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WACKER NEUSON

Operator's Manual

Track excavator

ET145



Machine models	**E11-02**
Edition	**1.0**
Document order number	**5100022117**
Language	**us**
From serial number	**WNCE1102JPAL00132**

This Operator's Manual includes the AEM Safety Manual CE-1009

AEM MEMBER

5 1 0 0 0 2 2 1 1 7

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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.

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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	**E11-02**
Trade name	**ET145**
Serial number	**--**
Output in kW	**55.0**
Measured sound power level dB(A)	**99.0**
Guaranteed sound power level dB(A)	**99.0**

Declaration of conformity

Notified body according to Directive 2006/42/EC, appendix XI:
DGUV Test-, Prüf- und Zertifizierungsstelle
Fachausschuss Bauwesen, Landsberger Str. 309, 80687 Munich, Germany
Distinguishing EU number 0515

Notified body involved in procedure

TÜV SÜD Industrie Service GmbH
Westendstr. 199
D-80686 Munich

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 474-1:2006+A4:2013, DIN EN 474-5:2006+A3:2013,
DIN EN ISO 3471:2010, DIN EN ISO 3744:2010, DIN EN ISO 3449:2008

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Austria

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.

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Notes:

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1 Foreword

1.1 Operator’s Manual

Information on this Operator’s Manual

The Operator’s Manual is stored in the compartment on the left side of the seat. A document box on the rear cabin wall is available as an option.

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 be kept at hand in 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.

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

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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 references: see page *1-1* (page)

Cross references: **7** (pos. no. or table no.)

Cross references: *fig. 2* (fig. no. 2)

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 information 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.

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Abbreviations

Fig.	=	Figure
AUX	=	Additional control circuit
B	=	Width
o/h	=	Operating hours
approx.	=	approximately
DPF	=	Diesel particulate filter
FGPS	=	Front Guard Protective Structure
FOPS	=	Falling Objects Protective Structure
if nec.	=	if necessary
Hydraulic quick-hitch	=	Hydraulic quickhitch (Oil Quick)
LS	=	Stick
max.	=	maximum
min.	=	minimum
NW	=	Nominal width
Pos.	=	Position
PS	=	Stabilizer blade
ROPS	=	Roll Over Protective Structure (without losing contact with the ground)
TOPS	=	Tip Over Protective Structure
e. g.	=	for example

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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	Tow the excavator out of the immediate danger zone (for example railroad crossing or job site).
DPF	Diesel particulate filter; burns soot particles in the exhaust gas.
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 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**.
Combined radiator	Combined water/hydraulic oil radiator and charge-air cooler.
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 IV (exhaust-gas standards)	The machine is equipped with a Tier IV engine, depending on the destination country.
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.
Loading weight	The actual weight of the machine at the beginning of transportation. This weight refers to machines which are equipped exclusively with options approved by Wacker Neuson.
Additional control circuits	Additional control circuits required for certain attachments. AUX I: auxiliary hydraulics (for example for hydraulic hammer or offset bucket) AUX II: 3rd control circuit (for example for universal grab) AUX III: for example Powertilt AUX IV: hydraulic quickhitch (for example Oil Quick)
Symbol definitions	
	Symbolizes a full battery

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Right/left/front/rear

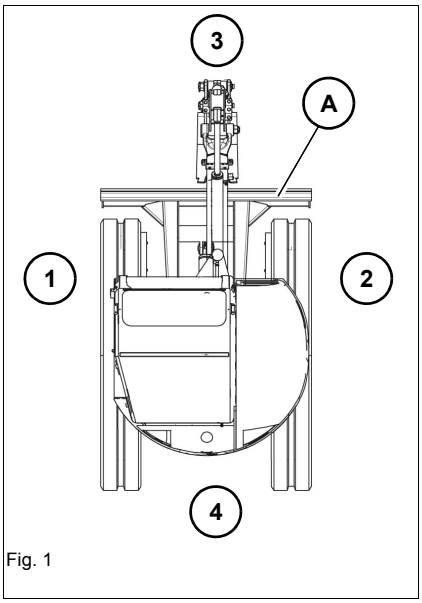


Fig. 1

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

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Target-group definition

This Operator's Manual is intended both for appropriately trained personnel on construction sites accustomed to handling construction machines, and also for private persons, for example, renting and operating a construction machine.

The Operator's Manual has been written in a way that allows machine operation by trained private persons without any special knowledge. As far as possible, no technical terms specific to construction machines are used.

This Operator's Manual must be fully read and understood both by private persons and the professional personnel on construction sites.

A dealer or person renting out the machine must instruct the operator and have this confirmed in writing.

Operator qualification and requirements for safe operation

Among other things, safe machine operation depends on the following points:

- Machine model and equipment.
- Machine maintenance.
- Work and travel speed.
- Nature of ground and work environment.

The most important points are the operator's qualification and power of judgement. A well-trained operator following the Operator's Manual and maintenance plan ensures a long service life and durability of the machine.

Specific training enables the operator to acquire, among other things, the following skills:

- Correct assessment of work situations.
- Feeling for the machine.
- Recognition of possible risk situations.
- Safe working by making the correct decisions for man, machine and the environment.

The operator is at risk if the machine is not operated correctly.

Follow the operating procedures and instructions described for the machine.

Access to the machine or machine operation is prohibited for children and persons under the influence of alcohol, drugs or medicine.

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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)

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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.

Exemption from 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, warnings and the Operator's Manual, and by the negligence of the duty to exercise due care when:
  - handling
  - operating
  - 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 and warnings.

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2 Safety Information

2.1 Safety Symbols Found in this Manual



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

- Obey all safety messages that follow this symbol.



DANGER

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

Consequences in case of non-observance.

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



WARNING

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

Consequences in case of non-observance.

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



CAUTION

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

Consequences in case of non-observance

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

Notice

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

Note: Contains additional information important to a procedure.

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Information

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 result in damage to the environment. The environment is in danger if environmentally hazardous material, such as waste oil, is not subject to proper use or disposal.

2.2 Warranty

Warranty claims must be submitted to your Wacker Neuson dealer only.

2.3 Designated Use

1. In accordance with its designated use, the machine may be used ONLY for moving earth, gravel, coarse gravel or ballast and rubble. It may also be used for working with the attachments approved in the “Fields of Application” chapter.
2. No other applications are designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. The operator alone will bear the risk.
3. “Designated use” also includes observing the instructions set forth in this Operator’s Manual and observing the maintenance schedule.
4. Machine safety can be negatively affected by performing machine modifications without proper authority and by using spare parts, equipment, attachments and optional equipment which have not been checked and released by Wacker Neuson. Wacker Neuson will not be liable for damage resulting from unapproved parts or unauthorized modifications.
5. Wacker Neuson shall not be liable for personal injury and/or damage to property caused by failure to observe the safety instructions on labels and in this Operator’s Manual, and by the negligence of the duty to exercise due care when:

- transporting the machine
- operating the machine
- servicing the machine and performing maintenance on or with the machine
- repairing the machine

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

1. Read and understand this Operator’s Manual before starting, moving, operating, servicing or repairing the machine. Observe all safety instructions.
2. The machine shall NOT be used for transport jobs on public roads!

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2.4 Preparing to use the machine

Conditions for use

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

Operator training and knowledge

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

Preparing for use

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

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Modifications and spare parts

- NEVER make any modifications, additions or conversions to the machine and its superstructures (for example, cab, etc.), or the machine's attachments, without the approval of Wacker Neuson! Such modifications may affect safety and/or machine performance. This also applies to the installation and adjustment of safety devices and valves, as well as to welding work on load-bearing elements.
- Spare parts must comply with the technical requirements specified by Wacker Neuson. Contact your Wacker Neuson dealer for assistance.
- The operator/machine owner commits himself to operate and keep the machine in perfect condition, and, if necessary or required by law, to require the operating or servicing persons to wear protective clothing etc.
- In the event of safety-relevant modifications or changes on the machine or of its behavior, stop the machine immediately and report the malfunction to the competent authority/person.
- Safety-relevant damage or malfunctions of the machine must be rectified immediately.

Applications with lifting gear

Lifting gear applications are procedures involving raising, transporting and lowering loads with the help of slings and load-securing devices (e.g. ropes, chains).

No applications with lifting gear under any circumstances!

Machines with a maximum authorized lifting capacity of over 1000 kg (2,205 lbs.) or an overturning moment of over 40,000 Nm (29,500 ft.lbs.) may be used for lifting gear applications if the following conditions are fulfilled:

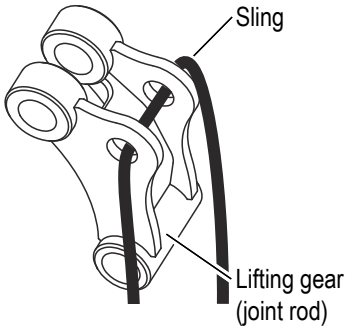


Abb. 1: Lifting gear – joint rod

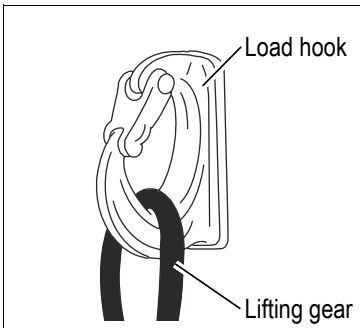


Abb. 2: Load hook

- Acoustic and optical warning device
  - see chapter 5 "Lifting gear applications" on page 5-35
- Load holding control valve- see chapter 5 "Load-retaining function" on page 5-45
- Proper equipment for slinging and securing the load must be available (joint rod enabling loads to be picked up, Powertilt unit with load hook).
- The lift capacity table must be observed - see chapter 9 "Safety instructions – lift capacity table" on page 9-16.
  - Get informed on and follow the legal regulations of your country.

Instructions on fastening loads

- The help of an accompanying person is necessary for securing and detaching the load.
- The load must be secured so as to prevent it from falling or slipping.
- Fasten the lifting gear so that it is not possible to unhook the sling unintentionally.
- Position the lifting gear ensuring the sling is not deflected by other parts.
- Do not use any lifting gear and slings that are damaged or not sufficiently dimensioned.
- The lifting gear must be designed to withstand the loads that can arise in the different positions of the work equipment or parts of the boom. Lateral loads and diagonal tensile forces must also be taken into account.

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- The lifting gear must be checked regularly by a technician, at least once a year.
- Replace damaged lifting gear immediately.
- Fasten lifting gear and slings avoiding danger (rotating parts, crushing or shearing) for the person securing the load. Furthermore, neither must the work equipment be affected by the lifting gear, nor must the functions of the lifting gear be affected by external influences (e.g. dirt that cannot be removed by simple means).
- Do not place slings over sharp edges.
- Always wear protective gloves and a hard hat when working with lifting gear and slings.
- The persons attaching or securing loads may approach the boom from the side only, and only after the machine operator has given his permission. The machine operator may give his permission only after the machine is at a standstill and the work attachment no longer moves!

General instructions

- Staying under suspended loads, in the danger zone or under the machine's attachment is prohibited.
- The machine operator and the person attaching or securing the load must have visual contact.
- Persons guiding the load or securing it must stay in visual contact with the machine operator! Should this not be possible, ask another person to guide.
- The machine operator must guide the load the nearest possible to the ground and avoid any oscillating or swinging movements!
- Perform machine travel with a raised load only if the path of the machine is level!
- The machine operator must not raise loads over persons.
- The machine operator may not leave his seat as long as the load is raised.

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2.5 Operator and Technician Qualifications and Basic Responsibilities

Operator/machine owner responsibility

- Only allow trained and experienced individuals to travel, maintain, or repair the machine. NEVER let unauthorized or underaged persons operate with the machine.
- Clearly and unequivocally define the individual responsibilities of the operator and technician for operation, maintenance, and repair.
- Define the machine operator’s responsibilities on the job site and for observing traffic rules. Give the operator the authority to refuse instructions by third parties that are contrary to safety.
- Do not allow persons to be trained or instructed by anyone other than an experienced person. Also, NEVER allow persons taking part in a general training course to work on or with the machine without being supervised by an experienced person.
- Before working on or with the machine, remove jewelery, such as rings, wristwatches, bracelets etc., and tie back long hair and do not wear loose-fitting garments, such as unbuttoned or unzipped jackets, ties or scarves.
- Injury can result from being caught up in the machinery or from rings catching on moving parts!

Repair person qualifications

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

2.6 Safety instructions Regarding Operation

Preparing for use

- The machine must only be used in technically perfect condition in accordance with its designated use and the instructions set forth in the Operator's Manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the machine. Any functional disorders, especially those affecting the safety of the machine, must therefore be rectified immediately!
- Before starting up the machine, inspect the machine for safety in work and road operation!
- In addition to the Operator's Manual, observe and instruct the operator in all other generally applicable legal and other mandatory regulations relevant to accident prevention and environmental protection.
- These compulsory regulations may also deal with handling hazardous substances, issuing and/or wearing personal protective equipment, or traffic regulations.
- With regard to specific operational features, e.g. those relevant to job organization, work sequences or the persons entrusted with the work, supplement the Operator's Manual by corresponding instructions, including those relevant to supervising and reporting duties.
- Careful and prudent working is the best way to avoid accidents!

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- Keep the machine clean. This reduces fire hazard (such as from combustible materials like rags), and reduces the injury hazard or operational accidents that can be caused by dirt build-up on the travel pedals or foot rests and steps.
- Observe all safety, warning, and informational signs and labels on the machine.
- Start and operate the machine from the seat only.
- The operator must sit in the seat, fasten and adjust the seat belt before putting the machine into operation.
- Always adjust the seat position before starting work. Do not change the seat position during machine travel or machine operation.
- Make sure that all safety devices are properly installed and functional before starting work.
- Before putting the machine/attachment into operation (startup/moving), make sure that no one in the immediate vicinity will be at risk.

Starting and stopping

- Perform starting and stopping procedures according to this Operator's Manual.
- Observe all indicator lights.
- Do not use starting fluid (for example, ether) especially in those cases in which a heater plug (intake air pre-heating) is used at the same time.
- Make sure the control levers, the signaling and the light systems are functional before operating the machine, and also before restarting after an interruption of work.
- Fold up the control lever base before releasing the seat belt in order to avoid unintentional operation.

Work area awareness

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

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Danger zone awareness

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

Operating the machine

- Never operate the machine if you are standing on the ground.
- Operate the machine ONLY when you are seated and you have fastened your seat belt. Stop the engine before releasing the seat belt.
- During operation on slopes, travel or work uphill or downhill. If traveling across a slope cannot be avoided, bear in mind the tilting limit of the machine. Always keep the attachments/work equipment close to the ground. This also applies to traveling downhill. When traveling or working across a slope, the load must be on the uphill side of the machine.
- On sloping terrain, adapt your travel speed to the prevailing ground conditions.
- Never get on or off during machine operation or travel, and do not jump off the machine.
- The travel control levers require practice before an operator becomes familiar with the control response. Therefore, adjust the travel speed to your abilities and the surroundings.
- When traveling across a slope with the telescopic undercarriage extended, position the boom facing down the slope, and the bucket about 10–20 cm (4–8’’) above the ground. This will help to minimize the possibility of personal injuries and equipment damage caused by a hydraulic hose/connector failure in the telescopic undercarriage actuation system. The weight of the machine will cause the undercarriage to retract to the narrow configuration if hydraulic system pressure decreases due to lost fluid.
- Install a front guard when working in areas with a risk of objects falling from the front (e.g. demolition work).
- On sloping terrain always adapt your travel speed to the prevailing ground conditions! Never change to lower gear on a slope but always before reaching it!

Carrying passengers

- Do not transport people on the machine or in the attachment.
- Never install a man basket or a working platform to the machine.

Mechanical integrity

- Take the necessary precautions to make sure the machine is used only when in a safe and serviceable state.
- Operate the machine ONLY if all protective and safety-oriented devices (ROPS, removable safety devices, soundproofing elements, mufflers, etc.) are in place and fully functional.

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- Check the machine before entering the cab to operate the machine for visible damage and defects. Report any changes, including changes in the machine's function and response, to your supervisor immediately!
- If the machine is functioning unpredictably, stop the machine immediately, lock it, and report the malfunction to a qualified tecnician or supervisor. Safety-relevant damage or malfunctions of the machine must be rectified immediately.

Traveling

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

2.7 Applications with Lifting Gear

General information

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

Safety criteria

- When used for craning applications, the machine must meet the following criteria:
  - Proper equipment for slinging and securing the load
  - Proper lift capacity per tables in this Operator's Manual
- In addition, a safe load indicator is required for machines bearing loads of over 1000 kg (2,205 lbs.) or an overturning moment of over 40000 Nm (29,477 ft.lbs.).

Conditions for safe operation

- Secure the load to prevent it from falling or slipping. Install an OSHA-approved load hook after removing the bucket or other approved attachment to provide a secure attachment point for the lifting sling, track, or cable.
- Have loads fastened, and crane operators instructed, by a qualified person competent in craning operation and standard hand signals. The person giving instructions to the operator must be within sight of the operator during load attachment and load disconnection.
- The load shall be kept as close to the surface as practical to accomplish the craning operation. The operator shall gently move the controls and machine to avoid swing or oscillating motion of the load. A tether line is recommended to dampen the tendency of the load to swing or oscillate during the craning operation.

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- Machine travel with a raised load must be done very carefully on a level surface moving very slowly to avoid sudden motion that can cause swinging or oscillating motion of the load.
- The person(s) attaching the load to the excavator shall approach only if the operator is in visual contact with them. No one shall approach the machine or attempt to attach the load until the excavator has stopped and the operator has signaled for the attachment.

2.8 Attachments

General information regarding attachments

- Prior to traveling remove all attachments which cannot be secured in compliance with the legal regulations of your country.
- The machine operating characteristics including steering vary with different option attachments and counter weights. The operator shall be familiar with the variations and act accordingly.
- Use only approved attachments and connecting hardware.
- Attach and remove attachments carefully to avoid damage and potential injury.
- Confirm that the attachment has been properly and securely attached to the machine according to the instructions. Before using the attachment, the operator shall confirm that the attachment performs correctly in response to control actuation.
- Do not attach the attachment with the engine running and the machine moving.
- Before putting the machine/attachment into operation (startup/moving), make sure that no one in the immediate vicinity will be at risk.
- Before leaving the seat, always secure the machine against unintentional movement and unauthorized use. Lower the attachments to the ground.
- Mount the attachments only if the engine and the drive have been stopped.
- Especially when traveling or operating machines equipped with a quickhitch for the attachments, make sure the attachment is securely locked in the quickhitch. The lock pin must be visible on either side of the bores on the attachment. Check before starting work.

Installation notes

- Couple and uncouple hydraulic hoses/lines (hydraulic quick couplers) only if the engine is stopped and the controls actuated to release the hydraulic pressure remaining in the circuit. Follow the operating instructions for releasing the pressure.
- Operate the machine only if all protective devices for the attachments have been installed and are functional, and if all brake, light and hydraulic connections have been connected.
- If an optional attachment is installed, make sure that all lights and associated indicator lights are installed and functional.
- The lock pin of the quick hitch attachment shall be visible at each end of the pin to confirm that the attachment is securely locked in place. The operator shall perform a check operation to confirm the latching integrity before operating at a production pace.

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- Prior to fitting attachments to the stick (the mobile extension of the boom), secure the control lever of the hydraulic control unit against unintentional movement. Raise the left arm rest to avoid unintentional activation for the ISO/SAE operating mode. Avoid actuating the right hand control if the alternative control mode is selected.

2.9 Transport and Towing

Towing

The machine must be towed, loaded and transported according to the procedures described within this Operator's Manual.

Transporting

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

2.10 Safety Guidelines for Maintenance

General maintenance notes

- Adhere to prescribed intervals or those specified in this Operator's Manual for routine checks/inspections and maintenance on or with the machine.
- For inspection and maintenance on or with the machine, ensure that all tools and service center equipment are capable of performing the tasks prescribed. Do not use malfunctioning or broken tools. Use certified measuring devices that are routinely calibrated for accuracy (torque wrench, pressure gauge, ammeter, etc.).
- Replace hydraulic hoses within stipulated and appropriate intervals even if no safety-relevant defects have been detected.
- Recycle scrapped parts and drained fluids according to environmental and hazardous material requirements. To avoid fire and health hazards, dispose of soiled shop towels by approved methods.
- Always tighten any screws, electrical connections, or hose connections that may have been loosened during maintenance.
- Upon completion of the maintenance and repair work, immediately refit and check any safety devices removed for set-up or maintenance purposes.

Personal safety measures

- Brief the technician and the operator before beginning maintenance or repair work. Appoint someone to supervise the activities.
- Always work in groups of two when diagnosing a machine problem requiring the engine to be running. Both persons must be trained on the machine—one person must be seated on the seat and maintain visual contact with the other person.

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- Observe the specific safety instructions in the Maintenance section of this Operator's Manual.
- Always keep a safe distance from all rotating and moving parts, for example, fan blades, V-belt drives, PTO shaft drives, fans, etc.
- Before starting work on the machine, always ensure safe blocking/ support.
- Apply special care when working on the fuel system due to the increased fire hazard.
- Engine and muffler system become very hot during operation and require cool-down time after machine is shut off. Avoid contact with hot parts. Wait for the machine to cool before touching components.
- Retainer pins can fly out or splinter when struck with force. Avoid striking the pins during operation, repair, or maintenance.
- Do not use starting fluid (for example, ether), especially in those cases in which a heater plug (intake air pre-heating) is used at the same time.

Preparing for maintenance and repair work

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

Performing maintenance and repairs

- Observe the adjustment, maintenance and inspection activities and intervals set forth in this Operator's Manual, including information on the replacement of parts and partial equipment. These activities must be performed only by qualified personnel.
- Disconnect the negative battery terminal when working on the electrical system.
- Do not allow the machine to be serviced, repaired, or test-driven by unauthorized personnel.
- If maintenance with the engine running cannot be avoided, lower the stabilizer blade and raise the control lever base.

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- Wear a safety harness when performing elevated maintenance on or with the machine. Keep all handles, steps, handrails, platforms, landings, and ladders free from dirt, snow and ice.
- Always use specially designed or otherwise safety-oriented ladders and working platforms to perform overhead assembly work. NEVER use machine parts or attachments/superstructures as a climbing aid!
- Do not use the work equipment as lifting platforms for persons.
- In accordance with this Operator's Manual and instructions for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) before performing any maintenance on or with the machine.
- Prior to performing assembly work on the machine, make sure no movable parts will roll away or start moving.
- To avoid accident hazard, parts and large assemblies being moved for replacement purposes must be carefully attached and secured to lifting gear.
- Use only suitable lifting gear and suspension systems in a technically perfect state with adequate load-bearing capacity! Stay clear of suspended loads!
- Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before performed maintenance/ repair work!
- Do not use aggressive detergents!
- Use lint-free cleaning rags!
- Before cleaning the machine with water, steam jet (high-pressure cleaner) or detergents, cover or tape up all openings which – for safety and functional reasons – must be protected against water, steam or detergent penetration. Special care must be taken with the electrical system.
- After cleaning, remove all covers and tapes applied for that purpose!
- After cleaning, examine all fuel, lubricant and hydraulic oil lines for leaks, chafe marks and damage!
- Rectify all defects without delay!
- Always tighten any screw connections that have been loosened during maintenance and repair!
- Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work
- Make sure all consumables and replaced parts are disposed of safely and with minimum environmental impact!

Special Hazards Battery

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

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- Starting the machine with a battery jumper cable can be hazardous if performed improperly. Observe the safety instructions regarding the battery.
- Before taking up work on machine parts hazardous for life and limb (bruising, cutting), always ensure safe blocking/support of these areas
- Perform maintenance and repair work beneath a raised machine, attachments or additional equipment only if a safe and secure support has been provided for (the sole use of hydraulic cylinders, jacks etc. does not sufficiently secure raised machines or equipment/attachments)
- Avoid contact with hot parts, such as the engine block or the exhaust system during the operation of the machine and for some time afterwards – burn hazard!
- Retainer pins can fly out or splinter when struck with force – personal injury hazard.
- Do not use starting fuel! This especially applies to those cases in which a heater plug (intake-air preheating) is used at the same time – explosion hazard.
- Apply special care when working on the fuel system – increased fire hazard.

Tracks

- Repair work on the tracks must be performed only by trained technical staff or by a Wacker Neuson service center.
- Malfunctioning tracks reduce the machine's operational safety. Therefore, check the tracks regularly for cracks, cuts or other damage.
- Check track tension at regular intervals.

Electric energy

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

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Hydraulics

- Check all lines, hoses, and threaded couplers and fittings regularly for leaks and obvious damage. Repair any damage and leaks immediately. Splashed oil can cause injury and fire!
- In accordance with the Operator's Manual/instructions for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) to be opened before perform any implementing/repair work!
- Hydraulic and compressed-air lines must be laid and fitted properly. Make sure no connections are interchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements

Noise

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

MSDS

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

Gas, dust, steam, smoke

- Operate the machine only on adequately ventilated premises! Before starting internal combustion engines or operating fuel-operated heating systems on enclosed premises, make sure there is sufficient ventilation!
- Observe the regulations in force at the respective site!
- Perform welding, flame-cutting and grinding work on the machine only if this has been expressly authorized. There can be an explosion and fire hazard, for example!
- Before performing welding, flame-cutting and grinding work, clean the machine and its surroundings from dust and other flammable substances, and make sure the premises are adequately ventilated – explosion hazard.

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2.11 Safety Guidelines while using Internal Combustion Engines

WARNING

Internal combustion engines present special hazards during operation and fueling.

Failure to follow the warnings and safety guidelines could result in severe injury or death.

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

Running the engine

When running the engine:

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

When running the engine:

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

Fueling the engine

When fueling the engine:

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

When fueling the engine:

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

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3 Introduction

3.1 Machine overview



Pos.	Designation	Pos.	Designation
1	Stabilizer blade	13	Stick
2	Travel gear	14	Bucket
3	Tracks	15	Cabin
4	Stabilizer blade lifting eyes	16	Tie-down points
5	Mirror	17	Footholds
6	Chassis working lights	18	Handhold
7	Valve cover	19	Door handle
8	Rotating beacon (option)	20	Door arrester
9	Reservoir filler inlet	21	Muffler
10	Auxiliary hydraulics	22	Engine cover
11	Boom	23	Roof lights (option)
12	One-piece boom		

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Model designations and trade names

Machine model/machine designation	Trade name
E11-02	ET145

3.2 Brief description of the machine

The Wacker Neuson model E11-02 track excavator is a self-propelled work machine.

It is a powerful, highly flexible, efficient and environmentally friendly construction machine. They are mainly used for loosening and moving earth, in particular for digging and filling up construction pits, for example. A wide range of attachments offers a large number of applications, for example hammer operation or bulk-material handling with a grab.

See chapter *Technical data of attachments on page 9-15* for further applications.

The main components of the machine are:

- Turbodiesel engine
- Hydraulic and electrical components
- Electronic multifunctional display, optionally with a separate display for the reversing camera
- Cabin
- Boom
- Travel gear
- Live ring
- Stabilizer blade

Information

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

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Cabin

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

- ROPS tested cabin.
- Protective FOPS structure category II (option) for cabin; protective structure against falling objects.
- Front Guard category II (option) for cabin; protective structure against objects from the front (for example pipes, tree trunks).

Definition of FOPS/Front Guard categories

Category I (FOPS):

Protection against small falling (FOPS) objects (for example bricks, small pieces of concrete, tools) for machines which are used for tasks such as road repair, landscaping work and work on other construction sites.

Category II (FOPS/Front Guard):

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

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3.3 Information and regulations on use

Designated use

The machine is intended for:

- moving earth, gravel or rubble, for hammer and grab operation as well as for
- working only with the attachments indicated in chapter *Technical data of attachments on page 9-15*.
- Every other use is regarded as not designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. 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 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 a matching attachment.
- A restricted work range applies to work with attachments (for example hammer) that can cause fragments to fly around.

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3.4 Labels

WARNING

Injury hazard due to missing or damaged labels!

An insufficient warning of dangers 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.

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Type labels



Fig. 4 (symbolic representation)

The machine type label is located at the front right of the chassis.

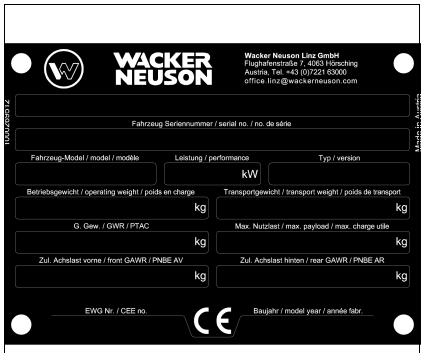


Fig. 5 (symbolic representation)

Serial number

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

The machine type label contains the following information:

Description of attachment	HYDRAULIC EXCAVATOR
Fahrzeug Seriennummer/serial no./no. de série	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. Gew./GWR/PTAC:	Gross weight rating (permissible)
Max. Nutzlast/max. payload/max. charge utile:	Maximum payload
Zul. Achslast vorne/front GAWR/PNBE AV:	Front gross axle weight rating
Zul. Achslast hinten/rear GAWR/PNBE AR:	Rear gross axle weight rating
EWG Nr./CEE no.:	EEC check number
Baujahr/model year/année fabr.:	Year of construction

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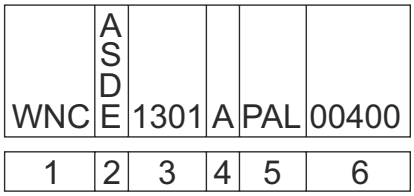


Fig. 6

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 hydraulic quickhitch, tilt bucket, rollbar) have numeric serial numbers only.

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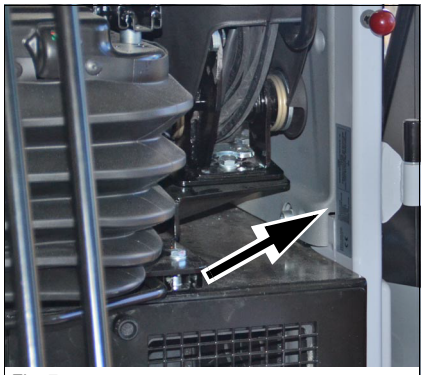


Fig. 7

Cabin number

The type label is located on the B pillar on the left.

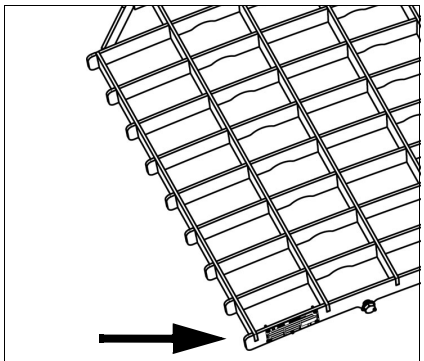


Fig. 8

FOPS screen type label

The type label is located at the front left on the chassis.

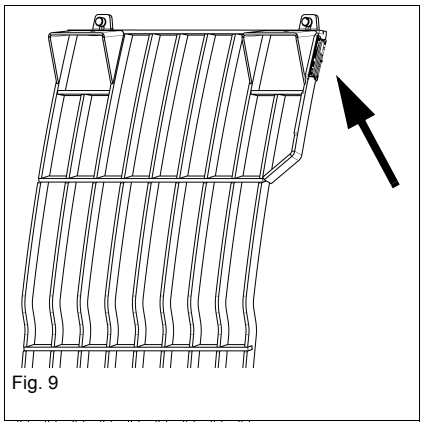


Fig. 9

Front Guard type label

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

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Warning labels

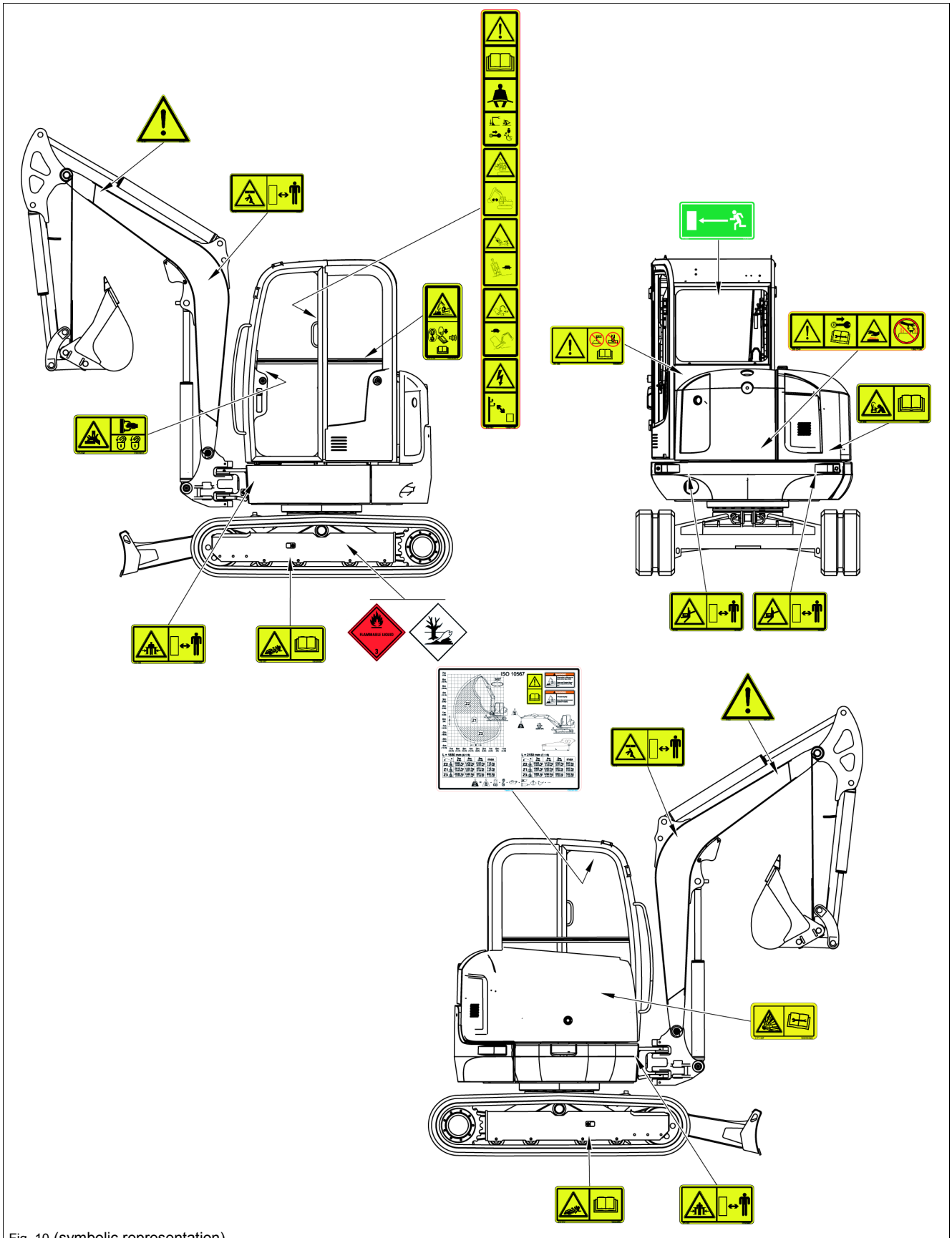


Fig. 10 (symbolic representation)

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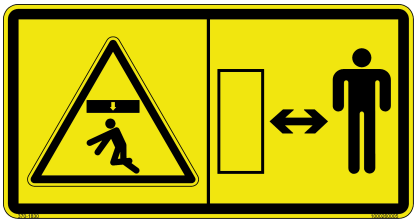


Fig. 11

Meaning

Crushing hazard.

All persons must stay clear of a raised load or of the danger zone.

Position

On the left and right side of the loader unit.

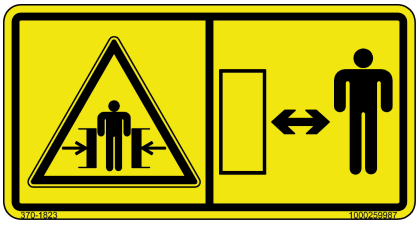


Fig. 12

Meaning

Crushing hazard.

Do not allow anyone to stay in the danger zone of the machine.

Position

At the front left and right of the chassis.



Fig. 13

Meaning

Explosion hazard due to wrong connection of battery jumper cables.

Position

Next to the battery.

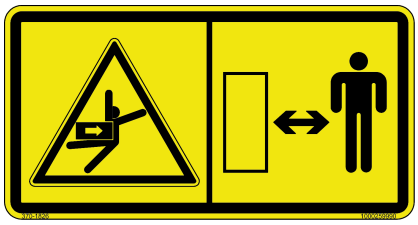


Fig. 14

Meaning

Crushing hazard.

During operation, all persons must stay clear of the swiveling range of the machine.

Position

On the bumper on the left and right.

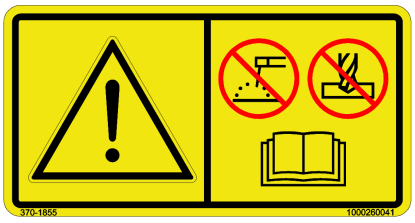


Fig. 15

Meaning

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

Position

On the cabin, rear left.



Fig. 16

Meaning

Crushing hazard.

1. Use the handholds for opening and closing the front window.
2. Lock the window into place.

Position

On the front window.

https://truckmanualshub.com/

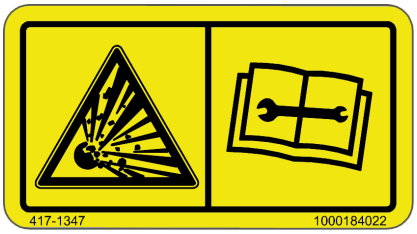


Fig. 17

Meaning

Accumulator is under high pressure. Maintenance or repair work may be performed only by a Wacker Neuson service center.

Position

Under the valve cover.

