Operator’s Manual

Track excavator

ET18/ET20/ET24

Machine model	**E12-02, 03, 04**
Edition	**1.5**
Document order number	**1000280663**
Language	**en**

WACKER NEUSON

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Legend	
Original Operator’s Manual	**x**
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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 figures and descriptions in this documentation that do not reflect products that have already been delivered and that will not be implemented on these machines.

Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions not accepted.

The cover features the machine with possible optional equipment.

Photographs and graphics are symbolic representations and may differ from the actual products.

The Operator’s Manual and any amendments to it must always be available at the place of use of the machine. Possible amendments are included at the end of the Operator’s Manual.

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EC Declaration of Conformity

Manufacturer

Wacker Neuson Linz GmbH, Flughafenstr. 7, 4063 Hörsching, Austria

CE

Product

Machine designation	**Hydraulic excavator**
Model/version	**E12-02**
Trade name	**ET18**
Serial number	**--**
Output in kW	**13,4**
Measured sound power level dB(A)	**92.5**
Guaranteed sound power level dB(A)	**93**

Declaration of conformity

Notified body according to Directive 2006/42/EC, appendix XI:

Notified body involved in procedure

Fachausschuss Bauwesen, Landsberger Str. 309, 80687 Munich, Germany

Directives and standards

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

2006/42/EC, 2005/88/EC, 2000/14/EC;

DIN EN ISO 12100:2010, DIN EN 474-1 and DIN EN 474-5,

DIN EN 3471, EN ISO 3744, DIN EN ISO 3449

Authorized representative for the compilation of technical documentation

Thomas Köck, team leader technical documentation

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Johannes Mahringer,

Managing director

The indications specified above correspond to the existing information at time of going to press. They have possibly changed in the meantime (refer to the original declaration of conformity supplied with the machine). Applies to EU countries, and countries with legislation similar to that of the EU. Applies to all machines with CE marks that have not been modified without authorization since the product was placed on the market.

EC Declaration of Conformity

Manufacturer

Wacker Neuson Linz GmbH, Flughafenstr. 7, 4063 Hörsching, Austria

CE

Product

Machine designation	**Hydraulic excavator**
Model/version	**E12-03**
Trade name	**ET20**
Serial number	**--**
Output in kW	**13,4**
Measured sound power level dB(A)	**92.5**
Guaranteed sound power level dB(A)	**93**

Declaration of conformity

Notified body according to Directive 2006/42/EC, appendix XI:

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EC Declaration of Conformity

Manufacturer

Wacker Neuson Linz GmbH, Flughafenstr. 7, 4063 Hörsching, Austria

CE

Product

Machine designation	**Hydraulic excavator**
Model/version	**E12-04**
Trade name	**ET24**
Serial number	**--**
Output in kW	**13,4**
Measured sound power level dB(A)	**92.5**
Guaranteed sound power level dB(A)	**93**

Declaration of conformity

Notified body according to Directive 2006/42/EC, appendix XI:

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Notes:

1 Foreword

1.1 Operator’s Manual

Information on this Operator’s Manual

This Operator’s Manual is stored in the compartment under the seat if the machine is equipped with a canopy. If the machine is equipped with a cabin, this Operator’s Manual is stored behind the seat. A document box on the headliner is available as an option for the cabin version.

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.

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 on the machine.

The operator must carefully read and understand the Operator’s Manual before starting up, servicing or repairing the machine.

This Operator’s Manual will help to familiarize yourself more easily with the machine, thereby enabling you to use it more safely and efficiently.

This Operator’s Manual does not include special superstructures.

This Operator’s Manual will help to familiarize yourself more easily with the machine, thereby enabling you to use it more safely and efficiently.

Please contact your dealer if you require more information on the machine or the Operator’s Manual.

Explanation of symbols and abbreviations

Explanation of symbols

- Identifies a list
  - Identifies a subdivision of a list
  - ➥ Description of a result

1. Identifies an activity
   Follow the order of the activity!
2. Continuation of an activity
   Follow the order of the activity!

A Identifies an alphabetical list

B Continuation of an alphabetical list

Cross reference formats: see page *1-1* (page)

Cross reference formats: **7** (pos. no. or table no.)

Cross-reference formats: *Fig. 6* (Fig. no. 1

Cross references: *– see chapter “5 Operation” on page 5-1*
(see chapter)

Cross references: *– see “Operation” on page 5-1* (-see text)

Information

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 cause damage to the environment.

Abbreviations

AUX	=	Auxiliary-hydraulics circuit
B	=	Width
NE	=	Nominal width
ROPS	=	Roll Over Protective Structure (without losing contact with the ground)
FOPS	=	Falling Objects Protective Structure
TOPS	=	Tip Over Protective Structure
FGPS	=	Front Guard Protective Structure
hp	=	Stabilizer blade
LS	=	Shovel arm
VDS	=	Vertical Digging System
Hydraulic quick-hitch	=	Hydraulic quickhitch, Easy Lock
o/h	=	Operating hours
Pos.	=	Position
Fig.	=	Figure
e. g.	=	for example
approx.	=	approximately
if nec.	=	if necessary
max.	=	maximum
min.	=	minimum

Glossary

Attachment	All exchangeable equipment (for example buckets) released by Wacker Neuson and developed for work with the machine.
Working lights	The lights on the roof, chassis and boom are referred to as working lights.
Towing	The excavator is towed out of an immediate danger zone (railroad crossing or job site, for example).
DOC	Diesel oxidation catalytic converter; removes carbon monoxide and residues of unburned fuel from the exhaust fumes
DPF	Diesel particulate filter; burns soot particles in the exhaust fumes
Operating company/person	A company (or person) operating the machine. This can be a job site operating company, for example.
Operators	Person performing machine travel and / or operation.
Machine	Unless otherwise specified, the term **"machine"** refers to the excavator described in this Operator's Manual. In some cases the machine is also referred to as excavator to avoid confusion with other vehicles.
Machine operation	All work (for example machine travel, moving material, daily maintenance) an operator is allowed to or has to perform in connection with the machine. The term **"machine operation"** does not include maintenance only a Wacker Neuson service center is allowed to perform.
Lift capacity table	The maximum weight which may be lifted in excavating operations. If the upper carriage is rotated, pay attention to the values of the **load diagrams**.
Crawling speed	Perform machine travel as slowly as possible and jerk free.
Hose rupture	Hydraulic oil under pressure escapes from a hydraulic hose.
Visual aids	Visual aids are, for example, rearview mirrors, cameras, but also persons assisting the operator during machine operation.
Control lever base	The foldable control lever base on the left.
Tier III/Tier IV/DOC/DPF	The machines comply with different exhaust-gas standards depending on optional equipment. Engine variants are described separately if there are engine-specific differences (for example regarding operation) .
Load diagram	Specifies the maximum load at a given boom extension with which the upper carriage may be rotated by 360° and the excavator may travel in creep gear with the stabilizer blade raised without tipping over.
Additional control circuits	Additional control circuits required for certain attachments.

Right/left/front/rear

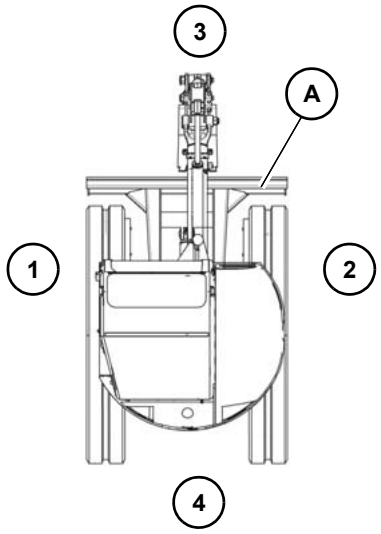


Fig. 1 (symbolic representation)

These terms are used from the view of an operator in the cabin if the front of the cabin faces toward the stabilizer blade **A**.

- **1**: left
- **2**: right
- **3**: front
- **4**: rear

Conversion table

The rounded imperial values are indicated in brackets, for example 1060 cm³ (64.7 in³).

Volume unit	
1 cm³	(0.061 in³)
1 m³	(35.31 ft³)
1 ml	(0.034 US fl.oz.)
1 l	(0.26 gal)
1 l/min	(0.26 gal/min)
Unit of length	
1 mm	(0.039 in)
1 m	(3.28 ft)
Weight	
1 kg	(2.2 lbs)
1 g	(0.035 oz)
Pressure	
1 bar	(14.5 psi)
1 kg/cm²	(14.22 lbs/in²)
Force/output	
1 kN	(224.81 lbf)
1 kW	(1.34 hp)
1 PS	(0.986 hp)
Torque	
1 Nm	(0.74 ft.lbs)
Speed	
1 kph	(0.62 mph)
Acceleration	
1 m/s²	(3.28 ft/s²)

1.2 Warranty and liability

Exemption from warranty and liability

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.

Have the maintenance, delivery inspection and the entries in the service booklet performed by a Wacker Neuson service center, otherwise warranty claims will not be acknowledged.

Liability

- 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.
- The safety of the machine can be negatively affected by performing machine modifications without proper authority and by using spare parts, equipment, attachments and optional equipment that have not been checked and released by Wacker Neuson. Warranty and product liability for possible damage caused by these modifications shall not be applicable.
- Wacker Neuson Linz GmbH shall not be liable for injury and/or damage to property caused by failure to observe the safety instructions and the Operator's Manual, and by the negligence of the duty to exercise due care when:
  - handling
  - Operation
  - servicing and performing maintenance and
  - repairing the machine. This is also applicable in those cases in which special attention has not been drawn to the duty to exercise due care, in the safety instructions as well as in the Operator's and maintenance manuals.
  - Read and understand the Operator's Manual before starting up, servicing or repairing the machine. Observe all safety instructions.

Notes:

2 Safety

2.1 Safety symbols and signal words

Explanation

The following symbol identifies safety instructions. It is used for alerting you to potential personal hazards.

DANGER

DANGER identifies a situation causing death or serious injury if it is not avoided.

Consequences in case of nonobservance.

► Avoidance of injury or death.

WARNING

WARNING identifies a situation that can cause death or serious injury if it is not avoided.

Consequences in case of nonobservance.

► Avoidance of injury or death.

CAUTION

CAUTION identifies a situation that can cause injury if it is not avoided.

Consequences in case of nonobservance.

► Avoidance of injury.

NOTICE

NOTICE identifies a situation that causes damage to the machine if it is not observed.

► Avoidance of damage to property.

2.2 Qualification of operating personnel

Owner's duties

- Only allow specifically authorized, trained and experienced persons to operate, drive and perform maintenance on the machine.
- Do not allow persons to be trained or instructed by anyone other than an authorized and experienced person.
- Have persons to be trained or instructed practice under supervision until they are familiar with the machine and its behavior (for example with the steering and braking behavior).
- Access to the machine or machine operation is prohibited for children and persons under the influence of alcohol, drugs or medicine.
- Clearly and unequivocally define the responsibilities of the operating and maintenance personnel.
- Clearly and unequivocally define the responsibilities on the job site, also in view of traffic regulations.
- Give the operator the authority to refuse instructions by other persons that are contrary to safety.
- Have the machine serviced and repaired only by an authorized service center.

Required knowledge of operator

- The operator is responsible for other persons.
- Avoid any operational mode that might be prejudicial to safety.
- The specific national driving license is required.
- The machine may only be operated by authorized and safety-conscious persons who are fully aware of the risks involved in operating the machine.
- The operator and owner are obligated to operate the machine only in a safe and working condition.
- All persons working on or with the machine must have read and understood the safety instructions in this Operator's Manual before starting work.
- Follow, and instruct the operator in, legal and other mandatory regulations relevant to accident prevention.
- Observe and instruct the operator in regulations regarding road traffic and environmental protection.
- Use only the defined accesses for getting on and off the machine.
- Be familiar with the emergency exit of the machine.

Preparatory measures for the operator

- Before starting, check the machine whether it can be driven and operated safely.
- Tie back long hair and remove all jewelry.
- Wear close-fitting work clothes that do not hinder movement.

2.3 Conduct

Prerequisites for operation

- The machine has been designed and built in accordance with state-of-the-art standards and the recognized safety regulations. Nevertheless its use can cause danger to the operator or other persons, or damage to the machine.
- Store this Operator's Manual in the place provided for this in or on the machine. Immediately replace a damaged or illegible Operator's Manual and any supplements to it.
- The machine must only be operated in accordance with its designated use and the instructions set forth in this Operator's Manual.
- The operator and owner are obligated not to put into operation or operate a damaged or malfunctioning machine.
  - If a damage or malfunction occurs during operation, put the machine out of operation immediately and secure it against restart.
  - Have all malfunctions jeopardizing the safety of the operator or other persons immediately repaired by an authorized service center.
- Do not put the machine into operation or operate it after an accident; have it inspected for damage by an authorized service center.
  - Have the seat belt replaced by an authorized service center after an accident, even if there is no visible damage.
  - Cabin and protective structures
- Remove all dirt, snow and ice from climbing aids (for example handholds, footholds, handrails).
- The owner is responsible for requiring the operating and maintenance personnel to wear protective clothing and equipment as required by the circumstances.

2.4 Operation

Preparatory measures

- Operation is only allowed with correctly installed and intact protective structures.
- Keep the machine clean. This reduces injury, accident and fire hazards.
- Safely store objects you carry with you in the places provided for this (for example in the storage compartment, drinks holder).
- Do not carry objects with you that protrude into the operator's work space. They can create another danger in case of an accident.
- Observe all safety, warning and information labels.
- Start and operate the machine only with the seat belt fastened and only from the place provided for this.
- Check the condition and the fastening of the seat belt. Have malfunctioning seat belts and mounting hardware replaced by an authorized service center.
- Before starting work, adjust the seating position so that all control elements can be reached and fully operated.
- Perform the personal adjustment at machine standstill only (for example of the operator seat, steering column).
- Ensure that all safety devices are properly installed and functional before starting work.
- Before starting work or after interrupting work, ensure that the brake, steering, signaling and light systems are functional.
- Before putting the machine into operation, ensure that nobody is in the danger zone.

Job site

- The operator is responsible for other persons.
- Before starting work, familiarize yourself with the job site. This applies to, for example:
  - Obstacles in the job site and machine travel area
  - Any barriers separating the job site from public roads
  - Soil weight-bearing capacity
  - Existing overhead and underground lines
  - Special operating conditions (for example dust, steam, smoke, asbestos)
- The operator must know the maximum dimensions of the machine and the attachment – see “Technical data”.
- Maintain a safe distance (for example from buildings, edges of building pits).
- During work in buildings or in enclosed areas, look out for:
  - Height of the ceiling/clearances
  - Width of entries/passages
  - Maximum load of ceilings and floors
  - Sufficient room ventilation (for example risk of carbon monoxide poisoning)
- Use existing visual aids to stay aware of the danger zone.
- In conditions of darkness and poor visibility, switch on existing work lights and ensure that motorists are not blinded by these lights.
- If the existing lights of the machine are not sufficient for performing work safely, ensure additional lighting of the job site.
- Due to hot machine parts, maintain a safe distance from easily flammable material (for example from hay, dry leaves).

Danger zone

- The danger zone is the area in which persons are in danger due to the movements of the machine, attachment or load.
- The danger zone also includes the area that can be affected by falling material, equipment or by parts that are thrown out.
- Extend the danger zone sufficiently in the immediate vicinity of buildings, scaffolds or other elements of construction.
- Seal off the danger zone should it not be possible to keep a sufficient safety distance.
- Stop machine operation immediately if persons do not stay clear of the danger zone.

Carrying passengers

- Carrying passengers with the machine is PROHIBITED.
- Carrying passengers on and in trailers is PROHIBITED.
- Carrying passengers on/in trailers is PROHIBITED.

Mechanical integrity

- The operator and owner are obligated to operate the machine only in a safe and working condition.
- Operate the machine only if all protective and safety-oriented equipment (for example protective structures such as a cabin or rollbar, removable safety devices) is installed and functional.
- Check the machine for visible damage and defects.
- In case of damage or unusual behavior, put the machine out of operation immediately and secure it against restart.
- Have all malfunctions jeopardizing the safety of the operator or other persons immediately repaired by an authorized service center.

Starts the engine

- Start the engine only according to the Operator's Manual.
- Observe all warning and indicator lights.
- Do not use any liquid or gaseous starting aids (for example ether or starting fuel).

Machine operation

- Start and operate the machine only with the seat belt fastened and only from the place provided for this.
- Put the machine into operation only if visibility is sufficient (have another person guide you if necessary).
- Operation on slopes:
  - Travel/work only uphill or downhill.
  - Avoid machine travel across a slope, observe the machine's permissible inclination (and of the trailer if necessary).
  - Keep loads on the uphill side of the machine and as close as possible to it.
  - Keep attachments/work equipment close to the ground.
- Adapt the travel speed to the circumstances (for example the ground conditions, weather conditions).
- There is increased danger during backward machine travel. Persons in the blind spot of the machine cannot be seen by the operator.
  - Ensure that nobody is in the danger zone when you change the travel direction.
- Never get on a moving machine and never jump off the machine.

Machine travel on public roads/sites

- The specific national driving license is required.
- Observe the national regulations (for example the road traffic regulations) during machine travel on public roads/sites.
- Ensure that the machine is in compliance with the national regulations.
- In order not to blind other motorists, using the existing work lights during machine travel on public roads/site is prohibited.
- When crossing for example underpasses, bridges, tunnels, ensure that the clearance height and width is sufficient.
- The attachment fitted onto the machine must be certified for travel on public roads/sites (for example see registration documents).
- The attachment fitted onto the machine must be empty and in transport position.
- The attachment fitted onto the machine must be equipped with the mandatory lights and protective equipment.
- Take measures against unintentional operation of the operating hydraulics.
- If the machine has different steering modes, ensure that the mandatory steering mode is selected.

Stop the engine

- Stop the engine only according to the Operator's Manual.
- Before stopping the engine, lower the work equipment/attachment to the ground.

Stopping and securing the machine

- Unbuckle the seat belt only after stopping the engine.
- Before leaving the machine, secure it to prevent it from rolling away (for example with the parking brake, suitable wheel chocks).
- Remove the starting key and secure the machine against unauthorized operation.

2.5 Lifting gear applications

Requirements

- Have loads fastened and the operator guided by a qualified person having specific knowledge of lifting gear applications and the usual hand signals.
- The person giving instructions to the operator must stay in visual contact with the operator when fastening, guiding or removing the load (maintain visual contact).
- If this not be possible, ask one more person with the same qualifications to guide.
- The operator may not leave his seat as long as the load is raised.

Fastening, guiding and removing loads

- Follow the applicable specific regulations for fastening, guiding and removing a load.
- Wear protective clothing and equipment when fastening, guiding and removing loads (for example a hard hat, safety glasses, protective gloves, safety boots).
- Do not place lifting and fastening gear over sharp edges or rotating parts. Loads must be fastened so as to prevent them from slipping or falling.
- Move loads only on horizontal, level and firm ground.
- Move loads close to the ground.
- In order to avoid oscillating movements of loads:
  - Perform smooth, slow movements with the machine.
  - Use cables to guide the load (do not use hands to guide).
  - Bear in mind the weather conditions (for example the wind force).
  - Keep a minimum safety distance from objects.
- The operator may allow the load to be fastened and removed only if the machine and its work equipment are not being moved.
- Danger zones must not overlap with the work zones of other machines.

Lifting gear applications

- The machine must be certified for lifting gear applications.
- Observe the national regulations for lifting gear applications.
- Lifting gear applications are procedures involving raising, transporting and lowering loads with the help of lifting and fastening gear.
- The help of an accompanying person is necessary for fastening, guiding and removing the load.
- There must be nobody under the load.
- Stop the machine immediately and stop the engine if persons enter the danger zone.
- Use the machine for lifting gear applications ONLY if the mandatory lifting gear (for example a joint rod and load hook) and safety equipment (for example optical and acoustic warning devices, hose burst valve, stability table) is installed and functional.
- Use only lifting and fastening gear certified by a test/certification body, observe the inspection intervals (Use only chains and shackles. No belts, slings or cables).
- Do not use any lifting and fastening gear that is dirty, damaged or not of sufficient size.
- Do not interrupt the work process with a load attached.

2.6 Trailer operation

Trailer operation

- The machine must be certified for trailer operation.
- Observe the national regulations for trailer operation.
- The specific national driving license is required.
- Carrying passengers on/in trailers is PROHIBITED.
- Observe the maximum permissible vertical and trailer load.
- Do not exceed the permissible trailer speed.
- Trailer operation with the towing gear of the machine is prohibited.
- Trailer operation changes the machine's operating behavior, the operator must be familiar with this and act accordingly.
- Bear in mind the machine's steering mode and the trailer's turning circle.
- Before hitching/unhitching the trailer, secure it to prevent it from rolling away (for example with the parking brake, suitable wheel chocks).
- There must be nobody between the machine and the trailer when hitching a trailer.
- Hitch the trailer onto the machine correctly.
- Ensure that all equipment works correctly (for example the brakes, lights).
- Before starting machine travel, ensure that nobody is between the machine and the trailer.

2.7 Operation of attachments

Attachments

- Use only attachments that are certified for the machine or its protective equipment (for example a shatter protection).
- All other attachments require the machine manufacturer's release.
- The danger zone and the work zone depend on the attachment used – see the Operator's Manual of the attachment.
- Secure the load.
- Do not overload attachments.
- Check the correct position of the lock.

Operation

- Carrying persons on/in an attachment is prohibited.
- Installing a work platform is prohibited.
  - Exception: The machine is certified and equipped with the necessary safety equipment.
- Attachments and counterweights modify handling, as well as the steering and brake capability of the machine.
- The operator must be familiar with these modifications and act accordingly.
- Before starting work, operate the attachment to check that it works correctly.
- Before putting the attachment into operation, ensure that nobody is in danger.
- Lower the attachment to the ground before leaving the operator seat.

Removing and fitting attachments

- Before uncoupling or coupling hydraulic connections:
  - Stop the engine
  - Release the pressure in the operating hydraulics
- Picking up and lowering attachments to the ground requires special care:
  - Pick up and safely lock the attachment in accordance with the Operator's Manual.
  - Lower the attachment only to firm, level ground and secure it to prevent it from tipping over or rolling away.
- Put the machine and the attachment into operation only if:
  - The protective equipment has been installed and is functional.
  - The connections for the lights and the hydraulic system have been established and are functional.
- Perform a visual check of the lock after locking the attachment.
- There must be nobody between the machine and the equipment when picking up or lowering an attachment to the ground.

2.8 Towing, loading and transporting

Towing

- Seal off the danger zone.
- Ensure that no one is near the towing bar or cable. The safety distance is equal to 1.5 times the length of the towing equipment.
- Observe the mandatory transport position, permissible speed and itinerary.
- A tractor vehicle of the same weight category must be used as a minimum. In addition, the tractor vehicle must be equipped with a safe braking system and sufficient tractive power.
- Use only towing bars or cables certified by a test/certification body, observe the inspection intervals.
- Do not use any towing bars or cables that are dirty, damaged or not of sufficient size.
- Fasten towing bars or cables only at the defined points.
- Tow away only in accordance with this Operator's Manual to avoid damage to the machine.
- Observe the national regulations (for example the light regulations) when towing on public roads/sites.

Crane-lifting

- Seal off the danger zone.
- The crane and the lifting gear must have suitable dimensions.
- Observe the machine's overall weight – see "Technical data".
- Wear protective clothing and equipment when fastening, guiding and removing the machine (for example a hard hat, safety glasses, safety shoes).
- Use only lifting and fastening gear certified by a test/certification body (for example cables, belts, hooks, shackles), observe the inspection intervals.
- Do not use any lifting and fastening gear that is dirty, damaged or not of sufficient size.
- Perform a visual check to ensure that all slinging points are neither damaged nor worn (no widening, no sharp edges, no cracks).
- Have loads fastened and crane operators only guided by experienced persons.
- The person guiding the crane operator must be within sight or sound of him.
- Observe all movements of the machine and lifting gear.
- Secure the machine against unintentional movement.
- Raise the machine only after it is safely attached and the person attaching the machine has given his approval.
- Use only the slinging points provided for fastening the lifting gear (for example cables, belts).
- Do not attach the machine by twining the lifting gear (for example cables, belts) around it.
- Ensure an even load distribution (center of gravity!) when fastening the lifting gear.
- Ensure that no one is in, on or under the machine when loading the machine.
- Observe the national regulations (for example "Merkheft Erdbau-maschinen", leaflet on earth moving machines of the German employers' liability insurance association for construction engineering).
- Load the machine only in accordance with this Operator's Manual to avoid damage to the machine.
- Do not raise a machine that is for example stuck or frozen onto the ground.
- Bear in mind the weather conditions (for example the wind force, visibility conditions).

Transportation

- For the safe transportation of the machine:
  - The transport vehicle must have a sufficient load capacity and platform – see “Technical data”
  - The maximum weight rating of the transport vehicle must not be exceeded.
- Use only lifting and fastening gear certified by a test/certification body, observe the inspection intervals.
- Do not use any lifting and fastening gear that is dirty, damaged or not of sufficient size.
- In order to secure the machine on the platform, use only the fastening points provided for this purpose.
- Ensure that nobody is in or on the machine during transportation.
- Observe the national regulations (for example “Merkheft Erdbaumaschinen”, leaflet on earth moving machines of the German employers’ liability insurance association for construction engineering).
- Bear in mind the weather conditions (for example ice, snow).
- Ensure the minimum load on the steering axle(s) of the transport vehicle, and ensure an even load distribution.

2.9 Maintenance

Maintenance

- Observe the intervals prescribed by law and those specified in this Operator’s Manual for routine checks/inspections and maintenance.
- For inspection and maintenance, ensure that all tools and service center equipment are adapted to the performance of the task described in this Operator’s Manual.
- Do not use any damaged or malfunctioning tools.
- Have hydraulic hoses replaced within stipulated intervals even if no visual defects can be detected.
- The machine and the engine must be stopped during maintenance.
- Once maintenance is over, correctly install safety equipment again that has been removed.
- Wait for the machine to cool down before touching components.

Personal safety measures

- Avoid any operational mode that might be prejudicial to safety.
- Wear protective clothing and equipment (for example a hard hat, protective gloves, safety boots).
- Tie back long hair and remove all jewelry.
- If maintenance on a running engine cannot be avoided:
  - Only work in groups of two.
  - Both persons must be authorized and trained for the operation of the machine.
  - One person must be seated on the operator seat and stay in contact with the second person.
  - Keep a safe distance from rotating parts (for example from fan blades, belts).
  - Keep a safe distance from hot parts (for example from the exhaust system).
  - Perform maintenance only in well-ventilated rooms or rooms with an exhaust-gas suction system.
- Safely lock/support machine components before starting work.
- Apply special care when working on the fuel system due to the increased fire hazard.

Preparatory measures

- Attach a warning label to the control elements (for example “Machine being serviced, do not start”).
- Before performing assembly work on the machine, support the areas to be serviced and use suitable lifting and supporting equipment for the replacement of parts over 9 kg (20 lbs.).
- Perform maintenance only if:
  - the machine is positioned on firm and level ground
  - the machine is secured to prevent it from rolling away (for example with the parking brake, wheel chocks), and if all attachments/the work equipment is lowered to the ground
  - the engine is stopped
  - the starting key has been removed
  - the pressure in the operating hydraulics has been released
- If maintenance has to be performed under a raised machine/ attachment, support the machine/attachment (for example with a lift platform, trestles) ensuring safety and stability.
- Hydraulic cylinders or jacks alone do not sufficiently secure a raised machine/attachment.

Measures for performing maintenance

- Perform only the maintenance described in this Operator’s Manual.
- All work that is not described in this Operator’s Manual must be performed by qualified and authorized technical personnel.
- Follow the maintenance plan – see “Maintenance plan”.
- Always use specially designed or otherwise safety-oriented ladders and working platforms to perform overhead maintenance. Do not use machine parts or attachments as a climbing aid.
- Do not use attachments/work equipment as a lift platform for persons.
- Remove all dirt, snow and ice from climbing aids (for example handholds, footholds, handrails).
- Disconnect the negative terminal of the battery before working on the electrical system.

Modifications and spare parts

- Do not modify the machine and the work equipment/attachment (for example safety equipment, lights, tires, straightening and welding work).
- Modifications must be approved by the manufacturer and performed by an authorized service center.
- Use only original spare parts.

Protective structures

- The cabin, rollbar and protective screen are tested protective structures and may not be modified (for example no drilling, bending, welding).
- Perform a visual check according to the maintenance plan (for example check the fastenings for damage).
- If damage or defects are detected, have them immediately checked and repaired by an authorized service center.
- Have retrofitting work only performed by an authorized service center.
- Replace self-locking fasteners (for example self-locking nuts) by new ones after removing them.

2.10 Measures for avoiding risks

Tires

- Have repair work on the tires only performed by trained technical personnel.
- Check the tires for correct pressure and visible damage (for example cracks, cuts).
- Check the wheel nuts for tightness.
- Use only approved tires.
- The machine must have identical tires (for example profile, revolutions per mile).

Tracks

- Repair work on tracks may be performed only by trained technicians.
- Check the tracks for correct tension and visible damage (for example cracks, cuts).
- Proceed with extreme care on slippery ground (for example on steel plates, ice), increased slipping hazard.
- Use only approved tracks.

Hydraulic and compressed-air system

- Check all lines, hoses and threaded fittings regularly for leaks and visible damage.
- Splashed oil can cause injury and fire.
- Leaking hydraulic and compressed-air lines can cause the full loss of the brake effect.
- Have damage and leaks immediately repaired by an authorized service center.
- Have hydraulic hoses replaced by an authorized service center within stipulated intervals even if no visual defects can be detected.

Electrical system

- Use only fuses with the specified current rating.
- In case of damage or malfunction in the electrical system:
  - Put the machine out of operation immediately and secure it against restart
  - Disconnect the battery or operate the battery master switch
  - Have the malfunction repaired
- Ensure that work on the electrical system is only performed by trained technical personnel.
- Have the electrical system checked regularly and malfunctions repaired immediately (for example loose connections, scorched cables).
- The operating voltage of machine, the attachment and the trailer must be the same (for example 12 V).

Battery

- Batteries contain caustic substances (for example sulfuric acid). When handling the battery observe the specific safety instructions and regulations relevant to accident prevention.
- A volatile oxyhydrogen mixture forms in batteries during normal operation and especially during charging. Always wear gloves and eye protection when working with batteries.
- Do not perform battery maintenance near open flames.
- Perform battery maintenance only in well-ventilated areas (for example due to vapors harmful to health, explosion hazard).
- Starting the machine with battery jumper cables is dangerous if performed improperly. Observe the safety instructions regarding the battery.

Safety instructions regarding internal combustion engines

- Internal combustion engines present special hazards during operation and fueling.
- Failure to follow the warnings and safety instructions can cause serious injury or death.
- Keep the area around the exhaust system free of flammable materials.
- Check the engine and fuel system for leaks (for example for loose fuel lines). Do start or let the engine run in case of leaks.
- Breathing the exhaust fumes causes death very quickly.
- Engine exhaust contains gases you cannot see or smell (for example carbon monoxide and dioxide).
  - Never operate the machine in enclosed premises or areas (for example in pits), if there is no suitable ventilation (for example exhaust-gas filters, suction systems).
- Do not operate the machine in potentially explosive areas.
- Do not touch the engine, exhaust system and cooling system as long as the engine is still running or has not cooled down yet.
- Do not remove the radiator cap when the engine is running or hot.
- The coolant is hot, under pressure and can cause serious burns.

Bleeding the fuel system and refueling

- Do not bleed the fuel system or refuel near open flames.
- Bleed the fuel system and refuel only in well-ventilated areas (for example due to vapors harmful to health, explosion hazard).
- Wipe away fuel spills immediately (for example due to fire hazard, slipping hazard).
- Firmly close the fuel tank cap, replace a malfunctioning fuel tank cap.

Handling oil, grease and other substances

- When handling oil, grease and other chemical substances (for example the battery acid, coolant), observe the safety data sheets.
- Wear appropriate protective equipment (for example protective gloves, safety glasses).
- Be careful when handling hot consumables – burn hazard.
- In polluted environment (dust, vapors, smoke, asbestos), work only with appropriate personal protective equipment (for example with a breathing mask).
- Do not use the vehicle in radioactively, biologically or chemically contaminated areas.

Fire hazard

- Fuel, lubricants and coolants are flammable.
- Do not put the machine into operation if there is a fire hazard.
- Do not use flammable detergents.
- Keep the area around the exhaust system free of flammable materials.
- Due to hot machine parts, maintain a safe distance from easily flammable material (for example from hay, dry leaves).
  - Stop and park the machine only in fire-protected areas.
- If the machine is equipped with a fire extinguisher, have it installed in its specific location.
- Keep the machine clean to reduce the fire hazard.

Working near electric supply lines

- Before performing any work, the operator must check whether there are any electric supply lines in the job site.
- If there are electric supply lines, only a machine with cabin may be used (Faraday cage).
- Keep a safe distance from existing electric supply lines.
- If this is not possible, the operator must take other safety measures (for example switching off the current) in agreement with the operating company or owner of the supply lines.
- If supply lines are exposed, they must be fastened, supported and secured accordingly.
- If live supply lines are touched nevertheless:
  - Do not leave/touch the cabin (Faraday cage)
  - If possible, drive the machine out of the danger zone
  - Warn others against approaching and touching the machine
  - Have the live wire de-energized
  - Do not leave the machine until the supply lines that have been touched or damaged have been safely de-energized

Working near non-electric supply lines

- Before performing any work, the operator must check whether there are any non-electric supply lines in the job site.
- If there are non-electric supply lines, the operator must take safety measures (for example switching off the supply line) in agreement with the operating company or owner of the supply lines.
- If supply lines are exposed, they must be fastened, supported and secured accordingly.

Behavior during thunderstorm

- Stop machine operation if a thunderstorm is gathering, stop the machine, secure and leave it, and avoid being near it.

Noise

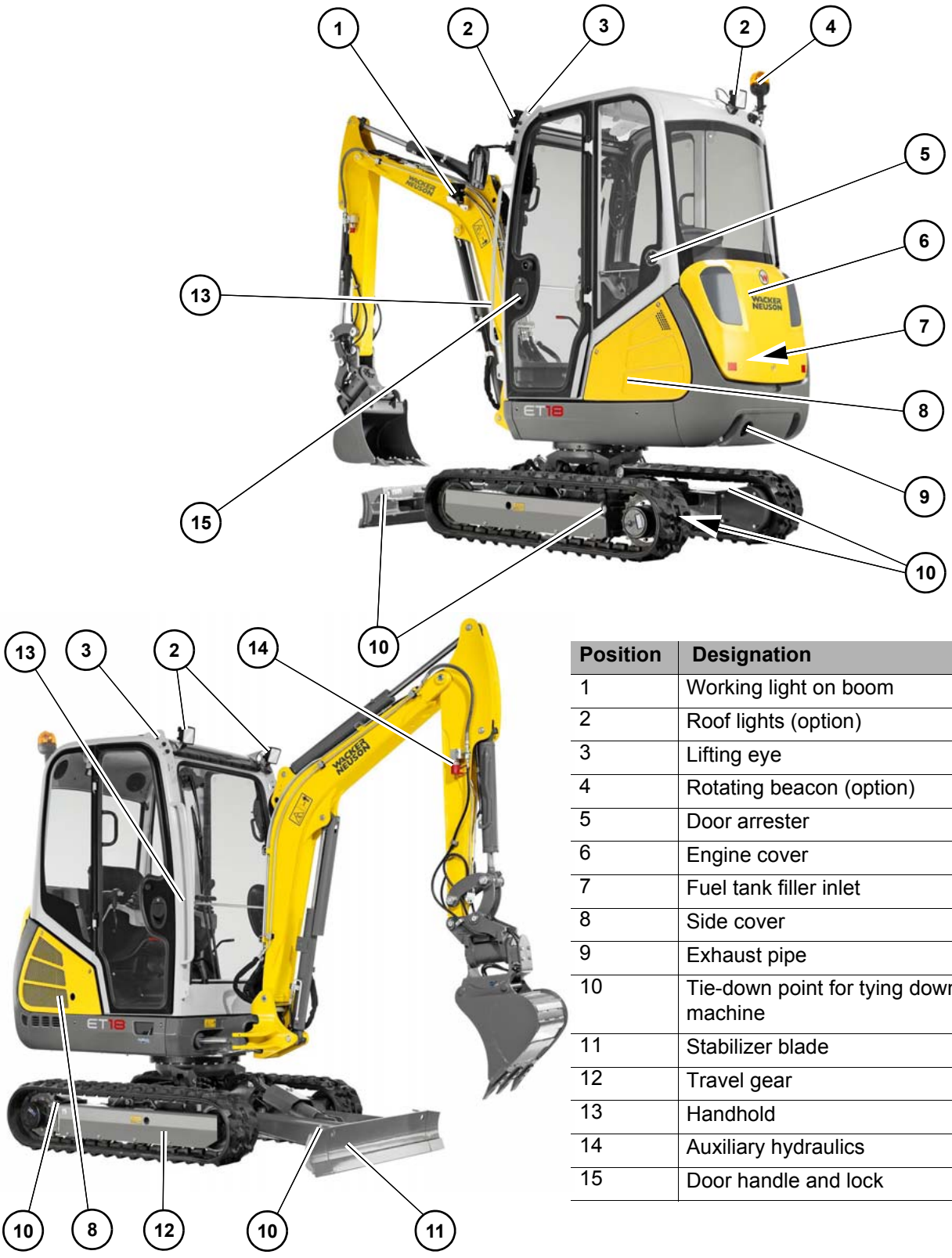
- Observe the noise regulations (for example during applications in enclosed premises).
- Bear in mind external sources of noise (compressed-air hammer, concrete saw).
- Do not remove the sound baffles of the machine/attachment.
- Have damaged sound baffles immediately replaced (for example an insulating mat, muffler).
- Before starting work, get informed on the noise level of the machine/ attachment (for example on the adhesive label) – wear ear protectors.
- Do not wear ear protectors during machine travel on public roads/sites.

Clean

- Injury hazard from compressed air and high-pressure cleaners.
  - Wear appropriate protective clothes.
- Do not use any dangerous and aggressive detergents.
  - Wear appropriate protective clothes.
- Operate the machine only in a clean condition.
  - Remove all dirt, snow and ice from climbing aids (for example handholds, footholds, handrails).
  - Keep the cabin glazing and visual aids clean.
  - Keep the light system and reflectors clean.
  - Keep the control elements and indicators clean.
  - Keep the safety, warning and information labels clean, and replace damaged and missing labels by new ones.
- Perform cleaning work only if the engine is stopped and cooled down.
- Bear in mind sensitive components and protect them accordingly (for example electronic control units, relays).
-

3 Introduction

3.1 Machine overview



Position	Designation
1	Working light on boom
2	Roof lights (option)
3	Lifting eye
4	Rotating beacon (option)
5	Door arrester
6	Engine cover
7	Fuel tank filler inlet
8	Side cover
9	Exhaust pipe
10	Tie-down point for tying down the machine
11	Stabilizer blade
12	Travel gear
13	Handhold
14	Auxiliary hydraulics
15	Door handle and lock

Fig. 2Machine overview

Overview of model designations and trade names

Machine model/machine designation	Trade name
E12-02	ET18
E12-03	ET20
E12-04	ET24

3.2 Brief description of machine

The machine model ET18/ET 20/ET24 is a self-propelled work machine.

Observe 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. A wide range of attachments accounts for the numerous applications of the machine, among others hammer and grab applications. When using these attachments, observe the legal regulations of your country and equip the machine with all the safety equipment required. See chapter 1.4 *Fields of application and use of attachments on page 3-5* for further applications.

The main components of the machine are:

- Undercarriage
  - Travel gear
  - Stabilizer blade
  - Live ring
- Upper carriage
  - Cabin
  - Water-cooled diesel engine
  - Hydraulic and electrical components
- Boom

Information

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

Traveling drive

The diesel engine permanently drives a twin axial variable displacement pump whose oil flow is sent to the control valve. Depending on actuation, each pump supplies a hydraulic motor or the operating hydraulics with oil.

Operating hydraulics

The twin axial variable displacement pump supplies the operating hydraulics for the main components with oil. This pump is output-controlled and supplies the oil quantity depending on the output required. This machine is also equipped with a gear pump flanged onto the variable displacement pump. Depending on engine speed, this pump supplies oil for the swivel unit, the stabilizer blade and travel gear extension/retraction (option).

Shock cartridges (option)

The auxiliary hydraulics are equipped with Schock cartridges to compensate pressure peaks in the hydraulic system.

Cooling system

The coolant temperature is monitored with the indicator light on the machine's instrument panel.

Cabin/canopy

The cabin/canopy have been specially designed for protection in case of an accident.

- ROPS/TOPS tested canopy (open version).
- ROPS/TOPS tested cabin (closed version/option).
- FOPS-protective structure (optional) for driver cabin/canopy; Protective structure against falling objects.
- Front guard with integrated FOPS (option) for driver's cabin / canopy; Protective structure against a hazard from the front (e.g. tubes, tree trunks, etc.) and falling objects.
- Shatter protection (optional) for canopy; Protective structure against frontal flying fragments.

Definition of FOPS/Front Guard levels

Level I:

Protection against small falling objects (FOPS) or small objects penetrating into the cabin from the front (Front Guard), such as bricks, small pieces of concrete, tools, for machines that are used for repairing roads, landscaping work and for working on other construction sites, for example.

Level II:

Protection against heavy falling objects (FOPS) or heavy objects penetrating into the cabin from the front (Front Guard), such as trees, pieces of rock, for machines that are used for clearance, demolition and forestry work.

3.3 Information and regulations on use

Designated use

- The machine is intended for:
  - Moving earth, gravel or rubble, for hammer operation as well as for
  - working only with the attachments indicated in chapter *Fields of application and use of attachments on page 3-5*.
  - Every other use is regarded as not designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from this; The user/operating company alone will bear the risk. Designated use also includes observing the instructions set forth in the Operator's Manual and observing the maintenance and service conditions.
- The machine may not be used for transport jobs on public roads.
- In applications with lifting gear, the machine is used according to its designated use only if the mandatory devices are installed and functional!
- The quickhitch is only used for locking an attachment.
- Hammer operation is only allowed in specified areas.

Fields of application and use of attachments

NOTICE

In order to avoid damage to the machine, only the attachments listed below have been certified for installation on the machine.

► Contact a Wacker Neuson service center if you wish to use other attachments.

Using attachments of other manufacturers, or attachments that have been released for other machine types, can reduce the machine's output and stability considerably, and can also cause damage to the machine and injury to the operator or the personnel.

Compare the weight of the attachment and its maximum payload with the indications in the lift capacity/stability table. Never exceed the maximum payload stated in the lift capacity/stability table.

Information

Please refer to the Operator's and maintenance manual of the attachment manufacturer for using and performing maintenance on attachments such as hammers, grabs, hydraulic quickhitches, etc.

Description of attachment	Weight	Capacity	Machine	Remarks
Quickhitch system - 5Easy Lock	19 kg (42 lbs)	--	ET18	Required for operation of the Wacker Neuson quickhitch system.
		--	ET 20	
		--	ET 24	
Powertilt with Easy Lock	55 kg (121 lbs)	--	ET 18	
		--	ET 20	
		--	ET 24	
Bucket 250 mm (10 in)	30 kg (66 lbs)	0.023 m^3 (0.81 ft^3)	ET 18	
Bucket 250 mm (10 in)	31 kg (68 lbs)	0.023 m^3 (0.81 ft^3)	ET 18	Easy Lock quickhitch
Bucket 250 mm (10 in)	34 kg (75 lbs)	0.030 m^3 (1.06 ft^3)	ET 20	Easy Lock quickhitch
Bucket 300 mm (12 in)	32 kg (71 lbs)	0.027 m^3 (0.95 ft^3)	ET 18	
	34 kg (75 lbs)	0.028 m^3 (0.99 ft^3)	ET 18	Easy Lock quickhitch
	42 kg (93 lbs)	0.037m3 (1.31 ft^3)	ET 20	
	37 kg (82 lbs)	0.036 m^3 (1.27 ft^3)	ET 20	Easy Lock quickhitch
	40.3 kg (89 lbs)	0.043 m^3 (1.52 ft^3)	ET 24	
	43 kg (95 lbs)	0.042 m^3 (1.48 ft^3)	ET 24	Easy Lock quickhitch

Description of attachment	Weight	Capacity	Machine	Remarks
Bucket 400 mm (16 in) **Standard bucket**	37 kg (82 lbs)	0.035 m^3 (1.24 ft^3)	ET 18	
	39 kg (86 lbs)	0.037 m^3 (1.31 ft^3)	ET 18	Easy Lock quickhitch
	46 kg (101 lbs)	0.051 m3 (1.80 ft^3)	ET 20	
	44 kg (97 lbs)	0.048 m^3 (1.70 ft^3)	ET 20	Easy Lock quickhitch
	48 kg (106 lbs)	0.059 m^3 (2.08 ft^3)	ET 24	
	50 kg (110 lbs)	0.056 m^3 (1.98 ft^3)	ET 24	Easy Lock quickhitch
Bucket 500 mm (20 in)	43 kg (95 lbs)	0.044 m^3 (1.55 ft^3)	ET 18	
	47 kg (104 lbs)	0.046 m^3 (1.62 ft^3)	ET 18	Easy Lock quickhitch
	56 kg (123 lbs)	0.064 m3 (2.26 ft^3)	ET 20	
	52 kg (115 lbs)	0.060 m^3 (2.12 ft^3)	ET 20	Easy Lock quickhitch
	54.3 kg (120 lbs)	0.075 m^3 (2.65 ft^3)	ET 24	
	60 kg (132 lbs)	0.070 m^3 (2.47 ft^3)	ET 24	Easy Lock quickhitch
Bucket 600 mm (24 in)	63 kg (139 lbs)	0.053 m^3 (1.87 ft^3)	ET 18	
	53 kg (117 lbs)	0.055 m^3 (1.94 ft^3)	ET 18	Easy Lock quickhitch
	61 kg (134 lbs)	0.077 m3 (2.72 ft^3)	ET 20	
	59 kg (130 lbs)	0.072 m^3 (2.54 ft^3)	ET 20	Easy Lock quickhitch
	63 kg (139 lbs)	0.091 m^3 (3.21 ft^3)	ET 24	
	67 kg (148 lbs)	0.084 m^3 (2.97 ft^3)	ET 24	Easy Lock quickhitch
Bucket 700 mm (28 in)	71 kg (157 lbs)	0.107 m^3 (3.78 ft^3)	ET 24	
Ditch cleaning bucket 850 mm (33 in)	63 kg (139 lbs)	0.065 m^3 (2.30 ft^3)	ET 18	Easy Lock quickhitch
			ET 20	
			ET 24	

Description of attachment	Weight	Capacity	Machine	Remarks
Ditch cleaning bucket 1000 mm (39 in)	65.4 kg (144 lbs)	0.082 m^3 (2.90 ft^3)	ET 18	
			ET 20	
			ET 24	
	72 kg (159 lbs)	0.078 m^3 (2.75 ft^3)	ET 18	Easy Lock quickhitch
			ET 20	
			ET 24	
Ditch cleaning bucket 1200 mm (47 in)	75 kg (165 lbs)	0.098 m^3 (3.46 ft^3)	ET 24	
	84 kg (185 lbs)	0.094 m^3 (3.32 ft^3)	ET 18	Easy Lock quickhitch
			ET 20	
			ET 24	
Offset bucket 850 mm (33 in)	86 kg (190 lbs)	0.054 m^3 (1.91 ft^3)	ET 18	Easy Lock quickhitch
	103 kg (227 lbs)	0.062 m^3 (2.19 ft^3)	ET 20	Easy Lock quickhitch
			ET 24	
Offset bucket 1000 mm (39 in)	93 kg (205 lbs)	0.063 m^3 (2.22 ft^3)	ET 18	Easy Lock quickhitch
	110 kg (243 lbs)	0.073 m^3 (2.58 ft^3)	ET 20	Easy Lock quickhitch
			ET 24	
Tilting 1200 mm (47 in)	121 kg (267 lbs)	0.088 m^3 (3.11 ft^3)	ET 20	Easy Lock quickhitch
			ET 24	
Hydraulic hammer NE 8	66 kg (146 lbs)	--	ET 18	Easy Lock quickhitch
Hydraulic hammer NE 12	110 kg (243 lbs)	--	ET 20	Easy Lock quickhitch
			ET 24	
Hydraulic hammer NE 16	150 kg (331 lbs)	--	ET 24	Easy Lock quickhitch

3.4 Labels

WARNING

Danger of accident due to missing or damaged labels!

A missing, incomplete or poor indication of danger can cause serious injury or death.

- ► Do not remove warning and information labels.
- ► Immediately replace damaged warning and information labels.

Information

Type, quantity, and position of the labels depend on options, country and machine.

Serial number

The serial number is both on the type label and the machine frame. The order of production refers to the serial number alone regardless of other characters, for example letters.

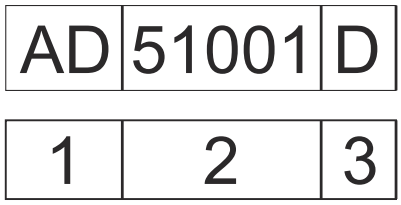


Fig. 3

7/8-digit serial number (up to 2012)

Position	Description
1	Machine version
2	Serial number
3	Equipment feature (optional)

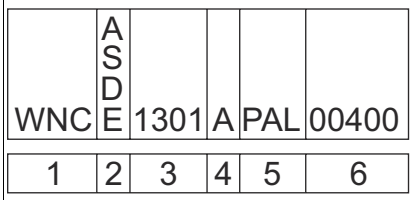


Fig. 4

17-digit serial number (from 2012)

For easier machine identification, Wacker Neuson introduced a 17-digit serial number for compact equipment in 2012 (for example for excavators). This serial number includes additional data, for example the manufacturer code and the production site.

Position	Description
1	Manufacturer code
2	Machine model
A	Unit
S	Compact loader
D	Dumper
E	Excavator
3	Internal model designation
4	Check letter
5	Production site
6	Serial number

Information

Wacker Neuson components (for example, Easy Lock, offset bucket, rollbar) have numeric serial numbers only.

Type labels

Fig. 5Position of type label

Machine type label

The type label is located at the front left on the upper carriage.

Fig. 6Type label (symbolic representation)

.

Description of attachment	HYDRAULIC EXCAVATOR
Vehicle serial no. / serial no.	Machine serial number
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. weight / 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
EWG Nr./CEE no.:	EEC check number
Baujahr/model year/année fabr.:	Year of construction

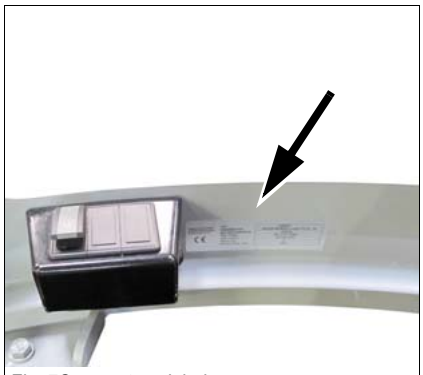


Fig. 7Canopy type label

Canopy type label

The type label is located behind the seat.

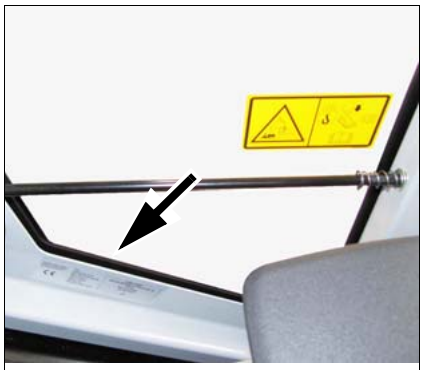


Fig. 8Cabin type label

Cabin type label

The type label is located under the window on the left.

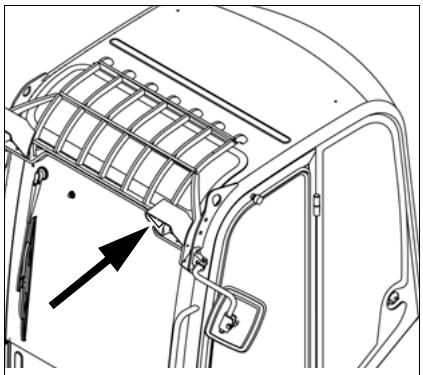


Fig. 9FOPS type label

FOPS screen type label

The type label is located at the upper left of the chassis.

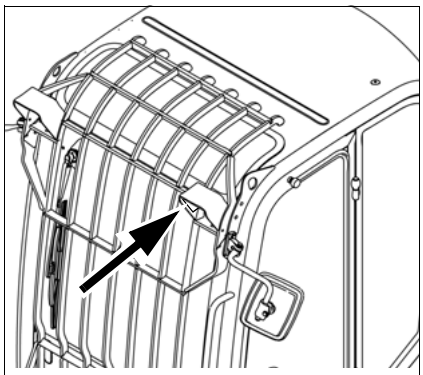
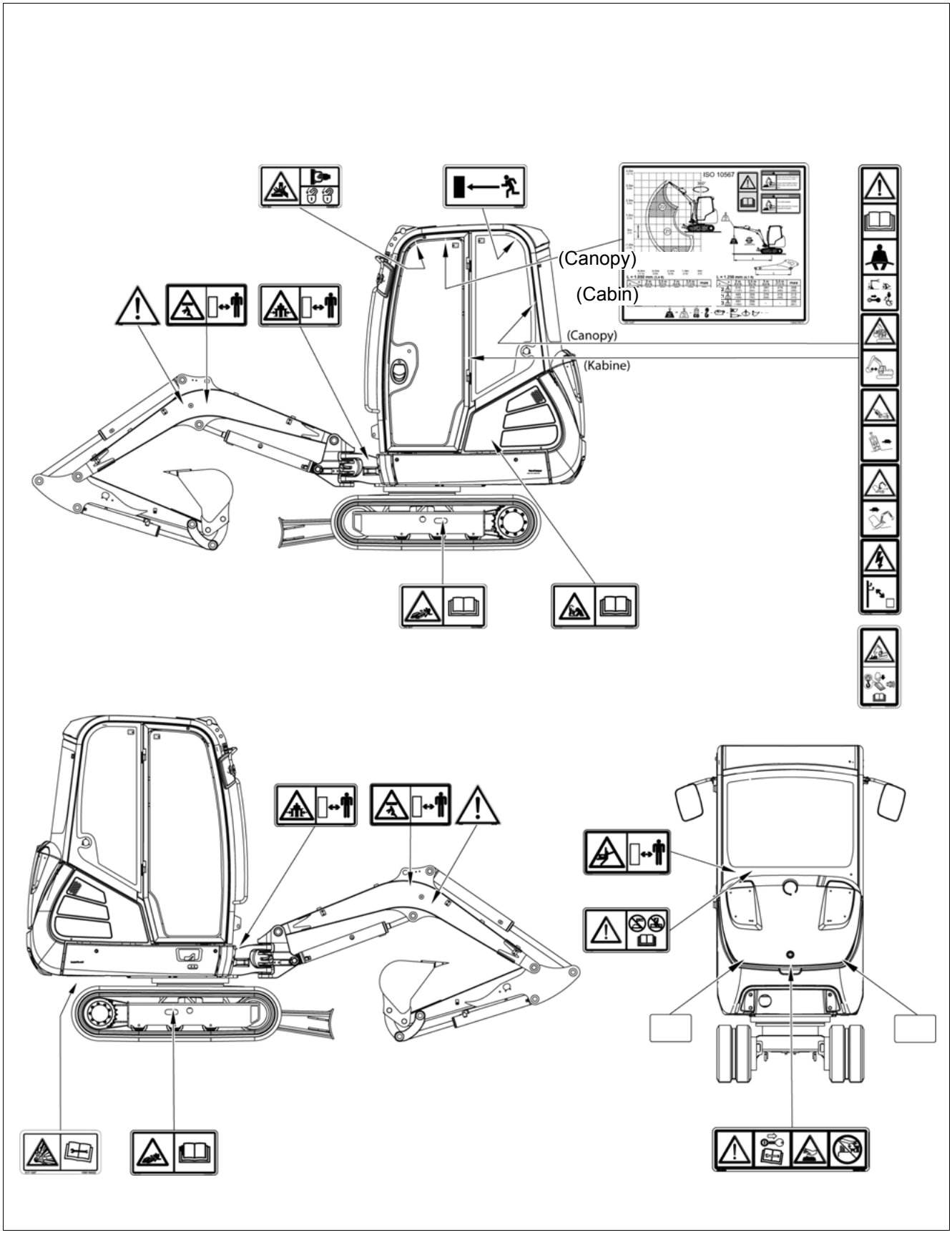


Fig. 10Front Guard type label

Front Guard type label

The type label is located at the upper left of the chassis.

Warning labels



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

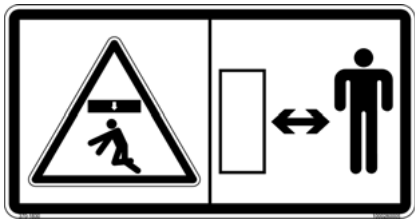


Fig. 12Danger zone

Meaning

Danger of serious or fatal injury.

Stay clear of suspended loads or of the danger zone of the machine during operation.

Position

On the boom on the left and right.

Fig. 13Track tensioner

Meaning

Danger due to grease squirting out.

Read the Operator's Manual before working with the track tensioner.

Position

On the travel gear near the lubrication system.

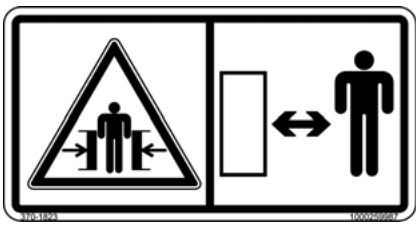


Fig. 14Articulation

Meaning

Danger of serious crushing of body.

Stay clear of the machine's danger zone during operation.

Position

At the front of the chassis near the swiveling console.

Fig. 15Battery

Meaning

Explosion hazard due to wrong connection of battery jumper cables.

