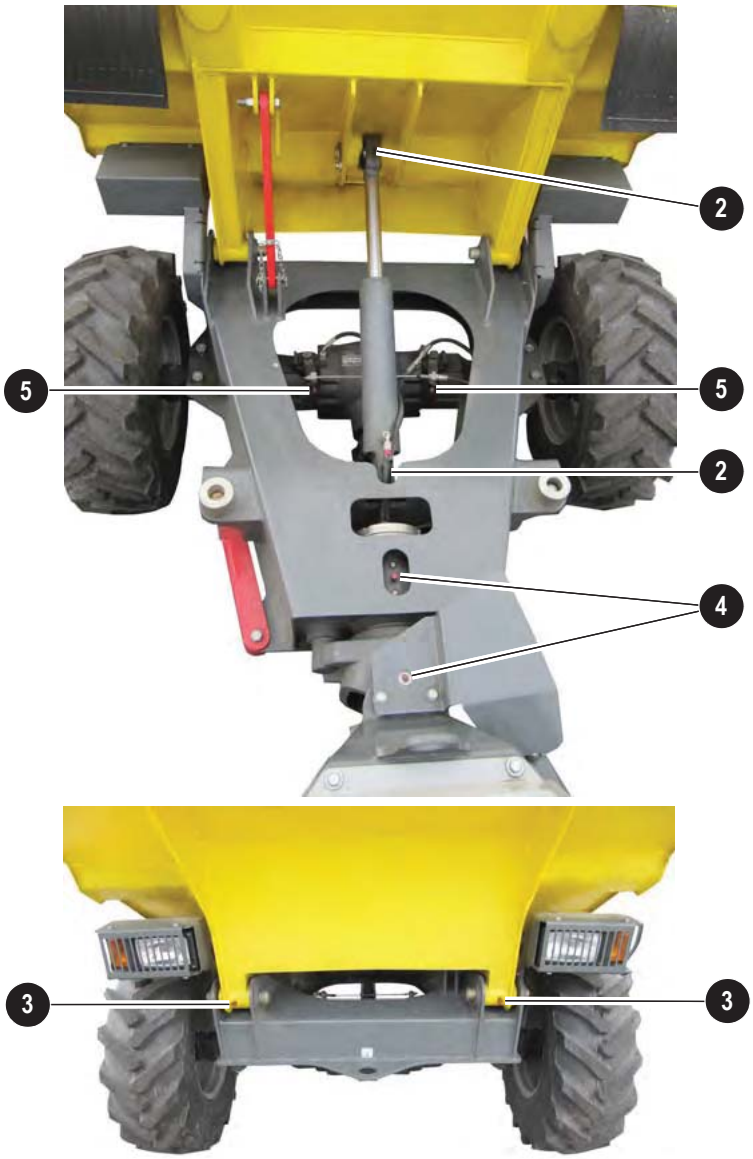


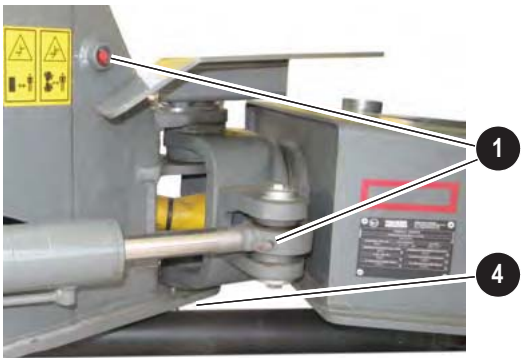
Cardan shaft – shown from the right (symbolic representation)

Pos.	Designation	Interval	Quantity
1	Steering hydraulic cylinder[1]	Daily	2
2	Tilt hydraulic cylinder	Daily	2
3	Swiveling hydraulic cylinder	Daily	4
4	Skip	Daily	2
5	Live ring	Daily	4
6	Articulated joint	Daily	3
7	Parking brake (Yanmar)	Every week	2
8	Cardan shaft	Every 500 s/h [2]	2

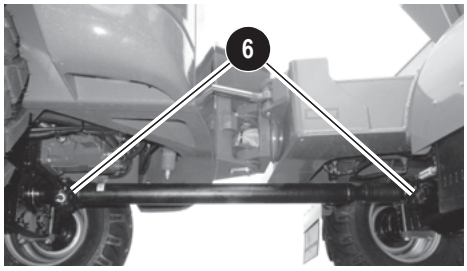
1. Steer the machine to the left and right when applying grease.
2. If the machine is used under extreme conditions (dirt, increased dust), reduce the interval to 250 s/h.

Lubrication plan for front skip (option)





Steering hydraulic cylinder and articulated joint – shown from the right



Cardan shaft – shown from the right (symbolic representation)

Pos.	Designation	Interval	Quantity
1	Steering hydraulic cylinder[1]	Daily	2
2	Tilt hydraulic cylinder	Daily	2
3	Skip	Daily	2
4	Articulated joint	Daily	3
5	Parking brake (Yanmar)	Every week	2
6	Cardan shaft	Every 500 s/h [2]	2

1. Steer the machine to the left and right when applying grease.
2. If the machine is used under extreme conditions (dirt, increased dust), reduce the interval to 250 s/h.

Maintenance label

Some maintenance work may only be performed by a Wacker Neuson service center (see maintenance plan).

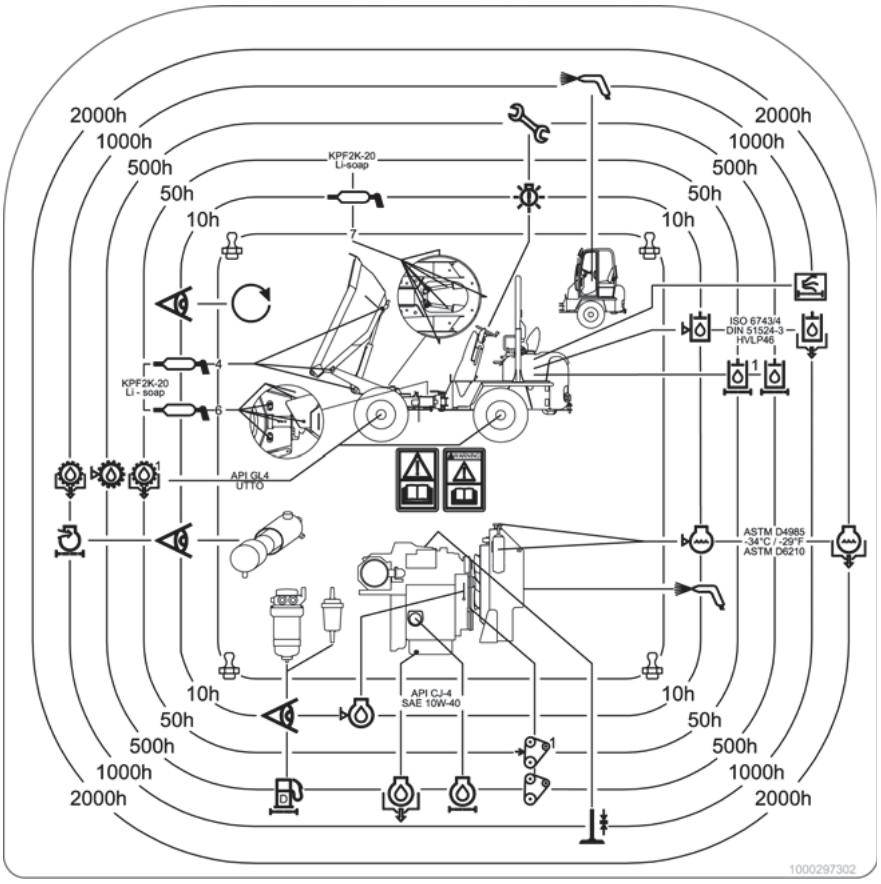
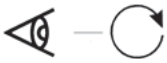