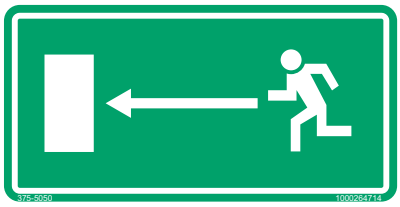


Fig. 18

Meaning (option)

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

Position

Inside the cabin on the rear window.

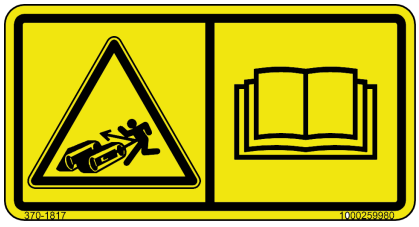


Fig. 19

Meaning (option)

Injury hazard due to grease escaping under pressure.

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

Position

On the travel gear on the left and right.

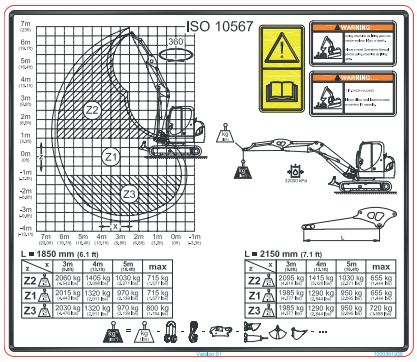


Fig. 20

Meaning (option)

Load diagram.

Position

On the left side of the roof window.

https://truckmanualshub.com/



Fig. 21

Meaning

Read the Operator's Manual before starting the machine.

Fasten your seat belt.

Lower the boom and the stabilizer blade to the ground.

Remove the starting key and carry it with you.

Raise the control lever base.

Crushing hazard.

Possible serious machine damage.

Keep a safe distance from the cabin.

Crushing hazard.

Possible serious machine damage.

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

Do not use high speed.

Death hazard due to electric shock.

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

Position

On the B pillar on the left.



Fig. 22

Meaning (option)

Switch on the safe load indicator during lifting gear applications.

A machine can cause serious injury or death if it tips over.

Possible serious machine damage.

Read and understand the Operator's Manual.

Position

On the right inside the cabin.

https://truckmanualshub.com/



Fig. 23

Meaning

Read the Operator's Manual before starting the machine.

Remove the starting key and carry it with you.

Injury hazard due to rotating parts.

- Open the engine cover only at engine standstill.

Burn hazard due to hot parts.

- Let the engine cool down.

Burn hazard due to hot fluid.

Injury hazard due to fluid escaping under pressure.

- Let the engine cool down.
- Release the pressure in the hydraulic system, then open the locks carefully.

Position

On the engine cover.



Fig. 24

Meaning

Burn hazard at the boom (lines, plug-and-socket connections, threaded fittings, hydraulic cylinders, couplings, etc.).

Position

On the boom on the left and right.

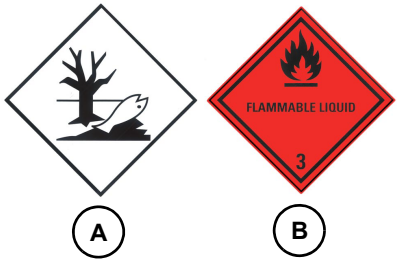


Fig. 25

Meaning

Environmentally hazardous substances (**A**)

Easily flammable fluids (**B**)

The tank and fuel lines contain diesel fuel according to the ADR guidelines (European Agreement concerning the International Carriage of Dangerous Goods by Road).

Position

On the travel gear on the left.

https://truckmanualshub.com/

Information labels

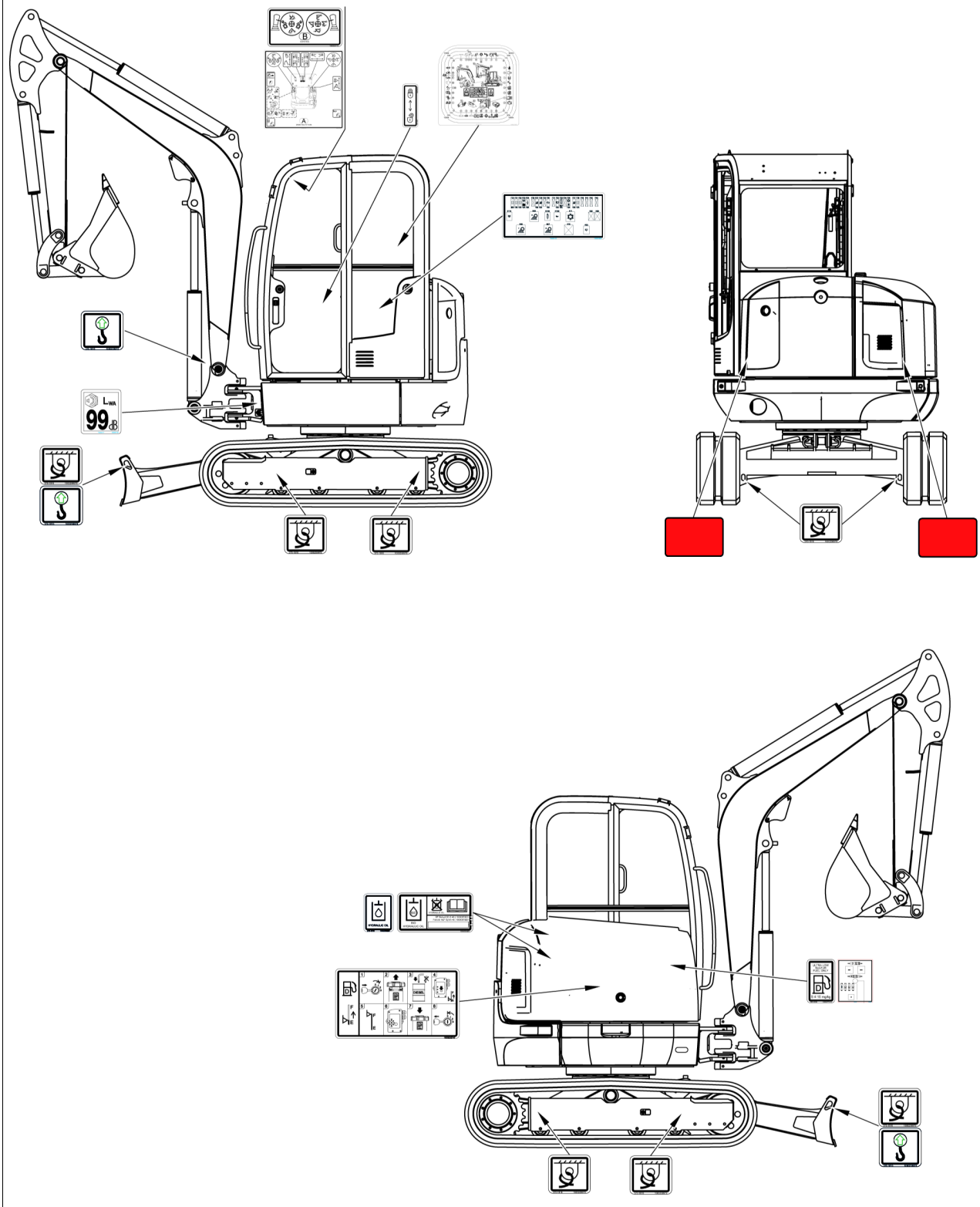


Fig. 26 (symbolic representation)

https://truckmanualshub.com/



Fig. 28

Meaning

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

Position

Next to the fuel tank filler inlet.

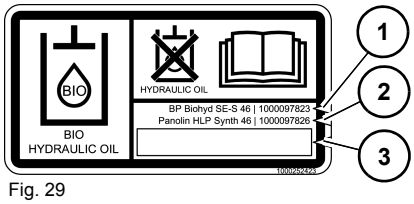


Fig. 29

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.

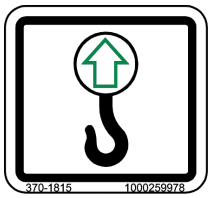


Fig. 30

Meaning

Lifting eyes.

Position

Right and left side of stabilizer blade, near lifting eye.

On the chassis near the swiveling console mount.



Fig. 31

Meaning

Tie-down points.

Position

2 adhesive labels each on stabilizer blade, inside of front and rear travel gear.

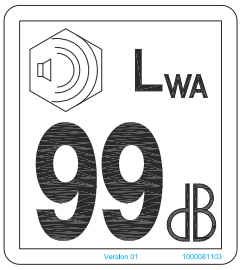


Fig. 32

Meaning

Indication of sound power level produced by the machine.

L_{Wa} = sound power level.

Position

At the front right of the chassis.

https://truckmanualshub.com/

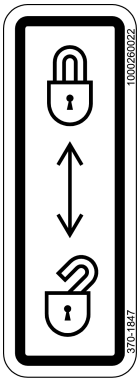


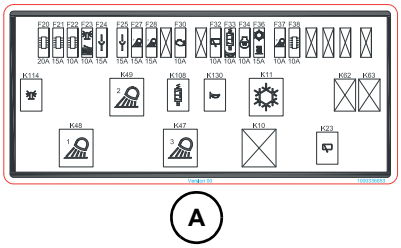
Fig. 33

Meaning

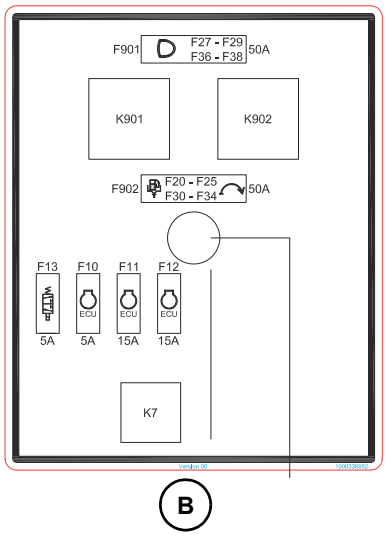
Work functions enabled or disabled.

Position

On control lever base.



A



B

Fig. 34

Meaning

Engine compartment relays and fuses (**B**).

Position

A: on the fuse box cover.

B: in valve compartment.



Fig. 35

Meaning

The reservoir contains hydraulic oil.

Position

Next to the filler inlet of the hydraulic oil reservoir.

https://truckmanualshub.com/

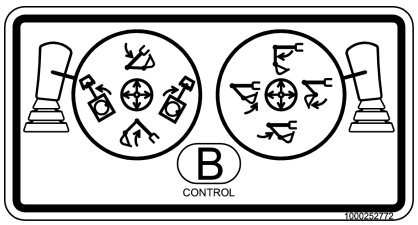


Fig. 36

Meaning (option)

Operating procedures differing from the ISO controls if the SAE controls are set.

Position

On the roof window on the right.

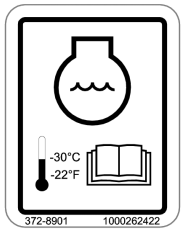


Fig. 37

Meaning

Thermal stability of coolant.

Position

On the radiator in the engine compartment.

https://truckmanualshub.com/

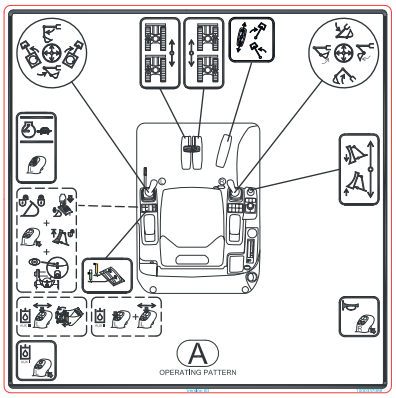


Fig. 38

Meaning

Functions of pedals and control levers (ISO controls).

Check the selected control mode before starting the machine.

Position

On the roof window.

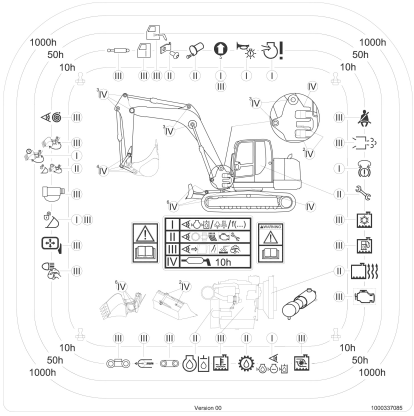


Fig. 39

Meaning

Maintenance intervals.

Position

On the left side window pane.

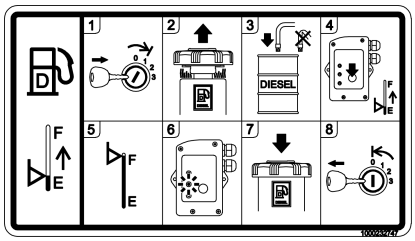


Fig. 40

Meaning

Fuel-filling pump.

Position

Under the valve cover.

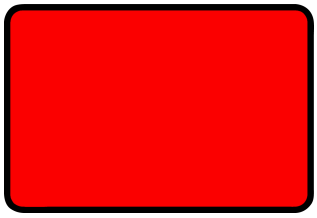


Fig. 41

Meaning (option)

Reflectors.

Position

At the rear left and right of the machine.

Information

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

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ANSI label (option)

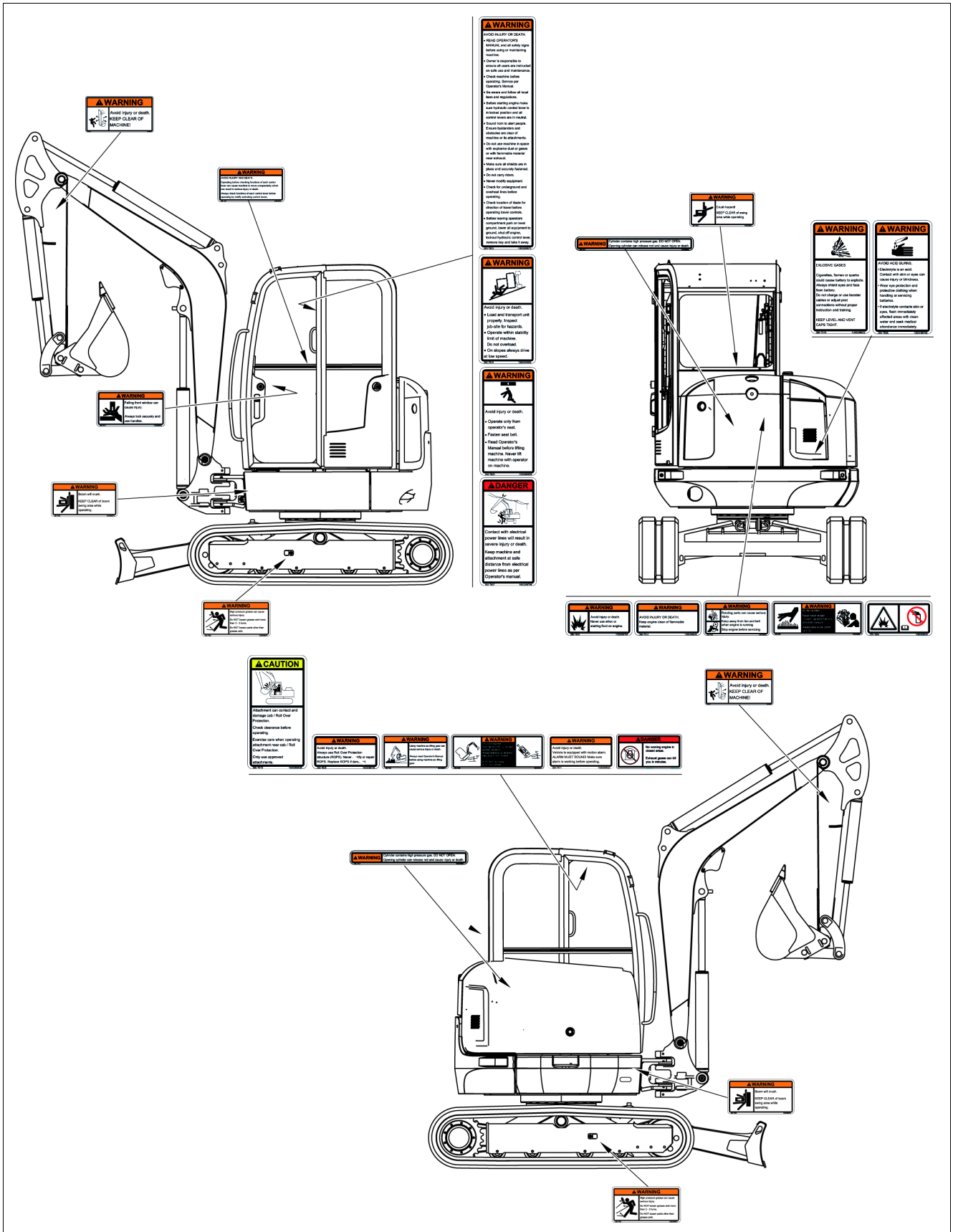


Fig. 42 (symbolic representation)

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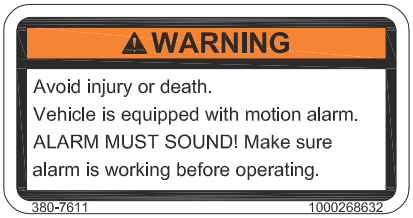


Fig. 43

Position

On the rear window.

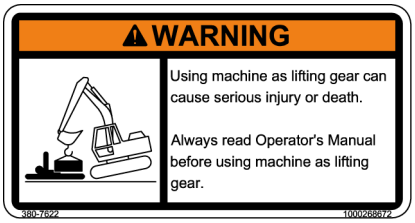


Fig. 44

Position

On the headliner.

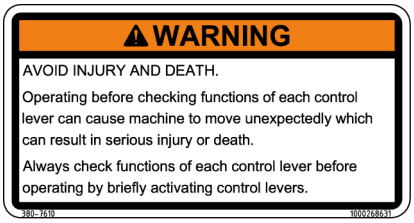


Fig. 45

Position

On the right inside the cabin.

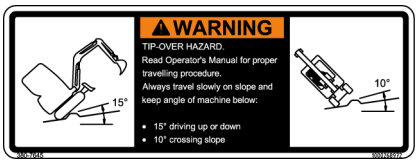


Fig. 46

Position

On the headliner.

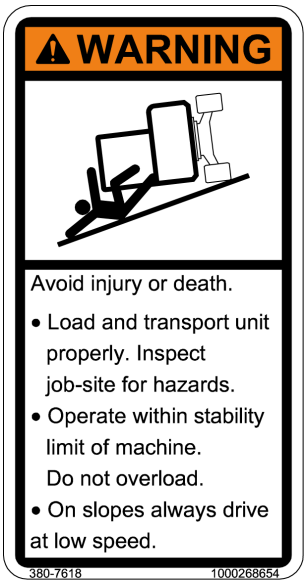


Fig. 47

Position

On the B pillar on the left.

https://truckmanualshub.com/

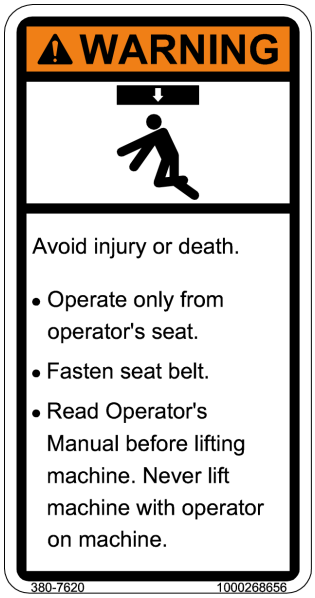


Fig. 48

Position

On the B pillar on the left.

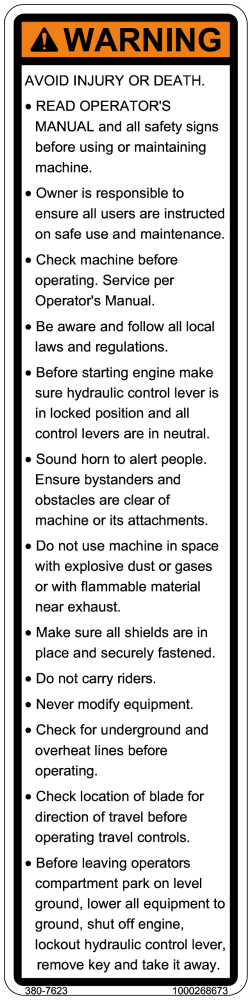


Fig. 49

Position

On the B pillar on the left.

https://truckmanualshub.com/

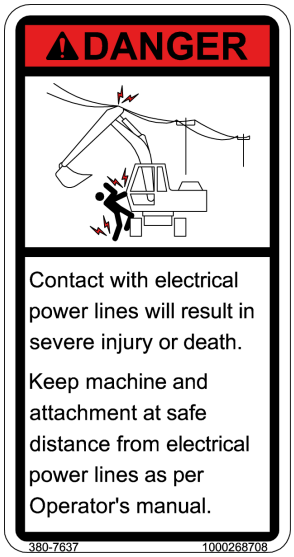


Fig. 50

Position

On the B pillar on the left.



Fig. 51

Position

In the engine compartment near the air filter.



Fig. 52

Position

In the engine compartment near the air filter.

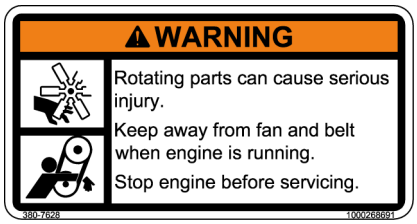


Fig. 53

Position

In the engine compartment near the engine cover handle.



Fig. 54

Position

In the engine compartment near the engine cover handle.

https://truckmanualshub.com/

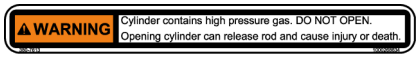


Fig. 55

Position

On the gas struts of the engine cover and tank cover.

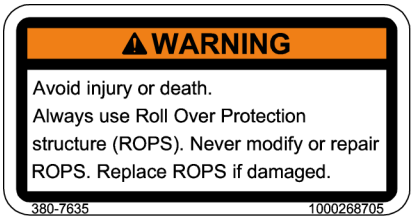


Fig. 56

Position

On the headliner.

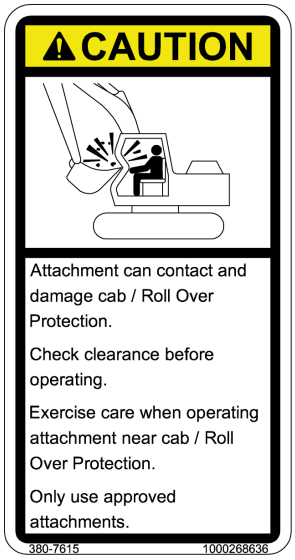


Fig. 57

Position

On the headliner.



Fig. 58

Position

On the boom on the left and right.

https://truckmanualshub.com/

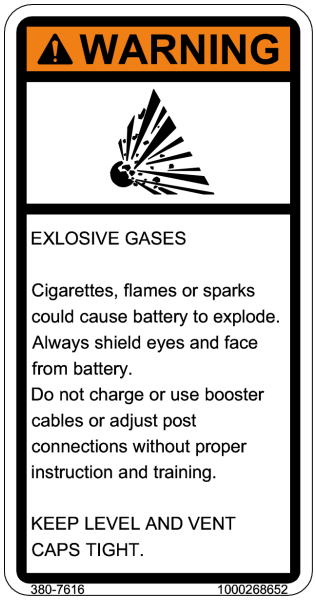


Fig. 59

Position

On the battery cover.

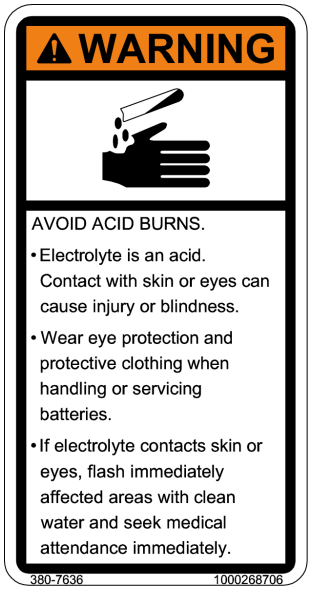


Fig. 60

Position

On the battery cover.



Fig. 61

Position

At the bottom left of the rear window.

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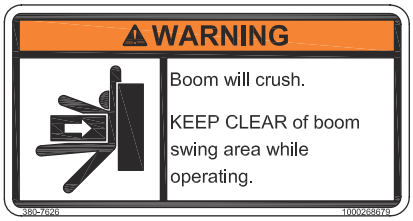


Fig. 62

Position

At the front left and right of the chassis.

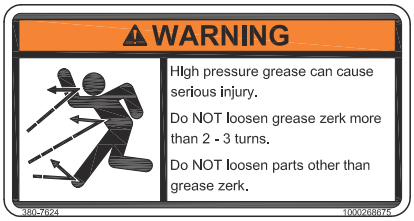


Fig. 63

Position

On the travel gear on the left and right.



Fig. 64

Position

On the front window.



Fig. 65

Position

On the battery cover.

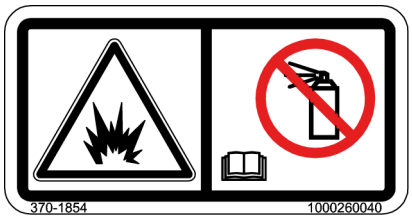


Fig. 66

Position

On the headliner.

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Notes:

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4 Putting into operation

4.1 Cabin/control stand

CAUTION

Injury hazard when entering or exiting!

Entering or exiting incorrectly can cause injury.

- ► Keep the mandatory climbing aids **A** clean and use only them for entering and exiting.
- ► Face the machine as you enter and leave it.
- ► Have damaged climbing aids replaced immediately. Do not operate the machine.

CAUTION

Crushing hazard due to unlocked cabin door!

Unlocked cabin doors can cause crushing.

- ► Lock the cabin door.
- ► Use the handholds for closing.

CAUTION

Injury hazard when opening or closing the front window!

Opening or closing the front window can cause injury.

- ► Use both handles.
- ► Duck your head.
- ► Let both locks lock into place.
- ► Keep body parts and clothes away from the window channel.

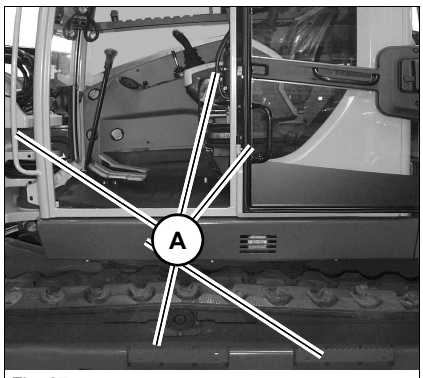


Fig. 67

Entry and exit

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

Information

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

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Unlocking and locking the door

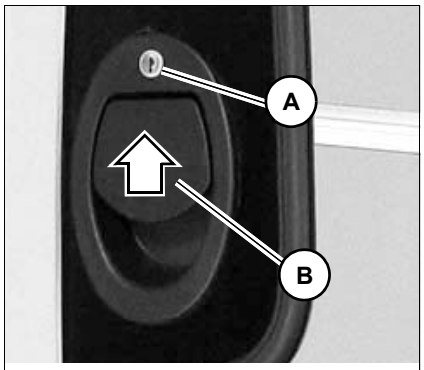


Fig. 68

Unlocking:

Turn the key in door lock **A** anticlockwise.

Locking:

Turn the key in door lock **A** clockwise.

Opening and closing the door

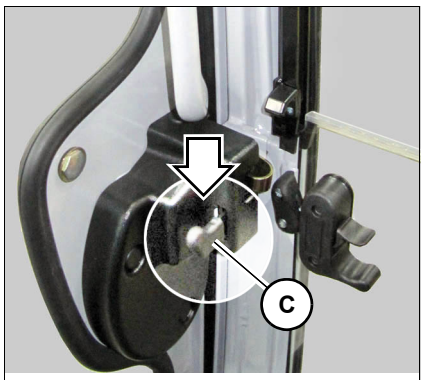


Fig. 69 (symbolic representation)

Opening:

Pull door handle **B**.

Closing:

Close the door applying firm pressure.

Opening the door from the inside:

Press lever **C** downward.

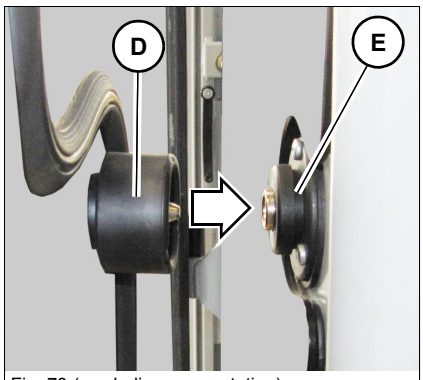


Fig. 70 (symbolic representation)

Securing an open door

Press bracket **D** firmly against arrester **E**.

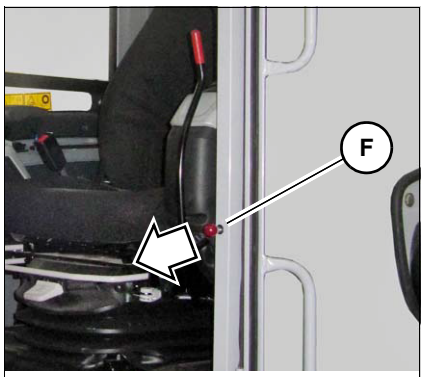


Fig. 71

Releasing the door arrester

Pull button **F**.

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Opening/closing the front window



Fig. 72

Opening the upper front window

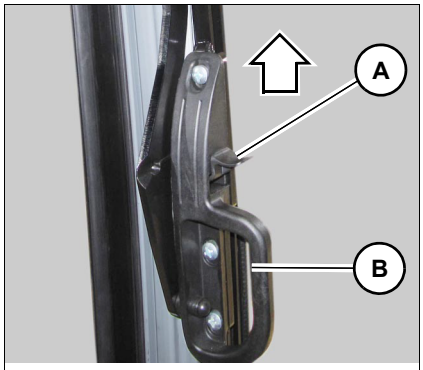


Fig. 73

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

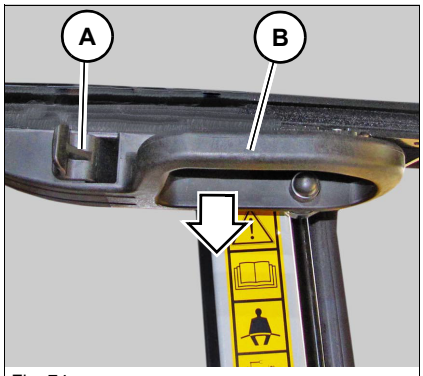


Fig. 74

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

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Fig. 75

Opening the lower front window

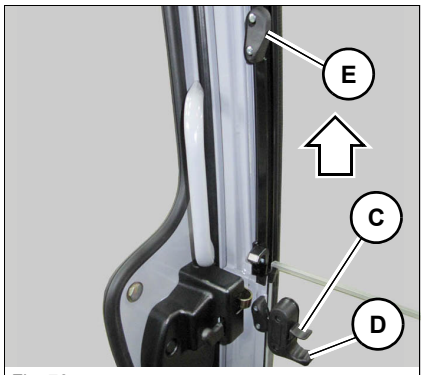


Fig. 76

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

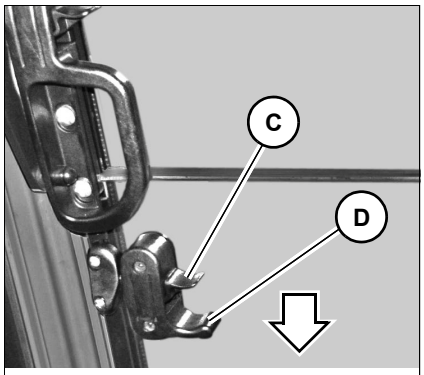


Fig. 77

Closing the lower front window

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

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Fig. 78

Opening the whole front window

1. Open the lower front window as described on page *4-4*.
2. Open both windows together as described on page *4-3*.

Closing the whole front window

1. Close both windows together as described on page *4-3*.
2. Close the lower front window as described on page *4-4*.

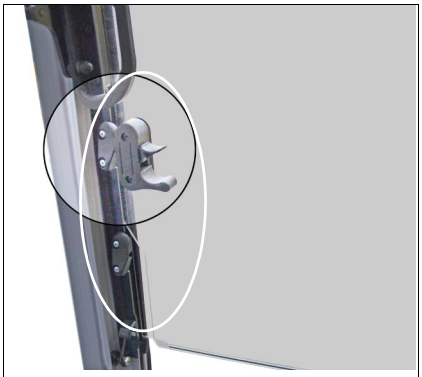


Fig. 79

NOTICE

If the protective Front Guard structure is installed, the front windows can be damaged.

► The lower front window must be fully open when the entire front window is opened or closed. (*Fig. 79*)



Fig. 80

Opening the front window to a gap (ventilation position)

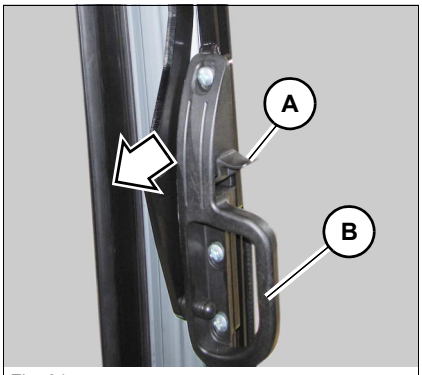


Fig. 81

1. Press levers **A** on the left and right, and slightly pull handles **B** on the left and right.
   ➥ The front window is unlocked.
2. Release levers **A** and pull handles **B** on the left and right until the front window engages.

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Opening/closing the side windows

Both side windows on the right can be opened.

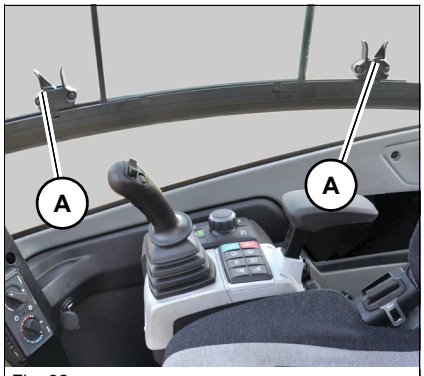


Fig. 82

Open

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

Close

Press lever **A** and close the side window.

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Emergency exit

There are several possibilities for an emergency exit:

- Front Guard not installed: front or right window
- Front Guard installed: rear window

WARNING

Injury hazard when leaving the cab in an emergency!

An emergency exit can cause serious injury or death.

► The front and the right of the machine have neither footholds nor handles for safely exiting the cabin.

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

WARNING

Injury hazard when leaving the cab in an emergency!

An emergency exit can cause serious injury or death.

► There are no footholds nor handles for safely exiting the cabin at the rear and the right side of the machine.

► Protect your face and eyes from the glass splinters flying around when you smash a window.

► Pay attention to glass splinters during an emergency exit.

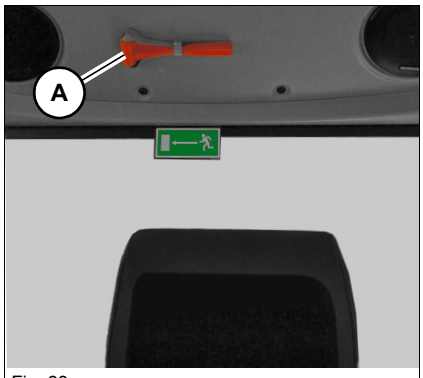


Fig. 83

The rear or right windows can be used as an emergency exit if the cabin door or front windows are blocked.

Smash the rear window with emergency hammer **A** above the rear window.

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Comfort seat

WARNING

Accident hazard due to seat adjustment during machine operation!

Adjusting the operator seat during machine operation can cause serious injury or death.

► Adjust the operator seat before putting the machine into operation.

► Ensure that the levers are locked into place.

Weight adjustment

CAUTION

Spinal cord injury due to incorrect seat adjustment!

An incorrect weight adjustment can cause injury to the spinal cord.

► Ensure that the seat is correctly adjusted to the operator's weight before machine travel or operation.

The comfort seat can be adjusted as follows:

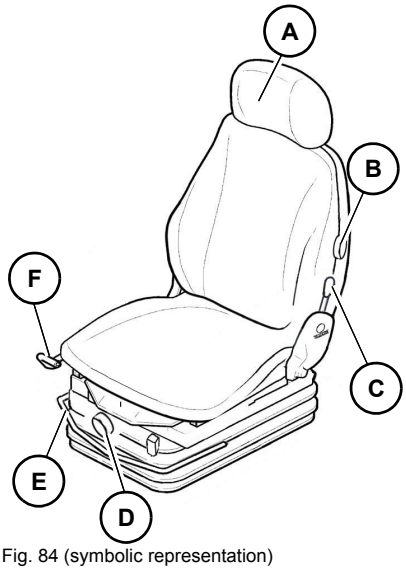


Fig. 84 (symbolic representation)

A Head rest
B Lumbar support (option)
C Backrest
D Weight
E Horizontal adjustment of seat and control lever console
F Horizontal seat adjustment

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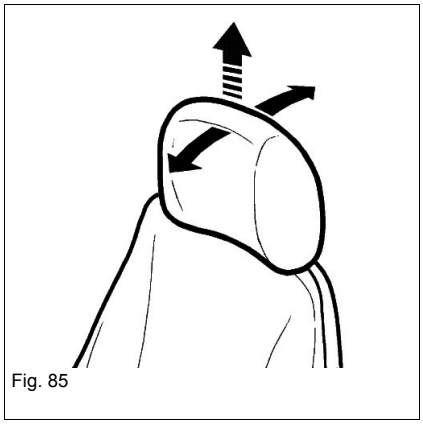


Fig. 85

Head rest

Function	Operation
Height adjustment	Pull up or push down
Inclination adjustment	Push forward or backward

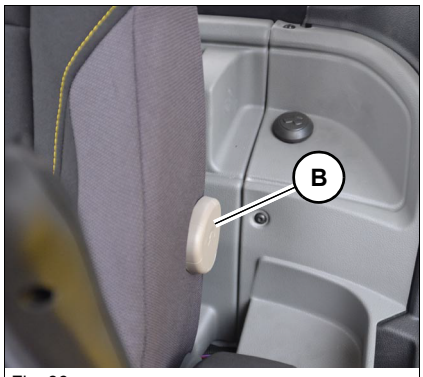


Fig. 86

Lumbar support (option)

The lumbar support can be adjusted to the natural curvature of the spine. This reduces the load on the spine and ensures a non-fatiguing seating position.