Position

Inside the engine compartment behind the cover on the left.

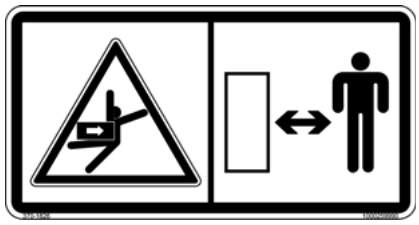


Fig. 16Swiveling range

Meaning

Danger of serious crushing of body.

Stay clear of the machine's swiveling range during operation.

Position

At the rear of the cabin on the left in travel direction.

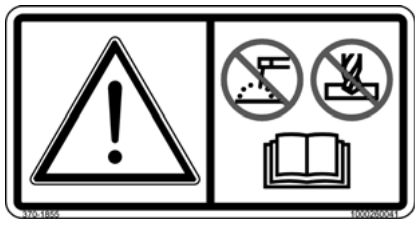


Fig. 17Cabin

Meaning

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

Position

At the rear of the cabin on the left in travel direction.

Fig. 18Front window

Meaning

Danger of serious crushing of hands.

1. Use the handles to open and close the front window.
2. Lock the front window with both locks.

Position

On the front window.

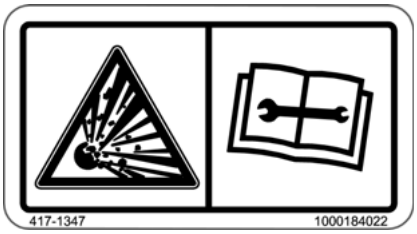


Fig. 19Pressure accumulator

Meaning

Accumulator is under high pressure. Always read the Operator's Manual before performing maintenance or repairs.

Position

Under the rear part of the machine, on the right (in travel direction) behind the engine oil sump.

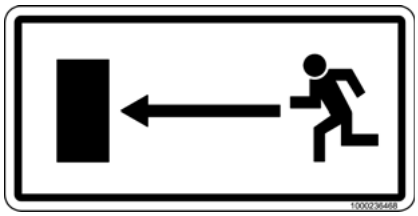


Fig. 20Emergency exit

Meaning (option)

This label indicates the emergency exit on machines equipped with the Front Guard option.

Position

On the upper edge of the rear window in the cabin.

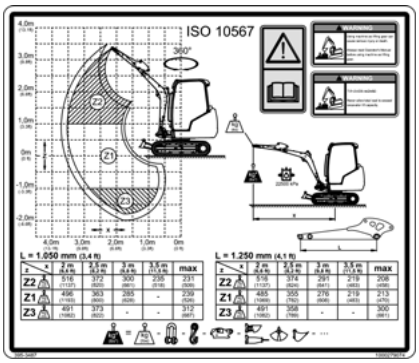


Fig. 21Stability

Meaning (option)

If the specified load/stability is exceeded, there is danger of serious crushing causing serious injury and even death.

Danger of serious damage to the machine.

Position

On the headliner.

Fig. 22B/C pillar

Meaning

Read the Operator's Manual before starting the machine.

Fasten the seat belt during operation.

When leaving the machine

Danger of serious crushing of body and even death.

Serious crushing hazard.

Keep a safe distance from the boom.

Danger of serious damage to the machine.

During machine operation on slopes, pay attention to the maximum gradient angle and maximum lateral angle of inclination.

Do not use high speed.

Danger of serious damage to the machine.

Death hazard due to electric shock.

During machine operation, maintain a safe distance from overhead electric lines.

Position

Canopy: on the C pillar on the left in travel direction.

Cabin: on the B pillar on the left in travel direction.

Fig. 23Overload

Meaning (option)

Switch on the safe load indicator during lifting (gear) applications. Failure to observe this can cause the machine to tip over, which in turn can cause serious injury and even death.

Read and understand the Operator's Manual.

Position

Canopy: on the C pillar on the left in travel direction.

Cabin: on the B pillar on the left in travel direction.

Fig. 24Engine cover

Meaning

Read the Operator’s Manual before starting the machine.

Injury hazard due to rotating parts.

- Open the engine cover only at engine standstill.

Burn hazard due to hot engine parts.

Position

On the engine cover.

Fig. 25Burn Hazard

Meaning

Burn hazard due to hot parts on the boom (lines, plug-and-socket connections, threaded fittings, hydraulic cylinders, couplings, etc.).

Position

On the boom on the left and right.

Fig. 26Reflector

Meaning

Reflector at the rear.

Position

At the rear left and right of the machine.

Information labels

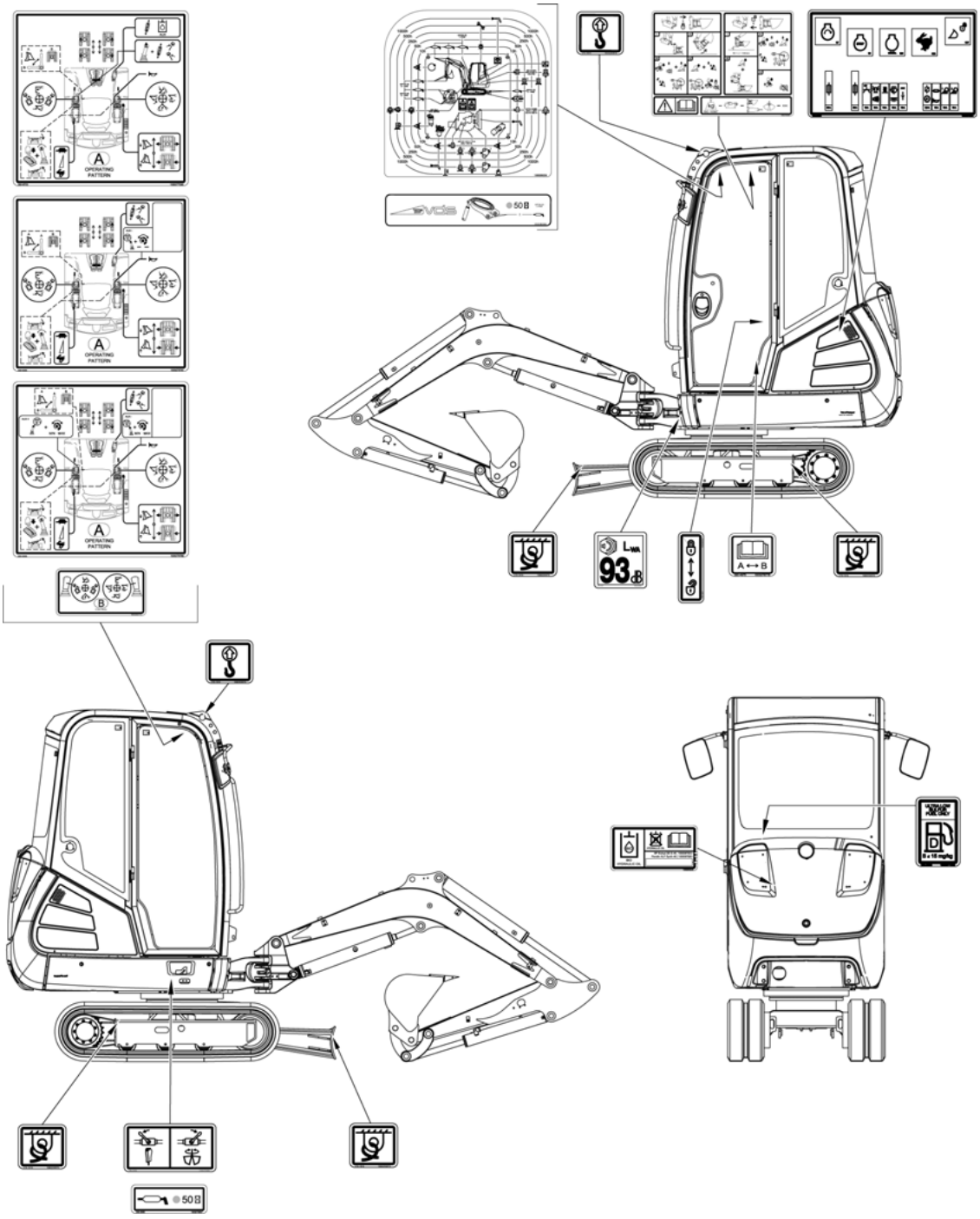


Fig. 28Diesel

Meaning

Only use diesel fuel with a sulfur content below 15 mg/kg.

Position

Next to the fuel tank filler inlet.

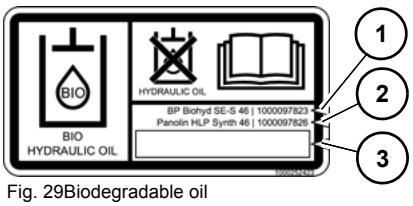


Fig. 29Biodegradable oil

Meaning (option)

The reservoir 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

Next to the filler inlet of the hydraulic oil reservoir.

Fig. 30Raise

Meaning

Indicates the lifting points of the machine.

Position

At the upper left and right of the cabin roof.

Fig. 31Tying down

Meaning (option)

Indicates the tie-down points for tying down the machine.

Position

- On (outside) left and right of travel gear.
- On (inside) left and right of travel gear.
- On the stabilizer blade on the left and right.

Fig. 32Sound power level

Meaning

Indication of sound power level produced by the machine.

L_{Wa} = sound power level.

Position

At the front on the chassis.

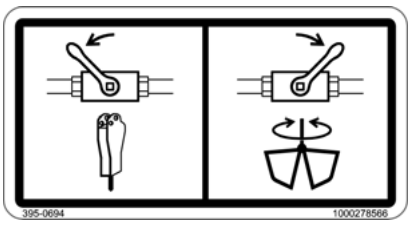


Fig. 33Hammer operation

Meaning

Changeover between hammer and dual-circuit function.

Position

On the upper carriage on the right in travel direction.

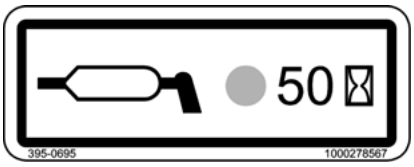


Fig. 34Lubrication point

Meaning

Indicates the interval at a which lubrication point must be lubricated.

Lubrication points/grease zerks marked green mean: lubrication every 50 hours or once a week.

Lubrication points/grease zerks marked blue mean: lubrication every 10 hours or daily.

Position

On the upper carriage on the right in travel direction.

Fig. 35VDS maintenance plan

Meaning (option)

Indicates the lubrication points of the VDS tilt console.

Position

Upper part of front window.

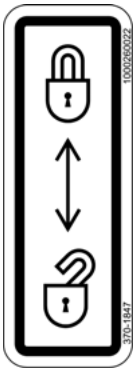


Fig. 36Lock

Meaning

This label indicates the position in which the control levers are locked.

Position

Canopy: on the control lever bases on the left and right.

Cabin: on the control lever base on the left (standard) and on the control lever base on the right (option).

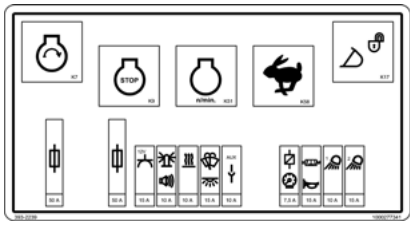


Fig. 37Fuse box

Meaning

Fuses and relays.

Position

Behind the cover on the left, outside on the cover.

Fig. 38ISO/SAE changeover

Meaning (option)

Check before starting the machine the operating pattern that has been chosen. Label shows the lever position in which the ISO or SAE controls are selected.

Wiring diagram	Controls
A	ISO controls
B	SAE controls

Position

At the left under the operator seat.

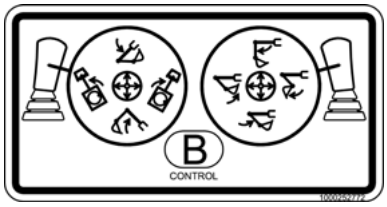


Fig. 39SAE function label

Meaning (option)

Indicates the control operations that do not comply with the ISO standard if the SAE controls are selected.

Position

On the roof window on right in travel direction.

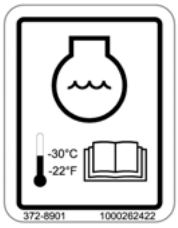


Fig. 40Coolant

Meaning

Thermal stability of coolant.

Position

In the engine compartment on the expansion tank.

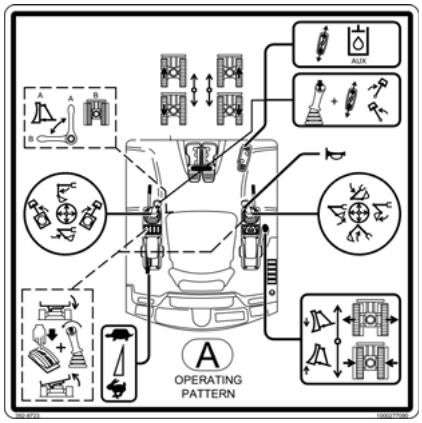


Fig. 41Function ET 18/ET 20 standard

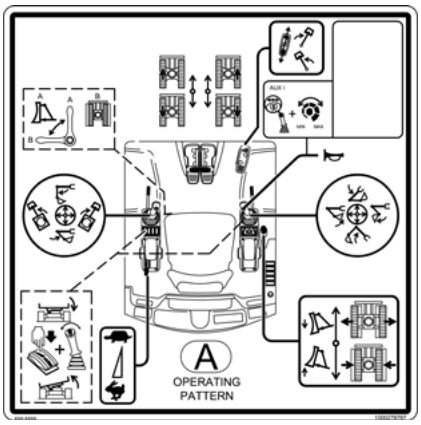


Fig. 42Function ET 18/ET 20 auxiliary hydraulics/ proportional controls

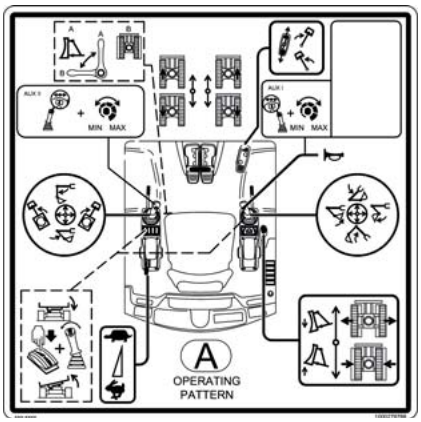


Fig. 43Function ET 18/ET 20 Powertilt/3rd control circuit

Meaning (ET18/ET20)

This label describes the pedal and control lever functions (control pattern A/ISO controls).

Check before starting the machine the operating pattern that has been chosen.

– see "ISO/SAE changeover" on page 3-20

Position

On the roof window on right in travel direction.

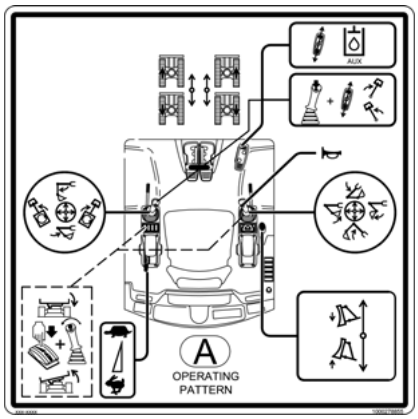


Fig. 44Function ET 24 standard

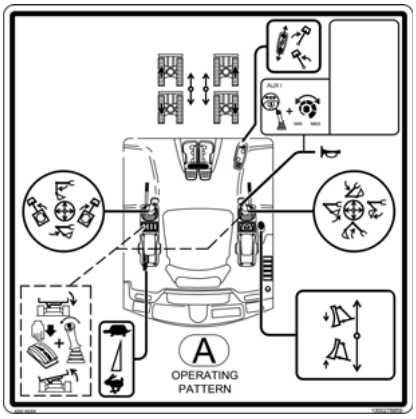


Fig. 45Function ET 24 auxiliary hydraulics/ proportional controls

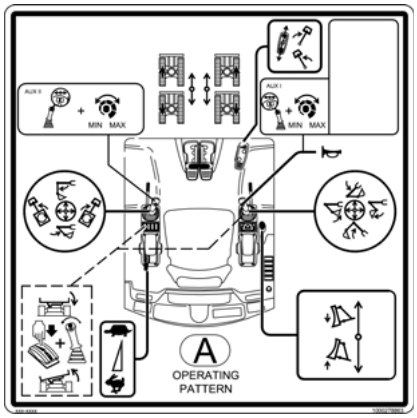


Fig. 46Function ET 24 Powertilt/3rd control circuit

Meaning (ET24)

This label describes the pedal and control lever functions (control pattern A/ISO controls).

Check before starting the machine the operating pattern that has been chosen.

– see “ISO/SAE changeover” on page 3-20

Position

On the roof window on right in travel direction.

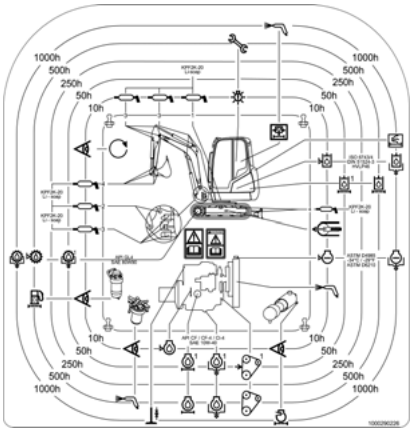


Fig. 47Maintenance plan

Meaning

Indication of maintenance intervals.

Position

On the roof window on right in travel direction.

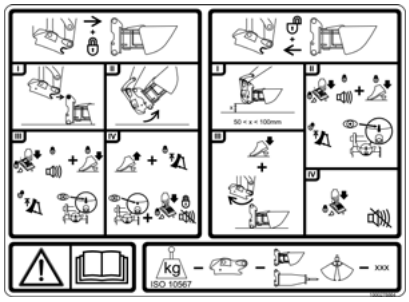


Fig. 48Hydraulic quickhitch

Meaning

This label describes the functions of the hydraulic quickhitch.

Position

Canopy: inside on the roof.

Cabin: at the upper edge of the rear window.

4 Putting into operation

4.1 Cabin/control stand

Safety instructions regarding entry and exit

CAUTION

Falling hazard when entering or exiting!

Entering or exiting incorrectly can cause injury.

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

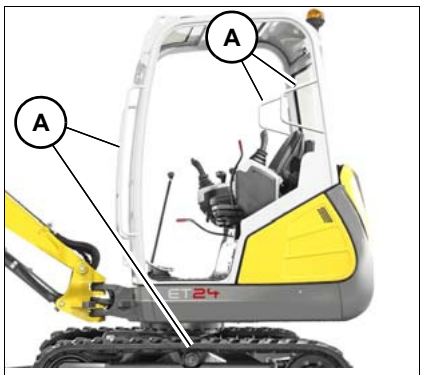


Fig. 49Entry and exit (canopy)

Entry and exit (canopy)

Stop the machine (see chapter “Operation, stopping the machine”).

If the machine is equipped with a canopy, it can be accessed from either side.

Information

Entry and exit via the tracks is only possible if the travel gear is telescopically extended (telescopic travel gear only for ET18 and ET20).

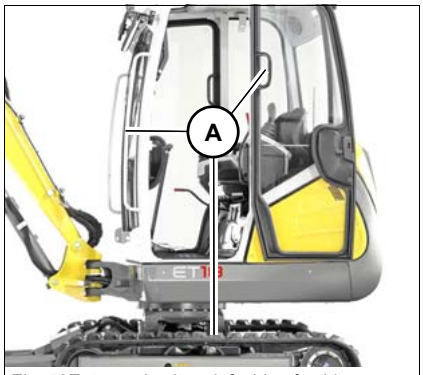


Fig. 50Entry and exit on left side of cabin

Cabin entry and exit

Stop the machine (see chapter “Operation, stopping the machine”).

Information

When entering or leaving the cabin on the left side, the door must be locked in the arrester.

Information

Entry and exit via the tracks is only possible if the travel gear is telescopically extended (telescopic travel gear only for ET18 and ET20).

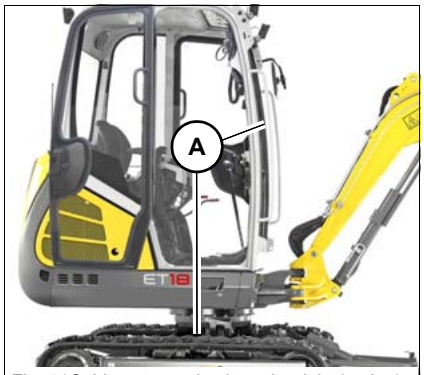


Fig. 51Cabin entry and exit on the right (option)

Information

Do not use the bar on the door when entering or exiting the cabin on the right.

Locking and unlocking the door

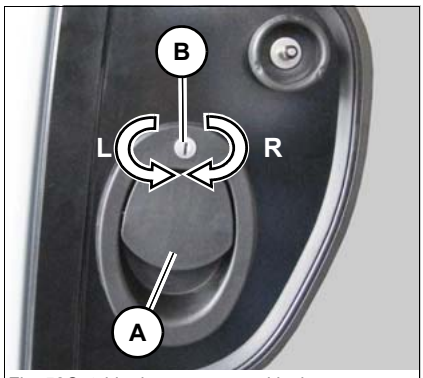


Fig. 52Outside door opener and lock

Opening the door from the outside:

Pull handle **A** outward.

Locking the door:

1. Turn the key in door lock **B** to the right (R).
2. The door is locked.

Unlocking the door:

1. Turn the key in door lock **B** to the left (L).
2. The door is unlocked.

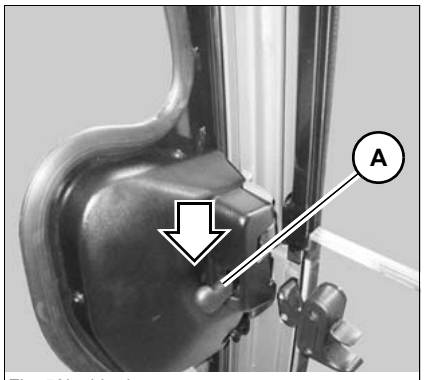


Fig. 53Inside door opener

Opening the door from the inside:

Press lever **A** on the door lock downward.

Securing an open door

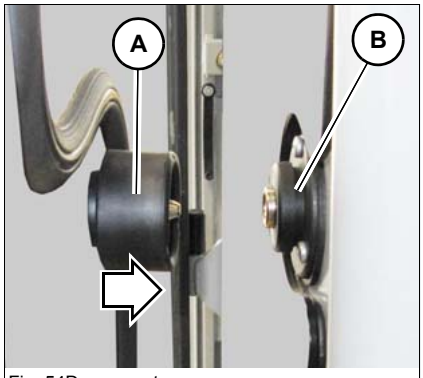


Fig. 54Door arrester

Press bracket **A** against arrester **B** until it engages with an audible click (only possible on the left).

Releasing the door arrester

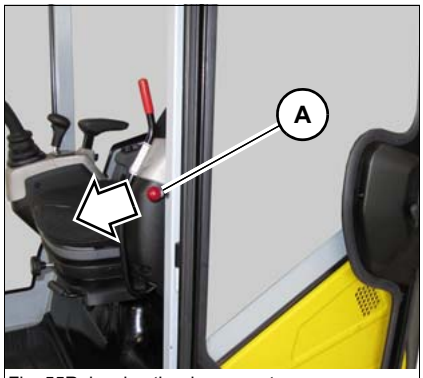


Fig. 55Releasing the door arrester

Pull button **A** to release the door out of the arrester.

Opening the door to a gap

NOTICE

The door can be damaged.

- ► Bear in mind the larger width of the machine if the door is opened to a gap.
- ► Close the doors when performing machine travel through passages.

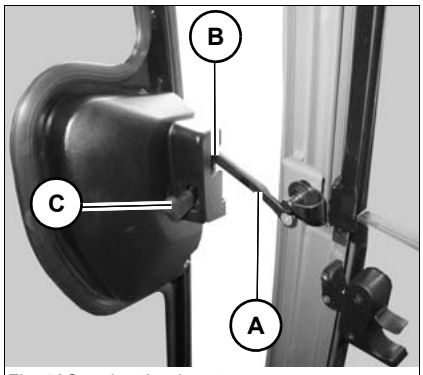


Fig. 56Opening the door to a gap

1. Raise door opener **A**.
2. Open the door until it engages in door lock **B**.
3. Let door opener **A** engage in door lock **B**.

Unlocking (from inside):

Press lever **C** inside on the door lock downward.

Unlocking (from outside):

Press the handle.

Opening/closing the front window

CAUTION

Crushing hazard! Be careful when opening and closing the front window.

Injury hazard due to crushing of parts of body.

- ► Stay clear (extremities, clothing) of the window channel.
- ► Open and close the front window with both handles.
- ► Let the front window engage in the locks as you open and close it.
- ► Fold up the control lever base before opening or closing the front window, in order to avoid any unintentional actuation of the pedals and drive levers.
- ► Take care not to hit the front window with your head as you open and close it.

Opening the front window

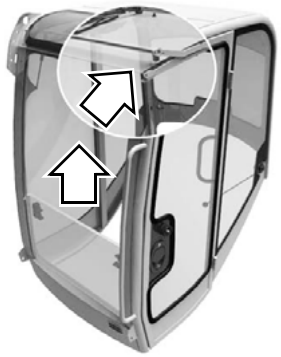


Fig. 57Front window

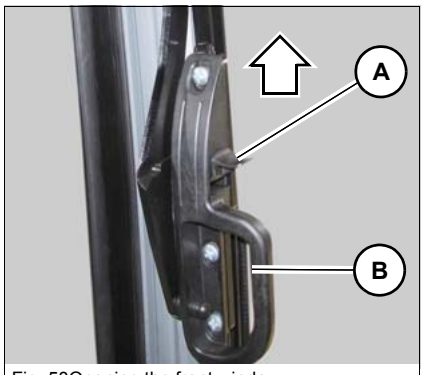


Fig. 58Opening the front window

1. Press and hold levers **A** on the left and right, and pull the front window forward with handles **B**.
2. Release levers **A** and press the window upward until it engages.

Closing the front window

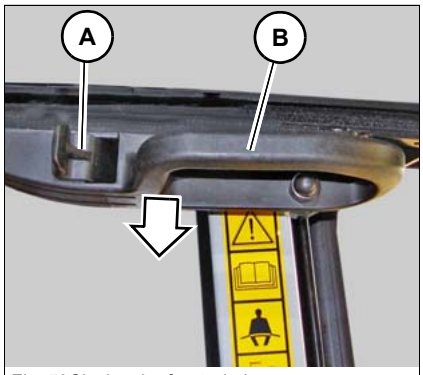


Fig. 59Closing the front window

1. Press levers **A** on the left and right, and pull the front window downward with handles **B** on the left and right.

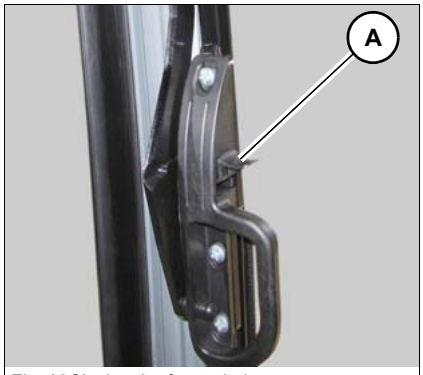


Fig. 60Closing the front window

2. Press the front window fully forward and release levers **A**.

Opening the lower front window

Fig. 61Lower front window

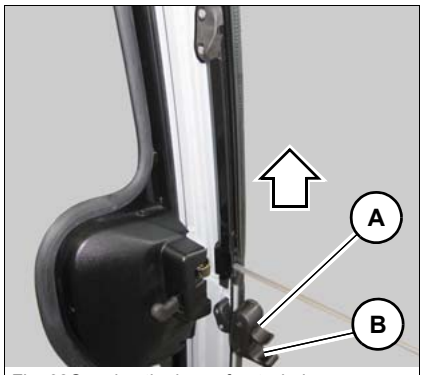


Fig. 62Opening the lower front window

Press levers **A** on the left and right, and pull the front window upward with handles **B** on the left and right until it engages.

Closing the lower front window

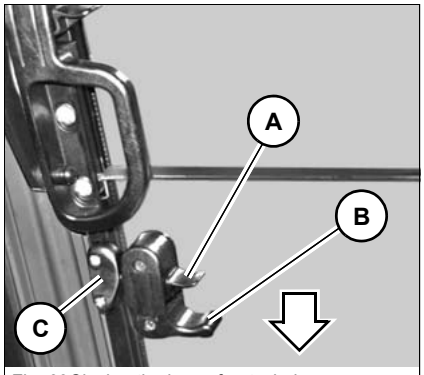


Fig. 63Closing the lower front window

Keep levers **A** pressed on the left and right, and pull the lower front window downward with handles **B** on the left and right until it engages.

Opening the whole front window

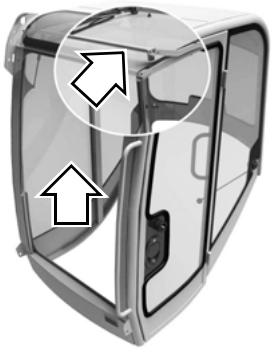


Fig. 64Whole front window

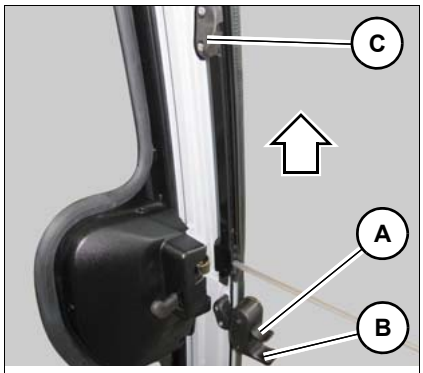


Fig. 65Opening the whole front window

1. Press levers **C** on the left and right, and pull the front window upward with handles **D** on the left and right until it engages.

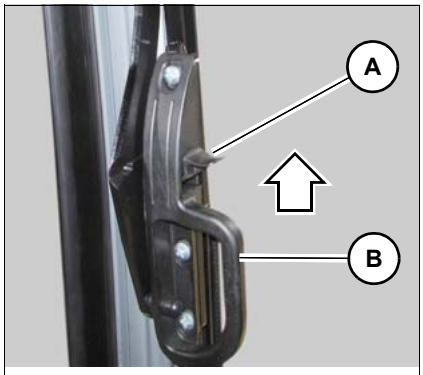


Fig. 66Opening the whole front window

2. Press and hold levers **A** on the left and right, and pull the entire front window forward with handles **B** on the left and right.
3. Release levers **A** on the left and right and press the window upward until it engages.

Closing the whole front window

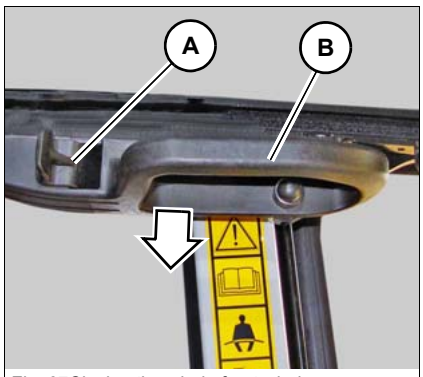


Fig. 67Closing the whole front window

1. Press levers **A** on the left and right, and pull the front window downward with handles **B** on the left and right.

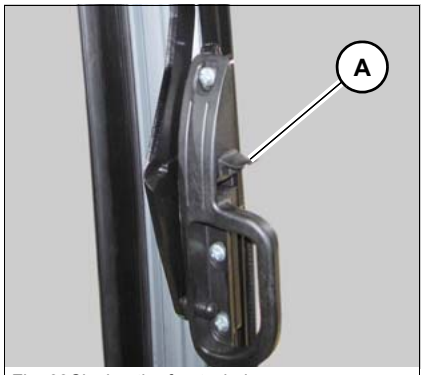


Fig. 68Closing the front window

2. Keep levers **B** pressed on the left and right, and pull the lower front window downward with handles **C**.
3. Release levers **B** and let the window engage.

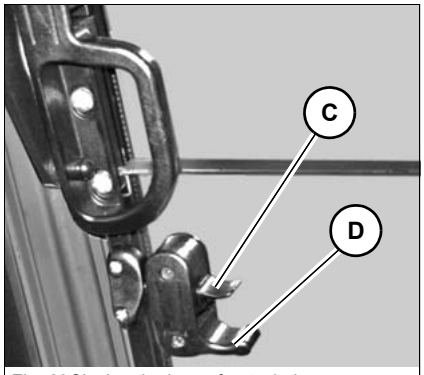


Fig. 69Closing the lower front window

4. Keep levers **C** pressed on the left and right, and pull the lower front window downward with handles **D**.
5. Release levers **C** on the left and right and let the window engage.

Opening the front window to a gap (ventilation position)


Fig. 70Opening the front window to a gap

Open

1. Press levers **A** on either side and pull the front window to the inside.
2. Release levers **A** and let them engage in both locks **B**.

Close

1. Press levers **A** on the left and right.
2. Press the front window forward, release levers **A** and let the window engage.

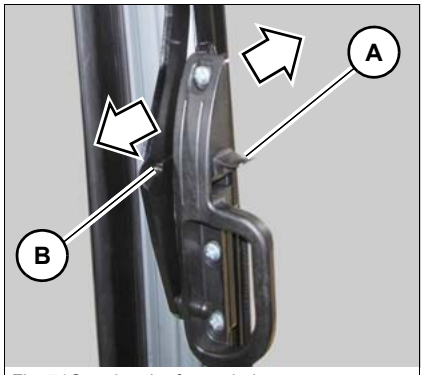


Fig. 71Opening the front window to a gap

Opening/closing the side window

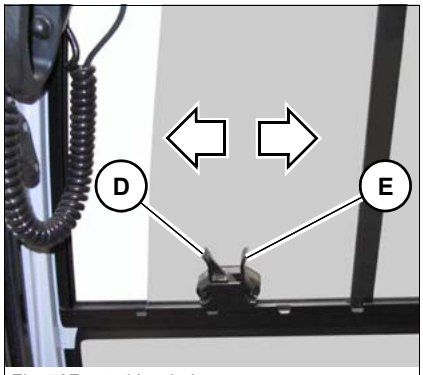


Fig. 72Front side window

Open

Press lever **D** and let the window engage in the required recess.

Close

Press lever **D** and close with handle **E**.

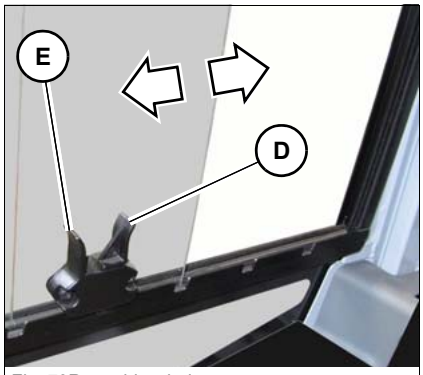


Fig. 73Rear side window

Open

Press lever **D** and let the window engage in the required recess.

Close

Press lever **D** and close with handle **E**.

Emergency exit

WARNING

Injury hazard during emergency exit!

Can cause serious injury or death.

- ► Stop the engine.
- ► Only use the windows for exiting the cabin if the access (cabin door) is obstructed or if it cannot be opened.
- ► If possible, ask for help.

The front window can be used for exiting the cabin in an emergency.

Emergency exit on machines equipped with protective Front Guard structures (option)

CAUTION

Injury hazard due to glass splinters!

Can cause injury.

- ► Protect face and hands sufficiently.
- ► Remove all glass splinters before leaving the cabin.

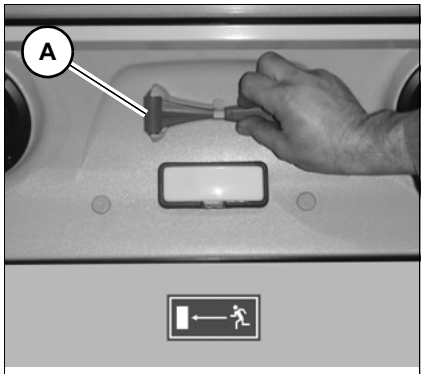


Fig. 74Emergency hammer on rear window

The rear window can be used as an emergency exit if the door is blocked.

The rear window is broken with emergency hammer **A** fastened over the rear window.

Seat adjustment

WARNING

Accident hazard due to distraction when adjusting the seat!

Can cause serious injury or death.

► Adjust the seat only when the machine is at a standstill.

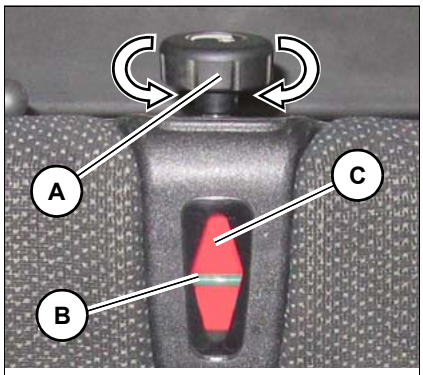


Fig. 75Weight adjustment

Weight adjustment

1. Sit down on the operator seat.
2. Adjust the weight with regulator **A** so that the green bar **B** is in the middle of indicator **C**.
   ➥ This ensures optimum ride comfort.

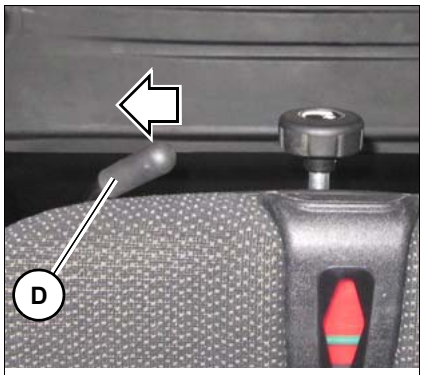


Fig. 76Horizontal adjustment

Horizontal adjustment

1. Sit down on the operator seat.
2. Move and hold lever **D** as far as it will go in the direction of the arrow.
3. Move and engage the seat in the required position.
4. Return lever **D** to the initial position.

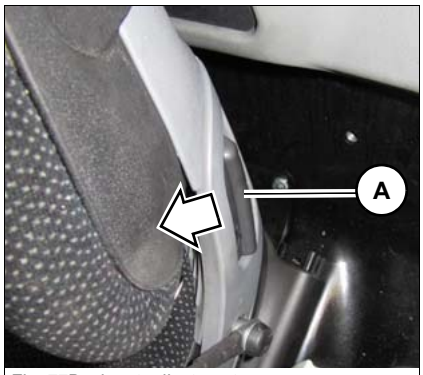


Fig. 77Backrest adjustment

Backrest adjustment

1. Sit down on the operator seat.
2. Press lever **A** in the direction of the arrow and move the backrest to the required position.
3. Release the lever again.

Seat belt adjustment

DANGER

Injury hazard! Do not drive or work with the seat belt unbuckled.

Causes serious injury or death.

- ► Fasten and adjust your seat belt before moving off or operating the machine.
- ► Do not twist the seat belt when you fasten it.
- ► Firmly fasten your seat belt over your hips and not over your stomach.
- ► Do not place the seat belt over hard, edged or fragile items (for example tools).
- ► Seat belt buckle must not be obstructed by foreign bodies (paper or similar); otherwise the buckle latch cannot lock into place.
- ► The seat belt must be replaced by a Wacker Neuson service center after an accident, and the bearing capacity of the fastening points and seat fixtures must be checked.
- ► Check the seat belts at regular intervals. Have damaged parts immediately replaced by a Wacker Neuson service center.

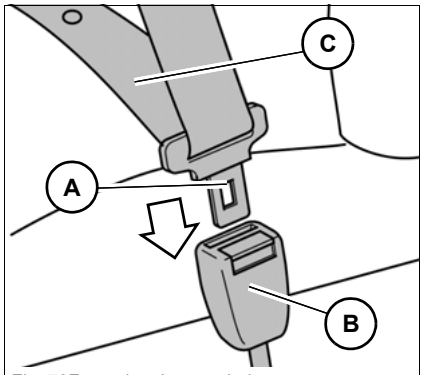


Fig. 78Fastening the seat belt

Fastening the seat belt

1. Insert buckle latch **A** into seat belt buckle **B** with an audible click.
2. Tighten seat belt **C** by pulling at its end.

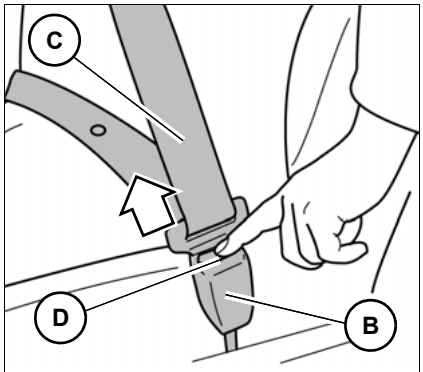


Fig. 79Unfastening the seat belt

Unfastening the seat belt

1. Press the red push button **D** on seat belt buckle **B** until the buckle latch comes out.
2. Place seat belt **C** aside.

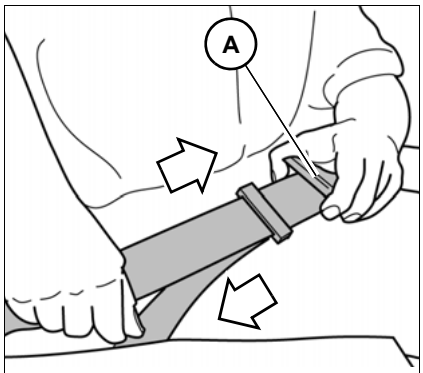


Fig. 80Longer/shorter seat belt adjustment

Longer/shorter seat belt adjustment

Longer seat belt adjustment

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

Shorter seat belt adjustment

Pull the free end of the seat belt and shorten it to the required length.

Adjusting the retracting seat belt (option)

DANGER

Injury hazard! Do not drive or work with the seat belt unbuckled.

Causes serious injury or death.

- ► Fasten and adjust your seat belt before moving off or operating the machine.
- ► Do not twist the seat belt when you fasten it.
- ► Firmly fasten your seat belt over your hips and not over your stomach.
- ► Do not place the seat belt over hard, edged or fragile items (for example tools).
- ► Seat belt buckle must not be obstructed by foreign bodies (paper or similar); otherwise the buckle latch cannot lock into place.
- ► The seat belt must be replaced by a Wacker Neuson service center after an accident, and the bearing capacity of the fastening points and seat fixtures must be checked.
- ► Check the seat belts at regular intervals. Have damaged parts immediately replaced by a Wacker Neuson service center.

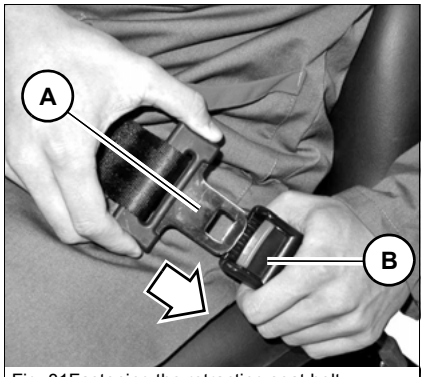


Fig. 81Fastening the retracting seat belt

Fastening the retracting seat belt

Insert buckle latch **A** into seat belt buckle **B** with an audible click.

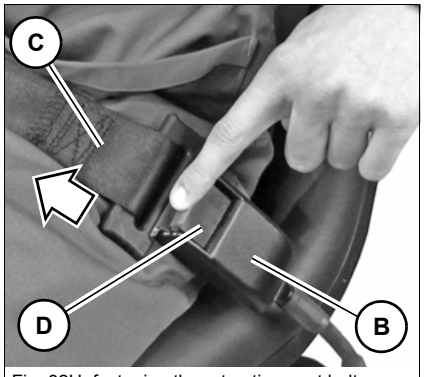


Fig. 82Unfastening the retracting seat belt

Unfastening the retracting seat belt

1. Press the red push button **D** on seat belt buckle **B** until the buckle latch comes out.

Seat belt **C** is automatically retracted.

Adjusting the rearview mirrors (option)

WARNING

Injury hazard to persons in the danger zone!

Persons in the danger zone are possibly not seen and can be injured during backward machine travel.

- ► Adjust the existing visual aids (for example the rearview mirrors) correctly.
- ► Interrupt work immediately if persons enter the danger zone.
- ► Pay attention to the movements and changing positions of attachments and persons.

WARNING

Accident hazard due to restricted field of vision on the job site!

Accidents resulting in serious injury or death can be caused by a restricted field of vision.

- ► Interrupt work immediately if persons enter the danger zone.
- ► Take appropriate measures if necessary (for example use a camera, mirrors, guide).
- ► Additional equipment or attachments must not be installed if they impair visibility.

WARNING

Accident hazard due to incorrect adjustment of visual aids!

Incorrectly adjusted visual aids can cause serious injury or death.

- ► Adjust the visual aids before putting the machine into operation.
- ► Immediately replace damaged or broken visual aids.
- ► Convex mirrors enlarge, reduce or distort the field of view. Bear this in mind when adjusting and using such mirrors.

Before using the machine, before starting work or when changing users, ensure that all visual aids (for example the 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.

- Use safety-oriented ladders and work platforms for adjustment work on the machine.
- Never use machine parts or attachments/superstructures as a climbing aid.

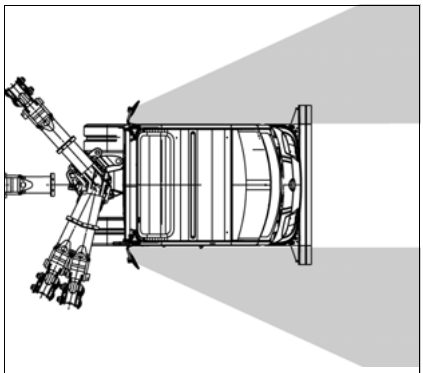


Fig. 83Adjusting the outside rearview mirrors

Adjusting the mirrors

Adjust the mirrors in order to:

- Ensure sufficient visibility from the operator seat onto the job site.
- Ensure maximum visibility to the rear.
- Ensure visibility of the rear left edge of the machine in the left mirror.
- Ensure visibility of the rear right edge of the machine in the right mirror.

Information

Set the machine to drive position before adjusting the mirrors – *see "Drive position" on page 5-3*.

Information

We recommend having the mirrors adjusted by a second person.

Information

Do not make any changes or modifications that impair visibility. Otherwise the machine does not meet the requirements for conformity and registration.

Control lever base

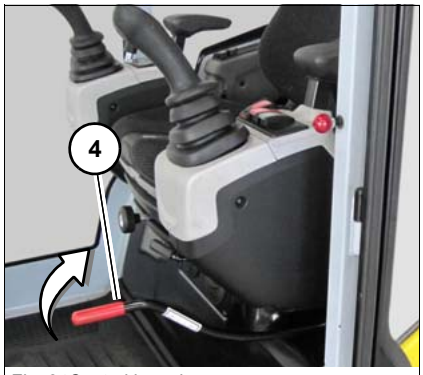


Fig. 84Control lever base

Raise the control lever base on the left **4** after stopping the engine.

Control lever base on the left raised:

- All hydraulic functions are locked.
- The upper carriage is secured against rotation. (The swivel unit brake is enabled.)
- The engine will not start unless the control lever base is raised.

Control lever base on the left lowered:

- All hydraulic functions are active.
- The upper carriage can be rotated.
- The engine cannot be started.

Functional check of control lever base

Perform a functional check of the control lever base every time before you start the machine.

1. Start the machine.
2. Perform machine travel on open terrain.
3. Secure the danger zone.
4. Stop the machine.
5. Raise the control lever base on the left.
6. Move all control levers and pedals in all directions.
   - ➥ The selected elements must not move.
   - ➥ The machine may be put into operation.
7. The selected elements move:
   - ➥ Stop operation immediately.
   - ➥ Contact a Wacker Neuson service center and have the malfunction rectified.

If the machine is equipped with a canopy (standard), raiseable control lever bases are installed on either side.

If the machine is equipped with a cabin, a raiseable control lever base is installed on the left side. If the machine is equipped with an optional second door, a raiseable control lever base is also installed on the right.

Fire extinguisher

Fig. 85Fire extinguisher on C pillar

A fire extinguisher is not available, neither as standard nor optional equipment.

A fire extinguisher according to DIN-EN 3 must be installed by a Wacker Neuson service center.

A bracket for the fire extinguisher must be fastened on the C pillar on the left for the cabin or canopy.

Information

Ensure the firm and safe installation of the fire extinguisher. Check the fire extinguisher at regular intervals, also ensure that it is safely installed. Observe the manufacturer's indications.

Arm rest

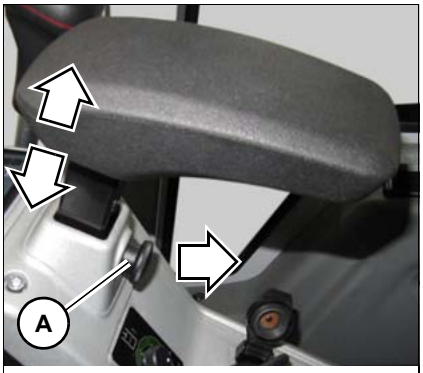


Fig. 86Arm rest

1. Hold the armrest, and loosen and pull out button **A**.
2. Move the armrest to the required position.
3. Let button **A** lock into place and tighten it.

Protective structures

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

DANGER

Accident hazard due to modified cabin and protective structures!

Causes serious injury 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 or cracked.
- ► Contact a Wacker Neuson service center in case of doubt.
- ► Retrofit and repair work may only be performed by a Wacker Neuson service center.

Information

Machine operation is only allowed with a correctly installed and intact cabin or correctly installed and intact canopy.

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

Information

Only a Wacker Neuson service center may install the protective structures for the first time.

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.

Protective FOPS structure/small screen – category I (option)

DANGER

Crushing hazard! Falling objects!

Causes serious injury or death.

- ► Install a protective FOPS structure in areas with danger of falling objects.
- ► Machine operation is prohibited without a protective FOPS structure.

Information

The protective FOPS structure corresponds to category I according to ISO 3449:1992

- ► The machine owner must ensure that the hazard situation is evaluated and that the national regulations are observed.
- ► The machine owner must ensure that only work is performed that does not require any higher protection.
- ► Accidents cannot be fully avoided despite equipping a machine with protective structures.

Fig. 87Protective FOPS structure/small screen – category I (symbolic representation)

Assembly (gray screen)

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Remove all lights and mirrors (option).
3. A minimum 2 persons are required for installing/removing.

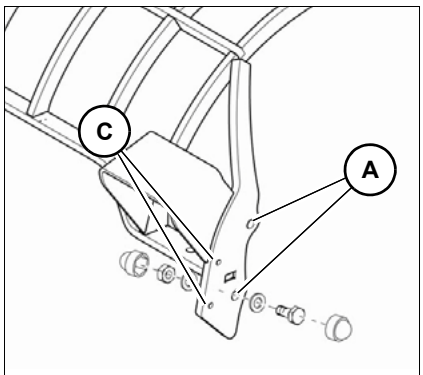


Fig. 88Small/gray FOPS (assembly)

4. Mounting point for protective structure: **A**

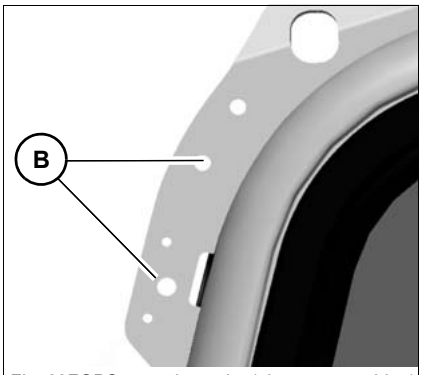


Fig. 89FOPS mounting point (above on machine)

5. Mounting point for cabin/canopy: **B**
6. Tighten screws **D** (M12/10.9) and lock nuts on the left and right to 110 Nm (87 ft.lbs).
7. Install the mirrors in both positions **C**.

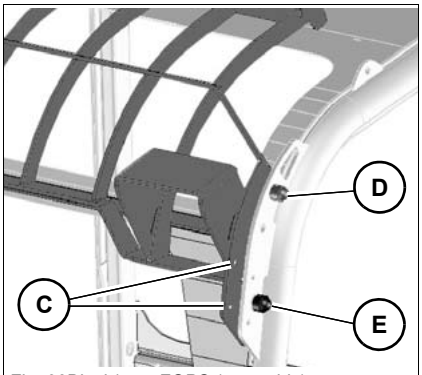


Fig. 90Black/gray FOPS (assembly)

Assembly (black screen)

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Remove all lights and mirrors (option).
3. A minimum 2 persons are required for installing/removing.
4. Mounting point for cabin/canopy: **B**
5. Tighten screws **D** (M10/8.8) and lock nuts on the left and right to 45 Nm (33 ft.lbs).
6. Tighten screws **E** (M12/8.8) and lock nuts on the left and right to 87 Nm (64 ft.lbs).
7. Install the mirrors in both positions **C**.

Protective Front Guard structure with integrated FOPS/category I respectively (option)

DANGER

Danger of piercing/penetration by objects from the front!

Causes serious injury or death.

- ► A protective Front Guard structure with integrated FOPS must be installed in areas with danger from the front (for example pipes, tree trunks, etc.) and of falling objects.
- ► Machine operation is prohibited without a protective Front Guard structure with an integrated FOPS.

Information

The protective FOPS structure corresponds to category I according to ISO 3449:1998

- ► The machine owner must ensure that the hazard situation is evaluated and that the national regulations are observed.
- ► The machine owner must ensure that only work is performed that does not require any higher protection.
- ► Accidents cannot be fully avoided despite equipping a machine with protective structures.

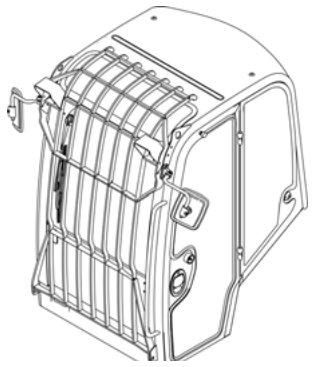


Fig. 91Front Guard with integrated FOPS (symbolic representation)

Assembly

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Remove all mirrors (option).
3. A minimum 2 persons are required for installing/removing.
4. Install the lock nuts and screws on either side.

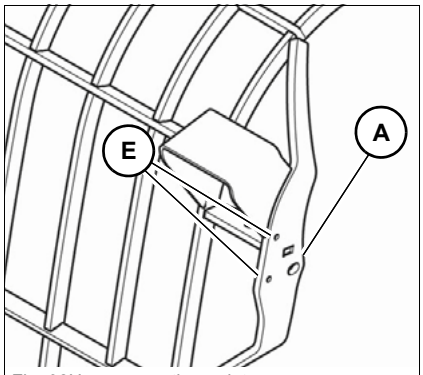


Fig. 92Upper mounting point

5. Mounting point for protective structure: **A** (upper)**/C** (lower).

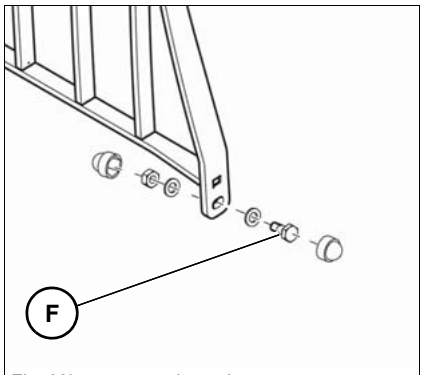


Fig. 93Lower mounting point

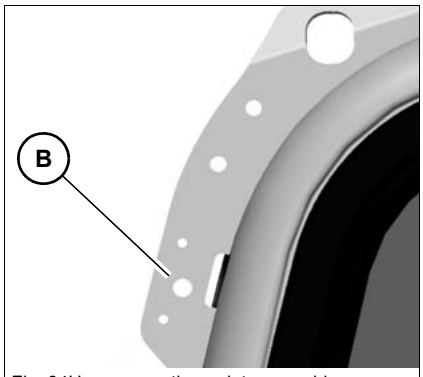


Fig. 94Upper mounting point on machine

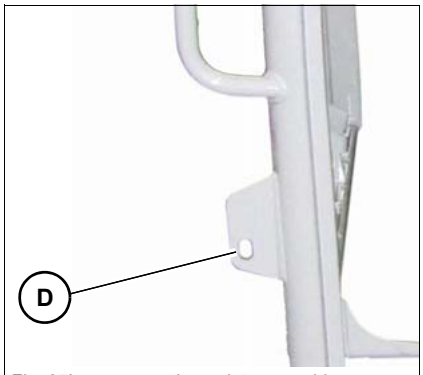


Fig. 95Lower mounting point on machine

6. Mounting point for cabin/canopy: **B** (upper)**/D** (lower)
7. Tighten screws **F** (M12/10.9) and lock nuts on the left and right to 110 Nm (87 ft.lbs).
8. Install the mirrors in both positions **E**.

Shatter protection (option)

DANGER

Danger of piercing/penetration by fragments from the front!

Causes serious injury or death.

- ► A shatter protection must be installed on a canopy version if an attachment (for example a hammer) causes fragments to fly around. This shatter protection takes over the function of a front window. If the machine is equipped with a cabin, the front window must be closed during hammer operation.
- ► Note restricted work area (see Fig. 96/97)
- ► Machine operation is prohibited without a shatter protection.

CAUTION

Accident hazard in conditions of restricted visibility due to rain, snowfall, dust, etc.

Can cause injury.

- ► Stop machine operation immediately.

NOTICE

Only a Wacker Neuson service center may install the shatter protection for the first time.

NOTICE

Do not use brushes, steel wool or other abrasive cleaners for cleaning the polycarbonate disk. Do not wipe dust in a dry state.

Information

The shatter protection (canopy option) protects the user against fragments from the front.

- ► The machine owner must ensure that the hazard situation is evaluated and that the national regulations are observed.
- ► The machine owner must ensure that only work is performed that does not require any higher protection.
- ► Accidents cannot be fully avoided despite equipping a machine with protective structures.

The shatter protection cannot be combined with a protective Front Guard structure.