Fig. 158 (Perkins)

Explanation of symbols on the maintenance label

Symbol	Assembly	Explanation
	General	Visual check
	General	Visual check of machine (walk-around)
	General	Lubrication points
	General	Clean the radiator fins and the water separator
	Fuel system	Replacing the fuel filter
	Radiator	Check the coolant
	Radiator	Draining coolant
	Engine	Check the engine oil level
	Engine	Change the engine oil
	Engine	Replace the engine oil filter
	Engine	Replacing the V-belt
	Engine	Check the V-belt tension
	Engine	Replacing the air filter element
	Engine	Checking valve clearance
	Traveling drive	Check the gearbox oil of the drive
	Traveling drive	Replace the gearbox oil of the drive
	Hydraulic system	Check the oil level of the hydraulic system
	Hydraulic system	Change the hydraulic oil
	Hydraulic system	Replace the hydraulic oil filter insert
	Hydraulic system	Replace the breather filter of the hydraulic oil reservoir
	Cabin and rollbar	Indicator lights are being checked
	Cabin and rollbar	Resetting the maintenance meter

5.20 Maintenance plan (overview – Yanmar)

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)								
	Service work (daily)	Every 50 s/h	Every 250 s/h	Every 500 s/h	Every 1000 s/h Once a year	Every 1500 s/h	Every 2000 s/h	Customer	Wacker Neuson service center
Fluid and filter changes ( ):									
Perform the following oil and filter changes (check oil levels after test run):									
• Engine oil[1]		●	●						●
• Engine oil filter[2]		●	●						●
• Fuel filter[3]		●		●					●
• Air filter [4]				●				●	
• Coolant					●				●
• Gear oil in axles, transfer gearbox [5]		●			●				●
• Brake fluid				●					●
• Hydraulic oil filter insert [6]		●		●					●
• Hydraulic oil[7]					●				●
• hydraulic oil reservoir breather					●				●
Inspection work ( ):									
Check the following material. Refill if necessary:									
• Engine oil	●							●	
• Engine coolant	●							●	
• Hydraulic oil	●							●	
• Fuel	●							●	
• Gearbox oil			●						●
• Check the gearbox and axles for leaks	●							●	
• Brake fluid	●							●	
Clean water ducts							●		●
Retighten the axle fastening screws		●						●	

5.20 Maintenance plan (overview – Yanmar)

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)								
	Service work (daily)	Every 50 s/h	Every 250 s/h	Every 500 s/h	Every 1000 s/h Once a year	Every 1500 s/h	Every 2000 s/h	Customer	Wacker Neuson service center
Check the protective structures (rollbar, optional cabin, protective screen)					●			●	
Check radiator for engine and hydraulic oil for dirt. Clean if necessary	●							●	
Check cooling systems, heating and hoses for leaks and pressure (visual check)	●							●	
Check the air filters for dirt and damage, clean/replace them if necessary			●					●	
Remove dust from dust valve	●							●	
Check correct function of air filter dirt indicator				●					●
Fuel prefilter with water separator: drain water	●							●	
• Clean				●					●
Check V-belt condition and tension	●							●	
Replacing the V-belt				●					●
Check the exhaust system for damage and condition	●							●	
Check valve clearance. Adjust if necessary					●				●
Lapping the intake and exhaust valves							●		●
Check and adjust the injection pressure of the injection nozzles, clean the injection needles/nozzles						●			●
Empty the fuel tank and check for dirt				●					●
Check battery electrolyte. Add distilled water if necessary		●		●				●	
Check the tires (damage, inflation pressure, tread depth)	●							●	
Check wheel nuts for tightness		●						●	
Check electric connections, bearing play and function of alternator and starter				●					●
Check preheating system and electric connections				●					●
Pressure check of primary pressure limiting valves [8]		●		●					●
Check piston rods for damage	●							●	

5.20 Maintenance plan (overview – Yanmar)

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)								
	Service work (daily)	Every 50 s/h	Every 250 s/h	Every 500 s/h	Every 1000 s/h Once a year	Every 1500 s/h	Every 2000 s/h	Customer	Wacker Neuson service center
Check the threaded fittings of the safety devices (for example cabin, etc.) for tightness	●							●	
Check screws for tightness				●					●
Check pin lock	●							●	
Check line fixtures	●							●	
Check indicator lights for correct function	●							●	
Check couplings, dirt pile-up on hydraulic system dust caps	●							●	
Check insulating mats in the engine compartment for damage/condition		●						●	
Adjust the mirrors (option) correctly, clean them and check them for damage and correct function	●							●	
Check all fastening screws on the mirrors (option) and tighten them if necessary		●						●	
Check accesses and exits for dirt	●							●	
Check labels and Operator's Manual for completeness and condition		●						●	
Check function of engine cover gas strut	●							●	
Lubrication service ( ):									
Lubricate the following assemblies/components – *see Overview of lubrication points* on page 5-46:									
• Steering hydraulic cylinder	●							●	
• Tilt hydraulic cylinder – swiveling hydraulic cylinder	●							●	
• Articulated joint	●							●	
• Swiveling console	●							●	
Functional check ( ):									
Check the function of the following assemblies/components. Rectify if necessary:									
• Lights, signalling system, acoustic warning system [9]	●							●	
• Heating function (option)		●						●	

5.20 Maintenance plan (overview – Yanmar)

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)								
	Service work (daily)	Every 50 s/h	Every 250 s/h	Every 500 s/h	Every 1000 s/h Once a year	Every 1500 s/h	Every 2000 s/h	Customer	Wacker Neuson service center
• Pedal function	●							●	
• Parking brake function	●							●	
• Steering function	●							●	
Leakage check ( ):									
Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings of the following assemblies and components. Rectify if necessary:									
• Visual check	●							●	
☞ Engine, hydraulic system and components	●							●	
☞ Cooling and heating circuit	●							●	
☞ Traveling drive	●							●	

1. Drain engine oil the first time after 50 s/h, then every 250 s/h.
2. Replace the engine oil filter the first time after 50 s/h, then every 250 s/h.
3. Replace the fuel filter the first time after 50 s/h, then every 500 s/h.
4. According to the dirt indicator, replace every 500 s/h at the latest. (Replace after 50 s/h when in extensive use in environments with acidic air, such as acid production facilities, steel and aluminium mills, chemical plants and other nonferrous-metal plants).
5. Replace the oil the first time after 50 s/h, then every 1000 s/h or once a year.
6. Replace the hydraulic oil filter insert the first time after 50 s/h, then every 500 s/h.
7. Replace the hydraulic oil the first time after 500 s/h, then every 1000 s/h.
8. Check the first time at 50 s/h, then every 500 s/h.
9. Check once a week.

Maintenance plan (Perkins)

Daily maintenance (operator)	
Inspection work (Check the following engine/machine fluids, check the oil levels after a test run and add oil if necessary)	Page
Check the engine/machine fluids (engine oil, engine coolant, hydraulic oil, brake fluid)	*5-10*, *5-14*, *5-26*, *5-33*,
Check the radiators (for example water, hydraulic oil) for dirt, clean them if necessary	*5-16*
Lubricate the machine according to the lubrication plan	*5-46*, *5-47*
Check the dirt indicator on the air filter[1]	*5-20*
Check the water separator and fuel filter: drain water if necessary (see sight glass)	*5-9*
Check the tires (damage, inflation pressure, tread depth)	*5-31*
Check the engine air intake	*5-23*
Check pin lock	--
Check line fixtures	--
Check indicator lights for correct function	*3-10*
Checking the service and parking brake function	*3-27*
Check the threaded fittings of the protective structures (rollbar, cabin, for example) for tightness	--
Clean the lights/light system, signalling system	--
Option	
Adjust the mirrors correctly, clean them and check them for damage, check the fastening screws and tighten them if necessary	*3-51*
Leakage check	
Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings of the following assemblies and components. Repair if necessary	Page
Engine and hydraulic system	--
Traveling drive, axles and transfer gearbox	--
Brake system	--
Cooling systems, heating and hoses (visual check)	--
Visual check	
Correct function; deformations, damage, surface cracks, wear and corrosion	Page
Check the exhaust system for damage	--
Check the insulating mats in the engine compartment for damage	--
Check the cabin and protective structures for damage (rollbar, for example)	--
Check the piston rods of the hydraulic cylinders for damage	--
Check the seat belt for damage	--
Check function of engine cover gas strut	--
Check the lifting eyes	--