To adjust the lumbar support, turn button **B**

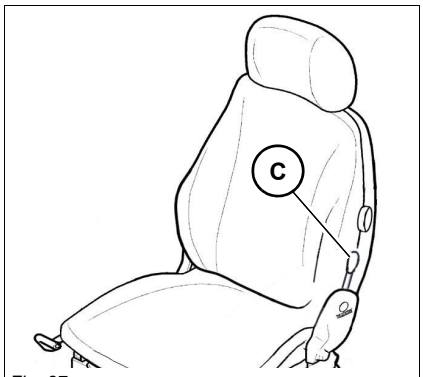


Fig. 87

Backrest

1. Sit down on the operator seat.
2. Push lever **C** backward and adjust the backrest.

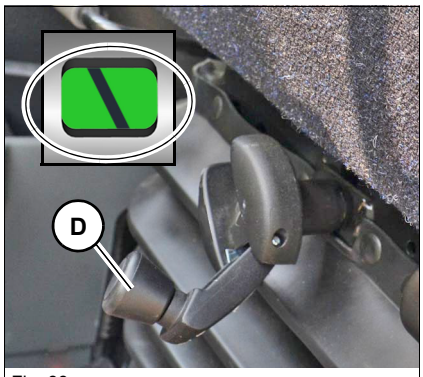


Fig. 88

Adjusting the weight

1. Sit down on the operator seat and unfold crank **D**.
2. Rotate crank **D** until the highlighted symbol appears.

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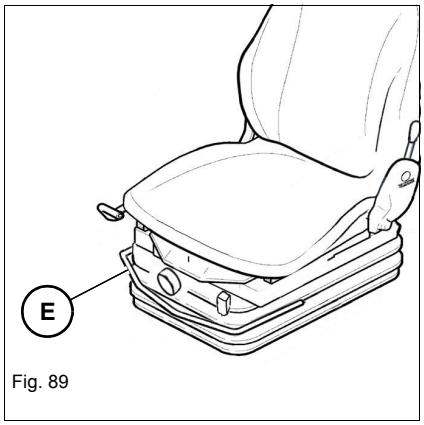


Fig. 89

Horizontal adjustment of seat and control lever console

The seat and control lever console can be adjusted simultaneously. This ensures a constant distance between the operator seat and the control levers.

1. Sit down on the operator seat.
2. Pull lever **E** upward and lock seat console in the required position.

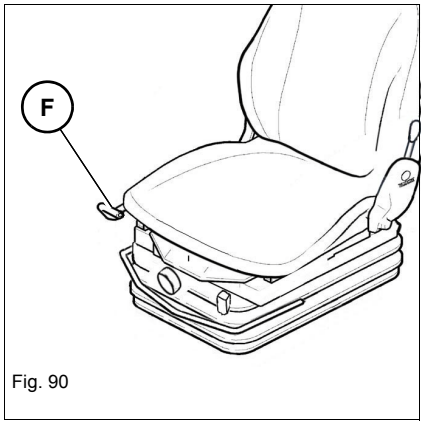


Fig. 90

Horizontal adjustment of seat and control lever console

1. Sit down on the operator seat.
2. Pull lever **F** upward and lock seat console in the required position.

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Air-suspension comfort seat (option)

WARNING

Accident hazard due to seat adjustment during machine operation!

Adjusting the operator seat during machine operation can cause serious injury or death.

► Adjust the operator seat before putting the machine into operation.

► Ensure that the levers are locked into place.

Weight adjustment

CAUTION

Spinal cord injury due to incorrect seat adjustment!

An incorrect weight adjustment can cause injury to the spinal cord.

► Ensure that the seat is correctly adjusted to the operator's weight before machine travel or operation.

Information

The weight can only be adjusted when the starter is engaged.

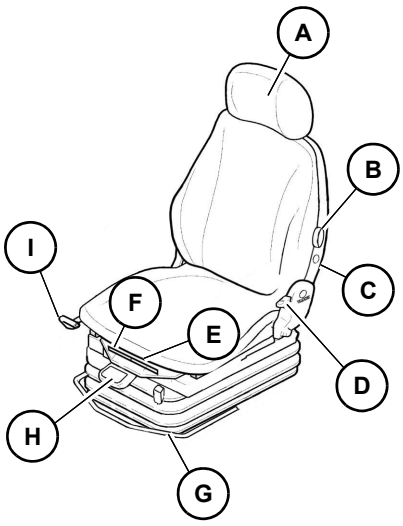


Fig. 91 (symbolic representation)

The air-suspension seat can be adjusted as follows:

A Head rest
B Lumbar support
C Heated seat (option)
D Backrest
E Length of seat surface
F Inclination of seat surface
G Horizontal adjustment of seat and control lever console
H Operator weight
I Horizontal seat adjustment

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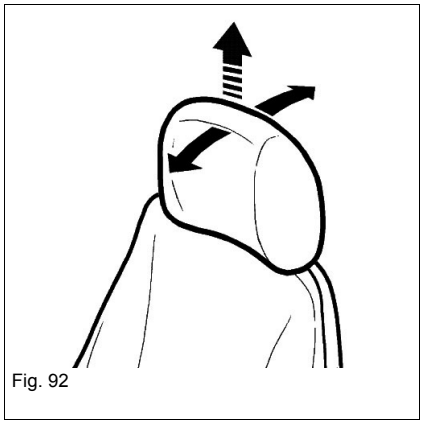


Fig. 92

Head rest

Function	Operation
Height adjustment	Pull up or push down
Inclination adjustment	Push forward or backward

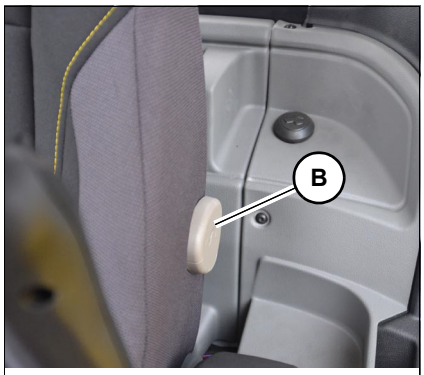


Fig. 93

Lumbar support

The lumbar support can be adjusted to the natural curvature of the spine. This reduces the load on the spine and ensures a non-fatiguing seating position.

To adjust the lumbar support, turn button **B**

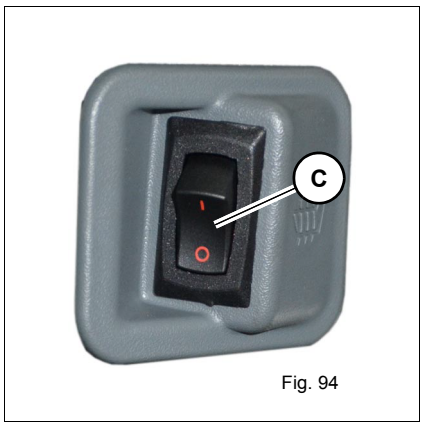


Fig. 94

Heated seat (option)

Press button **C** to switch on or off.

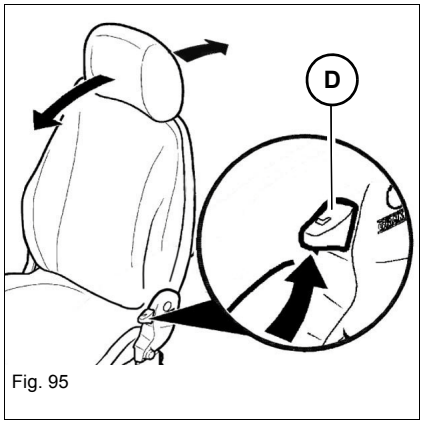


Fig. 95

Backrest

1. Sit down on the operator seat.
2. Push lever **D** backward and adjust the backrest.

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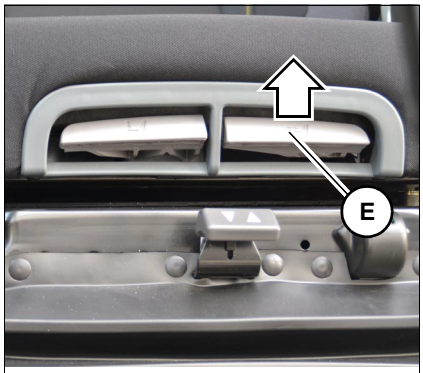


Fig. 96

Length of seat surface

1. Sit down on the operator seat.
2. Pull lever **E** upward and adjust the length of the seat surface.
   ➥ The seat surface must engage.

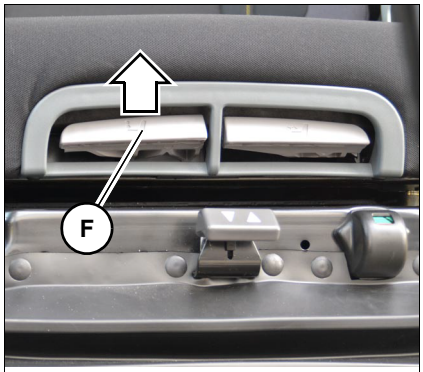


Fig. 97

Inclination of seat surface

1. Sit down on the operator seat.
2. Pull lever **F** upward and adjust the inclination of the seat surface.
   ➥ The seat surface must engage.

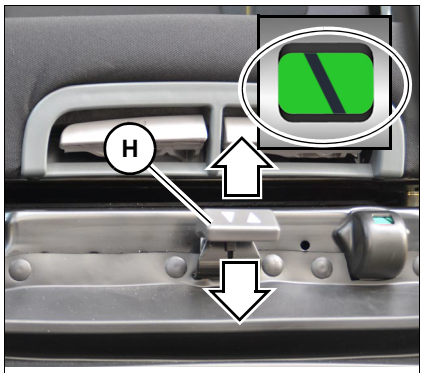


Fig. 98

Weight adjustment

1. Sit down on the operator seat.
2. Push or pull push button **H** until the highlighted symbol appears.

NOTICE

Possible damage to the compressor due to long operation of the switch.

► Do not hold the push button more than one minute.

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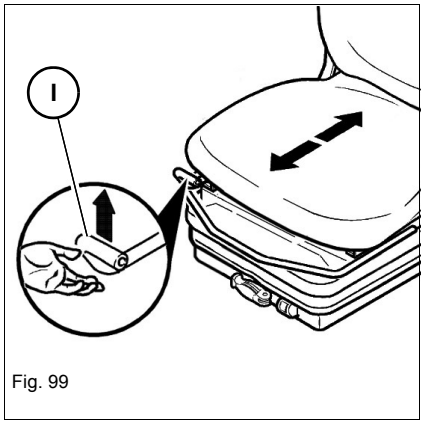


Fig. 99

Horizontal seat adjustment

1. Sit down on the operator seat.
2. Pull lever **I** upward and lock seat console in the required position.

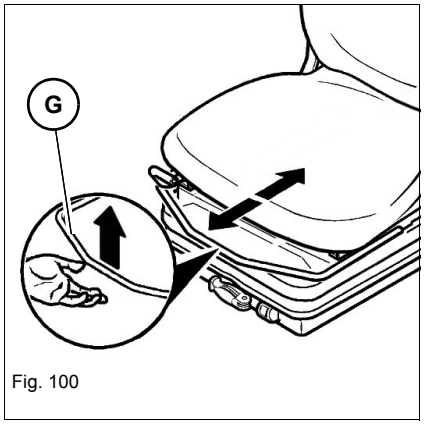


Fig. 100

Horizontal adjustment of seat and control lever console

The seat and control lever console can be adjusted simultaneously. This ensures a constant distance between the operator seat and the control levers.

1. Sit down on the operator seat.
2. Pull lever **G** upward and lock seat console in the required position.

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Adjusting the retracting seat belt

WARNING

Injury hazard if the seat belt is not fastened correctly or not at all!

Fastening the seat belt incorrectly, or not at all, can cause serious injury or death.

- ► Firmly fasten your seat belt over your hips before starting machine operation.
- ► Do not fasten a twisted seat belt, and do not place it over hard, edged or fragile items in your clothes.
- ► Ensure that the buckle is inserted (pull test).
- ► Do not use seat belt extensions.

CAUTION

Injury hazard due to damaged or dirty seat belt!

A damaged or dirty seat belt can cause serious injury or death.

- ► Keep the seat belt and buckle clean, and check them for damage.
- ► Have a damaged seat belt and buckle immediately replaced by a Wacker Neuson service center.
- ► Have the seat belt immediately replaced after every accident and the bearing capacity of the fastening points and seat fixtures checked by a Wacker Neuson service center.

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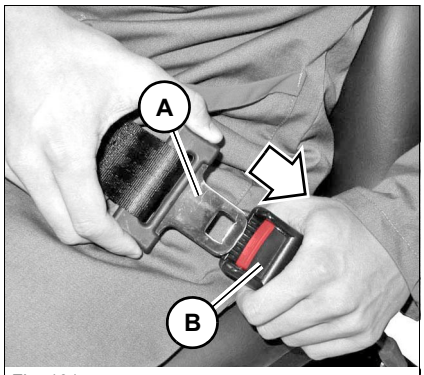


Fig. 101

Fastening the retracting seat belt

Insert buckle latch **A** into seat belt buckle **B** until it engages.

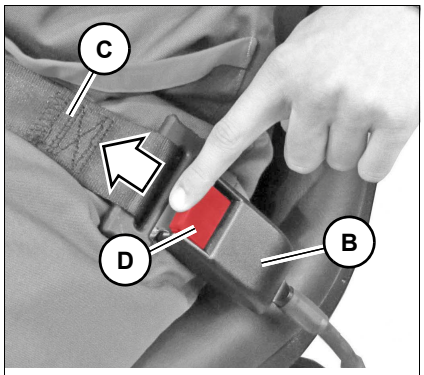


Fig. 102

Unfastening the retracting seat belt

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

➥ Seat belt **C** is automatically retracted.

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Adjusting the mirrors (option)

WARNING

Injury hazard to persons in the danger zone!

Persons in the danger zone are possibly not seen when reversing the machine. This can cause accidents with serious injuries or death.

- ► 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.

- ► Do not allow anyone to stay in the danger zone.
- ► Use suitable visual aids if necessary (camera, mirrors, guide, for example).
- ► 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.

- ► Before starting work, ensure that all visual aids are clean, functional and adjusted in accordance with the instructions in this Operator's Manual.
- ► Immediately replace damaged or broken visual aids.
- ► Convex mirrors enlarge, reduce or distort the field of view.
- ► The operator must follow the national and regional regulations.

- Use safety-oriented ladders and work platforms for adjustment work on the machine.
- Do not use machine parts or attachments as a climbing aid.
- Set the boom to travel position before adjusting the mirrors.

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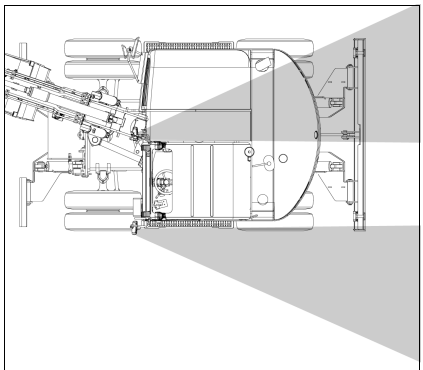


Fig. 103 (symbolic representation)

Outside rearview mirrors of cabin on left and right

- 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 mirror on the left.
- Ensure visibility of the rear right edge of the machine in the mirror on the right.

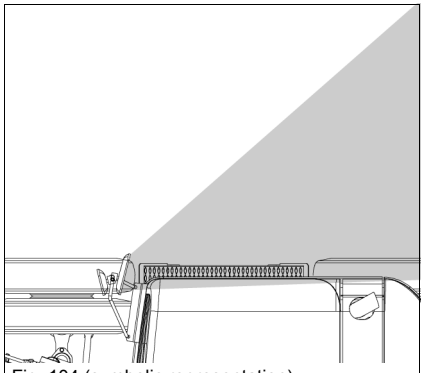


Fig. 104 (symbolic representation)

Outside mirror on the right

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

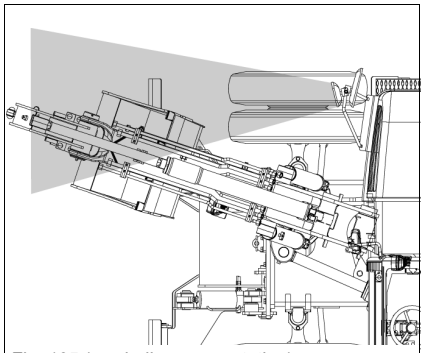


Fig. 105 (symbolic representation)

Upper carriage mirror on the right

- Ensure sufficient visibility from the operator seat onto the job site.
- The area covered by the boom and the area in front of the track on the right must be visible in the mirror.
- The front edge of the track on the right must be barely visible in the mirror.

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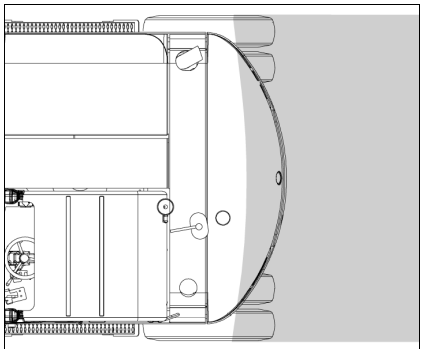


Fig. 106 (symbolic representation)

Rear outside mirror of cabin

- Ensure sufficient visibility from the operator seat onto the job site.
- The immediate area at the rear, the machine limits on the left and right and the engine cover must be visible in the mirror.
- Persons in the danger zone are possibly not seen.

Information

Wacker Neuson recommends adjusting the mirrors with two persons.

Information

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

Reversing camera (option)



Fig. 107 (symbolic representation)

The reversing camera is located on top of the engine cover. It allows the operator to see the area behind the machine.

Toggling between camera view (**1**) and status display (**2**):

Turn control button **A**.

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Fig. 108

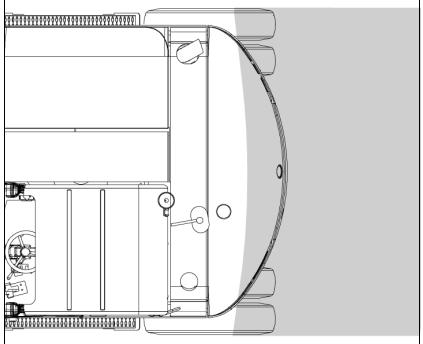


Fig. 109 (symbolic representation)

Adjusting the camera – rear visual range

- Ensure sufficient visibility from the operator seat onto the job site.
- The immediate area at the rear of the machine and the outside left and right sides of the stabilizer blade must be visible.

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Armrest

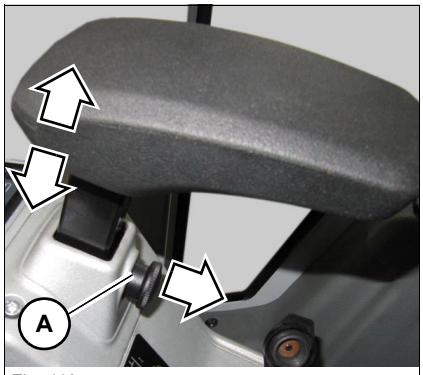


Fig. 110

1. Hold the armrest and pull out button **A**.
2. Adjust the armrest height.
3. Release button **A**.

Fire extinguisher



Fig. 111

A fire extinguisher is not available from Wacker Neuson.

Get in touch with a Wacker Neuson service center for the installation of a fire extinguisher (DIN-EN 3).

Information

Ensure the firm and safe installation of the fire extinguisher. Check the holder and the fire extinguisher at regular intervals. Observe the manufacturer's indications.

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Protective structures

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

DANGER

Accident hazard due to modified cabin or protective structures!

Modifications (for example drilling) weaken the structure and 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, assembly and repair work may only be performed by a Wacker Neuson service center.
- ► Replace self-locking fasteners.

Information

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

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

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.

Assembly

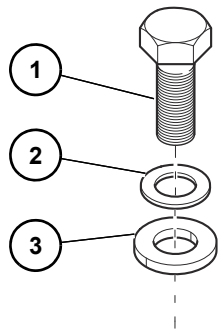


Fig. 112

The term **screw** is used for fastening equipment used in the following sequence:

1. Screw
2. Schnorr washer
3. Washer

Information

Only install protective structures with the help of a crane.

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

DANGER

Crushing hazard due to falling objects!

Causes serious injury or death.

► Install a protective FOPS structure for machine operation in areas with danger of falling objects.

Information

The protective FOPS structure corresponds to category I according to ISO 10262:1998/EN ISO 3449:2008.

► 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.

► Have the initial assembly performed by a Wacker Neuson service center.

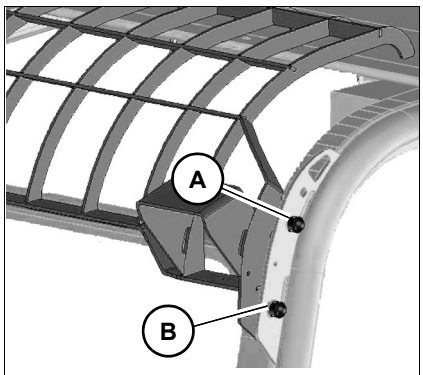


Fig. 113

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Install screws **A** and **B** (M12) and lock nuts and tighten them to 87 Nm (64 ft.lbs.).

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Protective FOPS structure/large screen – category II (option)

DANGER

Crushing hazard due to falling objects!

Causes serious injury or death.

► Install a protective FOPS structure for machine operation in areas with danger of falling objects.

Information

The protective FOPS structure corresponds to category II according to ISO 10262:1998/EN ISO 3449:2008.

► 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.

► Have the initial assembly performed by a Wacker Neuson service center.

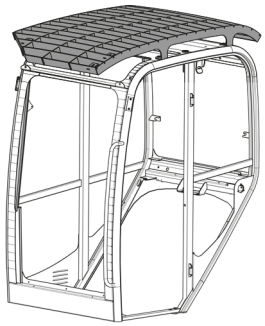


Fig. 114: FOPS category II (symbolic representation)

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.

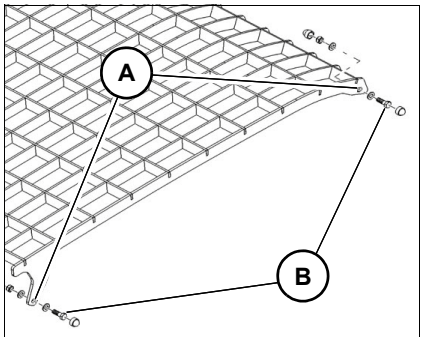


Fig. 115: FOPS category II (assembly)

2. Front and rear fastening points **A**
3. Tighten screws **B** and lock nuts on the left and right to 110 Nm (81 ft.lbs.).

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Protective Front Guard structure category II (option)

DANGER

Danger of piercing/penetration by objects from the front!

Causes serious injury or death.

► Install a protective Front Guard structure in areas with danger from the front (for example pipes, tree trunks).

Information

The protective Front Guard structure corresponds to category II according to ISO 10262:1998.

► 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.

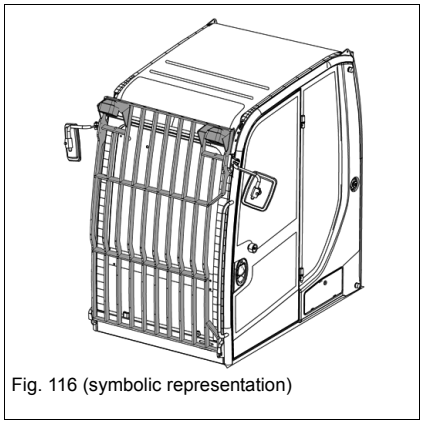
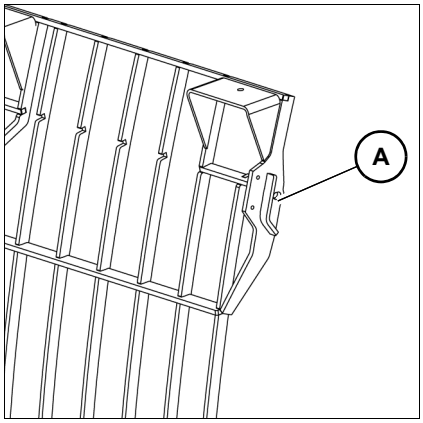


Fig. 116 (symbolic representation)

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.



2. Mounting point **A** (upper).

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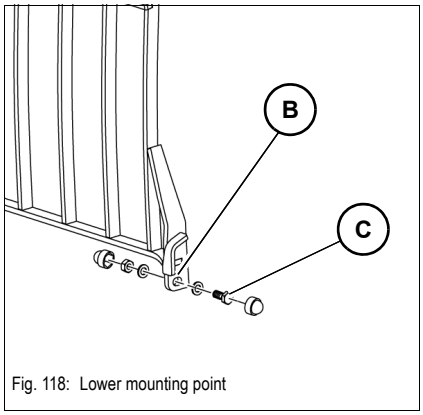


Fig. 118: Lower mounting point

3. Mounting point **B** (lower).
4. Tighten screws **C** and lock nuts at the upper and lower left and right to 110 Nm (81 ft.lbs.).

Document box (option)

The document box is located on the rear side of the cabin.

Socket



Fig. 119

A 12 V power outlet is located at the rear right of the cabin.

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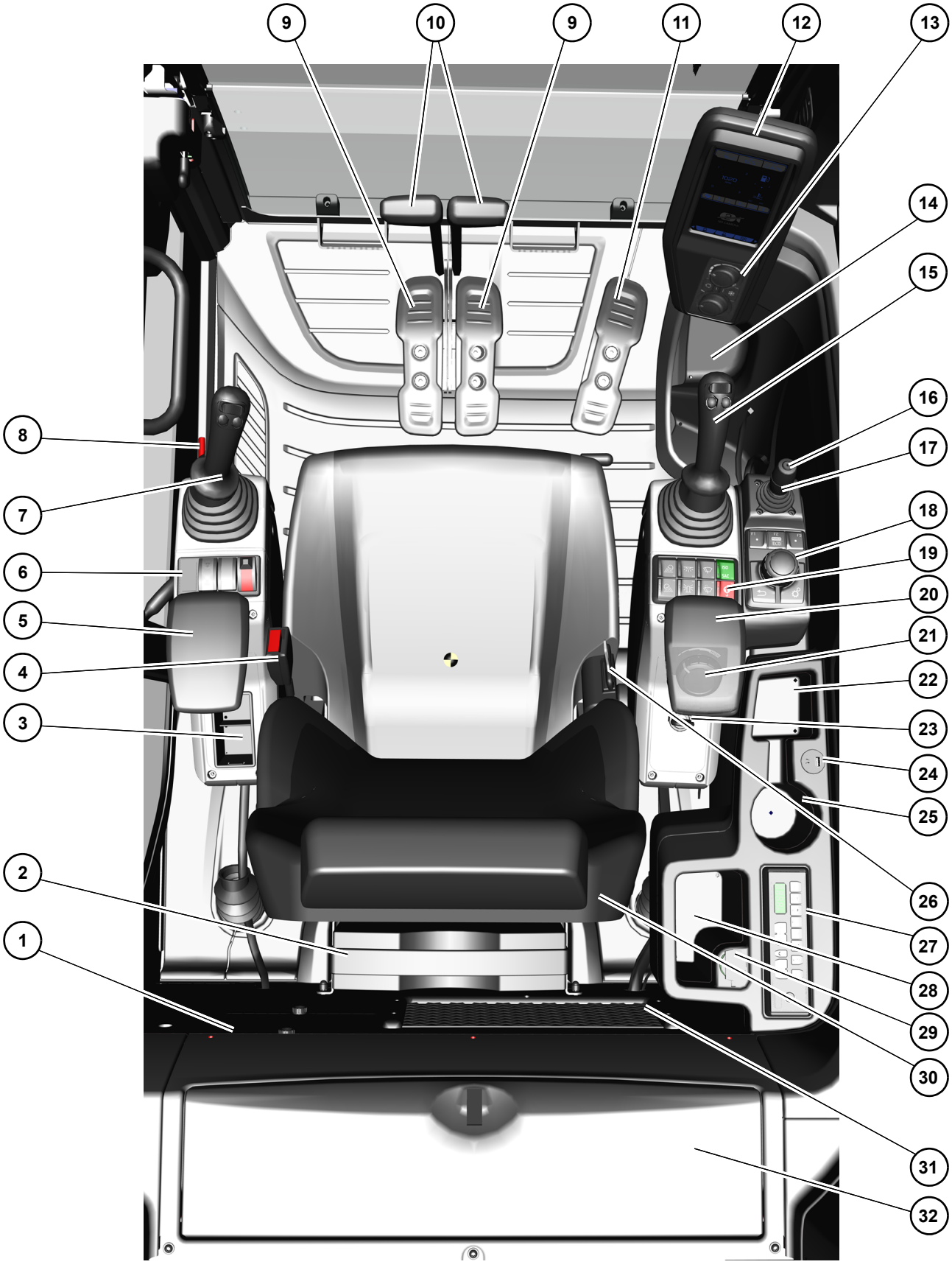
4.2 Overview of control elements

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.

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Cabin



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Designation	See page
1 Cabin fuse box	*9-5*
2 Document box (option)	--
3 Left storage compartment	--
4 Seat belt buckle	*4-15*
5 Armrest (left)	*4-21*
6 Switch panel	*4-30*
7 Control lever on the left	*5-20*
8 Control lever base	*4-46*
9 Drive pedals	*5-7*
10 Drive levers	*5-7*
11 Boom swivel pedal	*5-34*
12 Multifunctional display	*4-30*
13 Temperature control/automatic air conditioning (option)	*5-17*
14 Bottle holder	--
15 Control lever on the right	*5-20*
16 Speed range selection	*5-2*
17 Stabilizer-blade lever	*5-24*
18 Jog dial	*4-30*; *5-5*
19 Keypad	*4-30*
20 Right armrest	--
21 Throttle	*5-1*
22 Storage compartment, right side	--
23 Starter	*4-45*
24 USB port for radio (see Radio Operation Manual)	--
25 Drinks holder	--
26 Retracting seat belt	*4-15*
27 Radio (option – see Radio Operation Manual)	--
28 Storage compartment	--
29 12 V socket	--
30 Operator seat	*4-8*; *4-11*
31 Storage compartment with elastic net	--
32 Rear storage compartment	--

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Operation – overview

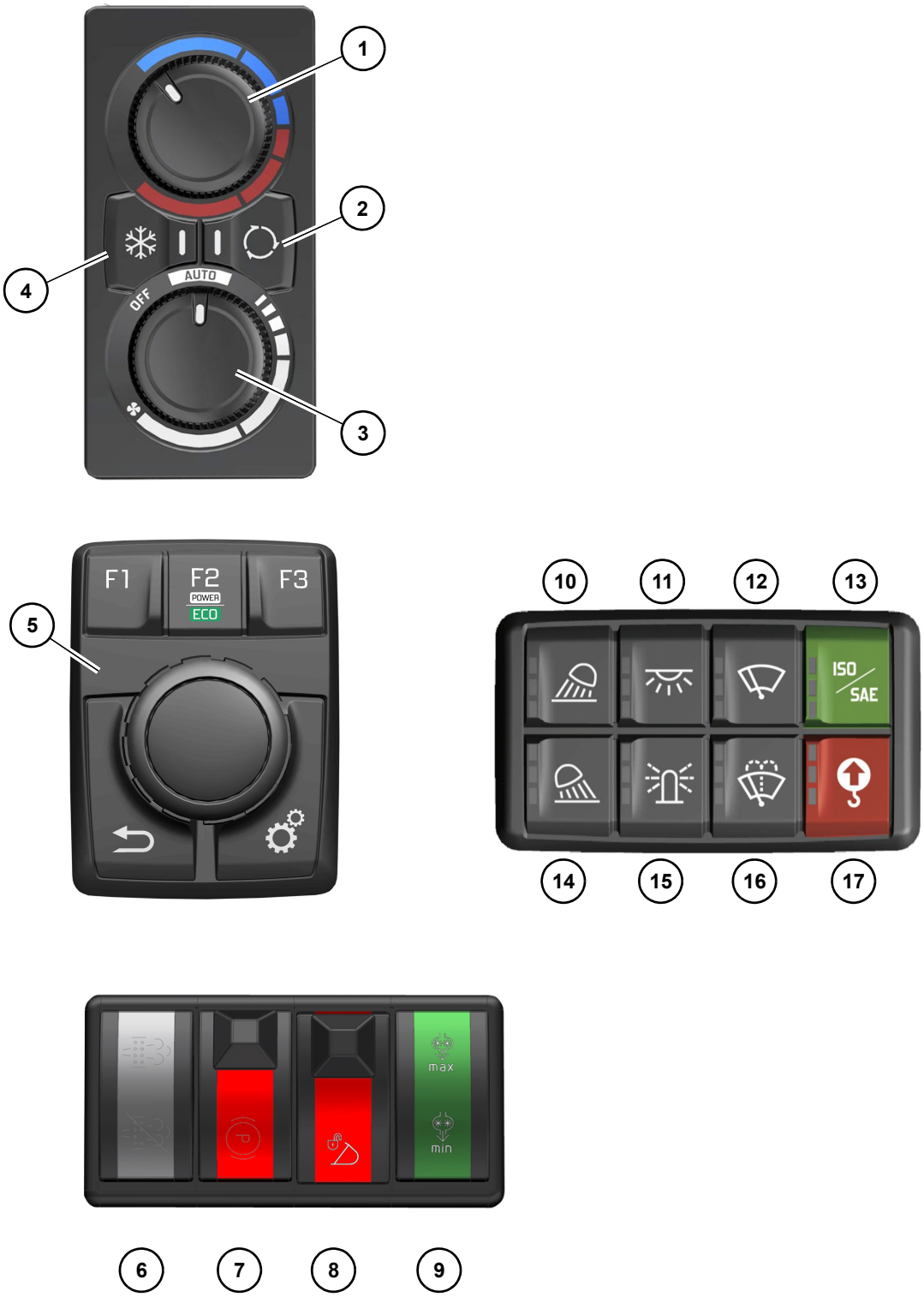


Fig. 121

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Designation		See page
1	Temperature setting	5-16
2	Recirculated air mode	5-17
3	Fan	5-16
4	Air conditioning system with automatic function	5-16
5	Jog Dial control unit	4-32
6	Diesel particulate filter regeneration	7-45
7	Parking brake (for diesel particulate filter regeneration)	7-49
8	Hydraulic quickhitch Oil Quick	5-38
9	Pump oil flow adjustment	5-34
10	Boom light	5-12
11	Interior light	5-14
12	Wiper	5-15
13	ISO/SAE changeover (option)	5-20
14	Roof and chassis lights	5-13
15	Rotating beacon (option)	5-14
16	Wiper/wash system	5-15
17	Safe load indicator	5-36

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Jog dial



Fig. 122

Control button

Menu levels are selected (turn) and confirmed (press) with control button **A**.

Control element			Function	See page
F1			Indicates operating states	*4-38*
F2			Changing the engine operating mode directly	*5-2*
F3			Automatic engine speed setting	*5-3*
Menu button	Press briefly		• Selecting control circuits	*5-32*
			• Changing the engine operating mode	*5-2*
	press and hold		• Selecting and configuring attachments	*5-32*
			• Stabilizer blade	*5-24*
			• Service menu/error messages	*8-6*
			• Adjusting the multifunctional display • Setting date and time • Individual menu	*5-5*
Return button			Back to previous menu	--
Control button			Selecting menu items (turn) Confirming menu items (press)	--

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Fig. 123

Daily and total operating hours

Function	Push button
Change view	Press F1 briefly
Reset the daily operating hours	Press F1 longer

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4.3 Indicator lights and warning lights (overview)

Display element/multifunctional display

The display element and the multifunctional display inform the operator about operating states, required maintenance procedures and possible machine malfunctions.

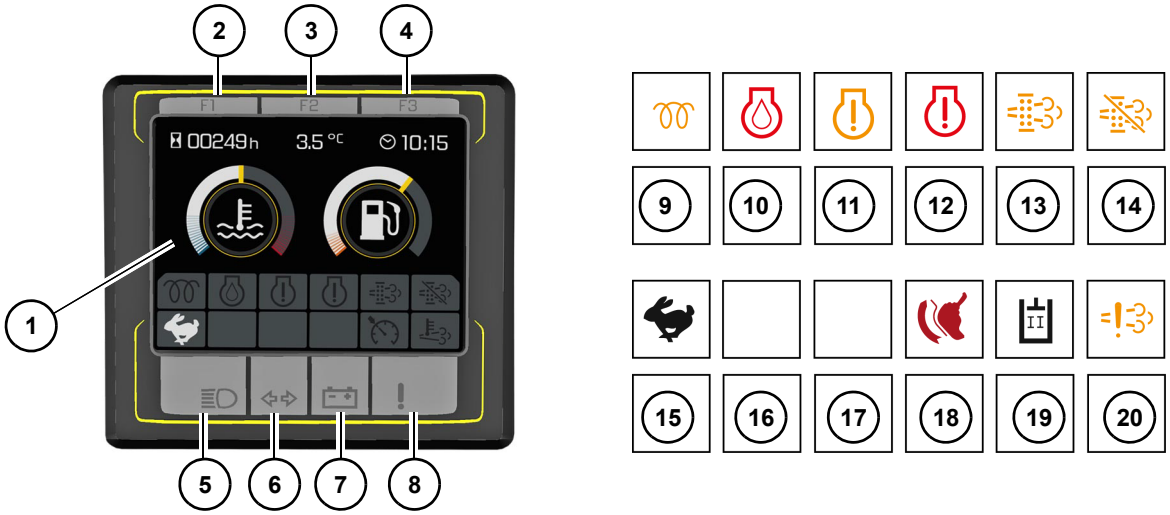


Fig. 124

Information

It may take a few seconds before a selected function is displayed.