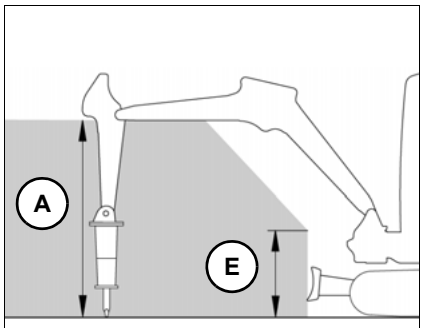


Fig. 96Job site with shatter protection

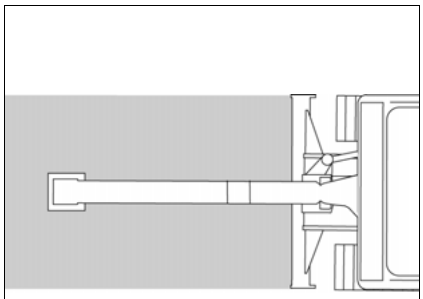


Fig. 97Work area with shatter protection (top view)

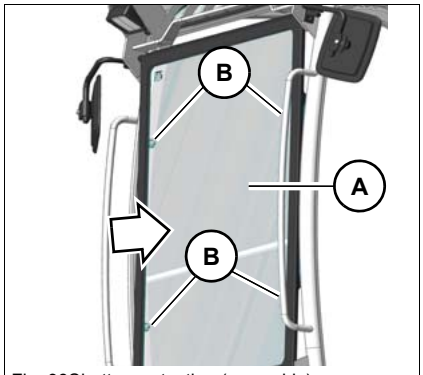


Fig. 98Shatter protection (assembly)

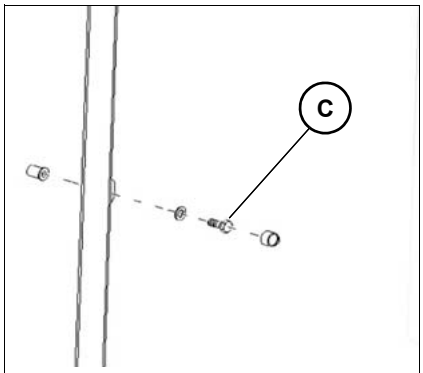


Fig. 99Shatter protection (assembly)

Job site

Work range height **A**: 120 cm (47 in), **E**: 50 cm (20 in).

Figures 96 and 97 refer to work with a Wacker Neuson hydraulic hammer.

Information

Working with another attachment can modify the height of the job site.

Installing/removing the shatter protection

1. A minimum 2 persons are required for installing/removing.
2. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
3. Install/remove shatter protection **A** from the front and fasten/remove it at the fastening points **B** with the fastening material supplied.
4. Tighten screws **C** at fastening points **B** to 25 Nm (18 ft.lbs).

Document box

Fig. 100Canopy

Canopy

The compartment under the seat is used for storing the Operator's Manual.

A document box on the headliner is available as an option.

Fig. 101Cabin (option)

Cabin (option)

The compartment behind the seat is used for storing the Operator's Manual.

A document box behind the seat is available as an option.

Power outlet

Fig. 102Position of outlet

A 12 V outlet is located at the front left of the machine chassis.

Swiveling console limit stop (option)

Fig. 103Swiveling console limit

Limits the limit stop on the left of the swiveling console for attachments with a max. width of 800 mm (31 in) and prevents the attachment from damaging the cabin.

NOTICE

The limit stop can only be used for attachments with a max. width of 800 mm (31 in).

4.2 Overview of control elements

This chapter describes the controls, and contains information on the function and handling of the indicator lights and controls in the cabin.

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

Cabin

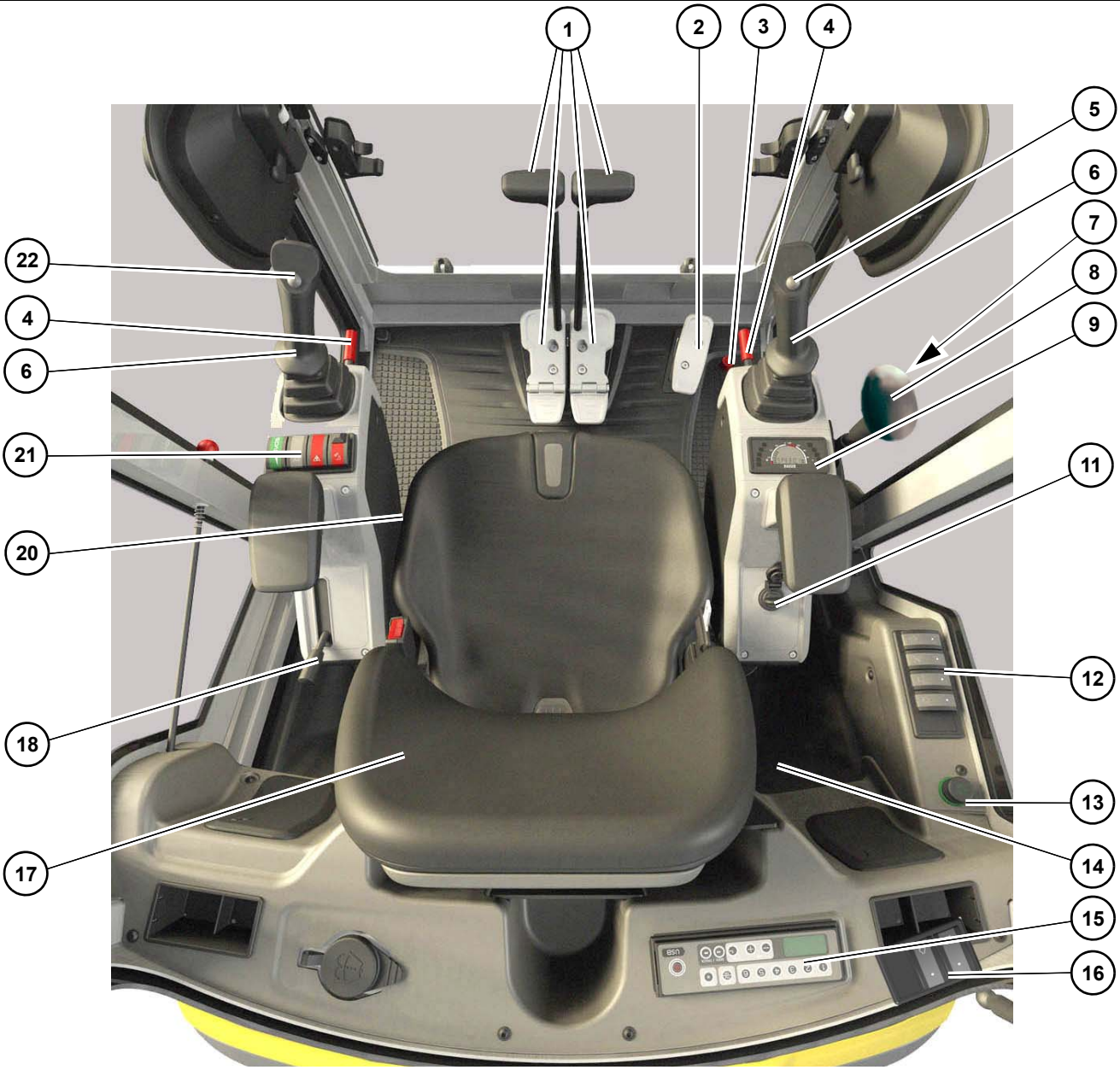


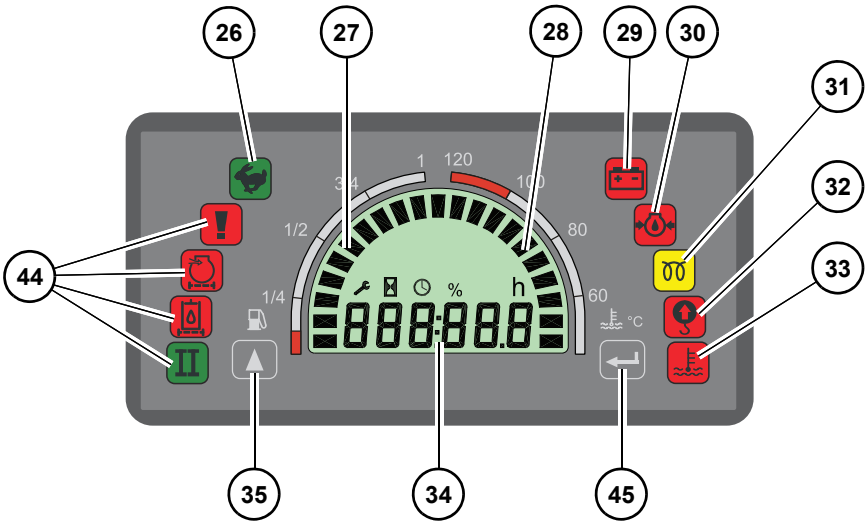
Fig. 104Overview of control elements

Fig. 104Control element overview – proportional controls

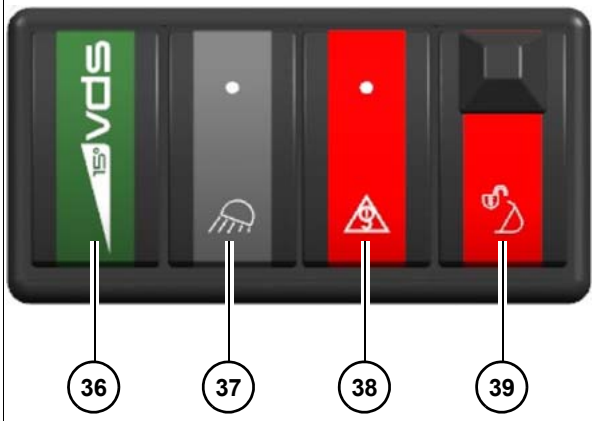
Designation	See page
1 Accelerator pedals/drive levers	*5-16*
2 Boom swivel/auxiliary hydraulics pedal (AUX I)	*5-32*, *5-30*
3 Foot-operated push button for hydraulic quickhitch (option)	*5-38*
4 Control lever base	*4-17*
5 Horn	*5-10*
6 Control levers	*5-13*
7 Travel speed changeover	*5-1*
8 Stabilizer blade/travel gear extension/retraction (option)	*5-21*, *5-23*
9 Display element	*4-32*
10 Oil flow AUX I rotary switch (proportional controls)	*5-26*
11 Starter	*4-39*
12 Switch panel on the right (cabin)	*4-30*
13 12 V power outlet (cabin)	--
14 Temperature controller (cabin)	*5-12*
15 Radio (option)	--
16 Switch panel (canopy)	*4-30*
17 Operator seat	*4-11*
18 Throttle	*5-1*
19 Oil flow AUX II rotary switch (proportional controls)	*5-26*
20 Changeover for stabilizer blade/travel gear extension/retraction	*5-21*, *5-23*
21 Switch panel on control lever base on the left	*4-30*
22 Boom swivel/auxiliary hydraulics pedal changeover (AUX I)	--
23 Powertilt (AUX II) or 3rd control circuit (AUX II) operation (option)	*5-36*, *5-35*
24 Auxiliary hydraulics (AUX I) operation (option) (proportional controls)	*5-31*
25 Boom swivel pedal (proportional controls)	*5-32*

Display element and switches

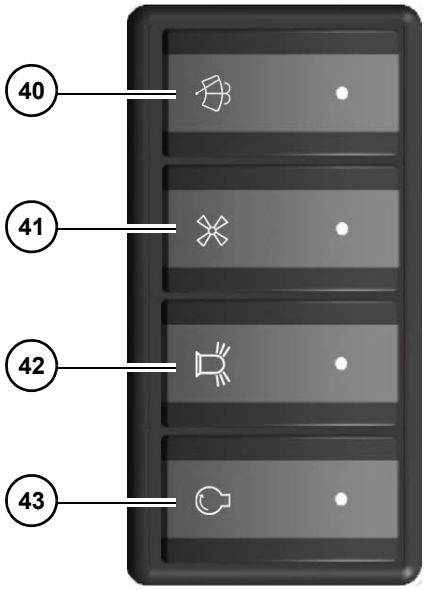
Maximum assignment shown



Switch panel on control lever base on the left



Switch panel on the right (cabin)



Switch panel (canopy)

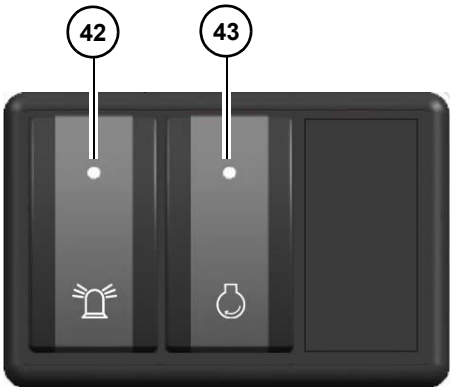


Fig. 105Display element and switches

Designation		See page
26	High speed (2nd speed)	*5-1*
27	Fuel level indicator	*4-34*
28	Coolant temperature	*4-34*
29	Charge indicator light	*4-33*
30	Engine oil pressure	*4-33*
31	Preheating	*4-33*
32	Safe load indicator light	*4-33*
33	Engine temperature	*4-33*
34	Hour meter/maintenance meter	*4-34*
35	Hour meter/maintenance meter changeover	*4-33*
36	Tilting the upper carriage (Vertical Digging System) (option)	*5-60*
37	Working lights	*5-9*
38	Safe load indicator (option)	*5-56*
39	Hydraulic quickhitch (option)	*5-38*
40	Wiper/wash system (cabin)	*5-11*
41	Ventilation/heating (cabin)	*5-12*
42	Rotating beacon (option)	*5-10*
43	Automatic engine speed setting (option)	*5-1*
44	Not assigned	--
45	For Wacker Neuson service center	--

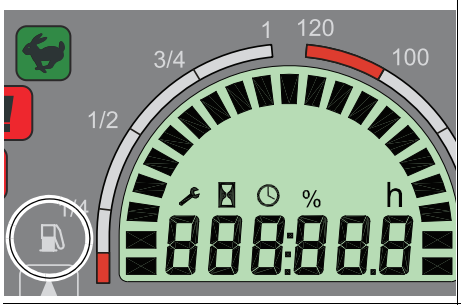
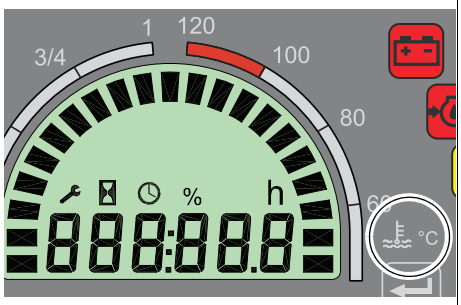
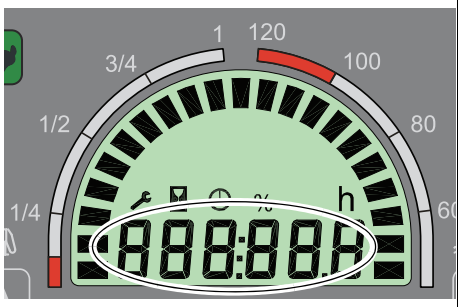
4.3 Indicator lights and warning lights (overview)

Display element

The display element provides information on problems

and malfunctions. After switching on the 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 operating hours are automatically displayed.

Symbol	Designation
	**High speed (2nd speed)** Illuminates with high speed enabled.
	**Charge indicator light** This indicator light illuminates if the electrical system has a malfunction. The battery is no longer or insufficiently charged. **Note:** 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.
	**Engine oil pressure** The indicator light illuminates and the buzzer sounds. • 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 light illuminates when the starter is turned on and goes out as soon as the engine runs. At low temperatures, the indicator light can illuminate for more than 10 seconds after the engine is started.
	**Preheating** The indicator light illuminates if the starting key is in position 2. The indicator light goes out after 4 seconds and the engine can be started. (A glow plug preheats the air in the combustion chamber of the engine when the key is in this position.) Contact a Wacker Neuson service center if the indicator light does not go out.
	**Safe load indicator light** The safe load indicator gives the operator optical and acoustic warnings when the values of the stability table are reached or exceeded. • Reduce reach or the lift load until both the acoustic signal and the indicator light in the display element go out.
	**Engine temperature** If the coolant temperature segment reaches the red range, the indicator light illuminates and the buzzer sounds. Stop and let the engine cool down before starting it again.
	**Changeover between hour meter and maintenance counter**

Symbol	Designation
	**Fuel level indicator** Indicates the remaining amount of fuel in the tank. Refuel immediately if the segments reach the red range.
	**Coolant temperature** Indicates the current coolant temperature of the engine. The indicator light illuminates if the segments reach the red range. • Stop the engine immediately. • Let the engine cool down and check the coolant level.
	**Hour meter/maintenance meter** Counts the engine operating hours with the engine running. **Hour meter** The counter runs as soon as the charge indicator light goes out. The hour meter is used for specifying the maintenance intervals. **Maintenance meter** 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.).

4.4 Preparatory work

Important information before putting the machine into operation

Before putting the machine into operation, perform a visual check to ensure that:

- there are no leaks,
- no parts are damaged or loose,
- there are neither persons nor objects,
- or other sources of danger around the machine.

Before putting the machine into operation, the user must familiarize himself with the position of the controls and instruments.

The machine may only be operated from the seat and with the seat belt fastened.

Before the operator uses the machine in work operation for the first time, we recommend first trying out the machine on open ground without any obstacles.

When using the machine, check the surroundings constantly in order to identify potential hazards in time.

Before using the machine, before starting work or when changing operators, ensure that all visual aids (for example the 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.

Perform a functional check of the control lever base.

Perform a functional check of the safe load indicator (option).

Do not make any changes or modifications that impair visibility. Otherwise the machine does not meet the requirements for conformity and registration.

Do not operate the vehicle in radioactively, biologically or chemically contaminated areas.

Also observe the safety instructions in chapter **"Safety 2.4"**.

Requirements and information for the operating personnel

Read, understand and follow this Operator's Manual and all other Operator's Manuals supplied with the machine.

The machine may only be put into operation by authorized personnel that has been instructed. See chapter "Safety 2.3".

The operator must know and bear in mind the requirements and risks at the work place.

Perform daily maintenance according to the Lubrication and maintenance plan (see chapter "Maintenance 7.2")

Face the machine as you enter and leave it.

Keep the footholds and the handholds clean to ensure a safe hold at all times. Immediately remove dirt, such as oil, grease, dirt, snow or ice.

Always use the mandatory climbing aids when entering and exiting the machine.

Never get on a moving machine and never jump off the machine.

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.

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

The checking and monitoring work listed below is described in greater detail in the following chapters.

Start-up checklist

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

No.	Question	Page	✔
1	Enough fuel in the tank?	*7-26*	
2	Water in water separator and fuel filter checked and drained if necessary?	*7-29* *7-30*	
3	Correct engine oil level?	*7-31*	
4	Coolant level OK?	*7-33*	
5	Correct oil level in the hydraulic oil reservoir?	*7-41*	
6	Water level in washer tank OK?	*7-46*	
7	Lubrication points greased?	*7-6*	
8	Tracks checked for cracks, cuts, etc.?	--	
9	Light system, signaling, warning and indicator lights operational?	--	
10	Windows, mirrors, lights, steps, all pedals and control levers clean?	--	
11	All control levers and pedals in neutral position?	--	
12	Control lever base raised?	*4-17*	
13	Attachment safely locked?	*5-38* *5-48*	
14	Tank cover closed? Engine cover locked?	*7-26* *7-14*	
15	Especially after cleaning, maintenance or repair work: Rags, tools and other loose objects removed?	--	
16	Seating position adjusted correctly?	*4-11*	
17	Are all mirrors functional and adjusted correctly?	*4-15*	
18	Seat belt fastened?	*4-12*	
19	Before putting the machine into operation, ensure that nobody is in the danger zone.	--	

Operation checklist

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

No.	Question	Page	✔
1	Anyone in the danger zone of the machine?	--	
2	Indicator light for engine oil pressure and alternator charge function gone out?	*4-32*	
3	Coolant temperature of engine in normal range?	*4-34*	
4	Do the pedals and control levers work correctly?	*5-13*	
5	Performed functional check of control lever base?	*4-17*	
6	Telescopic travel gear extended?	*5-23*	

Parking checklist

Check and observe the following points when parking the machine:

No.	Question	Page	✔
1	Attachment lowered to the ground?	*5-41* *5-46*	
2	Stabilizer blade lowered to the ground?	*5-21*	
3	Control lever base raised?	*4-17*	
4	Cabin locked; particularly if the vehicle cannot be supervised?	*4-2*	
When parking on public roads:			
5	Machine appropriately secured? Machine additionally secured with chocks under the tracks to prevent it from rolling away?	*5-8*	
When parking on slopes:			
6	Machine additionally secured with chocks under the tracks to prevent it from rolling away?	*5-8*	

Putting into operation for the first time and running-in period

Before putting the machine into operation for the first time, check it visually for exterior damage due to transport, and check whether the equipment supplied with the machine is complete.

- Check the fluid levels according to chapter “Maintenance”.

Each machine is correctly adjusted and checked before it is delivered.

Handle the machine carefully during its first 50 operating hours.

- Do not load a cold engine.
- Warm up the machine at low engine speed and little load, do not warm it up at a standstill.
- Do not change engine speed abruptly.
- Avoid using the machine under heavy loads or at high speeds.
- Avoid abrupt acceleration, braking and changing travel direction.
- Do not run the engine at high speed for extended periods.
- Strictly observe the maintenance plans and perform (or have performed) the specified maintenance *– see chapter “7.2 Maintenance overview” on page 7-2*.

Machine travel on public roads

Information

The machine is not certified for travel on public roads.

4.5 Starting and stopping the engine

Preparations for starting the engine

Set the throttle to the middle position if the engine is cold.

The starter cannot be actuated if the engine is already running (start repeat interlock).

Do not run the starter for more than 10 seconds.

Wait about 1 minute so the battery can recover and the starter does not overheat before trying again.

Information

Ensure that there is sufficient ventilation before operating the machine in small and enclosed areas.

Information

All controls must be within easy reach. You must be able to move the drive levers to their limit positions.

Starter

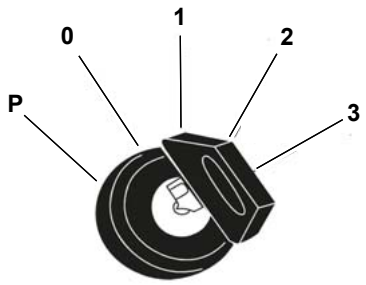


Fig. 106Starter

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

Starts the engine

NOTICE

In order to avoid damage to the starter:

► Do not start the engine again immediately after stopping it.

► Wait at least 10 seconds after stopping the engine.

NOTICE

Actuating the preheating system too long can damage the preheater.

► Never preheat the engine more than 3 – 5 seconds.

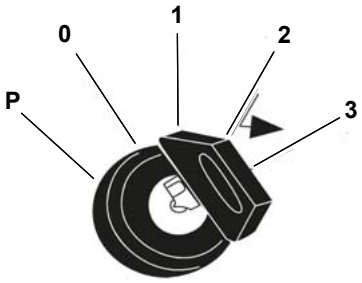


Fig. 107Starter

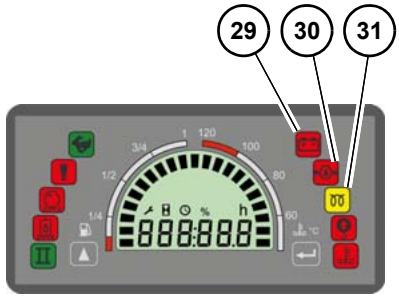


Fig. 108Display element

1. Insert the starting key.
2. Turn the starting key to position **1**.
3. All indicator lights illuminate for 2 seconds.

➥ Replace malfunctioning indicator lights immediately.

4. Turn and hold the starting key in position **2** until indicator light **31** (preheating) goes out.

➥ Indicator light **29** (charge indicator light) illuminates.

➥ Indicator light **30** (engine oil pressure) illuminates.

5. Turn and hold the starting key in position **3** until the engine starts.

➥ All indicator lights go out.

➥ If the engine does not start after 10 seconds:

- ➥ Interrupt the start procedure and repeat it after about 1 minute.
- ➥ If the engine still does not start after the second try: contact a Wacker Neuson service center for error analysis.

6. As soon as the engine runs:
7. Release the starting key as soon as the engine runs.

Information

The engine will not start unless the control lever on the left is raised.

Letting the engine warm up

After the engine has started, allow it to warm up at slightly increased idling speed until it reaches its operating temperature of 82 °C (180 °F) (coolant).

Warm up the machine at low engine speed and little load, do not warm it up at a standstill.

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.

Jump-starting the engine

WARNING

Explosion hazard in case of incorrect handling of battery!

Can cause serious injury or death.

- ► Never jump start the engine if the battery is frozen. Dispose of a frozen battery.
- ► In order to avoid electrical short-circuit or overvoltage, the battery jumper cable connected on the positive terminals of the batteries must never be brought into contact with electrically conductive vehicle parts.
- ► The vehicles must not touch each other during the starting aid.
- ► The voltage of the auxiliary power supply must be 12 V; higher voltage will damage the electrical system of both vehicles.
- ► Use only authorized battery jumper cables which conform to the safety requirements and which are in perfect condition.
- ► Route the battery jumper cables so they cannot catch on rotating components in the engine compartment.
- ► Do not lean over the battery.
- ► Keep ignition sources away from the battery.

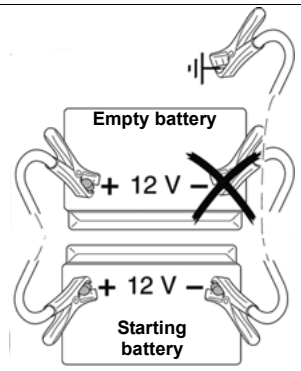


Fig. 109Overview

1. Drive the jump-starting vehicle close enough to the machine so that the battery jumper cables can reach to connect both batteries.
2. Let the engine of the jump-starting vehicle run.
3. First connect one end of the red battery jumper cable (**+**) to the positive terminal of the empty battery, then connect the other end to the positive terminal of the starting battery.
4. Connect one end of the black battery jumper cable (**−**) to the negative terminal of the starting battery.
5. Connect the other end of the black battery jumper cable (**−**) 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 empty battery, as otherwise explosive gas emerging from the battery can ignite if sparks are formed.
6. Start the engine of the machine with the empty battery.

Once the engine has started:

- With the engine running, disconnect both battery jumper cables in the reverse order.

Information

In order to avoid sparking, first disconnect the battery jumper cable on the negative terminal, then the battery jumper cable on the positive terminal.

Low-load operation

NOTICE

The running behavior of the engine can be negatively affected if it runs at idling speed or high speed and at less than 20% of the load.

► Run the engine in regular operation at loads of over 20 %.

Possible consequences of low-load operation are:

- Increased lube oil consumption.
- Lube oil in exhaust system, and therefore engine contamination.
- Blue smoke in exhaust gas.

Stopping the engine

NOTICE

Engine damage by stopping the engine after full load.

► In order to stabilize the temperature, let the engine run at idling speed with no load for at least five minutes, and then shut it off.

Turn the starting key to “**0**” and remove it.

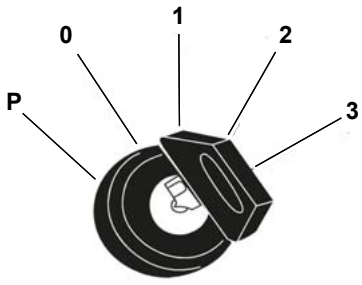


Fig. 110Starter

Battery master switch

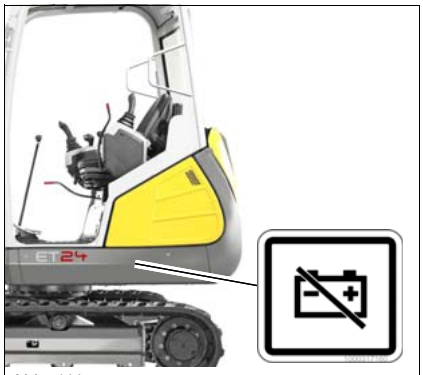


Abb. 111

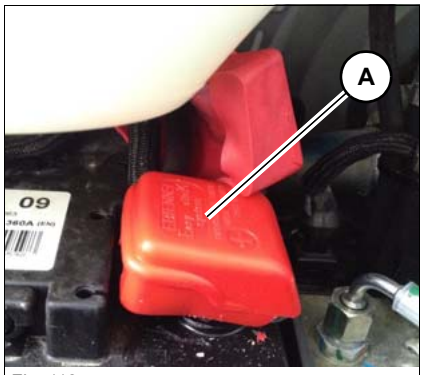


Fig. 112

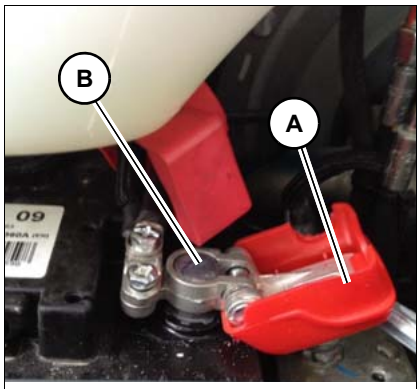


Fig. 113

NOTICE

Possible damage to the electronics due to improper actuation of the battery master switch!

- ► Do not operate the battery master switch with a running engine.
- ► Actuate the battery isolator switch no sooner than two minutes after shutting down the engine.

From serial number WNCE0801KPAL01357, the ET20 has a battery isolator switch as a standard. The ET18/ET24 can be optionally outfitted with this.

Actuate the battery isolator switch:

- If the vehicle is parked for longer periods of time (e.g. over the weekend).
- If the vehicle is to be particularly protected against unintentional starting.
- If required by national and regional provisions.

The battery isolator switch **A** is located on the battery below the left side flap.

Interrupt the electric power supply:

Flip up the battery isolator switch**A** and remove from the**B** positive terminal.

Establish the electric power supply:

Set the battery isolator switch **A** to the positive terminal **B** and fold down.

5 Operation

5.1 Steering system

See “Drive levers and accelerator pedals”

5.2 Accelerator actuation

Manual throttle

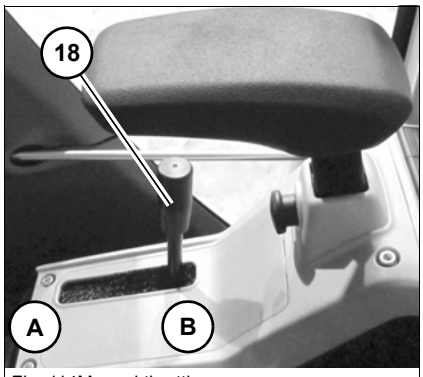


Fig. 114Manual throttle

Speed can be set continuously with throttle **18**.

- Position **A**: maximum engine speed
- Position **B**: idling speed

Travel speeds

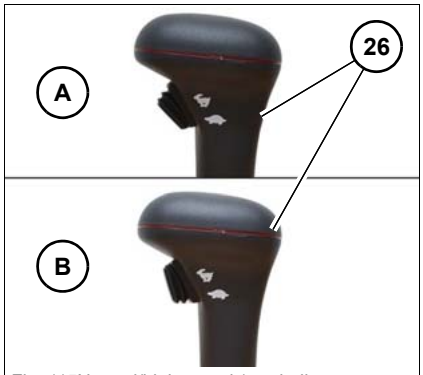


Fig. 115Normal/high speed (symbolic representation)

The machine has two speed ranges that can be selected with the stabilizer-blade lever **26**.

Normal speed (A):

Check the selected speed in the display element. The high-speed symbol does not illuminate.

High speed (B):

Check the selected speed in the display element. The high-speed symbol illuminates.

Information

Reduced tractive power in high speed can affect machine handling when cornering.

Automatic engine speed setting (option)

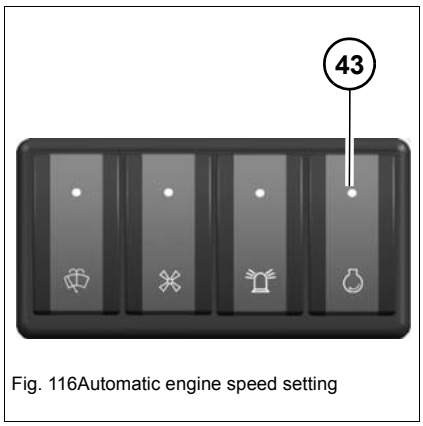


Fig. 116Automatic engine speed setting

The switch is located on the switch panel on the right.

Diesel engine speed is automatically reduced to idling after 5 seconds if no hydraulic functions are performed and if the automatic engine speed setting is enabled.

As soon as a hydraulic function is performed with the control levers/drive levers, diesel engine speed is automatically increased again to the engine speed adjusted with the throttle.

Position	Function	
ON	Press switch **43** down	Automatic engine speed setting is enabled, the indicator light in switch **43** illuminates
OFF	Press switch **43** up	Automatic engine speed setting is disabled, the indicator light in switch **43** goes out

5.3 Brake

Hydraulic brake

Releasing the drive levers/accelerator pedals brakes the machine.

During downhill machine travel, the automatic hydraulic brake valves prevent the machine from moving faster than the permissible travel speed.

Information

Reduce travel speed with the drive levers/accelerator pedals, and *not* with the engine speed control of the diesel engine.

Mechanical brake

The stabilizer blade is used as a parking brake. Press the stabilizer blade against the ground.

5.4 Travel operation

Drive position

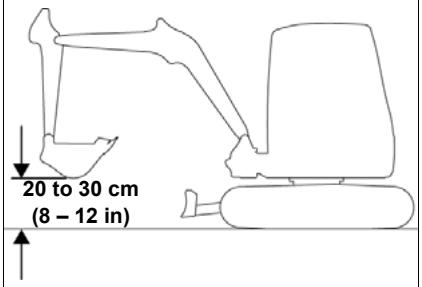


Fig. 117Machine travel position

- Position the machine as shown.
- Position the boom at the center and raise it about 20 to 30 cm (8 – 12 in) off the ground.

Information

During machine travel, raise the stabilizer blade sufficiently high off the ground to avoid ground contact on rough terrain.

Starting machine travel and stopping

WARNING

Accident hazard due to incorrectly rotated upper carriage!

If rotated incorrectly, the upper carriage blocks the visibility of the travel path.

► Before starting machine travel on a construction site, align the upper carriage so that the operator has an unrestricted view of the travel path.

Starting machine travel

After starting the engine:

- Indicator lights **29** (charge indicator light) and **30** (engine oil pressure) go out.
- Slowly actuate the drive lever.

➥ Machine travel starts.

Information

Machine travel cannot be started unless the control lever bases are folded down.

Stopping

The drive levers automatically return to their initial positions as soon as they are released. This creates sufficient hydraulic braking effect.

During downhill machine travel, the automatic hydraulic brake valves prevent the machine from moving faster than the permissible travel speed.

Information

Use the drive levers to reduce the travel speed as required.

Operating temperature range

The following operating conditions must be fulfilled in order to ensure optimal output and a long service life of the machine.

Do not operate the machine at ambient temperatures above +45 °C (+104 °F) or below −15 °C (−5 °F).

Machine travel on slopes

WARNING

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

Can cause serious injury or death.

- ► Travel on slopes only on firm and level ground.
- ► Drive on slopes only with the telescopic travel gear extended (normal operation).
- ► Never exceed the stability limits of the machine (maximum gradient angle 15°, maximum lateral angle of inclination 10°).
- ► Raise the boom 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the machine. In an emergency, lower the boom immediately to increase stability.
- ► Do not actuate high speed during uphill or downhill machine operation.
- ► Do not drive downhill in reverse travel speed.
- ► Do not turn or swivel the upper carriage and the boom when driving downhill or uphill with a full attachment.
- ► Performing machine travel diagonally on slopes is prohibited.

Stones and the humidity in the upper layer of the ground can drastically affect machine traction and stability.

The machine can slip sideways on gravel or loose, rocky soil. The stability of the machine can be reduced on rough terrain.

Newly filled or muddy ground can give away under the weight of the machine, or the tracks can dig into the ground and increase the angle of the machine (maximum gradient angle and maximum lateral angle of inclination).

If the engine dies as you drive on a slope, immediately put the control levers to neutral position and start the engine again.

Observe under all circumstances during uphill or downhill travel:

- Keep the drive levers near the neutral position.
- Perform slow and smooth travel movements.
- Avoid sudden travel movements.
- Reduce the engine speed.

The machine can slip even on gentle slopes if it travels across grass, leaves, humid metal surfaces, frozen ground or ice.

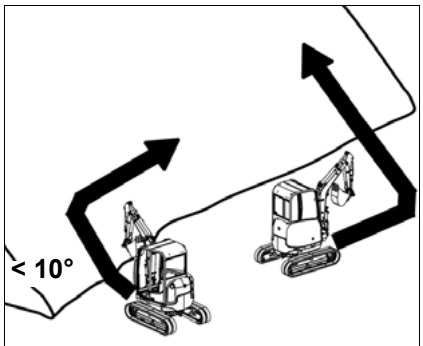


Fig. 118Driving on slopes

Preparations for performing machine travel on slopes

Perform straight-ahead machine travel on slopes.

When changing position, do not exceed a maximum gradient angle of 15° and a maximum lateral angle of inclination of 10°.

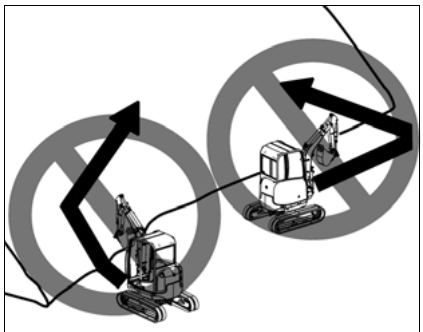


Fig. 119Driving diagonally on slopes

Information

Performing machine travel diagonally on slopes is prohibited.

Change position on level ground and then perform straight-ahead machine travel onto the slope.

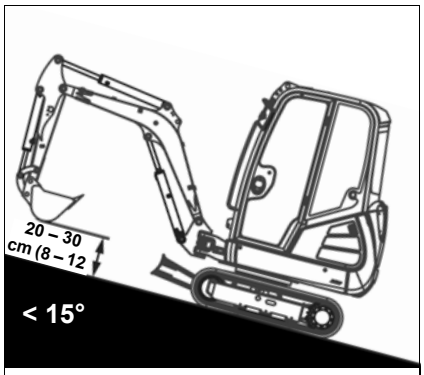


Fig. 120Uphill machine operation

Uphill machine operation

During uphill machine operation, the front window of the cabin must face uphill.

Set the stabilizer blade uphill.

Raise the boom about 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the machine.

Do not exceed a maximum gradient angle of 15°.

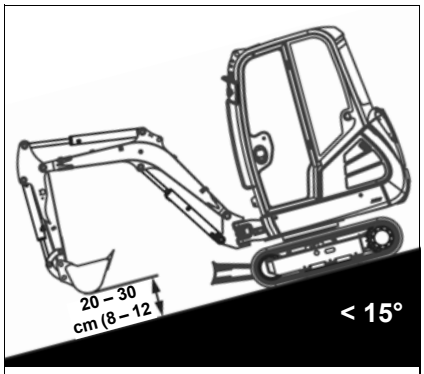


Fig. 121Downhill machine operation

Downhill machine operation

During downhill machine operation, the front window of the cabin must face downhill.

Set the stabilizer blade downhill.

Raise the boom about 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the machine.

Do not exceed a maximum sloping angle of 15°.

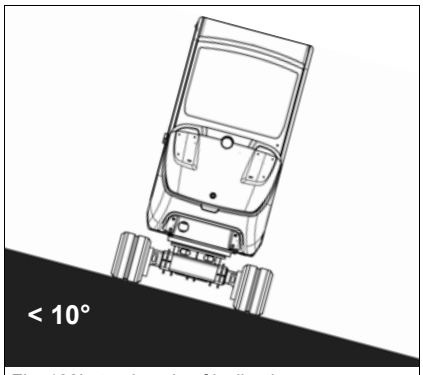


Fig. 122Lateral angle of inclination

Lateral angle of inclination

Do not exceed a maximum lateral angle of inclination of 10°.

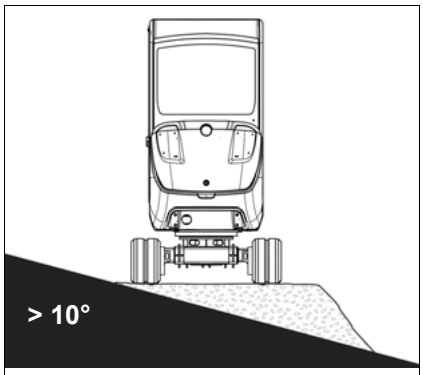


Fig. 123Platform

On lateral inclinations over 10°, pile up material to create a level surface that can be used as a platform for the machine.

Parking the machine

WARNING

Accident hazard if machine tips over or rolls away after parking it!

Can cause serious injury or death.

► Lower the boom and the stabilizer blade to the ground.

► Secure the machine accordingly (for example with chocks).

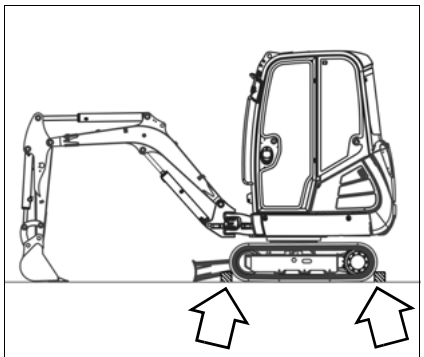


Fig. 124Parking the machine

1. Park the vehicle on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the machine.
3. Lower the boom and the stabilizer blade to the ground.
4. Stop the engine.
5. Operate the control lever repeatedly to release the pressure in the hydraulic system.
6. Remove the starting key and carry it with you.
7. Raise the control lever base.
8. Close the windows and doors.
9. Close and lock all covers and doors.
10. Secure the tracks accordingly (for example with chocks, blocks) as shown in *Fig. 124*.

Information

Fill up the tank with the correct fuel type at the end of each working day to prevent the formation of condensation water in the fuel tank. Do not fill the tank completey so the fuel can expand.

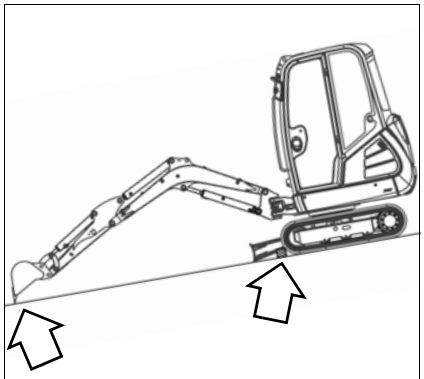


Fig. 125Parking the machine on slopes

Parking the machine on slopes

If parking the machine on a slope cannot be avoided, observe the following in addition:

- Position the boom on the downhill side of the machine and firmly press the attachment into the ground.
- Press the stabilizer blade against the ground.
- Secure the tracks accordingly (for example with chocks, blocks) as shown in *Fig. 125*.

5.5 Differential lock

Not available

5.6 Lights/signaling system

Working lights

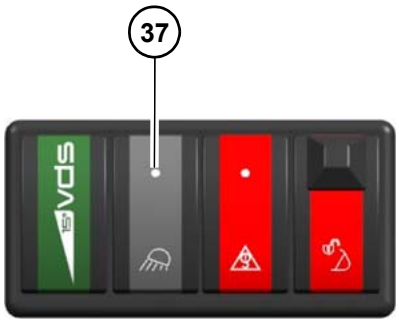


Fig. 126Working light switch

The switch is located on the control lever base on the left.

WARNING

Accident hazard due to blinded motorists!

Can cause serious injury or death.

► Switch on the working lights on the job site on public roads only if road users are not expected to be blinded.

Position	Function	
ON	Press switch **37** down	Working lights switched on, the indicator light in switch **37** illuminates
OFF	Press switch **37** up	Working lights switched off, the indicator light in switch **37** goes out

Information

Switch on the working lights (option) in poor light conditions. If illumination still is not sufficient, use external lights. If this is yet not enough to illuminate the job site sufficiently, stop machine operation and only start it again when sufficient illumination can be ensured.

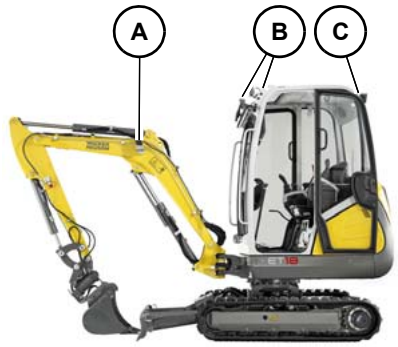


Fig. 127Working lights

Position	Designation
A	Working light (standard)
B	Front working lights (option)
B and C	Front and rear working lights (option)

Interior light

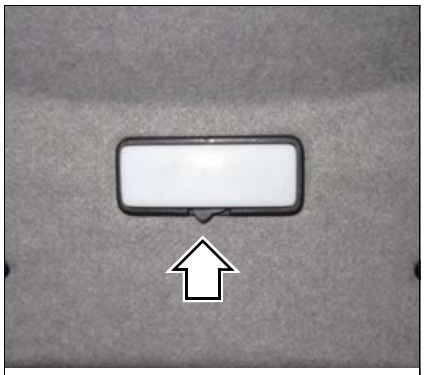


Fig. 128Interior light

Switched on:

Press the switch to the left.

Switched off:

Press the switch to the center position or to the right.

Horn

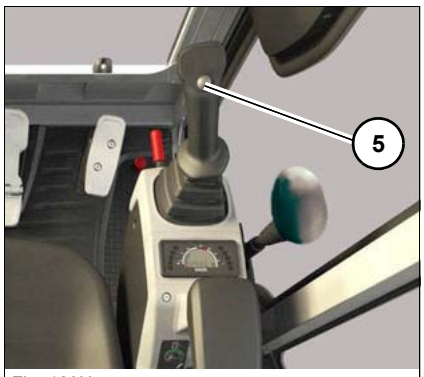


Fig. 129Horn

Press button **5** on the control lever on the right to actuate the horn.

Rotating beacon (option)

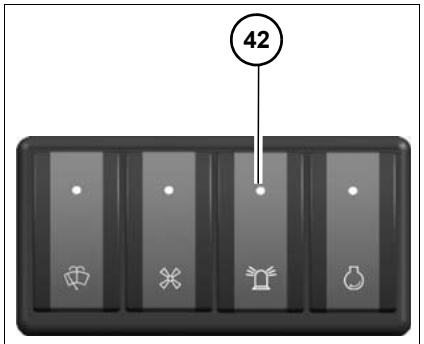


Fig. 130Rotating beacon

The switch is located on the switch panel on the right.

Position	Function	
ON	Press switch **42** down	Rotating beacon switched on, the indicator light in switch **42** illuminates
OFF	Press switch **42** up	Rotating beacon switched off, the indicator light in switch **42** goes out

Information

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

Travel signal (option)

A travel signal sounds as soon as at least one of the tracks moves.

DANGER

Accident hazard during forward/backward machine travel.

Serious crushing hazard causing death or serious injury.

- ► Do not allow anyone to stay in the danger zone.
- ► Do not rely on the travel signal under any circumstances.
- ► If the travel signal does not sound, stop machine operation immediately and contact a Wacker Neuson service center (observe the relevant national regulations).

5.7 Wiper/wash system (option)

Front wiper

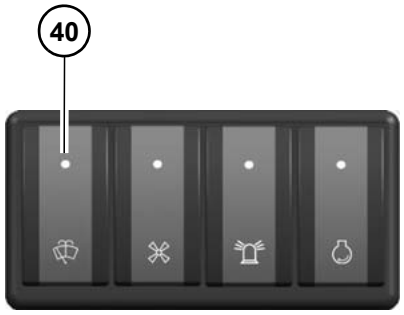


Fig. 131Wiper/wash system switch

The switch is located on the switch panel on the right.

Position	Function	
Off	Press switch **40** up	Wiper returns to base position
1st speed	Press switch **40** down to the 1st position	Wiper is operational

NOTICE

Damage to wiper if the front window is raised.

- ► Do not actuate the wipers if the front window is raised.

Washer system

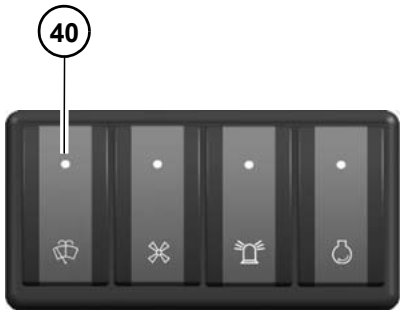


Fig. 132Wiper/wash system switch

Position	Function	
2nd speed	Press switch **40** down to the 2nd position	Pump sprays washer water on the window

NOTICE

Damage to electric pump if the reservoir is empty.

- ► Do not actuate the washer system if the reservoir is empty.

5.8 Heating, ventilation and air conditioning system

Ventilation/heating (option)

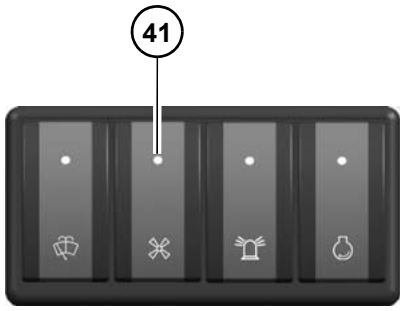


Fig. 133Ventilation/heating

The switch is located on the switch panel on the right.

Position	Function	
1st position	Press switch **41** down one step	Low fan speed
2nd position	Press switch **41** down two steps	High fan speed
OFF	Press switch **41** all the way up	Fan is switched off

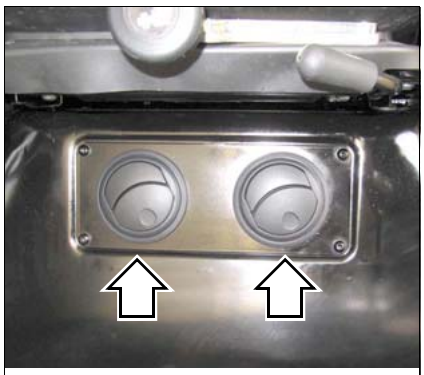


Fig. 134Air vents

Adjust the nozzles so that the required temperature can be reached.

Air the cabin from time to time.

Information

If the windows are fogged or iced up, adjust the nozzles to the front and open them completely.

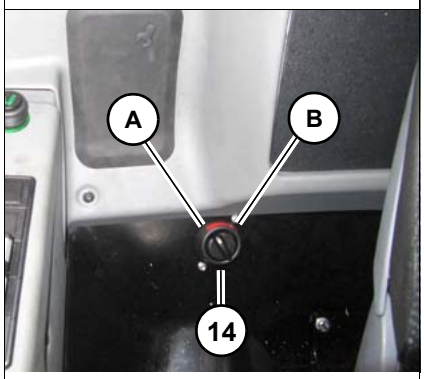


Fig. 135Temperature setting

Temperature setting

The temperature controller is located at the right behind the seat.

Cooling

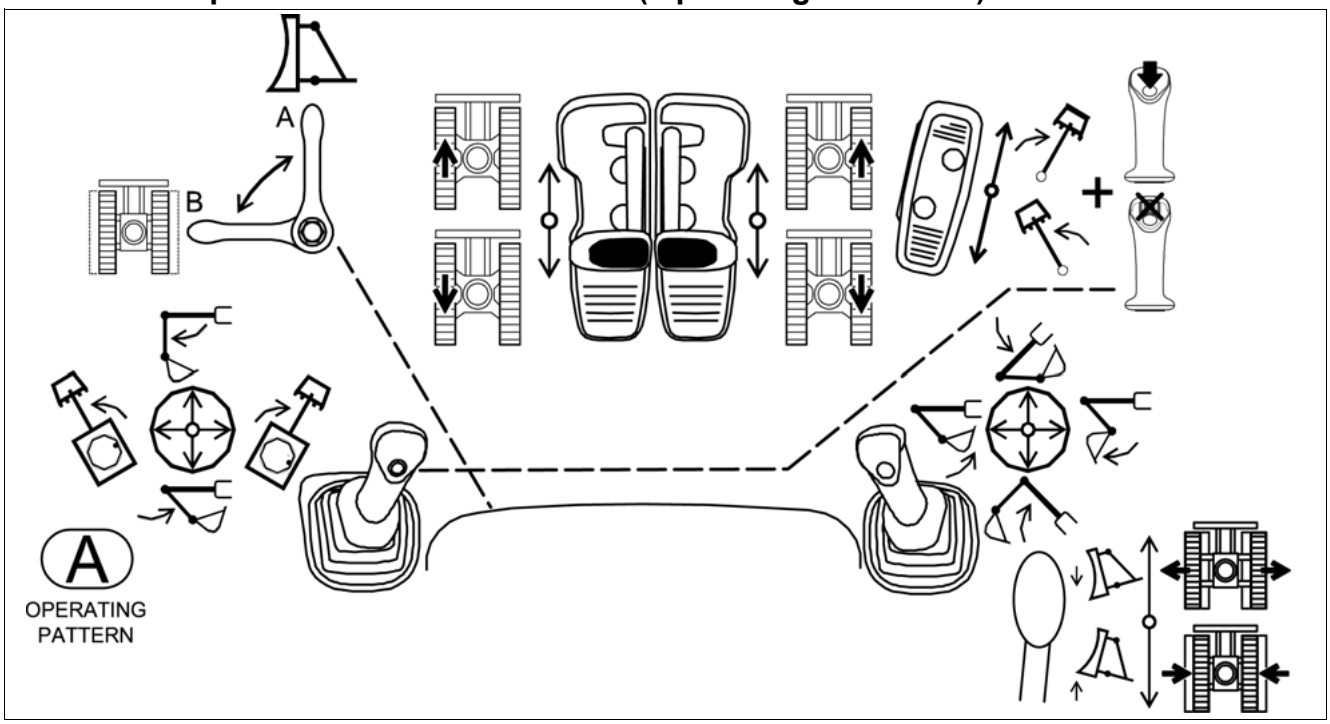
Turn temperature controller **14** toward **B**.

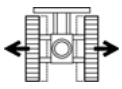
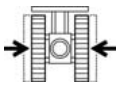
Heating

Turn temperature controller **14** toward **A**.

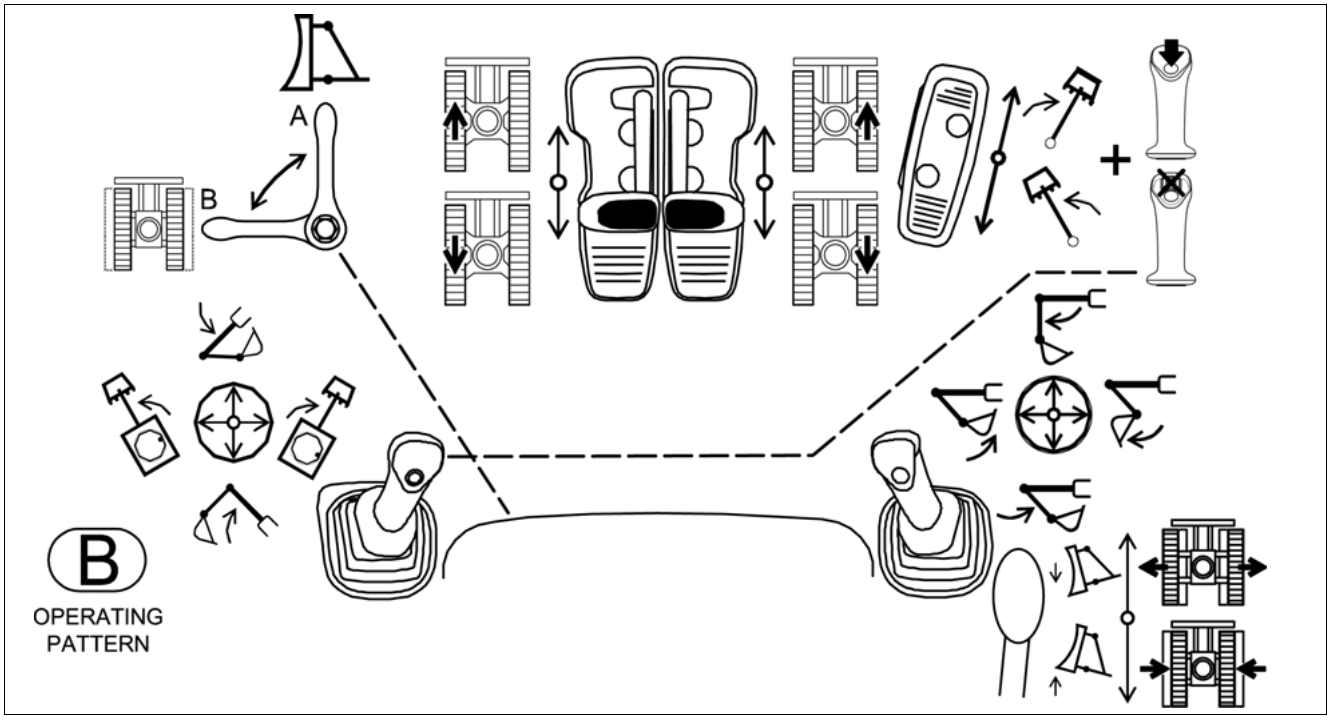
5.9 Work hydraulics

Overview of pedals and control levers (Operating Pattern A)



Symbol	Designation	Symbol	Designation
	Left track (forward)		Right track (forward)
	Left track (reverse)		Right track (reverse)
	Extend stick		Swivel upper carriage to the right
	Retract stick		Swivel upper carriage to the left
	Swivel boom to the right		Swivel boom to the left
	Lower the boom		Tilt out the bucket
	Raise the boom		Tilt in the bucket
	Lower stabilizer blade		Raise stabilizer blade
	Extend telescopic travel gear		Retract telescopic travel gear
	Telescopic travel gear/stabilizer blade changeover		ISO controls (Europe)

Overview of pedals and control levers (Operating Pattern B)



Symbol	Designation	Symbol	Designation
	Left track (forward)		Right track (forward)
	Left track (reverse)		Right track (reverse)
	Extend stick		Swivel upper carriage to the right
	Retract stick		Swivel upper carriage to the left
	Swivel boom to the right		Swivel boom to the left
	Lower the boom		Tilt out the bucket
	Raise the boom		Tilt in the bucket
	Lower stabilizer blade		Raise stabilizer blade
	Extend telescopic travel gear		Retract telescopic travel gear
	Telescopic travel gear/stabilizer blade changeover		SAE controls (US)

Drive levers/accelerator pedals

CAUTION

Accident hazard! The machine moves in the opposite direction if the upper carriage is rotated by 180° and the drive levers/accelerator pedals are actuated.