1. Air filter replacement according to the dirt indicator, every 1000 s/h or once a year at the latest. (Replace after 50 s/h when in extensive use in environments with acidic air, such as acid production facilities, steel and aluminium mills, chemical plants and other nonferrous-metal plants, independently of the dirt indicator)

Weekly maintenance (every 50 service hours) (operator)	Page
Lubricate the machine according to the lubrication plan	*5-46*, *5-47*
Retighten the axle mounting	*5-17*
Check wheel nuts for tightness	*5-32*
Check accesses and exits for dirt	--
All steps for previous maintenance intervals	--

Only once after the first 50 service hours (Wacker Neuson service center)	
Hydraulic oil filter insert replacement	--
Replacement of gearbox oil in traveling drive, axles and transfer gearbox	--
Check V-belt condition and tension	--
Check the threaded fittings for tightness	--
Check labels and Operator's Manual for completeness and condition	--
Pressure check of primary pressure limiting valves	--
All steps for maintenance once a day and once a week	--

Every 500 service hours or once a year (Wacker Neuson service center)	
Engine oil replacement	--
Engine oil filter replacement	--
Fuel filter replacement	--
Replace the water separator (prefilter element)	--
Hydraulic oil filter insert replacement	--
Replace the V-belt	--
Replace the brake system fluid	--
Check the gearbox oil in the traveling drive, axles and transfer gearbox	--
Clean the dust valve	--
Drain the condensation water (fuel tank)	--
Check the electric cables and connectors (cable and earth connections etc.)	--
Check the threaded fittings for tightness	--
Clean the cabin air filter (if necessary)	--
Reset the maintenance meter	--
All steps for maintenance once a day and once a week	--

Every 1000 service hours (Wacker Neuson service center)	
Hydraulic oil replacement	--
Replacement of hydraulic oil reservoir breather filter	--
Replacement of gearbox oil in traveling drive, axles and transfer gearbox	--
Replacement of air filter elements [1]	--
Replace the crankshaft housing filter	--
Check the exhaust-gas turbocharger	--
Check valve clearance, adjust if necessary	--
Change the cabin air filter	--
Pressure check of primary pressure limiting valves	--
Check the battery condition (charge condition, terminals etc.)	--
Lifting eye wear (check at least once a year)	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 service hours)	--

1. Air filter replacement according to the dirt indicator, every 1000 s/h or once a year at the latest. (Replace after 50 s/h when in extensive use in environments with acidic air, such as acid production facilities, steel and aluminium mills, chemical plants and other nonferrous-metal plants, independently of the dirt indicator)

Every 2000 service hours or every 2 years (Wacker Neuson service center)	
Coolant replacement	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 and 1000 service hours)	--

Every 3000 service hours or every 3 years (Wacker Neuson service center)	
Check the injection nozzles and clean and test them if necessary	--
Clean the diesel particulate filter	--
Replace the fuel-burner glow plug	--
Check the water pump (visual check)	--
Replace the coolant thermostat	--
Check the radiator cap	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 and 1000 service hours)	--

Information!

Maintenance work with the note **Wacker Neuson service center** must only be performed by the trained and qualified personnel of a Wacker Neuson **service center**.

Information!

The maintenance meter starts at 500.0 hours. It counts down to 0.0 hours. A wrench symbol flashes as soon as the maintenance meter reaches this value.

6 Specifications

6.1 Chassis

Sturdy steel sheet chassis, rubber-mounted engine

6.2 Engine

Engine	3001 (up to serial no. AD310200)	3001 (from serial no. AE310242)
Product	Yanmar diesel engine	
Type	3TNV88-KNSV	3TNV88-BKNSV
Design	Water-cooled 4 stroke diesel engine	
Number of cylinders	3	
Displacement	1642 cm^3 (100.2 in^3)	
Nominal bore and stroke	88 x 90 mm (3.46 x 3.54 in)	
Output	26 kW +/– 5 % at 2800 rpm (34.9 hp +/– 5 % at 2800 rpm)	24.4 kW +/– 5 % at 2800 rpm (32.7 hp +/– 5 % at 2800 rpm)
Interm. torque	108.9 Nm at 1680 rpm (80.3 ft lbs at 1680 rpm)	106.5 Nm at 1200 rpm (78.6 ft lbs at 1200 rpm)
Max. engine speed without load	2995 rpm +/– 25 rpm (2995 rpm +/– 25 rpm)	
Idling speed	~ 1000 rpm +/– 25 rpm (~1000 rpm +/– 25 rpm)	
Fuel injection system	Direct injection	
Starting aid	Preheater (preheating time 15 seconds)	Glow elements (preheating time 10 – 15 seconds)
Exhaust values according to	97/68/EC tier 2 EPA tier 2	EC tier 3A EPA tier IV interim

Engine	3001
Product	Perkins diesel engine
Type	403F-15T
Design	Water-cooled 4 stroke diesel engine
Number of cylinders	3
Displacement	1496 cm^3 (91.3 in^3)
Nominal bore and stroke	84 x 90 mm(3.3 x 3.5 in)
Output	27 kW +/– 5 % at 2800 rpm (36.2 hp +/− 5 % at 2,800 rpm)
Interm. torque	112 Nm at 1800 rpm (78.6 ft lbs at 1800 rpm)
Max. engine speed without load	2800 rpm +/− 25 rpm (2,800 rpm +/– 25 rpm)
Idling speed	1200 rpm +/− 25 rpm (1,200 rpm +/− 25 rpm)
Fuel injection system	Indirect injection
Starting aid	Glow elements (preheating time 10 – 15 seconds)
Exhaust values according to	EPA tier IV final

6.3 Operating hydraulics

Operating hydraulics	3001
Hydraulic pump displacement	16.8 cm³/rev (1 in³/rev)
Hydraulic pump flow rate (at 2,800 rpm)	47 l/min (12.4 gal/min)
Max. operating pressure	220 bar (3,191 psi)
Secondary pressure limiting for swiveling hydraulic cylinder	145 bar (2,103 psi)
Steering system	140 bar (2,031 psi)
Hydraulic tank capacity	33 l (8.7 gal)
Hydraulic oil quantity (system fill)	48 l (12.7 gal)

6.4 Traveling drive

Variable displacement pump	3001
Design	Axial piston pump
Flow rate (at 2800 rpm)	47 l/min (12.4 gal/min)
Max. operating pressure	360 bar (5,221 psi)

6.5 Drive specifications

Steering system	3001 (standard tires)	3001 (tire size 10.0/75 x 15.3)
Travel speed I	0 – 7 kph (0 – 4.35 mph)	0 – 6.3 kph (0 – 4 mph)
Travel speed II	0 – 24.5 kph (0 – 15.2 mph)	0 – 22 kph (0 – 13.7 mph)
Articulation	+/– 37°	
Oscillation	+/− 15°	
Outside turning radius	3850 mm (12'-8")	
Safe authorized inclination	14° (25 %) in all directions	

6.6 Brakes

Service brake/parking brake	3001
Design	Wet multidisc brakes
Location	Front axle
Effect	Hydraulic service brake mechanical parking brake

6.7 Steering system

Steering system	3001
Design	Hydrostatic
Steering mode	Chassis articulation steering