Information

The indicator lights are tested when the starter is engaged and are illuminated for a few seconds.

Information

The standard equipment of the machine includes a 3.5” multifunctional display.

If the **reversing camera** option is selected, a 7” multifunctional display is installed. Any differences between the two displays are indicated separately.

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No.	Symbol	Color	Designation
1	--	--	**Multifunctional display**
2	F1	--	**F1 (operating state indicator)**
3	F2	--	**F2 (maintenance meter, engine operation mode indicator)**
4	F3	--	**F3 (time display, automatic engine speed setting)**
5		**Blue**	**Not assigned.**
6		**Green**	**Not assigned**
7		**Red**	**Charge indicator light**
8		**Red**	**General machine malfunction**
9		**Yellow**	**Preheating**
10		**Red**	**Engine oil pressure**
11		**Yellow**	**Engine warning**
12		**Red**	**Engine stop**
13		**Yellow**	**Regeneration required**

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No.	Symbol	Color	Designation
14		Yellow	Regeneration disabled/interrupted
15		--	Speed range 2
		--	Speed range 1
16		--	Not assigned
17		--	Not assigned
18		Red	Hydraulic functions locked
		Red	Hydraulic functions active
19		--	Additional control circuit AUX II (option)
		--	Additional control circuit AUX III (option)
20		Yellow	Exhaust-gas temperature

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Error symbols

If an error occurs, the following symbols are displayed for a few seconds in the multifunctional display.

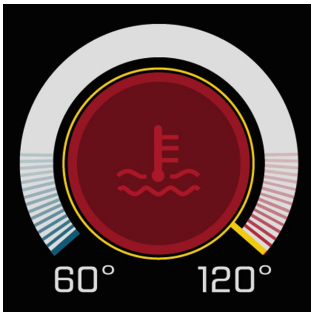
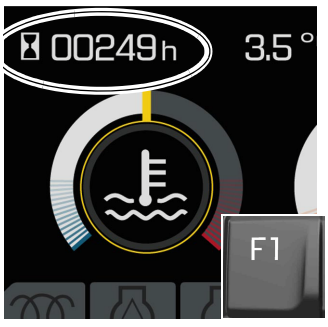
Error symbols are listed according to priority.

Symbol	Designation	Symbol	Designation
	**01 Engine stop (short indication)**		**05 Charge indicator light (short indication)**
	**02 General malfunction (short indication)**		**06 Hydraulic oil temperature (permanent indication)**
	**03 Engine oil pressure (short indication)**		**07 Hydraulic oil filter (short indication, appears again upon starting the engine)**
	**04 Engine malfunction (short indication)**		**08 Air filter (short indication, appears again upon starting the engine)**
	**Work functions enabled**		**Work functions disabled**

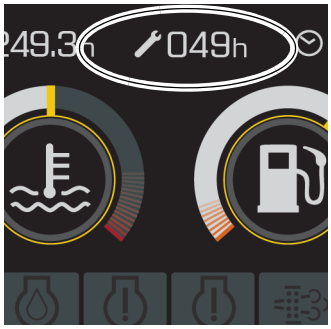
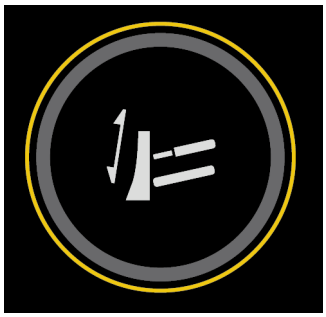
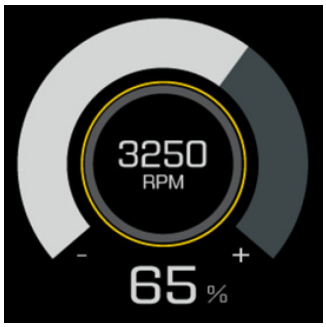
– see chapter “8.2 Malfunctions (display element/multifunctional display)” on page 8-4

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Status indicators

Symbol	
	**Starter/engine start** • **A**: starting key in position **1** • **B**: engine starts
	**Coolant temperature** If the coolant temperature is too high the symbol shown on the left appears and the buzzer sounds. • Let the engine run at idling speed without any load. • Wait until the temperature drops and the indicator light goes out. • Stop the engine. • Check the coolant level.
	**Fuel tank capacity** Refuel if the symbol shown on the left appears.
	**Operating states** Press **F1** to toggle between the operating state displays: • Operating hours • Daily hours of operation • Engine speed • Outside temperature (automatic air-conditioning option) • Hydraulic oil temperature • Time

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Symbol	
	**Maintenance meter** Counts the remaining engine operating hours down to the next maintenance work due. If less than 10 hours are displayed, the wrench symbol flashes.
	**Stabilizer blade** This symbol appears when the stabilizer blade is raised or lowered.
	**Engine speed** This symbol appears when the throttle is operated.
	**No function** This symbol appears when a control element without function is operated.
	**Overload** The symbol shown on the left appears and the buzzer sounds. The permissible load diagram values are exceeded. • Reduce the load until both the buzzer and the warning light go out – *see chapter “ Lifting gear applications” on page 5-35*. When the safe load indicator is switched on, the symbol is illuminated and the buzzer sounds as a functional check.

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Symbol	
	**Status indicator for 7” multifunctional display (option)** Additional status indicators are displayed: • Battery voltage • Engine oil pressure • Hydraulic oil temperature • Preset maximum flow rate of the additional control circuits AUX I through AUX III Use the rotary switch of the jog dial control unit to toggle between camera view and status display.

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4.4 Preparatory work

Important information before putting the machine into operation

Perform a visual check before starting work:

- There must be no leaks.
- There must be no damaged or loose parts.
- Do not allow anyone to stay in the danger zone.

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

Only operate the machine from the seat with the seat belt fastened.

Before using the machine in work operation for the first time, Wacker Neuson recommends 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 starting work, ensure that all visual aids are clean, functional and adjusted in accordance with the instructions in this Operator's Manual.

The operator must follow the national and regional regulations.

Perform a **functional check of the control lever base**.

Perform a **functional check of the safe load indicator**.

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

Observe the safety instructions *– see chapter "2 Safety Information" on page 2-1*.

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 "2.5 Operator and Technician Qualifications and Basic Responsibilities" on page 2-6*.

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 exit it, and only use the mandatory climbing aids for entering and exiting.

Keep the footholds and the handholds clean to ensure a safe hold at all times. Immediately remove dirt, oil, snow, etc.

Do not get on a moving machine, or jump off it.

Do not operate the machine if the standard protective equipment (for example the cabin) has been removed.

No clothes or parts of the body may protrude outside the machine during operation.

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Check lists

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

Wacker Neuson does not claim those lists to be exhaustive.

If the answer to one of the questions is **No**, first rectify the cause of the fault (or have it rectified) before starting 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?	*7-23*
2	Water drained from the water separator?	*7-27*
3	Correct engine oil level?	*7-30*
4	Coolant level OK?	*7-32*
5	Correct oil level in the hydraulic oil reservoir?	*7-36*
6	Glass cleaner in washer reservoir?	*7-41*
7	Lubrication points greased?	*7-8*
8	Tracks checked for cracks, cuts, etc.?	--
9	Light system, mirrors, signaling, warning and indicator lights operational and/or adjusted correctly?	--
10	Windows, visual aids, lights, steps, all pedals and control levers clean?	--
11	All control levers and pedals in neutral position?	--
12	Does the washer system work correctly?	--
13	Control lever base raised?	--
14	Are other persons required to guide you?	--
15	Attachment safely locked?	*5-38* *5-48*
16	Engine cover locked? Filler cap closed tightly?	*7-17* *7-23*
17	Tools and other loose objects removed?	--
18	Seating position adjusted correctly?	*4-8* *4-11*
19	Are all visual aids functional, clean and adjusted correctly?	*4-17* *4-19*
20	Seat belt fastened?	*4-15*

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Operation checklist

Check/observe the following before beginning operation or after starting the engine:

No.	Question	Page
1	Are there any persons or objects in the danger zone of the machine?	*5-50*
2	All indicator lights gone out?	*4-34*
3	Coolant temperature of engine in normal range?	*4-34*
4	Do the pedals and control levers work correctly?	--
5	Performed functional check of control lever base?	*4-46*
6	Perform a functional check of the safe load indicator.	*5-36*
7	Braking effect sufficient?	*5-4*

Parking checklist

Check and observe the following points when parking the machine:

No.	Question	Page
1	Attachment lowered to the ground?	*5-38* *5-48*
2	Stabilizer blade lowered to the ground?	*5-24*
3	Control lever base raised?	*4-46*
4	Cabin locked?	*4-2*
When parking on slopes:		
5	Machine secured with wheel chocks in addition to prevent it from rolling away?	*5-11*

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

Before putting the machine into operation for the first time, 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.
- Observe the maintenance plans – *see chapter “7.2 Maintenance overview” on page 7-2*.

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4.5 Starting and stopping the engine

Preparatory work

WARNING

Accident hazard due to unintentional operation of the machine!

Unintentional operation can cause serious injury or death.

► Only operate the machine from the seat with the seat belt fastened.

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 30 seconds.

Wait two minutes so the battery can recover and the starter does not overheat before trying again.

Information

Ensure sufficient ventilation during operation in enclosed premises.

Information

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

Starter

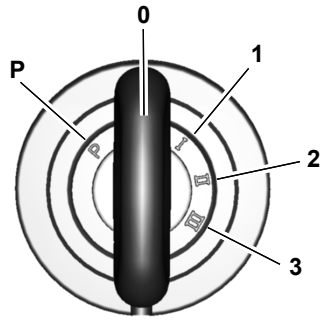


Fig. 125

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

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Starting and stopping the engine

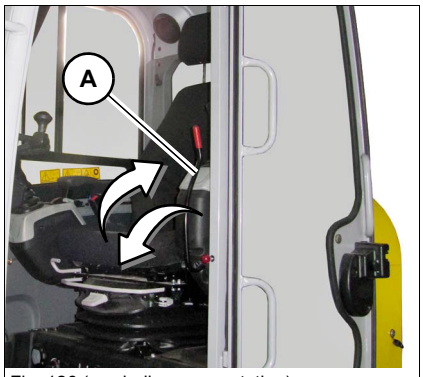


Fig. 126 (symbolic representation)

Control lever base	Indication	Effect
Raised		The engine can be started
Lowered		The engine cannot be started

All hydraulic functions are locked if the control lever is raised with a running engine.

Functional check of control lever base

Before starting work, perform a functional check of the control lever base.

1. Start the machine.
2. Fold the control lever base down.
3. Perform machine travel on open terrain.
4. Secure the danger zone.
5. Stop the machine.
6. Raise the control lever base.
7. Move all control levers and pedals in all directions.

➥ The selected elements do not move:
  ➥ Work may be performed with the machine.

➥ The selected elements move:
  ➥ Stop operation immediately.

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

NOTICE

Possible damage if the engine is started again immediately after stopping it.

► Wait at least two minutes before starting the engine again.

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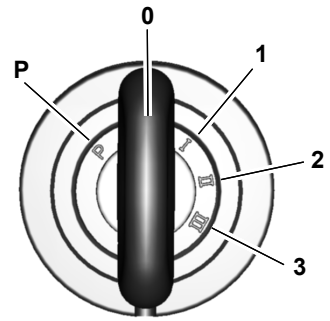


Fig. 127

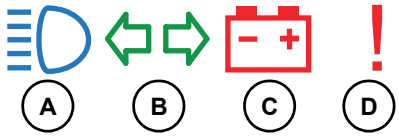




Fig. 128

1. Insert the starting key.
2. Turn the starting key to position **1**.
3. Indicator lights **A – D** are illuminated for a few seconds.

➥ Have malfunctioning indicator lights immediately replaced.

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

➥ The indicator lights **engine oil pressure (F)** and **alternator charging (C)** are illuminated.

5. Turn the starting key to position **3** until the engine runs.

➥ All indicator lights go out.

➥ If the engine does not start after 30 seconds:

- ➥ Interrupt the start procedure and repeat it after two minutes.
- ➥ If the engine still does not start after a few tries, contact a Wacker Neuson service center and have the error rectified.

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

Warm-up phase of machine

After the engine has started, allow it to warm up at slightly increased idling speed until the coolant reaches its operating temperature of about 80 °C (176 °F).

Do not let the machine warm up at standstill.

Check for unusual noise, exhaust color, leaks, malfunctions or damage.

In case of malfunctions, damage or leaks:

Secure the machine, park it and find out the cause for the damage and have it repaired.

Information

Raise the control lever base **A** after stopping the engine.

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Starting aid

WARNING

Explosion hazard in case of incorrect handling of battery!

Incorrect battery handling can cause serious injury or death.

- ► Wear protective equipment.
- ► Fire, open flames and smoking is prohibited.
- ► Do not jump start the engine if the battery is malfunctioning or frozen, or if the acid level is too low.

WARNING

Burn hazard due to hot surfaces!

Can cause serious burns or death.

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

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

- ► Open the engine cover only at engine standstill.

NOTICE

Possible damage due to electrical short circuit or overvoltage.

- ► The positive terminal of the starting battery must not be brought into contact with electrically conductive vehicle components.
- ► The vehicles must not touch each other during the starting aid.
- ► If the engine still does not start despite a starting aid, contact a Wacker Neuson service center.

NOTICE

Possible damage due to wrong battery voltage.

- ► Only use batteries with the same voltage (12 V).

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NOTICE

Possible damage to machine with empty battery due to voltage peaks.

NOTICE

Possible damage to battery jumper cables when placing them near rotating parts.

► Do not place the battery jumper cables near rotating parts.

Information

Use only authorized battery jumper cables which conform to the safety requirements.

Designations/symbols	Meaning
X	Machine with empty battery
Y	Vehicle with full battery
A	Positive/machine **X**
B	Positive/vehicle **Y**
C	Negative/vehicle **Y**
D	Negative/machine **X**
	Full battery

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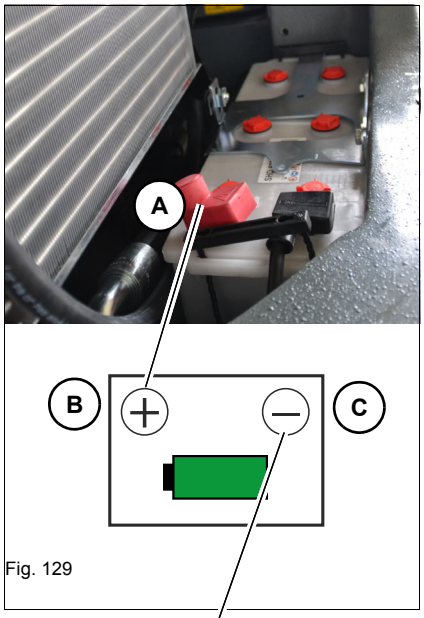


Fig. 129

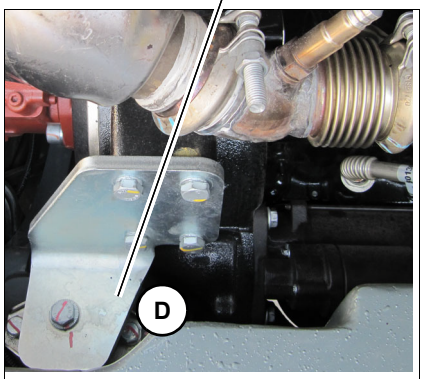


Fig. 130

1. Move vehicle **Y** close to machine **X** so that the length of the battery jumper cables is sufficient.
2. Stop the engine of vehicle **Y**.
3. Open the engine covers of both vehicles.
4. Connect the battery jumper cables in the following order: **A – B – C – D**.
5. Start the engine of vehicle **Y**.
6. Wait 5 minutes for the empty battery to be charged a little.
7. Start the engine of machine **X**.
8. Switch on the boom light of machine **X**.
9. Disconnect the battery jumper cables in the following sequence: **D – C – B – A**.

Position **D**: left-side angled engine bracket.

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Low-load operation

NOTICE

Possible damage to the engine due to low-load operation.

► Run the engine at idling speed or at high engine speed at over 20 % engine load.

Possible consequences of low-load operation are:

- Increased engine oil consumption.
- Dirt in engine due to engine oil in exhaust system.
- Blue smoke in exhaust gas.
- Shorter diesel particulate filter regeneration cycles.

Stopping the engine

NOTICE

Possible damage to the engine when it is stopped after running under high load.

► Letting the engine run at idling speed before stopping it avoids engine damage and increases the engine's service life.

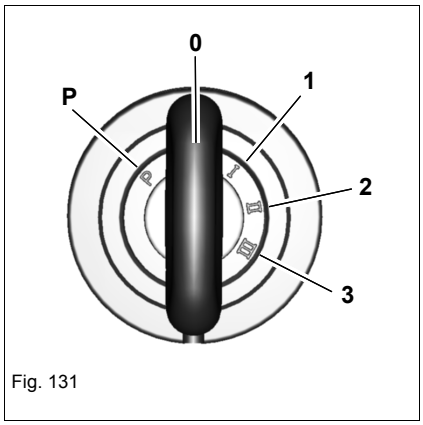


Fig. 131

1. Let the engine run at idling speed for five minutes without any load.
2. Turn the starting key to "**0**" and remove it.

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Notes:

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5 Operation

5.1 Steering system

Movement	Drive levers/accelerator pedals
Steering to the left	
Steering to the right	
Rotation to the left	
Rotation to the right	

5.2 Accelerator actuation

Throttle

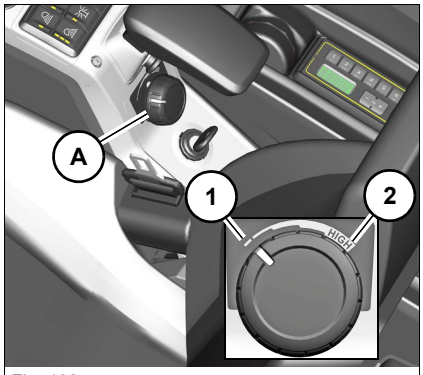


Fig. 132

Engine speed can be set continuously with throttle **A**.

Engine speed	Position
Idling speed	**1**
maximum	**2**

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Engine operating mode

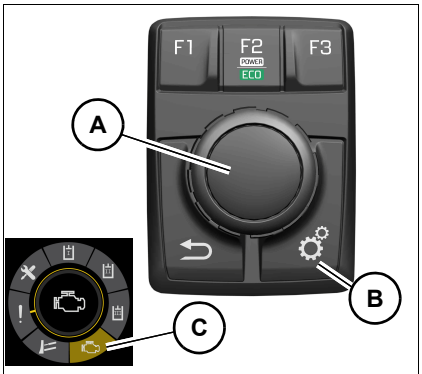


Fig. 133

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Engine operating mode	Application
ECO	For powerful and fuel-saving work
PWR	Maximum pump capacity

Changing the engine operating mode directly

Press push button **F2**.



Fig. 134

Presetting the engine operating mode

1. Press menu button **B**.
2. Press control button **A** to select menu item **Engine Operating Mode C**.
3. Press control button **A**.
4. Turn control button **A** to select the required operating mode (ECO/ PWR).
5. Press control button **A**.

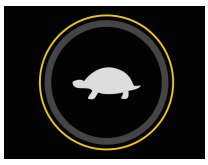
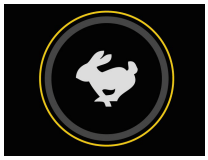
The engine starts up in the selected operating mode.

Speed range selection



Fig. 135

The machine has two speed ranges that can be selected with push button **A** on the stabilizer blade lever.

Speed range selection	Push button	Indication
Speed range 1		
Speed range 2		

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Automatic engine speed setting

The diesel engine shifts to idling speed if the hydraulic system is not operated for more than five seconds.

If the hydraulic system is operated, the diesel engine runs at the engine speed set with the throttle.

The automatic engine speed setting can be switched on and off with push button **F3** on the jog dial.

Automatic engine speed setting	Push button	Indication
On		
Off		--

Changing engine speed manually

Push button **B** on the left control lever makes it possible to toggle manually at any time between idling speed and the engine speed set with the throttle.

The selected symbol flashes while the engine is in idling speed.

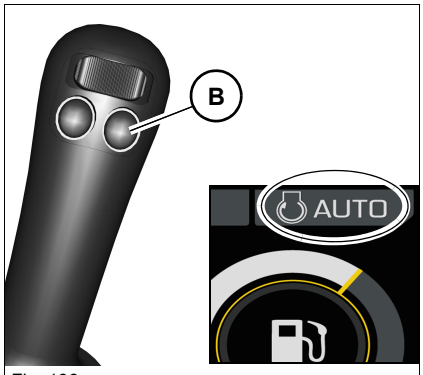


Fig. 136

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5.3 Brakes

Hydraulic brake

The machine will slow down when the drive levers or accelerator pedals are released.

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

Information

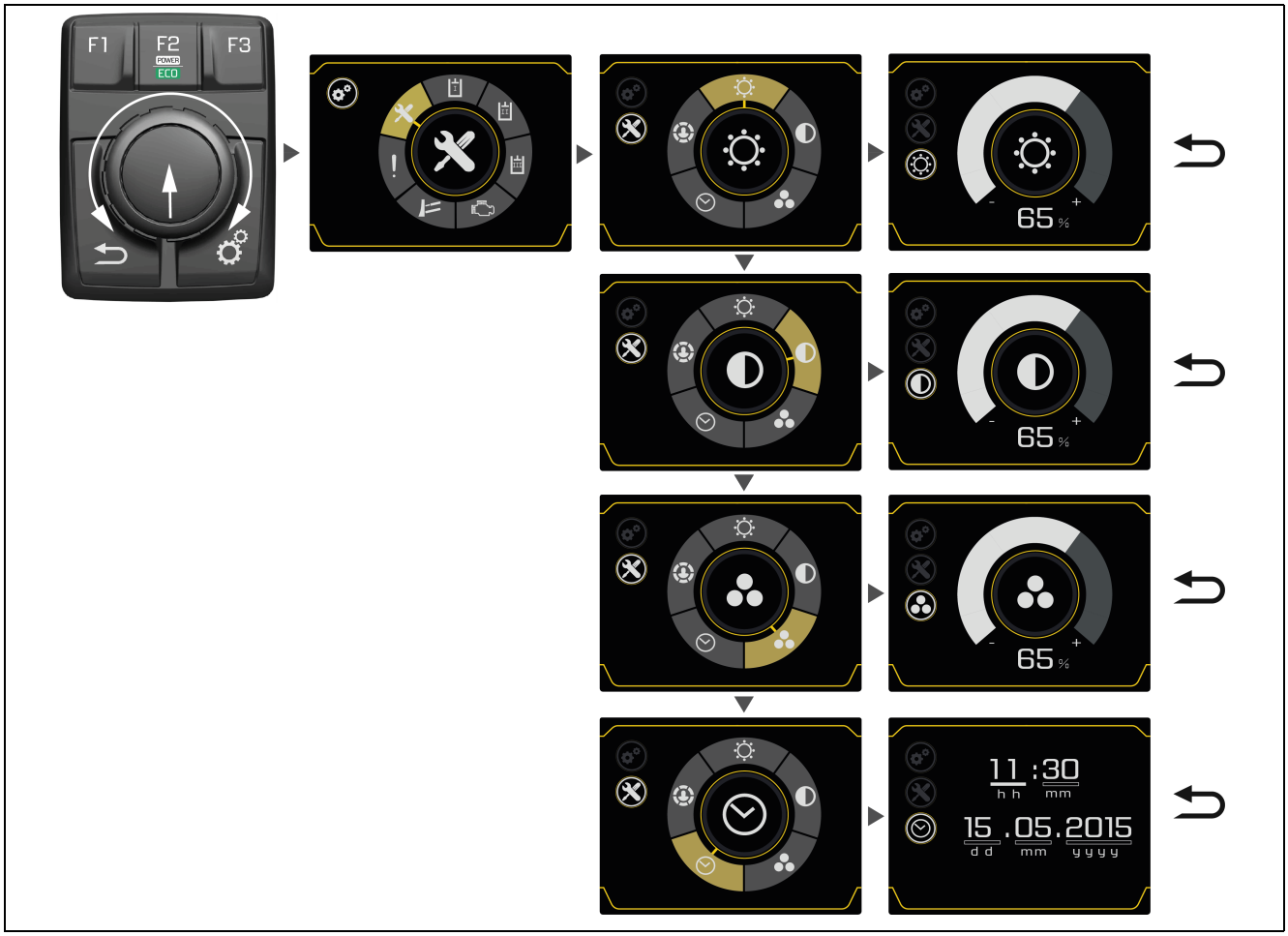
Reduce the speed with the drive levers or accelerator pedals, and not with the throttle.

Mechanical brake

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

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Adjusting the multifunctional display



Information

The color intensity can only be adjusted on the 7” display.

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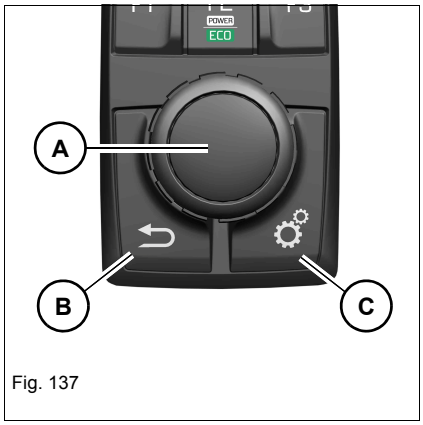


Fig. 137

Performing the adjustments

- Push button **C**: call the settings.
- Adjustment button **A**: select settings (turn) and confirm (press).
- Push button **B** (return): back to previous menu level.

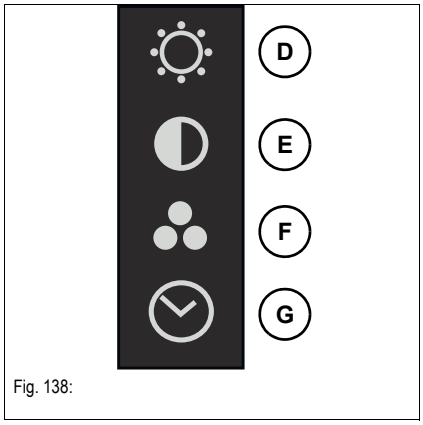


Fig. 138:

Symbols

D: Brightness

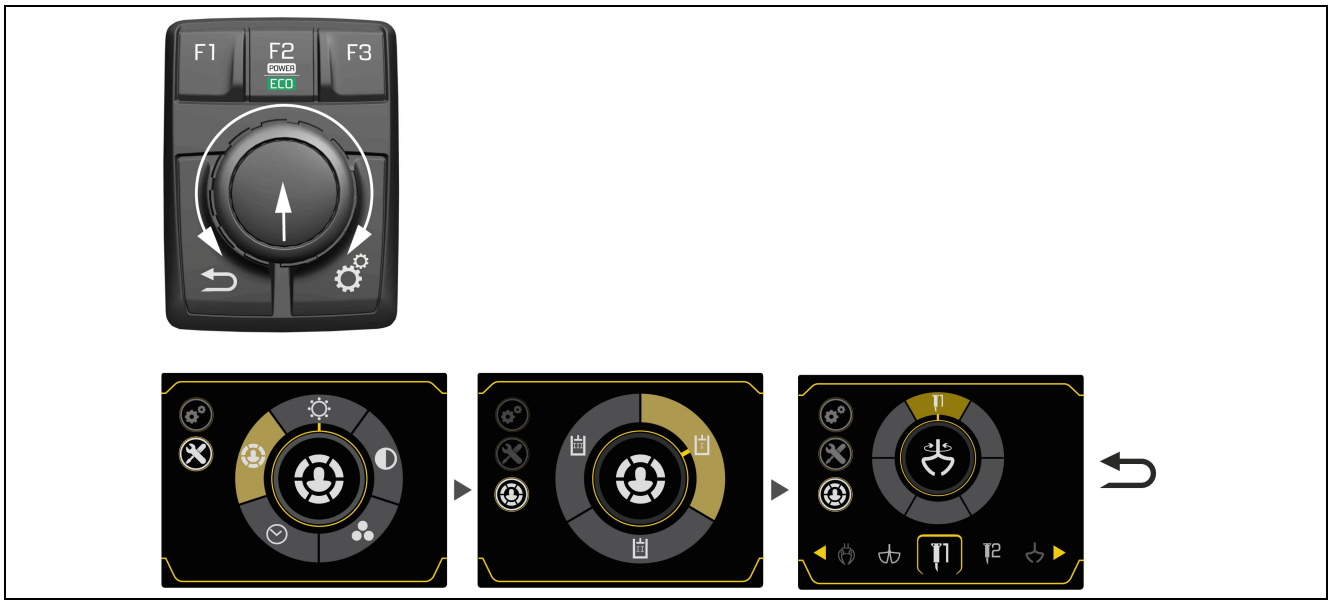
E: Contrast

F: Color (7” display only)

G: time/date

Individual menu

The order of the attachments can be adjusted manually by the operator.



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5.4 Machine travel

Machine travel position

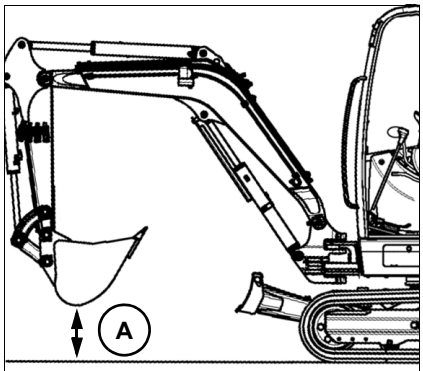


Fig. 139

Position the machine as shown.

Position the boom at the center and raise it off the ground.

- **A** = 30 – 40 cm (12 – 16 in).

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.

WARNING

Accident hazard due to incorrect machine operation!

The machine moves in the opposite direction if the upper carriage is rotated by 180° and the drive levers are actuated.

Incorrect operation can cause serious injury and death.

► Slowly and carefully actuate the control levers.

Starting machine travel

Operate the drive levers or accelerator pedals.

➥ The machine starts moving.

Stopping

Release the drive levers or accelerator pedals.

➥ The machine stops.

Information

The control lever base must be folded down in order to start machine travel.

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Operating temperature range

Operate the machine only at ambient temperatures between −15 °C (5 °F) and +45 °C (+113 °F).

Machine travel on slopes

WARNING

Crushing hazard due to tipping over of machine!

A tipping machine can cause serious injury or death.

- ► Raise the boom 30 – 40 cm (12 – 16 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.
- ► Travel on slopes only on firm and level ground.
- ► Adapt the travel speed to the prevailing conditions.
- ► Pay attention to persons and obstacles.
- ► Pay attention to the stability limits of the machine (maximum gradient angle 15°, maximum lateral angle of inclination 10°).
- ► Perform uphill and downhill machine travel only in speed range 1.
- ► Never reverse downhill.
- ► Ensure that no parts of the body protrude outside the machine.
- ► Do not exceed the permissible payloads.
- ► Do not turn or swivel the upper carriage and the boom during downhill or uphill machine operation with a full attachment.
- ► Performing machine travel diagonally on slopes is prohibited.

Stones and the humidity in the upper layer of the ground can 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.

On soft ground, the machine sinks into it or the tracks dig into it. This increases the machine angle (maximum gradient angle and maximum lateral angle of inclination), and the machine can tip over.

If the engine dies as you perform uphill or downhill machine travel, immediately put the control levers to neutral position and restart the engine.

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.

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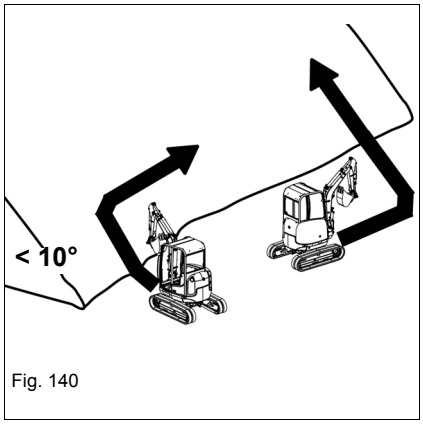


Fig. 140

Preparations for performing machine travel on slopes

Always perform uphill or downhill machine travel in a straight line.

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

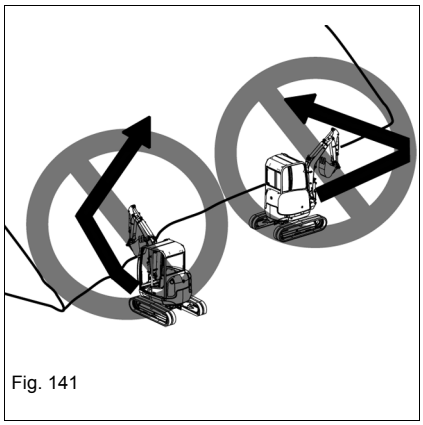


Fig. 141

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

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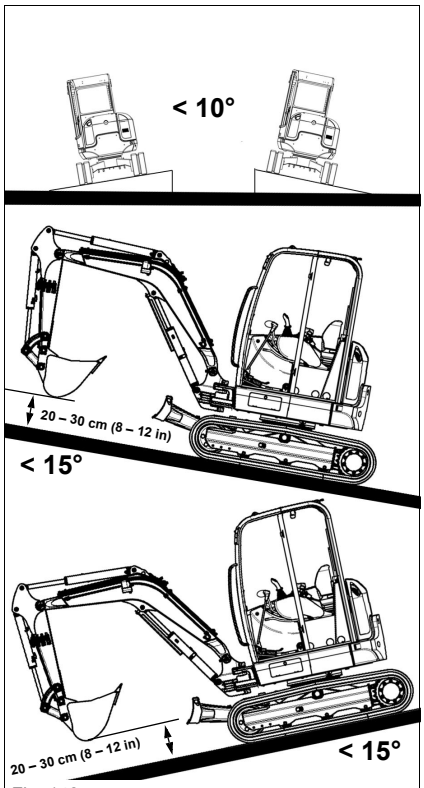


Fig. 142

Uphill machine operation

- Raise the boom 30 – 40 cm (12 – 16 in) off the ground and position it straight ahead at the center of the machine.
- Do not perform machine travel on slopes steeper than 15°.
- Do not perform machine travel on slopes with a lateral angle of inclination over 10°.

Downhill machine operation

- Raise the boom 30 – 40 cm (12 – 16 in) off the ground and position it straight ahead at the center of the machine.
- In order to minimize the risk of tipping over, adapt the travel speed to the circumstances.
- Do not perform machine travel on slopes steeper than 15°.
- Do not perform machine travel on slopes with a lateral angle of inclination over 10°.

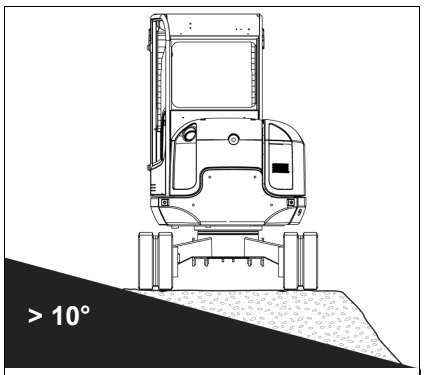


Fig. 143 (symbolic representation)

On lateral inclinations over 10°, pile up material to create a horizontal, firm and level standing surface for the machine.

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Parking the machine

WARNING

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

Serious injury or death can be caused by not securing the machine.

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

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

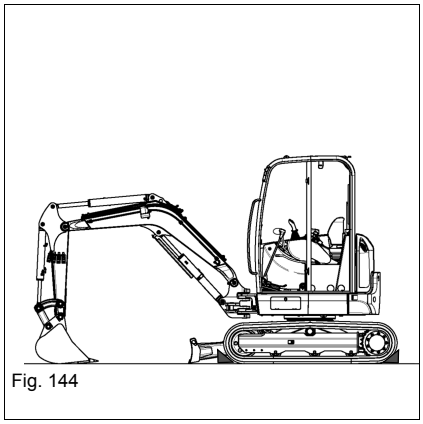


Fig. 144

1. Park 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. 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 machine with wheel chocks (see *Fig. 144*).

Information

In order to prevent the formation of condensation water, fill up the fuel tank nearly completely at the end of each working day.

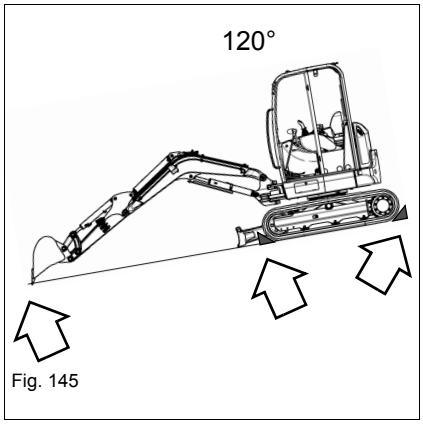


Fig. 145

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.
- Place stabilizer blade on the downhill side.
- Press the stabilizer blade against the ground.
- Secure the machine with wheel chocks (see *Fig. 145*).

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5.5 Differential lock

Not available.

5.6 Lights/signaling system

WARNING

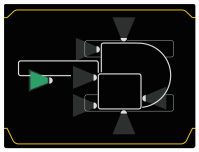
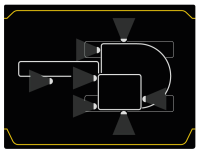
Motorists can be blinded by bright lights on the job site!

Working lights can blind motorists. This can cause serious injury or death.