Injury hazard due to incorrect machine operation.

► Slowly and carefully actuate the pedals and control levers.

NOTICE

In order to avoid excessive track abrasion:

► Ensure that both tracks move as you change direction.

The stabilizer blade side is the front side.

Raise the attachment and the stabilizer blade.

Both the drive levers and the accelerator pedals can be used for driving.

The travel speed depends on the position of the drive levers or accelerator pedals.

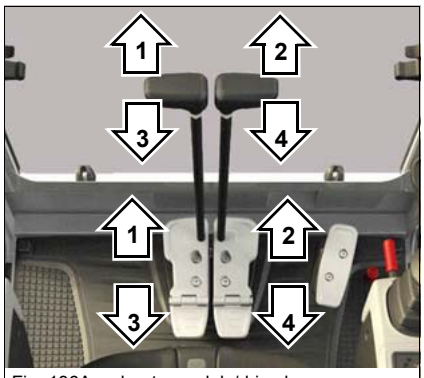


Fig. 136Accelerator pedals/drive levers

Position	Function	
1 2	Move forward Move forward	Machine moves forward
3 4	Move backward Move backward	Machine moves backward
3 2	Move backward Move forward	Machine turns to the left
1 4	Move forward Move backward	Machine turns to the right

The rear part of the accelerator pedals can be folded forward to save space.

Rotating the upper carriage

WARNING

Accident hazard! Upper carriage can rotate a little bit further.

Can cause serious injury or death.

- ► The upper carriage can rotate a little bit further as long as the hydraulic fluid has not reached its operating temperature yet.
- ► If the machine is equipped with an extra weight (option), the upper carriage projects beyond the tracks when it is rotated.
- ► Ensure that there are no obstacles in the immediate area before rotating the upper carriage.
- ► If the joystick is moved further, the revolving superstructure rotates quickly; If the joystick is moved less far, the revolving superstructure rotates slowly.
- ► If the upper carriage is supposed to be rotated on a slope, operate the control lever carefully to avoid fast movements.

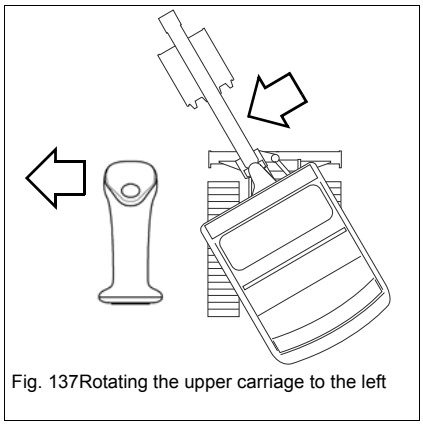


Fig. 137Rotating the upper carriage to the left

Rotating the upper carriage to the left

Push the control lever on the left to the left.

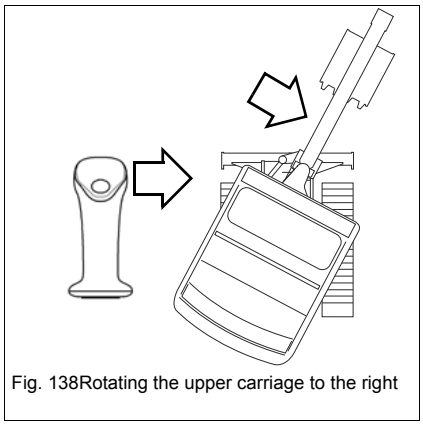


Fig. 138Rotating the upper carriage to the right

Rotating the upper carriage to the right

Push the control lever on the left to the right.

Swivel unit brake

The swivel unit brake is enabled if:

- the control lever base is raised.
- The starter is turned to position **0** or the engine is stopped.

This secures the upper carriage against rotation.

Hydraulic swivel unit brake:

The upper carriage's rotation is sufficiently braked by moving the control lever on the left back to initial position. Moving the control lever in the opposite direction (counteraction) brakes the upper carriage with maximum hydraulic output.

Mechanical swivel unit brake:

A multidisk brake integrated in the rotation drive has an additional mechanical brake effect. The brake is used for braking the swivel unit. The upper carriage can be stopped in any position.

Functional check of swivel unit brake

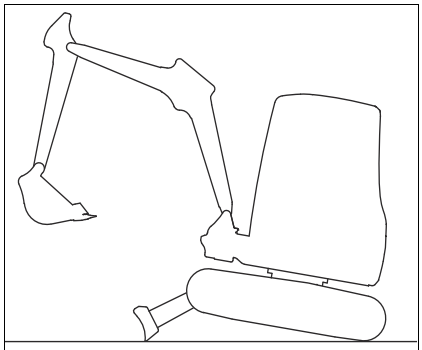


Fig. 139 Raising the machine

1. After finishing work, park the machine at operating temperature on firm, level, and horizontal ground.
2. Raise the machine with the stabilizer blade as far as it will go.

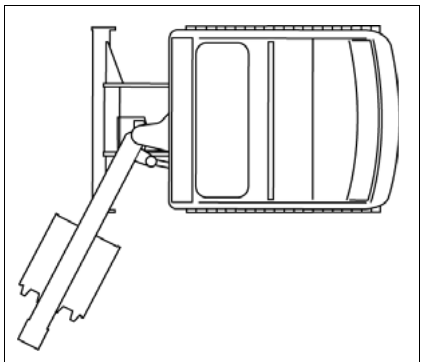


Fig. 140Swivel boom to the left

3. Swivel the boom to the left as far as it will go.

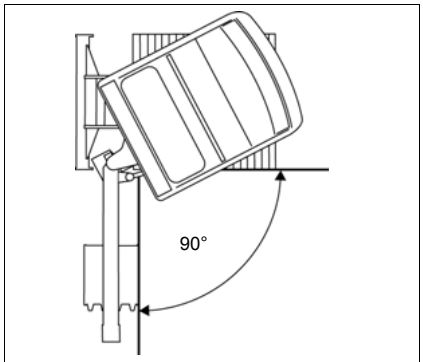


Fig. 141Boom 90° to the machine

4. Turn the upper carriage so that the boom is 90° to the travel gear.

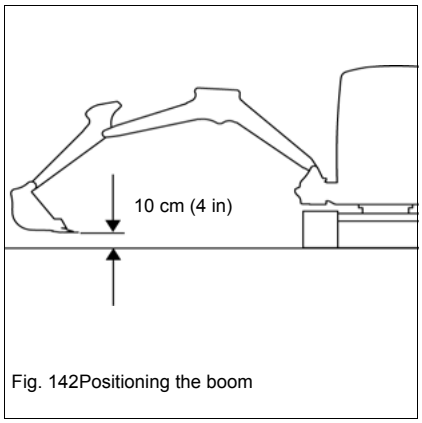


Fig. 142Positioning the boom

5. Position the boom as shown in *Fig. 142*.
6. Stop the engine, remove the starting key and carry it with you.
7. Raise the control lever base.
8. Wait one minute.

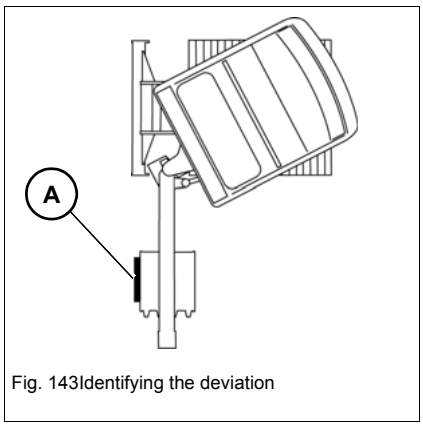


Fig. 143Identifying the deviation

9. Put a piece of wood **A** against the attachment.
10. Wait one minute.

If the attachment does not move from the piece of wood:

➥ Machine is operational.

If the attachment moves away from the piece of wood:

➥ Stop operation immediately.

➥ Contact a Wacker Neuson service center and have the malfunction rectified.

ISO/SAE controls (option)

WARNING

Accident hazard due to modified control lever operation!

Can cause serious injury or death.

- ► Ensure that you know which control mode has been selected before starting work.
- ► Secure the wing nut on the changeover lever of the directional valve.

NOTICE

Do not operate the machine with a malfunctioning wing nut.

- ► Contact a Wacker Neuson service center and replace the malfunctioning wing nut.

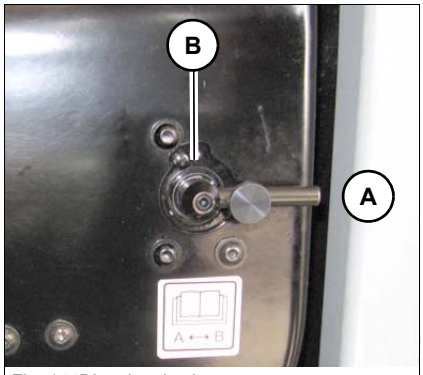


Fig. 144Directional valve

The directional valve is located at the left under the seat.

The ISO controls **(A)** and SAE controls **(B)** can be changed over with the directional valve.

The function label for the controls is affixed on the roof window.

Wiring diagram	Controls
A	ISO controls
B	SAE controls

Stabilizer blade

Position	Function
1	The stabilizer blade is actuated.
2	The telescopic travel gear is actuated.

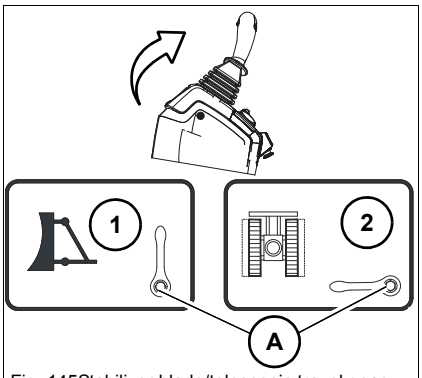


Fig. 145Stabilizer blade/telescopic travel gear

1. Raise the control lever base.
2. Make sure that the lever **A** is situated left under the driver`s seat in position **1** .

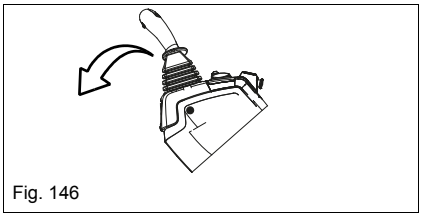


Fig. 146

3. Lower the control lever base.

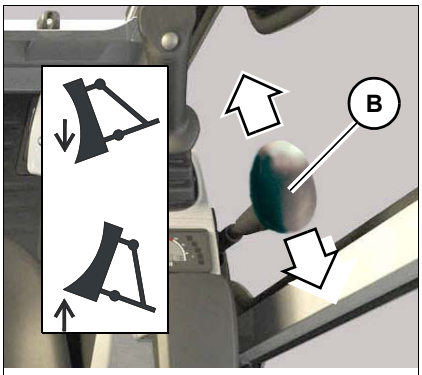


Fig. 147Stabilizer blade

4. Set the dozer blade to the desired position.

Function	Position
Raise stabilizer blade	Pull lever **B** backward
Lower stabilizer blade	Push lever **B** forward

Information

Lowering the stabilizer blade too deeply into the ground can create a high resistance.

► Slightly raise the stabilizer blade.

► The clearance between the dozer blade and the ground should be about 1 cm (0.4 in).

► Raise the stabilizer blade before moving off.

Information

The stabilizer blade is also used as a parking brake.

► Press the stabilizer blade against the ground.

Information

Only perform work with an extended telescopic travel gear (option). Lower the stabilizer blade and turn out the extensions (option).

Changing the width of the stabilizer blade (option)

NOTICE

Damage to machine when driving through door frames, etc.

- ► Pay attention to the width of the stabilizer blade and of the telescopic travel gear when performing machine travel through passages.
- ► Adjust the stabilizer blade and the telescopic travel gear to the same widths when operating the machine.

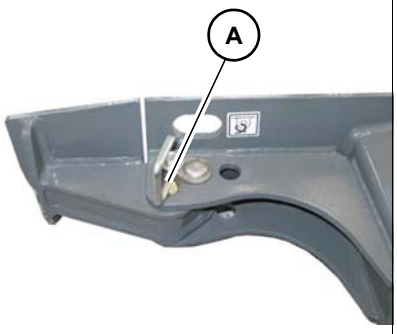


Fig. 148Changing the width of the stabilizer blade

Reducing the width of the stabilizer blade

1. Raise the dozer blade to about 1 – 2 cm (about 0.4 - 0.8 in).
2. Pull out pins **A** on either side.

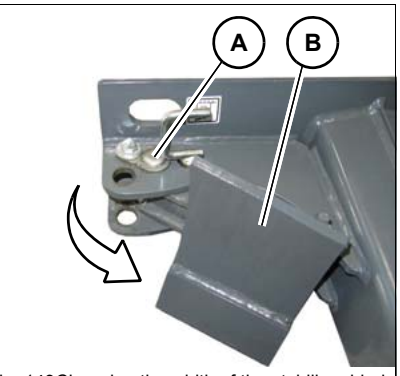


Fig. 149Changing the width of the stabilizer blade

3. Turn in the stabilizer blade extensions **B** on either side.
4. Insert pins **A** on either side.

Increasing the width of the stabilizer blade

1. Raise the dozer blade to about 1 – 2 cm (about 0.4 - 0.8 in).
2. Pull out pins **A** on either side.
3. Turn out the stabilizer blade extensions **B** on either side.
4. Insert pins **A** on either side.

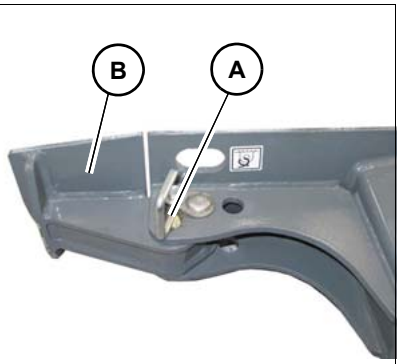


Fig. 150Changing the width of the stabilizer blade

Telescopic travel gear (option)

WARNING

Crushing hazard due to tipping over of machine.

Can cause serious injury or death.

- ► Only perform work with an extended telescopic travel gear.
- ► Performing machine travel with a retracted telescopic travel gear is only allowed for machine travel over very short distances through passages. Pay attention to the reduced stability.
- ► Retract or extend the telescopic travel gear completely.
- ► Raise the boom about 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the machine. In an emergency, lower the boom immediately to increase stability.
  This prevents the machine from tipping over in case of a hose rupture on the telescopic cylinder. A hose rupture might cause the travel gear to retract and reduce stability.

WARNING

Danger of crushing when retracting the telescopic travel gear!

Can cause serious injury or death.

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

NOTICE

In order to avoid damage to the machine when performing machine travel through door frames, etc.:

- ► Pay attention to the width of the stabilizer blade and of the telescopic travel gear when performing machine travel through passages.
- ► Adjust the stabilizer blade and the telescopic travel gear to the same widths when operating the machine.

Position	Function
1	The stabilizer blade is actuated.
2	The telescopic travel gear is actuated.

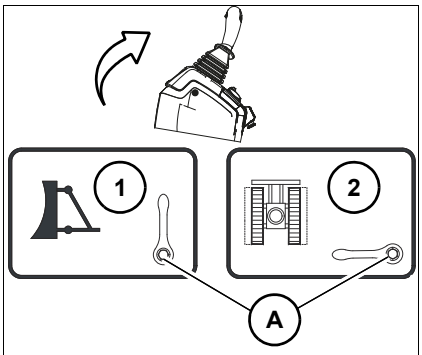


Fig. 151Stabilizer blade/telescopic travel gear

1. Raise the control lever base.
2. Make sure that the lever **A** is situated left under the driver`s seat in position **1** .

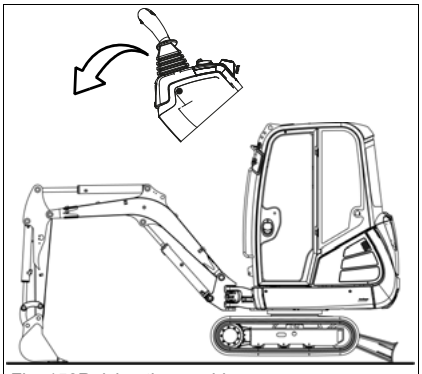


Fig. 152Raising the machine

3. Lower the control lever base.
4. Raise the vehicle using the stabilizer blade and boom so far that no contact with the earth exists and so that there are no foreign objects in the travel gear during retraction or extension.

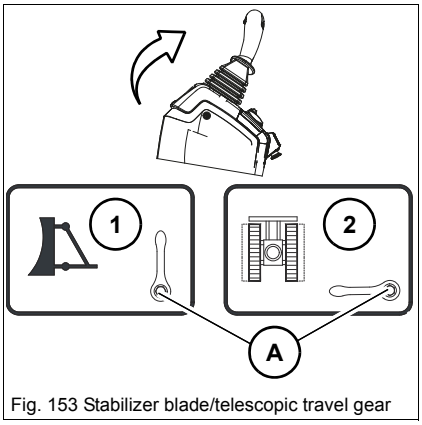


Fig. 153 Stabilizer blade/telescopic travel gear

5. Raise the control lever base.
6. Bring lever **A** in position **2** .

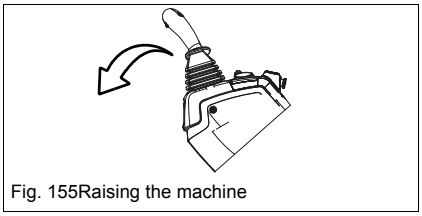


Fig. 155Raising the machine

7. Lower the control lever base.

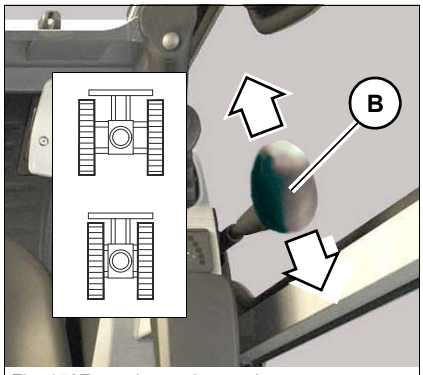


Fig. 156Extension and retraction

8. Set the travel gear to the desired position.

Telescopic travel gear	Position
Extend	Push lever **B** forwards.
Retract	Pull lever **B** backward.

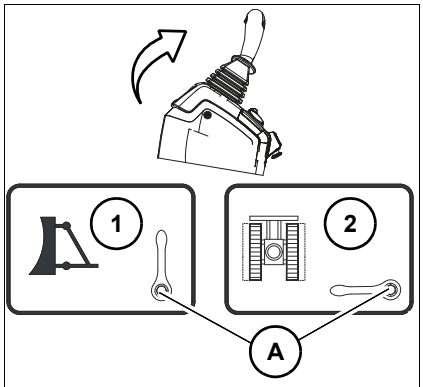


Fig. 157

9. Raise the control lever base.
10. Bring lever **A** in position **1** .

Information

Only perform work with an extended telescopic travel gear. Lower the stabilizer blade and turn out the extensions.

Proportional controls (option)

The proportional controls make it possible to adapt the speed with which the attachments move. Moving the control lever slowly causes the attachment to move slowly.

This control mode offers proportional operation of the auxiliary hydraulics depending on the position of slide switch **A** on the control lever.

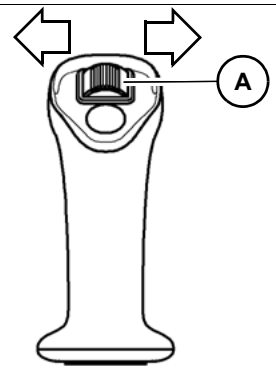


Fig. 158Control lever for proportional controls

If precision work (for example with an offset bucket) does not require the full oil flow of the auxiliary hydraulics (AUX I and AUX II), turn the rotary switch to the left (MIN).

If the full oil flow is required, turn the rotary switch to the right (MAX).

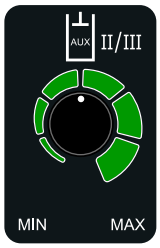


Fig. 159Rotary switch on control lever base on the left

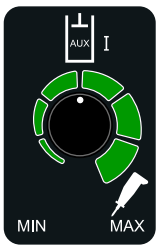


Fig. 160Rotary switch on control lever base on the right

Hammer operation

Important information regarding hammer operation

Use the canopy version only with a shatter protection during hammer operation.

If the machine is equipped with a cabin (option), the front window must be closed.

– see chapter " Shatter protection (option)" on page 4-24

WARNING

Danger of piercing/penetration by objects from the front!

Work involving risk of piercing/penetrating by objects from the front can cause accidents with serious injury or death.

- ► During operation, all persons must stay clear of the job site of the machine.
- ► Do not position the vehicle under the workplace during demolition, since debris could fall onto the machine.
- ► Observe the mandatory limits of the work area.
- ► Do not hammer horizontally or upward.
- ► Only hammer with attached shatter protection or closed front windshield.

WARNING

Accident hazard due to tipping over of machine!

A tipping machine can cause serious injury or death.

- ► During operation, all persons must stay clear of the job site of the machine.
- ► Do not perform any demolition work under the machine. This could cause the machine to tip over.
- ► The machine can lose its balance and tip over if a hammer or other heavy attachment is used.
- ► Never turn, lower or set down the attachment abruptly.
- ► Do not extend or retract the boom abruptly.
- ► Do not use the impact force of the attachment to perform demolition work. Broken or falling pieces can cause serious injury.
- ► Use a hammer only at machine standstill.

Information

In combination with Powertilt, only use the smallest possible released hydraulic breaker.

NOTICE

In order to avoid damage to the machine or hydraulic hammer, observe the following points:

- ► Observe the Operator's Manual of the hydraulic hammer.
- ► Do not hammer horizontally or upward.
- ► Do not use the hammer to raise loads.
- ► Do not hit the hammer against rocks, concrete, etc..
- ► Do not hammer in the same spot uninterruptedly for more than 15 seconds.
- ► Do not raise the machine with the boom.
- ► Do not work with fully extended cylinders or arm system. Do not pivot the Powertilt unit beyond 30° during breaker operation, otherwise the load on the boom increases tremendously.
- ► Stop machine operation immediately if a hydraulic hose moves back and forth in an unusual manner. The pressure accumulator could be malfunctioning. Contact a Wacker Neuson service center and have the malfunction rectified immediately.
- ► Do not use the impact force of the attachment to perform demolition work. Broken or falling pieces can cause damage to the equipment.

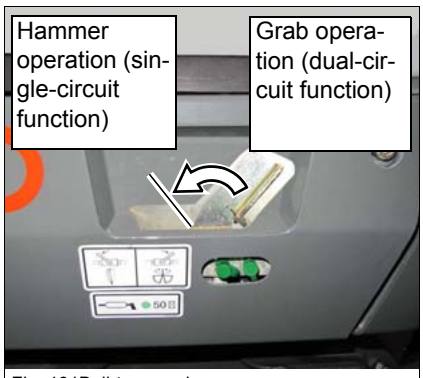


Fig. 161Ball-type cock

Switch over to breaker operation:

Set the ball valve on the revolving superstructure on the right to **breaker** operation.

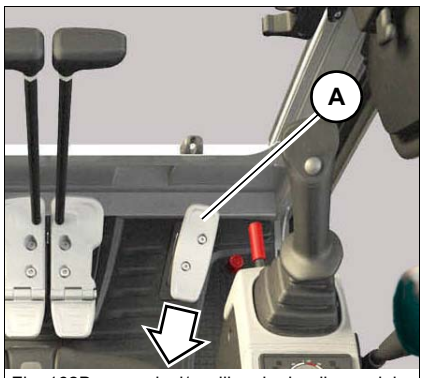


Fig. 162Boom swivel/auxiliary hydraulics pedal

Hammer operation	Position
Switched on	Actuate the pedal **A** in the rear
Switched off	Release the pedal **A**

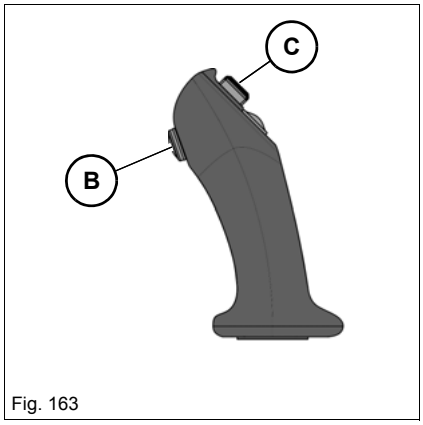


Fig. 163

Breaker operation (proportional control)[1]	Position
Switched on	Hold downtouch control **B** on the right joystick
Switched off	Releasetouch button **B**

1. ET18: from serial number WNCE1202TPAL02691
   ET20: from serial number WNCE1203APAL01350
   ET24: from serial number WNCE1204JPAL00977

Information

The hydraulic breaker can be operated with the gate **C**.

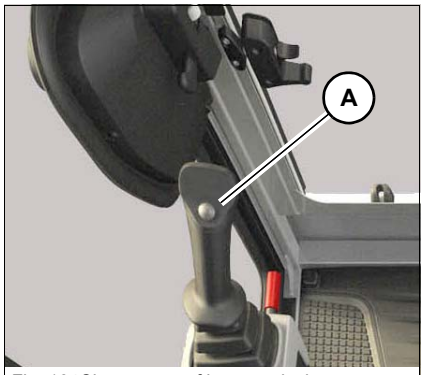


Fig. 164Changeover of boom swivel

Information

The auxiliary hydraulics is enabled when the machine is started.

► Pressing button **A** changes over to boom swivel.

Additional control circuit – AUX I (option)

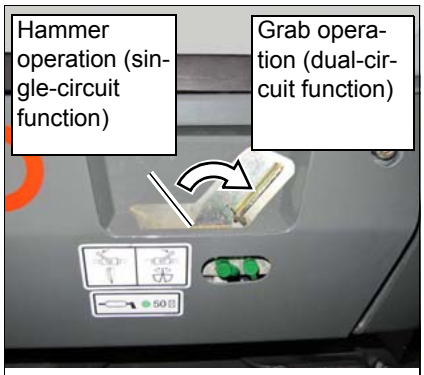


Fig. 165Ball-type cock

Set the ball valve on the revolving superstructure on the right to **grab** operation.

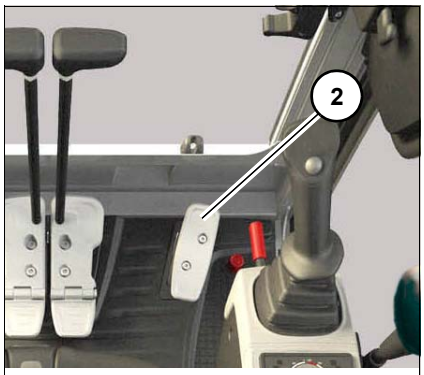


Fig. 166Boom swivel/auxiliary hydraulics pedal

Operating the additional control circuit

Oil flow to line on the right:

Press pedal **2** forward.

Oil flow to line on the left:

Press pedal **2** backward.

Proportionally controlled additional control circuit – AUX I (option)

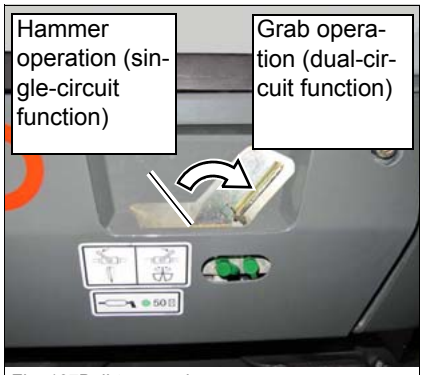


Fig. 167Ball-type cock

1. Changeover to the dual-circuit function. The ball-type cock is located on the right in travel direction on the upper carriage.

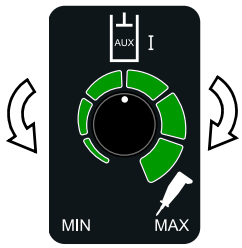


Fig. 168Setting the oil flow

2. Turn the rotary switch on the control lever base on the left to the required position.

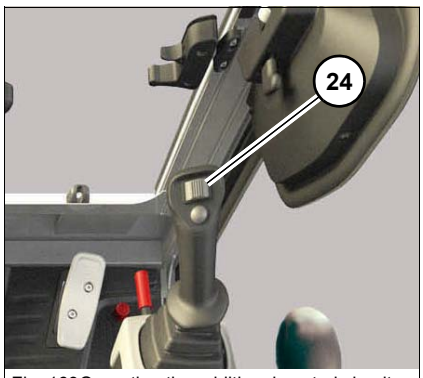


Fig. 169Operating the additional control circuit

Operating the additional control circuit

Oil flow to line on the left:

Push slide switch **24** on the left-hand control lever to the left.

Oil flow to line on the right:

Push slide switch **24** on the left-hand control lever to the right.

Swiveling the boom

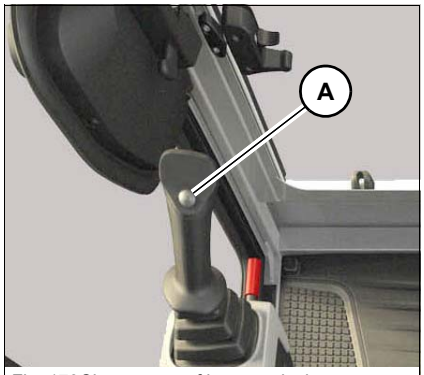


Fig. 170Changeover of boom swivel

Press and hold button **A** on the control lever base on the left.

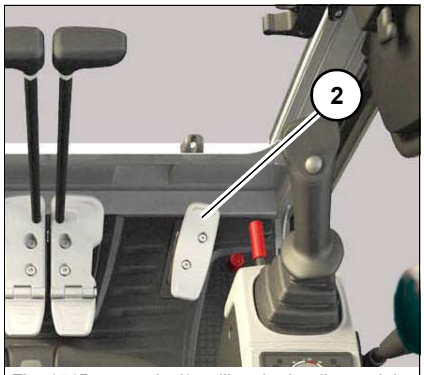


Fig. 171Boom swivel/auxiliary hydraulics pedal

Swiveling the boom to the right:
Press pedal **2** forward.

Swiveling the boom to the left:
Press pedal **2** backward.

Swiveling the boom (proportionally controlled)

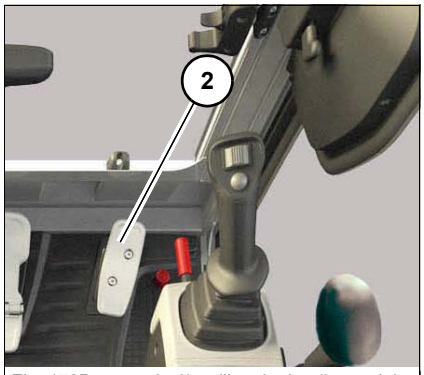


Fig. 172Boom swivel/auxiliary hydraulics pedal

Swiveling the boom to the right:
Press pedal **2** forward.

Swiveling the boom to the left:
Press pedal **2** backward.

Lifting gear applications

DANGER

Crushing hazard due to tipping over of machine.

Causes serious crushing or injury resulting in death.

- ► Observe chapter **Safety/Safety instructions regarding lifting gear applications**.
- ► Do not exceed the weight specified in the stability table.
- ► If a bucket or attachment (for example a hammer) is installed, the weight of the attachment must be subtracted from the weight specified in the table.
- ► Use the machine for lifting gear applications only if the mandatory lifting gear (for example a load hook) and safety equipment (for example optical and acoustic warning devices (safe load indicator), stability table, hose burst valve) is installed, functional and enabled.
- ► Functional check of safe load indicator (see chapter “Safe load indicator”).
- ► Do not tilt the upper carriage (Vertical Digging System option).
- ► The telescopic travel gear must be extended (option).

NOTICE

If the specified weight is exceeded, danger of damage to property due to tipping over of machine.

- ► Do not exceed the weight specified in the stability table.

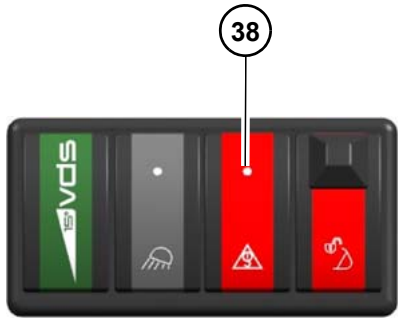


Fig. 173Safe load indicator

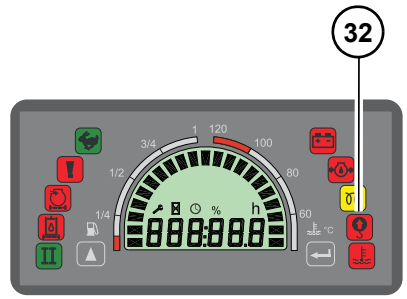


Fig. 174Safe load indicator light

In lifting gear applications, switch on switch **38** for the safe load indicator.

As soon as indicator light **32** illuminates and the warning sounds:

- Reduce the load until the indicator light goes out and the warning no longer sounds.

Suitable equipment for fastening and securing loads must be available.

– see chapter " Safe load indicator (option)" on page 5-56

Additional control circuits

3rd control circuit – AUX II (option)

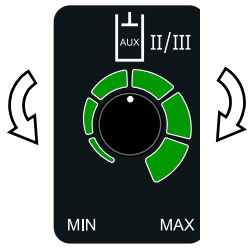


Fig. 175Setting the oil flow

Turn the rotary switch on the control lever base on the left to the required position.

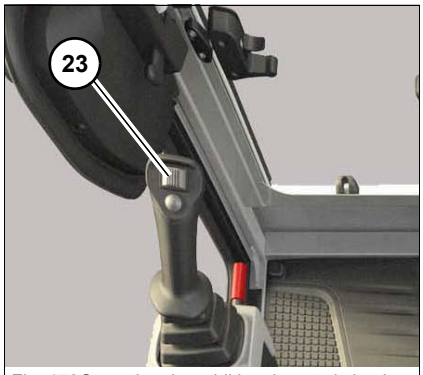


Fig. 176Operating the additional control circuit

Operating the additional control circuit

Oil flow to line on the left:

Push slide switch **23** on the left-hand control lever to the left.

Oil flow to line on the right:

Push slide switch **23** on the left-hand control lever to the right.

Powertilt – AUX II (option)

WARNING

Crushing hazard due to rotating movements of the Powertilt unit!

Can cause serious injury or death.

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

Information

For more information, see **Easy Lock/Powertilt with Easy Lock** Operator's Manual.

Information

The Powertilt unit may only be installed and removed by a Wacker Neuson service center!

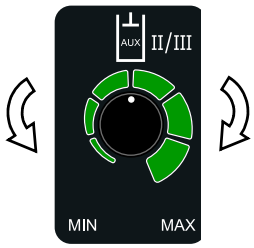


Fig. 177Setting the oil flow

Adjust the required oil flow with the rotary switch on the control lever base on the left.

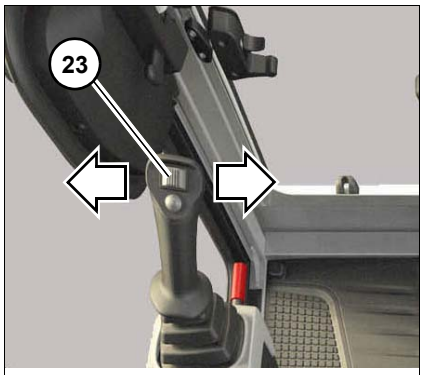


Fig. 178Actuating the Powertilt unit

Actuating the Powertilt unit

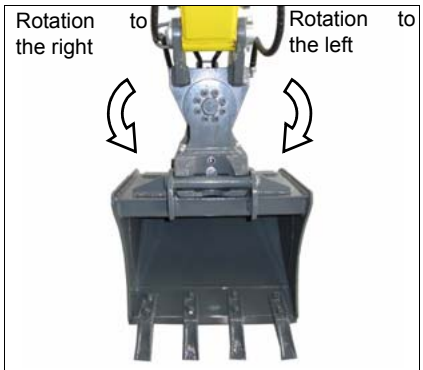


Fig. 179Rotating the Powertilt unit

Rotating the Powertilt unit to the left:

Push slide switch **23** on the left-hand control lever to the left.

Rotating the Powertilt unit to the right:

Push slide switch **23** on the left-hand control lever to the right.

Hydraulic Easy Lock quickhitch (option)

- Attend specific training before putting into operation. Training must be given by authorized technical personnel and must be understood by the operator.
- For safety reasons, the quickhitch must be operated with two control elements. This avoids opening the quickhitch unintentionally during work operation.
- There must be no dirt on the claws before hitching.
- For more information, see **Easy Lock/Powertilt with Easy Lock** Operator's Manual.
- Store the Operator's Manual of the hydraulic quickhitch together with the Operator's Manual of the machine.

WARNING

Accident hazard when picking up attachments!

If an attachment is not locked correctly, it can come off and cause serious injury or death.

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

► Do not use damaged attachments.

► Check pin **F** must be fully retracted. Otherwise repeat the lock cycle until check pin **F** is retracted.

► Ensure safe locking with a rapid succession of stick and bucket movements as close as possible to the ground.

► Operate the machine only with a safely locked attachment.

WARNING

Danger of crushing when attachments are removed!

If an attachment is not locked correctly, it can tip over and cause serious injury or death.

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

► Lower the attachment to level and firm ground ensuring stability.

WARNING

Danger of crushing due to incorrect operation of the hydraulic quickhitch system!

For system-specific reasons, the quickhitch can also be operated with other hydraulic functions. This can cause serious injury or death.

► Operate the hydraulic quickhitch only with the function **Raise stabilizer blade**.

Picking up an attachment

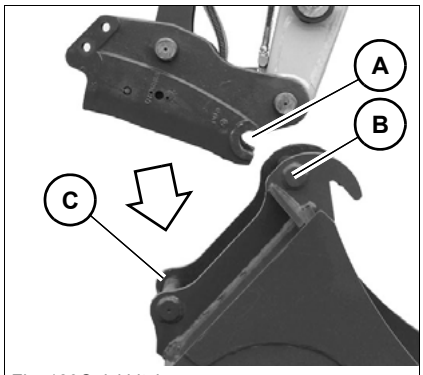


Fig. 180Quickhitch

1. Hitch claws **A** (on the side of the machine) into pins **B** of the attachment mount.
2. Extend the bucket cylinder so that the second bolt **C** of the attachment touches the quick coupler system.
3. Move the attachment inward completely.

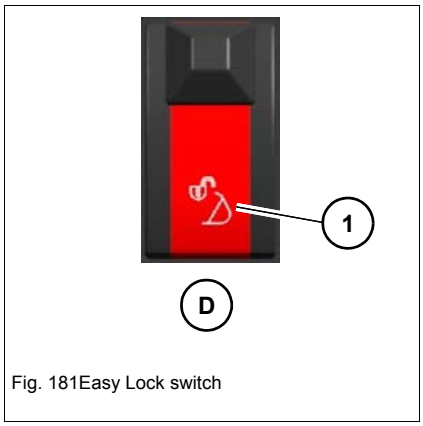


Fig. 181Easy Lock switch

4. Unlock switch **D** and press it to position **1**.
   ➥ The quickhitch is enabled and the buzzer sounds.

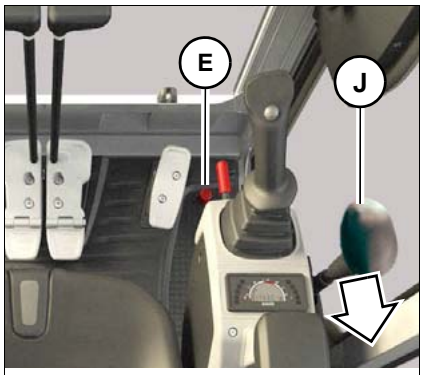


Fig. 182Foot-operated push button and stabilizer-blade lever

5. Press and hold the foot-operated touch button **E** and at the same time pull back the **J** dozer blade lever.
   ➥ The quickhitch opens.

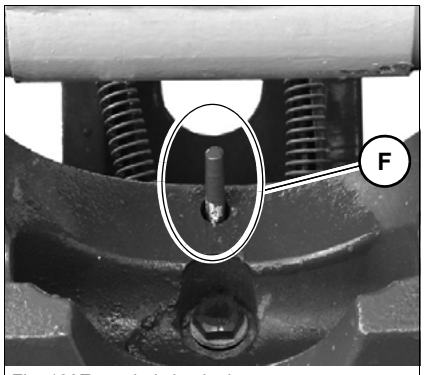


Fig. 183Extended check pin

➥ Check pin **F** must be fully extended.
➥ The attachment engages.

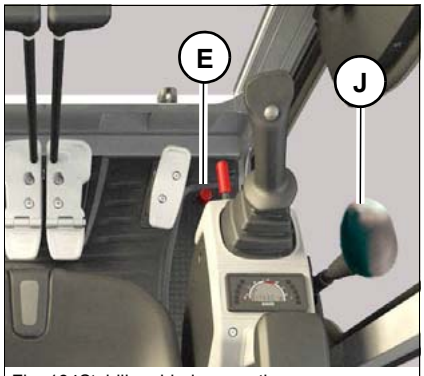


Fig. 184Stabilizer blade operation

6. Release the dozer blade lever **J** and foot-operated touch button **E** .
   ➥ The quickhitch closes.

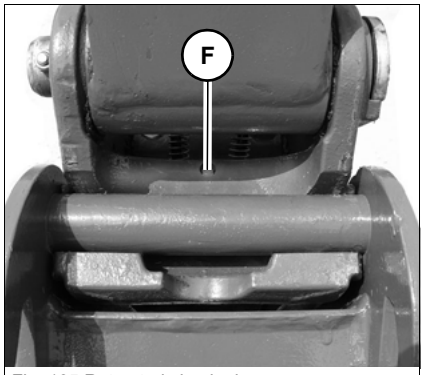


Fig. 185 Retracted check pin

➥ Check pin **F** must be fully retracted.

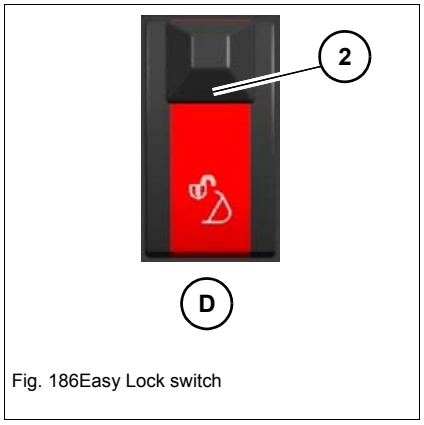


Fig. 186Easy Lock switch

7. Press switch **D** to position **2**.
   ➥ The quickhitch is disabled and the buzzer does not sound any longer.

Setting down an attachment

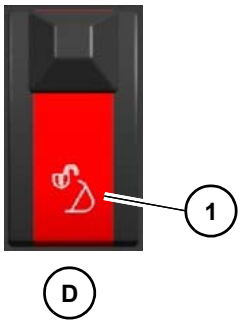


Fig. 187Easy Lock switch

1. Move the attachment inward completely and position it at 5–10 cm (2–4 in) above the ground.
2. Unlock switch **D** and press it to position **1**.
   ➥ The quickhitch is enabled and the buzzer sounds.

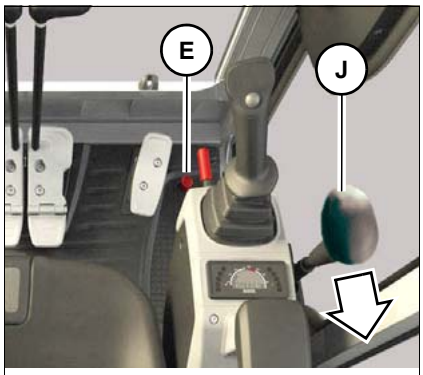


Fig. 188Foot-operated push button and stabilizer-blade lever

3. Press and hold the foot-operated touch button **E** and at the same time pull back the **J** dozer blade lever.
   ➥ The quickhitch opens.

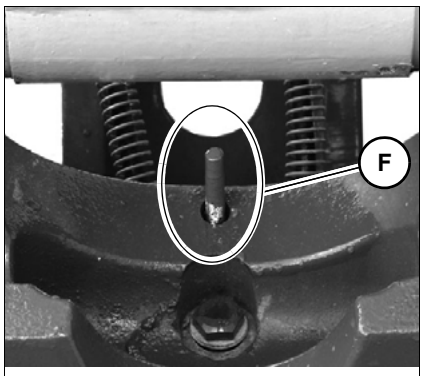
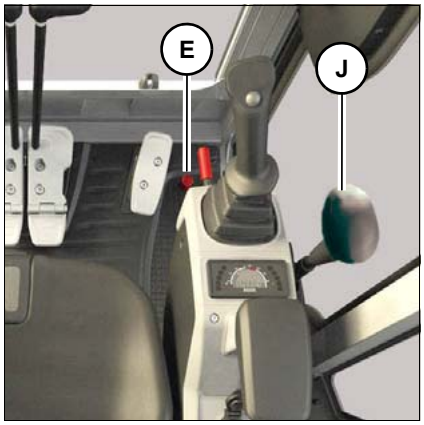


Fig. 189Extended check pin

   ➥ Check pin **F** must be fully extended.

Fig. 190Quickhitch

4. Retract the bucket cylinder.
   ➥ The attachment is lowered to the ground.



5. Release the dozer blade lever **J** and foot-operated touch button **E** .
   ➥ The quickhitch closes.

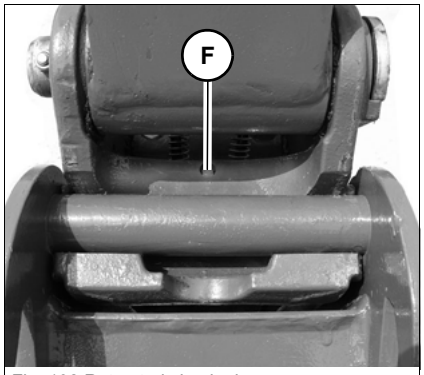


Fig. 192 Retracted check pin

➥ Check pin **F** must be fully retracted.

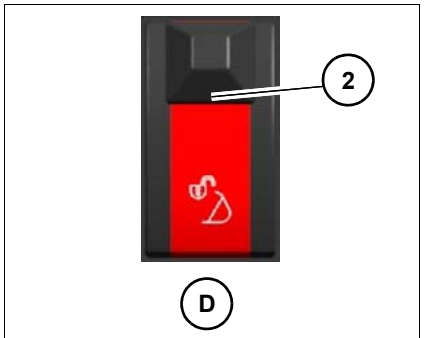


Fig. 193Easy Lock switch

6. Press switch **D** to position **2**.
   ➥ The quickhitch is disabled and the buzzer does not sound any longer.

Grab control circuit (option)

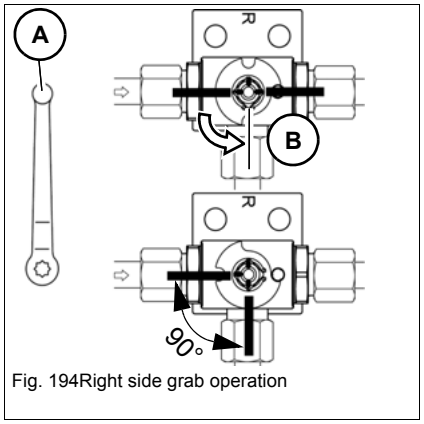


Fig. 194Right side grab operation

Right side grab operation:

1. Fit lever **A** onto the ball-type cock.
2. Set the ball-type cock to position **B**.
   ➥ The 90° notch indicates that grab operation is set.
3. Remove the lever after the changeover.

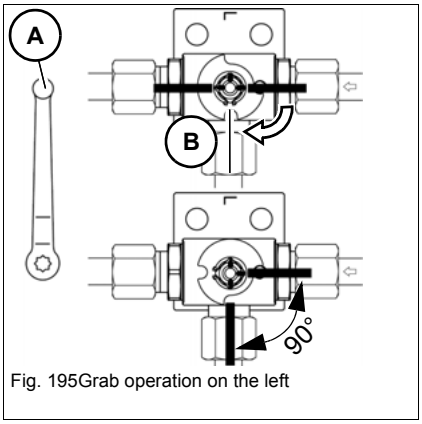


Fig. 195Grab operation on the left

Grab operation on the left:

1. Fit lever **A** onto the ball-type cock.
2. Set the ball-type cock to position **B**.
   ➥ The 90° notch indicates that grab operation is set.
3. Remove the lever after the changeover.

Connecting and disconnecting hydraulic couplings

1. Stop and park the machine. See “Preparing lubrication”.
2. Position the boom straight ahead at the center of the machine.
3. Lower the stabilizer blade to the ground.
4. Turn the starting key to position **1**.
5. Move the control lever or the pedal of the hydraulic circuit in all directions repeatedly.
6. Remove the starting key and carry it with you.

➥ The grab hose couplings can now be coupled and uncoupled from the couplings.

Hydraulic connections

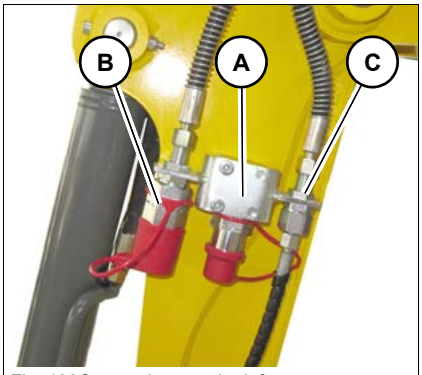


Fig. 196Connections on the left

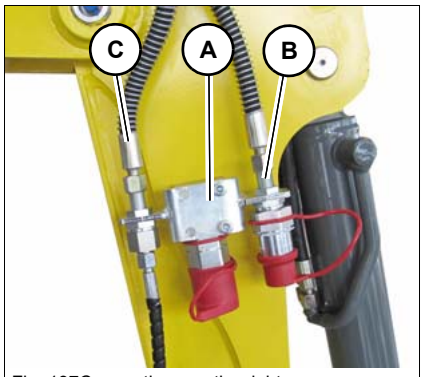


Fig. 197Connections on the right

Connection	Stick (left/right)
A	Auxiliary hydraulics
B	Grab control circuit (option)
C	3rd control circuit or Powertilt (option)

Information

Follow the instructions in the Operator’s Manual of the attachment manufacturer for connecting the hydraulics to the attachment.

5.10 Attachments

Picking up

WARNING

Danger of fluid escaping under high pressure!

Can cause serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► Before connecting or removing hydraulic lines from the attachment, ensure that the operating hydraulics is not under pressure.
- ► Release the pressure in the operating hydraulics.

WARNING

Injury hazard when attachments are picked up!

Can cause serious injury or death.

- ► Wear protective equipment when installing the connecting pins of the attachment.
- ► Ensure that no one is in the danger zone.
- ► Only use attachments that are in perfect condition.
- ► After hitching the attachment or before starting work, ensure that the lock is correctly connected with the mount.
- ► Align the fastening bores in the bucket with a mandrel. This makes it easier to slide the pin into the bore connecting the attachment with the stick.
- ► Do not correct an incorrect alignment with the connecting pin and a hammer. Fragments can chip off the pin if it is struck with a hammer.
- ► Remove the connecting pins from the bucket only if it is in a stabile position and if it cannot be moved when removing the connecting pins. Do not stand on the closed rear side of the bucket as you remove it. Do not place your foot underneath the bucket.
- ► Remove the bucket only if it is firmly positioned on the ground or on a solid base. Do not remove the connecting pins if the bucket is raised. The bucket can cause serious injury if it falls.
- ► Do not align the connecting bores with your fingers. In order to avoid possible injury, keep your fingers and hands away from the connections as you align the connecting bores.

Setting down

WARNING

Crushing hazard due to uncontrolled movements of the attachment!

Can cause serious injury or death.

► Ensure that no one is in the danger zone.

► Lower the attachment to level and firm ground ensuring stability.

Re-equipping the attachments is described below for a bucket. If you are fitting or removing attachments with their own hydraulic functions – offset bucket, for example – you must follow the special information given in the Operator's Manual of the attachment.

Also refer to the Operator's Manual for the procedure to follow for fitting an attachment onto an Easy Lock quickhitch.

Information

The hydraulic system of the machine is still pressurized even when the engine is not running. Due to the residual pressure, the hydraulic quick couplers can be removed but not installed back on again.

► Release the pressure in the operating hydraulics.

Releasing the pressure in the operating hydraulics

1. Stop the machine on firm, level, and horizontal ground.
2. Lower the attachment completely to the ground.
3. Lower the stabilizer blade to the ground.
4. Stop the engine.
5. Turn the starting key to position **1**.
6. Move the control lever or the slide switch of the proportional controls of the relevant hydraulic circuit in all directions repeatedly.
   - ➥ The pressure in the system sections that have been actuated is released. This can be seen by the brief movement the hoses make as the pressure is released.
   - ➥ Uncouple the attachment immediately after the pressure has been released, otherwise pressure can be created again!

Retrofitting a bucket

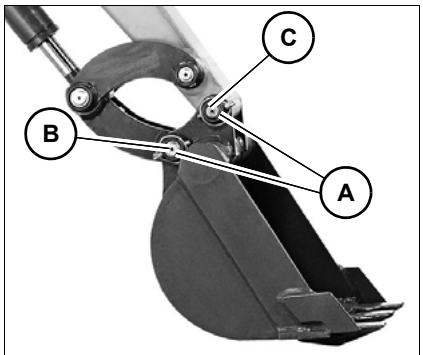


Fig. 198Removing

Removing

1. Lower the bucket to level ground with the flat side facing downward.
2. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
3. Remove linch pins **A**.
4. First remove the bolt **B**, then bolt **C**; carefully drive out seized bolts with a breaker and brass punch.

If pin **C** is stuck:

1. Start the engine.
2. Slighty raise and lower the boom to take the load off the pin.
3. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
4. Raise the control lever base.
5. Remove the starting key and carry it with you.

Information

Place the bucket only with minimum pressure on the ground as you remove the pins. The higher the pressure on the ground, the higher the resistance and the more difficult it is to remove the pins.

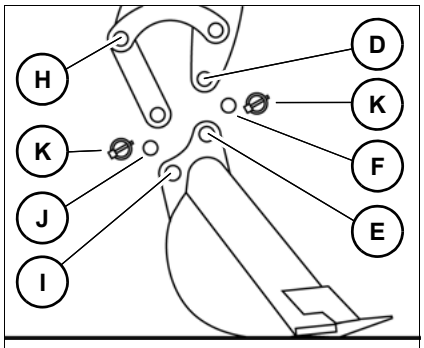


Fig. 199Mount

Mount

1. Install a bucket only if it is positioned on level ground with the flat side facing downward.
2. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
3. Apply grease to the pins and joints before inserting the pins.
4. Start the engine.
5. Straighten the stick so that bores **D** and **E** are flush.
6. Stop the engine. Raise the control lever base.
7. Insert pin **F**.
8. Actuate the stick cylinder until bores **H** and **I** are flush.
9. Stop the engine. Raise the control lever base.
10. Insert pin **J**.

Install linch pins **K**.

5.11 Work operation

Inadmissible work procedures

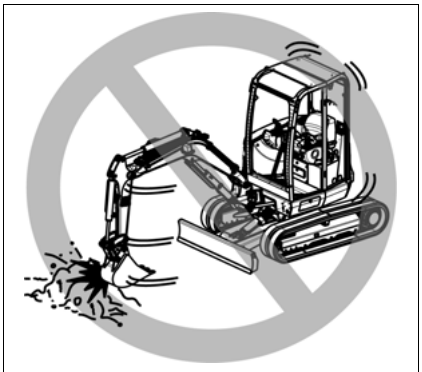


Fig. 200Working with the swivel force

Working with the swivel force

- Do not use the swivel force of the upper carriage to tear down walls or to create level surfaces.
- Never ram the attachment into the ground when swiveling the upper carriage.
  ➥ This can damage the machine or the attachment.

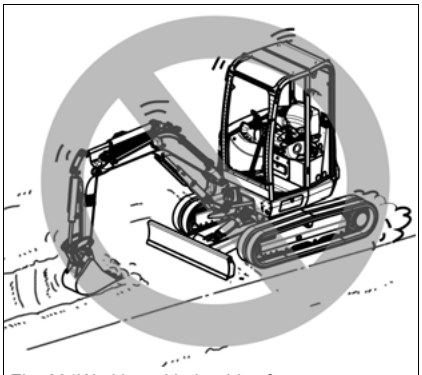


Fig. 201Working with the drive force

Working with the drive force

- Never ram the attachment into the ground to dig during machine travel.
  ➥ This can damage the machine or the attachment.

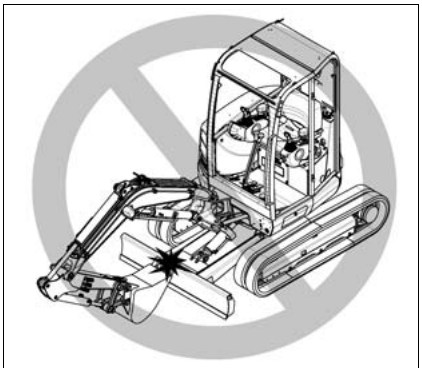


Fig. 202Retracting the attachment

Retracting the attachment

- When retracting the attachment, ensure that it does not touch the stabilizer blade.

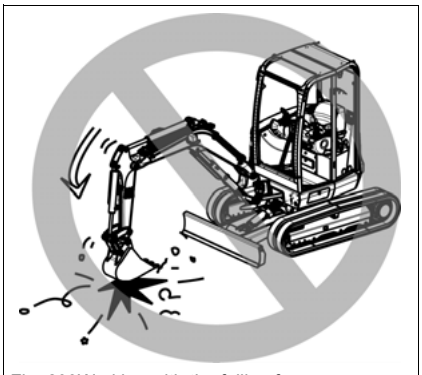


Fig. 203Working with the falling force

Working with the falling force by lowering the attachment

- Do not use the falling force of the attachment as a hoe, hammer or pile-driver.
  ➥ Working this way can greatly reduce the machine's service life.