6.8 Tires

Type	Tire size	Tire pressure	Load-bearing capacity
TS 05, standard tires (up to serial number WNCD0305TPAL00339)	11.5/80 x 15.3	3.5 bar (51 psi)	PR 10
TS 05, standard tires (from serial number WNCD0305EPAL00340)	11.5/80 x 15.3	3.5 bar (51 psi)	PR 14
TR 03 (option)	11.5/80 x 15.3	4.75 bar (69 psi)	PR 14
TS 05, for special skip (option)	10.0/75 x 15.3	3.2 bar (46 psi)	PR 8
TS 05, foam-filled (option) (up to serial number WNCD0305TPAL00339)	11.5/80 x 15.3	--	PR 10
IM04, golf-course tires (option)	15.0/55 x 17	3.1 bar (45 psi)	PR 14
Spare wheel (option) corresponds to respective tires			

6.9 Skip

Skip		Front skip	Swivel skip (option)	Special swivel skip (option)
Skip capacity	Struck	1500 l (396 gal)	1315 l (347 gal)	1020 l (269 gal)
	Heaped	1850 l (489 gal)	1790 l (473 gal)	1300 l (343 gal)
	Liquid capacity	1160 l (306 gal)	930 l (246 gal)	820 l (217 gal)
Payload		3000 kg (6614 lbs)		2600 kg (5732 lbs)

6.10 Coolant compound table

Yanmar

Outside temperature	Coolant			
	Water	Anticorrosion agent		Antifreeze
Up to °C (°F)	% by volume	cm³/l / (in³/gal)	% by volume	% by volume
−37 (−34.6)	50	10 (2.6)	1	50

Use the 1:1 concentration for warm outside temperatures, too:

- Protection against corrosion, cavitation and deposits.

Do not mix the coolant with other coolants.

Machine filled at the factory with Eurolub SF D12 coolant (ethylene glycol basis).

Perkins

Water	Antifreeze
% by volume	% by volume
50	50
40	60

Do not mix the coolant with other coolants.

6.11 Vibration

Vibration	
Effective acceleration value for the upper extremities of the body (hand-arm vibration)	< Trigger value < 2.5 m/s²
Effective acceleration value for the body (whole-body vibration)	< 0.5 m/s²

Vibration values indicated in m/s².

Directive 2002/44/EC of European Parliament and Coucil on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

Indications on hand-arm vibration

Hand-arm vibration is less than 2.5 m/s² during correct machine operation.

Indications on whole-body vibration

Whole-body vibration is less than 0.5 m/s² during correct machine operation.

Uncertainty of measurement K has been taken into account for the specified values.

The degree of vibration is influenced by various parameters.

Some of them are listed below:

- Operator: training, behavior, working method and strain.
- Work site: organization, preparation, surroundings, weather conditions and material.
- Machine: version, seat quality, quality of suspension system, attachments and condition of attachments.

Precise indications on the vibration degrees cannot be made for the machine.

Determination of vibration level for the three vibration axes.

- Under typical operating conditions, use the average vibration values measured.
- In order to obtain the estimated vibration value for an experienced operator on level ground, subtract the factors from the average vibration value.

- In case of an aggressive working method or difficult terrain, add the environmental factors to the average vibration level in order to obtain the estimated vibration level.

Note:

For farther vibration indications, refer to the indications in ISO/TR 25398 Mechanical Vibrations – Directive on Estimation of whole-body vibration when traveling earth moving machines. This publication uses measuring values of international institutes, organizations and manufacturers. It contains information on whole-body vibration for operators in earth moving machines. For more information on the vibration values of the machine, refer to Directive 2002/44/EC of European Parliament and Coucil on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

It explains the values for vertical vibration under heavy operating conditions.

Directives on reduction of vibration values in earth moving machines:

- Perform correct adjustments and maintenance work on the machine.
- Avoid jerky movements during machine operation.
- Keep slopes in a perfect condition.

Whole-body vibration can be reduced with the following guidelines:

- Use a machine and equipment of correct type and size.
- Follow the manufacturer's recommendations for maintenance.
  - Tire pressure.
  - Brake and steering systems.
  - Control elements, hydraulic system and linkage.
- Keep the work area in good condition:
  - Remove large rocks or obstacles.
  - Fill up ditches and holes.
  - Provide a machine and enough time to keep the work area in good condition.
- Use an operator seat according to the ISO 7096 requirements. Keep the operator seat in good condition and adjust it correctly:
  - Adjust the operator seat and suspension to the operator's weight and size.
  - Check and maintain the seat adjustment and suspension.
- Perform the following activities smoothly without any jerks:
  - Steering
  - Braking
  - Acceleration
  - Shifting gears
- Move attachments without any jerks.
- Adapt your speed and the itinerary to minimize vibration:
  - Travel around obstacles and uneven ground.
  - Reduce your speed when traveling across rough terrain.
- Reduce vibration to a minimum during long work cycles or when traveling over long distances:
  - Use a machine with a suspension system (operator seat, for example).
  - Enable the hydraulic oscillation damping if the machine is equipped with tracks.
  - If the machine is not equipped with hydraulic oscillation damping, reduce your speed to avoid bumps and jolts.
  - Load the machine on a truck or trailer to move between work sites.
- Other risk factors can affect travel comfort negatively. The following measures can improve travel comfort:
  - Adjust the operator seat and the control elements to a relaxed body posture.

- Adjust the rearview mirrors to ensure optimal visibility so you can adopt an upright seating position.
- Provide breaks to avoid sitting for long periods.
- Do not jump off the cabin.
- Picking up and raising loads repeatedly must be limited to a minimum.

Reference:

The vibration values and calculations are based on the indications made in ISO/TR 25398 Mechanical Vibrations – Guidelines for assessment of exposure to whole-body vibration when operating earth moving machines.

The harmonized data comply with measurements made by international institutes, organizations and manufacturers. This publication offers information on the calculation of whole-body vibrations for operators of earth moving machines. This method is based on vibration measurements under real operating conditions for all machines. Read the original guidelines. This chapter summarizes part of the legal regulations. However, its aim is not to replace the original references. Other parts of this document are based on information of the United Kingdom Health and Safety Executive.

For more information on vibration, refer to Directive 2002/44/EC of European Parliament and Coucil on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

Your Wacker Neuson dealer provides information on other machine functions reducing vibration and on safe operation.

6.12 Electrical system

Electrical system	3001 (Yanmar)	3001 (Perkins)
Alternator	12 V 40 A (up to serial number EA02427) 80 A (from serial number EA02428)	12 V 85 A
Alternator (machine with optional cabin)	12 V 40 A (up to serial number EA02427) 80 A (from serial number EA02428)	12 V 85 A
Starter	12 V 1.4 kW (1.9 hp) (3TNV88-KNSV) 12 V 1.7 kW (2.3 hp) (3TNV88-BKNSV)	12 V 2.0 kW (2.7 hp)
Battery	12 V 88 Ah	
Socket (option)	7-pole	

Fuses and relays (up to serial no. EA01931, Yanmar)

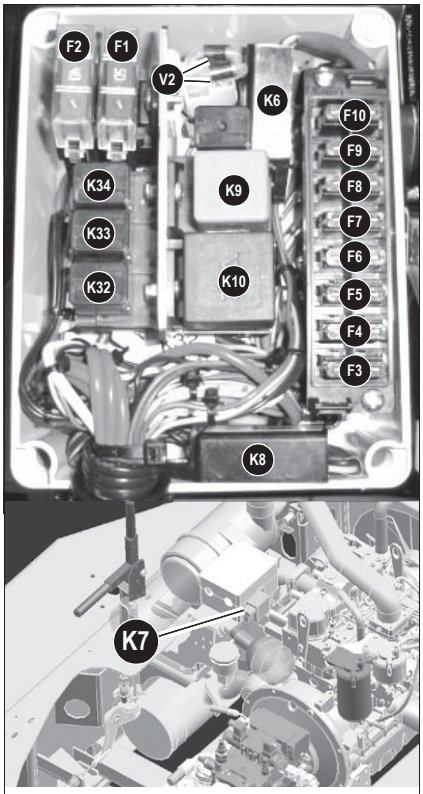


Fig. 159: Fuses and relays (up to serial no. EA01931)

- The fuse box is located on the right under the engine cover.
- Machine with optional cabin:
  ➥ In the cabin on the right beside the operator seat.