- ► Stop machine operation if motorists are blinded.
- ► Only take up work again if sufficient illumination of the job site can be ensured without blinding other motorists.

Boom light

The push button is located on the right keypad.

Boom light	Push button	Indication
On		
Off		

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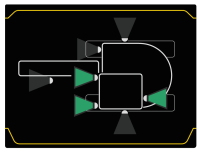
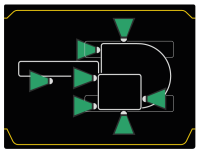
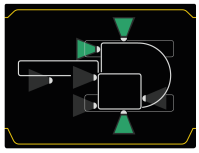
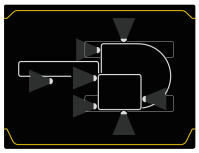
Roof and chassis lights

The machine can be equipped with the following lights:

- Roof lights (two at the front, one at the rear)
- Chassis lights (left, right, front)

Optionally the lights can be equipped with energy-saving LED lamps.

The push button is located on the right keypad.

Roof/chassis lights	Push button	Indication
Roof lights ON		
Roof lights ON Chassis lights ON		
Chassis lights ON		
Roof lights off Chassis lights off		

Information

Switch on the working lights in conditions of poor visibility. If illumination still is not sufficient, use external lights. If this is still not enough to illuminate the job site sufficiently, stop machine operation and only resume it when sufficient illumination is present.

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Horn

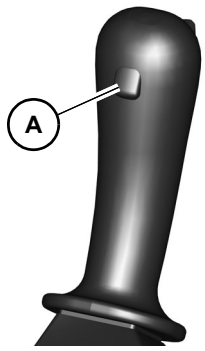


Fig. 146

Press push button **A** on the rear side of the right control lever.

Interior light

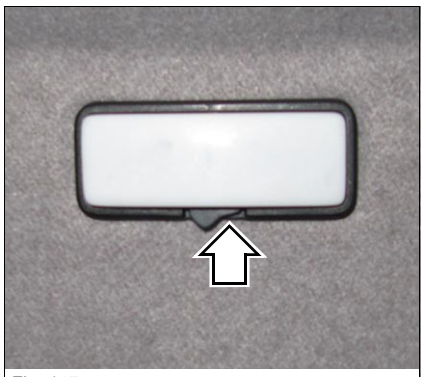


Fig. 147

The mechanical switch above the left B-pillar must be in the position on the right so that the interior light can be switched on and off with the help of the keypad.

The push button is located on the right keypad.

Interior light	Push button	Indication
On		
Off		

Rotating beacon (option)

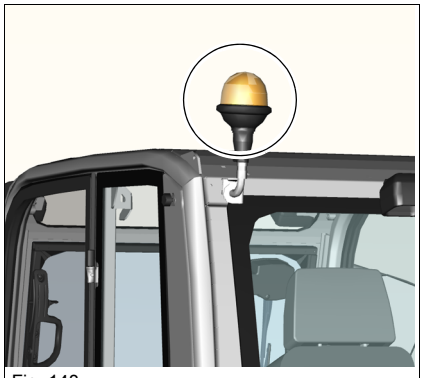


Fig. 148

The push button for the rotating beacon is located on the right keypad.

Rotating beacon	Push button	Indication
On		
Off		

Information

Observe the national and regional regulations.

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5.7 Wiper/wash system

The push buttons are located on the right keypad.

Wiper/wash system	Push button
Windshield wiper on	
Intermittent windshield wiper	
Windshield wiper off	
Spray function on	
Spray function off	

NOTICE

Damage to pump if the reservoir is empty.

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

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5.8 Heating, ventilation and air conditioning system

CAUTION

Damage to health due to incorrect operation of automatic air conditioning.

Can cause health hazards.

► Do not direct the air vents directly at the face when the automatic air conditioning is switched on.

Operation

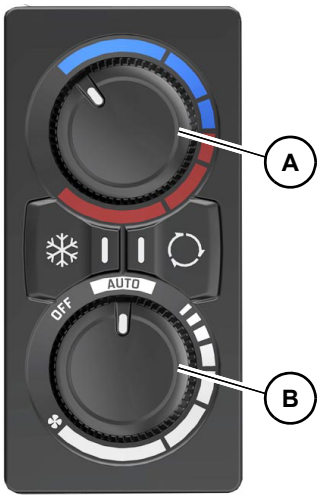


Fig. 149

The regulators and push buttons are located below the multifunctional display.

Set the required temperature (regulator **A**) and ventilation (regulator **B**).

Air conditioning system with automatic function

The air conditioning system cools and dehumidifies the air inside the cabin. In automatic mode (controller **B** set to **AUTO**) the adjusted temperature is held at a constant level.

Cooling function	Push button	Indication
On		
Off		

In switch position **OFF** the entire system including the fan and heating is switched off.

Information

Cool down the inside of the cabin quickly:

1. Open the windows and the door.
2. Set the fan to maximum speed so that the hot air can escape.
3. Close the windows and the door.
4. Set the air conditioning system to maximum output and switch on recirculated-air mode.
5. Change over to fresh-air operation after reaching a comfortable temperature inside the cabin.

Information

Let the air conditioning system run a few minutes several times a month to avoid damage to the air-conditioning compressor.

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Recirculated air mode

The recirculated-air mode prevents outside air pollutants from entering the cabin.

Recirculated air mode	Push button	Indication
On		
Off (fresh-air mode)		

Information

In recirculated-air mode the windows and the door must be closed. If the recirculated-air mode is used too long, the windows mist up. Switch to fresh air mode as soon as possible.

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Traveling signal (option)

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

DANGER

Accident hazard during forward/backward machine operation!

Serious crushing hazard causing death or serious injury.

- ► Do not allow anyone to stay in the danger zone.
- ► Despite the traveling signal the danger zone must also be monitored visually.
- ► If the traveling signal does not sound, stop machine operation immediately and get in touch with a Wacker Neuson service center. Follow the relevant national and regional regulations.

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5.9 Operating hydraulics

Basic control lever functions (ISO and H controls)

Control mode		ISO controls		SAE controls	
	Required function	Control levers[1]		Control lever[1]	
		Left	Right	Left	Right
					
	Swivel upper carriage to the left		--		--
	Swivel upper carriage to the right		--		--
	Extend stick		--	--	
	Rectract the stick		--	--	
	Lower the boom	--			--
	Raise the boom	--			--
	Tilt in the bucket	--		--	
	Tilt out the bucket	--		--	

1. The control levers shown are symbolic representations.

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ISO/SAE controls (option)

The standard equipment of the machine includes ISO controls. SAE controls are available as an option. This results in a different control lever operation.

WARNING

Accident hazard due to modified control mode!

Modified controls can cause incorrect operation, and serious injury or death.

► Before starting work, check the selected control type.

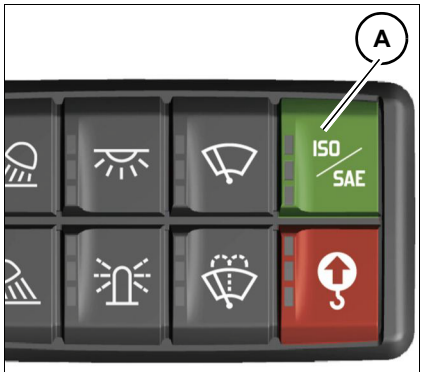


Fig. 150

Information

Button **A** to change the control mode on the right keypad is not assigned.

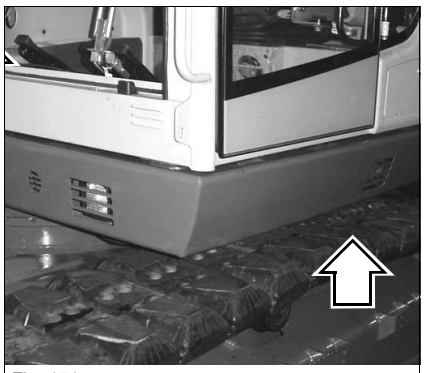


Fig. 151

Switching from ISO to SAE controls and vice versa:

The directional valve is located on the left below the base plate. Change the control mode through the opening in the cover on the lower side.

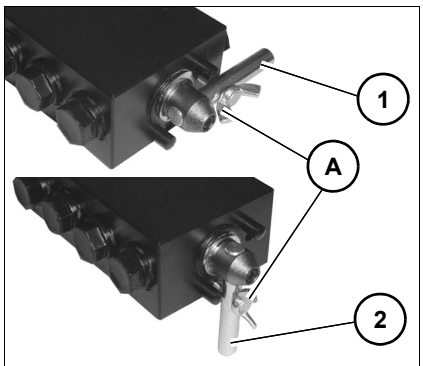


Fig. 152

Tightening wing nut **A**, depending on controls:

Controls	Position
ISO	1
SAE (Option)	2

Information

No traveling or operating the machine if the wing nut is malfunctioning. Replace wing nut immediately.

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Upper carriage rotation

WARNING

Crushing hazard due to rotating range of machine!

Persons in the rotation range of the machine can be seriously injured or killed.

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

NOTICE

Possible damage to machine when working in the immediate vicinity of walls, parts of buildings or other obstacles.

► Ensure that there are no obstacles is in the danger zone.

Information

As long as the hydraulic fluid has not reached its operating temperature, the upper carriage can continue moving after releasing the control lever. Operate the control lever carefully in a cold operating state.

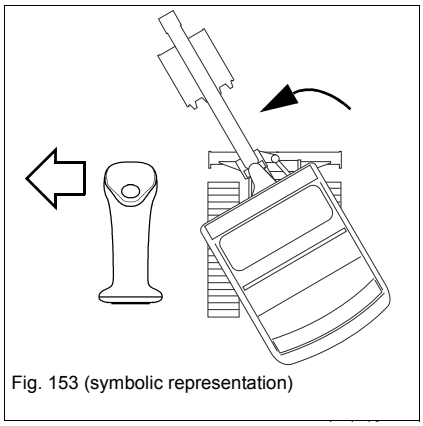


Fig. 153 (symbolic representation)

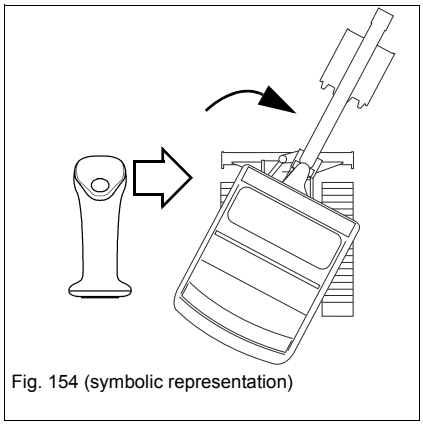


Fig. 154 (symbolic representation)

Upper carriage rotation	Position
To the left	Push the control lever on the left to the left
To the right	Push the control lever on the left to the right

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Swivel unit brake

Automatic swivel unit brake

When the upper carriage is rotated, the swivel unit brake is enabled with a time delay to hold the upper carriage.

The swivel unit brake is disabled again if the upper carriage is rotated again.

Hydraulic swivel unit brake

Normal braking: release the control lever.

Maximum braking: press the control lever in the opposite direction until the upper carriage is at a standstill.

Functional check of swivel unit brake

Perform the functional check on a warm machine after work once a day.

If the machine is put into operation again after a standstill of more than two weeks, perform a functional check once **before starting work**.

1. Park the machine on firm, level and horizontal ground.
2. Raise the machine with the stabilizer blade as far as it will go.

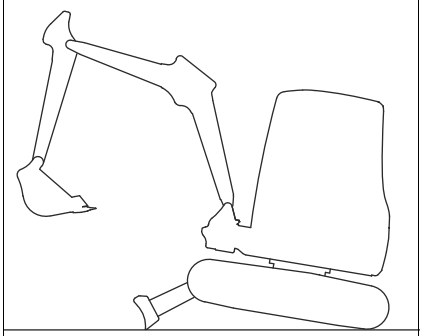


Fig. 155 (symbolic representation)

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

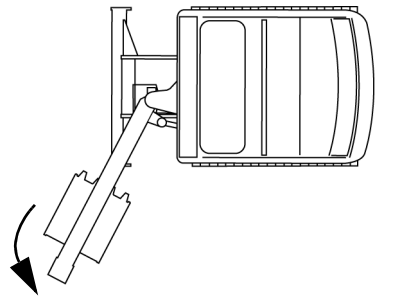


Fig. 156 (symbolic representation)

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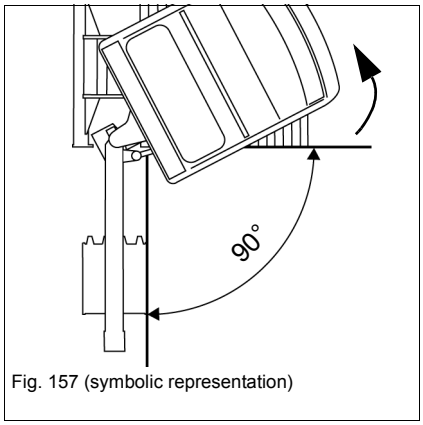


Fig. 157 (symbolic representation)

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

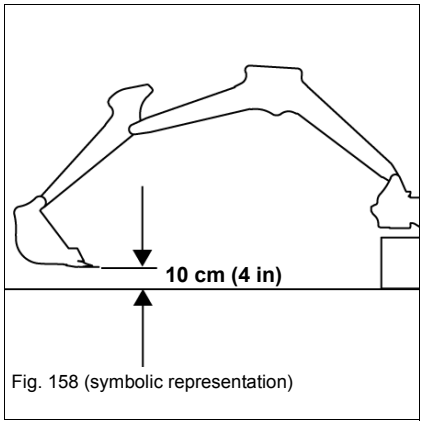


Fig. 158 (symbolic representation)

5. Position the boom as shown in *Fig. 158*.
6. Stop the engine, remove the starting key and carry it with you.
7. Raise the control lever base.
8. Wait one minute.

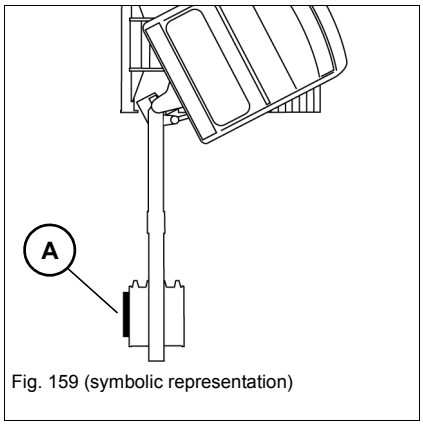


Fig. 159 (symbolic representation)

9. Put a measuring rod **A** against the attachment.
10. Wait one minute.

➥ If the attachment does not move from the measuring rod:
  ➥ Machine is ready for operation.

➥ If the attachment moves from the measuring rod:
  ➥ Stop operation immediately.
  ➥ Contact a Wacker Neuson service center and have the malfunction rectified.

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Stabilizer blade

WARNING

Crushing hazard due to unintentional actuation!

Unintentional actuation can cause serious injury or death.

- ► Raise the control lever base.
- ► Lower the stabilizer blade to the ground after the work shift.
- ► Do not allow anyone to stay in the danger zone.

NOTICE

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

- ► Slightly raise the stabilizer blade. The clearance between the stabilizer blade and the ground should be about 1 cm (0.4 in).
- ► Check the stabilizer-blade position before performing machine travel.

Information

In order to achieve the best possible stability, lower the stabilizer blade.

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

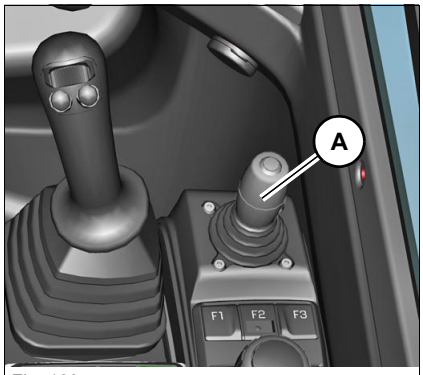


Fig. 160

Function	
Raise	Pull lever **A** backward
Lower	Push lever **A** forward

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Hydraulic connections

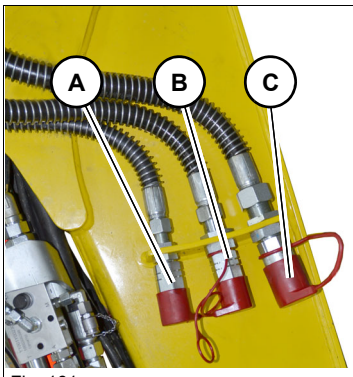


Fig. 161

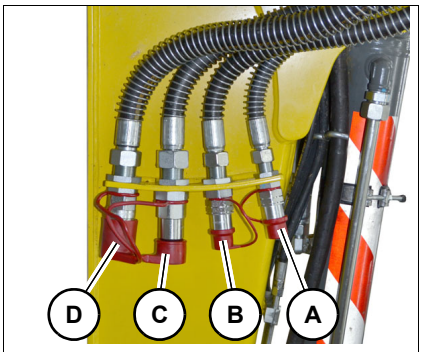


Fig. 162

Connection	Stick (left/right)
A	AUX V
B	AUX II
C	AUX I
D	Hammer return line

Information

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

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Hammer operation

WARNING

Danger of piercing/penetration by objects from the front!

Work involving piercing/penetrating 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 machine under the workplace during demolition, since debris could fall onto the machine.
- ► Observe the mandatory limits of the work area.
- ► The front window has to be closed.

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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 the smallest possible hydraulic hammer may be used.

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Working with a hydraulic hammer

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.
- ► Working with the cylinders or the boom fully extended is prohibited.
- ► Do not swivel the Powertilt unit beyond 30° during hammer operation, otherwise the load on the boom increases enormously.
- ► 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.

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NOTICE

Set the maximum oil flow. *– see chapter " Adjusting the starting point and maximum required flow rate" on page 5-33*.

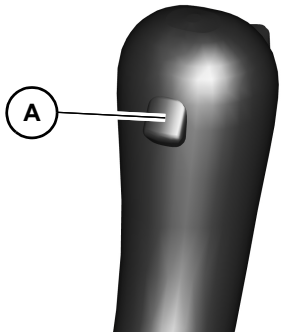


Fig. 163

Hammer operation	Position
Switch ON/OFF	Press push button **A** on the control lever on the left

Auxiliary hydraulics – AUX I

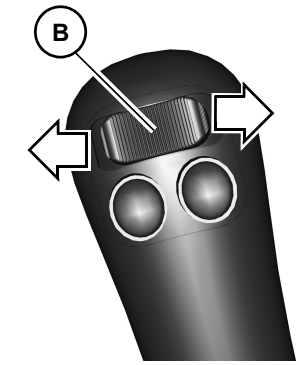


Fig. 164

The auxiliary hydraulics system is operated with the right control lever.

Adjust the required oil flow *– see chapter " Adjusting the starting point and maximum required flow rate" on page 5-33*.

Oil flow	Position
To the line on the left	Press switch **B** to the left
To the line on the right	Press switch **B** to the right

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Additional control circuits

AUX II (option)

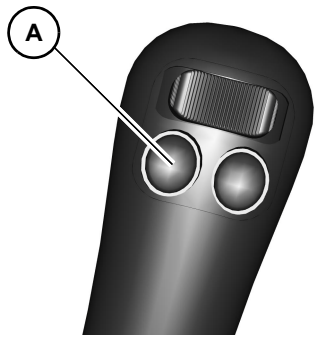


Fig. 165

Toggle between **AUX II** and **AUX III** with push button **A** on the left control lever.

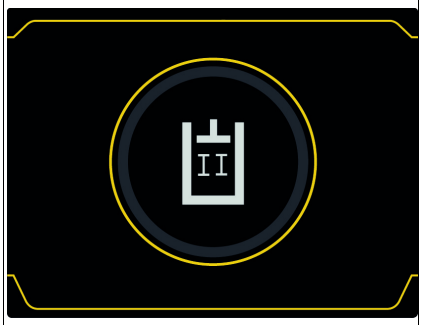


Fig. 166

If the **AUX II** function is selected, the symbol appears in the center of the display for a few seconds.

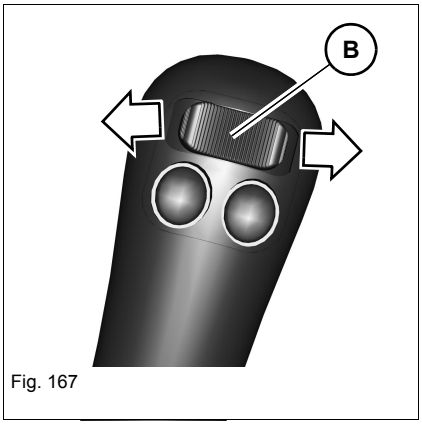


Fig. 167

Adjust the required oil flow – *see chapter " Adjusting the starting point and maximum required flow rate" on page 5-33*.

Oil flow	Position
To the line on the left	Press switch **B** to the left
To the line on the right	Press switch **B** to the right

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AUX III (option)

WARNING

Crushing hazard due to rotating movements of the Powertilt unit!

Rotating the Powertilt unit can cause serious injury or death.

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

Information

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

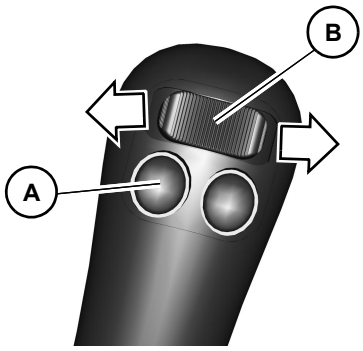


Fig. 168

Toggle between **AUX III** and **AUX II** with push button **A** on the left control lever.

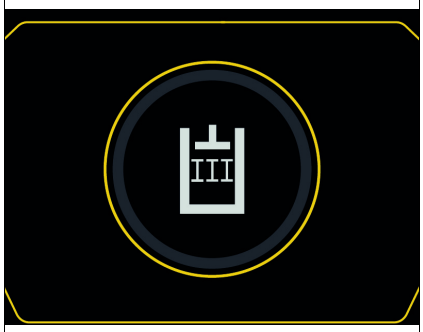


Fig. 169

If the **AUX III** function is selected, the symbol appears in the center of the display for a few seconds.

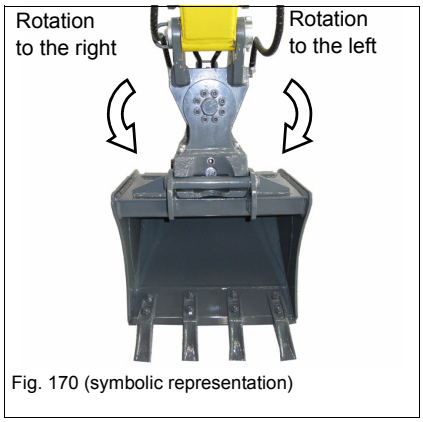


Fig. 170 (symbolic representation)

Adjust the required oil flow – *see chapter " Adjusting the starting point and maximum required flow rate" on page 5-33*.

Powertilt	Position
Rotation to the left	Press switch **B** to the left
Rotation to the right	Press switch **B** to the right

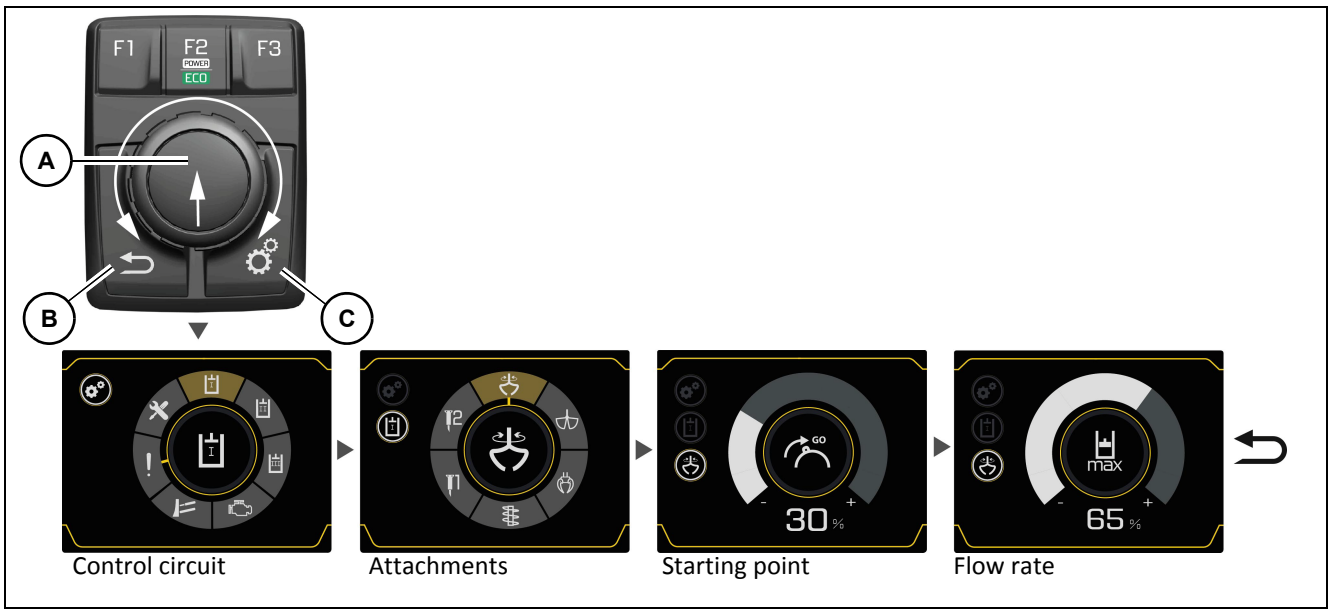
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Proportional controls

The proportional controls make it possible to apply the same speed to the attachment as the one with which a control element (for example a switch) is actuated.

The proportional controls are available for control circuits AUX I through AUX III and for the stabilizer blade control:

The flow rate can be set continuously for the control circuits AUX I – III.



Information

Example for AUX I. Operation of AUX II, AUX III and the stabilizer blade is identical.

Performing the adjustments

- Press push button **C** to call the settings.
- The settings are selected (turn) and confirmed (press and hold) with adjustment button **A**.

Push button **B** (return) takes you back to the previous menu level.

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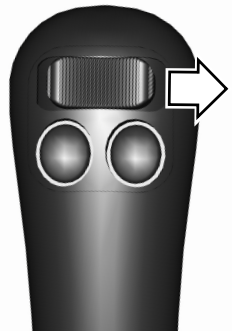


Fig. 171

Adjusting the starting point and maximum required flow rate

The starting point of the control lever switch and the maximum required flow rate can be configured according to the attachment and the work to be performed.

1. Press the switch to the position at which the attachment is supposed to start moving.

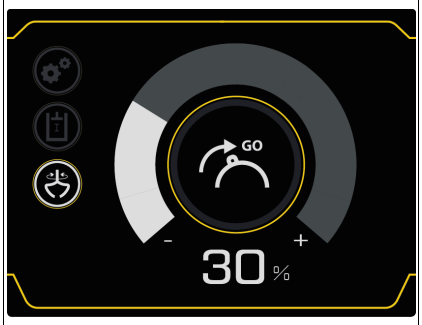


Fig. 172

2. Hold the switch and turn adjustment button **A** at the same time to select the starting point.
3. Press adjustment button **A** to confirm.

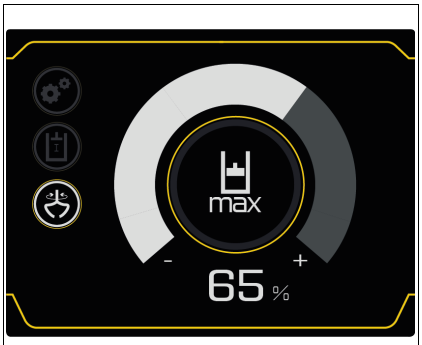


Fig. 173

4. Press the switch to the position at which the maximum required flow rate is supposed to be available.
5. Hold the switch and turn adjustment button **A** to select the maximum required flow rate.
6. Press adjustment button **A** to confirm.

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Pump flow rate



Fig. 174

The working speed of the machine and the attachments can be adapted individually to the working situation through the pump flow rate.

Output	Position
Full flow rate	max
Reduced flow rate	min

Swiveling the boom

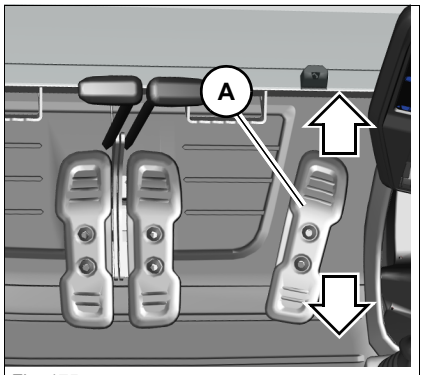


Fig. 175

Boom	Position
To swivel to the left	Press rear side of pedal **A**
To swivel to the right	Press front side of pedal **A**

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Lifting gear applications

Lifting gear applications are procedures involving raising, transporting and lowering loads with the help of lifting and fastening gear.

DANGER

Crushing hazard due to tipping over of machine!

The machine causes serious injury or death when it tips over.

- ► Do not exceed the weights specified in the load diagram.
- ► Subtract the weight of the attachment from the weight specified in the relevant load diagram.
- ► Use the machine for lifting gear applications only if the mandatory lifting gear and safety equipment is installed, functional and enabled.

WARNING

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

Serious injury or death can be caused by a machine tipping over.

- ► Reduce the load until both the buzzer and the indicator light on the display element go out.
- ► Observe the load diagrams.

WARNING

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

Serious injury or death can be caused by a machine tipping over.

- ► Switch on the safe load indicator during lifting gear applications.
- ► Operate the machine only with an intact safe load indicator.

NOTICE

Machine damage due to a machine tipping over if the weight in the load diagram is exceeded.

- ► Do not exceed the weights indicated in the load diagrams.

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Safe load indicator

The safe load indicator alerts the operator visually and acoustically if the load on the boom is too high.

The push button for activating and deactivating the safe load indicator is located on the keypad.

Safe load indicator	Push button	Indication
On		
Off		No symbol

Functional check of 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.

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Fig. 176

Warning devices	Result
The buzzer sounds and symbol **A** is displayed	The machine may be used for lifting gear applications.
Buzzer does not sound or symbol **A** is not displayed	The machine may not be used for lifting gear applications. Contact a Wacker Neuson service center.

Perform a functional check of the control lever base.

– see chapter " Funktionsprüfung Steuerhebelträger" on page 4-46

Only the following lifting gear may be used for lifting gear applications:

- Powertilt/quickhitch with load hook
- Joint rod with lifting eye

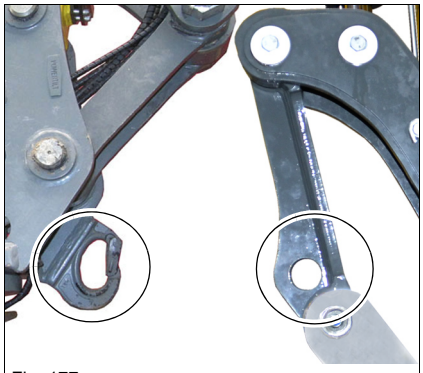


Fig. 177



Fig. 178

When symbol **A** is displayed and the buzzer sounds:

- Reduce the load until the buzzer goes out and the symbol disappears.

Suitable equipment for fastening and securing loads must be available.

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Hydraulic quickhitch Oil Quick (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.
- Both hitch claws must be clean before hitching.
- Store the Operator's Manual of the hydraulic quickhitch together with the Operator's Manual of the machine.

WARNING

Crushing hazard when attachments are picked up!

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 **D** must be fully retracted. Otherwise repeat the lock cycle until check pin **D** 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

Crushing hazard when attachments are removed!

If an attachment is not removed 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.

Information

If more than 10 seconds pass between the actuation of switch **B** and push button **C**, the symbols **Hydraulic quickhitch enabled** and **Hydraulic quickhitch disabled** are displayed alternately. The buzzer sounds in shorter intervals.

► Press switch **B** again and press push button **C** within 10 seconds.

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Picking up an attachment

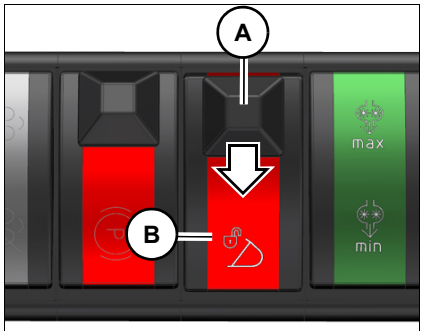


Fig. 179

1. Pull lock **A** down.
2. Press switch **B** down.



Fig. 180

➥ The symbol **Hydraulic quickhitch enabled** appears and the buzzer sounds.

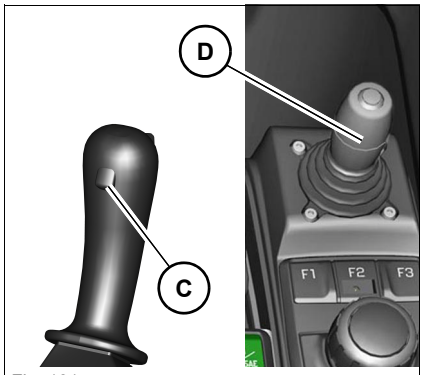


Fig. 181

3. Press push button **C** on the control lever on the left within 80 seconds, and keep it pressed.
4. Pull and hold stabilizer-blade lever **D** as far as it will go at the same time.



Fig. 182

➥ The quickhitch opens.

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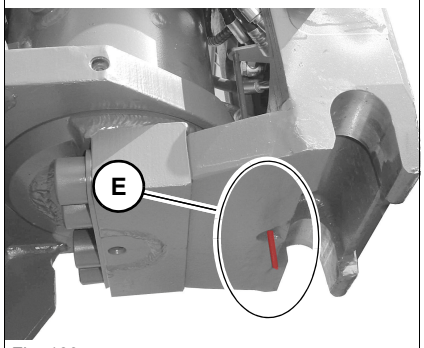


Fig. 183

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

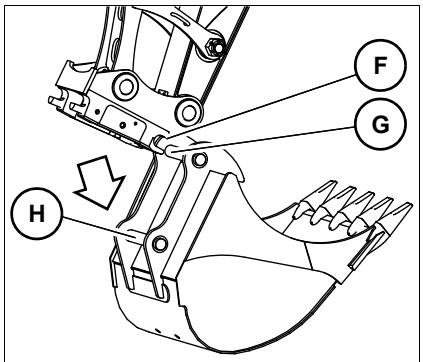


Fig. 184

5. Hitch claws **F** (on the side of the machine) into pins **G** of the attachment mount.
6. Extend the bucket cylinder so that pin **H** of the attachment touches the quickhitch.
7. Check whether the attachment touches the quickhitch with the second pin **H**.

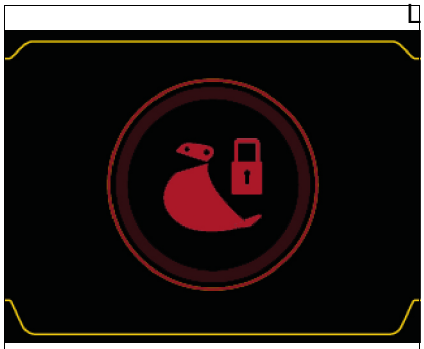


Fig. 185

8. Release push button **C** or stabilizer-blade lever **D**.

➥ The quickhitch closes.

➥ The symbol **Hydraulic quickhitch disabled** appears for a few seconds and the buzzer does not sound any more.

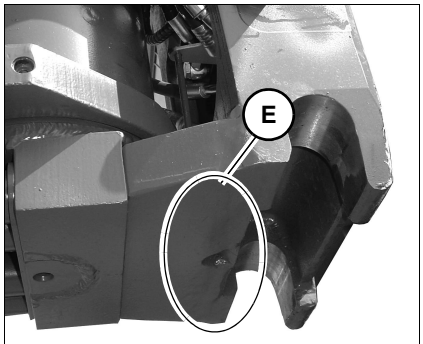


Fig. 186

9. The check pin **E** must be fully retracted.

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

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Setting down an attachment

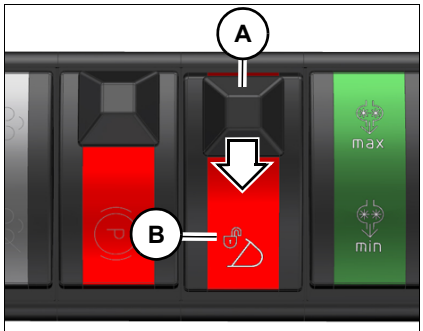


Fig. 187

1. Lower the attachment to about 5 – 10 cm (2 – 4 in) above the ground.
2. Pull lock **A** down.
3. Press switch **B** down.



Fig. 188

➥ The symbol **Hydraulic quickhitch enabled** appears and the buzzer sounds.

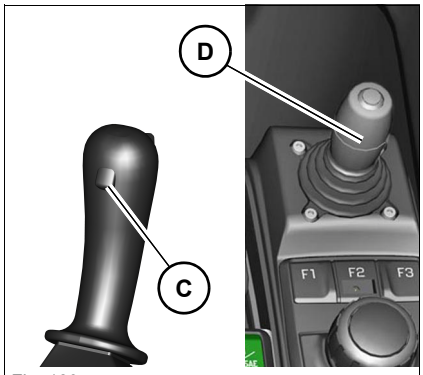


Fig. 189

4. Press push button **C** on the control lever on the left within 80 seconds, and keep it pressed.
5. Pull and hold stabilizer-blade lever **D** as far as it will go at the same time.

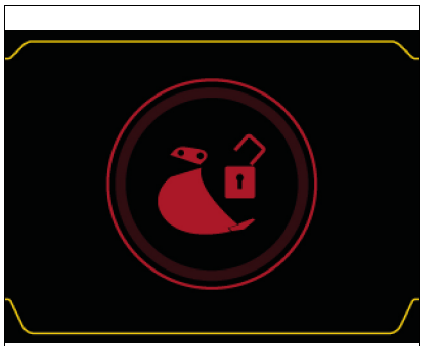


Fig. 190

➥ The quickhitch opens.