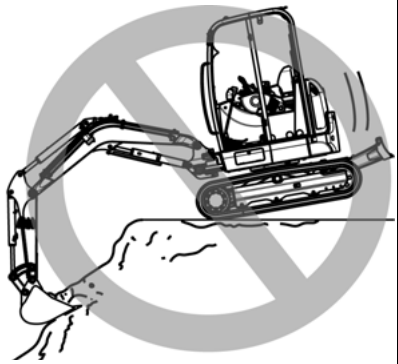


Fig. 204Working with the falling force

Fig. 205Working with the falling force

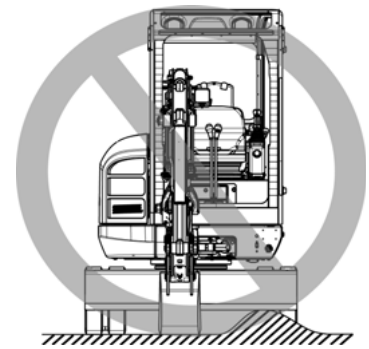


Fig. 206Lowering the stabilizer blade

Working with the falling force by lowering the machine

- Never use the dead weight of the machine for work.
- Use only the hydraulic force of the cylinders.

Fully lowering the stabilizer blade

- Apply the full weight of the machine over the entire width of the stabilizer blade when using it for stabilization.

Protecting the stabilizer blade against shocks

- The stabilizer blade or stabilizer blade cylinder can be damaged when hitting it against rocks, etc.

General information regarding work operation

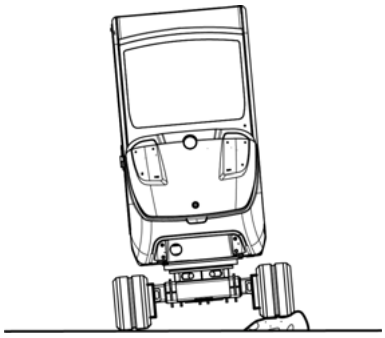


Fig. 207Travel operation

Travel operation

Performing machine travel over obstacles (rocks, tree stumps, etc.) can put a heavy load on the undercarriage, and cause damage. Avoid performing machine travel over obstacles if possible.

If it cannot be avoided, lower the boom to ground level and travel over the obstacle at low speed at the middle of the running gear.

Drive operation in high speed

Perform machine travel slowly on rough terrain and avoid starting machine travel and stopping abruptly as well as changing direction suddenly.

The stabilizer blade must be at the front during high speed machine travel.

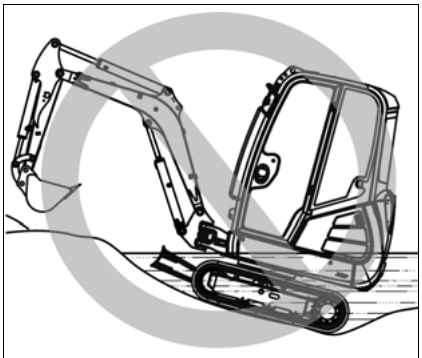


Fig. 208Driving out of water

Operation in water

Do not immerse the rear end of the machine in water. Bear this in mind in particular when leaving water, in order not to damage the machine.

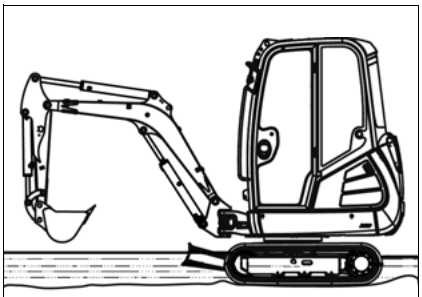


Fig. 209Driving in water

Water must not reach any further than the upper edge of the tensioning wheel.

Lubricate lubrication points again that were immersed in water for a longer time in order to expel the old grease.

Never immerse the live ring or the upper carriage in water.

Working with the standard bucket

The following section describes work operations with the machine equipped with the standard bucket (backhoe bucket 400 mm/16 in). The standard bucket is mainly used for earth-moving applications, namely for digging, loosening, picking up and loading loose or solid material.

The standard position the stabilizer blade is on the excavation side of the machine.

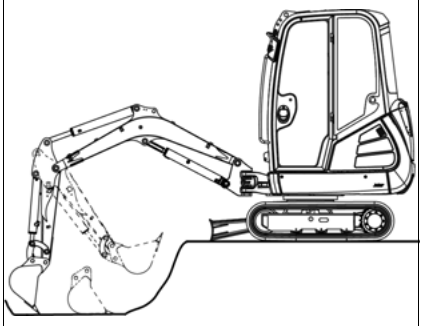


Fig. 210Bucket position when digging

Bucket position when digging

Perform long, level excavation movements with the stick and the bucket. The maximum excavation force is achieved at an angle of 80 to 120° between the boom and the stick.

1. Penetrate into the ground with the bucket.
2. Lower the stick and at the same time, position the bucket so that the flat lower side of the bucket is parallel with the ground.
3. Move the stick toward the machine and tilt in the bucket at the same time.

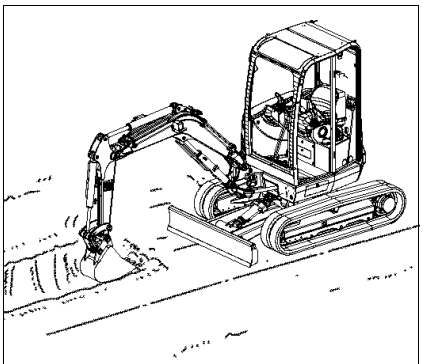


Fig. 211Excavating

Working alongside trenches

- For more efficient work:
  - Install a suitable bucket.
  - Position the tracks parallel to the trench.
- When digging wide trenches, dig the side sections first and then the middle section.

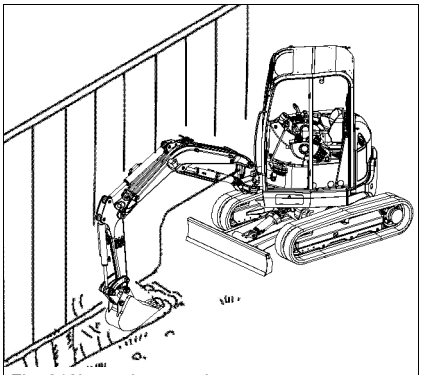


Fig. 212Lateral excavation

- The machine can be used in tight spaces for excavating laterally.
  - To do this: rotate the upper carriage and swivel the boom at the same time.

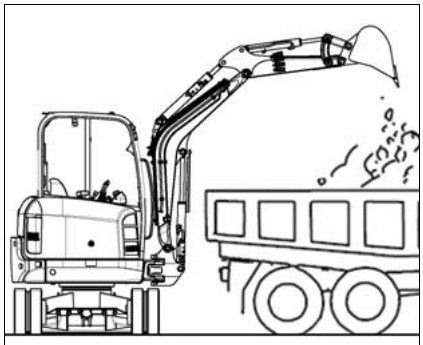


Fig. 213Loading material

Loading material

- Loading material on trucks is easier and more efficient if:
  - The machine is positioned at the rear end of the truck.
  - The loading platform of the truck is loaded by starting at the rear end.
  - Work is performed with the smallest possible swivel angle.

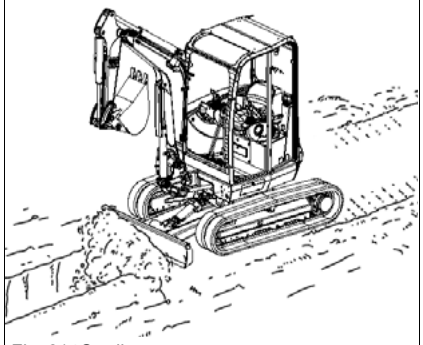


Fig. 214Grading

Grading

- Use the stabilizer blade to:
  - Fill in trenches.
  - Grade surfaces.

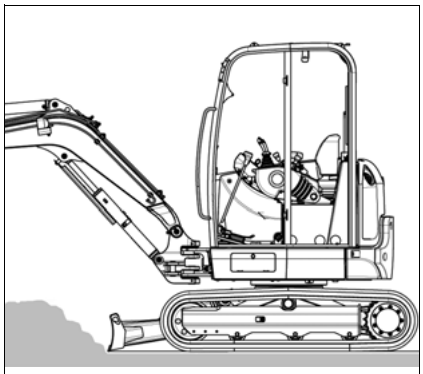


Fig. 215Grading

- Lower the stabilizer blade to the ground for grading work.
- Set the depth of the layer you want to remove with the stabilizer-blade lever.
  - ➥ The machine must not be raised by lowering the stabilizer blade.

The clearance between the stabilizer blade and the ground should be about 1 cm (0.4 in).

Working on slopes

WARNING

Tipping hazard of machine on slopes!

A tipping machine can cause serious injury or death.

► Secure slopes before beginning to work. Pay attention to ground conditions, machine weight, etc.

► Stabilize the machine with the stabilizer blade during excavation work.

Fig. 216Working on slopes

NOTICE

Lifting arm cylinders can be damaged from improper operation.

► The piston rod must not touch the stabilizer blade.

Hints for digging

When planning and performing digging work, Wacker Neuson recommends that you observe the following points:

- Exits from pits must be outside the digging line and as level as possible.
- Dig by removing adjacent strips if possible.
- Ensure that you can drive forward when driving out of the digging area with a fully loaded bucket.
- Perform transport trips downhill with loaded bucket in reverse operation.

Freeing the machine

If the machine gets stuck in the ground:

- Tilt out the bucket until the blade is vertical above the ground.
- Lower the boom all the way.
- Slowly tilt out the bucket.
  ➥ The machine is pushed backward.
- Reverse slowly.
- Repeat this procedure until the tracks reach firm ground.
- Reverse the machine away.

5.12 Emergency lowering

DANGER

Crushing hazard during boom lowering!

Causes serious crushing or injury resulting in death.

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

Information

Lower the boom immediately after stopping the engine.

Observe the following during emergency lowering:

1. Turn the starting key to position 1.
2. Lower the control lever base.
3. Actuate the corresponding control lever until the boom is completely lowered.
4. Return the control lever to neutral.

5.13 Options

Safe load indicator (option)

The safe load indicator gives the driver optical and acoustic warnings when the values of the stability table are exceeded.

DANGER

Danger of tipping over due to failure to pay attention to the safe load indicator!

A tipping machine can cause serious injury or death.

► Reduce reach or the lift load until both the acoustic signal and the indicator light in the display element go out.

► Pay attention to the stability table.

WARNING

Accident hazard due to switched-off or malfunctioning safe load indicator!

A tipping machine can cause serious injury or death.

► Switch on the safe load indicator during lifting gear applications.

Functional check of the pressure switch of the safe load indicator

Always perform a functional check of the safe load indicator before performing lifting gear applications.

1. Start the machine.
2. Perform machine travel on open terrain.
3. Secure the danger zone.
4. Stop the machine.
5. Switch on the safe load indicator.
6. Raise the boom as far as it will go and hold the control lever in this position.
   ➥ The acoustic signal must sound and the indicator light must illuminate.
   ➥ The machine may be used for lifting gear applications.
7. The acoustic signal does not sound, or the indicator light does not illuminate.
   ➥ The machine may *not* be used for lifting gear applications.
   ➥ Contact a Wacker Neuson service center and have the malfunction rectified.

Perform a functional check of the control lever base.

– see chapter " Functional check of control lever base" on page 4-17

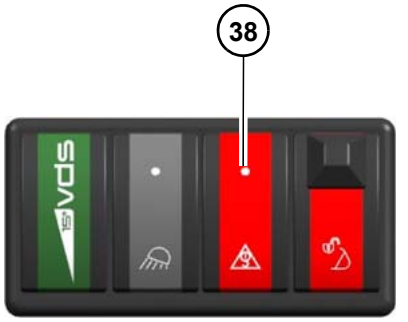


Fig. 217Safe load indicator

Switching on the safe load indicator

The safe load indicator switch is located on the control lever base on the left.

1.Press switch **38** on the instrument panel down.

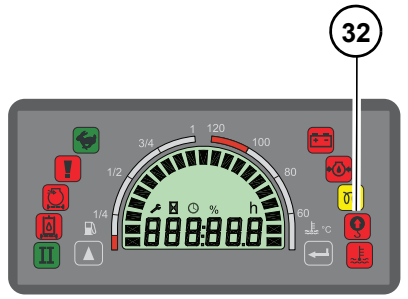


Fig. 218Safe load indicator light

➥ Indicator light **32** in the display element is used for monitoring.

➥ As soon as the permissible values are exceeded, indicator light **32** illuminates and an acoustic signal sounds.

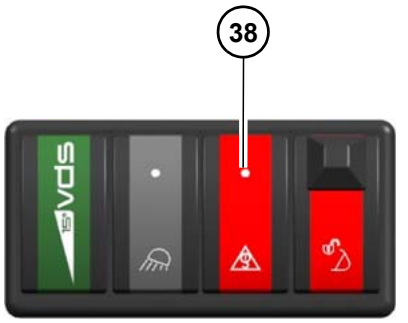


Fig. 219Safe load indicator

Switching off the safe load indicator

1. Press switch **38** on the instrument panel forward.

Hose burst valve

CAUTION

Burn hazard due to hot hydraulic oil!

Hot hydraulic oil can cause burns to the skin.

► Move the control levers to neutral position if a hose bursts.

Stabilizer blade cylinder

If a hose bursts on the stabilizer blade cylinder, the standard hose burst valve keeps the blade in its position.

Hose burst valve “Basic” (option)

The boom and stick are equipped with a hose burst valve that keeps them in the last position if a hose bursts.

The hose burst valve is adjusted and sealed at the factory.

Warranty is void if the seal is removed or if the hose burst valve is tampered with.

Hose burst valve “Advanced” (option)

The boom and stick are equipped with a hose burst valve, and the stabilizer blade with a counterbalance valve that keep them in the last position if a hose bursts.

The hose burst valve (boom and stick) is adjusted and sealed at the factory.

Warranty is void if the seal is removed or if the hose burst valve is tampered with.

Proceed as follows after a damage:

1. Stop the machine immediately.
2. Stop the engine.
3. Perform emergency lowering if possible – *see chapter “5.12 Emergency lowering” on page 5-55*.
4. Raise the control lever base.
5. Stop the engine.
6. Remove the starting key and lock the cabin.
7. Secure the machine and the attachment.
8. Contact a Wacker Neuson service center and have the malfunction rectified.

Environment

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

Immobiliser

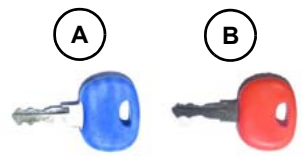


Fig. 220Immobilizer key

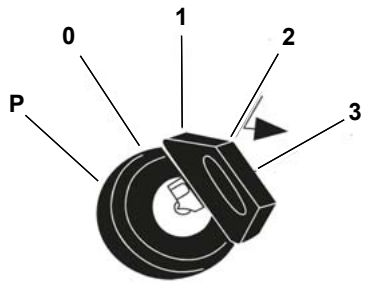


Fig. 221Starting with the immobilizer

A = operator's key (blue key)

For starting the machine. Scope of delivery includes 2 keys.

B = master key (red key)

Information

Store the master key in a safe place. It is only used for coding new keys. All coded keys are deleted if the key remains in position 1 for more than 20 seconds.

The machine can be started without performing any further settings.

Coding a new key

1. Insert master key **B** in the starter.
2. Turn the starting key to position **1** for a maximum 5 seconds.
3. Turn the starting key to position **0** and remove master key **B**.
4. Now insert the new key or the key requiring coding in the starter and turn it to position **1** within 15 seconds.
5. This action registers the key.

The procedure is automatically cancelled if no key requiring coding is detected by the system within 15 seconds. Several keys requiring coding can be inserted one after another in the starter. Each key must then remain at least 1 second in position **1**. Coding can be performed for a maximum 10 keys.

Deleting coded keys

Deleting coded keys is necessary whenever a coded key is lost.

1. Insert master key **B** in the starter.
2. Turn the starting key to position **1** for a minimum 20 seconds.
3. All coded keys are deleted after 20 seconds, and all existing keys can be re-coded.

The master key code is not deleted during deletion.

Tilting the upper carriage (Vertical Digging System) (option)

DANGER

Crushing hazard due to tipping over of machine!

Serious crushing hazard causing death or serious injury.

- ► On a slope, position the machine so that the upper carriage is tilted toward the slope.
- ► Tilt the machine only on firm ground.
- ► Perform smooth and slow movements with the machine.
- ► Tilt the machine only if it is at a standstill and if the attachment is empty.
- ► Never turn, lower, or set down the attachments abruptly.
- ► Do not extend or retract the boom abruptly.
- ► Do not exceed a maximum lateral angle of inclination of 10°.
- ► Do not exceed a maximum sloping angle of 15°.

WARNING

Crushing hazard. Due to tilting the machine in the immediate vicinity of walls or parts of buildings.

Danger of serious crushing that can cause death or serious injury.

- ► Ensure that no parts of the body protrude outside the machine.
- ► All persons must stay clear of the danger zone when tilting the machine.
- ► Neither access nor leave the machine when it is tilted.

NOTICE

Tipping hazard of machine. Damage to machine due to open doors and covers.

- ► Perform smooth and slow movements with the machine.
- ► All doors and covers must be closed when tilting the machine.
- ► Tilt the machine only on firm ground.
- ► Tilt the machine only if it is at a standstill and if the attachment is empty.
- ► Never turn, lower, or set down the attachments abruptly.
- ► Do not extend or retract the boom abruptly.
- ► Do not exceed a maximum lateral angle of inclination of 10°.
- ► Do not exceed a maximum gradient angle of 15°. Do not exceed a maximum sloping angle of 15°.
- ► On a slope, position the machine so that the upper carriage is tilted toward the slope.

NOTICE

Walls and parts of building touched by machine.

- ► When working in the immediate vicinity of a wall or parts of a building, ensure that the upper carriage does not touch anything when it is tilted.

Tilting the upper carriage hydraulically and steplessly by up to 15° allows you to compensate slopes of up to 27 %.

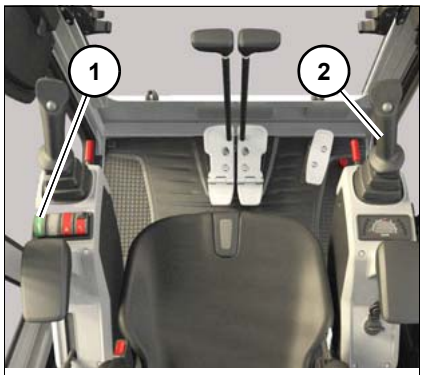


Fig. 222Tilting/lowering the upper carriage

Lowering the upper carriage:

1. Press and hold switch **1** backward.
2. Press the right-hand control lever **2** to the right.
   ➥ The upper carriage is lowered.
3. If the required tilt angle is reached, return control lever **2** to the neutral position and release button **1**.

Tilting the upper carriage:

1. Press and hold switch **1** backward.
2. Press the right-hand control lever **2** to the left.
   ➥ The upper carriage is tilted.
3. If the required tilt angle is reached, return control lever **2** to the neutral position and release button **1**.

Shovel bucket operation

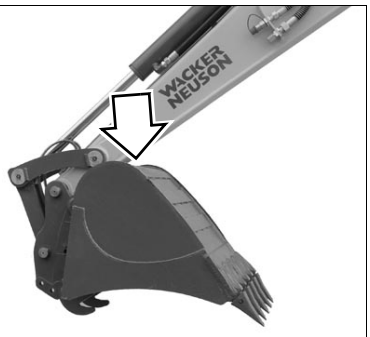


Fig. 223Damage during shovel bucket operation

With some restrictions, Wacker Neuson backhoe buckets can also be used for shovel bucket operation.

NOTICE

Do not tilt the bucket fully back in shovel bucket operation, otherwise the bucket base can touch and damage the stick.

Trailer operation

The machine is not certified for trailer operation!

5.14 Putting out of operation/back into operation

The specified measures refer to putting the machine out of operation and back into operation after more than 30 days.

Putting out of operation temporarily

Store the machine indoors if possible.

If the machine has to be stored outdoors, place it on a wooden base (if possible) and cover it with a watertight tarp to protect it against humidity.

1. Park the machine – *see "Parking the machine" on page 5-8*.
2. Clean the engine with a high-pressure cleaner in a suitable place – *see chapter "7.5 Cleaning and maintenance" on page 7-20*.
3. Check the machine for leaks and loose nuts, screws and connections.
4. Carefully clean and dry the entire machine.
5. Spray an anticorrosion agent onto bare metal parts of the machine (for example piston rods of hydraulic cylinders).
6. Apply grease to all lubrication points.
7. Fill the fuel tank completely.
8. Check the hydraulic oil and coolant levels, and add hydraulic oil and coolant if necessary.
9. Change engine oil.
10. Remove the battery and store it in a safe place. Charge the battery and perform battery maintenance at regular intervals.
11. Set the fuel cock to **OFF**.
12. Close the air-intake openings of the air filter system and exhaust pipe.

Putting back into operation

Information

If the machine was put out of operation over a longer period of time without performing the steps specified above, contact a Wacker Neuson service center before putting the machine back into operation.

1. Remove anticorrosion agents from bare metal parts.
2. Charge, install and connect the battery.
3. Open the air-intake openings of the air filter system and exhaust pipe.
4. Check the condition of the air filter elements and replace the elements if necessary.
5. Check the dust valve.
6. Switch on the fuel filter (turn it to ON).
7. Turn the starting key to position **1** for 2 minutes to supply the engine with fuel.
8. Check the machine for leaks.
9. Lubricate the machine according to the lubrication plan.
10. Check all engine/machine fluids in the units or reservoirs, and add fluids if necessary.
11. If the machine was out of operation for over 6 months, change the oil in the gearbox, engine, hydraulic oil reservoir and other units.
12. Replace the hydraulic oil filters (return and breather filters) if the machine was out of service for over 6 months.
13. Remove and keep the starting key and fuse **F1** in a safe place.
14. Insert the starting key and make the engine turn 15 seconds.
15. Wait 15 seconds.
16. Make the engine turn another 15 seconds.
17. Remove the starting key and put fuse **F1** back in.
18. Start the engine.
19. Let the engine run at idling speed for at least 15 minutes without load.
20. Check the oil levels in all units and add oil if necessary.
21. Check the machine for leaks.
22. Avoid operation at maximum engine speed or load for an hour.

Start the machine and ensure that each function and all warning systems work correctly before putting the machine back into operation.

5.15 Permanently putting out of operation

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 in an environmentally friendly manner.

Disposal may only be performed by a Wacker Neuson service center. Observe the corresponding national guidelines regarding disposal.

Environment

Avoid damage to the environment. Do not allow environmentally damaging wastes to get into the ground or stretches of water and dispose of them in an environmentally friendly manner.

If the machine is no longer used according to its designated use, ensure that it is 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.

Notes:

6 Transport

6.1 Towing the machine

Important information regarding towing

WARNING

Accident hazard due to towing!

Can cause serious injury or death.

- ► The machine may only be towed using suitable towing equipment (towing bar or cable) in connection with suitable towing facilities, such as a towing coupling, hooks and eyes.
- ► Start machine travel and tow away slowly.
- ► Ensure that no one is between the vehicles during towing.
- ► Have a recovery service or a Wacker Neuson service center tow the machine away if necessary.
- ► See chapter “Safety, section 2.8”.
- ► Ensure that no one is near the towing bar or cable. The lateral safety distance is equal to 1.5 times the length of the towing equipment.

NOTICE

Only tow the machine if absolutely necessary.

- ► Tow away the machine only if the engine is running and if the drive is functional. A malfunctioning machine must be loaded with a crane.
- ► If necessary, contact a Wacker Neuson service center for towing the machine away.
- ► Fasten the towing equipment only on the towing eye provided for this.
- ► The maximum permissible load of the towing eye hook is equal to 1.5 times the maximum weight of the machine.
- ► A tractor vehicle of the same weight category must be used as a minimum.
  In addition, the tractor vehicle must be equipped with a safe braking system and sufficient tractive power.

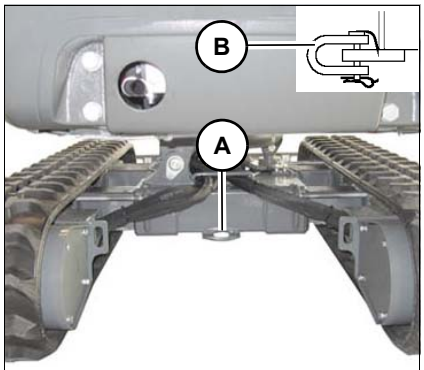


Fig. 224Towing gear

1. Ensure that the machine can be towed safely.
2. Use towing eye hook **A** of the machine for towing.
3. Use towing eye **A** only for towing.
4. Secure shackle **B** with the shackle pin and a lock pin.
5. Install towing equipment of appropriate size on the shackle.
6. Start machine travel and tow away slowly.
7. Tow away the machine only until it can travel on its own.

Information

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

Using towing eye hook **A** to pull other machines or to tow equipment is prohibited.

6.2 Loading the machine

Important information regarding loading

WARNING

Accident hazard due to incorrect loading!

Incorrect loading can cause accidents and serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► Observe the loading weight. Add the weight of subsequently installed accessories to the weight of the vehicle.

Driving onto transport vehicles

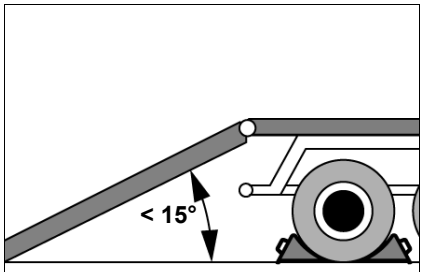


Fig. 225Access ramps

Preparations

1. Secure the transport vehicle with chocks to prevent it from rolling.
2. Position the ramps at the smallest possible angle. Ensure that the grade does not exceed 15° (27 %).
3. Use access ramps with an antiskid surface only.
4. Ensure that the loading area is clear and access to it is not obstructed – due to superstructures, for example.

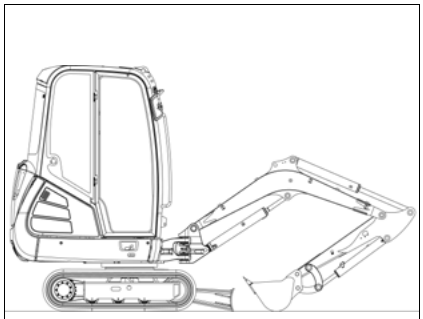


Fig. 226Transport position

1. Driving onto transport vehicles
2. Start the engine of the machine.
3. Raise the attachment and the stabilizer blade to avoid touching the ramps.
4. Carefully drive the machine onto the middle of the transport vehicle.
5. Move the machine to transport position.
6. Stop the engine.
7. Raise the control lever base.
8. Remove the starting key and carry it with you.
9. Leave the cabin, close and lock all doors, windows and covers.
10. Secure and tie down the machine.

Crane-lifting

WARNING

Accident hazard due to incorrect loading!

Incorrect loading can cause accidents and serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► Observe the loading weight. Add the weight of subsequently installed accessories to the weight of the vehicle.
- ► The machine may only be raised with suitable lifting gear.

NOTICE

Possible damage to the machine due to incorrect loading.

- ► Observe the loading weight. Add the weight of subsequently installed accessories to the weight of the vehicle.
- ► The machine may only be raised with suitable lifting gear.

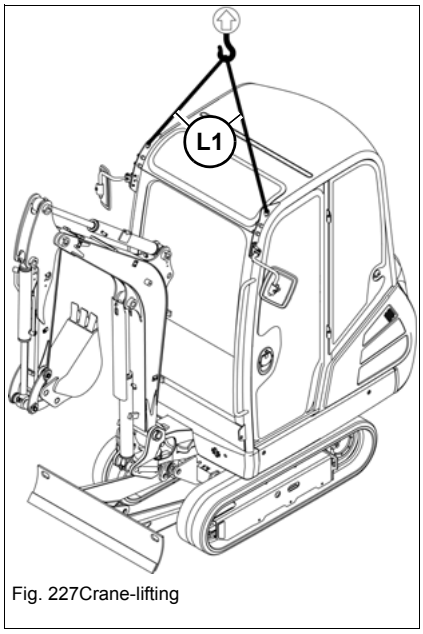


Fig. 227Crane-lifting

1. Fit an empty standard bucket and lock it safely.
2. Remove all dirt from the machine.
3. Park the vehicle on firm, level, and horizontal ground.
4. Tilt in the standard bucket and lower it to transport position.
5. Fully raise the boom.
6. Pull the stick toward the machine.
7. Raise the stabilizer blade.
8. Position the boom straight ahead at the center of the machine.
9. Stop the engine.
10. Operate the control lever repeatedly to release the pressure in the hydraulic system.
11. Raise the control lever base.
12. Remove the starting key and carry it with you.
13. Remove all loose objects from inside the machine.
14. Leave the cabin, close and lock all doors, windows and covers.
15. Install suitable slings at the points provided for lifting the machine.
16. Slowly raise the machine until there is no more contact with the ground.
17. Wait until the machine does not swing any more.
18. If the balance, and the condition and position of the slings is correct, slowly raise the machine to the required height and load it.

Mandatory length L1 of slings:

Length	Dimension
L1	Minimum 1300 mm (51 in)

6.3 Transporting the machine

Important information regarding transport

The swivel unit brake is enabled if:

- the control lever base is raised.
- The starter is turned to position **0** or the engine is stopped.

This secures the upper carriage against rotation.

Tying down

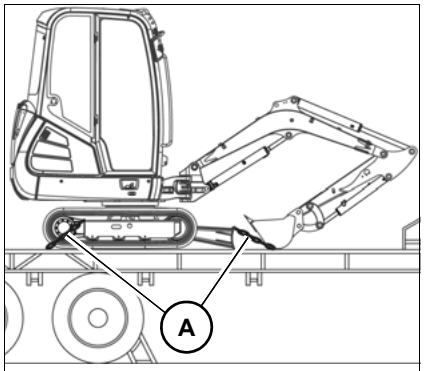


Fig. 228Tying down the machine

1. Ensure that the authorized maximum height is not exceeded.
2. Secure the machine at the tie-down points.
3. Position the boom straight ahead at the center of the machine.
4. Lower the boom and the stabilizer blade.
5. Firmly fasten the machine on the loading area with tie-down points **A** with slings of appropriate size (observe the legal regulations).
6. Before transporting the machine through heavy rain:
   close the outlet of the exhaust pipe with a simple cap or suitable adhesive tape.
7. Ensure that the driver of the transport vehicle knows the overall height, width and weight of his transport vehicle (including the machine) before moving off, and the legal transport regulations of the countries where transport is taking place.

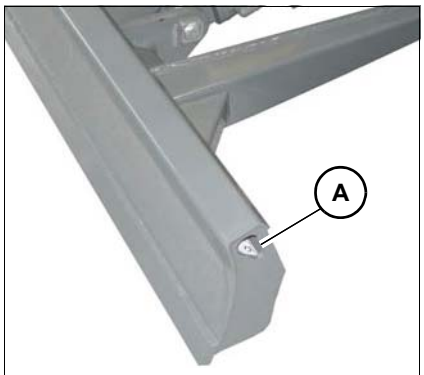


Fig. 229Lashing points on either side of stabilizer blade

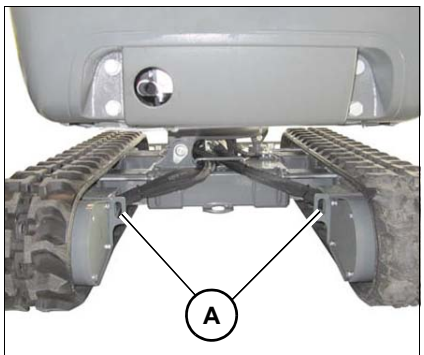


Fig. 230Lashing points inside the travel gear

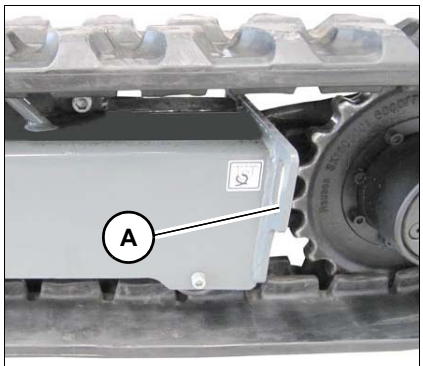


Fig. 231Lashing points on either side outside on the travel gear

7 Maintenance

7.1 Information on maintenance

Responsibilities and prerequisites

The working order and the service life of machines are heavily dependent on maintenance.

Daily and weekly servicing and maintenance must be performed by specifically trained personnel.

Have the maintenance, delivery inspection and the entries in the service booklet performed by a Wacker Neuson service center, otherwise warranty claims will not be acknowledged.

It is therefore in the interest of the machine owner to perform the mandatory maintenance.

This is necessary to ensure optimal functioning. Immediately repair or replace parts that are already damaged or not working properly before they are due for replacement.

Repair or replacement of safety-relevant parts may be performed only by a Wacker Neuson service center.

Repair or replacement of safety-relevant parts may be performed only by a Wacker Neuson service center.

The manufacturer shall not be liable for damage to the machine or injury caused by failure to observe the specific information and descriptions

Important safety instructions on maintenance

- Follow all safety instructions given in this Operator's Manual.
- Follow the instructions given in chapter **Safety, safety instructions on maintenance** and **qualification of the operating and maintenance personnel** in this Operator's Manual.
- Follow the maintenance and safety instructions given in the Operator's Manuals of the attachments.
- In order to avoid injury hazard, do not perform work on a hot and running engine.
- Wear protective gloves and clothing.
- Observe the danger indications and safety instructions during maintenance.
- Use a suitable container to collect fluids and lubricants as they flow out and dispose of them in an environmentally friendly manner.
- Attach a warning label to the control elements (for example, **"Machine being serviced, do not start"**).
- Stop the machine (see Preparing lubrication).

7.2 Maintenance overview

Maintenance plan

Daily maintenance (user)	
Inspection work (Check the following fluids and lubricants, check the oil levels after a test run and add oil if necessary)	Page
Check the fluids and lubricants (engine oil, engine coolant, hydraulic oil)	*7-31*, *7-33*, *7-41*
Check the radiator and hydraulic oil cooler for dirt, clean them if necessary	*7-34*
Lubricate the machine according to the lubrication schedule	*7-6*
Check the dirt indicator on the air filter [1]	*7-36*
Check the water separator and fuel filter: drain water if necessary (see sight glass)	*7-29*, *7-30*
Check the track tension and retension the tracks if necessary	*7-47*, *7-48*
Check the engine air intake	*7-38*
Check pin lock	--
Check line fixtures	--
Check indicator lights for correct function	*4-32*
Check the hydraulic couplings for dirt	--
Check the threaded fittings of the protective structures (for example the cabin) for tightness	--
Option	
Adjust the mirrors correctly, clean them and check them for damage, check the fastening screws and tighten them if necessary	*4-15*
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	--
Travelling drive	--
Cooling systems, heating, and hoses (visual check)	--
Option	
Hydraulic quickhitch (Easy Lock) and Powertilt (hoses, valve)	--
Visual check	
Functionality; Deformations, damage, superficial 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 (for example the front guard, FOPS)	--
Check the tracks for damage	--
Check the travel gear for damage (for example the track rollers, insert rolling bearings)	--
Check the piston rods of the cylinders for damage	--
Check the seat belt for damage	--

Daily maintenance (user)	
Option	
Check the load hook, joint rod, lifting eyes	*7-50*
Check the hydraulic quickhitch (Easy Lock) for damage	--
Check the Powertilt for damage	--
Weekly maintenance (every 50 operating hours) (user)	Page
Lubricate the machine according to the lubrication schedule	*7-6*
Clean the lights/light system, signaling system, acoustic warning system	--
Check V-belt condition and tension	*7-39*, *7-40*
Option	
Actuate Powertilt swivel device in final position for 1 minute [2]	--
All steps for previous maintenance intervals	--

1. Air filter replacement according to the dirt indicator, every 1000 o/h or once a year at the latest. (Replace after 50 o/h when in extensive use in environments with acidic air, such as acid production facilities, steel and aluminum mills, chemical plants and other nonferrous-metal plants, independently of the dirt indicator)
2. Rinse the system to remove dirt. Repeat the procedure in the opposite flow direction.

Information

Check the antifreeze at temperatures below 4 °C (39 °F).

Once at 50 operating hours (Wacker Neuson service center)	
Engine oil change (Tier IV final – up to 2012/Tier IV final – from 2012)	--
Engine oil filter change (Tier IV final – up to 2012/Tier IV final – from 2012)	--
Hydraulic oil filter insert replacement	--
Drive gearbox oil replacement	--
Check V-belt condition and tension	--
Check screws for tightness	--
Check labels and Operator's Manual for completeness and condition	--
All steps for maintenance once a day and once a week	7-2

Every 250 (500, 750, 1000, etc.) operating hours (Wacker Neuson service center)	
Engine oil change (Tier IV final – from 2012)	--
Engine oil filter change (Tier IV final – from 2012)	--

Every 500 (1000, 1500, 2000, etc.) operating hours (Wacker Neuson service center)	
Engine oil change (Tier IV final – up to 2012)	--
Engine oil filter change (Tier IV final – up to 2012)	--
Fuel filter replacement	--
Clean the water separator (prefilter element)	--
Hydraulic oil filter insert replacement	--
Replace the V-belt	--
Drain the condensation water from the hydraulic oil reservoir	--
Check the drive gearbox oil	--
Remove dust from dust valve	--
Drain the condensation water (fuel tank)	--
Check bearing play of tread rollers, track carrier rollers, front idlers	--
Check the electric cables and connectors (cable and grounding connections, etc.)	--
Check screws for tightness	--
Resetting the maintenance meter	--
Clean the fresh-air filter (replace it if necessary)[1]	
All steps for maintenance once a day and once a week	7-2
Option	
Check Powertilt for axial play (must not be over 0.38 mm/0.015 in)	--

1. When in extensive use in dusty environment, after 1000 o/h at the latest

Every 1000 (2000, 3000, 4000, etc.) operating hours or once a year (Wacker Neuson service center)	
Hydraulic oil replacement	--
Replacement of hydraulic oil reservoir breather filter	--
Drive gearbox oil replacement	--
Replacement of air filter elements [1]	--
Check the pilot control filter for dirt, clean it if necessary	--
Check valve clearance, adjust if necessary	--
Replacing the fresh-air filter	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 operating hours)	*7-2*, *7-4*
Option	
Wear of load hook and joint rod (check at least once a year)	--

1. Air filter replacement according to the dirt indicator, every 1000 o/h or once a year at the latest. (Replace after 50 o/h when in extensive use in environments with acidic air, such as acid production facilities, steel and aluminum mills, chemical plants and other nonferrous-metal plants, independently of the dirt indicator)

Every 1500 (3000, 4500, etc.) operating hours (Wacker Neuson service center)	
Check the injection nozzles and clean and test them if necessary	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 operating hours)	

Every 2000 (4000, 6000, etc.) operating hours or every 2 years (Wacker Neuson service center)	
Coolant replacement	--
Check the bladder-type accumulator	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 and 1000 operating hours)	*7-2*, *7-4*, *7-5*, *7-5*

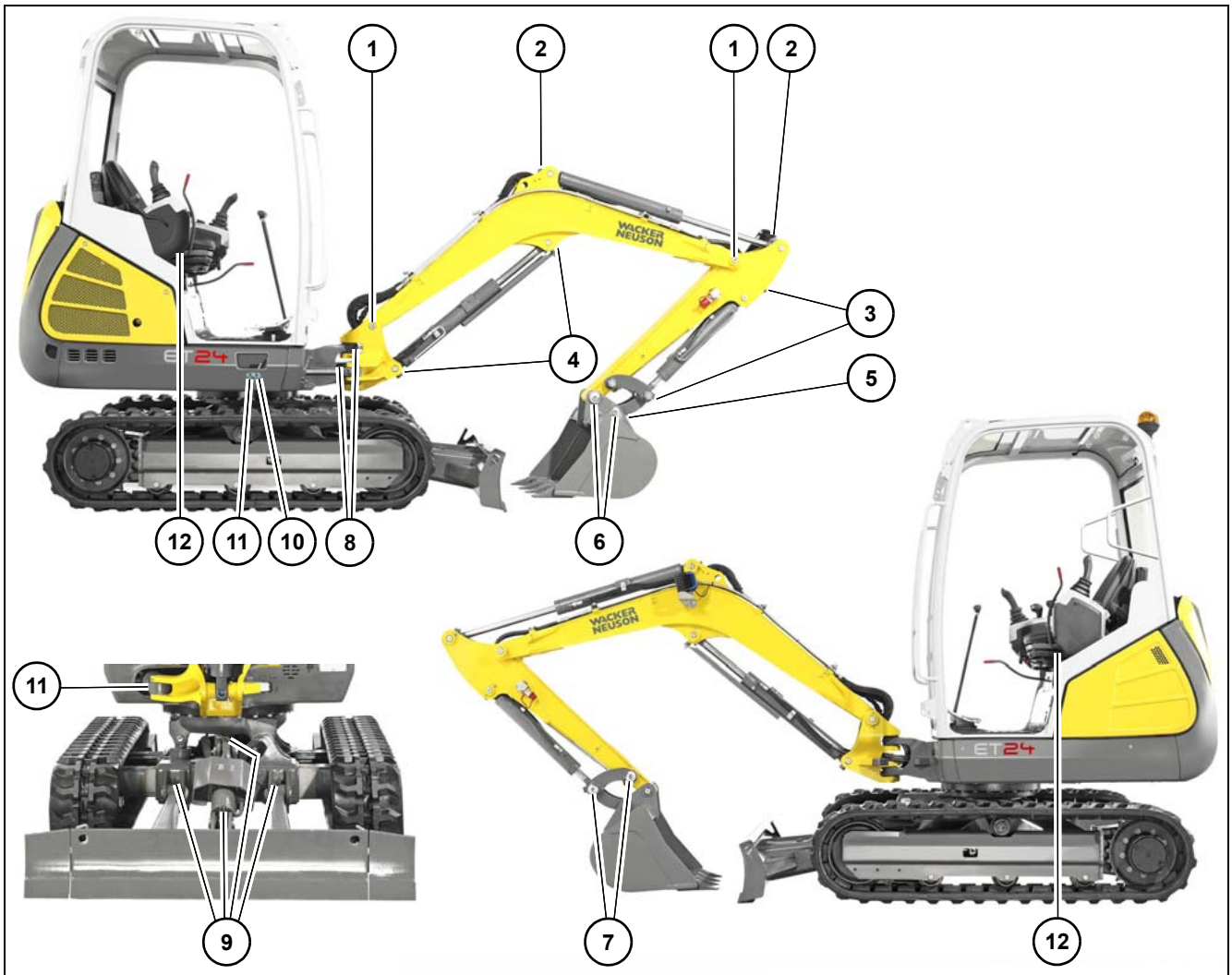
Information

Maintenance with the note **Wacker Neuson service center** must only be performed by the trained and qualified personnel of a **Wacker Neuson service center**.

Information

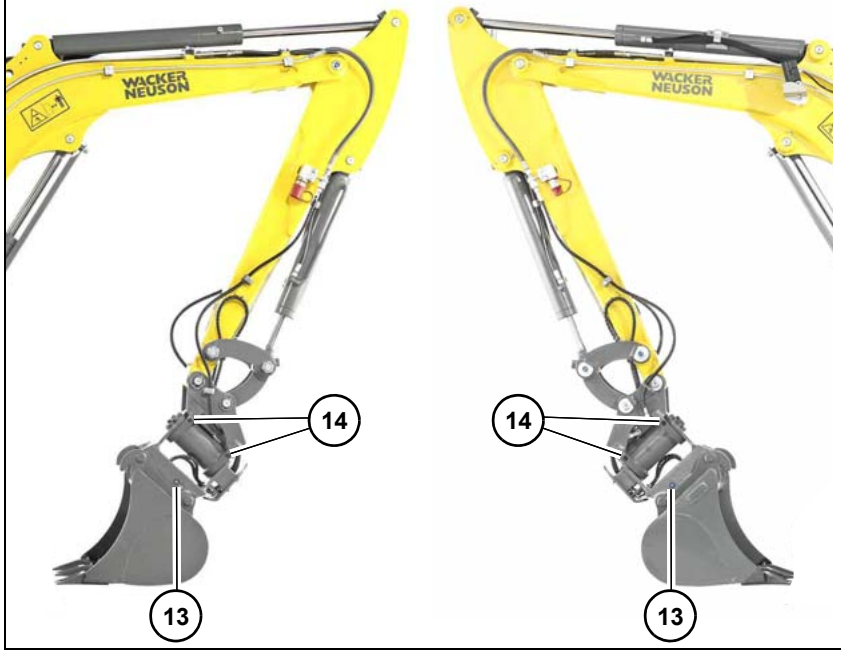
The maintenance meter starts at 500.0 hours. It counts down to 0.0 hours. A wrench symbol flashes as soon as the maintenance meter reaches this value.

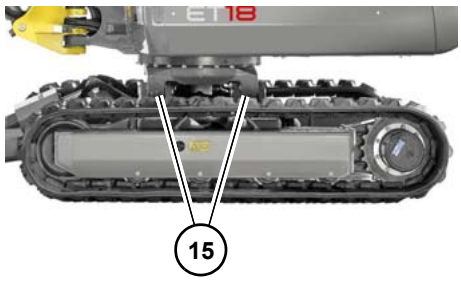
Lubrication plan



Powertilt with hydraulic quickhitch (option)

Vertical Digging System (option)





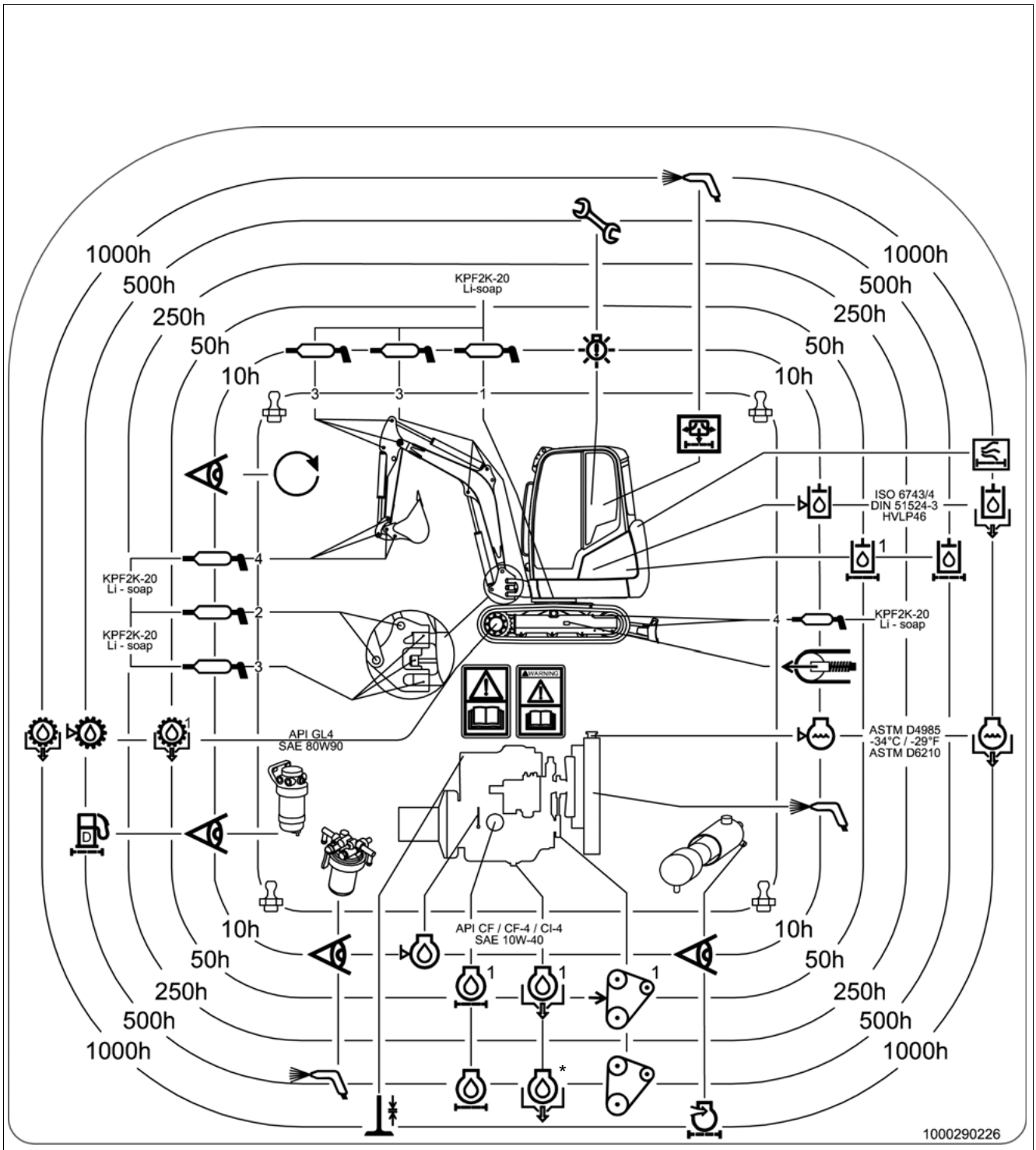
Position	Lubrication point	Interval	Quantity
1	Boom	Daily	2
2	Stick cylinder	Daily	2
3	Bucket cylinder	Daily	2
4	Boom cylinder	Daily	2
5	Joint rod	Daily	1
6	Bucket pin	Daily	2
7	Joint rod pin	Daily	2
8	Swiveling console	Daily	2
9	Stabilizer blade	Every week	4
10	Ball bearing race	Every week	1
11	Swiveling cylinder	Daily	2
12	Control lever base Control lever base (two-door cabin option)	Every week	3 (6)
13	Hydraulic quickhitch (option)	Daily	2
	Claw	Every week	--
14	Powertilt (option)	Daily	4
15	Vertical Digging System (VDS) (option)	Every week	2
16	Door hinge (cabin option) Door hinge (two-door cabin option)	Every week	2 4
17	Pin, lock notch and lock (cabin option)	Every week	4
18	Front window rail (cabin option)	Every week	2

Green means: lubrication every 50 hours or once a week.

Blue means: lubrication every 10 hours or daily.

Maintenance label

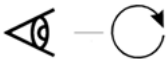
Some maintenance may only be performed by a Wacker Neuson service center (see maintenance plan).



*Motor oil change interval tier IV final (from 2012): First service at 50 hours of operation; then at 250, 500, 750

Fig. 232Maintenance label overview

Explanation of symbols on the maintenance label

Symbol	Assembly	Explanation
	General	Visual check
	General	Visual check of machine
	General	Lubrication points
	General	Clean the radiator fins, water separator and fresh-air filter of the heating
	fuel system	Replace the fuel filter
	Radiator	Check the coolant
	Radiator	Draining coolant
	Engine	Check the engine oil level
	Engine	Changing engine oil
	Engine	Replacing the engine oil filter
	Engine	Replacing the V-belt
	Engine	Checking V-belt tension
	Engine	Replace the air filter element
	Engine	Checking valve clearance
	Travelling drive	Check the gearbox oil of the drive
	Travelling drive	Replace the gearbox oil of the drive
	Travel gear	Checking track tension
	Hydraulic system	Check the oil level of the hydraulic system
	Hydraulic system	Replace the hydraulic oil
	Hydraulic system	Replace the hydraulic oil filter insert
	Hydraulic system	Replace the breather filter of the hydraulic oil reservoir
	Cabin	Clean the fresh-air filter
	Cabin	Indicator lights are being checked
	Cabin	Resetting the maintenance meter

7.3 Fluids and lubricants

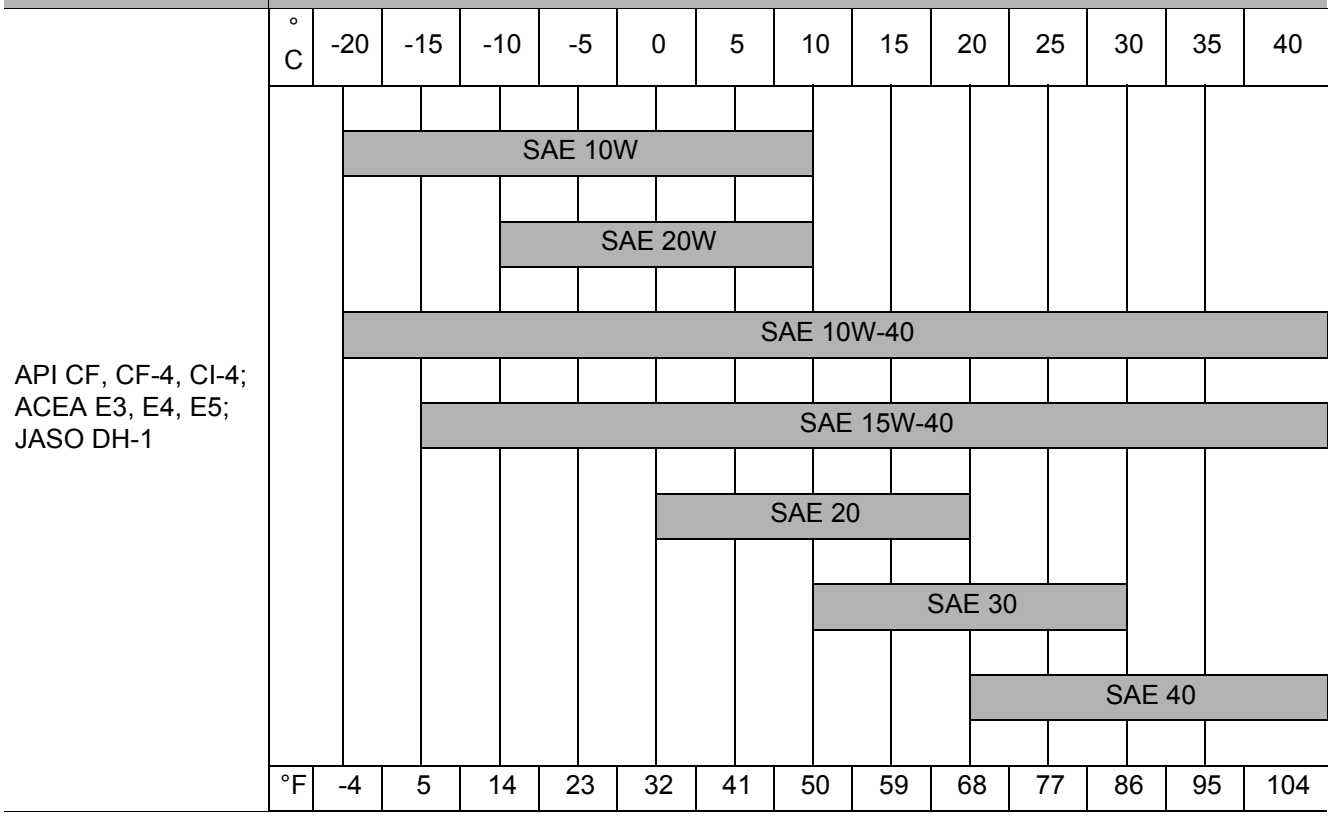
Fluids and lubricants

Unit	Fluid/lubricant	Specification	Season/temperature	Capacities [1]
Diesel engine	Engine oil[2]	SAE 10W-40	-15 °C (-5 °F) +45 °C (+104 °F)	About 3.5 l (0.9 gal)
Hydraulic oil reservoir	Hydraulic oil	HVLP 46[3]	Year-round[4]	19.1 liters (5 gal)
	Biodegradable oil[5]	Panolin HLP Synth 46		
		BP BIOHYD SE-S 46		
Grease	Roller and friction bearings	KPF 2 K-20[6] ISO-L-X-BCEB 2[7]	Year-round	As required
	Open transmissions live ring: ball bearing			
	Live ring gears			
	Grease zerks			
Battery terminals	Acid-proof grease [8]	FINA Marson L2	Year-round	As required
Fuel [9]	Diesel fuel[10]	ASTM D975-94: 1D, 2D (USA)	Summer or winter diesel depending on outside temperatures	24.2 l (6.4 gal)
		EN 590 (EU)		
		ISO 8217 DMX (International)		
		BS 2869-A1, A2 (GB)		
		JIS K2204 (Japan)		
		KSM-2610 (Korea)		
		GB252 (China)		
	Biodiesel	EN 14214		
		ASTM D-6751		
Engine cooling system	Coolant	Distilled water and antifreeze SF D12 Plus/ ASTM D4985 (reddish)[11]	Year-round	3.5 l (0.9 gal)
		Distilled water and antifreeze D40 Super/ ASTM 6210 (violet)[12]		
Control lever base	Adhesive fluid grease	Förch S401	Year-round	As required
Washer system	Cleaning solution	Water and antifreeze	Year-round	1.22 l (0.3 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. Depending on local conditions – *see "Engine oil types" on page 7-11*.
5. Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES.
6. KPF 2 K-20 according to DIN 51502 lithium-saponified grease.
7. ISO-L-X-BCEB 2 according to DIN ISO 6743-9, lithium-saponified grease.
8. Standard acid-proof grease NGLI category 2.
9. Sulfur content below 0.05 %, cetane number over 45
10. In countries where level 3A/Tier IV exhaust emission regulations apply provisionally, use diesel fuels with a sulfur content of < 15 ppm.
11. ET18: up to serial number WNCE1202PPAL01199; ET20: up to serial number WNCE1203HPAL00699; ET24: up to serial number WNCE1204TPAL00599
12. ET18: from serial number WNCE1202HPAL01200; ET20: from serial number WNCE1203CPAL00700; ET24: from serial number WNCE1204LPAL00600

Engine oil types

Engine oil grade	Ambient temperature (°C)



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.

► Observe the following intervals.