Fuse no.	Rated current (A)	Protected circuit
F1	50 A	Main fuse
F2	40 A	Main fuse
F 3	10 A	Cutoff solenoid, cutoff solenoid time lag relay
F 4	15 A	Drive solenoid valves
F 5	10 A	Horn, brake lights
F 6	15 A	Turn indicators
F 7	15 A	High beam
F 8	10 A	Low beam
F 9	10 A	Clearance light
F 10	10 A	Hazard warning system (option)

Relay no.	Protected circuit	Relay no.	Protected circuit
K 6	Preheating time lag relay	K32	Start interlock relay
K7	Start high-current relay	K33	Low beam relay
K 8	Cutoff solenoid time lag relay	K34	High beam relay
K 9	Cutoff solenoid switching relay	V2	Diodes
K 10	Turn indicator relay		

Fuses and relays (Yanmar)

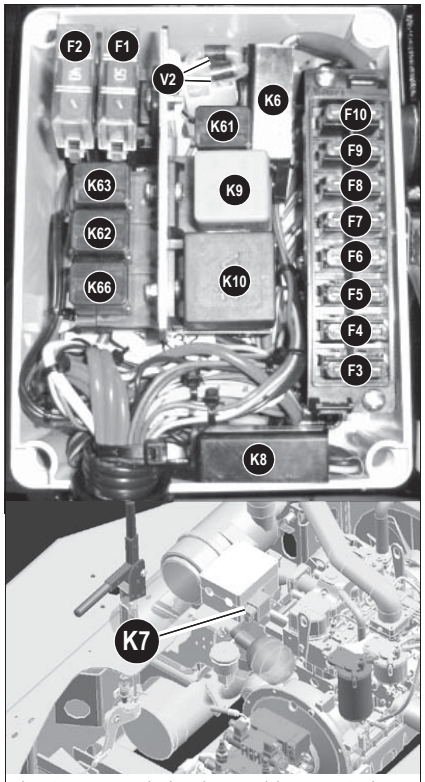


Fig. 160: Fuses and relays (up up to serial no. EA01950)

- The fuse box is located on the right under the engine cover.
- Machine with optional cabin:
  ➥ In the cabin on the right beside the operator seat.

Fuse no.	Rated current (A)	Protected circuit
F1	50 A	Main fuse
F2	40 A	Main fuse
F 3	10 A	Cutoff solenoid, cutoff solenoid time lag relay, fuel pump, indicator
F 4	15 A	Drive solenoid valves, parking brake, 2nd speed
F 5	10 A	Horn, brake lights
F 6	15 A	Turn indicators
F 7	15 A	High beam, rotating beacon
F 8	10 A	Low beam
F 9	10 A	Clearance light
F 10	10 A	Hazard warning system (option)

Relay no.	Protected circuit	Relay no.	Protected circuit
K 6	Preheating time lag relay	K61	Parking brake relay
K7	Start high-current relay	K62	Low beam relay
K 8	Cutoff solenoid time lag relay	K63	High beam relay
K 9	Cutoff solenoid switching relay	K66	Start interlock relay
K 10	Turn indicator relay	V2	Diodes

Additional fuses for machine with optional cabin (Yanmar)

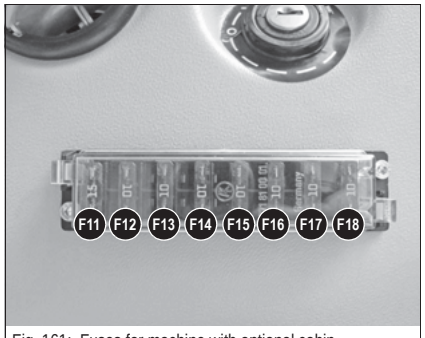


Fig. 161: Fuses for machine with optional cabin

The fuse panel is located on the right under the instrument panel, under the starter.

Fuse no.	Rated current (A)	Protected circuit
F11	15 A	Roof lights
F12	10 A	Wiper, radio
F 13	10 A	Heating
F 14	10 A	Rotating beacon
F 15	10 A	Not assigned
F 16	10 A	Radio, interior lighting
F 17	10 A	Not assigned
F18	10 A	Not assigned

Fuses and relays (Perkins)

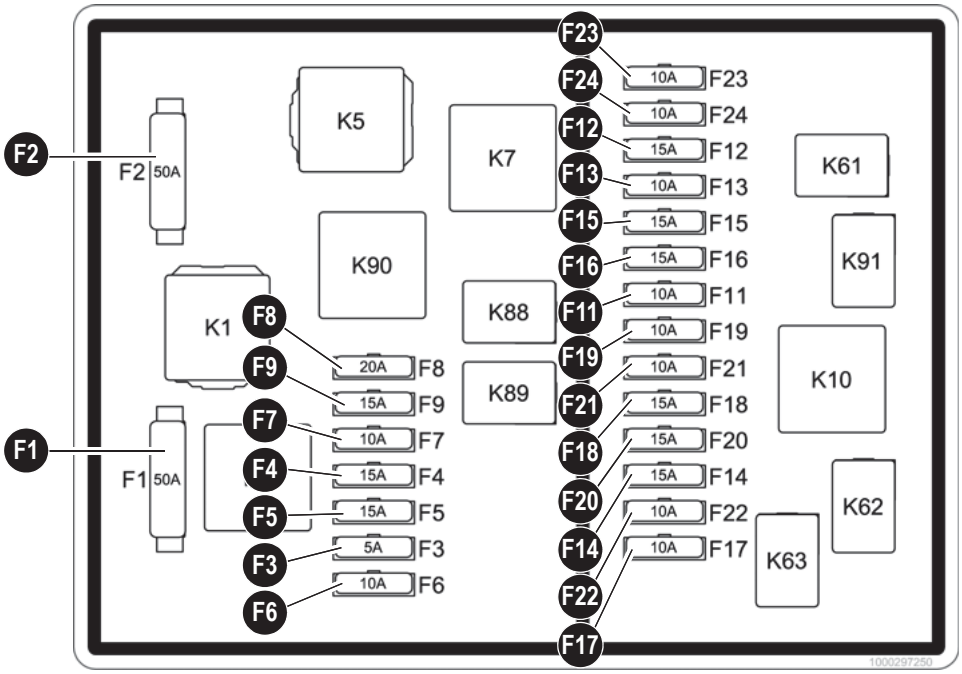


Fig. 162: Fuses

The fuse box is located at the front right of the chassis under the control stand.