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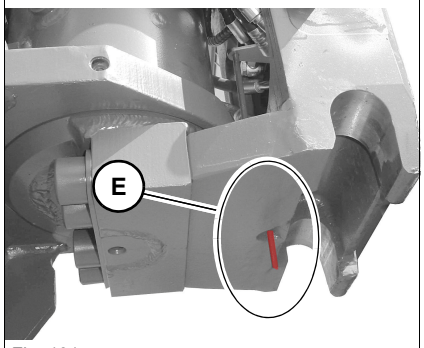


Fig. 191

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

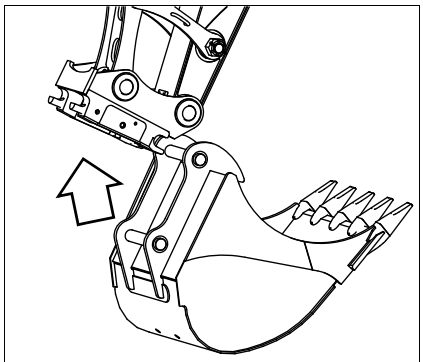


Fig. 192

6. Retract the bucket cylinder.
7. Set down the attachment.
8. Raise the boom.

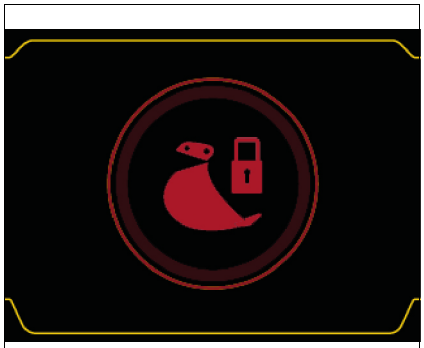


Fig. 193

9. Release push button **C** or stabilizer-blade lever **D**.

➥ The quickhitch closes.

➥ The symbol **Hydraulic quickhitch disabled** appears for a few seconds and the buzzer does not sound any more.

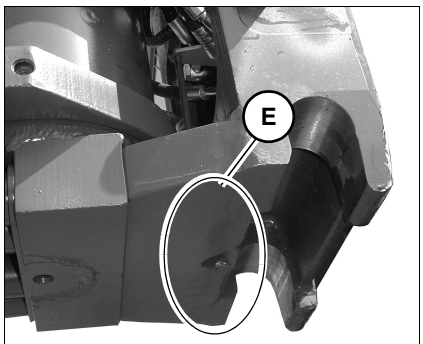


Fig. 194

- The check pin **E** must be fully retracted.

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Preparation for hydraulic quickhitch (option)

If quickhitches or attachments other than those authorized by Wacker Neuson are used, the following points must be observed:

- Wacker Neuson will not be liable for injury or damage due to the use of unauthorized quichhitches or attachments.
- There may be differences regarding the control functions or the operation of the machine. Follow the Operator's Manual of the quick-hitch or attachment.
- If required, modifications on the machine (for example additional adhesive labels) or the Operator's Manual of the machine (if operation is different) must be made.
- The intended purpose of the machine may be restricted.
- If unauthorized quickhitches or attachments are used, the declarations of conformity of the relevant components or of the machine may become invalid.

AUX V (option)

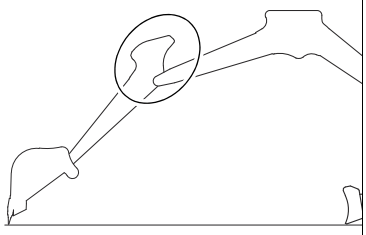


Fig. 195

Changeover is performed on either side of the stick.

The ball-type cock is located at the end of the bucket cylinder.

Position the boom straight ahead at the center of the machine (see figure).

Lower the boom and the stabilizer blade to the ground

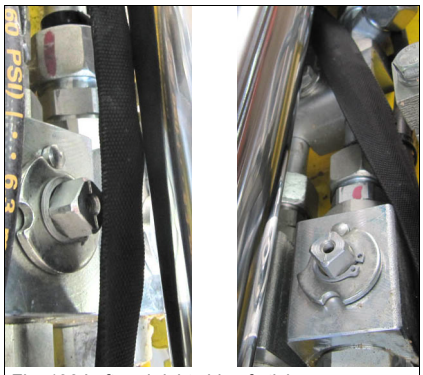


Fig. 196 Left and right side of stick

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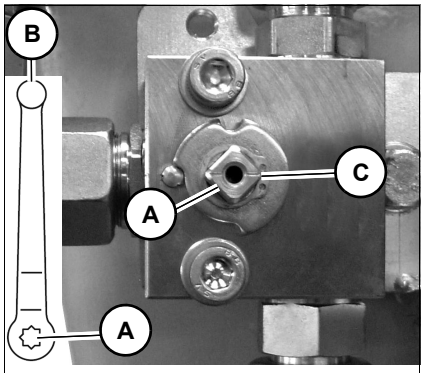


Fig. 197

Selecting:

Set ball-type cock **A** to the required position with lever **B** on both sides of the stick.

➥ Notch **C** indicates the flow direction.

Notch position	Operation
	Bucket operation
	Grab operation

Information

Lever **B** must always be removed before operation.

Connecting and disconnecting hydraulic couplings

1. Park the machine – *see "Preparing lubrication" on page 7-7*.
2. Turn the starting key to position **1**.
3. Move the control lever or the pedal of the hydraulic circuit in all directions repeatedly.
4. Remove the starting key and carry it with you.

➥ The couplings of the attachment can now be coupled and uncoupled.

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Load-retaining function

WARNING

Injury hazard due to fluid escaping under pressure!

Hydraulic oil escaping under pressure can penetrate the skin and cause serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► If a hose bursts, move the control elements to neutral position so that as little hydraulic oil as possible escapes.

WARNING

Burn hazard due to hot hydraulic oil!

Hot hydraulic oil can cause burns to the skin.

- ► If a hose bursts, move the control elements to neutral position so that as little hydraulic oil as possible escapes.
- ► Wear protective equipment.

Information

Hose burst valves are set at the factory and secured with seals. The correct functioning is no longer ensured and warranty is void if a seal is removed or if the hose burst valve is tampered with.

If a hose bursts, move the control lever or stabilizer blade lever to neutral.

Proceed as follows after a damage:

1. Stop the machine immediately.
2. Stop the engine.
3. Move the control lever or stabilizer blade lever to neutral.
4. Perform emergency lowering if possible. *– see chapter “5.12 Emergency lowering” on page 5-58*.
5. Raise the control lever base.
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.

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5.10 Attachments

Picking up

WARNING

Injury hazard due to fluid escaping under pressure!

Hydraulic oil escaping under pressure can penetrate the skin and cause serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► Release the pressure in the hydraulic system before connecting or disconnecting the attachment – – *see chapter " Releasing the pressure in the operating hydraulics" on page 5-48*.
- ► Wear protective clothes.
- ► Always consult a doctor immediately, even if the wound seems insignificant. Hydraulic oil causes blood poisoning.

WARNING

Accident hazard when attachments are picked up!

Picking up attachments incorrectly can cause serious injury or death.

- ► Wear protective equipment during installation of the connecting pins.
- ► Do not allow anyone to stay in the danger zone.
- ► Only use attachments that are in perfect condition.
- ► Set and adjust the boom to the correct position with the control levers.
- ► Align the fastening bores in the attachment with a mandrel to make it easier to insert the pin in the bores.
- ► Ensure correct 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

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Setting down

WARNING

Crushing hazard when attachments are removed!

If an attachment is not removed 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.
- ► Only remove the pins from the attachment if it is in a stable position.
- ► Lower the attachment to the ground without too much pressure, otherwise the resistance when removing the pins is too high.

The procedure of changing attachments is described below for a backhoe bucket.

Follow the special information when fitting or removing attachments with their own hydraulic functions (for example an offset bucket). Observe the Operator's Manual of the attachment.

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 *– see chapter " Releasing the pressure in the operating hydraulics" on page 5-48*.

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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. Lower the control lever base.
7. Move the control lever, the slide switch of the proportional controls or the pedal (triple articulation boom) of the relevant hydraulic circuit in all directions repeatedly.
   ➥ The pressure in the corresponding system sections 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.

Re-equipping

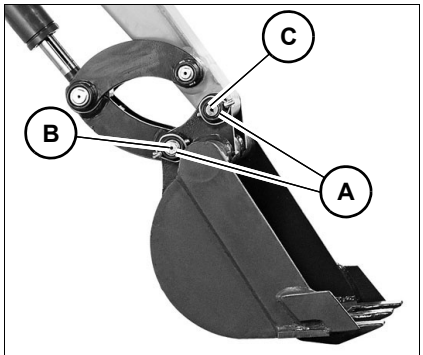


Fig. 198 (symbolic representation)

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" on page 7-7*.
3. Remove linch pins **A**.
4. First remove pin **B** and then pin **C**. Carefully expel pins that are stuck with a hammer and a 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" on page 7-7*.
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.

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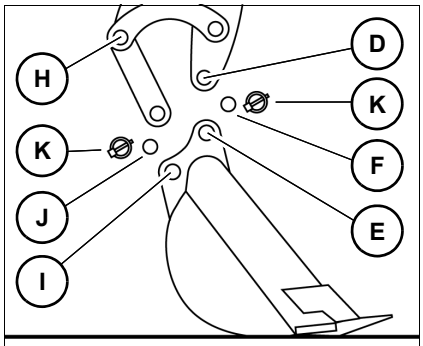


Fig. 199 (symbolic representation)

Assembly

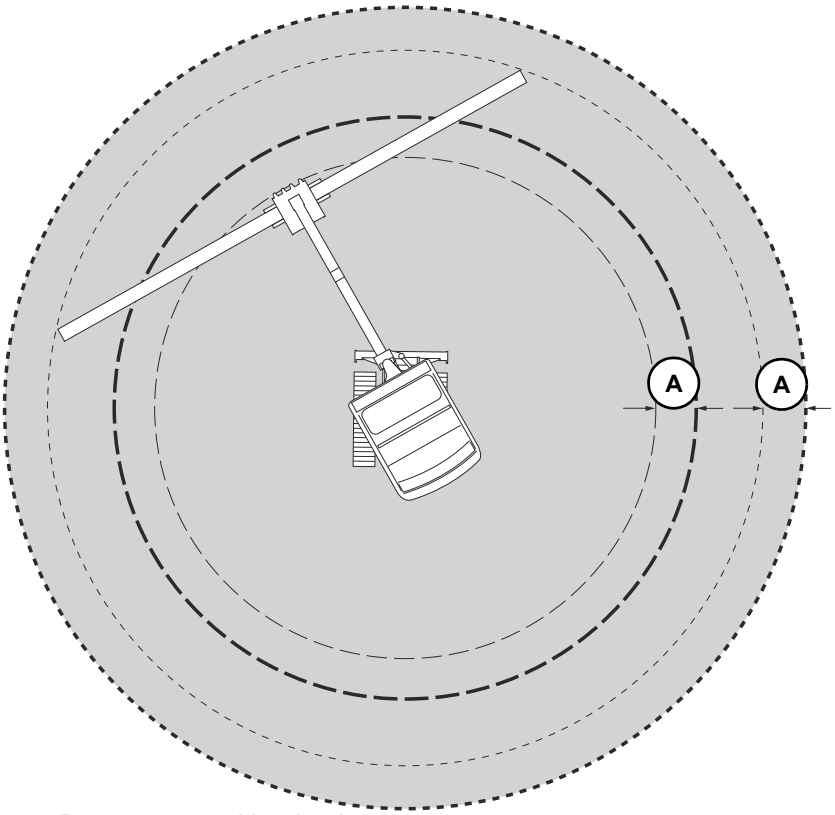
1. Install a bucket only if it is positioned on level ground with the flat side facing downward.
2. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
3. Apply grease to the pins and joints before inserting the pins.
4. Start the engine.
5. Straighten the stick so 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**.
11. Install linch pins **K**.

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5.11 Work operation

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.
- The danger zone on a slope is different from the one on a level surface (secure the load). See chapter **“Operation**, **driving on slopes”**.
- Stop machine operation immediately if persons do not stay clear of the danger zone.
- Seal off the danger zone should it not be possible to keep a sufficient safety distance.
- Extend the danger zone sufficiently in the immediate vicinity of buildings, scaffolds or other elements of construction.



Danger zone with a bucket

Danger zone with a bucket and a safety distance of 1.5 m (59 in)

Danger zone with a grab (for example for picking up a pipe)

Danger zone with a grab and a safety distance of 1.5 m (59 in)

A Safety distance of 1.5 m (59 in)

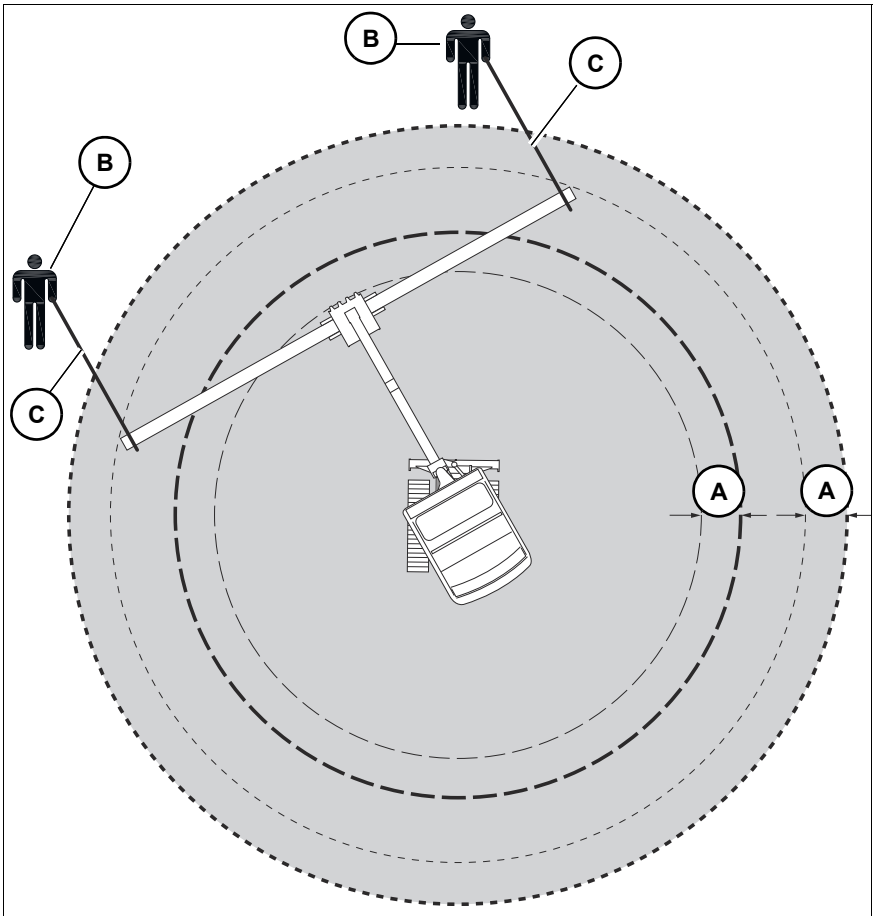
Fig. 200 (symbolic representation)

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Danger zone during lifting-gear applications

In lifting gear applications the load must be stabilized by slingers (B) with the help of ropes (C).

Slingers must remain out of the danger zone – *see chapter " Lifting gear applications" on page 5-35*.



Danger zone with a bucket

Danger zone with a bucket and a safety distance of 1.5 m (59 in)

Danger zone with a grab (for example for picking up a pipe)

Danger zone with a grab and a safety distance of 1.5 m (59 in)

A Safety distance of 1.5 m (59 in)

Fig. 201 (symbolic representation)

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Inadmissible work procedures

NOTICE

Inadmissible operation can damage the machine or the attachment.

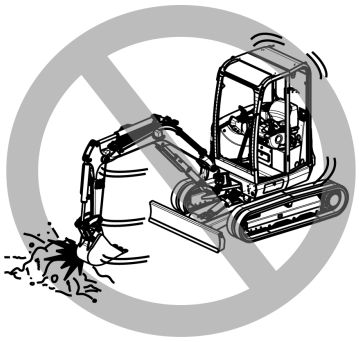


Fig. 202

Working with the swivel force

Do not use the swivel force of the upper carriage to tear down walls or to create level surfaces.

Do not ram the attachment into the ground when swiveling the upper carriage.

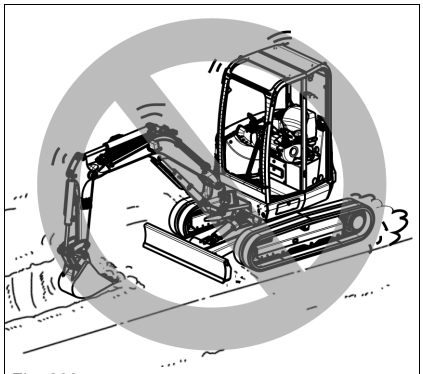


Fig. 203

Working with the drive force

Do not ram the attachment into ground or lower the boom during machine travel.

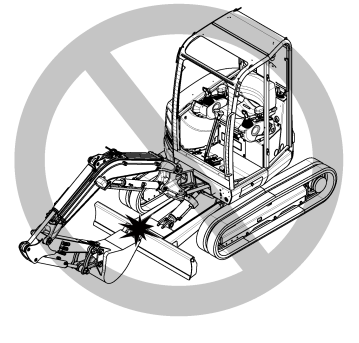


Fig. 204

Retracting the attachment

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

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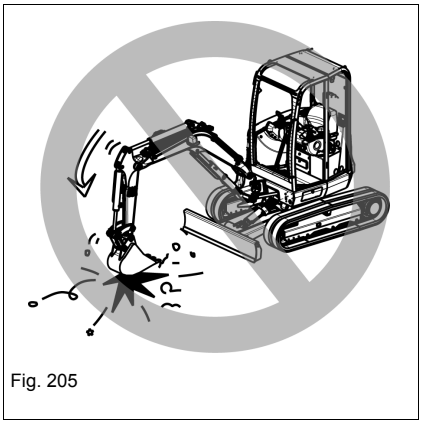


Fig. 205

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.

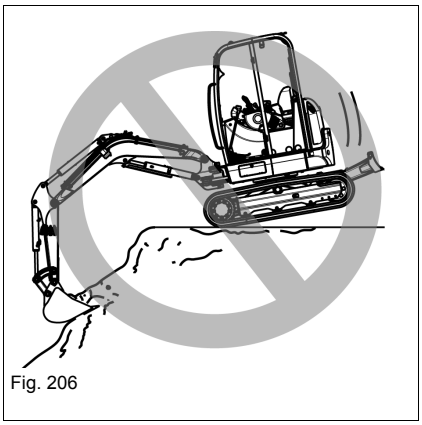


Fig. 206

Working with the falling force by lowering the machine

Do not use the dead weight of the machine for work.

Use the force of the hydraulic cylinders exclusively.

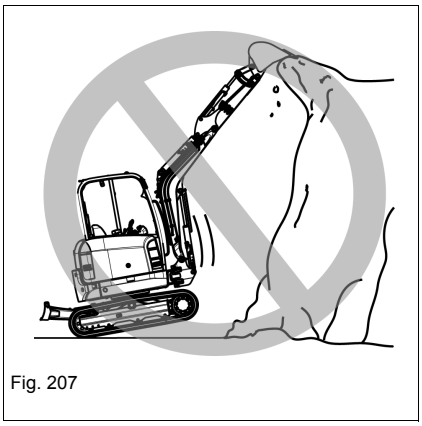


Fig. 207

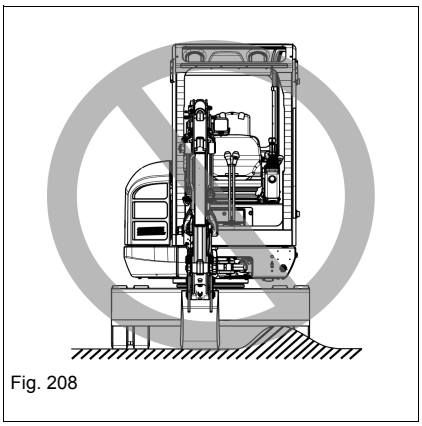


Fig. 208

Fully lowering the stabilizer blade

If the stabilizer blade is used for support, apply the load of the machine over the entire width.

Protecting the stabilizer legs/blade against shocks

The stabilizer blade or stabilizer blade cylinder can be damaged when the stabilizer blade hits against obstacles.

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General information regarding work operation

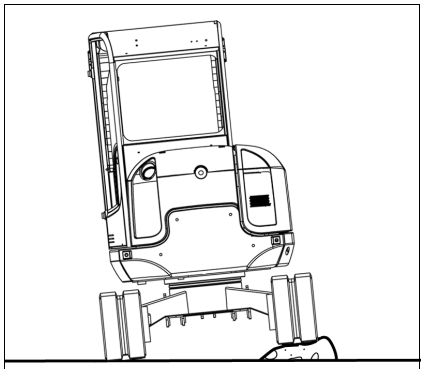


Fig. 209 (symbolic representation)

Machine travel

Performing machine travel over obstacles 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.

Traveling in speed range 2

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

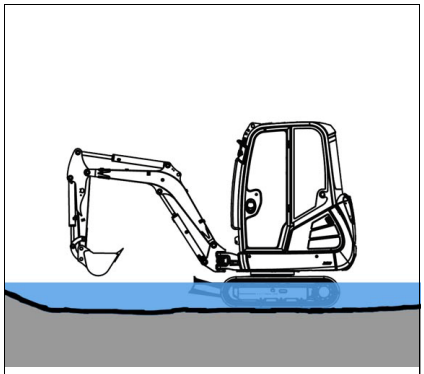


Fig. 210

Operation 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.

Do not immerse the live ring and upper carriage in the water.

Operation in salt water is prohibited.

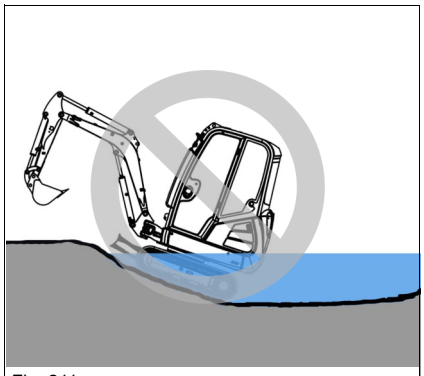


Fig. 211

Do not immerse the live ring and upper carriage in the water.

Operation near the sea

Clean the machine regularly when using it in a saline environment.

See chapter **Cleaning and maintenance**.

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Working with the bucket

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

Place the stabilizer blade on the side you want to dig.

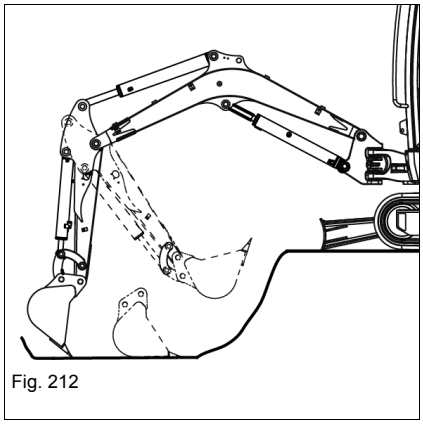


Fig. 212

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.

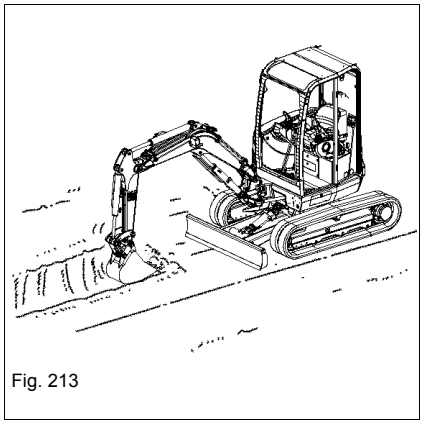


Fig. 213

Working alongside trenches

For a more efficient working method, install a suitable bucket and set the tracks parallel to the trench.

When digging wide trenches, dig the side sections first and then the middle section.

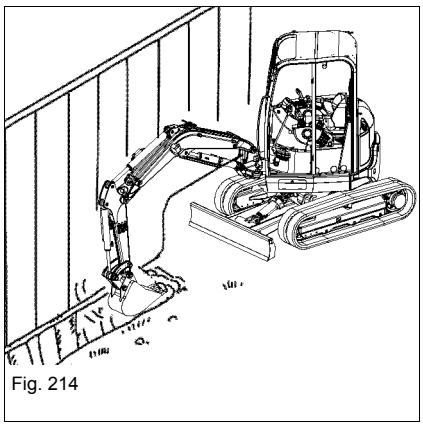


Fig. 214

For excavating laterally in tight spaces, turn the upper carriage and swivel the boom.

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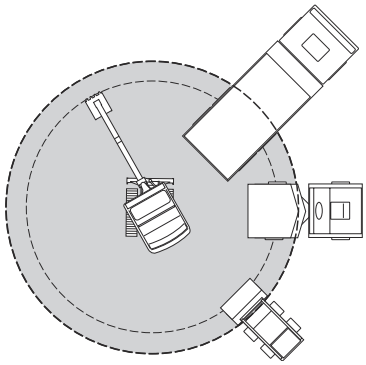


Fig. 215

Loading material

Notes on loading site dumpers:

- Position the site dumper so that its cabin is outside the danger zone of the excavator.
- The loading platform of the truck is loaded by starting at the rear end.
- Keep the swivel angle as small as possible.
- Raise the full bucket to dump height only as you rotate toward the site dumper.
- Tilt out dusty material with the wind behind you to keep the dust away from your eyes, air filters and fans.
- If possible, the site dumper and the working direction of the bucket should form an angle of 45°.

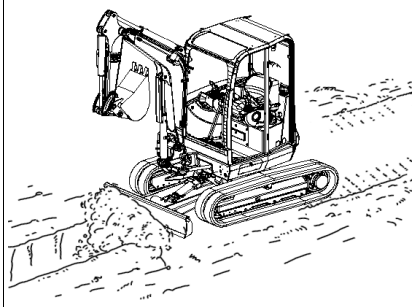


Fig. 216

Grading

The stabilizer blade is used for filling up trenches or grading the ground.

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.

➥ Do not dig in the machine or let it sink in.

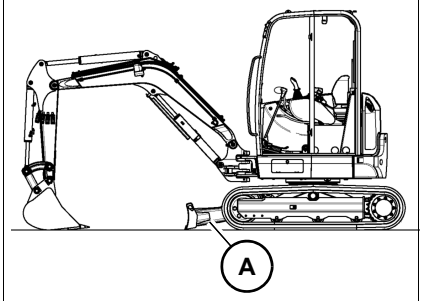


Fig. 217

Digging position

Place stabilizer blade **A** on the side you want to dig.

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Working alongside trenches

WARNING

Tipping hazard of machine alongside trenches!

A tipping machine can cause serious injury or death.

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

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

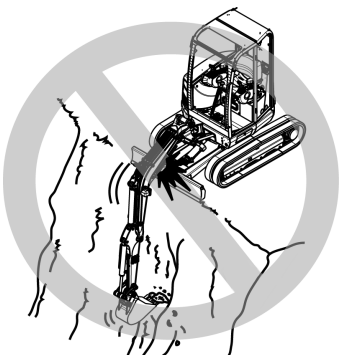


Fig. 218

NOTICE

The hydraulic boom cylinders can be damaged when operated incorrectly during work in trenches, on slopes, etc.

► Always stabilize the machine with the stabilizer blade during excavation work.

► The piston rod must not touch the stabilizer blade.

Further **recommendations 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 travel forward when driving out of the digging area with a fully loaded bucket.
- Perform reverse machine travel when transporting a full bucket down a steep slope.

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.

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5.12 Emergency lowering

WARNING

Crushing hazard during boom lowering!

Causes serious crushing or injury resulting in death.

- ► Do not allow anyone to stay in the danger zone.
- ► Stop machine operation immediately as soon as someone enters the danger zone.

Observe the following during emergency lowering:

1. Turn the starting key to position **1**.
2. Lower the control lever base.
3. Lower the boom completely.
4. Return the control lever to neutral.

Information

Lower the boom immediately after stopping the engine.

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5.13 Options

Immobilizer (option)

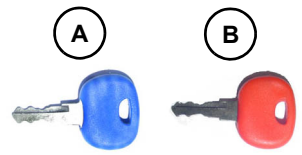


Fig. 219

A = starting key (blue)

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

B = master key (red)

The machine can be started without performing any further settings.

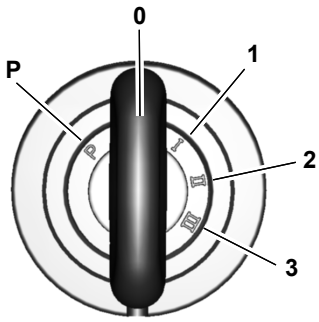


Fig. 220

Coding new starting keys

1. Insert master key **B** in the starter and turn it to position **1** for a maximum five seconds.
2. Remove master key **B**.
3. Keep the master key at least 50 cm (20 in) away from the starter.
4. Within 15 seconds, turn starting keys requiring coding to position **1** for at least one second.
5. Repeat step 4 if more starting keys require coding.
6. With this the coding of the starting keys is completed.

Coding can be performed for a maximum 10 keys.

Information

The procedure is automatically cancelled if no key requiring coding is detected by the system within 15 seconds.

Deleting coded keys

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

The master key code is not deleted during deletion.

1. Insert master key **B** in the starter and turn it to position **1** for at least 20 seconds.
2. Code the starting keys.

Information

Store the master key in a safe place. It can only be used for coding new starting keys.
A new immobilizer must be installed if the master key is lost.

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Shovel bucket operation



Fig. 221 (symbolic representation)

NOTICE

The stick can be damaged if it is hit by the bucket base.

► Do not tilt out the bucket completely if it is used as a shovel bucket.

Trailer operation

The machine is not certified for trailer operation.

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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 firm ground if possible (concrete, for example), and cover it with a watertight tarp to protect it against humidity.

1. Park the machine – *see "Parking the machine" on page 5-11*.
2. Clean the engine with a high-pressure cleaner in a suitable place – *see chapter "7.5 Cleaning and maintenance" on page 7-19*.
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 (piston rods of hydraulic cylinders, for example).
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. Remove the battery and store it in a safe place. Charge the battery and perform battery maintenance at regular intervals.
10. Close the air-intake openings of the air filter system and exhaust pipe.

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Putting back into operation

Information

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

1. Perform a general visual check for damage on the electric cables, connectors, fuel lines, corrosion, etc. on the engine and diesel particulate filter.
2. Start the engine once a month to ensure optimal lubrication.
3. Remove anticorrosion agents from bare metal parts.
4. Charge, install and connect the battery.
5. Open the air-intake openings of the air filter system and exhaust pipe.
6. Check the condition of the air filter elements and have them replaced by a Wacker Neuson service center if necessary.
7. Check the dust valve.
8. Bleed the fuel system – *see "Water separator" on page 7-27*.
9. Check the machine for leaks.
10. Lubricate the machine according to the lubrication plan.
11. Check all engine/machine fluids in the units or reservoirs, and add fluids if necessary.
12. If the machine was out of service for over 6 months, have the oil in the gearbox, engine, hydraulic oil reservoir and other units changed by a Wacker Neuson service center.
13. Have the hydraulic oil filters (pressure, return and breather filters), the engine oil filter and diesel filter (prefilter and main filter) by a Wacker Neuson service center if the machine was out of operation for over 6 months.
14. Switch on the starter and check whether there are any malfunctions. *– see "Malfunctions" on page 8-1*
    Contact a Wacker Neuson service center and have the malfunction rectified.
15. Start the engine.
16. Let the engine run at idling speed at least 15 minutes without load.
17. Check the oil levels in all units and add oil if necessary.
18. Check the machine for leaks.
19. Start the machine and ensure that all functions and warning systems work correctly.

Avoid operation at maximum engine speed or load for more than an hour.

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5.15 Permanently putting out of operation

Disposal

All fluids, lubricants, material, etc., used on the machine are subject to specific regulations. Dispose of different materials and consumables separately and in an environmentally friendly manner.

Disposal may be performed only by a Wacker Neuson service center. Observe the national and regional regulations for disposal.

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 national and regional regulations.

- Machine disposal must be performed in accordance with state-of-the-art standards that apply at the time of disposal.

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Notes:

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6 Transportation

6.1 Towing the machine

WARNING

Accident hazard due to incorrect towing!

Incorrect towing can cause accidents and serious injury or death.

- ► Tow the machine away only from the immediate danger zone until it can be loaded.
- ► Only tow the machine using suitable towing equipment in connection with suitable towing facilities, such as a towing hooks, eyes, etc.
- ► There must be nobody between the vehicles during towing. The lateral safety distance is equal to 1.5 times the length of the towing equipment.
- ► Do not tow the machine if it is stuck or on a slope. Load the machine.
- ► Wear protective equipment.
- ► Start machine travel and tow away slowly.

NOTICE

The machine can be damaged during towing.

- ► Tow the machine away only from the immediate danger zone until it can be loaded.
- ► Tow away the machine only if the engine is running and if the drive is functional.
- ► Do not tow the machine if it is stuck or on a slope. Load the machine.
- ► Only tow the machine using suitable towing equipment in connection with suitable towing facilities, such as a towing hooks, eyes, etc.
- ► The maximum permissible load of the towing eye 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.

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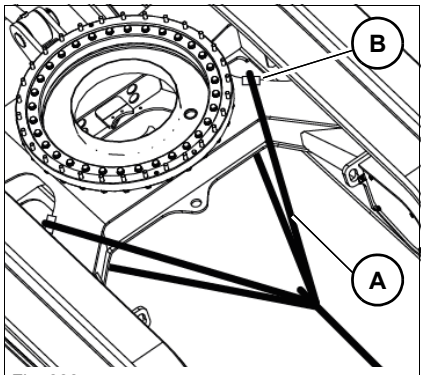


Fig. 222

1. – see chapter “2.9 Transport and Towing” on page 2-11
2. Ensure that the machine can be towed safely.
3. Put sling **A** around the travel gear as shown in *Fig. 222*. Use edge guard **B**.
4. Start machine travel and tow away slowly.
5. Tow the machine only until it reaches a position from where it can be loaded.

6.2 Loading the machine

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.
- ► Bear in mind the transport weight on the machine’s type label.
- ► Determine the loading weight – see chapter “ Determining the loading weight” on page 9-13.

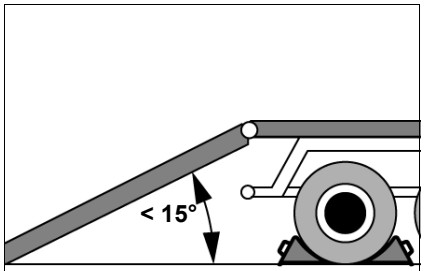
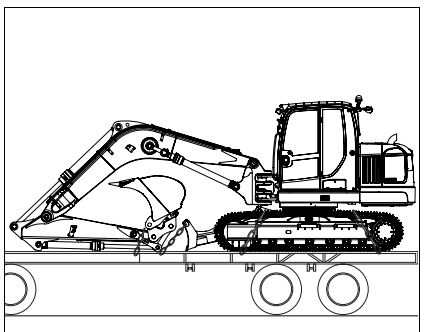


Fig. 223

1. – see chapter “2.9 Transport and Towing” on page 2-11
2. Secure the transport vehicle with chocks to prevent it from rolling.
3. Install access ramps at the smallest possible angle. Ensure that the grade does not exceed 15° (27 %).
4. Use access ramps and transport surfaces with an antiskid surface only.
5. Ensure that the loading area is clear and access to it is not obstructed, for example by superstructures.
6. Start the engine.
7. Raise the boom and the stabilizer blade to avoid touching the access ramps.
8. Carefully travel the machine onto the middle of the transport vehicle.


Fig. 224

9. Move the machine to transport position:
   - Position the boom straight ahead at the center of the machine.
   - Lower the boom and the stabilizer blade.
10. Stop the engine.
11. Raise the control lever base.
12. Remove the starting key and carry it with you.
13. Leave the cabin, close and lock all doors, windows and covers.
14. Firmly fasten the machine on the loading area with tie-down points **A** to **D** with slings of appropriate size.

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Tie-down points

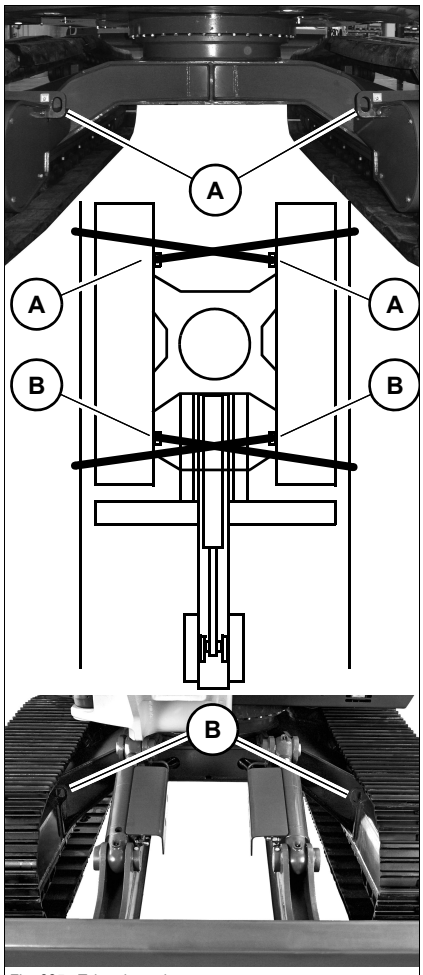


Fig. 225: Tying down the excavator

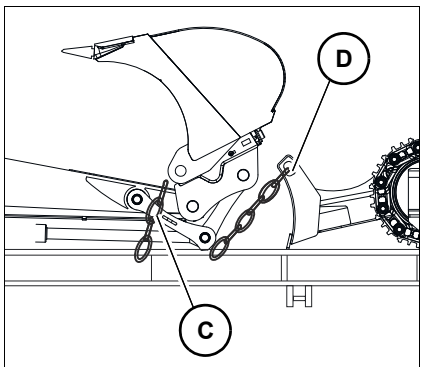


Fig. 226

Information

Only use OSHA-approved lifting devices.