Application		Hydraulic oil	Hydraulic oil filter insert
Normal work		Every 1000 o/h	Replace the first time after 50 o/h, then every 500 o/h
Percentage of hammer work	20%	Every 800 o/h	300 o/h
	40%	Every 400 o/h	
	60%	Every 300 o/h	100 o/h
	Over 80 %	Every 200 o/h	

Hydraulic oil types

Hydraulics oil grade	Ambient temperature (°C)														
	°C	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	50
HVLP 46 [1]		ISO VG32													
					ISO VG46										
							ISO VG68								
	°F	-4	5	14	23	32	41	50	59	68	77	86	95	104	122

1. According to DIN 51524 section 3, ISO-VG 46.

Important information regarding operation with biodegradable oil

- Use only the biodegradable oils that 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 oil.
- 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 oil 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 % by weight 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.
- 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.

7.4 Maintenance accesses

Engine cover

WARNING

Burn hazard due to hot engine parts!

Can cause serious injury or death.

► Stop the engine and allow it to cool down at least 10 minutes.

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

► Open the engine cover only at engine standstill.

CAUTION

Injury hazard due to open engine cover!

Can cause injury.

► Take care not to knock your head on the open engine cover.

Fig. 233Engine cover lock

Opening:

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover by pressing button **A**.

The engine cover is supported by a gas strut.

Closing:

Firmly press down the engine cover.

Locking and unlocking:

The engine cover is locked with the starting key.

Turn the starting key in lock **A** to the right **R**.

➥ Engine cover locked.

Turn the starting key in lock **A** to the left **L**.

➥ Engine cover unlocked.

Cover on the left

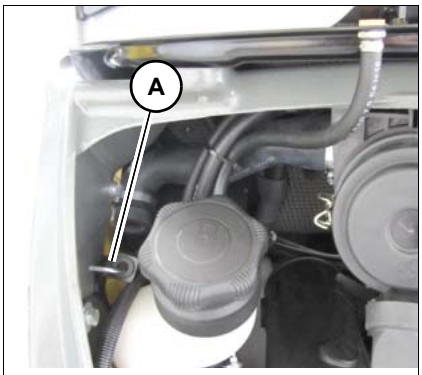


Fig. 234Opening the lock

Opening:

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Pull out lock **A**.

➥ The side cover is folded sideways.

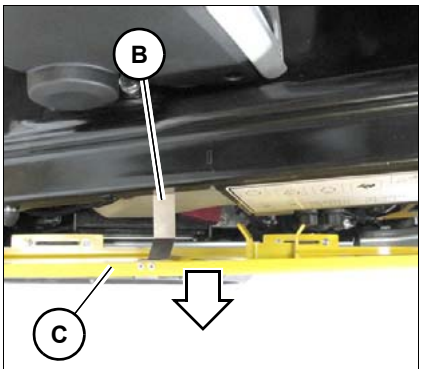


Fig. 235Unlocking the bow clip

4. To unlock bow clip **B**, press and hold it downward.
5. Push side cover **C** forward.

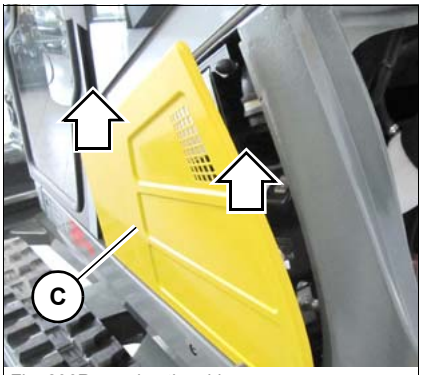


Fig. 236Removing the side cover

6. Remove side cover **C**.

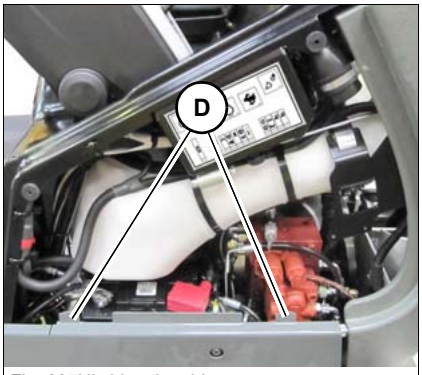


Fig. 237Hitching the side cover

Closing:

1. Hitch side cover **C** into both shackles **D**.

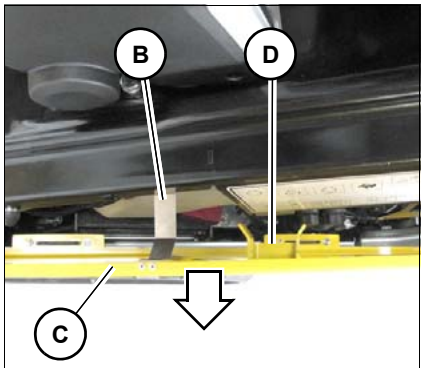


Fig. 238Hitching the side cover

2. Press bow clip **B** downward and hitch it.
3. Position lock **D** opposite notch **B**.
4. Press side cover **C** toward the machine with both hands until it engages with an audible click.
5. Close the engine cover.

Cover on the right

Fig. 239Opening the cover on the right

Opening:

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Unscrew both screws **A**.
3. Fold down the side cover.
4. Remove the side cover.

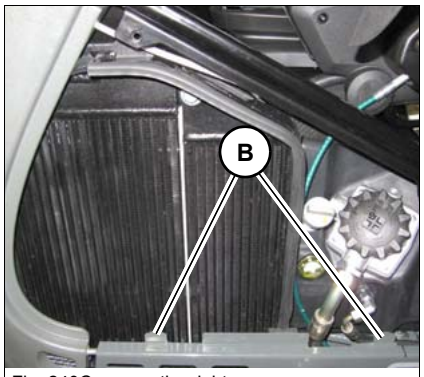


Fig. 240Cover on the right

Closing:

1. Hitch the side cover on the lower side into both shackles **B**.
2. Raise the side cover.
3. Tighten both screws **A**.

Fuse box

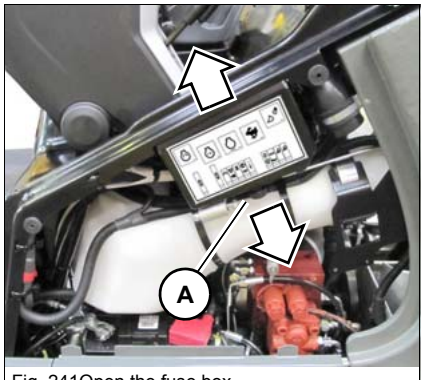


Fig. 241Open the fuse box

Opening:

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the cover on the left.
3. Slacken screws **A** and lower the cover.

Closing:

1. Install the cover and tighten screws **A**.
2. Close the side cover.

Removing/installing the cabin/canopy

DANGER

Danger of accidents when performing machine travel without cabin/canopy!

Causes serious injury or death.

- ► Performing machine travel with a removed cabin/canopy is only allowed for performing machine travel over very short distances.
- ► Fastening the seat belt is prohibited.
- ► Do not perform any work without a cabin/canopy.
- ► Obtain the approval of the appropriate national authority.
- ► Machine travel is only allowed on level ground.
- ► Avoid tipping movements of the machine under all circumstances.
- ► Machine travel in areas involving a risk of falling objects is prohibited.

NOTICE

Check for damage as you raise the machine.

- ► Slowly raise the cabin.
- ► Wait until the machine does not swing any more.
- ► The lifting gear must not chafe or touch glass surfaces.

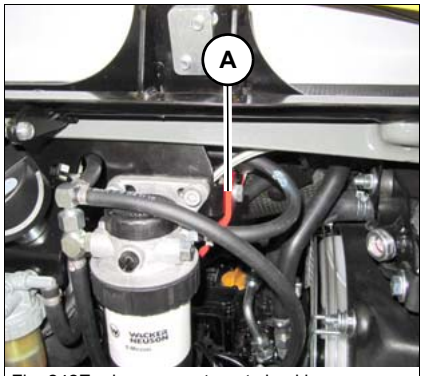


Fig. 242Engine compartment shackle

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Remove shackle **A** in the engine compartment.

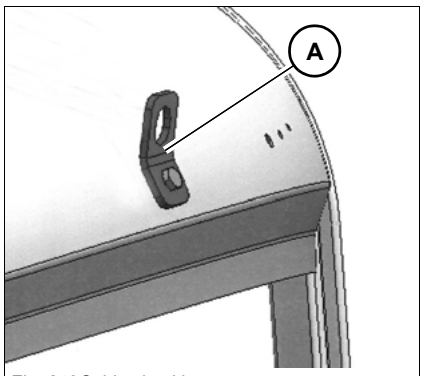


Fig. 243Cabin shackle

4. Remove the rear roof lights (option).
5. Install shackle **A** and tighten the screw to 45 Nm (33.2 ft.lbs).

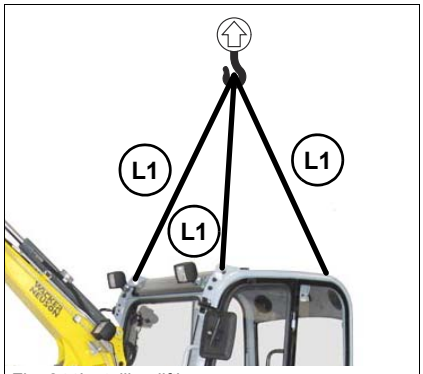


Fig. 244Installing lifting gear

6. Install the lifting gear at the points on the cabin provided for lifting the machine. The required length **L1** is 1000 mm (39.4 in).
7. Apply tension to the cabin with the lifting gear.

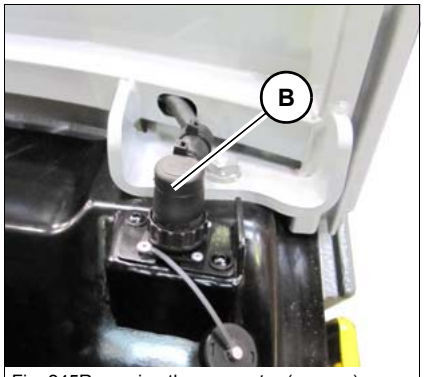


Fig. 245Removing the connector (canopy)

8. **Canopy:** Remove the electric connector **B**. The connector is located on the left behind the operator seat.
   Install the protective cap to protect the connector.

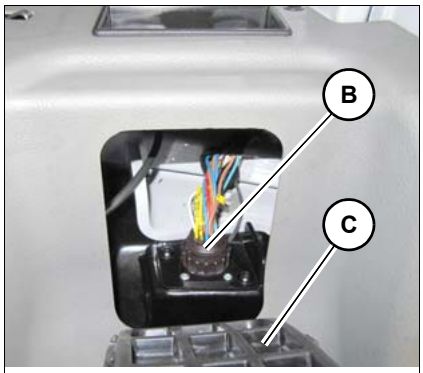


Fig. 246Removing the connector (cabin)

9. **Cabin (option):** Fold cover **C** forward. Remove the electric connector **B**. The connector is located on the left behind the operator seat.
   Install the protective cap to protect the connector.

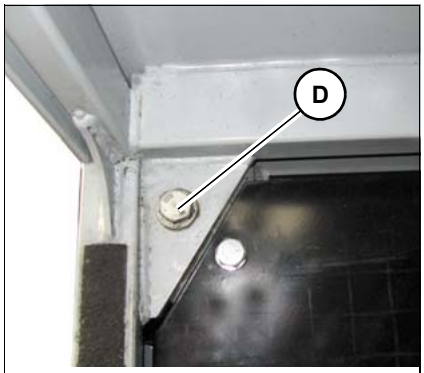


Fig. 247Screws on the left and right

10. Raise the floor mat on either side.
11. Remove screws **D** on either side in the leg-room area.

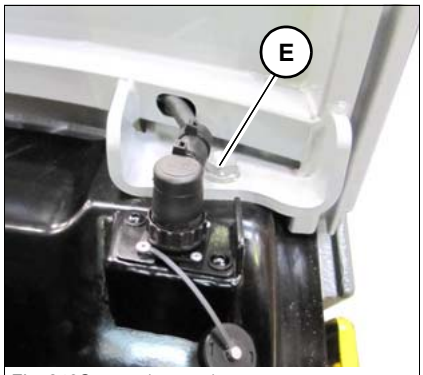


Fig. 248Screws (canopy)

12. **Canopy:** Remove screws **E** on either side.

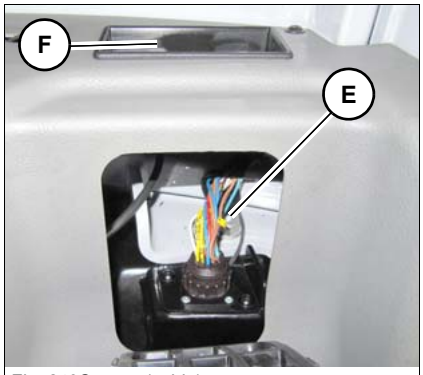


Fig. 249Screws (cabin)

13. **Cabin (option):** Remove screws **E** on either side.
14. Raise the cabin as follows:
    - Raise the control lever base.
    - Remove the starting key and carry it with you.
    - Close the doors, windows and all covers.
    - Remove all loose objects from inside the machine.
    - Leave the cabin.
    - Close and lock all covers.
15. Set down the cabin safely and ensure that it cannot tip over.
16. Install the cabin in the reverse order.
17. Tighten screws **D** and **E** to 110 Nm (81 ft.lbs). The washers and securing elements can be used again.

Information

Cover **F** can be removed for better access.

7.5 Cleaning and maintenance

Important information on cleaning and maintenance

Cleaning the machine is divided into 3 separate areas:

- Inside the cabin.
- Exterior of the machine.
- Engine compartment.

The wrong choice of cleaning equipment and agents can impair the operating safety of the machine on the one hand, and on the other undermine the health of the persons in charge of cleaning the machine. Follow the information below.

Cleaning with washing solvents

- Ensure sufficient room ventilation.
- Wear suitable protective clothing.
- Do not use flammable liquids, such as gasoline 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 sufficient room ventilation.
- Do not use unprotected lights or open flames.
- Do not smoke.

Environment

In order to avoid damage to the environment, clean the machine only in wash bays and places provided to this effect.

Use of solvents

NOTICE

Do not clean rubber and electrical parts with solvents.

► Do not use solvents, benzine, or other aggressive chemicals.

Cleaning the cabin/canopy

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

Cleaning the outside of the machine

We recommend using the following aids to clean the machine:

- High-pressure cleaner
- Steam jet

Cleaning the engine compartment

WARNING

Burn hazard due to hot engine parts!

Can cause serious injury or death.

► Stop the engine and allow it to cool down at least 10 minutes.

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

► Open the engine cover only at engine standstill.

NOTICE

When cleaning the engine with a water or steam jet, the humidity penetrating the electronics causes it to fail and leads to engine damage!

- ► The engine must be cold.
- ► Do not point the water jet directly at any of the electric sensors such as temperature and oil pressure switches or control valves.
- ► Protect all electric parts, such as the alternator, connectors, relays, etc. from humidity.
- ► If water contacts electrical components, dry them with compressed air and apply contact spray to them.

Clean the engine compartment as follows:

1. Park the machine in a wash bay or place suitable for washing.
2. Stop the engine. See “Preparing lubrication”.
3. Clean the machine.

Cleaning the seat belt

Keep the seat belt clean, as coarse dirt can impair the proper functioning of the seat belt buckle.

Clean the seat belt (which remains fitted in the machine) with a mild soap solution only. Do not use chemical agents as they can destroy the fabric!

Cleaning the shatter protection

Clean the window only with water and a mild soap solution.

Do not use aggressive detergents!

Do not use brushes, steel wool or similar abrasive means. Never wipe dust in a dry state.

Threaded fittings and attachments

All threaded fittings must be checked regularly for tightness.

- Engine fastening screws
- Fastening screws on the hydraulic system
- Line, bucket teeth and pin fastenings on the attachment

Retighten loose connections immediately, and have them immediately replaced by a Wacker Neuson service center if necessary.

7.6 Lubrication work

Preparing lubrication

Fig. 250Parking the machine

1. Stop the machine on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the machine.
3. Lower the boom and the stabilizer blade to the ground.
4. Stop the engine.
5. Operate the control lever repeatedly to release the pressure in the hydraulic system.
6. Raise the control lever base.
7. Remove the starting key and carry it with you.
8. Remove all loose objects from inside the machine.
9. Close the windows and doors.
10. Close and lock all covers and doors.
11. Attach a warning label to the control elements (for example, “Machine being serviced, do not start”).
12. Wait at least 10 minutes after stopping the engine!

Live ring (ball bearing race)

DANGER

Crushing hazard. Do not tilt or rotate the upper carriage during lubrication!

Serious crushing hazard causing death or serious injury!

- ► Park the machine as shown in *Fig. 250*.
- ► Do not rotate the upper carriage.
- ► Do not tilt the upper carriage if the machine is equipped with the Vertical Digging System option.

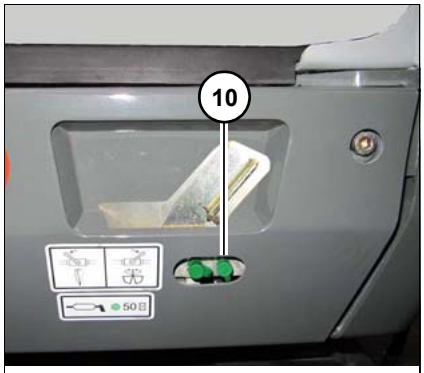


Fig. 251Lubrication point of ball bearing race

1. Park the vehicle on firm, level, and horizontal ground.
2. Lower the boom and the stabilizer blade to the ground.
3. Stop the engine, remove the starting key and carry it with you.
4. Raise the control lever base.
5. Apply grease to lubrication point **10** with one stroke of the grease gun.

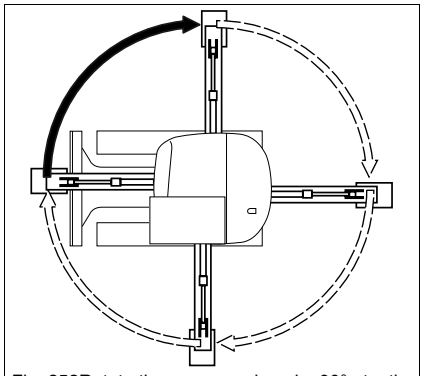


Fig. 252Rotate the upper carriage by 90° at a time

6. Start the engine, raise the boom and the stabilizer blade.
7. Rotate the upper carriage by 90°.
8. Repeat steps 2 – 7 three times until the upper carriage is back in its initial position.
9. Rotate the upper carriage several times by 360°.

Information

Keep the lubrication points clean and remove ejected grease.

Control lever base

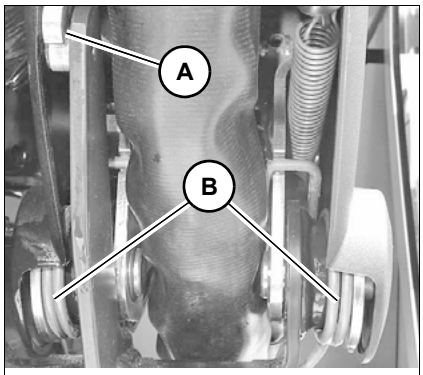


Fig. 253Guide lever and double spring

CAUTION

Crushing hazard! In the area of the moving parts of the control lever base.

Injury hazard due to crushing of parts of body!

► Stay clear (extremities, clothing) of the moving parts.

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Raise the control lever base.
3. Spray fluid grease onto guide lever **A**.
4. Spray fluid grease on both sides of the double spring **B**.
5. Raise and lower the control lever base several times.

Information

Keep the lubrication points clean and remove ejected grease.

7.7 Fuel system

Important information regarding the fuel system

Information

Fill up the tank with the correct fuel type at the end of each working day to prevent the formation of condensation water in the fuel tank. Do not fill the tank completey so the fuel can expand.

Information

Do not run the fuel tank completely dry. Otherwise, air is drawn into the fuel system. This requires bleeding the fuel system.

Diesel fuel specification

NOTICE

Use only the diesel fuels indicated.

- ► If other fuels are used, warranty rights shall not apply in case of diesel engine damage.
- ► Do not use diesel fuel with additives.

– see “Fluids and lubricants” on page 7-10

Refueling

WARNING

Explosion and fire hazard when handling fuel!

Can cause serious burns or death.

- ► Never perform work on the fuel system near open flames or sparks.
- ► Do not smoke.
- ► Keep the maintenance area clean.
- ► Do not refuel in closed rooms.

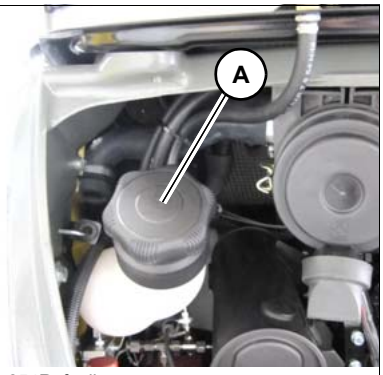


Fig. 254Refueling

Filler inlet **A** of the fuel tank is located in the engine compartment.

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Remove the filler cap.
4. Refuel.
5. Close the filler cap.
6. Close and lock the engine cover.

NOTICE

Do not refuel with cans in order to avoid dirt in the fuel.

Stationary fuel pumps

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

- 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 (5.85 in) above the bottom of the barrel
- Only fill the tank using refueling aids (funnels or filler pipes) with an integral microfilter
- Keep all refueling containers clean

Bleeding the fuel system

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
- If the machine is put into operation after having been out of operation for more than 30 days.

Bleed the fuel system as follows:

1. Raise the control lever base.
2. Remove the starting key.
3. Fill up and close the fuel tank.
4. Turn the starting key to the first position.
5. Wait about 5 minutes while the fuel system bleeds itself automatically.
6. Start the engine.

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

1. Stop the engine.
2. Raise the control lever base.
3. Remove the starting key and carry it with you.
4. Bleed the fuel system again as described above.
5. Check for leaks after starting the engine.
6. Have a Wacker Neuson service center perform a check if necessary.

Checking the water separator

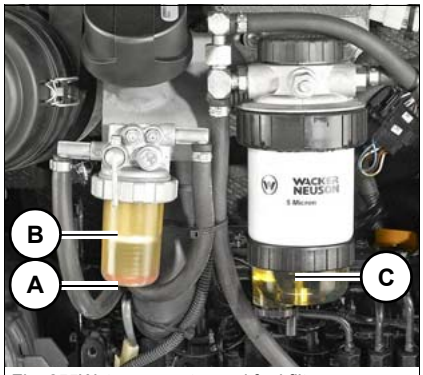


Fig. 255Water separator and fuel filter

Water separator

Empty the water separator if the red indicator ring **A** rises to position **B**.

Fuel filter

Empty the fuel filter if the fuel/water mixture rises to position **C**.

Emptying the water separator

WARNING

Explosion and fire hazard when handling fuel!

Can cause serious burns or death.

- ► Bleed the fuel system only if the engine is cold.
- ► Wear protective equipment.
- ► Never perform work on the fuel system near open flames or sparks.
- ► Do not smoke.
- ► Keep the maintenance area clean.

Information

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

– see chapter " Bleeding the fuel system" on page 7-28.

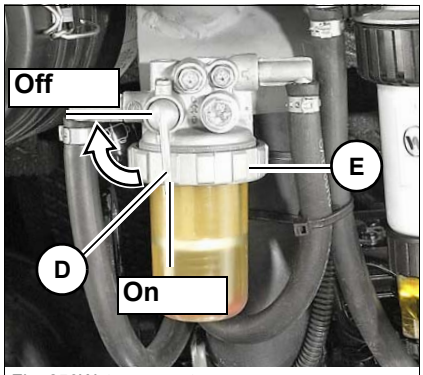


Fig. 256Water separator

1. Stop and park the machine. Stop the engine. See "Preparing lubrication".
2. Prepare a suitable container for collecting the fuel/water mixture.
3. Open the engine cover.
4. Turn ball-type cock **D** to the **OFF** mark.
   ➥ Fuel supply is interrupted.
5. Unscrew threaded ring **E**.
6. Collect the fuel/water mixture in a suitable container.
7. Screw threaded ring **E** back on again.
   ➥ The indicator ring is at the base of the water separator.
8. Turn ball-type cock **D** to the **ON** mark.
   ➥ Fuel supply is open.
9. Close and lock the engine cover.

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

Emptying the fuel filter

WARNING
Explosion and fire hazard when handling fuel!

Can cause serious burns or death.

- ► Bleed the fuel system only if the engine is cold.
- ► Wear protective equipment.
- ► Never perform work on the fuel system near open flames or sparks.
- ► Do not smoke.
- ► Keep the maintenance area clean.

Information
The fuel system can be bled automatically even if the engine is at operating temperature
– see chapter “ Bleeding the fuel system” on page 7-28.

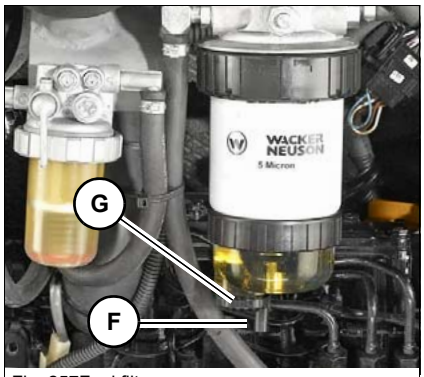


Fig. 257Fuel filter

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Connect a drain hose to connection **F**. Place the hose into a container on the ground.
4. Open screw **G**.
5. Collect the fuel/water mixture in a suitable container.
6. Close screw **G**.
7. Remove the hose.
8. Close and lock the engine cover.

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

7.8 Engine lubrication system

Important information regarding the engine lubrication system

Information

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.

NOTICE

In order to avoid engine damage, use the oil quantity and grade specified in the fluids and lubricants table.

- ► The oil level must be between the MAX and MIN marks.
- ► Use only the specified engine oil (refill with the same engine oil).
- ► Have the oil changed only by a Wacker Neuson service center.

NOTICE

In order to avoid engine damage, add the engine oil slowly so it can go down without entering the intake system.

Checking the engine oil level

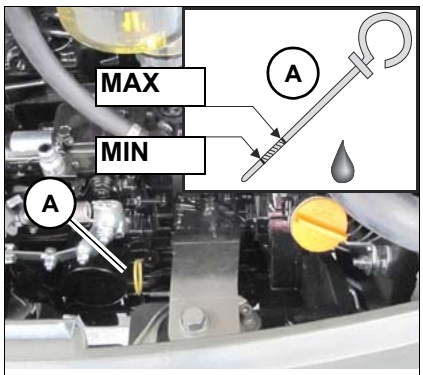


Fig. 258Checking the oil level

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Clean the area around the oil dipstick with a lint-free cloth.
4. Pull out oil dipstick **A**.
5. Wipe it with a lint-free cloth.
6. Push it back in as far as possible.
7. Withdraw it and read off the oil level.
   - ➥ The oil level must be between the MAX and MIN marks.
   - ➥ Add engine oil if necessary.
8. Close and lock the engine cover.

Adding engine oil

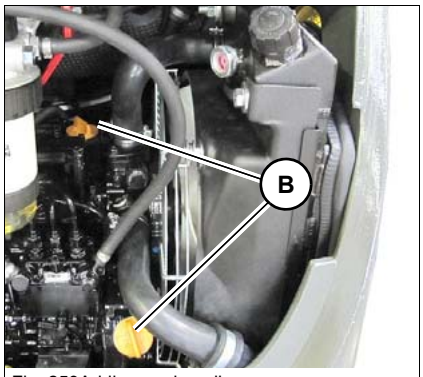


Fig. 259Adding engine oil

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Clean the area around the oil filler cap with a lint-free cloth.
4. Open filler cap **B**.
5. Raise oil dipstick **A** slightly to allow any trapped air to escape.
6. Add engine oil.
7. Wait about 3 minutes until all the oil has run into the oil sump.
8. Check the oil level.
9. Add oil if necessary and check the oil level again.
10. Close filler cap **B**.
11. Push oil dipstick **A** back in as far as possible.
12. Close and lock the engine cover.

Information

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

7.9 Cooling system

Important information regarding the cooling system

The oil/water radiator is located behind the cover on the right, on the right side of the engine. It cools the diesel engine, and the hydraulic oil of the drive and operating hydraulics.

NOTICE

In order to avoid damage to the engine and radiator.

- ► Observe the fluids and lubricants table, and the coolant compound table.
- ► Check the coolant level once a day.

Checking the coolant level

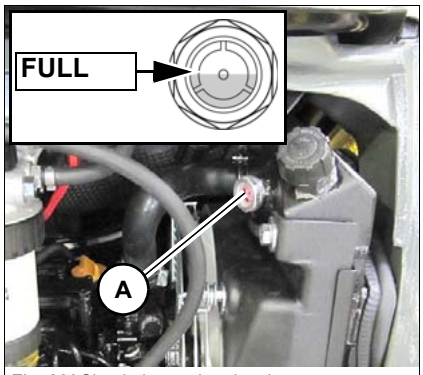


Fig. 260Check the coolant level

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Check the coolant level on sight glass **A**.
4. If the coolant level is below the **FULL** mark:
   ➥ Add coolant.
5. Close and lock the engine cover.

Information

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

Adding coolant

WARNING

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

Causes serious injury or death.

- ► Wear protective gloves and eye protection.
- ► Stop the engine and allow it to cool down at least 10 minutes.
- ► Carefully open the radiator cap.

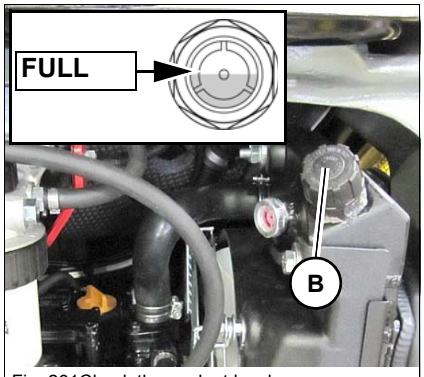


Fig. 261Check the coolant level

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Release overpressure in the radiator. Carefully unscrew filler cap **B** and release the pressure.
4. Open filler cap **B**.
5. Add coolant up to the **FULL** mark.
6. Close filler cap **B**.
7. Start the engine and let it warm up for about 5 – 10 minutes.
8. Stop the engine.
9. Remove the starting key and carry it with you.
10. Let the engine cool down.
11. Check the coolant level again.
12. If necessary, add coolant and repeat the procedure until the coolant level remains constant.
13. Close and lock the engine cover.

NOTICE

Do not add a different coolant to the one in the reservoir.

- ► Use only the coolant prescribed by Wacker Neuson – *see chapter “7.3 Fluids and lubricants” on page 7-10*.

Cleaning the radiator

CAUTION

Burn hazard during maintenance on the radiator!

Can cause injury.

- ► Stop the engine and allow it to cool down at least 10 minutes.
- ► Wear protective gloves and eye protection.

NOTICE

Dirt on the radiator fins reduces the radiator's heat dissipation capacity and can cause damage to the diesel engine and the hydraulic system!

► 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

In order to ensure the radiator's optimal cooling capacity, do not damage the radiator fins as you clean them with a compressed-air gun!

► Maintain a sufficient distance from the radiator to avoid damage to the radiator fins.

► Use oil-free compressed air (2 bar/29 psi max.) to clean.

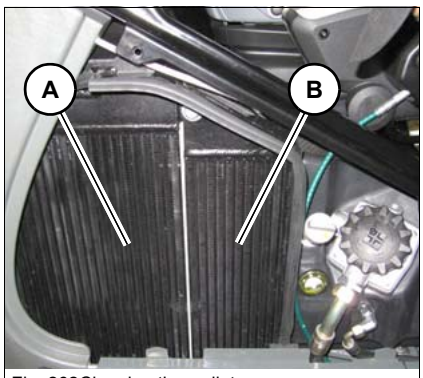


Fig. 262Cleaning the radiator

Water radiator **A** and hydraulic oil radiator **B** are located behind the cover on the right.

1. Stop and park the machine. Stop the engine. See "Preparing lubrication".
2. Remove the cover on the right.
3. Remove dust and other foreign bodies from the fins with compressed air.
4. Install the side cover.

7.10 Air filter

Important information regarding the air filter

- Store filters in their original packaging and in a dry place.
- Check air filter attachments, air intake hoses and the air filter element for damage, and immediately repair or replace them if necessary.
- Check the screws at the induction manifold and the clamps for tightness.

Dirt indicator

NOTICE

In order to avoid damage to the diesel engine, bear in mind the following:

► Replace the air filter elements as soon as the red mark on the dirt indicator is displayed.

► Do not clean air filter elements, replace them.

► Do not use any damaged air filter elements.

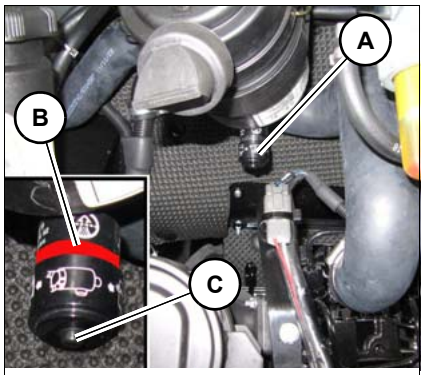


Fig. 263Dirt indicator

Replace the air filter elements as soon as the red mark **B** is on the dirt indicator **A** is displayed.

- After replacing the air filter elements, press button **C** to reset the red mark **B**.

Replacing the air filter

NOTICE

Air filter elements 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 aluminum mills, chemical plants and other nonferrous-metal plants.
- ► Replace the air filter elements according to the dirt indicator, every 1000 o/h or once a year at the latest.

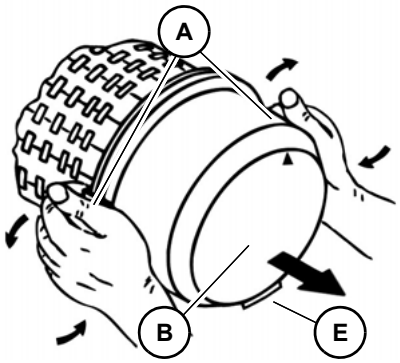


Fig. 264Lower housing section

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Remove the starting key and carry it with you.
3. Open the engine cover.
4. Remove dirt and dust from the air filter housing and the area around it.
5. Fold bow clips **A** on lower housing section **B** to the outside.
6. Remove the lower housing section **B**.

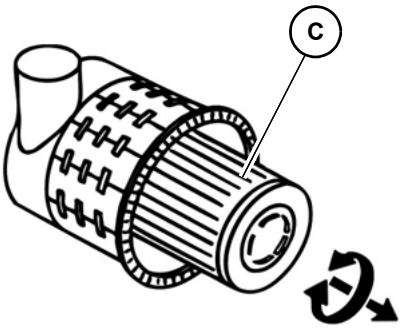


Fig. 265Outside filter

7. Carefully remove outside filter **C** with slightly turning movements.
8. Ensure that all dirt (dust) inside the upper and lower housing sections, including the dust valve, has been removed.
9. Clean the parts with a clean lint-free cloth, do not use compressed air.

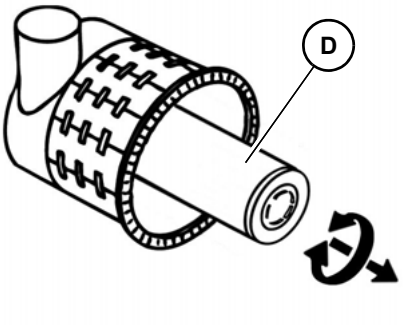


Fig. 266Inside filter

10. Carefully remove inside filter **D** with slightly turning movements.
11. Check the new inside filter **D** and outside filter **C** for damage and carefully insert them in the housing section.
12. Position the lower housing section **B**.
13. Close bow clips **A**.
14. Press button **C** to reset the red mark **B**.
15. Close and lock the engine cover.

Information

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

Checking the air intake

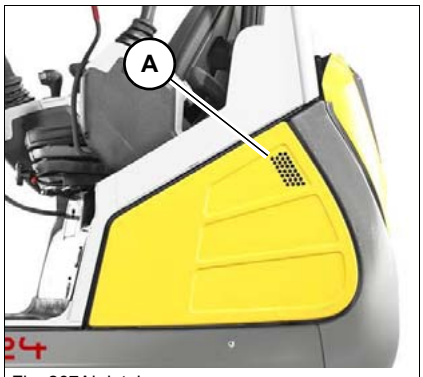


Fig. 267Air intake

NOTICE

In order to avoid engine damage when crossing fords:

- ► Keep the opening of the engine air intake **A** above the water.
- ► Check once a day for cleanliness before putting the machine into operation.

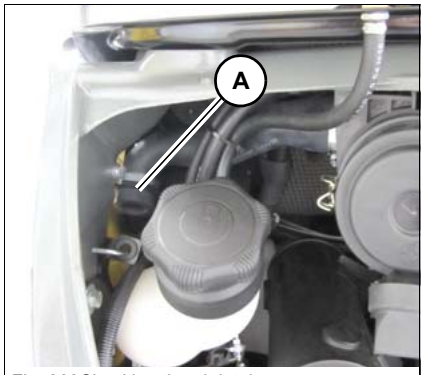


Fig. 268Checking the air intake

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Remove the starting key and carry it with you.
3. Open the engine cover.
4. Check and, if necessary, clean air intake **A**.
5. Close and lock the engine cover.

7.11 V-belt

Checking V-belt condition and tension

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

► Stop the engine before opening the engine cover.

► Only check the V-belt when the engine is at a standstill.

NOTICE

Danger of damage to property in case of a malfunctioning V-belt.

► Do not start the engine.

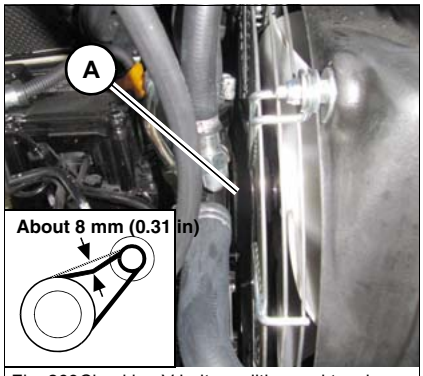


Fig. 269Checking V-belt condition and tension

1. Park the vehicle on firm, level, and horizontal ground.
2. Stop the engine. See “Preparing lubrication”.
3. Remove the starting key and carry it with you.
4. Let the engine cool down.
5. Open the engine cover.
6. Carefully check V-belt **A** for damage, cracks or cuts.
7. If the V-belt is damaged (cracks, wear, ruptures, etc.):
   ➥ Have the V-belt replaced by a Wacker Neuson service center.
   ➥ Replace the V-belt if it touches the base of the V-belt groove or if the pulleys are damaged.
8. Press with your thumb about 100 N (22.5 lbf) to check the deflection of the V-belt between the crankshaft disk and the fan wheel.
9. A new V-belt should have a deflection of 6 to 8 mm (0.24 to 0.31 in), a used V-belt (after about 5 minutes running time) should have a deflection of 7 to 9 mm (0.27 to 0.35 in).
10. If V-belt tension is not correct:
    ➥ Have the V-belt replaced or retightened by a Wacker Neuson service center.
11. Close and lock the engine cover.

7.12 Hydraulic system

Important information on the hydraulic system

WARNING

Burn hazard when performing maintenance on a hot engine and hydraulic system.

Can cause serious injury or death.

- ► Wait at least 10 minutes after stopping the engine.
- ► Wear protective equipment.

WARNING

Danger of fluid escaping under high pressure! Removing the filler plug can cause oil to escape.

Can cause serious injury or death.

- ► Do not operate the machine with leaking or damaged hydraulic system components.
- ► Open the breather filter carefully to slowly release the pressure inside the reservoir.
- ► Wear protective equipment.
- ► Wear safety glasses to protect the eyes. If oil contacts the eye flush immediately with clean water and seek medical treatment.
- ► Do not search for hydraulic leaks with your bare hands. Wear protective gloves and search for hydraulic leaks with a piece of cardboard.
- ► Always consult a doctor immediately, even if the wound seems insignificant. Hydraulic oil causes blood poisoning.

NOTICE

In order to avoid damage to the hydraulic system:

- ► Use hydraulic oil and grade according to fluids and lubricants table.
- ► Add hydraulic oil using the filling screen.
- ► Check the hydraulic oil level once a day.
- ► If the hydraulic oil in the sight glass is cloudy, this indicates that water or air has penetrated the hydraulic system. Contact a Wacker Neuson service center.
- ► 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 a Wacker Neuson service center if the filter of the hydraulic system is dirty.

Checking the hydraulic oil level

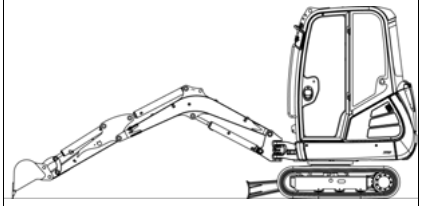


Fig. 270Parking the machine

1. Park the vehicle on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the machine (see figure).
3. Lower the boom and the stabilizer blade to the ground.
4. Stop the engine.
5. Operate the control lever repeatedly to release the pressure in the hydraulic system.
6. Remove the starting key and carry it with you.

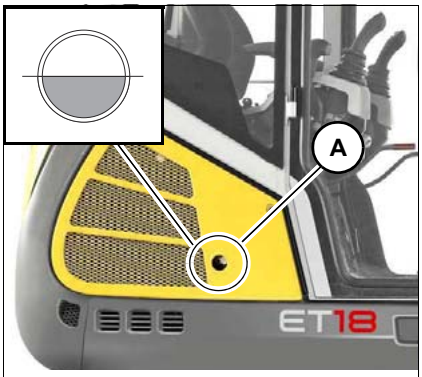


Fig. 271Oil level indicator on the hydraulic oil reservoir (symbolic representation)

7. Sight glass **A** is located on the right side of the machine.
8. Check the oil level on sight glass **A**.
   ➥ On a warm engine, the oil level must be about at the middle of the sight glass.

Add hydraulic oil if the oil level is lower.

Adding hydraulic oil

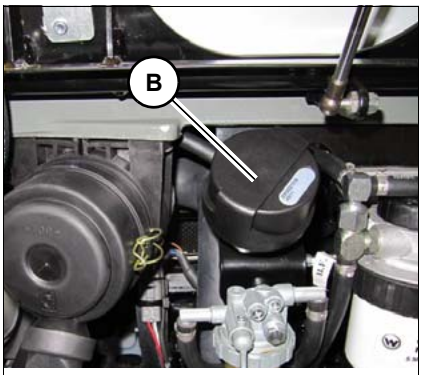


Fig. 272Opening the breather filter

9. Remove the cover on the right
   – see “Cover on the right” on page 7-16.
10. Open breather filter **B** carefully to release the pressure.
11. Open filler cap **C** slowly.
12. Add hydraulic oil up to the corresponding mark.
13. Check the hydraulic oil level on sight glass **A**.
14. Add if necessary and check again.
15. Close filler cap **C** of the hydraulic oil reservoir hand tight.

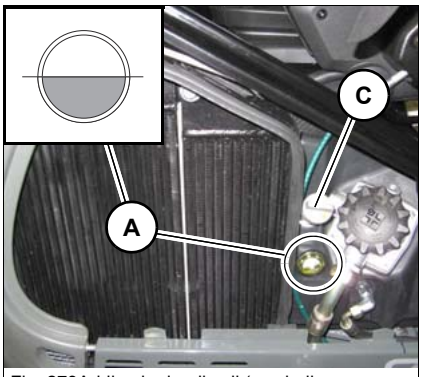


Fig. 273Adding hydraulic oil (symbolic representation)

16. Tighten breather filter **B** by hand.
17. Install the right cover.

Environment

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

Checking the hydraulic system for leaks

NOTICE

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.

► Leaks and damaged pressure lines must be immediately repaired or replaced by an authorised service centre.

► Have hydraulic hoses replaced every 6 years from the date of manufacture, even if they do not seem to be damaged.

- Do not operate the machine with leaking or damaged hydraulic system components.
- Use a piece of cardboard to diagnose the source of hydraulic leaks.
- Retighten leaking threaded fittings and hose connections only when the system is not under pressure. Release the pressure before working on pressurized lines.
- Never weld or solder damaged or leaking pressure lines and threaded fittings, but have damaged parts replaced.
- Wear protective equipment.
- Do not search for leaks with your bare hands. Wear protective gloves and search for hydraulic leaks with a piece of cardboard.

Checking the condition and age of hydraulic hoses

NOTICE

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.

► Leaks and damaged pressure lines must be immediately repaired or replaced by an authorised service centre.

► Have hydraulic hoses replaced every 6 years from the date of manufacture, even if they do not seem to be damaged.

In this respect, we recommend that you observe all the relevant safety regulations for hydraulic lines, as well as the safety regulations regarding accident prevention and occupational health and safety in your country. Also observe DIN 20 066, part Tl. 5.

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

Have a 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.

7.13 Electrical system

Important information regarding the electrical system

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

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

Alternator

- Start the engine only if the battery is connected.
- When connecting the battery, ensure that the poles (+/−) are not inverted.
- Always disconnect the battery before connecting a quick battery charger.
- Have malfunctioning charge indicator lights immediately replaced.

WARNING

Explosion hazard! During normal operation of batteries.

Can cause serious injury or death.

► Wear protective gloves and eye protection.

► Do not smoke and never work with an open flame or sparks near open battery cells.

► Do not attempt to jump-start the machine if the battery is frozen or if the acid level is low. The battery can burst or explode. Replace the battery immediately.

► Disconnect the negative terminal (–) from the battery before starting repair work on the electrical system.

Information

Use only 12 V power sources. Higher voltages will damage the electrical components.

When connecting the battery leads, ensure that the poles +/− are not inverted, otherwise sensitive electrical components will be damaged.

Do not interrupt voltage-carrying circuits at the battery terminals because of the sparking hazard.

Do not place tools or other conductive articles on the battery – risk of short circuit.

Environment

Dispose of used batteries properly and in an environmentally friendly manner.

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).

– see chapter “ Relays” on page 9-5

– see chapter “ Fuses” on page 9-5

Battery condition

May be performed only by a Wacker Neuson service center.

Charging the battery

May be performed only by a Wacker Neuson service center.

Replacing the battery

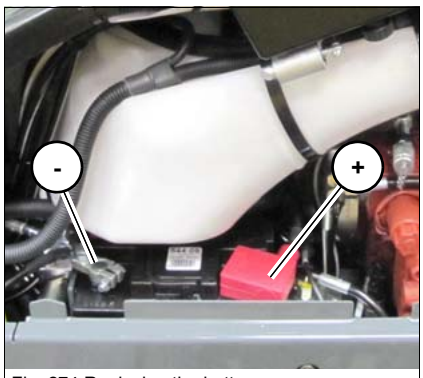


Fig. 274 Replacing the battery

The battery is located under the cover on the left.

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.

NOTICE

In order to avoid damage to the engine electronics, do not disconnect the battery while the engine is running.

7.14 Heating, ventilation and air conditioning system

Checking/replacing the fresh-air filter

Have maintenance performed only by a Wacker Neuson service center.

7.15 Washer system

Important information regarding the washer system

Only use glass cleaner (with antifreeze if necessary) for refilling.

Checking the fluid level and adding fluid

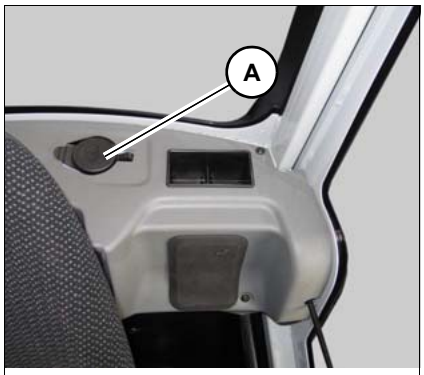


Fig. 275Fluid level

The reservoir filler inlet is located in the cabin.

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Check the fluid level in tank **A** and add fluid if necessary.Axles/ traveling drive

Have maintenance performed only by a Wacker Neuson service center.

7.16 Braking system

Have maintenance performed only by a Wacker Neuson service center.

7.17 Tracks

Important information regarding the tracks

Track wear can vary according to work and ground conditions.

Checking track tension

DANGER

Crushing hazard during work under the machine!

Causes serious crushing or injury resulting in death.

- ► Ensure that no one is in the danger zone.
- ► Support the machine so as to allow the tracks to sag freely.

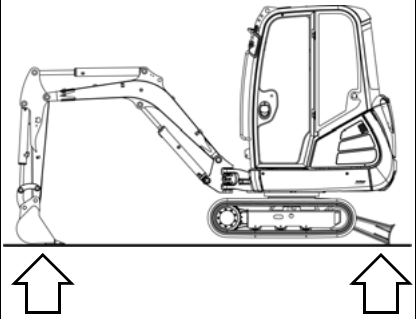


Fig. 276Raising the machine

1. Park the vehicle on firm, level, and horizontal ground.
2. Raise the machine evenly and horizontally by means of the boom and stabilizer blade.

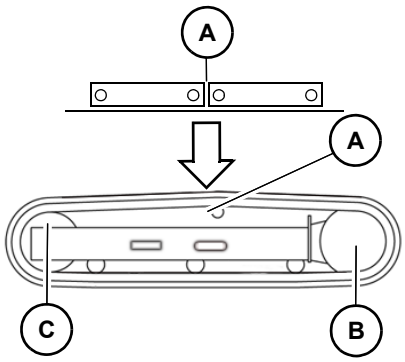


Fig. 277Rubber track mark

3. Place the tracks so that mark **A** is in the middle between drive pinion **B** and track tension roller **C**.
4. Stop the engine.
5. Raise the control lever base.
6. Remove the starting key and carry it with you.

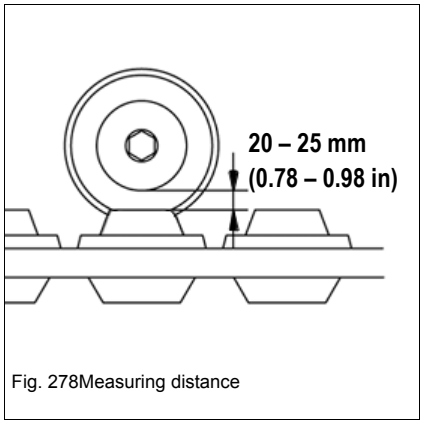


Fig. 278Measuring distance

7. Adjust the correct track tension if the play between the track roller and the track is not 20 – 25 mm (0.8 – 1 in).

Correcting track tension

DANGER

Risk of escaping lubricant! High grease pressure in the hydraulic cylinder.

Causes serious injury or death!

- ► Open the lubricating valve only very carefully and do not unscrew it more than a revolution.
- ► Keep your face away from the lubricating valve connection.
- ► Contact a Wacker Neuson service center if this does not reduce track tension.
- ► Release grease only as described below. (Observe the safety instructions!)

NOTICE

Excessive tension of the tracks causes serious damage to the cylinder and the track.

- ► Tighten the tracks only up to the mandatory measuring distance.

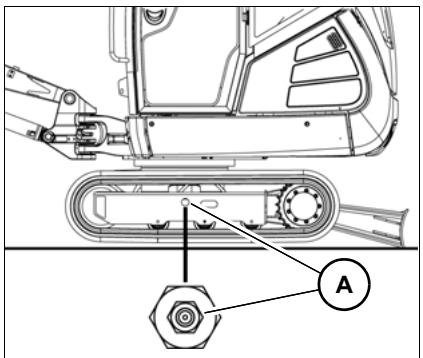


Fig. 279Tightening the tracks

Tightening the tracks

1. Park the vehicle on firm, level, and horizontal ground.
2. Raise the machine evenly and horizontally by means of the boom and stabilizer blade.
3. Stop the engine.
4. Operate the control lever repeatedly to release the pressure in the hydraulic system.
5. Pump grease with a grease gun through lubricating valve **A**.
6. In order to check that the tension is correct:
   - Start the engine
   - Let it run at idling speed without any load
   - Slowly move the machine forward and reverse and switch it off again.
7. Check the track tension again.
   ➥ If it is not correct:
8. Adjust again.
9. Should the tracks still be slack after pumping more grease, replace the tracks or the seals in the cylinders. Contact a Wacker Neuson service center in this case.

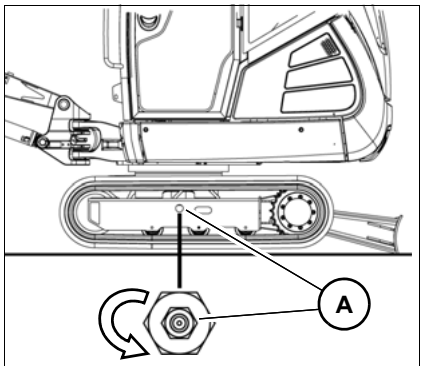


Fig. 280Releasing grease

Reducing tension

1. Place a suitable container underneath to collect the grease.
2. Slowly turn lubricating valve **A** one revolution anticlockwise to release the grease.
   ➥ The grease flows out of the groove of the lubricating valve.
3. Retighten lubricating valve **A**.
4. In order to check that the tension is correct:
   - Lowering the machine to the ground, starting the engine, letting it run at idling speed without any load and slowly moving the machine forward and reverse and switching it off again. Raise the machine again by means of the boom and stabilizer blade.
5. Check the track tension again.
   ➥ If it is not correct:
6. Adjust again.

Environment

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

7.18 Maintenance of attachments

Important information regarding maintenance of attachments

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments. Please observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments.

7.19 Maintenance of options

Joint rod (lifting eye) and load hook

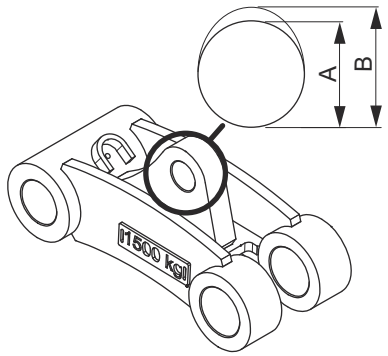


Fig. 281Lifting eye joint rod (symbolic representation)

Wear of joint rod (lifting eye)

Immediately replace lifting eyes with inadmissible wear (for example if they are beyond the max. tolerance), damage, deformations, surface cracks and corrosion.

The nominal size must not be worn more than 5 % (max. tolerance). Measurement can be performed with the accuracy of a slide gage.

Welding is prohibited!

Joint rod (lifting eye)	Nominal size A	Max. tolerance B
ET18 – ET24	32 mm (1 1/4 in)	33.6 mm (1 3/8 in)

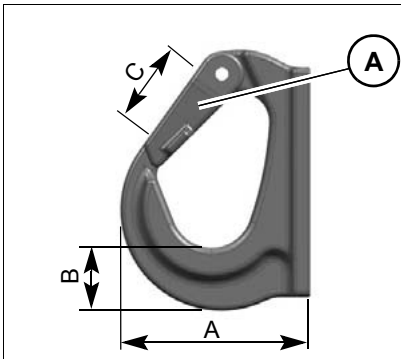


Fig. 282Powertilt load hook (symbolic representation)

Load hook wear

Have load hooks (Powertilt, Powertilt for Easylock) with inadmissible wear (for example beyond the tolerance), damage, deformations, surface cracks and corrosion immediately replaced by a Wacker Neuson service center.

The nominal size must not be worn more than 10 % (max. tolerance). Measurement can be performed with the accuracy of a slide gage.

Welding is prohibited!

If the spring mechanism of snap link **C** does not automatically close any more, stop machine operation with the load hook and have the error repaired by a Wacker Neuson service center.

Load hook	Nominal size A	Max. tolerance A	Nominal size B	Max. tolerance B	Nominal size C	Max. tolerance C
ET18-24 (PTS-4.5)	86 mm (3 3/8 in)	94.6 mm (3 3/4 in)	30 mm (1 1/8 in)	27 mm (1 in)	33 mm (1 1/4 in)	36.3 mm (1 3/8 in)

7.20 Exhaust gas treatment

Not available

7.21 Machine preservation

Machines are partly preserved at the factory (for example in the engine compartment). Operation in an aggressive environment (for example salt deposits) is prohibited.

Notes:

8 Malfunctions

NOTICE

Contact a Wacker Neuson dealer or customer service in case of malfunctions or signs that are not listed in the following tables or that persist after maintenance has been performed correctly.

8.1 Diesel engine

Malfunction/sign	Possible cause	Remedy	See
Engine does not start or is not easy to start	Empty fuel tank	Refueling	*7-26*
	Malfunctioning or empty battery	Replace the battery	*7-45*
	Malfunctioning fuse	Check the fuse	*9-5*
Engine starts, but does not run smoothly or faultless	Air in fuel system		*7-28*
Engine overheats	Engine oil level too low	Adding engine oil	*7-32*
	Dirty air filter	Replace the air filter	*7-37*
	Dirty radiator fins	Cleaning the radiator	*7-34*
	Coolant level too low	Adding coolant	*7-34*
Engine does not have enough output	Dirty air filter	Replace the air filter	*7-37*
Insufficient or no engine oil pressure	Engine oil level too low	Adding engine oil	*7-32*
Black engine smoke	Dirty air filter	Replace the air filter	*7-37*

8.2 Travelling drive

No malfunctions specified.

8.3 Hydraulic system

Malfunction/sign	Possible cause	Remedy	See
Upper carriage is difficult to rotate, or does not rotate at all	Insufficient lubrication	Lubrication	*7-24*
Machine does not work, or with reduced output	Hydraulic oil level too low	Adding hydraulic oil	*7-41*
The display element emits a continuous buzzing sound	Malfunctioning pressure switch of safe load indicator	Have the error repaired by an authorised service centre.	--

8.4 Electrical system

No malfunctions specified.

8.5 Air conditioning

No malfunctions specified.