Fuse no.	Rated current (A)	Protected circuit
F1	50 A	Main fuse
F2	50 A	Main fuse
F3	5 A	ECU (engine control unit)
F4	15 A	ECU (engine control unit)
F5	15 A	ECU (engine control unit)
F6	10 A	ECU (engine control unit)
F7	10 A	Particulate filter, fuel pump
F8	20 A	Particulate filter
F9	15 A	Starter
F10	10 A	--
F11	10 A	ECU (engine control unit)
F12	15 A	Wiper (option)
F13	10 A	Heating (option)
F14	15 A	Radio (option)
F15	15 A	Roof lights (option)
F16	15 A	Lights
F17	10 A	Spare
F18	15 A	Low/high beam
F19	10 A	2nd speed, parking brake, drive valves
F20	15 A	Brake lights, horn
F21	10 A	Left/right turn indicators 12 V 15, radio, rotating beacon (option)
F22	10 A	Hazard warning system 12 V 30
F23	10 A	Clearance light (right)
F24	10 A	Clearance light (left)

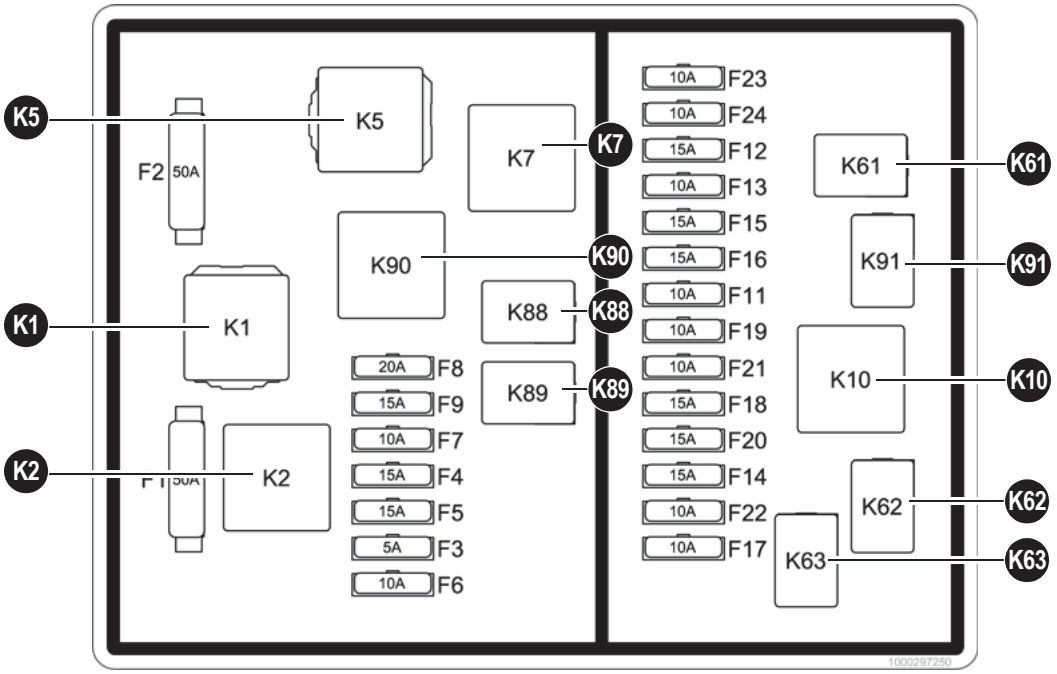


Fig. 163: Relays

Relay no.	Protected circuit
K1	Main relay
K2	Main relay ECU
K5	Preheating
K7	Starting relay
K10	Turn indicator relay
K61	Starting relay
K62	Low beam
K63	High beam
K88	Fuel pump
K89	Particulate filter
K90	Particulate filter
K91	Parking brake

6.13 Noise levels (Yanmar)

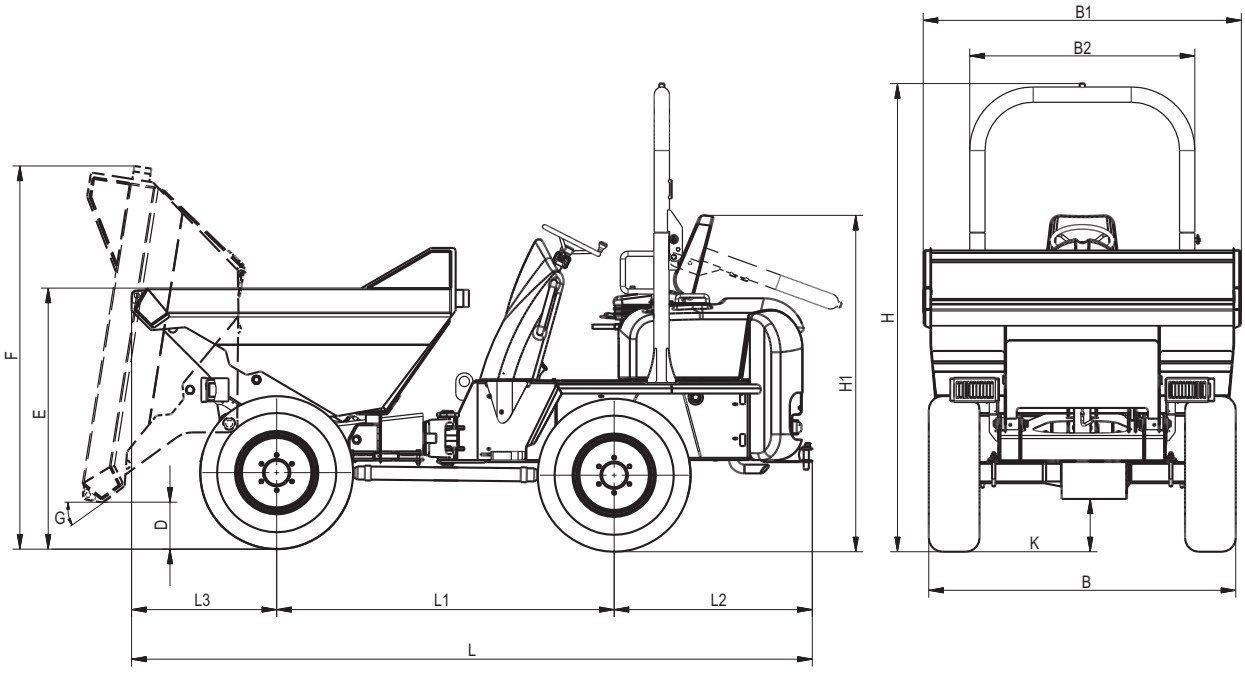
	3001
Measured sound power level LwA [1]	100.5 dB (A)
Guaranteed sound power level LwA[1]	101 dB (A)
Uncertainty factor KpA [2]	0.9
Operator-perceived sound pressure level LpA (without cabin) [3]	83 dB(A)
Operator-perceived sound pressure level LpA (with cabin) [3]	87 dB (A)

1. According to ISO 6395 (EC Directives 2000/14/EC and 2005/88/EC)
2. According to EN ISO 4871 (EC Directives 2000/14/EC and 2005/88/EC)
3. According to ISO 6394 (EC Directives 84/532/EEC, 89/514/EEC, 95/27/EEC)

Information!

Measurements performed on asphalted surface.

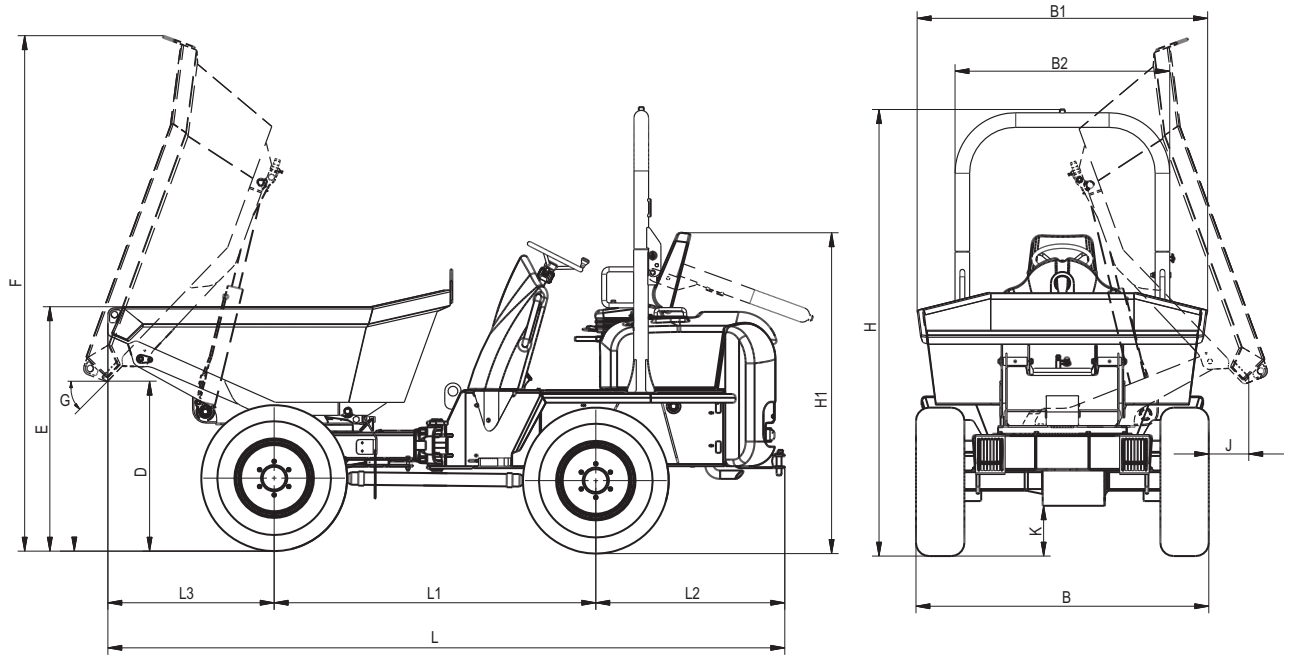
6.14 Dimensions model 3001 (front skip)