Use edge protectors to avoid damage both oto the machine and the OSHA-approved lifting devices.

Position		Quantity
A	Inside of travel gear, rear	2
B	Inside of travel gear, front	2
C	Stick	1
D	Stabilizer blade	2

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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.
- ► Bear in mind the transport weight on the machine's type label.
- ► Determine the loading weight – *see chapter " Determining the loading weight" on page 9-13*.
- ► The machine may only be raised with suitable lifting gear.

NOTICE

Possible damage to the machine due to incorrect loading.

- ► Bear in mind the transport weight on the machine's type label.
- ► The machine may only be raised with suitable lifting gear.
- ► Ensure that the lifting gear has the required lengths L1 and L2.

Information

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

Do not attempt to lift the excavator with any type of crane including wheel loaders unless the crane operator is qualified to lift loads in craning operations. The crane operator shall be knowledgeable of OSHA 1910 craning regulations.

Lifting eyes

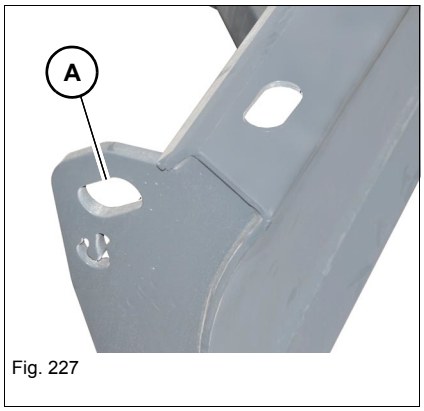


Fig. 227

The machine must only be raised using the lifting eyes indicated below.

A: Left and right lifting eyes on stabilizer blade

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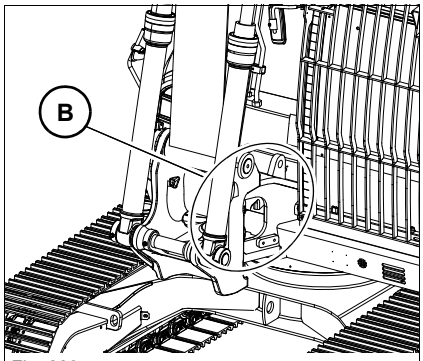


Fig. 228

B: upper carriage lifting eye

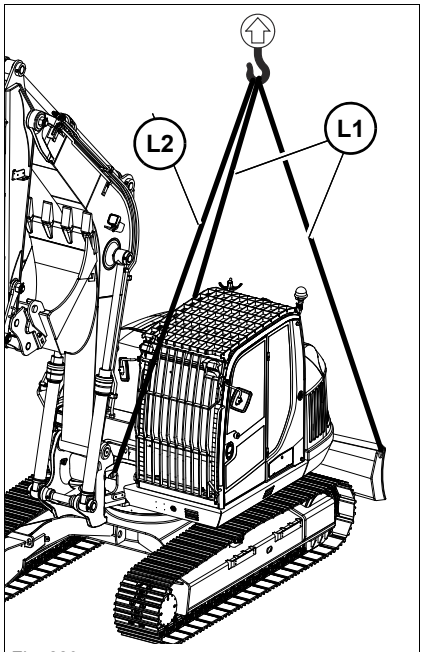


Fig. 229

Ensure that the lifting gear has the required lengths L1 and L2.

Length	Dimensions
L1	5300 mm (17'-5")
L2	4300 mm (14'-1")

1. Fit an empty bucket and lock it safely.
2. Remove all dirt from the machine.
3. Park the machine on firm, level and horizontal ground.
4. Tilt in bucket.
5. Raise the loader unit completely.
6. Pull the stick toward the machine.
7. Raise the stabilizer blade completely.
8. Position the boom straight ahead at the center of the machine.
9. Rotate the upper carriage by 180° so that the stabilizer blade points to the rear.
10. Stop the engine.
11. Operate the control lever repeatedly to release the pressure in the hydraulic system.
12. Raise the control lever base.
13. Remove the starting key and carry it with you.
14. Safely store all loose objects.
15. Leave the cabin, close and lock all doors, windows and covers.
16. Attach slings on the lifting eyes **A** and **B**.
17. The lifting gear must be of appropriate size so that the machine can be lifted horizontally.
18. Slowly raise the machine until there is no more contact with the ground.
19. Let the machine swing until it comes to rest.
20. If the machine balance, and the condition and position of the slings is correct, slowly raise the machine to the required height and load it.

Information

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

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6.3 Transporting the machine

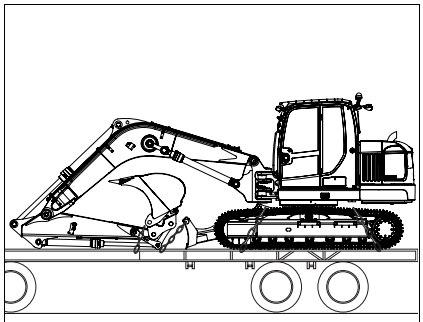


Fig. 230

1. Firmly fasten the machine on the loading area with tie-down points **A** to **D** (*– see "Tie-down points" on page 6-3*) with slings of appropriate size. Observe the legal regulations.
2. The driver of the transport vehicle must observe the following before departure:
   - Permitted overall height, width and weight of the transport vehicle including the excavator.
   - The legal regulations of the countries where transport is to take place.
3. Close the exhaust pipe before transporting the machine through wet weather.

Information

The automatic swivel unit brake secures the upper carriage against rotation.

Information

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

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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 ensure optimal machine operation.

Repair or replace defective parts immediately, even if they are not yet due for replacement.

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

Use only original spare parts for repairs.

Wacker Neuson shall not be liable for damage to the machine or personal 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.
- Wear protective equipment (for example hard hat, safety glasses, protective gloves, safety boots).
- Observe the danger indications and safety instructions during maintenance.
- In order to avoid injury hazard, do not perform work on a hot or running engine.
- 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"**).
- Park the machine – *see "Preparing lubrication" on page 7-7*.
- In order to avoid damage to electronic components, do not perform welding work on the machine, add-on parts or tools. Contact a Wacker Neuson service center.
- High engine load or a manual regeneration of the diesel particulate filter can lead to shorter engine oil maintenance intervals. Output is reduced if the machine is used beyond the maintenance interval. If the machine is operated less than 500 hours per year the engine oil must be changed once a year.

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7.2 Maintenance overview

Maintenance label

Maintenance that has to be performed by the operator is indicated on the maintenance label.

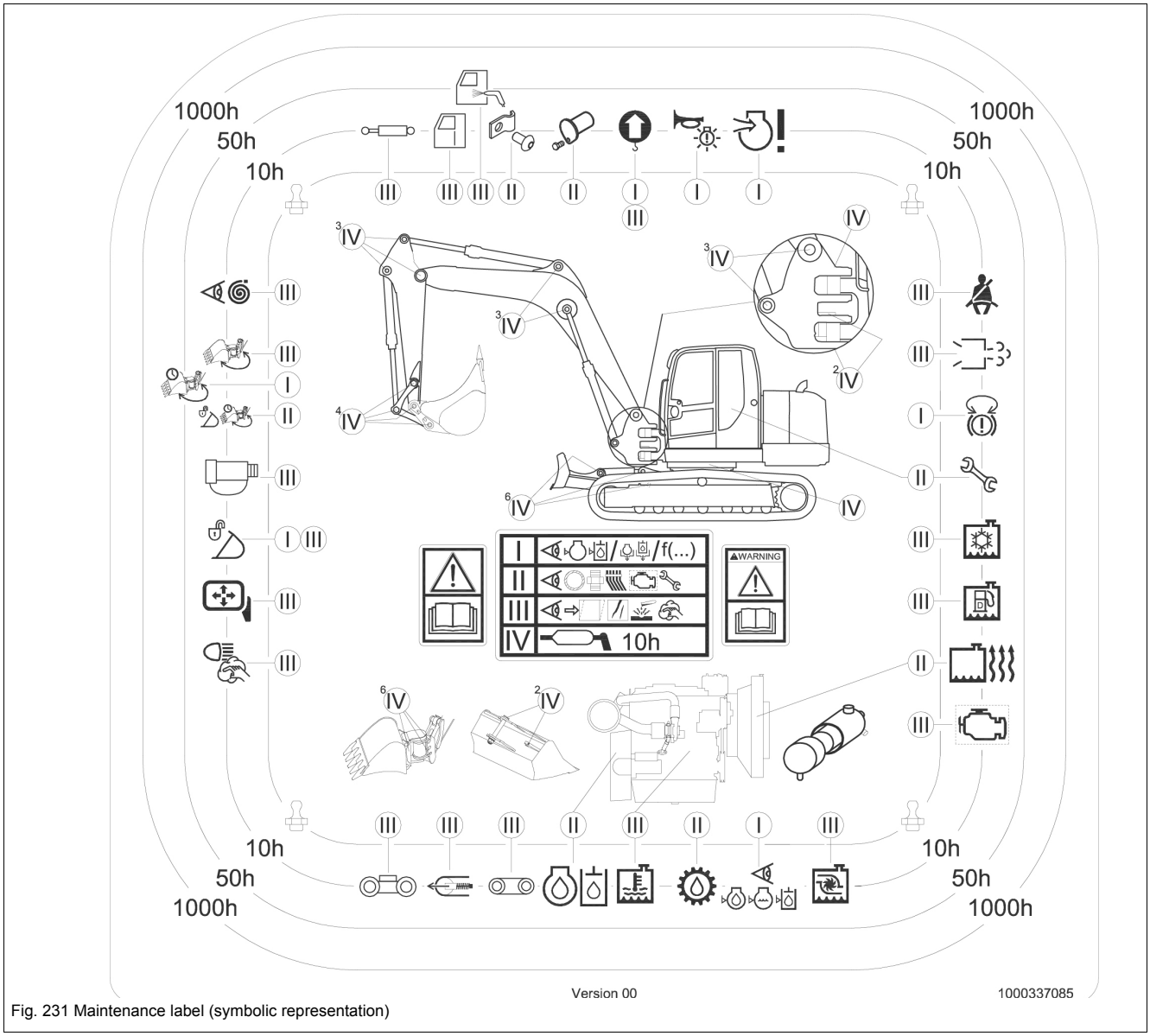


Fig. 231 Maintenance label (symbolic representation)

I = Add and drain fluids, lubricants, material, etc.; check machine functions.

II = check wear parts, seals, hoses, and threaded fittings.

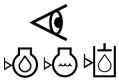
III = Check for damage, corrosion and dirt.

IV = lubricate daily after the work shift.

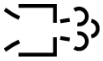
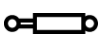
Superscript numbers, for example ^{2}: number of lubrication points

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Maintenance plan

Daily maintenance (operator)		
Symbol	**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)	*7-30*,*7-32*, *7-36*
	Check the radiator and hydraulic oil cooler for dirt, clean them if necessary	*7-33*
	Check the charge-air cooler for dirt, clean it if necessary	*7-33*
	Check the fuel radiator for dirt, clean it if necessary	*7-33*
	Lubricate the machine according to the lubrication plan	*7-8*
	Check the track tension and retension the tracks if necessary	*7-42*
	Check the engine air intake	*7-34*
	Check the pin locks	--
	Check line fixtures	--
	Check the indicator lights and acoustic warning device	*4-34*, *5-18*
	Check the swivel unit brake for correct function	*5-22*
	Check the hydraulic couplings for dirt	--
	Check the threaded fittings of the protective structures (for example the cabin) for tightness	--
	Clean the lights/light system, signaling system	--
	Safe load indicator: check the acoustic warning system	*5-36*
	Clean fresh-air and recirculated-air coarse filters with compressed air (heating, air conditioning)	*7-33*
	Hydraulic quickhitch (Oil Quick): check acoustic warning system	*5-38*

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Daily maintenance (operator)		
	Lubricate the Powertilt according to the lubrication plan	*7-8*
	Adjust the mirrors correctly, clean them and check them for damage, check the fastening screws and tighten them if necessary	--
	Check the condenser for dirt, clean it if necessary	*7-33*
	Leakage check	
	Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings of the following assemblies and components. Repair if necessary	Page
	Engine and hydraulic system	--
	Traveling drive	--
	Cooling systems, heating and hoses (visual check)	--
	Option	
	Hydraulic quickhitch (Oil Quick) and Powertilt (hoses, valve)	--
	Visual check	
	Correct function; deformations, damage, surface cracks, wear and corrosion	Page
	Check the exhaust system for damage	--
	Check the insulating mats in the engine compartment for damage	--
	Check the cabin and protective structures for damage (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	--
	Check the hydraulic hoses for damage	--
	Option	

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Daily maintenance (operator)		
	Check the load hook, joint rod and lifting eyes	--
	Check hydraulic quickhitch (Oil Quick) for damage	--
	Check the Powertilt for damage	--
	Weekly maintenance (every 50 operating hours) (operator)	Page
	Check accesses and exits for dirt	--
	Replace the air filter[1]	--
	Option	
	Actuate the Powertilt swivel device in the limit positions in both flow directions for one minute each to rinse the system	--
All steps for maintenance intervals once a day		--

1. Replace the air filter according to the multifunctional display, every 1000 o/h or once a year at the latest.
When in extensive use in environments with acidic air (for example acid production facilities, steel and aluminum mills, chemical plants and other nonferrous-metal plants): replace after 50 o/h without regard to multifunctional display. Contact a Wacker Neuson service center.

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Only once after the first 50 operating hours (Wacker Neuson service center)	
Replace the hydraulic oil filter	--
Replace the gearbox oil (traveling drive)	--
Check V-belt condition and tension	--
Check the threaded fittings for tightness	--
Check labels and Operator's Manual for completeness and condition	--
Check the pressure of the primary pressure limiting valves (operating hydraulics)	--
Reset the maintenance meter	--
All steps for maintenance once a day and once a week	--

Other maintenance intervals (Wacker Neuson service center):

- Every 500 operating hours or annually
- Every 1000 operating hours
- Every 2000 operating hours
- Every 3000 operating hours

For more detailed information contact a Wacker Neuson service center.

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.

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Preparing lubrication

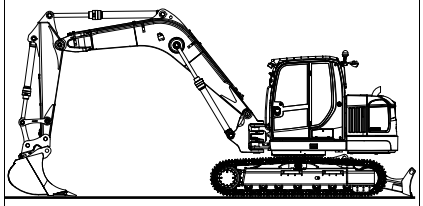


Fig. 232

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 legs 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. Safely store all loose objects.
9. Close the windows and doors.
10. Close and lock all covers.
11. Attach a warning label to the control elements (for example **“Machine being serviced, do not start”**).

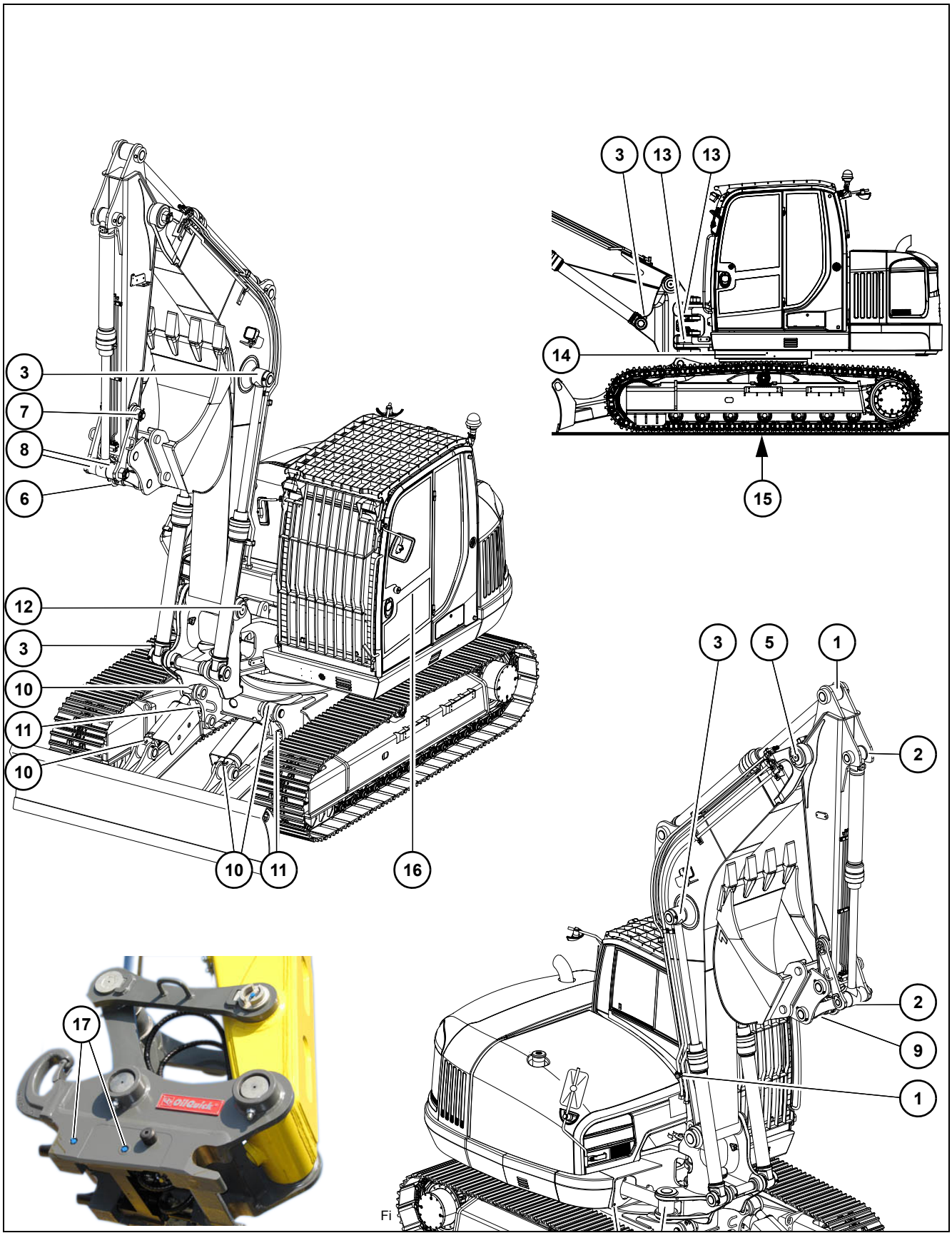
Wait at least 10 minutes after stopping the engine.

Information

Keep all lubrication points clean and remove any escaping grease.

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Lubrication plan



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Position	Lubrication point	Quantity
1	Stick cylinder	2
2	Bucket cylinder	2
3	Boom cylinder – boom	2 x 2
4	Swiveling cylinder	2
5	Boom – stick	1
6	Stick	1
7	Pivot plate – stick	1
8	Bucket cylinder joint rod	2
9	Joint rod	1
10	Stabilizer blade cylinder	4
11	Stabilizer blade – chassis	2
12	Swiveling console – boom	1
13	Chassis – swiveling console	2
14	Live ring (ball bearing) *– see “Live ring (ball bearing)” on page 7-10*	2 x 2
15	Teeth of live ring *– see “Teeth of live ring” on page 7-11*	1
16	Control lever base *– see “Starting and stopping the engine” on page 4-46*	3
17	Hydraulic quickhitch – OilQuick (option)	2 x 2

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Live ring (ball bearing)

DANGER

Crushing hazard during lubrication!

Serious crushing hazard causing death or serious injury.

► No one must be in the danger zone during upper carriage rotation.

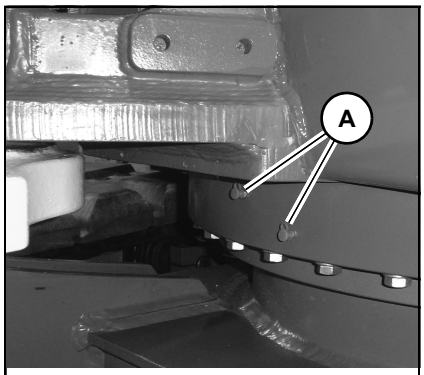


Fig. 234

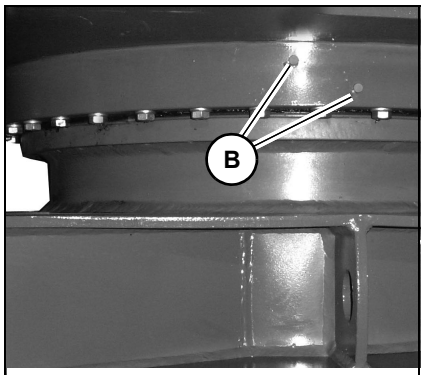


Fig. 235

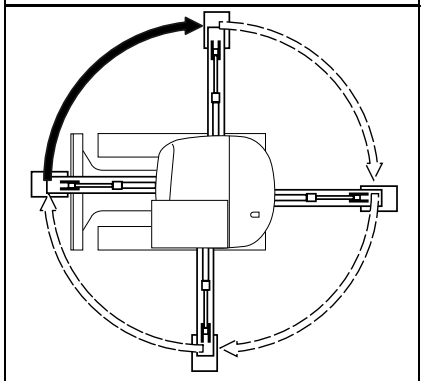


Fig. 236

The lubrication points are located on the right side of the upper carriage.

1. Park the machine 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. Apply grease to lubrication points **A** and **B** with two strokes of the grease gun each.
5. Start the engine, raise the boom and the stabilizer blade.
6. Rotate the upper carriage by 90°.
7. Repeat steps 2 – 6 three times until the upper carriage is back in its initial position.
8. Rotate the upper carriage several times by 360°.

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Teeth of live ring

DANGER

Crushing hazard during lubrication!

Serious crushing hazard causing death or serious injury.

► No one must be in the danger zone during upper carriage rotation.

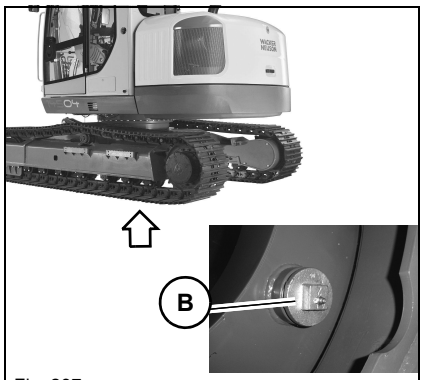


Fig. 237

The lubrication point **A** is located on the lower side of the travel gear.

1. Travel the machine over a pit.
2. Lower the stabilizer blade to the ground.
3. Stop the engine, remove the starting key and carry it with you.
4. Apply grease to lubrication point **A** with five strokes of the grease gun.
5. Start the engine, raise the boom and the stabilizer blade.

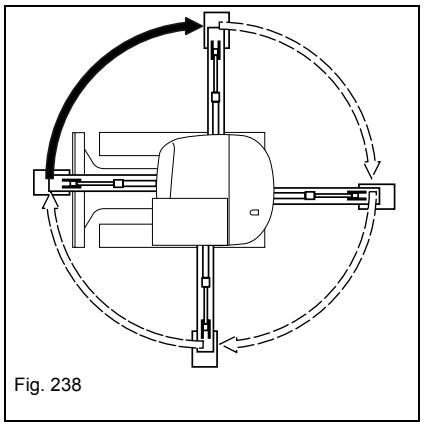


Fig. 238

6. Rotate the upper carriage by 90°.
7. Repeat steps 2 – 6 three times until the upper carriage is back in its initial position.

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Control lever base

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.

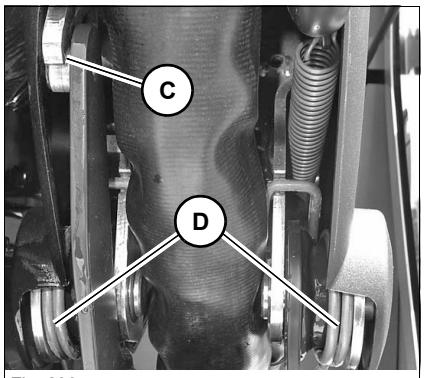


Fig. 239

1. Raise the control lever base.
2. Spray fluid grease onto the guide lever in the area of **C**.
3. Spray fluid grease on both sides **D** of the double spring.

Powertilt with Oil Quick – Operation in water

- Apply grease to the lubrication points before using in water.
- After using in water, apply grease to the lubrication points to remove all water.

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7.3 Consumables

Application	Fluid/lubricant	Specification	Season/ temperature	Capacities [1]
Engine	Diesel fuel	ASTM D975 grade 2D S15 (USA)[2]	Summer or winter diesel depending on outside temperatures	170 l (45 gal)
		EN 590 (EU)[3]		
		BS 2869:2010 class A2 (GB)[4]		
	Coolant	Soft water and ASTM D6210	Year-round	About 15 l (4 gal) [5]
	Engine oil[6]	API CJ-4; ACEA E9; ECF-3	−18 °C (−0.4 °F) +50 °C (+122 °F)	15 l (4 gal)
Hydraulic oil reservoir	Hydraulic oil	Eurolub HVLP 46[7]	Year-round[8]	136 l (36 gal)
	Biodegradable oil[9]	Panolin HLP Synth 46		
		BP BIOHYD SE-S 46		
Washer system	Cleaning solution	Glass cleaner and anti-freeze	Year-round	1.2 l (0.3 gal)
Grease zerks	Grease	KPF 2 K-20[10] ISO-L-X-BCEB 2[11]	Year-round	As required
Battery terminals	Acid-proof grease [12]	FINA Marson L2	Year-round	As required
Air conditioning	Coolant	R134a	Year-round	1000 g (2.2 lb)
	Compressor oil	Sanden SP10	Year-round	See service manual
Control lever base	Adhesive fluid grease	Förch S401	Year-round	As required

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. Sulfur content up to 0.0015 % (= 15 ppm)
3. Sulfur content up to 0.0010 % (= 10 ppm)
4. Sulfur content up to 0.0010 % (= 10 ppm)
5. System fills incl. hoses and diesel engine
6. According to DIN 51511 (API CJ-4, ACEA E9, ECF-3) – *see chapter " Engine oil types" on page 7-14*
7. According to DIN 51524 section 3, ISO-VG 46
8. Depending on local conditions – *see chapter " Engine oil types" on page 7-14*
9. Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES
10. KPF 2 K-20 according to DIN 51502 lithium-saponified grease
11. ISO-L-X-BCEB 2 according to DIN ISO 6743-9, lithium-saponified grease
12. Standard acid-proof grease NGLI category 2

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Hydraulic oil types

Viscosity class	Ambient temperature			
HVLP 46 [1]	min. °C	min. °F	max. °C	max. °F
ISO VG32	-20	-4	30	86
ISO VG46	-5	23	40	104
ISO VG68	5	41	50	122

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

Replacement intervals

Replace the hydraulic oil and hydraulic oil filter depending on the percentage of hammer operation.

Percentage of hammer work	Hydraulic oil	Hydraulic oil filter
20 %	800 o/h	300 o/h
40 %	400 o/h	
60 %	300 o/h	100 o/h
Over 80 %	200 s/h	

Engine oil types

Viscosity class	Ambient temperature			
	min. °C	min. °F	max. °C	max. °F
SAE 0W30	-30	22	30	86
SAE 0W40	-30	22	40	104
SAE 5W30	-25	13	30	86
SAE 5W40	-25	13	50	122
SAE 10W30	-18	0	40	104
SAE 10W40	-18	0	50	122
SAE 15W40	-10	14	50	122

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Important information regarding operation with biodegradable hydraulic oil

- Use only the biodegradable oils that have been tested and released by Wacker Neuson. Get in touch with a Wacker Neuson dealer before using other products that have not been released. 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.
- Add only biodegradable oil of the same type. In order to avoid misunderstandings, attach a label near the hydraulic oil filler inlet providing clear information regarding the type of oil currently used.
  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 the original hydraulic oil in the hydraulic system does not exceed 2 % when changing the biodegradable oil. Observe the manufacturer's indications.
- Do not add mineral oil – the content of mineral oil should not exceed 2 % of the system fill 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.
- Additional hydraulic attachments must be filled with the same oil as the one in the hydraulic system of the excavator.
- Subsequent change from mineral oil to biodegradable oil must be performed by a Wacker Neuson service center.

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7.4 Maintenance accesses

WARNING

Burn hazard due to hot surfaces!

Can cause serious burns or death.

► Stop the engine and let hot surfaces cool down.

► Wear protective equipment.

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 maintenance accesses!

Can cause injury.

► Take care to avoid injuries when the maintenance access door is open.

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Opening the engine cover

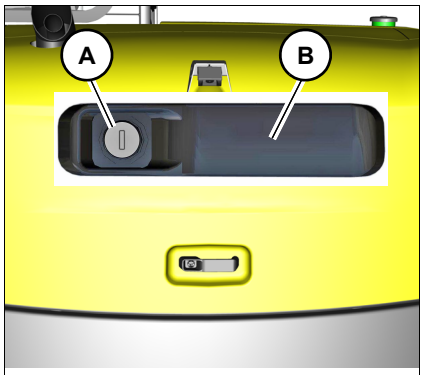


Fig. 240: Opening the engine cover

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Turn the starting key in lock **A** anticlockwise.
3. Press lock **A** and pull handle **B**.

The engine cover is supported by a gas strut.

Close the engine cover

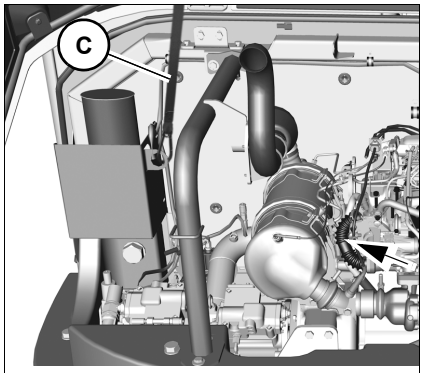


Fig. 241

1. Pull on fastening strap **C**.
2. Use handle **B** to pull engine cover downward slightly.
3. Pull handle **B** firmly downward until the engine cover engages.
4. Turn the starting key in lock **A** clockwise.

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Opening the valve cover

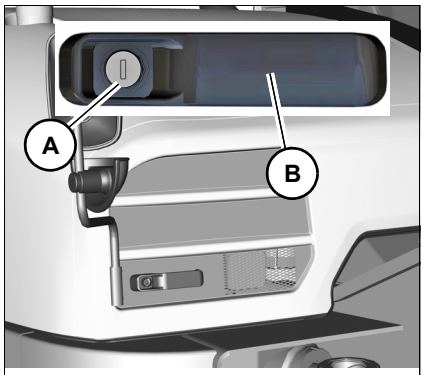


Fig. 242

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Turn the starting key in lock **A** anticlockwise.
3. Press lock **A** and pull handle **B**.

The engine cover is supported by a gas strut.

Close the valve cover

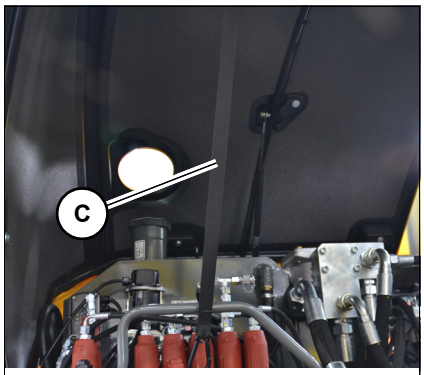


Fig. 243

1. Pull valve cover down with fastening strap **C**.
2. Pull handle **B** firmly downward until the valve cover engages.
3. Turn the starting key in lock **A** clockwise.

Fuse boxes

– *see chapter "9.8 Electrical system" on page 9-3*

Tool kit

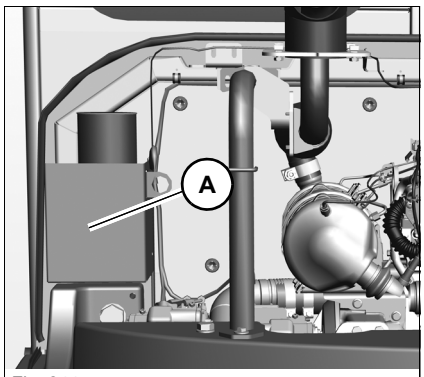


Fig. 244

Tool kit **A** is located on the left in the engine compartment.

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7.5 Cleaning and maintenance

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

► Open the engine cover only at engine standstill.

WARNING

Injury hazard due to hot surfaces!

Hot surfaces can cause serious burns or death.

► Stop the engine and let it cool down.

► Wear protective equipment.

CAUTION

Health hazard due to cleaning agents!

Cleaning agents can be harmful to health.

► Use only suitable cleaning agents.

► Ensure sufficient ventilation.

NOTICE

Damage to rubber and electrical parts when cleaning with solvents.

Do not use solvents, benzine or other aggressive chemicals.

NOTICE

Damage to electronics due to water jet.

► Do not point the water jet directly at electric components, and protect the electric components against humidity.

► If water contacts electrical components, dry them with compressed air and apply contact spray to them.

Environment

In order to avoid damage to the environment, clean the machine only in wash bays and places authorized by the authorities.

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Cleaning the machine is divided into three separate areas:

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

Washing solvents

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

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.

High-pressure cleaner

- Cover electric parts.
- Do not point the water jet directly at electric parts and damping material.
- 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 (for example alternator, control valves).
  - Control devices and seals.
  - Air intake filters, etc.

Volatile and easily flammable anticorrosion agents and sprays:

- Ensure sufficient room ventilation.
- Fire, open flames and smoking is prohibited.

Inside the cabin

Recommended aids:

- Vacuum cleaner
- Moist cloths
- Brush
- Water with mild soap solution

Exterior of the machine

Recommended aids:

- High-pressure cleaner
- Steam jet

Engine compartment

1. Park the machine in a wash bay or place.
2. Stop the engine – *see “Preparing lubrication” on page 7-7*.
3. Clean the machine.

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Seat belt

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

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

Cleaning in a saline environment

1. Park the machine in a wash bay or place – *see "Preparing lubrication" on page 7-7*.
2. Check the machine for salt deposits or corrosion. Have corrosion removed by a Wacker Neuson service center.
3. Clean the machine with a high-pressure cleaner. Clean the machine ensuring that there are no salt deposits in places that are difficult to access.
   Bear in mind the information on cleaning and maintenance.
4. Lubricate the machine according to the lubrication plan.
5. Allow the machine to dry and check it again for salt deposits.

Loose threaded fittings and attachments

Contact a Wacker Neuson service center.

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7.6 Lubrication work

– see chapter “ Preparing lubrication” on page 7-7

7.7 Fuel system

Important information regarding the fuel system

Information

In order to prevent the formation of condensation water, fill up the fuel tank nearly completely at the end of each working day.

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

Engine damage due to incorrect or dirty diesel fuel.

- ► Only use clean diesel fuel according to the engine/machine **fluids and lubricants**.
- ► Do not use any diesel fuel with additives.

– see “Consumables” on page 7-13

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Refueling

WARNING

Explosion hazard due to flammable fuel/air mixtures!

Fuels develop explosive and flammable mixtures with air that can cause serious burns or death.

- ► Fire, open flames and smoking is prohibited.
- ► Open tank lock carefully to release the pressure in the fuel tank.
- ► Keep the maintenance area clean.
- ► Do not refuel in closed rooms.
- ► Do not add gasoline to diesel fuel.
- ► Let the engine cool down.

CAUTION

Health hazard due to diesel fuel!

Diesel fuel and fuel vapors are harmful to health.

- ► Avoid contact with the skin, eyes and mouth.
- ► Seek medical attention immediately in case of accidents with diesel fuel.
- ► Wear protective equipment.

CAUTION

Fire hazard due to diesel fuel!

Diesel fuel gives off flammable vapors. This can cause injury.

- ► Fire, open flames and smoking is prohibited.
- ► Adding gasoline is prohibited.

CAUTION

Slipping/tripping hazard when refueling the machine!

Can cause injury.

- ► Use climbing aids **B** for refueling the machine.
- ► Do not use attachments as a climbing aid.

NOTICE

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

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Refueling with a stationary fuel pump

Filler inlet **A** is located on the right on the valve cover.

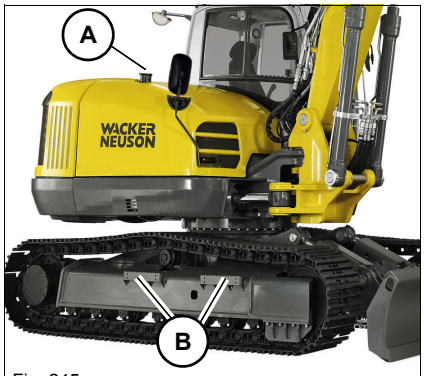


Fig. 245

1. Stop the machine on firm, level and horizontal ground.
2. Rotate the upper carriage by about 15° for better access to the tank lock.
3. Lower the boom.
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.
8. Use climbing aids **B** to climb onto the tracks.

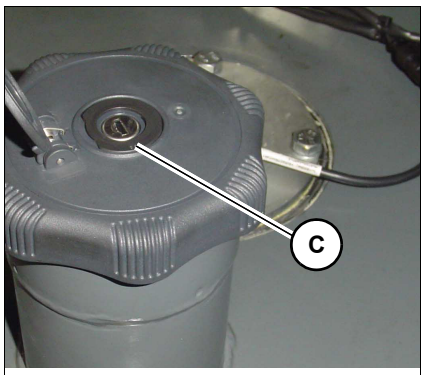


Fig. 246

9. Unlock tank lock **C** with the starting key.
10. Open tank lock **C** carefully to release the pressure in the fuel tank.
11. Refuel.
12. Lock tank lock **C** with the starting key.