8.6 Attachments

Powertilt unit

Malfunction/sign	Possible cause	Remedy	See
Powertilt does not maintain its position	Internal release valve activated	Repeat the work operation with less load. If this problem persists, contact a Wacker Neuson dealer or a Wacker Neuson service center	--
Lateral movement of the bucket	A little play due to necessary spacing between teeth is normal	--	--

9 Technical data

9.1 Models and trade names

Machine model/machine designation	Trade name
E12-02	ET18
E12-03	ET20
E12-04	ET24

9.2 Engine

Engine	ET18	ET20	ET24
Product	Yanmar diesel engine		
Type	3TNV76-SNSE12		
Design	Water-cooled 4 stroke diesel engine		
Number of cylinders	3		
Displacement	1116 cm^3 (68.1 in^3)		
Nominal bore and stroke	76 x 82 mm (2.9 x 3.2 in)		
Power	13.4 kW/2200 rpm (18 hp/2200 rpm)		
Max. torque	65.6 Nm/1600 rpm (48.4 ft.lbs/1600 rpm)		
Max. engine speed without load	2375 +/− 50 rpm		
Idling speed	1300 +/− 25 rpm		
fuel injection system	Indirect injection		
Starting aid	Glow plug (preheating time 4 seconds)		
Fuel tank	24 litres (6.3 gal)		
Exhaust values according to	EPA – Tier IV final (up to 2012)		

Engine	ET18	ET20	ET24
Product	Yanmar diesel engine		
Type	3TNV80F-SSNS1		
Design	Water-cooled 4 stroke diesel engine		
Number of cylinders	3		
Displacement	1266 cm3 (77.3 in^3)		
Nominal bore and stroke	80 x 84 mm (3.1 x 3.3 in)		
Power	12.8 kW/2200 rpm (17.2 hp/2200 rpm)		
Max. torque	65.8 Nm/1600 rpm (48.5 ft.lbs./1600 rpm)		
Max. engine speed without load	2375 +/− 50 rpm		
Idling speed	1300 +/− 25 rpm		
fuel injection system	Indirect injection		
Starting aid	Glow plug (preheating time 4 seconds)		
Fuel tank	24 litres (6.3 gal)		
Exhaust values according to	EPA – Tier IV final (from 2012)		

Information

The machine has about 17 % less output at altitudes over 800 m (2625 ft) above see level. This does not affect excavator operation (Tier IV final – from 2012).

9.3 Traveling drive/axles

Travelling drive	ET18	ET20	ET24
Design	Axial-piston motor with planetary drive		

9.4 Brake

See drive lever

9.5 Tracks

Rubber tracks	ET18	ET20	ET24
Track width	230 mm (9 in)	250 mm (10 in)	
Number of tread rollers	3	4	3

9.6 Steering system

See drive lever

9.7 Operating hydraulics

Work hydraulics	ET18	ET20
Pump	Double variable displacement + twin gear pump 10 + 10 + 8 + 2.7 cm³ (0.60 + 0.60 + 0.49 + 0.16 in^3)	
Flow rate	23.8 (P1) + 23.8 (P2) + 19 (P3) + 6.4 (P4) l/min at 2375 rpm (6.3 + 6.3 + 5 + 1.7 gal/min at 2375 rpm)	
Number/type of pumps	4	
Oil flows of variable displacement pumps (P1 + P2)	23.8 l/min (6.3 gal/min)	
Oil flow of gear pump 1 (P3) (3rd control circuit or Powertilt)	19 l/min (5 gal/min)	
Oil flow of gear pump 2 (P4)	6.4 l/min (1.7 gal/min)	
Operating pressure for operating and travel hydraulics	200 bar (2900 psi)	
Swivel unit operating pressure	125 bar (1813 psi)	150 bar (2176 psi)
Upper carriage rotation speed	10 rpm	
Hydraulic reservoir capacity	19 l (5 gal)	
Hydraulic oil quantity (system fill)	34 l (9 gal)	

Work hydraulics	ET 24
Pump	Double variable displacement + twin gear pump 11 + 11 + 8.2 + 2.7 cm³ (0.67 + 0.67 + 0.50 + 0.16 in^3)
Flow rate	26.1 (P1) + 26.1 (P2) + 19.4 (P3) + 6.4 (P4) l/min at 2375 rpm (6.9 + 6.9 + 5.1 + 1.7 gal/min at 2375 rpm)
Number/type of pumps	4
Oil flows of variable displacement pumps (P1 + P2)	26.1 l/min (6.9 gal/min)
Oil flow of gear pump 1 (P3) (3rd control circuit or Powertilt)	19.4 l/min (5.1 gal/min)
Oil flow of gear pump 2 (P4)	6.4 l/min (1.7 gal/min)
Operating pressure for operating and travel hydraulics	240 bar (3481 psi)
Swivel unit operating pressure	150 bar (2176 psi)
Upper carriage rotation speed	10 rpm
Hydraulic reservoir capacity	19 l (5 gal)
Hydraulic oil quantity (system fill)	34 l (9 gal)

Speed

	ET 18	ET 20	ET 24
2 speed ranges	3/5.3 kph (1.9/3.3 mph)	2.1/4.1 kph (1.3/2.6 mph)	2.5/4 kph (1.6/2.5 mph)

9.8 Electrical system

Electrical components

	ET 18/ET 20/ET 24
Alternator	12 V 55 A
Starter	12 V 1.1 kW (1.5 hp)
Battery	12 V 44 Ah

Fuses

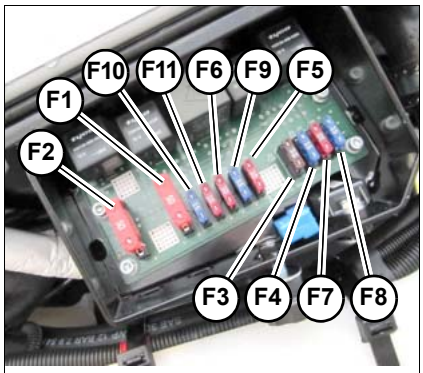


Fig. 283Fuses

The fuses are located behind the cover on the left.

Fuses	Rated current (A)	ET 18/ET 20/ET 24
F1	50 A	Starter, cutoff solenoid, socket
F2	50 A	Starter, air-pressure sensor/output adaptation (Yanmar 3TNV80F-SNNS1)
F3	7.5 A	Display, cutoff solenoid
F4	15A	Valves, horn, high speed, hydraulic quickhitch, upper carriage tilting, automatic engine speed setting
F5	10A	Proportional auxiliary hydraulics (AUX I) Proportional 3rd control circuit (AUX II)
F6	10A	Heating, overload, driving signal
F7	10A	Lights
F8	15A	Lights
F9	15A	Wiper, radio, interior light
F10	15A	12 V power outlet
F11	10A	Rotating beacon, radio

Relays

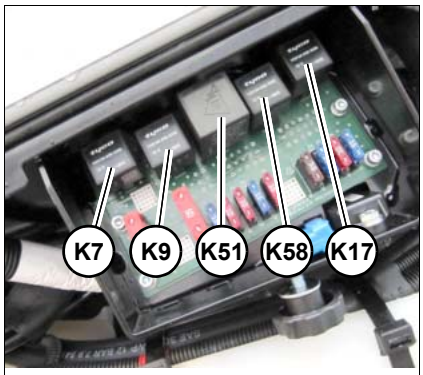


Fig. 284Relays

The relays are located behind the cover on the left.

Relays	ET 18/ET 20/ET 24
K7	Starting relay
K9	Cutoff solenoid
K51	Idling speed
K58	High speed (2nd travel speed)
K17	Hydraulic quickhitch

Bulbs

	ET 18	ET 20	ET 24
Working lights/roof lights	Halogen lamp 12 V 55 W H3		
Interior light	Festoon lamp 10x38 12 V/5 W		
Rotating beacon	Halogen lamp 12 V-55 W H1		

Powertilt (option)

	ET 18	ET 20	ET 24
Model size	4.5		
Piston stroke	240 cm³ (14.6 in³)		
Required oil flow	2 – 4 l/min (0.5 – 1 gal/min)		
Connections	1/8 in		
Swiveling range	180°		
Weight	35 kg (77.2 lbs)		
Drive torque – at 210 bar (3045 psi)	930 Nm (685 ft.lbs.)		
Holding torque – at 225 bar (3263 psi)	2470 Nm (1,820 ft.lbs.)		
Minimum hose/pipe size Connecting hose size	6 mm (0.23 in) 6 mm (0.23 in)		

9.9 Tightening torques

General tightening torques

Property class	8.8	10.9	12.9	8.8	10.9
Screw dimensions	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)
M5	5.5 (4)	8 (6)	10 (7)	5 (4)	7 (5)
M6	10 (7)	14 (10)	17 (13)	8.5 (6)	12 (9)
M8	25 (18)	35 (26)	42 (31)	20 (15)	30 (22)
M10	45 (33)	65 (48)	80 (59)	40 (30)	59 (44)
M12	87 (64)	110 (81)	147 (108)	69 (51)	100 (74)
M14	135 (100)	180 (133)	230 (170)	110 (81)	160 (118)
M16	210 (155)	275 (203)	350 (258)	170 (125)	250 (184)
M18	280 (207)	410 (302)	480 (354)	245 (181)	345 (254)
M20	410 (302)	570 (420)	690 (509)	340 (251)	490 (361)
M22	550 (406)	780 (575)	930 (686)	460 (339)	660 (487)
M24	710 (524)	1000 (738)	1190 (878)	590 (435)	840 (620)
M27	1040 (767)	1480 (1092)	1770 (1305)	870 (642)	1250 (922)
M30	1420 (1047)	2010 (1482)	2400 (1770)	1200 (885)	1700 (1254)

Tightening torques/fine-pitch thread					
Property class	8.8	10.9	12.9	8.8	10.9
Screw dimensions	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)
M8X1.0	25 (18)	37 (28)	43 (32)	22 (16)	32 (24)
M10X1.0	50 (37)	75 (55)	88 (65)	43 (32)	65 (48)
M10X1.25	49 (36)	71 (52)	83 (61)	42 (31)	62 (46)
M12X1.25	87 (64)	130 (96)	150 (111)	75 (55)	110 (81)
M12X1.5	83 (61)	125 (92)	145 (107)	72 (53)	105 (77)
M14X1.5	135 (100)	200 (148)	235 (173)	120 (89)	175 (129)
M16X1.5	210 (155)	310 (229)	360 (266)	180 (133)	265 (195)
M18X1.5	315 (232)	450 (332)	530 (391)	270 (199)	385 (284)
M20X1.5	440 (325)	630 (465)	730 (538)	375 (277)	530 (391)
M22X1.5	590 (435)	840 (620)	980 (723)	500 (369)	710 (524)
M24X2.0	740 (546)	1070 (789)	1250 (922)	630 (465)	900 (664)
M27X2.0	1100 (811)	1550 (1143)	1800 (1328)	920 (679)	1300 (959)
M30X2.0	1500 (1106)	2150 (1586)	2500 (1844)	1300 (959)	1850 (1364)

9.10 Coolant

Compound table

Outside temperature[1]	Distilled water	Coolant[2]
Up to °C (°F)	% by volume	% by volume
-37 (-34.6)	50	50

1. Use the 1:1 concentration for warm outside temperatures, too, to ensure protection against corrosion, cavitation, and deposits.
2. Do not mix the coolant with other coolants.

9.11 Noise emissions

	ET 18	ET 20	ET 24
	(Tier IV final (up to 2012)		
Measured sound power level LwA [1]	92.5 dB(A)	92.5 dB(A)	92.5 dB(A)
Guaranteed sound power level LwA [1]	93 dB (A)	93 dB (A)	93 dB (A)
Uncertainty factor KpA [2]	0,8	0,8	0,8
Operator-perceived sound pressure level LpA [3]	75.8 dB(A)	75.8 dB(A)	75.8 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.

9.12 Vibration

Vibration	
Effective acceleration value for the upper extremities of the body (hand-arm vibration)	< Trigger value < 2.5 m/s^2
Effective acceleration value for the body (whole-body vibration)	< 0.5 m/s^2

Vibration values indicated in m/s².

Directive 2002/44/EC of European Parliament and Council 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.
- Job 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 further vibration indications, refer to the indications in ISO/TR 25398 Mechanical Vibrations – Directive on Estimation of whole-body vibration during operation of 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 Council 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 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 job site in good condition:
  - Remove large rocks or obstacles.
  - Fill up ditches and holes.
  - Provide a machine and enough time to keep the job site 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
  - Brakes
  - 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 during machine travel across rough terrain.
- Reduce vibration to a minimum during long work cycles or during machine operation over long distances:
  - Use a machine with a suspension system (for example on the operator seat).
  - 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 job sites.
- Other risk factors can affect drive comfort negatively. The following measures can improve drive 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 during operation of 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 Council 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.

9.13 Weight

Machine weight

Weight		ET 18	ET 20	ET 24
Transport weight[1]	Canopy	1582 kg (3,488 lbs)	-	2057 kg (4,535 lbs)
	Canopy telescopic travel gear	1707 kg (3,763 lbs)	1862 kg (4,105 lbs)	-
	Canopy VDS	1817 kg (4,006 lbs)	1941 kg (4,279 lbs)	2166 kg (4,775 lbs)
	Cabin	1689 kg (3,724 lbs)	-	2164 kg (4,771 lbs)
	Cabin telescopic travel gear	1814 kg (3,999 lbs)	1969 kg (4,341 lbs)	-
	Cabin VDS	1924 kg (4,242 lbs)	2047 kg (4,513 lbs)	2273 kg (5,011 lbs)
Operating weight[2]	Canopy	1725 kg (3,803 lbs)	-	2200 kg (4,850 lbs)
	Canopy telescopic travel gear	1850 kg (4,079 lbs)	2005 kg (4,420 lbs)	-
	Canopy VDS	1960 kg (4,321 lbs)	2083 kg (4,592 lbs)	2309 kg (5,090 lbs)
	Cabin	1831 kg (4,037 lbs)	-	2307 kg (5,086 lbs)
	Cabin telescopic travel gear	1956 kg (4,312 lbs)	2112 kg (4,656 lbs)	-
	Cabin VDS	2067 kg (4,557 lbs)	2190 kg (4,828 lbs)	2416 kg (5,326 lbs)

1. Transport weight: basic machine + 10 % fuel capacity.
2. Operating weight: basic machine + full fuel tank + backhoe bucket (400 mm/16 in) + user (75 kg/165 lbs).

Information

The actual machine weight depends on the selected options and must be read off the type label.
Add the weight of all subsequently installed equipment to the weight of the machine.
Weight indications can vary by +/− 2 %.

Weight of attachments

– see "Fields of application and use of attachments" on page 3-5

Standard bucket backhoe bucket 400 mm (16 in)

Excavator forces

According to ISO 6015

	ET 18	ET 20	ET 24
Max. tearout force (short stick)	11.2 kN (2518 lbf)	12.5 kN (2810 lbf)	15 kN (3372 lbf)
Max. tearout force (long stick)	9.8 kN (2203 lbf)	11.1 kN (2495 lbf)	13.3 kN (2990 lbf)
Max. breakout force at bucket tooth	18.8 kN (4226 lbf)		21.8 kN (4901 lbf)

Ground clearance/ground pressure

	ET18	ET18 telescopic travel gear	ET18 VDS/telescopic travel gear
Ground clearance	210 mm (8 1/4 in)	170 mm (6 3/4 in)	170 mm (6 3/4 in)
Ground pressure	0.31 kg/cm² (4.4 lbs/in²)	0.30 kg/cm² (4.3 lbs/in²)	0.32 kg/cm² (4.6 lbs/in²)
Upper carriage swivel speed	10 rpm		

	ET20 telescopic travel gear	ET 20 VDS/telescopic travel gear
Ground clearance	170 mm (6 3/4 in)	160 mm (6 1/4 in)
Ground pressure	0.28 kg/cm² (4 lbs/in²)	0.29 kg/cm² 4.1 lbs/in²)
Upper carriage swivel speed	10 rpm	

	ET24	ET24 VDS
Ground clearance	295 mm (11 5/8 in)	280 mm (11 in)
Ground pressure Canopy/standard travel gear	0.29 kg/cm² 4.1 lbs/in²)	0.30 kg/cm² (4.3 lbs/in²)
Upper carriage swivel speed	10 rpm	

9.14 Payload/stability

Safety instructions – lift capacity table

The values of the lift capacity table apply to normal operation (for example excavating).

The values of the stability table apply to lifting gear applications.

DANGER

Crushing hazard due to tipping over of machine.

Causes serious crushing or injury resulting in death.

- ► Do not exceed the weight specified in the table (the smallest value applies).
- ► Get informed on the lift capacity of the attachment before using it.
- ► If a bucket or attachment (for example a hammer) is installed, the dead weight and the contents of the bucket must be subtracted from the weight specified in the table. Pay attention to the density of the load.

NOTICE

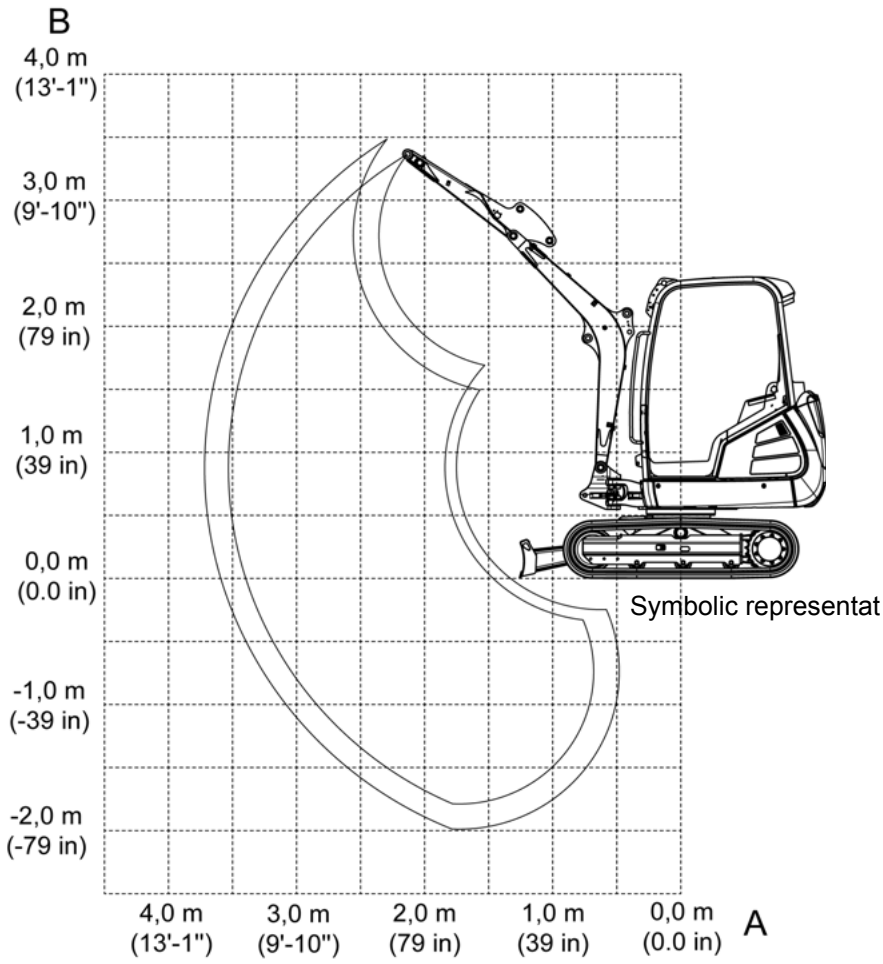
If the specified weight is exceeded, danger of damage to property due to tipping over of machine.

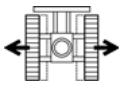
- ► Do not exceed the weight specified in the table (the smallest value applies).

Information

The indications are only approximate values. Attachments, uneven ground and soft or bad ground conditions affect lift capacity. The operator must take these influences into account.

Legend



Designation	Explanation
A	Reach from live ring center
B	Load hook height
max	Authorized lift capacity with horizontal boom
	With the stabilizer blade in travel direction
	With or without the stabilizer blade, 90° to travel direction
	Lowered stabilizer blade
	Raised stabilizer blade
	Telescopic travel gear extended

All table values are specified in kg (lbs) under the following conditions:

- Upper carriage not tilted.
- Machine placed on firm, level and horizontal ground.
- No bucket or other attachment (hammer, etc.) installed.

The machine's lift capacity is restricted by the hydraulic output and the hydraulic system's stabilizing features.

Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

Calculation basis: according to ISO 10567.

Setting pressure on boom cylinder:

ET 18/20: 20000 kPa (2900 psi)

ET 24: 24000 kPa (3480 psi)

The lift capacity applies to machines under the following conditions:

- Lubricants and engine/machine fluids at the mandatory levels.
- Full fuel tank.
- Cabin or canopy.
- Machine at operating temperature.
- Operator weight 75 kg (165 lbs).

Lift capacity table ET 18

Cabin and standard travel gear (short stick)

A / B	max			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
2.5 m (98 in)	382 (842)	290 (639)	249 (549)	-	-	-	366 (807)	318 (701)	274 (604)	-	-	-	-	-	-
2.0 m (79 in)	384 (847)	239 (527)	203 (448)	-	-	-	371 (818)	316 (697)	271 (597)	-	-	-	-	-	-
1.0 m (39 in)	402 (886)	201 (443)	169 (373)	423 (933)	228 (503)	193 (425)	492 (1,085)	295 (605)	251 (553)	641 (1,413)	399 (880)	340 (750)	-	-	-
0.0 m (0.0 in)	430 (948)	204 (450)	171 (377)	466 (1,027)	219 (483)	183 (403)	591 (1,303)	277 (611)	233 (514)	814 (1,795)	370 (816)	312 (688)	1257 (2,771)	550 (1,213)	463 (1,021)
−1.0 m (−39 in)	461 (1,016)	263 (580)	222 (489)	-	-	-	507 (1,118)	279 (615)	234 (516)	702 (1,548)	372 (820)	314 (692)	1004 (2,213)	559 (1,232)	473 (1,043)
−1.5 m (−59 in)	460 (1,014)	378 (833)	321 (708)	-	-	-	-	-	-	475 (1,047)	386 (851)	327 (721)	705 (1,554)	575 (1,268)	488 (1,076)

Cabin and standard travel gear (long stick)

A / B	max			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
2.5 m (98 in)	341 (752)	252 (556)	215 (474)	-	-	-	304 (670)	304 (670)	276 (609)	-	-	-	-	-	-
2.0 m (79 in)	346 (763)	213 (470)	180 (397)	335 (739)	237 (523)	201 (443)	318 (701)	316 (697)	272 (600)	-	-	-	-	-	-
1.0 m (39 in)	365 (805)	181 (399)	151 (333)	392 (864)	225 (496)	190 (419)	448 (988)	294 (648)	249 (549)	567 (1,250)	401 (884)	343 (756)	-	-	-
0.0 m (0.0 in)	393 (866)	183 (403)	152 (335)	454 (1,001)	213 (470)	178 (392)	573 (1,263)	272 (600)	228 (503)	793 (1,748)	364 (803)	306 (675)	1271 (2,802)	539 (1,188)	453 (999)
−1.0 m (−39 in)	426 (939)	227 (500)	189 (417)	-	-	-	541 (1,193)	268 (591)	224 (494)	740 (1,631)	361 (796)	303 (668)	1089 (2,401)	544 (1,199)	457 (1,008)
−1.5 m (−59 in)	440 (970)	299 (659)	252 (556)	-	-	-	-	-	-	586 (1,292)	370 (816)	312 (688)	851 (1,876)	557 (1,228)	470 (1,036)

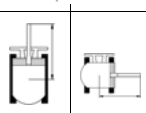
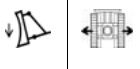
Cabin and telescopic travel gear (short stick)

A / B	max			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
2,5 m (98 in)	382 (842)	382 (842)	313 (690)	-	-	-	366 (807)	366 (807)	344 (758)	-	-	-	-	-	-
2.0 m (79 in)	384 (847)	352 (776)	258 (569)	-	-	-	371 (818)	371 (818)	341 (752)	-	-	-	-	-	-
1.0 m (39 in)	402 (886)	299 (659)	217 (478)	423 (933)	340 (750)	247 (545)	492 (1,085)	440 (970)	320 (706)	641 (1,413)	607 (1,338)	435 (959)	-	-	-
0.0 m (0.0 in)	430 (948)	306 (675)	221 (487)	466 (1,027)	330 (728)	237 (522)	591 (1,303)	421 (928)	302 (666)	814 (1,795)	575 (1,268)	406 (895)	1257 (2,771)	894 (1,971)	611 (1,347)
−1.0 m (-39 in)	461 (1,016)	398 (877)	286 (631)	-	-	-	507 (1,118)	423 (933)	303 (668)	702 (1,548)	577 (1,272)	408 (899)	1004 (2,213)	905 (1,995)	621 (1,369)
-1.5 m (-59 in)	460 (1,014)	460 (1,014)	413 (911)	-	-	-	-	-	-	475 (1,047)	475 (1,047)	422 (930)	705 (1,554)	705 (1,554)	637 (1,404)

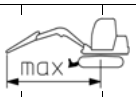
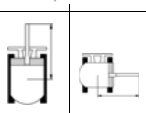
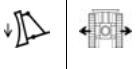
Cabin and telescopic travel gear (long stick)

A / B	max			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
2,5 m (98 in)	341 (752)	341 (752)	273 (602)	-	-	-	304 (670)	304 (670)	304 (670)	-	-	-	-	-	-
2.0 m (79 in)	346 (763)	316 (697)	230 (507)	335 (739)	335 (739)	256 (564)	318 (701)	318 (701)	318 (701)	-	-	-	-	-	-
1.0 m (39 in)	365 (805)	273 (602)	196 (432)	392 (864)	337 (743)	244 (538)	448 (988)	439 (968)	319 (703)	567 (1,250)	567 (1,250)	438 (966)	-	-	-
0.0 m (0.0 in)	393 (866)	277 (611)	198 (437)	454 (1,001)	324 (714)	232 (511)	573 (1,263)	416 (917)	296 (653)	793 (1,748)	569 (1,254)	400 (882)	1271 (2,802)	883 (1,947)	600 (1,323)
−1.0 m (-39 in)	426 (939)	345 (761)	247 (545)	-	-	-	541 (1,193)	412 (908)	293 (646)	740 (1,631)	566 (1,248)	397 (876)	1089 (2,401)	889 (1,960)	606 (1,336)
-1.5 m (-59 in)	440 (970)	440 (970)	326 (719)	-	-	-	-	-	-	586 (1,292)	575 (1,268)	406 (895)	851 (1,876)	851 (1,876)	619 (1,365)

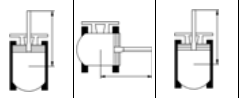
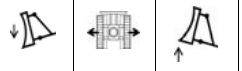
Cabin, telescopic travel gear and VDS (short stick)

A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2,5 m (98 in)	381 (840)	381 (840)	282 (622)	-	-	-	362 (798)	362 (798)	328 (723)	-	-	-	-	-	-
2.0 m (79 in)	385 (849)	377 (831)	236 (520)	383 (844)	383 (844)	241 (531)	379 (836)	379 (836)	324 (714)	-	-	-	-	-	-
1.0 m (39 in)	405 (893)	329 (725)	202 (445)	430 (948)	374 (825)	231 (509)	507 (1,118)	483 (1,065)	301 (664)	673 (1,484)	663 (1,462)	414 (913)	-	-	-
0.0 m (0.0 in)	434 (957)	344 (758)	209 (461)	465 (1,025)	365 (805)	222 (489)	594 (1,310)	465 (1,025)	284 (626)	816 (1,799)	636 (1,402)	387 (853)	1243 (2,740)	993 (2,189)	598 (1,318)
−1.0 m (-39 in)	464 (1,023)	464 (1,023)	286 (631)	-	-	-	472 (1,041)	470 (1,036)	289 (637)	671 (1,479)	641 (1,413)	392 (864)	956 (2,108)	956 (2108)	611 (1,347)
-1.5 m (-59 in)	451 (994)	451 (994)	451 (994)	-	-	-	-	-	-	-	-	-	607 (1,338)	607 (1,338)	607 (1,338)

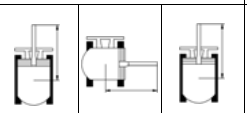
Cabin, telescopic travel gear and VDS (long stick)

A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2,5 m (98 in)	341 (752)	341 (752)	246 (542)	-	-	-	303 (668)	303 (668)	303 (668)	-	-	-	-	-	-
2.0 m (79 in)	347 (765)	340 (750)	210 (463)	337 (743)	337 (743)	241 (531)	327 (721)	327 (721)	325 (717)	-	-	-	-	-	-
1.0 m (39 in)	367 (809)	301 (664)	182 (401)	400 (882)	371 (818)	228 (503)	466 (1,027)	466 (1,027)	300 (661)	603 (1,329)	603 (1,329)	416 (917)	-	-	-
0.0 m (0.0 in)	396 (873)	311 (686)	186 (410)	457 (1,008)	359 (791)	216 (476)	579 (1,276)	460 (1,014)	278 (613)	800 (1,764)	629 (1,387)	380 (838)	1268 (2,795)	981 (2,163)	586 (1,292)
−1.0 m (-39 in)	430 (948)	400 (882)	242 (534)	-	-	-	522 (1,151)	459 (1,012)	277 (611)	718 (1,583)	629 (1,387)	380 (838)	1050 (2,315)	990 (2,183)	595 (1,312)
-1.5 m (-59 in)	441 (972)	441 (972)	341 (752)	-	-	-	-	-	-	531 (1,171)	531 (1,171)	392 (864)	779 (1,717)	779 (1,717)	611 (1,347)

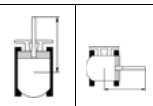
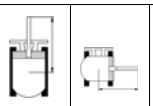
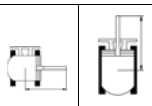
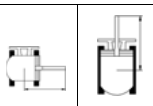
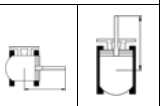
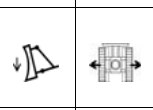
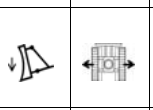
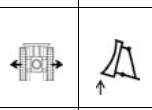
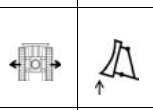
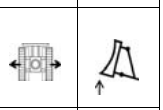
Canopy and standard travel gear (short stick)

A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2.5 m (98 in)	382 (842)	268 (591)	227 (500)	-	-	-	366 (807)	294 (648)	251 (553)	-	-	-	-	-	-
2.0 m (79 in)	384 (847)	220 (485)	184 (406)	-	-	-	371 (818)	292 (644)	248 (547)	-	-	-	-	-	-
1.0 m (39 in)	402 (886)	183 (403)	152 (335)	423 (933)	209 (461)	174 (384)	492 (1,085)	271 (597)	227 (500)	641 (1,413)	368 (811)	310 (683)	-	-	-
0.0 m (0.0 in)	430 (948)	186 (410)	153 (337)	466 (1,027)	200 (441)	165 (364)	591 (1,303)	253 (558)	210 (463)	814 (1,795)	339 (747)	281 (619)	1257 (2,771)	504 (1,111)	419 (924)
−1.0 m (−39 in)	461 (1,016)	241 (531)	200 (441)	-	-	-	507 (1,118)	255 (562)	211 (465)	702 (1,548)	341 (752)	283 (624)	1004 (2,213)	514 (1,133)	428 (944)
-1.5 m (-59 in)	460 (1,014)	347 (765)	291 (642)	-	-	-	-	-	-	475 (1,047)	354 (780)	296 (653)	705 (1,554)	529 (1,166)	444 (979)

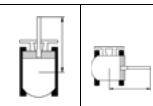
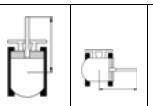
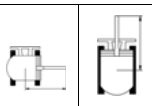
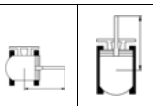
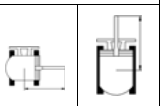
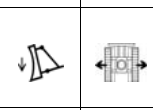
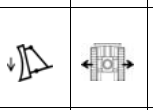
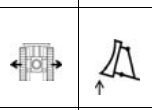
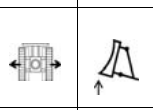
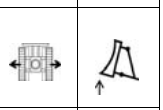
Canopy and standard travel gear (long stick)

A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2.5 m (98 in)	341 (752)	232 (511)	196 (432)	-	-	-	304 (670)	297 (655)	253 (558)	-	-	-	-	-	-
2.0 m (79 in)	346 (763)	195 (430)	163 (359)	335 (739)	218 (481)	183 (403)	318 (701)	293 (646)	249 (549)	-	-	-	-	-	-
1.0 m (39 in)	365 (805)	165 (364)	135 (298)	392 (864)	206 (454)	171 (377)	448 (988)	270 (595)	226 (498)	567 (1,250)	370 (816)	312 (688)	-	-	-
0.0 m (0.0 in)	393 (866)	166 (366)	135 (298)	454 (1,001)	194 (428)	159 (351)	573 (1,263)	248 (547)	204 (450)	793 (1,748)	333 (734)	275 (606)	1271 (2,802)	494 (1,089)	408 (899)
−1.0 m (−39 in)	426 (939)	206 (454)	169 (373)	-	-	-	541 (1,193)	245 (540)	201 (443)	740 (1,631)	330 (728)	272 (600)	1089 (2,401)	498 (1,098)	413 (911)
-1.5 m (-59 in)	440 (970)	274 (604)	227 (500)	-	-	-	-	-	-	586 (1,292)	339 (747)	281 (619)	851 (1,876)	511 (1,127)	425 (937)

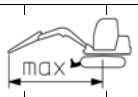
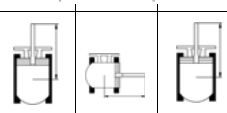
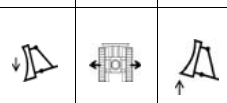
Canopy and telescopic travel gear (short stick)

A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2,5 m (98 in)	382 (842)	382 (842)	289 (637)	-	-	-	366 (807)	366 (807)	317 (699)	-	-	-	-	-	-
2.0 m (79 in)	384 (847)	326 (719)	237 (522)	-	-	-	371 (818)	371 (818)	315 (694)	-	-	-	-	-	-
1.0 m (39 in)	402 (886)	276 (608)	198 (437)	423 (933)	314 (692)	226 (498)	492 (1,085)	408 (899)	294 (648)	641 (1,413)	563 (1,241)	400 (882)	-	-	-
0.0 m (0.0 in)	430 (948)	282 (622)	201 (443)	466 (1,027)	304 (670)	216 (476)	591 (1,303)	389 (858)	275 (606)	814 (1,795)	531 (1,171)	371 (818)	1257 (2,771)	827 (1,823)	559 (1,232)
−1.0 m (-39 in)	461 (1,016)	368 (811)	261 (575)	-	-	-	507 (1,118)	390 (860)	277 (611)	702 (1,548)	533 (1,175)	373 (822)	1004 (2,213)	838 (1,847)	569 (1,254)
-1.5 m (-59 in)	460 (1,014)	460 (1,014)	379 (836)	-	-	-	-	-	-	475 (1,047)	475 (1,047)	387 (853)	705 (1,554)	705 (1,554)	586 (1,292)

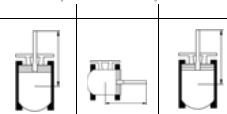
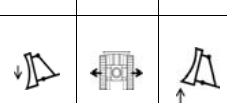
Canopy and telescopic travel gear (long stick)

A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2,5 m (98 in)	341 (752)	341 (752)	251 (553)	-	-	-	304 (670)	304 (670)	304 (670)	-	-	-	-	-	-
2.0 m (79 in)	346 (763)	292 (644)	211 (465)	335 (739)	324 (714)	235 (518)	318 (701)	318 (701)	316 (697)	-	-	-	-	-	-
1.0 m (39 in)	365 (805)	251 (553)	179 (395)	392 (864)	311 (686)	223 (492)	448 (988)	407 (897)	292 (644)	567 (1,250)	566 (1,248)	403 (888)	-	-	-
0.0 m (0.0 in)	393 (866)	255 (562)	180 (397)	454 (1,001)	298 (657)	210 (463)	573 (1,263)	383 (844)	270 (595)	793 (1,748)	525 (1,157)	365 (805)	1271 (2,802)	816 (1,799)	549 (1,210)
−1.0 m (-39 in)	426 (939)	318 (701)	224 (494)	-	-	-	541 (1,193)	380 (838)	267 (589)	740 (1,631)	522 (1,151)	362 (798)	1089 (2,401)	822 (1,812)	554 (1,221)
-1.5 m (-59 in)	440 (970)	422 (930)	298 (657)	-	-	-	-	-	-	586 (1,292)	532 (1,173)	371 (818)	851 (1,877)	837 (1,845)	567 (1,250)

Canopy, telescopic travel gear and VDS (short stick)

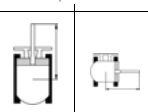
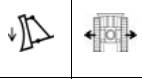
A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2,5 m (98 in)	381 (840)	381 (840)	256 (564)	-	-	-	362 (798)	362 (798)	298 (657)	-	-	-	-	-	-
2.0 m (79 in)	385 (849)	351 (774)	212 (467)	383 (844)	358 (789)	217 (478)	379 (836)	379 (836)	294 (648)	-	-	-	-	-	-
1.0 m (39 in)	405 (893)	306 (675)	180 (397)	430 (948)	348 (767)	207 (456)	507 (1,118)	450 (992)	271 (597)	673 (1,484)	619 (1,365)	374 (825)	-	-	-
0.0 m (0.0 in)	434 (957)	319 (703)	186 (410)	465 (1,025)	339 (747)	198 (437)	594 (1,310)	433 (955)	254 (560)	816 (1,799)	591 (1,303)	347 (765)	1243 (2,740)	924 (2,037)	537 (1,184)
−1.0 m (-39 in)	464 (1,023)	433 (955)	256 (564)	-	-	-	472 (1,041)	437 (963)	259 (571)	671 (1,479)	597 (1,316)	352 (776)	956 (2,108)	938 (2,068)	550 (1,213)
-1.5 m (-59 in)	451 (994)	451 (994)	415 (915)	-	-	-	-	-	-	-	-	-	607 (1,338)	607 (1,338)	571 (1,259)

Canopy, telescopic travel gear and VDS (long stick)

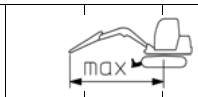
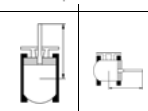
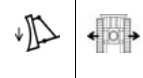
A / B				3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)			1.5 m (59 in)		
															
															
2,5 m (98 in)	341 (752)	341 (752)	222 (489)	-	-	-	303 (668)	303 (668)	301 (664)	-	-	-	-	-	-
2.0 m (79 in)	347 (765)	316 (697)	189 (417)	337 (743)	337 (743)	217 (478)	327 (721)	327 (721)	295 (650)	-	-	-	-	-	-
1.0 m (39 in)	367 (809)	279 (615)	161 (355)	400 (882)	345 (761)	204 (450)	466 (1,027)	449 (990)	270 (595)	603 (1,329)	603 (1,329)	376 (829)	-	-	-
0.0 m (0.0 in)	396 (873)	289 (637)	165 (364)	457 (1,008)	333 (734)	192 (423)	579 (1,276)	427 (941)	248 (547)	800 (1,764)	585 (1,290)	340 (750)	1268 (2,795)	912 (2,011)	525 (1,157)
−1.0 m (-39 in)	430 (948)	372 (820)	216 (476)	-	-	-	522 (1,151)	426 (939)	247 (545)	718 (1,583)	585 (1,290)	340 (750)	1050 (2,315)	921 (2,030)	534 (1,177)
-1.5 m (-59 in)	441 (972)	441 (972)	306 (675)	-	-	-	-	-	-	531 (1,171)	531 (1,171)	352 (776)	779 (1,717)	779 (1,717)	551 (1,215)

Lift capacity tables ET 20

Cabin and telescopic travel gear (short stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2,5 m (98 in)	382 (842)	355 (783)	322 (710)	- -	- -	- -	385 (849)	349 (769)	316 (697)	355 (783)	355 (783)	355 (783)	- -	- -	- -
2.0 m (79 in)	383 (845)	304 (670)	275 (606)	- -	- -	- -	378 (833)	348 (768)	316 (696)	384 (847)	384 (847)	384 (847)	- -	- -	- -
1.0 m (39 in)	397 (876)	263 (580)	237 (523)	399 (880)	266 (586)	240 (529)	445 (981)	333 (734)	301 (663)	532 (1,173)	432 (952)	389 (858)	722 (1,592)	593 (1,308)	531 (1,171)
0.0 m (0.0 in)	420 (925)	267 (589)	241 (531)	- -	- -	- -	501 (1,105)	319 (703)	287 (632)	639 (1,409)	408 (900)	366 (807)	887 (1,956)	557 (1,228)	496 (1,094)
−1.0 m (-39 in)	443 (976)	332 (732)	299 (659)	- -	- -	- -	- -	- -	- -	578 (1,274)	407 (897)	364 (802)	778 (1,715)	558 (1,231)	497 (1,097)
-1.5 m (-59 in)	442 (975)	435 (960)	391 (642)	- -	- -	- -	- -	- -	- -	- -	- -	- -	608 (1,340)	569 (1,255)	508 (1,120)

Cabin and telescopic travel gear (long stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2,5 m (98 in)	341 (752)	313 (690)	283 (624)	- -	- -	- -	326 (719)	326 (719)	317 (699)	- -	- -	- -	- -	- -	- -
2.0 m (79 in)	345 (761)	272 (600)	246 (542)	- -	- -	- -	334 (736)	334 (736)	314 (692)	330 (728)	330 (728)	330 (728)	- -	- -	- -
1.0 m (39 in)	360 (794)	238 (525)	214 (472)	370 (816)	260 (573)	234 (516)	411 (906)	328 (723)	296 (653)	485 (1,069)	429 (946)	386 (851)	639 (1,409)	595 (1,312)	533 (1,175)
0.0 m (0.0 in)	382 (842)	240 (529)	215 (474)	400 (882)	251 (553)	225 (496)	484 (1,067)	311 (686)	279 (615)	616 (1,358)	400 (882)	358 (789)	863 (1,903)	548 (1,208)	487 (1,074)
−1.0 m (-39 in)	407 (897)	289 (637)	260 (573)	- -	- -	- -	451 (994)	308 (679)	276 (608)	596 (1,254)	394 (869)	352 (776)	808 (1,781)	543 (1,197)	482 (1,063)
-1.5 m (-59 in)	416 (917)	360 (794)	323 (712)	- -	- -	- -	- -	- -	- -	492 (1,085)	401 (885)	359 (791)	679 (1,497)	552 (1,217)	491 (1,082)

Cabin, telescopic travel gear and VDS (short stick)

A / B	max			3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
2,5 m (98 in)	380 (838)	351 (774)	274 (604)	-	-	-	378 (833)	358 (789)	280 (617)	356 (785)	356 (785)	356 (785)	-	-	-
2.0 m (79 in)	383 (844)	305 (672)	235 (518)	-	-	-	380 (838)	356 (785)	278 (613)	394 (869)	394 (869)	374 (825)	-	-	-
1.0 m (39 in)	399 (880)	269 (593)	204 (450)	401 (884)	272 (600)	207 (456)	452 (996)	341 (752)	262 (578)	548 (1,208)	442 (974)	343 (756)	754 (1,662)	605 (1,334)	474 (1,045)
0.0 m (0.0 in)	422 (930)	278 (613)	210 (463)	-	-	-	502 (1,107)	328 (723)	249 (549)	643 (1,418)	420 (926)	322 (710)	889 (1;960)	574 (1,265)	443 (977)
−1.0 m (-39 in)	445 (981)	355 (783)	271 (597)	-	-	-	-	-	-	561 (1,237)	421 (928)	323 (712)	758 (1,671)	578 (1,274)	447 (985)
-1.5 m (-59 in)	446 (983)	446 (983)	446 (983)	-	-	-	-	-	-	-	-	-	386 (851)	386 (851)	386 (851)

Cabin, telescopic travel gear and VDS (long stick)

A / B	max			3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
2,5 m (98 in)	341 (752)	312 (688)	240 (529)	-	-	-	325 (717)	325 (717)	280 (617)	-	-	-	-	-	-
2.0 m (79 in)	346 (763)	274 (604)	209 (461)	-	-	-	338 (745)	338 (745)	276 (608)	341 (752)	341 (752)	341 (752)	-	-	-
1.0 m (39 in)	362 (798)	244 (538)	183 (403)	375 (827)	268 (591)	202 (445)	420 (926)	337 (743)	258 (569)	502 (1,107)	439 (968)	341 (752)	675 (1,488)	608 (1,340)	477 (1,052)
0.0 m (0.0 in)	385 (849)	250 (551)	187 (412)	400 (882)	259 (571)	194 (428)	336 (741)	321 (708)	242 (534)	475 (1,047)	412 (908)	314 (692)	872 (1,922)	565 (1,246)	433 (955)
−1.0 m (-39 in)	411 (906)	309 (681)	233 (514)	-	-	-	437 (963)	320 (705)	241 (531)	586 (1,292)	409 (902)	310 (683)	794 (1,750)	563 (1,241)	432 (952)
-1.5 m (-59 in)	419 (924)	396 (873)	302 (666)	-	-	-	-	-	-	443 (977)	418 (922)	319 (703)	648 (1,429)	574 (1,265)	442 (974)

Canopy and telescopic travel gear (short stick)

A / B	max	3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
2.5 m (98 in)	382 (842)	329 (725)	298 (657)	- -	- -	- -	385 (849)	323 (712)	292 (644)	355 (783)	355 (783)	355 (783)	- -	- -	- -
2.0 m (79 in)	383 (844)	281 (620)	254 (560)	- -	- -	- -	378 (833)	323 (714)	292 (644)	384 (847)	384 (847)	384 (847)	- -	- -	- -
1.0 m (39 in)	397 (875)	242 (534)	218 (481)	399 (880)	244 (538)	220 (485)	445 (981)	307 (677)	277 (611)	532 (1,173)	400 (882)	359 (791)	722 (1,592)	549 (1,210)	491 (1,082)
0.0 m (0.0 in)	420 (926)	245 (486)	220 (485)	- -	- -	- -	501 (1,105)	293 (646)	263 (580)	639 (1,409)	376 (829)	336 (741)	887 (1,956)	513 (1,131)	456 (1,005)
−1.0 m (-39 in)	443 (977)	305 (672)	274 (604)	- -	- -	- -	- -	- -	- -	578 (1,274)	374 (825)	335 (739)	778 (1,715)	515 (1,135)	458 (1,010)
-1.5 m (-59 in)	442 (974)	402 (886)	360 (794)	- -	- -	- -	- -	- -	- -	- -	- -	- -	608 (1,340)	526 (1,160)	468 (1,032)

Canopy and telescopic travel gear (long stick)

A / B	max	3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
2.5 m (98 in)	341 (752)	289 (637)	261 (575)	- -	- -	- -	326 (719)	324 (714)	293 (646)	- -	- -	- -	- -	- -	- -
2.0 m (79 in)	345 (761)	250 (551)	226 (498)	- -	- -	- -	334 (736)	321 (708)	290 (639)	330 (728)	330 (728)	330 (728)	- -	- -	- -
1.0 m (39 in)	360 (794)	218 (481)	195 (430)	370 (816)	239 (527)	215 (474)	411 (906)	303 (668)	272 (600)	485 (1,069)	397 (875)	357 (787)	639 (1,409)	552 (1,217)	493 (1,087)
0.0 m (0.0 in)	382 (842)	220 (485)	196 (432)	400 (882)	230 (507)	206 (454)	484 (1,067)	285 (628)	255 (562)	616 (1,358)	368 (811)	328 (723)	863 (1,903)	504 (1,111)	447 (985)
−1.0 m (-39 in)	407 (897)	265 (584)	237 (523)	- -	- -	- -	451 (994)	283 (624)	253 (558)	596 (1,314)	362 (798)	322 (710)	808 (1,781)	500 (1,102)	443 (977)
-1.5 m (-59 in)	416 (917)	331 (730)	296 (653)	- -	- -	- -	- -	- -	- -	492 (1,085)	369 (814)	329 (725)	679 (1,497)	508 (1,120)	451 (994)

Canopy, telescopic travel gear and VDS (short stick)

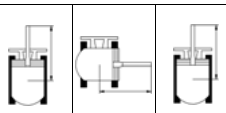
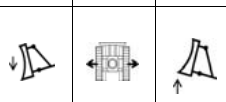
A / B	max			3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
2,5 m (98 in)	380 (838)	326 (719)	248 (547)	-	-	-	378 (833)	332 (732)	253 (558)	356 (785)	356 (785)	349 (769)	-	-	-
2.0 m (79 in)	383 (844)	282 (622)	212 (467)	-	-	-	380 (838)	331 (730)	251 (553)	394 (869)	394 (869)	341 (752)	-	-	-
1.0 m (39 in)	399 (880)	248 (547)	182 (401)	401 (884)	251 (553)	185 (408)	452 (996)	315 (694)	236 (520)	548 (1,208)	409 (902)	310 (683)	754 (1,662)	562 (1,239)	429 (946)
0.0 m (0.0 in)	422 (930)	256 (564)	187 (412)	-	-	-	502 (1,107)	302 (666)	223 (492)	643 (1,418)	388 (855)	288 (635)	889 (1,960)	531 (1,171)	398 (877)
−1.0 m (-39 in)	445 (981)	328 (723)	243 (536)	-	-	-	-	-	-	561 (1,237)	389 (858)	289 (637)	758 (1,671)	535 (1,179)	402 (886)
-1.5 m (-59 in)	446 (983)	446 (983)	446 (983)	-	-	-	-	-	-	-	-	-	386 (851)	386 (851)	386 (851)

Canopy, telescopic travel gear and VDS (long stick)

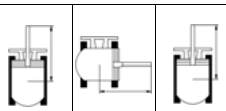
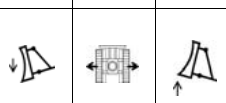
A / B	max			3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
2,5 m (98 in)	341 (752)	288 (635)	216 (477)	-	-	-	325 (717)	325 (717)	254 (560)	-	-	-	-	-	-
2.0 m (79 in)	346 (763)	253 (558)	187 (412)	-	-	-	338 (745)	329 (725)	250 (551)	341 (752)	341 752()	341 (752)	-	-	-
1.0 m (39 in)	362 (798)	224 (494)	162 (357)	375 (827)	246 (542)	180 (397)	420 (926)	311 (686)	232 (511)	502 (1,107)	407 (897)	308 (679)	675 (1,488)	564 (1,243)	432 (952)
0.0 m (0.0 in)	385 (849)	230 (507)	165 (364)	400 (882)	238 (525)	172 (379)	336 (741)	295 (650)	216 (476)	475 (1,047)	380 (838)	281 (619)	872 (1,922)	521 (1,149)	388 (855)
−1.0 m (-39 in)	411 (906)	284 (626)	207 (456)	-	-	-	437 (963)	294 (648)	215 (474)	586 (1,292)	377 (831)	277 (611)	794 (1,750)	520 (1,146)	387 (853)
-1.5 m (-59 in)	419 (924)	365 (805)	271 (597)	-	-	-	-	-	-	443 (977)	385 (849)	286 (631)	648 (1,429)	530 (1,168)	397 (875)

Lift capacity table ET 24

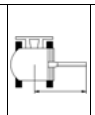
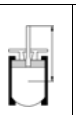
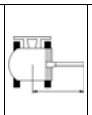
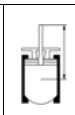
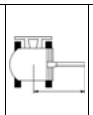
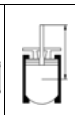
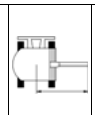
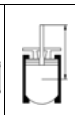
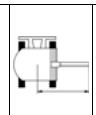
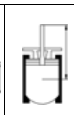
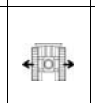
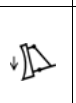
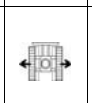
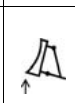
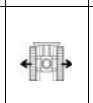
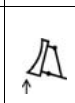
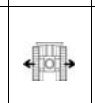
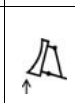
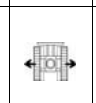
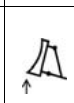
Cabin and standard travel gear (short stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	552 (1,217)	440 (970)	356 (785)	-	-	-	547 (1,206)	449 (990)	364 (802)	513 (1,131)	513 (1,131)	500 (1,102)	-	-	-
2.0 m (79 in)	557 (1,228)	383 (844)	306 (675)	-	-	-	552 (1,217)	447 (985)	362 (798)	569 (1,254)	569 (1,254)	490 (1,080)	-	-	-
1.0 m (39 in)	580 (1,279)	339 (747)	267 (589)	584 (1,287)	343 (756)	271 (597)	657 (1,448)	429 (946)	344 (758)	794 (1,750)	558 (1,230)	454 (1,001)	1088 (2,399)	770 (1,698)	638 (1,407)
0.0 m (0.0 in)	615 (1,356)	351 (774)	276 (608)	-	-	-	730 (1,609)	415 (915)	329 (725)	932 (2,055)	533 (1,175)	428 (944)	1285 (2,833)	735 (1,620)	600 (1,323)
−1.0 m (−39 in)	649 (1,431)	450 (992)	358 (789)	-	-	-	-	-	-	815 (1,797)	534 (1,177)	429 (946)	1098 (2,421)	739 (1,629)	605 (1,334)
-1.5 m (-59 in)	646 (1,424)	618 (1,362)	504 (1,111)	-	-	-	-	-	-	-	-	-	819 (1,806)	754 (1,662)	621 (1,369)

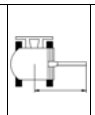
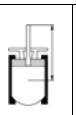
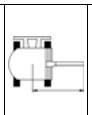
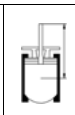
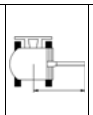
Cabin and standard travel gear (long stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	499 (1,100)	392 (864)	314 (692)	-	-	-	533 (1,175)	439 (968)	354 (780)	-	-	-	-	-	-
2.0 m (79 in)	507 (1,118)	346 (763)	274 (604)	-	-	-	536 (1,182)	437 (963)	352 (776)	541 (1,193)	541 (1,193)	482 (1,063)	-	-	-
1.0 m (39 in)	532 (1,173)	309 (681)	241 (531)	572 (1,261)	332 (732)	260 (573)	627 (1,382)	422 (930)	336 (741)	794 (1,750)	534 (1,177)	429 (946)	980 (2,161)	775 (1,709)	643 (1,418)
0.0 m (0.0 in)	566 (1248)	318 (701)	247 (545)	574 (1,265)	327 (721)	255 (562)	714 (1,574)	406 (895)	320 (705)	910 (2,006)	526 (1,160)	421 (928)	1272 (2,804)	727 (1,603)	593 (1,307)
−1.0 m (−39 in)	605 (1,334)	393 (866)	309 (681)	-	-	-	618 (1,362)	406 (895)	320 (705)	855 (1,885)	521 (1,149)	416 (917)	1147 (2,529)	727 (1,603)	592 (1,305)
-1.5 m (-59 in)	618 (1,362)	504 (1,111)	404 (891)	-	-	-	-	-	-	664 (1,464)	531 (1,171)	427 (941)	943 (2,079)	737 (1,625)	603 (1,329)

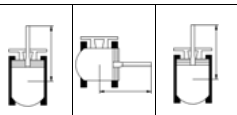
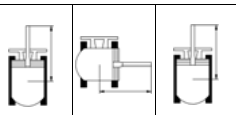
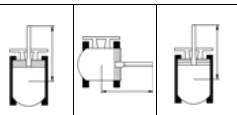
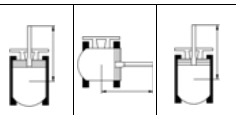
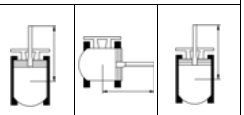
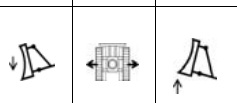
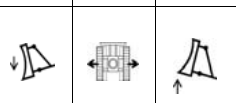
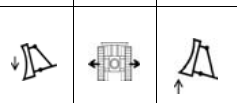
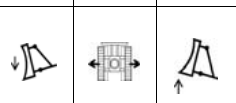
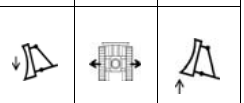
Cabin, standard travel gear and VDS (short stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	552 (1,217)	430 (948)	344 (758)	-	-	-	547 (1,206)	440 (970)	352 (776)	513 (1,131)	513 (1,131)	484 (1,067)	-	-	-
2.0 m (79 in)	557 (1,228)	374 (825)	295 (650)	-	-	-	552 (1,217)	438 (966)	350 (772)	569 (1,254)	569 (1,254)	474 (1,045)	-	-	-
1.0 m (39 in)	580 (1,279)	331 (730)	257 (567)	584 (1,287)	335 (739)	261 (575)	657 (1,448)	420 (926)	332 (732)	794 (1,750)	546 (1,204)	438 (966)	1088 (2,399)	754 (1,662)	617 (1,360)
0.0 m (0.0 in)	615 (1,356)	343 (756)	265 (584)	-	-	-	730 (1,609)	405 (893)	316 (697)	932 (2,055)	521 (1,149)	412 (908)	1285 (2,833)	718 (1,583)	579 (1,276)
−1.0 m (−39 in)	649 (1,431)	439 (968)	345 (761)	-	-	-	-	-	-	815 (1,797)	522 (1,151)	413 (911)	1098 (2,421)	723 (1,594)	584 (1,287)
-1.5 m (-59 in)	646 (1,424)	605 (1,334)	486 (1,071)	-	-	-	-	-	-	-	-	-	819 (1,806)	738 (1,627)	600 (1,323)