	Main data	3001 (Yanmar)	3001 (Perkins)
	Transport weight[1]	2450 kg (5,401 lbs)	2470 kg (5,445 lbs)
	Operating weight [2]	2525 kg (5,566 lbs)	2545 kg (5,611 lbs)
B	Width	1785 mm (70 in)	
B1	Skip width	1860 mm (73 in)	
B2	Rollbar width	1310 mm (52 in)	
D	Ground clearance of tilted skip	260 mm (10 in)	
E	Height of front edge of skip	1475 mm (58 in)	
F	Height of upper edge of tilted skip	2220 mm (87 in)	
G	Tilt angle of skip	51°	
H	Height of raised rollbar	2670 mm (8'-9")	
H1	Height of lowered rollbar	1870 mm (74 in)	
K	Ground clearance	280 mm (11 in)	
L	Length	3980 mm (13'-1")	4080 mm (13'-5")
L1	Wheelbase	1960 mm (77 in)	
L2	Tail-end lateral projection	1160 mm (46 in)	1260 mm (50 in)
L3	Front projection	860 mm (34 in)	
	Outside turning radius	3850 mm (12'-8")	
	Safe authorized inclination	14° (25 %) in all directions	

1. Transport weight: basic machine + 10 % fuel capacity.
2. Service weight: basic machine + operator (75 kg/165 lbs).

6.15 Dimensions model 3001s (swivel skip) (option)

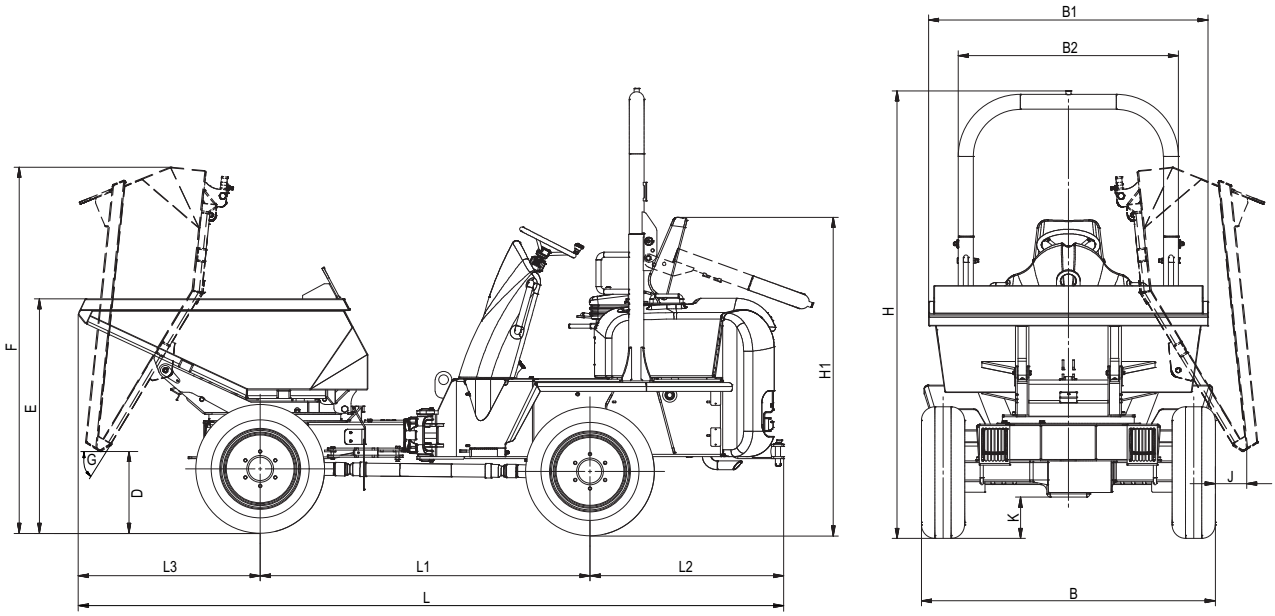


	Main data	3001s (Yanmar)	3001s (Perkins)
	Transport weight[1]	2550 kg (5,622 lbs)	2570 kg (5,666 lbs)
	Operating weight [2]	2625 kg (5,787 lbs)	2645 kg (5,831 lbs)
B	Width	1785 mm (70 in)	
B1	Skip width	1775 mm (70 in)	
B2	Rollbar width	1310 mm (52 in)	
D	Ground clearance of tilted skip	1020 mm (40 in)	
E	Height of front edge of skip	1475 mm (58 in)	
F	Height of upper edge of tilted skip	3125 mm (10'-3")	
G	Tilt angle of skip	46°	
H	Height of raised rollbar	2670 mm (8'-9")	
H1	Height of lowered rollbar	1870 mm (74 in)	
K	Ground clearance	280 mm (11 in)	
L	Length	4140 mm (13'-7")	4240 mm (13'-11")
L1	Wheelbase	1960 mm (77 in)	
L2	Tail-end lateral projection	1160 mm (46 in)	1260 mm (50 in)
L3	Front projection	1020 mm (40 in)	
J	Projection of rotated skip	245 mm (10 in)	
	Outside turning radius	3850 mm (12'-8")	
	Safe authorized inclination	14° (25 %) in all directions	

1. Transport weight: basic machine + 10 % fuel capacity.
2. Service weight: basic machine + operator (75 kg/165 lbs).

6.16 Dimensions model 3001s special skip (swivel skip) (option)

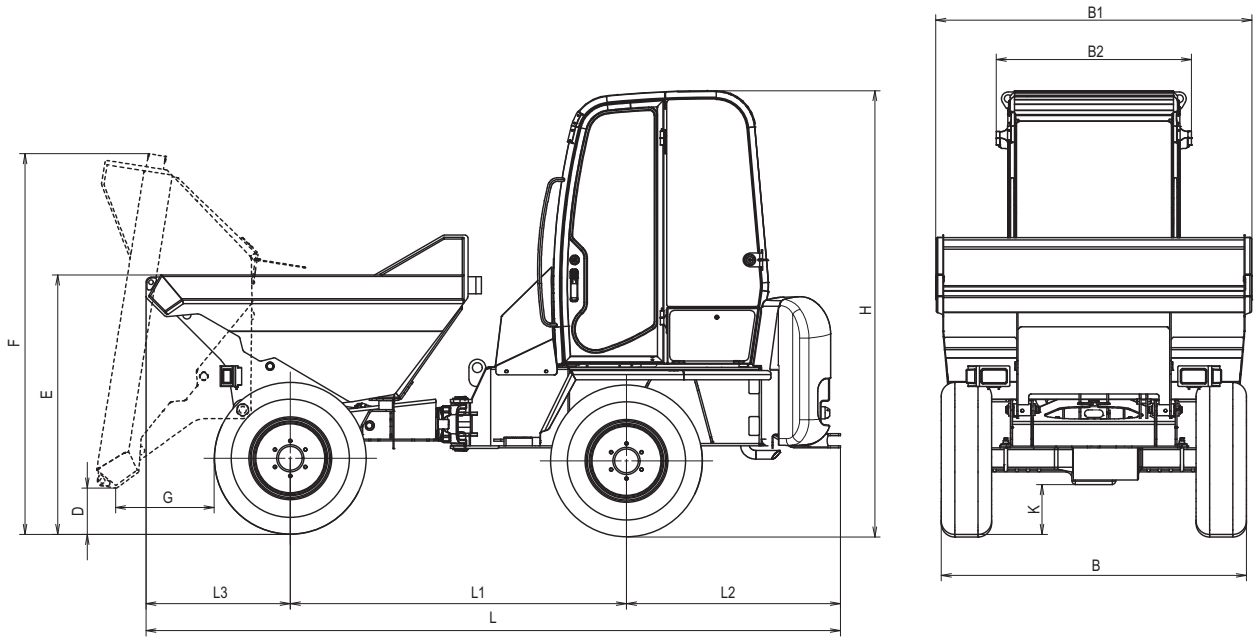
Tilted height 2.2 m (86.6 in)



	Main data	3001s (Yanmar)	3001s (Perkins)
	Transport weight[1]	2400 kg (5,291 lbs)	2570 kg (5,666 lbs)
	Operating weight [2]	2475 kg (5,456 lbs)	2645 kg (5,831 lbs)
B	Width	1785 mm (70 in)	
B1	Skip width	1775 mm (70 in)	
B2	Rollbar width	1310 mm (52 in)	
D	Ground clearance of tilted skip	1020 mm (40 in)	
E	Height of front edge of skip	1475 mm (58 in)	
F	Height of upper edge of tilted skip	2200 mm (87 in)	
G	Tilt angle of skip	46°	
H	Height of raised rollbar	2670 mm (8'-9")	
H1	Height of lowered rollbar	1870 mm (74 in)	
K	Ground clearance	280 mm (11 in)	
L	Length	4140 mm (13'-7")	4240 mm (13'-11")
L1	Wheelbase	1960 mm (77 in)	
L2	Tail-end lateral projection	1160 mm (45.7 in)	1260 mm (50 in)
L3	Front projection	1020 mm (40 in)	
J	Projection of rotated skip	245 mm (10 in)	
	Outside turning radius	3850 mm (12'-8")	
	Safe authorized inclination	14° (25 %) in all directions	

1. Transport weight: basic machine + 10 % fuel capacity.
2. Service weight: basic machine + operator (75 kg/165 lbs).

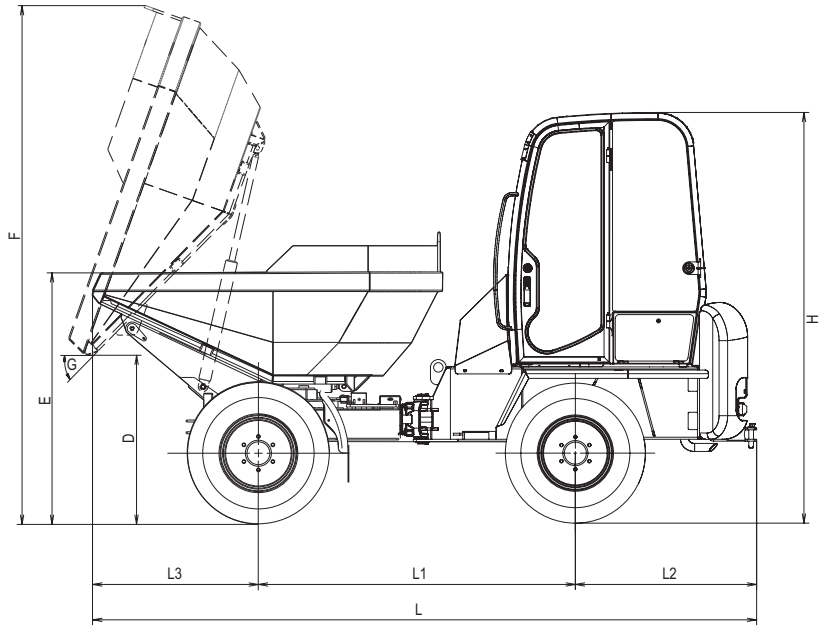
6.17 Dimensions model 3001 (front skip) cabin (option)

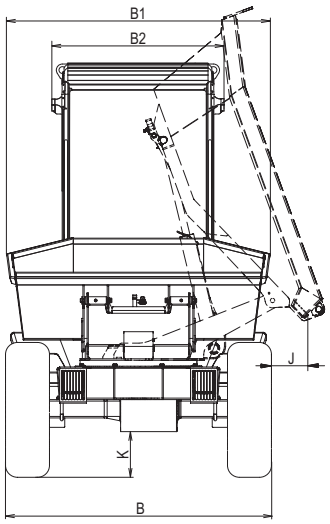


	Main data	3001 (Yanmar)	3001 (Perkins)
	Transport weight[1]	2550 kg (5,622 lbs)	2640 kg (5,821 lbs)
	Operating weight [2]	2625 kg (5,787 lbs)	2715 kg (5,986 lbs)
B	Width	1785 mm (70 in)	
B1	Skip width	1860 mm (73 in)	
B2	Cabin width	1140 mm (45 in)	
D	Ground clearance of tilted skip	260 mm (10 in)	
E	Height of front edge of skip	1475 mm (58 in)	
F	Height of upper edge of tilted skip	2200 mm (87 in)	
G	Tilt angle of skip	51°	
H	Height	2610 mm (8'-7")	
K	Ground clearance	280 mm (11 in)	
L	Length	3980 mm (13'-1")	4080 mm (13'-5")
L1	Wheelbase	1960 mm (77 in)	
L2	Tail-end lateral projection	1160 mm (46 in)	1260 mm (50 in)
L3	Front projection	860 mm (34 in)	
J	Projection of rotated skip	-	
	Outside turning radius	3850 mm (12'-8")	
	Safe authorized inclination	14° (25 %) in all directions	

1. Transport weight: basic machine + 10 % fuel capacity.
2. Service weight: basic machine + operator (75 kg/165 lbs).

6.18 Dimensions model 3001s (swivel skip) cabin (option)





	Main data	3001s (Yanmar)	3001s (Perkins)
	Transport weight[1]	2650 kg (5,842 lbs)	2740 kg (6,041 lbs)
	Operating weight [2]	2725 kg (6,001 lbs)	2815 kg (6,206 lbs)
B	Width	1785 mm (70 in)	
B1	Skip width	1775 mm (70 in)	
B2	Cabin width	1140 mm (45 in)	
D	Ground clearance of tilted skip	1020 mm (40 in)	
E	Height of front edge of skip	1475 mm (58 in)	
F	Height of upper edge of tilted skip	3125 mm (10'-3")	
G	Tilt angle of skip	46°	
H	Height	2610 mm (8'-7")	
K	Ground clearance	280 mm (11 in)	
L	Length	4140 (13'-7")	4240 mm (13'-11")
L1	Wheelbase	1960 mm (77 in)	
L2	Tail-end lateral projection	1160 mm (46 in)	1260 mm (50 in)
L3	Front projection	1020 mm (40 in)	
J	Projection of rotated skip	245 mm (10 in)	
	Outside turning radius	3850 mm (12'-8")	
	Safe authorized inclination	14° (25 %) in all directions	

1. Transport weight: basic machine + 10 % fuel capacity.
2. Service weight: basic machine + operator (75 kg/165 lbs).

Wacker Neuson Linz 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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