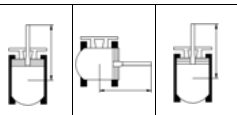
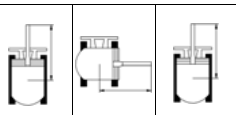
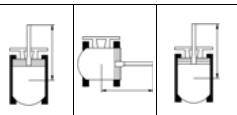
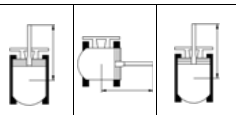
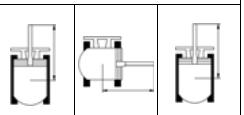
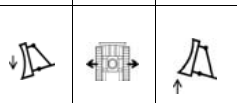
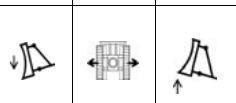
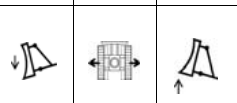
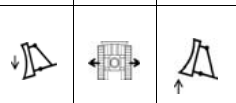
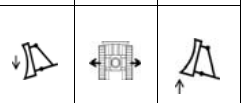
Cabin, standard travel gear and VDS (long stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
2.5 m (98 in)	499 (1,100)	383 (844)	303 (668)	-	-	-	533 (1,175)	429 (946)	342 (754)	-	-	-	-	-	-
2.0 m (79 in)	507 (1,118)	338 (745)	264 (582)	-	-	-	536 (1,182)	428 (944)	340 (750)	541 (1,193)	541 (1,193)	466 (1,027)	-	-	-
1.0 m (39 in)	532 (1,173)	302 (666)	232 (511)	572 (1,261)	324 (714)	250 (551)	627 (1,382)	412 (908)	324 (714)	794 (1,750)	522 (1,151)	414 (913)	980 (2,161)	758 (1,671)	622 (1,371)
0.0 m (0.0 in)	566 (1,248)	310 (683)	238 (525)	574 (1,265)	319 (703)	244 (538)	714 (1,574)	396 (873)	308 (679)	910 (2,006)	514 (1,133)	405 (893)	1272 (2,804)	711 (1,567)	572 (1,261)
−1.0 m (−39 in)	605 (1,334)	384 (847)	298 (657)	-	-	-	618 (1,362)	397 (875)	308 (679)	855 (1,885)	509 (1,122)	401 (884)	1147 (2,529)	710 (1,565)	571 (1,259)
-1.5 m (-59 in)	618 (1,362)	493 (1,087)	389 (858)	-	-	-	-	-	-	664 (1,464)	519 (1,144)	411 (906)	943 (2,079)	720 (1,587)	582 (1,283)

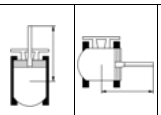
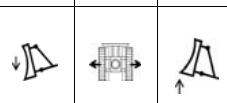
Canopy and standard travel gear (short stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	552 (1,217)	412 (908)	352 (776)	-	-	-	547 (1,206)	421 (928)	333 (734)	513 (1,131)	513 (1,131)	460 (1,014)	-	-	-
2.0 m (79 in)	557 (1,228)	358 (789)	278 (613)	-	-	-	552 (1,217)	419 (924)	331 (730)	569 (1,254)	557 (1,228)	450 (992)	-	-	-
1.0 m (39 in)	580 (1,279)	316 (697)	241 (531)	584 (1,287)	320 (705)	245 (540)	657 (1,448)	401 (884)	312 (688)	794 (1,750)	522 (1,151)	413 (911)	1088 (2,399)	722 (1,592)	583 (1,285)
0.0 m (0.0 in)	615 (1,356)	327 (721)	249 (549)	-	-	-	730 (1,609)	387 (853)	297 (655)	932 (2,055)	498 (1,098)	388 (855)	1285 (2,833)	686 (1,512)	545 (1,202)
−1.0 m (−39 in)	649 (1,431)	420 (926)	325 (717)	-	-	-	-	-	-	815 (1,797)	499 (1,100)	389 (858)	1098 (2,421)	691 (1,523)	550 (1,213)
-1.5 m (-59 in)	646 (1,424)	579 (1,276)	458 (1,010)	-	-	-	-	-	-	-	-	-	819 (1,806)	706 (1,556)	566 (1,248)

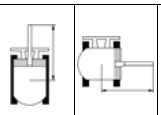
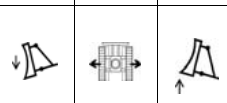
Canopy and standard travel gear (long stick)

A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	499 (1,100)	367 (809)	286 (631)	-	-	-	533 (1,175)	411 (906)	323 (712)	-	-	-	-	-	-
2.0 m (79 in)	507 (1,118)	323 (712)	248 (547)	-	-	-	536 (1,182)	409 (902)	321 (708)	541 (1,193)	541 (1,193)	442 (974)	-	-	-
1.0 m (39 in)	532 (1,173)	288 (635)	217 (478)	572 (1,261)	309 (681)	234 (516)	627 (1,382)	394 (869)	305 (672)	794 (1,750)	498 (1,098)	389 (858)	980 (2,161)	726 (1,601)	588 (1,296)
0.0 m (0.0 in)	566 (1,248)	296 (653)	222 (489)	574 (1,265)	304 (670)	229 (505)	714 (1,574)	378 (833)	289 (637)	910 (2,006)	490 (1,080)	381 (840)	1272 (2,804)	679 (1,497)	538 (1,186)
−1.0 m (−39 in)	605 (1,334)	366 (807)	279 (615)	-	-	-	618 (1,362)	378 (833)	289 (637)	855 (1,885)	486 (1,071)	376 (829)	1147 (2,529)	678 (1,495)	537 (1,184)
-1.5 m (-59 in)	618 (1,362)	470 (1,036)	366 (807)	-	-	-	-	-	-	664 (1,464)	496 (1,093)	386 (851)	943 (2,079)	689 (1,519)	548 (1,208)

Canopy, standard travel gear and VDS (short stick)

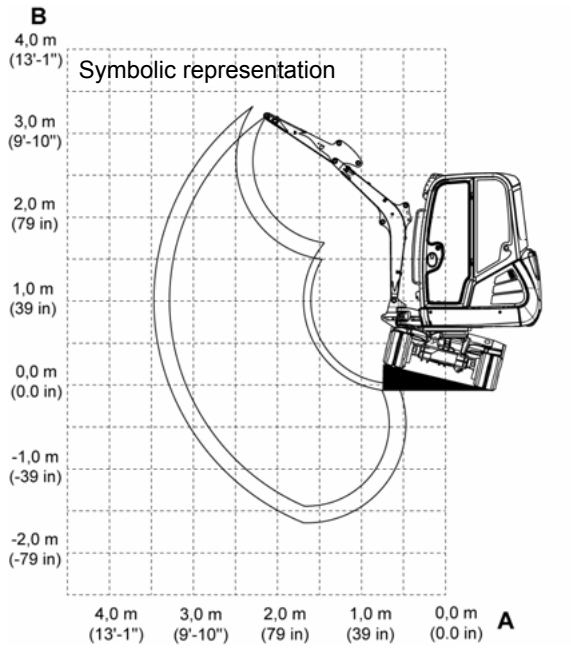
A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	552 (1,217)	403 (888)	313 (690)	-	-	-	547 (1,206)	412 (908)	321 (708)	513 (1,131)	513 (1,131)	444 (979)	-	-	-
2.0 m (79 in)	557 (1,228)	349 (769)	267 (589)	-	-	-	552 (1,217)	410 (904)	318 (701)	569 (1,254)	545 (1,202)	434 (957)	-	-	-
1.0 m (39 in)	580 (1,279)	308 (679)	231 (509)	584 (1,287)	312 (688)	235 (518)	657 (1,448)	392 (864)	300 (661)	794 (1,750)	510 (1,124)	398 (877)	1088 (2,399)	706 (1,556)	561 (1,237)
0.0 m (0.0 in)	615 (1,356)	319 (703)	239 (527)	-	-	-	730 (1,609)	377 (831)	285 (628)	932 (2,055)	486 (1,071)	372 (820)	1285 (2,833)	670 (1,477)	523 (1,153)
−1.0 m (−39 in)	649 (1,431)	409 (902)	312 (688)	-	-	-	-	-	-	815 (1,797)	487 (1,074)	373 (822)	1098 (2,421)	674 (1,486)	528 (1,164)
-1.5 m (-59 in)	646 (1,424)	565 (1,246)	441 (972)	-	-	-	-	-	-	-	-	-	819 (1,806)	690 (1,521)	544 (1,199)

Canopy, standard travel gear and VDS (long stick)

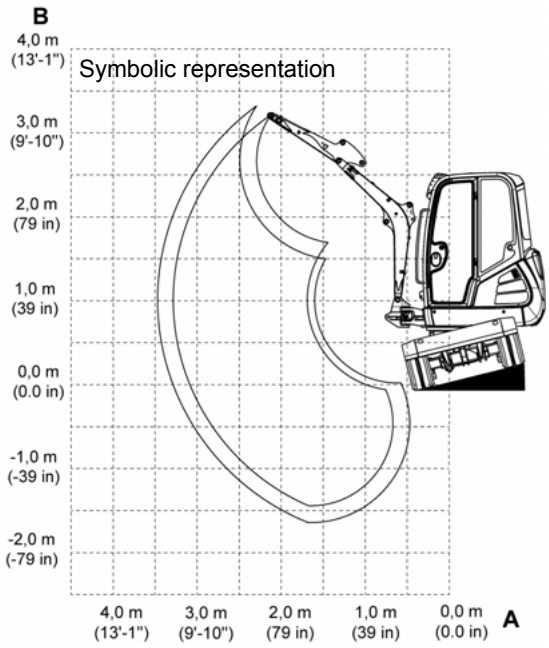
A / B				3.5 m (11'-6")			3.0 m (9'-10")			2.5 m (98 in)			2.0 m (79 in)		
															
															
2.5 m (98 in)	499 (1,100)	358 (789)	275 (606)	-	-	-	533 (1,175)	401 (884)	310 (683)	-	-	-	-	-	-
2.0 m (79 in)	507 (1,118)	315 (694)	238 (525)	-	-	-	536 (1,182)	400 (882)	308 (679)	541 (1,193)	537 (1,184)	426 (939)	-	-	-
1.0 m (39 in)	532 (1,173)	280 (617)	208 (459)	572 (1,261)	301 (664)	224 (494)	627 (1,382)	384 (847)	293 (646)	794 (1,750)	486 (1,071)	374 (825)	980 (2,161)	710 (1,565)	566 (1,248)
0.0 m (0.0 in)	566 (1,248)	288 (635)	213 (470)	574 (1,265)	296 (653)	219 (483)	714 (1,574)	368 (811)	276 (608)	910 (2,006)	478 (1,054)	365 (805)	1272 (2,804)	663 (1,462)	516 (1,138)
−1.0 m (−39 in)	605 (1,334)	357 (787)	267 (589)	-	-	-	618 (1,362)	369 (814)	277 (611)	855 (1,885)	474 (1,045)	361 (796)	1147 (2,529)	662 (1,459)	516 (1,138)
-1.5 m (-59 in)	618 (1,362)	459 (1,012)	351 (774)	-	-	-	-	-	-	664 (1,464)	484 (1,067)	371 (818)	943 (2,079)	672 (1,482)	526 (1,160)

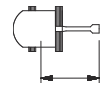
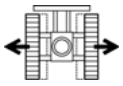
Lift capacity tables VDS (upper carriage tilted)

Boom uphill (15° slope)



Boom downhill (15° slope)



Designation	Explanation
A	Reach from live ring center
B	Load hook height
max	Authorized lift capacity with horizontal boom
	Without the stabilizer blade, 90° to travel direction
	Telescopic travel gear extended

ET18 – VDS, cabin, boom uphill

			3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)		1.5 m (59 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
										
2,5 m (98 in)	382 (841)	343 (756)	-	336 (741)	361 (796)	306 (675)	-	-	-	-
2.0 m (79 in)	357 (787)	323 (712)	377 (831)	343 (756)	394 (867)	344 (758)	-	-	-	-
1.0 m (39 in)	322 (710)	394 (868)	365 (805)	362 (798)	471 (1,038)	469 (1,034)	644 (1,420)	645 (1,422)	-	-
0.0 m (0.0 in)	347 (765)	313 (690)	358 (789)	351 (774)	456 (1,005)	450 (992)	623 (1,374)	616 (1,358)	974 (2,147)	961 (2,119)
−1.0 m (-39 in)	466 (1,027)	427 (941)	-	-	-	453 (999)	608 (1,340)	620 (1,366)	866 (1,909)	975 (2,150)
-1.5 m (-59 in)	-	437 (963)	-	-	-	-	-	-	-	634 (1,398)

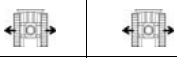
ET18 – VDS, cabin, boom downhill

			3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)		1.5 m (59 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
										
2,5 m (98 in)	297 (655)	264 (582)	-	275 (606)	361 (796)	306 (675)	-	-	-	-
2.0 m (79 in)	258 (569)	232 (512)	273 (602)	272 (600)	360 (794)	344 (758)	-	-	-	-
1.0 m (39 in)	231 (509)	209 (460)	262 (578)	258 (569)	337 (743)	334 (736)	455 (1,003)	456 (1,056)	-	-
0.0 m (0.0 in)	247 (545)	221 (487)	255 (562)	248 (547)	323 (712)	316 (697)	435 (959)	428 (944)	661 (1,457)	648 (1,428)
−1.0 m (-39 in)	361 (796)	302 (666)	-	-	-	320 (706)	445 (981)	432 (952)	678 (1,495)	661 (1,457)
-1.5 m (-59 in)	-	437 (963)	-	-	-	-	-	-	-	634 (1,398)

ET18 – VDS, canopy, boom uphill

			3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)		1.5 m (59 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
										
2,5 m (98 in)	382 (841)	339 (747)	-	336 (741)	361 (796)	306 (675)	-	-	-	-
2.0 m (79 in)	332 (732)	300 (661)	351 (774)	343 (756)	394 (869)	344 (758)	-	-	-	-
1.0 m (39 in)	299 (690)	372 (820)	339 (747)	336 (741)	438 (966)	436 (961)	600 (1,323)	601 (1,325)	-	-
0.0 m (0.0 in)	322 (710)	290 (639)	332 (732)	325 (718)	423 (933)	417 (919)	579 (1,277)	572 (1,261)	906 (1,997)	893 (1,969)
−1.0 m (-39 in)	466 (1,027)	396 (873)	-	-	-	421 (928)	589 (1,299)	576 (1,270)	866 (1,909)	907 (2,000)
-1.5 m (-59 in)	-	437 (963)	-	-	-	-	-	-	-	634 (1,398)

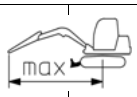
ET18 – VDS, canopy, boom downhill

			3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)		1.5 m (59 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
										
2,5 m (98 in)	274 (604)	243 (536)	-	253 (558)	340 (750)	306 (675)	-	-	-	-
2.0 m (79 in)	237 (523)	213 (470)	251 (553)	250 (551)	333 (734)	333 (734)	-	-	-	-
1.0 m (39 in)	211 (465)	191 (421)	240 (529)	237 (522)	309 (681)	307 (677)	419 (924)	420 (926)	-	-
0.0 m (0.0 in)	226 (498)	202 (445)	233 (514)	226 (498)	296 (653)	289 (637)	399 (880)	392 (864)	608 (1,340)	595 (1,312)
−1.0 m (-39 in)	332 (732)	277 (611)	-	-	-	293 (646)	409 (902)	396 (873)	624 (1,376)	608 (1,340)
-1.5 m (-59 in)	-	435 (959)	-	-	-	-	-	-	-	628 (1,385)

ET20 – VDS, cabin, boom uphill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
2,5 m (98 in)	328 (723)	293 (646)	-	-	354 (780)	326 (719)	364 (803)	310 (683)	-	-
2.0 m (79 in)	291 (642)	263 580)	-	271 (598)	350 (772)	348 (767)	415 (915)	362 (798)	467 (1,030)	-
1.0 m (39 in)	264 (582)	239 (527)	267 (589)	262 (578)	334 (736)	329 (725)	431 (950)	427 (941)	588 (1,296)	588 (1,296)
0.0 m (0.0 in)	280 (617)	251 (553)	-	255 (562)	323 (712)	315 (695)	413 (911)	404 (891)	565 (1,246)	554 (1,221)
−1.0 m (-39 in)	379 (836)	325 (717)	-	-	-	-	418 (922)	405 (893)	573 (1,263)	557 (1,128)
-1.5 m (-59 in)	427 (941)	417 (919)	-	-	-	-	-	-	438 (966)	570 (1,257)

ET20 – VDS, cabin, boom downhill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
2,5 m (98 in)	261 (575)	232 (512)	-	-	282 (622)	282 (622)	364 (803)	310 (683)	-	-
2.0 m (79 in)	231 (509)	207 (456)	-	214 (471)	278 (613)	276 (609)	368 (811)	362 (798)	467 (1,030)	-
1.0 m (39 in)	208 (459)	187 (412)	210 (463)	205 (452)	263 (560)	258 (569)	338 (745)	334 (736)	455 (1,003)	454 (1,001)
0.0 m (0.0 in)	220 (485)	195 (430)	-	198 (437)	252 (556)	244 (538)	321 (708)	312 (688)	433 (955)	423 (933)
−1.0 m (-39 in)	297 (655)	253 (558)	-	-	-	-	326 (719)	313 (690)	441 (972)	426 (939)
-1.5 m (-59 in)	427 (941)	345 (761)	-	-	-	-	-	-	438 (966)	439 (968)

ET20 – VDS, canopy, boom uphill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
										
2,5 m (98 in)	304 (670)	271 (598)	-	-	328 (723)	326 (719)	364 (803)	310 (683)	-	-
2.0 m (79 in)	269 (593)	242 (534)	-	250 (551)	324 (714)	322 (710)	415 (915)	362 (798)	467 (1,030)	-
1.0 m (39 in)	243 (536)	219 (483)	246 (542)	241 (531)	308 (679)	303 (668)	398 (877)	395 (871)	544 (1,199)	545 (1,202)
0.0 m (0.0 in)	258 (569)	231 (509)	-	234 (516)	297 (655)	289 (637)	381 (840)	372 (820)	521 (1,148)	511 (1,127)
−1.0 m (-39 in)	350 (772)	299 (659)	-	-	-	-	386 (851)	373 (822)	530 (1,169)	514 (1,133)
-1.5 m (-59 in)	427 (941)	410 (904)	-	-	-	-	-	-	438 (966)	528 (1,164)

ET20 – VDS, canopy, boom downhill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
										
2,5 m (98 in)	241 (531)	213 (470)	-	-	261 (575)	260 (573)	351 (774)	310 (683)	-	-
2.0 m (79 in)	212 (467)	189 (417)	-	196 (432)	257 (567)	255 (562)	341 (752)	341 (752)	467 (1,029)	-
1.0 m (39 in)	190 (419)	170 (375)	193 (426)	187 (412)	241 (531)	237 (523)	311 (686)	308 (679)	419 (924)	419 (924)
0.0 m (0.0 in)	201 (443)	178 (392)	-	180 (397)	231 (509)	223 (492)	294 (648)	286 (631)	398 (877)	387 (853)
−1.0 m (-39 in)	273 (602)	231 (509)	-	-	-	-	299 (659)	286 (631)	406 (895)	390 (860)
-1.5 m (-59 in)	414 (913)	317 (699)	-	-	-	-	-	-	423 (933)	403 (889)

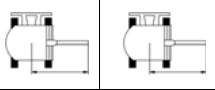
ET24 – VDS, cabin, boom uphill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
2,5 m (98 in)	410 (904)	368 (811)	-	-	453 (999)	453 (999)	535 (1,180)	459 (1,012)	-	-
2.0 m (79 in)	368 (811)	335 (739)	-	350 (772)	447 (986)	446 (983)	588 (1,296)	546 (1,203)	713 (1,572)	-
1.0 m (39 in)	341 (752)	311 (686)	344 (758)	339 (747)	428 (944)	424 (940)	553 (1,219)	550 (1,213)	758 (1,671)	759 (1,673)
0.0 m (0.0 in)	368 (811)	332 (732)	-	332 (732)	417 (919)	409 (902)	535 (1,180)	526 (1,160)	736 (1,623)	725 (1,598)
−1.0 m (−39 in)	518 (1,142)	442 (974)	-	-	-	-	544 (1,199)	529 (1,166)	748 (1,649)	732 (1,614)
-1.5 m (-59 in)	609 (1,343)	614 (1,354)	-	-	-	-	-	-	485 (1,069)	750 (1,654)

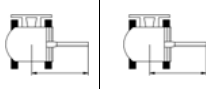
ET24 – VDS, cabin, boom downhill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
2,5 m (98 in)	309 (681)	276 (609)	-	-	343 (756)	342 (753)	457 (1,008)	459 (1,012)	-	-
2.0 m (79 in)	276 (609)	249 (549)	-	261 (575)	337 (743)	335 (739)	444 (979)	445 (981)	622 (1,460)	-
1.0 m (39 in)	253 (558)	229 (505)	256 (564)	250 (551)	319 (703)	314 (692)	410 (904)	407 (897)	556 (1,226)	556 (1,226)
0.0 m (0.0 in)	273 (602)	243 (536)	-	244 (538)	308 (679)	300 (661)	393 (866)	384 (847)	535 (1,179)	524 (1,155)
−1.0 m (−39 in)	384 (847)	325 (717)	-	-	-	-	402 (886)	387 (853)	546 (1,204)	530 (1,169)
-1.5 m (-59 in)	609 (1,343)	468 (1,032)	-	-	-	-	-	-	485 (1,069)	547 (1,206)

ET24 – VDS, canopy, boom uphill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
2,5 m (98 in)	384 (847)	345 (761)	-	-	426 (939)	426 (939)	535 (1,180)	459 (1,011)	-	-
2.0 m (79 in)	345 (761)	313 (690)	-	327 (721)	420 (926)	418 (922)	554 (1,221)	546 (1,204)	713 (1,572)	-
1.0 m (39 in)	318 (701)	290 (639)	322 (710)	317 (699)	401 (884)	397 (875)	518 (1,142)	515 (1,135)	711 (1,568)	712 (1,570)
0.0 m (0.0 in)	344 (758)	309 (681)	-	310 (683)	390 (860)	382 (842)	500 (1,102)	491 (1,083)	689 (1,519)	678 (1,495)
−1.0 m (−39 in)	486 (1,072)	413 (911)	-	-	-	-	509 (1,122)	495 (1,091)	701 (1,545)	685 (1,510)
-1.5 m (-59 in)	609 (1,343)	596 (1,314)	-	-	-	-	-	-	485 (1,069)	703 (1,550)

ET24 – VDS, canopy, boom downhill

			3.5 m (11'-6")		3.0 m (9'-10")		2.5 m (98 in)		2.0 m (79 in)	
	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick	Short stick	Long stick
A / B										
2,5 m (98 in)	287 (633)	255 (562)	-	-	319 (703)	319 (703)	428 (944)	429 (946)	-	-
2.0 m (79 in)	256 (564)	230 (507)	-	241 (531)	314 (692)	312 (688)	415 (915)	416 (917)	583 (1,285)	-
1.0 m (39 in)	233 (514)	210 (463)	236 (520)	231 (509)	295 (650)	291 (642)	381 (840)	378 (833)	516 (1,138)	516 (1,138)
0.0 m (0.0 in)	252 (556)	224 (494)	-	224 (494)	285 (628)	276 (609)	363 (800)	355 (783)	496 (1,094)	485 (1,069)
−1.0 m (−39 in)	356 (785)	300 (661)	-	-	-	-	372 (820)	358 (789)	507 (1,118)	491 (1,083)
-1.5 m (-59 in)	597 (1,316)	434 (957)	-	-	-	-	-	-	485 (1,069)	508 (1,120)

Safety instructions – stability table

The values of the stability tables apply to lifting gear applications.

DANGER

Crushing hazard due to tipping over of machine.

Causes serious crushing or injury resulting in death.

- ► Do not exceed the weight specified in the stability table.
- ► Get informed on the lift capacity of the attachment before using it.
- ► If an attachment with load hook or joint rod is installed, the weight of the attachment must be subtracted from the weight specified in the table.
- ► Use the machine for lifting gear applications only if the mandatory lifting gear (for example a load hook) and safety equipment (for example optical and acoustic warning devices (safe load indicator), stability table, hose burst valve) is installed, functional and enabled.
- ► Do not tilt the upper carriage (VDS).
- ► Do not retract the telescopic travel gear (option).
- ► Observe chapter **Safety/Safety instructions regarding lifting gear applications**.

NOTICE

If the specified weight is exceeded, danger of damage to property due to tipping over of machine.

- ► Do not exceed the weight specified in the stability table.

Information

The indications are only approximate values. Attachments, uneven ground and soft or bad ground conditions affect lift capacity. The operator must take these influences into account.

Legend

Designation	Explanation
X	Reach from live ring center
Z	Load hook height in the respective range
max	Authorized lift capacity with horizontal boom
L	Stick short/long

Authorized lift capacity applies to entire swiveling range of 360°.

All table indications in kg (lbs) and horizontal position on firm and level ground without bucket or exchangeable attachment.

The machine's lift capacity is restricted by the settings of the pressure limiting valves and the hydraulic system's stabilizing features.

Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

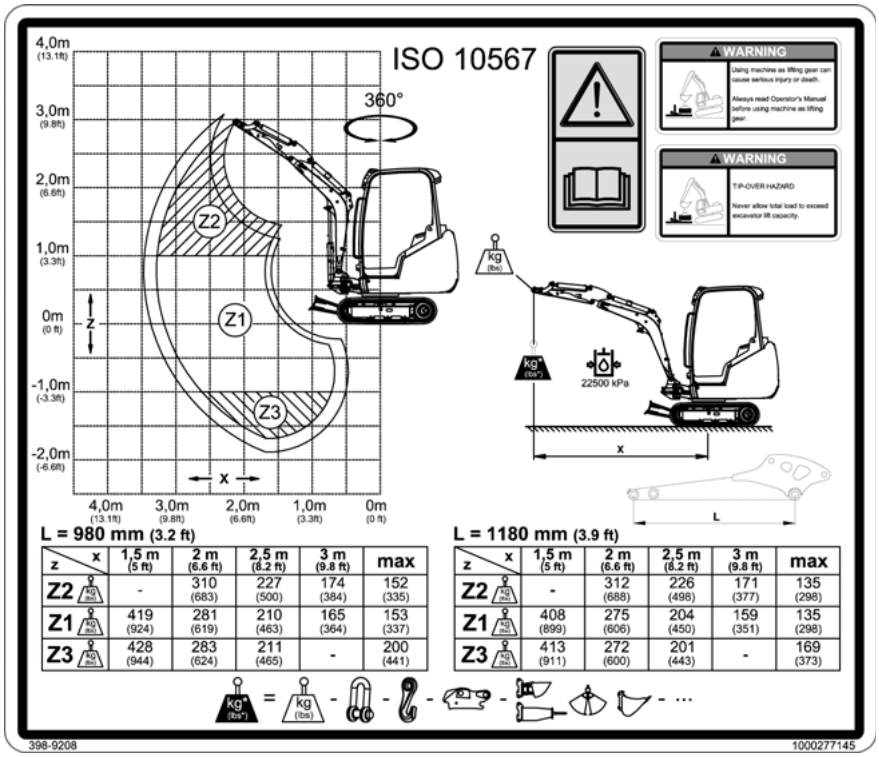
Calculation basis: according to ISO 10567. Setting pressure on boom cylinder 22500 kPa (3263 psi).

Lift capacities apply to machines under the following conditions:

- Lubricants and engine/machine fluids at the mandatory levels
- Full fuel tank
- Cabin or canopy
- Machine at operating temperature
- Operator weight 75 kg (165 lbs)

Stability tables ET 18

Cabin/canopy and standard travel gear



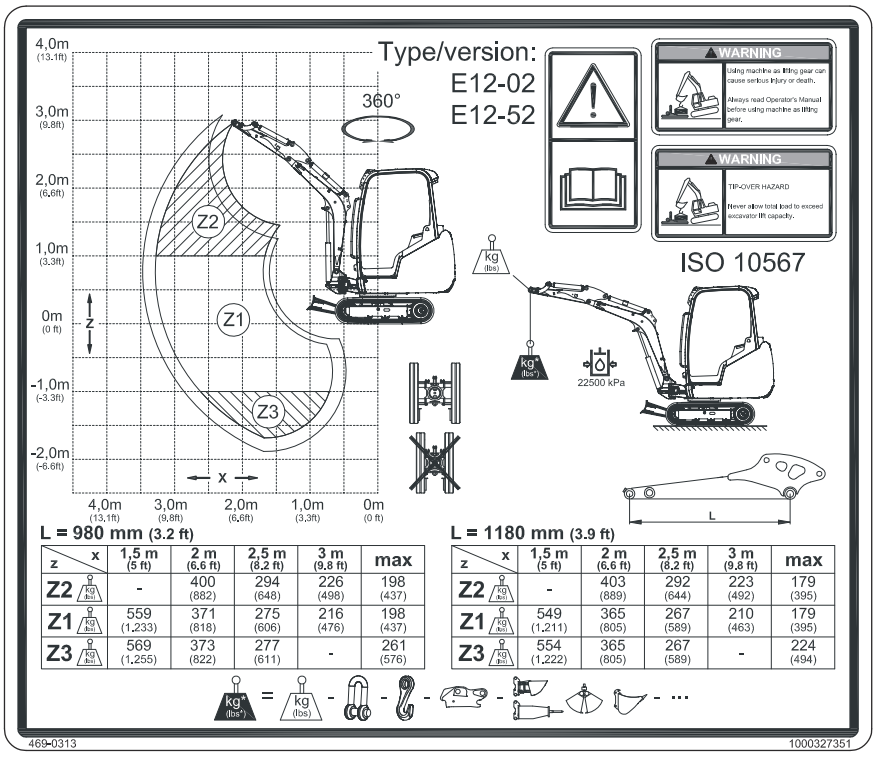
L = 980 mm (3.2 ft)

z \ x	1,5 m (5 ft)	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9.8 ft)	max
Z2	-	310 (683)	227 (500)	174 (384)	152 (335)
Z1	419 (924)	281 (619)	210 (463)	165 (364)	153 (337)
Z3	428 (944)	283 (624)	211 (465)	-	200 (441)

L = 1180 mm (3.9 ft)

z \ x	1,5 m (5 ft)	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9.8 ft)	max
Z2	-	312 (688)	226 (498)	171 (377)	135 (298)
Z1	408 (899)	275 (606)	204 (450)	159 (351)	135 (298)
Z3	413 (911)	272 (600)	201 (443)	-	169 (373)

Cabin/canopy and telescopic travel gear



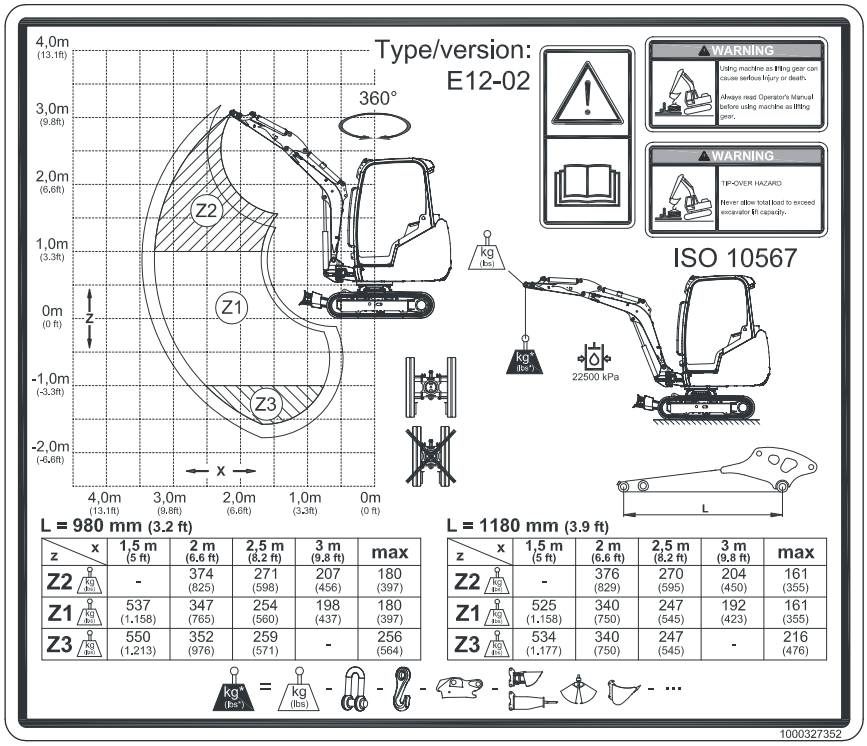
L = 980 mm (3.2 ft)

z \ x	1,5 m (5 ft)	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9,8 ft)	max
Z2	-	400 (882)	294 (648)	226 (498)	198 (437)
Z1	559 (1,233)	371 (818)	275 (606)	216 (476)	198 (437)
Z3	569 (1,255)	373 (822)	277 (611)	-	261 (576)

L = 1180 mm (3.9 ft)

z \ x	1,5 m (5 ft)	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9,8 ft)	max
Z2	-	403 (889)	292 (644)	223 (492)	179 (395)
Z1	549 (1,211)	365 (805)	267 (589)	210 (463)	179 (395)
Z3	554 (1,222)	365 (805)	267 (589)	-	224 (494)

Cabin/canopy, telescopic travel gear and VDS



L = 980 mm (3.2 ft)

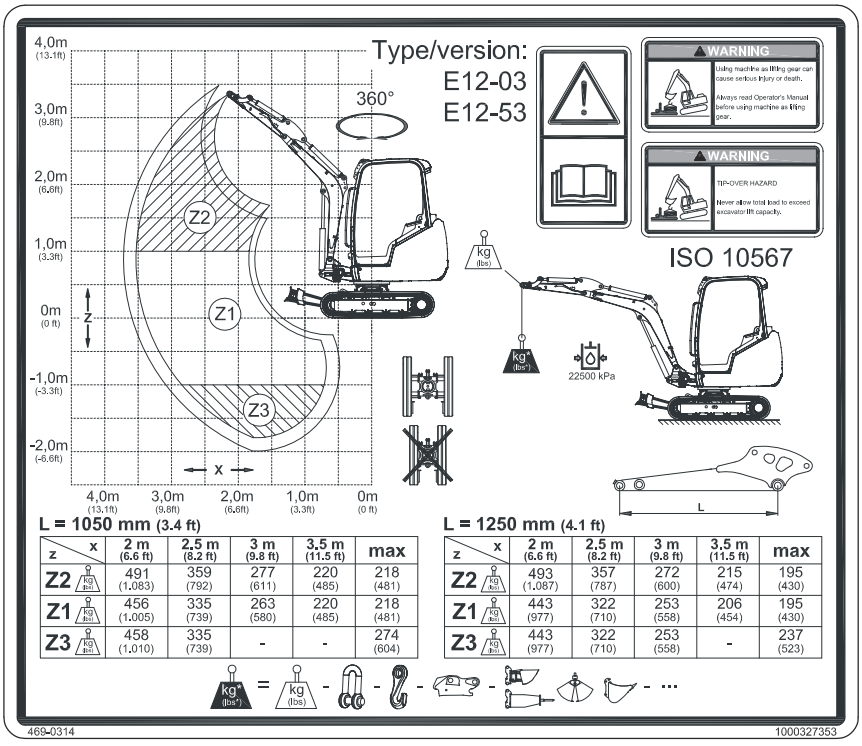
z \ x	1,5 m (5 ft)	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9.8 ft)	max
Z2	-	374 (825)	271 (598)	207 (456)	180 (397)
Z1	537 (1,158)	347 (765)	254 (560)	198 (437)	180 (397)
Z3	550 (1,213)	352 (976)	259 (571)	-	256 (564)

L = 1180 mm (3.9 ft)

z \ x	1,5 m (5 ft)	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9.8 ft)	max
Z2	-	376 (829)	270 (595)	204 (450)	161 (355)
Z1	525 (1,158)	340 (750)	247 (545)	192 (423)	161 (355)
Z3	534 (1,177)	340 (750)	247 (545)	-	216 (476)

Stability tables ET 20

Cabin/canopy and telescopic travel gear



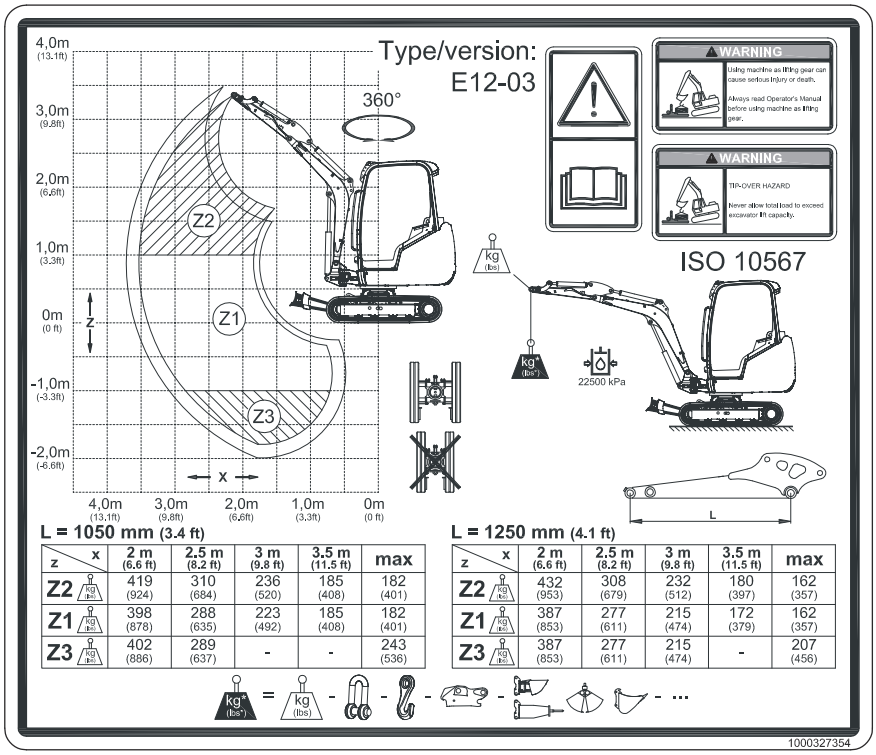
L = 1050 mm (3.4 ft)

z \ x	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9.8 ft)	3,5 m (11.5 ft)	max
Z2	491 (1,083)	359 (792)	277 (611)	220 (485)	218 (481)
Z1	456 (1,005)	335 (739)	263 (580)	220 (485)	218 (481)
Z3	458 (1,010)	335 (739)	-	-	274 (604)

L = 1250 mm (4.1 ft)

z \ x	2 m (6.6 ft)	2,5 m (8.2 ft)	3 m (9.8 ft)	3,5 m (11.5 ft)	max
Z2	493 (1,087)	357 (787)	272 (600)	215 (474)	195 (430)
Z1	443 (977)	322 (710)	253 (558)	206 (454)	195 (430)
Z3	443 (977)	322 (710)	253 (558)	-	237 (523)

Cabin/canopy, telescopic travel gear and VDS

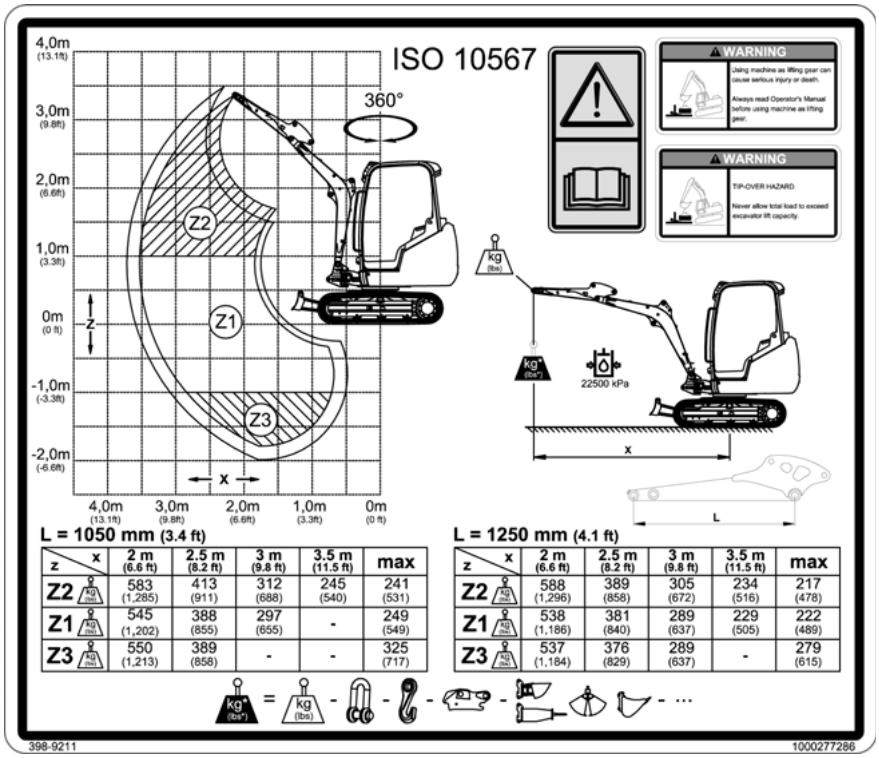


L = 1050 mm (3.4 ft) z \ x	2 m (6.6 ft)	2.5 m (8.2 ft)	3 m (9.8 ft)	3.5 m (11.5 ft)	max
Z2	419 (924)	310 (684)	236 (520)	185 (408)	182 (401)
Z1	398 (878)	288 (635)	223 (492)	185 (408)	182 (401)
Z3	402 (886)	289 (637)	-	-	243 (536)

L = 1250 mm (4.1 ft) z \ x	2 m (6.6 ft)	2.5 m (8.2 ft)	3 m (9.8 ft)	3.5 m (11.5 ft)	max
Z2	432 (953)	308 (679)	232 (512)	180 (397)	162 (357)
Z1	387 (853)	277 (611)	215 (474)	172 (379)	162 (357)
Z3	387 (853)	277 (611)	215 (474)	-	207 (456)

Stability tables ET 24

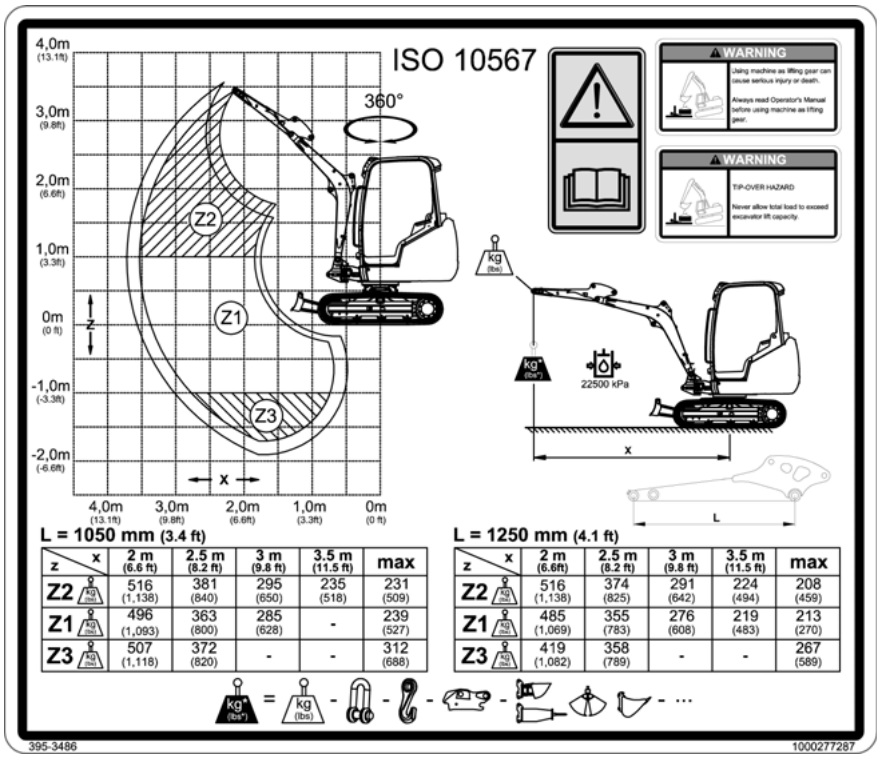
Cabin/canopy and standard travel gear



L = 1050 mm (3.4 ft) z \ x	2 m (6.6 ft)	2.5 m (8.2 ft)	3 m (9.8 ft)	3.5 m (11.5 ft)	max
Z2	583 (1,285)	413 (911)	312 (688)	245 (540)	241 (531)
Z1	545 (1,202)	388 (855)	297 (655)	-	249 (549)
Z3	550 (1,213)	389 (858)	-	-	325 (717)

L = 1250 mm (4.1 ft) z \ x	2 m (6.6 ft)	2.5 m (8.2 ft)	3 m (9.8 ft)	3.5 m (11.5 ft)	max
Z2	588 (1,296)	389 (858)	305 (672)	234 (516)	217 (478)
Z1	538 (1,186)	381 (840)	289 (637)	229 (505)	222 (489)
Z3	537 (1,184)	376 (829)	289 (637)	-	279 (615)

Cabin/canopy, standard travel gear and VDS



L = 1050 mm (3.4 ft)

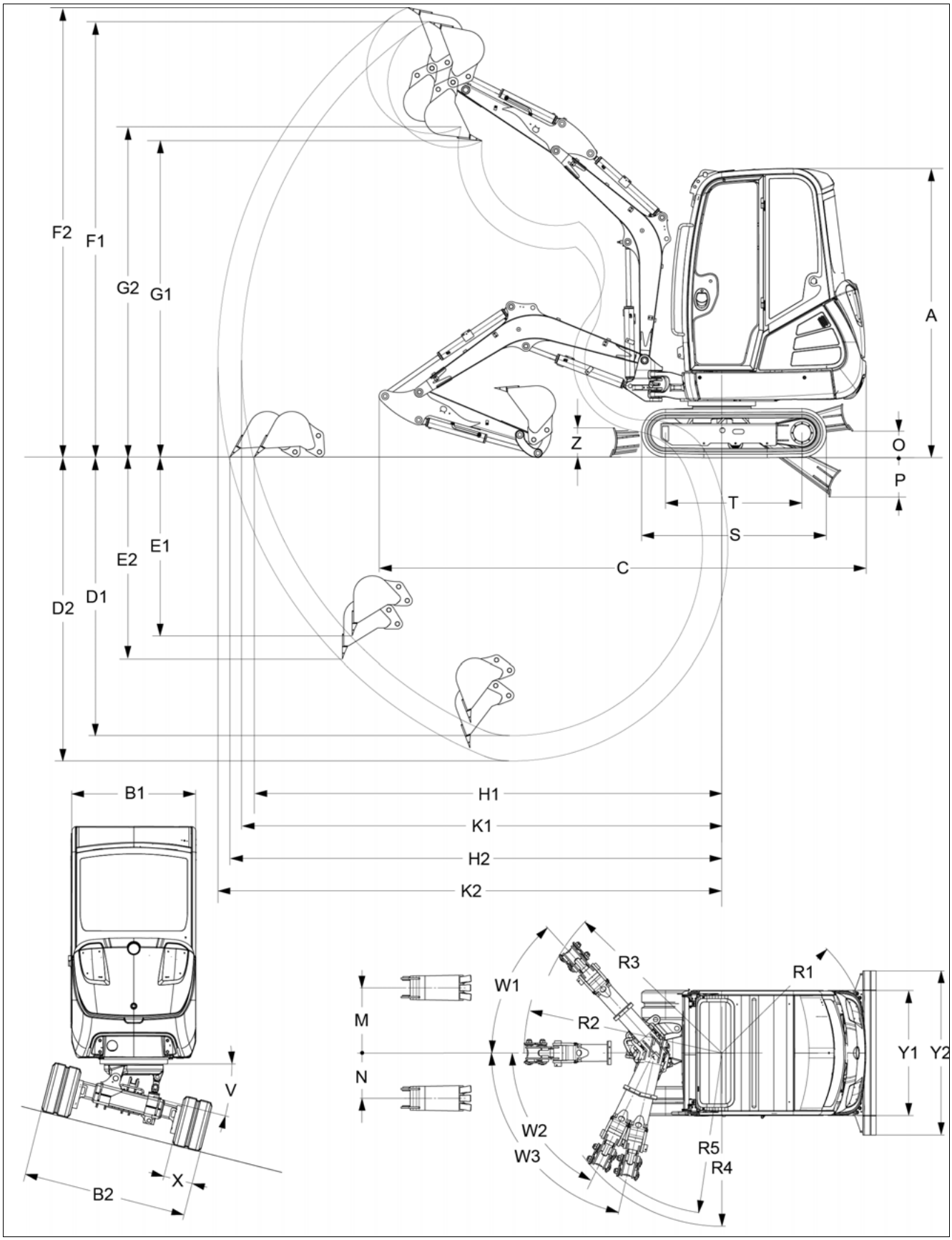
z \ x	2 m (6.6 ft)	2.5 m (8.2 ft)	3 m (9.8 ft)	3.5 m (11.5 ft)	max
Z2	516 (1,138)	381 (840)	295 (650)	235 (518)	231 (509)
Z1	496 (1,093)	363 (800)	285 (628)	-	239 (527)
Z3	507 (1,118)	372 (820)	-	-	312 (688)

L = 1250 mm (4.1 ft)

z \ x	2 m (6.6ft)	2.5 m (8.2 ft)	3 m (9.8 ft)	3.5 m (11.5 ft)	max
Z2	516 (1,138)	374 (825)	291 (642)	224 (494)	208 (459)
Z1	485 (1,069)	355 (783)	276 (608)	219 (483)	213 (270)
Z3	419 (1,082)	358 (789)	-	-	267 (589)

Dimensions

Overview ET18, ET20, ET24



	ET18	Standard / telescopic travel gear	Telescopic travel gear + VDS
A	Height	2290 mm (7'-6")	2390 mm (7'-10")
B1	Upper carriage width	990 mm (39 in)	
B2	Width with retracted travel gear	990 mm (39 in)	
B2	Width with extended travel gear (telescopic travel gear only)	1300mm (51 in)	
C	Transport length	3855 mm (12'-8")	3800 mm (12'-6")
D1	Max. digging depth (short stick)	2200 mm (86 in)	2100 mm (83 in)
D2	Max. digging depth (long stick)	2400 mm (94 in)	2300 mm (91 in)
E1	Max. vertical digging depth (short stick)	1420 mm (56 in)	1320 mm (52 in)
E2	Max. vertical digging depth (long stick)	1610 mm (63 in)	1500 mm (59 in)
F1	Max. digging height (short stick)	3450 mm (11'-4")	3550 mm (11'-8")
F2	Max. digging height (long stick)	3560 mm (11'-8")	3660 mm (12'-0")
G1	Max. tilt-out height (short stick)	2500 mm (98 in)	2610 mm (8'-7")
G2	Max. tilt-out height (long stick)	2620 mm (8'-7")	2720 mm (8'-11")
H1	Max. reach at ground level (short stick)	3700 mm (12'-2")	3670 mm (12'-0")
H2	Max. reach at ground level (long stick)	3900 mm (12'-10")	3870 mm (12'-8")
K1	Max. digging radius (short stick)	3800 mm (12'-6")	
K2	Max. digging radius (long stick)	4000 mm (13'-1")	
M	Max. boom displacement to bucket center (right side)	520 mm (20 in)	
N	Max. boom displacement to bucket center (left side)	360 mm (14 in)	
O	Max. lift height of stabilizer blade over ground (short)	200 mm (8 in)	270 mm (11 in)
O	Max. lift height of stabilizer blade over ground (long)	300 mm (12 in)	360 mm (14 in)
P	Max. scraping depth of stabilizer blade below ground surface (short)	320 mm (13 in)	260 mm (10 in)
P	Max. scraping depth of stabilizer blade below ground surface (long)	380 mm (15 in)	310 mm (12 in)
R1	Min. tail end swiveling radius	1160 mm (46 in)	
R2	Boom swivel radius (center)	1580 mm (62 in)	
R3	Boom swivel radius (right)	1500 mm (59 in)	
R4	Boom swivel radius (left) limit	1380 mm (54 in)	
R5	Max. boom swivel radius (left)	1280 mm (50 in)	
S	Total running gear length (standard travel gear)	1460 mm (57 in)	-
S	Total running gear length (telescopic travel gear)	1605 mm (63 in)	
T	Running gear length (Turas front idler) (standard travel gear)	1080 mm (42 in)	-
T	Running gear length (Turas front idler) (telescopic travel gear)	1225 mm (48 in)	
V	VDS tilt angle	-	0 – 15°
W1	Max. tilting angle of boom to the right	48°	
W2	Max. tilting angle of boom to the limit on the left	64°	
W3	Max. tilting angle of boom to the left	77°	
X	Track width	230 mm (9 in)	
Y1	Stabilizer blade width	990 mm (39 in)	
Y2	Stabilizer blade width with extension (only telescopic travel gear)	1300 mm (51 in)	
Z	Stabilizer blade height	230 mm (9 in)	

	ET20	Telescopic travel gear	Telescopic travel gear + VDS
A	Height	2295 mm (7'-6")	2385 mm (7'-10")
B1	Upper carriage width	990 mm (39 in)	
B2	Width with retracted travel gear	990 mm (39 in)	
B2	Width with extended travel gear	1300mm (51 in)	
C	Transport length	4050 mm (13'-4")	4030 mm (12'-3")
D1	Max. digging depth (short stick)	2490 mm (98 in)	2400 mm (94 in)
D2	Max. digging depth (long stick)	2690 mm (8'-10")	2600 mm (8'-6")
E1	Max. vertical digging depth (short stick)	1670 mm (66 in)	1570 mm (62 in)
E2	Max. vertical digging depth (long stick)	1850 mm (73 in)	1760 mm (69 in)
F1	Max. digging height (short stick)	3840 mm (12'-7")	3930 mm (12'-11")
F2	Max. digging height (long stick)	3960 mm (13'-0")	4050 mm (13'-3")
G1	Max. tilt-out height (short stick)	2720 mm (8'-11")	2810 mm (9'-3")
G2	Max. tilt-out height (long stick)	2840 mm (9'-4")	2930 mm (9'-7")
H1	Max. reach at ground level (short stick)	4030 mm (13'-3")	4000 mm (13'-1")
H2	Max. reach at ground level (long stick)	4230 mm (13'-11")	4200 mm (13'-9")
K1	Max. digging radius (short stick)	4130 mm (13'-7")	
K2	Max. digging radius (long stick)	4330 mm (14'-2")	
M	Max. boom displacement to bucket center (right side)	520 mm (20 in)	
N	Max. boom displacement to bucket center (left side)	360 mm (14 in)	
O	Max. lift height of stabilizer blade over ground (short)	220 mm (9 in)	270 mm (11 in)
O	Max. lift height of stabilizer blade over ground (long)	300 mm (12 in)	360 mm (14 in)
P	Max. scraping depth of stabilizer blade below ground surface (short)	300 mm (12 in)	260 mm (10 in)
P	Max. scraping depth of stabilizer blade below ground surface (long)	360 mm (14 in)	320 mm (13 in)
R1	Min. tail end swiveling radius	1160 mm (46 in)	
R2	Boom swivel radius (center)	1660 mm (65 in)	
R3	Boom swivel radius (right)	1580 mm (62 in)	
R4	Boom swivel radius (left) limit	1450 mm (57 in)	
R5	Max. boom swivel radius (left)	1350 mm (53 in)	
S	Total running gear length	1710 mm (67 in)	
T	Running gear length (Turas front idler)	1325 mm (52 in)	
V	VDS tilt angle	-	0 – 15°
W1	Max. tilting angle of boom to the right	48°	
W2	Max. tilting angle of boom to the limit on the left	64°	
W3	Max. tilting angle of boom to the left	77°	
X	Track width	250 mm (10 in)	
Y1	Stabilizer blade width	990 mm (39 in)	
Y2	Stabilizer blade width with extension (only telescopic travel gear)	1300 mm (51 in)	
Z	Stabilizer blade height	230 mm (9 in)	

	ET24	Standard	VDS
A	Height	2390 mm (7'-10")	2470 mm (8'-1")
B1	Upper carriage width	990 mm (39 in)	
B2	Travel gear width	1400 mm (55 in)	
C	Transport length	4030 mm (13'-3")	3980 mm (13'-1")
D1	Max. digging depth (short stick)	2500 mm (98 in)	2420 mm (95 in)
D2	Max. digging depth (long stick)	2700 mm (8'-10")	2620 mm (8'-7")
E1	Max. vertical digging depth (short stick)	1660 mm (65 in)	1580 mm (62 in)
E2	Max. vertical digging depth (long stick)	1850 mm (73 in)	1770 mm (70 in)
F1	Max. digging height (short stick)	3960 mm (13'-0")	4040 mm (13'-3")
F2	Max. digging height (long stick)	4080 mm (13'-5")	4160 mm (13'-8")
G1	Max. tilt-out height (short stick)	2750 mm (9'-0")	2830 mm (9'-3")
G2	Max. tilt-out height (long stick)	2870 mm (9'-5")	2950 mm (9'-8")
H1	Max. reach at ground level (short stick)	4025 mm (13'-2")	4000 mm (13'-1")
H2	Max. reach at ground level (long stick)	4220 mm (13'-10")	4190 mm (13'-9")
K1	Max. digging radius (short stick)	4150 mm (13'-7")	
K2	Max. digging radius (long stick)	4340 mm (14'-3")	
M	Max. boom displacement to bucket center (right side)	520 mm (20 in)	
N	Max. boom displacement to bucket center (left side)	360 mm (14 in)	
O	Max. lift height of stabilizer blade over ground	300 mm (12 in)	350 mm (14 in)
P	Max. scraping depth of stabilizer blade below ground surface	340 mm (13 in)	320 mm (13 in)
R1	Min. tail end swiveling radius	1160 mm (46 in)	
R2	Boom swivel radius (center)	1660 mm (65 in)	
R3	Boom swivel radius (right)	1580 mm (62 in)	
R4	Boom swivel radius (left) limit	1450 mm (57 in)	
R5	Max. boom swivel radius (left)	1350 mm (53 in)	
S	Total running gear length	1840 mm (72 in)	
T	Running gear length (Turas front idler)	1385 mm (55 in)	
V	VDS tilt angle	-	0 – 15°
W1	Max. tilting angle of boom to the right	48°	
W2	Max. tilting angle of boom to the limit on the left	64°	
W3	Max. tilting angle of boom to the left	77°	
X	Track width	250 mm (10 in)	
Y1	Stabilizer blade width	1400 mm (55 in)	
Y2	Stabilizer blade width with extension (only telescopic travel gear)	-	
Z	Stabilizer blade height	300 mm (12 in)	

Notes:

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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 figures and descriptions in this documentation that do not reflect products that have already been delivered and that will not be implemented on these machines.

Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions not accepted.

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