Refueling with the fuel-filling pump

CAUTION

Injury hazard in case of incorrect handling of fuel-filling pump

Can cause injury.

► Keep body parts away from tank hoses.

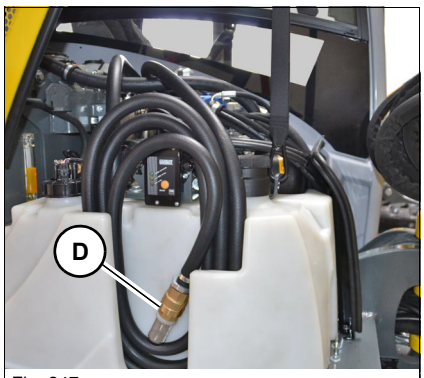


Fig. 247

Refueling procedure

1. Stop the machine on firm, level and horizontal ground.
2. Rotate the upper carriage by about 15° for better access to the tank lock.
3. Lower the boom.
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. Open the valve cover – *see “Opening the valve cover” on page 7-18*
8. Unlock tank lock **C** with the starting key.
9. Open tank lock **C** carefully to release the pressure in the fuel tank.
10. Turn the starting key to position **1**.

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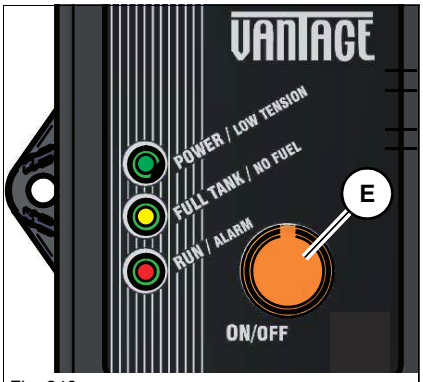


Fig. 248

11. Put hose **D** into the fuel tank.
12. Switch on the fuel-filling pump with push button **E**.
    - ➥ The green LED illuminates. The red LED illuminates, too, as soon as fuel is pumped by the pump.
    - ➥ Refueling stops automatically when the tank is full.
    - ➥ The green and yellow LEDs illuminate once refueling is over.
13. Switch off the fuel-filling pump with push button **E**.
14. Stow away hose **D**.
15. Close and lock filler cap **C**.
16. Close the valve cover – *see "Close the valve cover" on page 7-18*

Information
After one minute without actuation the pump automatically enters standby mode.

Fuel-filling pump status indicators

LED			
Green	Yellow	Red	Status
POWER	**FULL TANK**	**RUN**	
On	On	On	Standby
Flashes	Off	Off	Voltage too low
On	Off	Off	Pump switched on
On	Off	On	Pump conveys fuel
On	Off	Flashes quickly	Contact a Wacker Neuson service center
On	Off	Flashes slowly	Contact a Wacker Neuson service center
On	On	Off	Refueling completed
On	Flashes	Off	Not enough fuel in the fuel hose (at the beginning of refueling)
			Not enough fuel in the barrel (at the end of refueling)
Flashes	Flashes	Off	Contact a Wacker Neuson service center
Off	Flashes	Flashes	Contact a Wacker Neuson service center

Information
Refueling stops in the following cases:
- ► Push button **E** is pressed and held for a longer period.
- ► The maximum refueling time of 10 minutes was exceeded.
- ► Due to an error message or a full fuel tank.

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Stationary fuel pumps

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

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Water separator



Fig. 249

Water separator **A** is located under the engine cover.

Emptying the water separator

Information

Empty the water separator if the error message SPN 97 appears on the multifunctional display.

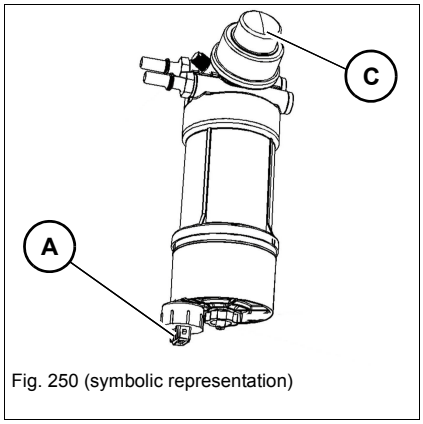


Fig. 250 (symbolic representation)

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Prepare a suitable container for collecting the fuel/water mixture.
3. Open the engine cover.
4. Connect a suitable hose to the drain device **A**.

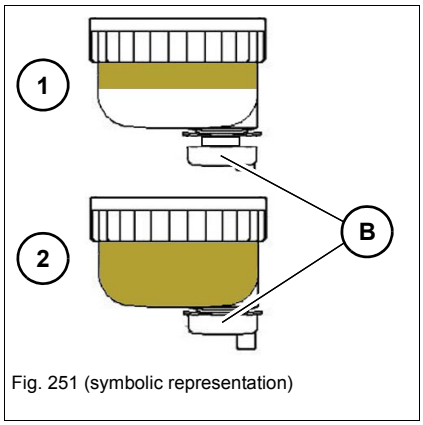


Fig. 251 (symbolic representation)

5. Open drain valve **B**.
6. Loosen bleed screw **C**.
7. Drain the fuel/water mixture into a receptacle (**1**).
8. Tighten bleed screw **C**.
9. Close drain valve **B** if nothing but fuel is visible in the sight glass (**2**).
10. Remove the hose.
11. Close and lock the engine cover.

Environment

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

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

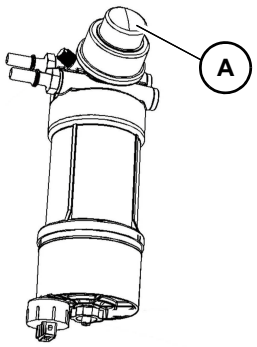


Fig. 252 (symbolic representation)

Bleed as follows:

1. Raise the control lever base.
2. Remove the starting key and carry it with you.
3. Fill up and close the fuel tank.
4. Open the engine cover.
5. Press pump **A** several times until a firmer resistance can be felt.
6. Press pump **A** five times.
7. 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.

Information

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

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7.8 Engine lubrication system

Important information regarding the engine lubrication system

NOTICE

Possible engine damage due to incorrect engine oil level.

► The oil level must be between the MIN and MAX marks.

NOTICE

Damage due to wrong engine oil.

► Use engine oil according to **“Fluids and lubricants”**.

► Have the oil changed only by a Wacker Neuson service center.

NOTICE

Possible engine damage due to adding engine oil too quickly.

► Add the engine oil slowly so it can go down without entering the intake system.

Information

Check the oil level once a day. Wacker Neuson recommends checking before starting the engine. Check the oil level not less than five minutes after stopping the engine.

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Checking the engine oil level

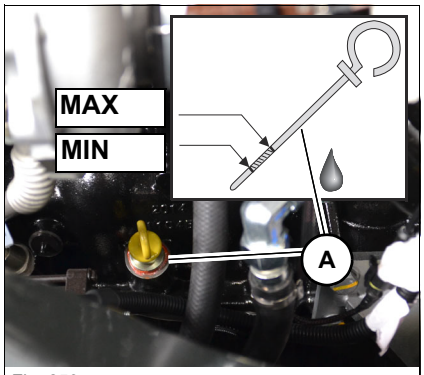


Fig. 253

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

Adding engine oil

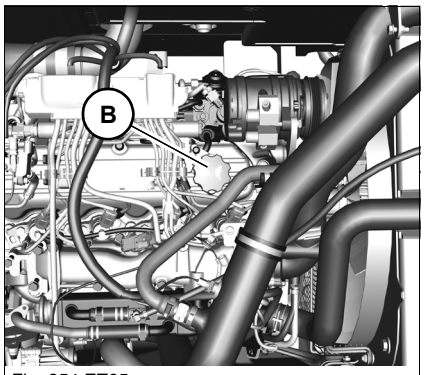


Fig. 254 ET65

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
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 five 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. Slide in oil dipstick **A** completely.
12. Close and lock the engine cover.

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7.9 Cooling system

Important information regarding the cooling system

The radiator is located in the engine compartment, on the right side of the engine.

WARNING

Poisoning hazard due to hazardous substances!

Contact with hazardous substances can cause serious injury or death.

- ► Wear protective equipment.
- ► Do not inhale or swallow coolant.
- ► Avoid contact of the coolant or antifreeze with the skin and eyes.

WARNING

Burn hazard due to coolant or antifreeze!

The coolant and antifreeze are easily flammable fluids that can cause serious burns or death if they are brought into contact with fire or open flames.

- ► Wear protective equipment.
- ► Only perform maintenance on an engine that has cooled down.
- ► Fire, open flames and smoking is prohibited.

WARNING

Burn hazard due to hot coolant!

At high temperatures, the cooling system is under pressure and can cause burning of the skin.

- ► Wear protective equipment.
- ► Let the engine cool down.
- ► Carefully open the radiator cap.

NOTICE

Possible engine damage due to wrong coolant.

- ► Observe the fluids and lubricants table, and the coolant compound table.

NOTICE

Possible engine damage due to low coolant level.

- ► Check the coolant level once a day.

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Checking the coolant level

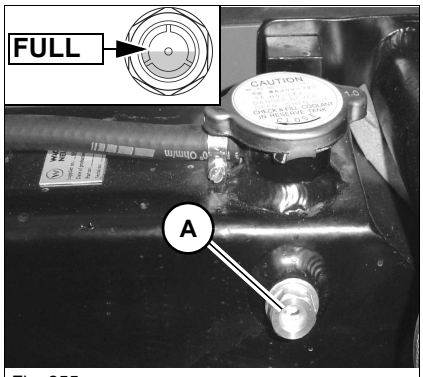


Fig. 255

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
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 before starting the engine. Observe the coolant compound table.

Adding coolant

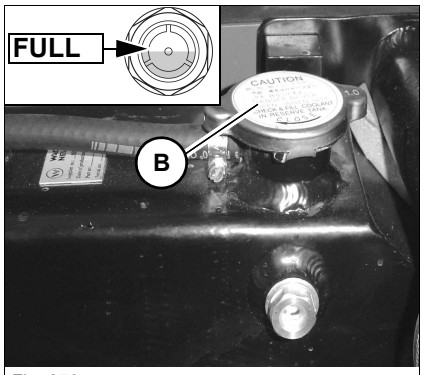


Fig. 256

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Open the engine cover.
3. 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.

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Cleaning the radiator

CAUTION

Burn hazard due to hot surfaces!

Hot radiators can cause burns.

► Stop the engine and let it cool down.

► Wear protective equipment.

NOTICE

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

► Check and if necessary clean the radiator once a day.

► In dusty or dirty work conditions, clean more frequently than indicated in the maintenance plans.

NOTICE

Possible damage to radiator fins during cleaning.

► Keep a safe distance from the radiator during cleaning.

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

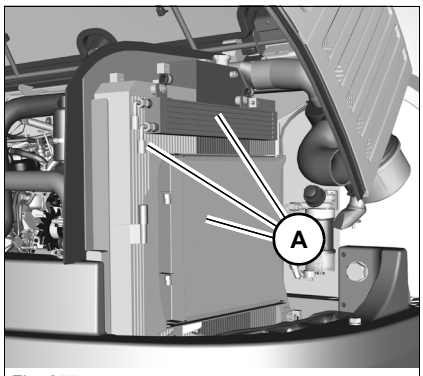


Fig. 257

The combined cooler, fuel radiator and condenser (option) **A** are located on the right in the engine compartment.

1. Stop and park the machine. Stop the engine *– see "Preparing lubrication" on page 7-7*.
2. Open the engine cover.
3. Remove dust and other foreign bodies from the fins with compressed air.
4. Close and lock the engine cover.

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7.10 Air filter

Have maintenance performed only by a Wacker Neuson service center.

Checking the air intake

NOTICE

Possible engine damage due to intake of dirty air.

► Check once a day before putting the machine into operation.

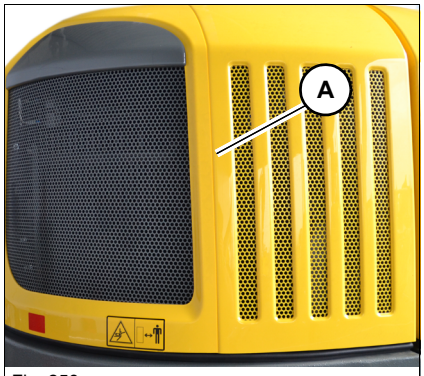


Fig. 258

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Remove the starting key and carry it with you.
3. Check and if necessary clean ventilation grill **A**.

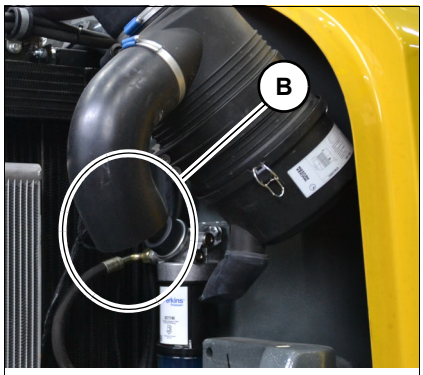


Fig. 259

4. Open the engine cover.
5. Check and if necessary clean air intake **B** at the air filter.
6. Close and lock the engine cover.

7.11 V-belt

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

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7.12 Hydraulic system

Important information on the hydraulic system

WARNING

Burn hazard due to hot hydraulic oil!

Hot hydraulic oil can cause burning to the skin, serious injury or death.

- ► Release the pressure in the hydraulic system.
- ► Let the engine cool down.
- ► Wear protective equipment.

WARNING

Injury hazard due to fluid escaping under pressure!

Hydraulic oil escaping under pressure can penetrate the skin and 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. If oil contacts the eye flush immediately with clean water and seek medical treatment.
- ► Have damaged or leaky threaded fittings, hoses and pressure lines immediately repaired or replaced by a Wacker Neuson service center. Search for hydraulic leaks with a piece of cardboard.

NOTICE

Damage due to wrong hydraulic oil.

- ► Use only hydraulic oil according to **Fluids and lubricants**.
- ► Have the hydraulic oil changed only by a Wacker Neuson service center.

NOTICE

Damage to hydraulic system due to incorrect hydraulic oil level.

- ► With a warm engine, the hydraulic oil must be about at the middle of the sight glass.
- ► Check the hydraulic oil level once a day.

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NOTICE

Possible damage to hydraulic system due to dirty hydraulic oil.

- ► Always add hydraulic oil using the filling screen.
- ► 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.
- ► Get in touch with a Wacker Neuson service center if the hydraulic oil filter is dirty.

Checking the hydraulic oil level

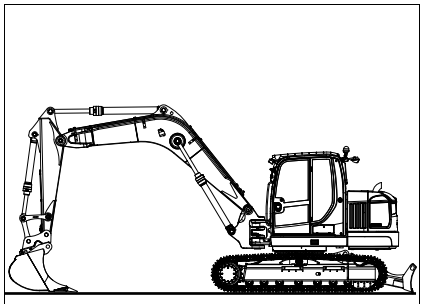


Fig. 260 (symbolic representation)

1. Park the machine 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.

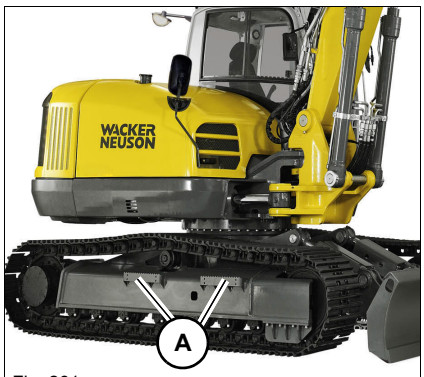


Fig. 261

7. Open the valve cover. Use climbing aids **A** to climb onto the tracks.

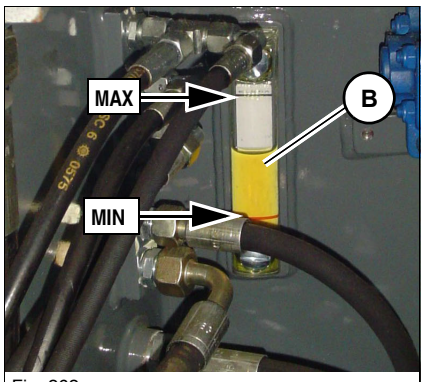


Fig. 262

8. Sight glass **B** is located below the valve cover.
9. Check the oil level on sight glass **B**.
   - ➥ With a warm engine, the oil level must be about at the middle of sight glass **B**.
10. Add hydraulic oil if the oil level is below this mark.

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Adding hydraulic oil

CAUTION

Slipping/tripping hazard when adding hydraulic oil!

Can cause injury.

► Use a safety-oriented ladder to add hydraulic oil.

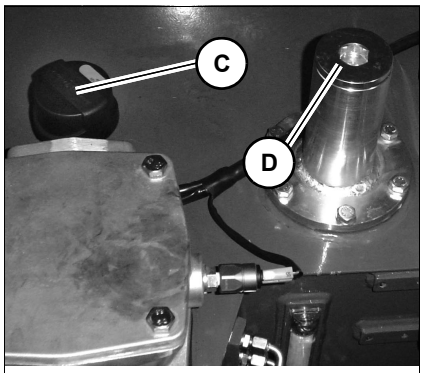


Fig. 263

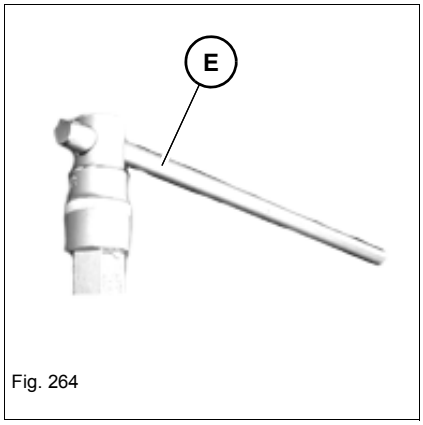


Fig. 264

1. Perform steps 1 – 9 *– see "Checking the hydraulic oil level" on page 7-36*.
2. Open breather filter **C** slowly to release the pressure inside the hydraulic oil reservoir.
3. Remove breather filter **C**.
4. Slowly open screw plug **D** with tool **E** included in the tool kit.
5. Add hydraulic oil up to the corresponding mark.
6. Check the hydraulic oil level on sight glass **B**.
7. Add if necessary and check again.
8. Put screw plug **D** into place and screw on tightly.
9. Put breather filter **C** into place and screw on tightly.
10. Close and lock the valve cover.

Environment

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

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Checking the hydraulic system and hoses

Check the hydraulic system and hoses daily for leaks and general condition.

NOTICE

Leaks and damaged pressure lines must immediately be 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.

► Have damaged or leaky pressure lines immediately repaired or replaced by a Wacker Neuson service center.

► 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.
- Retighten leaking threaded fittings and hose connections only when the system is not under pressure. Release the pressure before working on pressure lines.
- Do not weld or solder damaged or leaking pressure lines and threaded fittings, but have them replaced.
- Wear protective equipment.

In this respect, Wacker Neuson recommends that you observe all the relevant safety regulations for hydraulic lines, as well as the safety regulations regarding accident prevention and occupational health and safety in your country. Also observe DIN 20066, part 5.

The article number is on the clamping section of each hose connection.

The date of manufacture is indicated on each flexible line.

Have a line immediately 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.

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7.13 Electrical system

Important information regarding the electrical system

Maintenance and repair work on the electrical system may be performed only by a Wacker Neuson service center!

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

Alternator

- Contact a Wacker Neuson service center if the alternator charge indicator light is malfunctioning.

WARNING

Injury hazard due to malfunctioning batteries!

Batteries give off explosive gases that can cause deflagrations if ignited.

► Wear protective equipment.
► Fire, open flames and smoking is prohibited.
► Do not jump start the engine if the battery is malfunctioning or frozen, or if the acid level is too low.
► Do not place conductive articles on the battery – risk of short circuit.

NOTICE

Possible damage to electrical components or engine electronics.

► Do not place conductive articles on the battery – risk of short circuit.
► Do not interrupt voltage-carrying circuits at the battery terminals because of the sparking hazard.
► Do not disconnect the battery while the engine is running.

Environment

Dispose of old batteries in an environmentally friendly manner.

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Fuses and relays

– see chapter “9.8 Electrical system” on page 9-3

Battery

The battery may be checked, disconnected, charged and replaced only by a Wacker Neuson service center.

7.14 Heating, ventilation and air conditioning system

Replacing/cleaning the cabin air filter

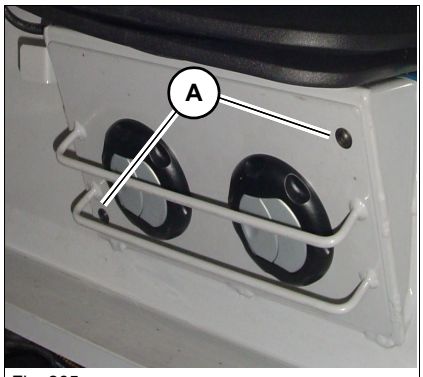


Fig. 265

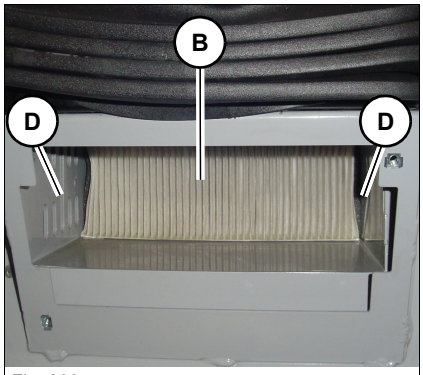


Fig. 266

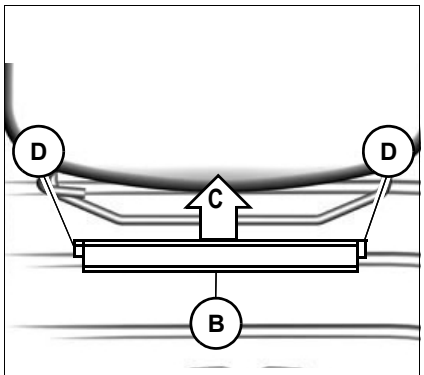


Fig. 267

The cabin air filters are located under the seat.

NOTICE

Water damages the filter elements.

- ► Never wash or brush out the filter elements.
- ► Only clean the filter elements with unlubricated compressed air with max. 2 bar (29 psi).

The cabin air filters are located under the seat.

1. Loosen screws **A** and take off the cover.
2. Remove filter **B** and clean it, or replace it after 1000 o/h.

Information

Bear in mind the direction of the air flow C on the cabin air filter.

- ► The arrow on the filter elements must point to the operator seat.
- ► The arrow on seal D must point to the operator seat.

3. Close seal D tightly on either side with the frame.
4. Install the cover and tighten screws **A**.

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7.15 Washer system

Only use glass cleaner (with antifreeze if necessary) for refilling.

Checking the fluid level and adding fluid

WARNING

Burn hazard due to hot surfaces!

Can cause serious burns or death.

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

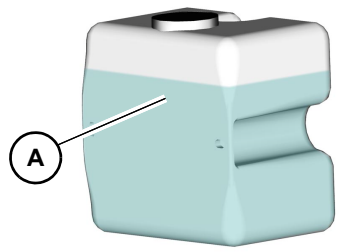


Fig. 268

Reservoir **A** is located on the right under the valve cover.

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Open the valve cover.
3. Check the fluid level in tank **A** and add fluid if necessary.
4. Close and lock the valve cover.

7.16 Axles/traveling drive

Have maintenance performed only by a Wacker Neuson service center.

7.17 Braking system

Have maintenance performed only by a Wacker Neuson service center.

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7.18 Tracks

WARNING

Crushing hazard during work under the machine!

Working under the tracks can cause serious injury or death.

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

Checking track tension

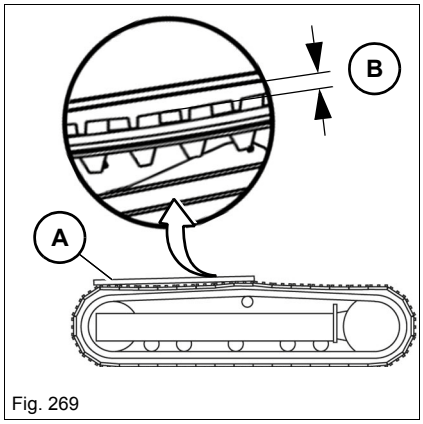


Fig. 269

Steel tracks

Place a measuring rod **A** across the highest points of the track.

- Adjust the track tension if tolerance **B** between the middle track roller and the track is not 35 mm (1.4 in).

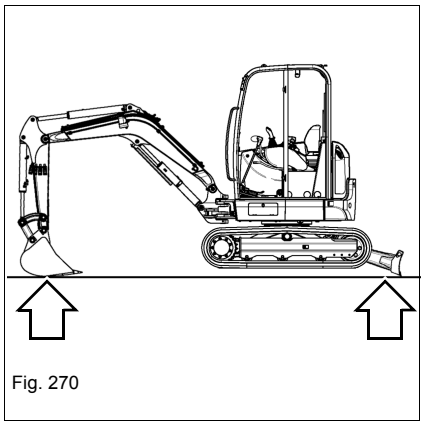


Fig. 270

Rubber tracks (option)

1. Park the machine on firm, level and horizontal ground.
2. Raise the machine evenly and horizontally by means of the boom and stabilizer blade.

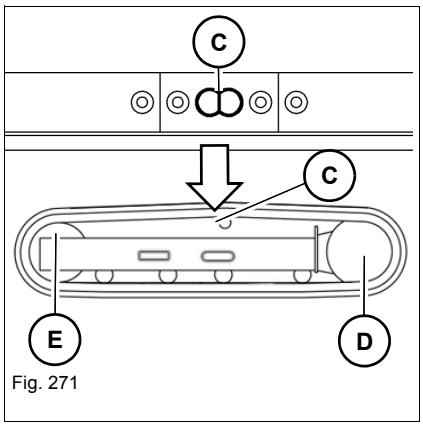


Fig. 271

3. Place the tracks so that mark **C** is in the middle between drive pinion **D** and track tension roller **E**.
4. Stop the engine.
5. Operate the control lever repeatedly to release the pressure in the hydraulic system.
6. Raise the control lever base.

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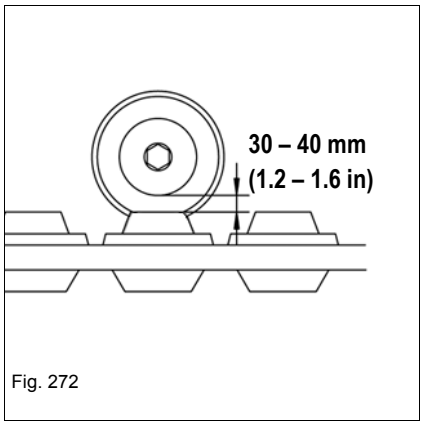


Fig. 272

Correcting track tension

7. Remove the starting key and carry it with you.
8. Adjust the track tension if the play between the track roller and the track is not 30 – 45 mm (1.2 – 1.6 in).

WARNING

Injury hazard due to grease escaping under pressure!

Grease escaping under pressure can penetrate the skin and cause serious injury or death.

- ► Open the lubricating valve only very carefully and do not unscrew it more than one revolution.
- ► Wear protective equipment.
- ► Contact a Wacker Neuson service center if you are unable to reduce the track tension.

NOTICE

Possible damage to cylinders and tracks due to overtightening.

- ► Tighten the tracks only up to the mandatory measuring distance.

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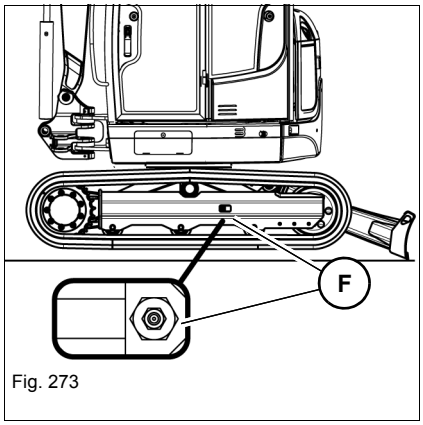


Fig. 273

Tightening the tracks

1. Park the machine 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 **F**.
6. Lower the machine to the ground.
7. 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.
8. Check the track tension again.
   ➥ If it is not correct:
9. Repeat steps 2 – 8. Contact a Wacker Neuson service center if track tension still is too low after pumping in more grease.

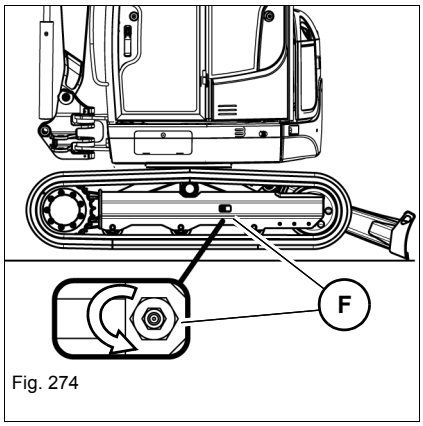


Fig. 274

Reducing tension

1. Place a suitable container underneath to collect the grease.
2. Slowly turn lubricating valve **F** a maximum of one revolution anticlockwise to release the grease.
   ➥ The grease flows out of the groove of the lubricating valve.
3. Retighten lubricating valve **F**.
4. In order to check that the tension is correct:
   - Lower the machine to the ground,
   - Start the engine,
   - Let it run at idling speed without any load, then slowly move the machine forward and reverse, then turn 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.

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7.19 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.

7.20 Maintenance of options

Eyes

Have a Wacker Neuson service center check all eyes regularly:

- Machine lifting eyes
- Attachment lifting eyes
- Attachment load hooks
- Tie-down points
- Towing eyes

Have eyes or load hooks with inadmissible wear, a defective spring mechanism, etc. immediately replaced by a Wacker Neuson service center.

Hydraulic quickhitch Oil Quick

Perform maintenance on the quickhitch once a day with the other machine maintenance according to maintenance plan.

7.21 Exhaust gas treatment

Diesel particulate filter

The machine is equipped with a diesel particulate filter.

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

Regeneration takes about 30 minutes. The more often the automatic regeneration mode is corrected or modified, the longer regeneration takes.

If the dirt in the diesel particulate filter reaches a critical value, engine output is reduced and machine operation has to be stopped.

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

WARNING

Health hazard due to exhaust gases!

Can cause serious health hazards or death.

► Do not inhale exhaust gases.

► Use suitable exhaust-gas suction systems.

► Ensure sufficient ventilation during operation in enclosed areas.

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WARNING

Burn hazard at the exhaust system!

During regeneration, the exhaust system can develop exhaust-gas temperatures of about 600 °C (1,112 °F), even if the engine is running at idling speed, which can cause serious burns or death.

► Keep a safe distance from the exhaust system.

WARNING

Fire hazard during regeneration!

Hot exhaust gases in easily flammable surroundings can cause serious injury or death.

► In environments with easily flammable material, disable the **automatic regeneration** mode.

► Do not perform manual regeneration in environments with easily flammable material.

► Use only exhaust gas suction systems that are suitable for the temperatures achieved during regeneration.

NOTICE

Possible damage to the engine.

► Only use clean diesel fuel according to the engine/machine **fluids and lubricants**. Do not use biodiesel.

Information

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

► High engine load = few deposits.

► Low engine load = more deposits.

Information

Wacker Neuson recommends not to influence the automatic regeneration system if possible. Should disabling or interrupting regeneration be necessary, perform it again as soon as possible.
This increases the service life of the diesel particulate filter and avoids unscheduled stops at the service center, for example with shorter engine-oil replacement intervals.

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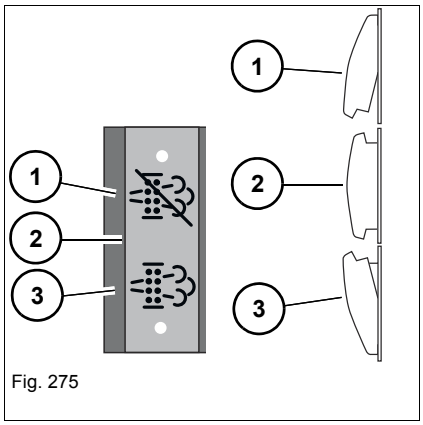


Fig. 275

Regeneration push button

The push button is in the middle position and can be pressed either upward or downward, but does not engage.

The **automatic regeneration** mode is preset if the engine is stopped for at least 30 seconds.

Push button functions:

1: disable/interrupt/re-enable regeneration

2: **automatic regeneration** mode (middle position)

3: start manual regeneration

Status messages – *see "Diesel particulate filter indicator lights" on page 8-3*.

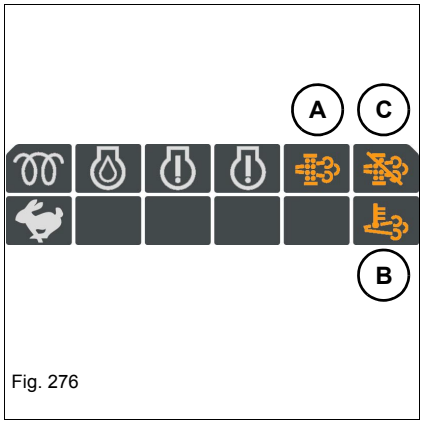


Fig. 276

Indicator lights

Three indicator lights indicate the regeneration status.

A: Regeneration required
This indicator light illuminates if the contamination level reaches a specific value.

B: Increased exhaust-gas temperature
This indicator light illuminates during regeneration. It goes out once regeneration is over and the system has cooled down.

C: Regeneration disabled/interrupted

This indicator light illuminates if the push button is pressed to position **1**.

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Automatic regeneration mode

The **automatic regeneration** mode is preset if the engine is stopped for at least 30 seconds.

NOTICE

Fire hazard at the exhaust system.

- ► There must be no easily flammable material in the direct vicinity of the exhaust system, in particular near the end pipe.
- ► In environments with easily flammable material, disable the **automatic regeneration** mode.

If the diesel particulate filter has reached a certain contamination level, indicator light **A** illuminates and an automatic regeneration is performed soon.

Indicator light **B** illuminates in addition during regeneration.

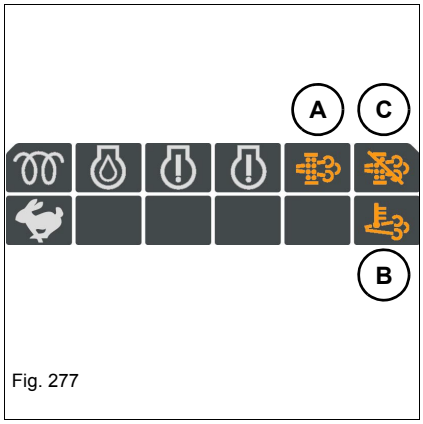


Fig. 277

Information

The machine can be operated as usual during regeneration.

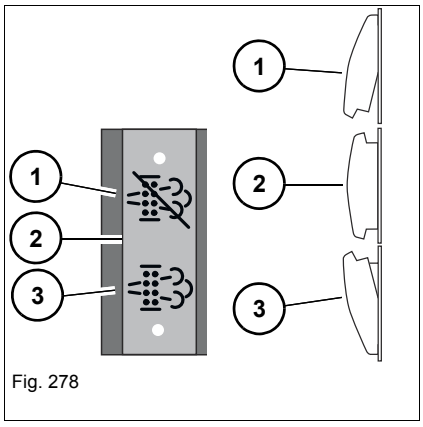


Fig. 278

To disable the **automatic regeneration** mode:

Press and hold the push button at least three seconds in position **1**.

➥ Indicator light **C** illuminates.

To re-enable the **automatic regeneration** mode:

Press and hold the push button at least three seconds in position **1**.

➥ Indicator light **C** does not illuminate.

To interrupt automatic regeneration:

Press and hold the push button at least three seconds in position **1**.

➥ Indicator light **C** illuminates.

Information

Disabling regeneration increases the contamination level in the particulate filter.

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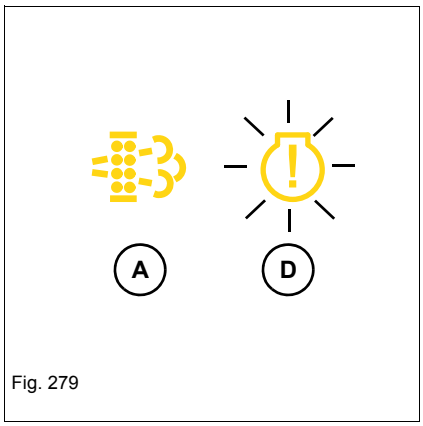


Fig. 279

Manual regeneration

Indicator light **A** illuminates and indicator light **D** flashes.

➥ Manual regeneration is possible only in this case and has to be started.

NOTICE

Possible damage to engine or particulate filter.

NOTICE

Fire hazard at the exhaust system.

► There must be no easily flammable material in the direct vicinity of the exhaust system, in particular near the end pipe.

► Do not perform manual regeneration in surroundings with easily flammable material.

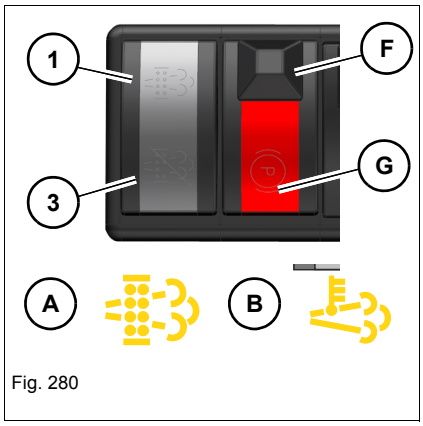


Fig. 280

Starting manual regeneration

1. Travel the machine out of the danger zone and into a safe area.
2. Apply the parking brake: pull lock **F** downward and press switch **G** downward.
3. Press and hold the **Regeneration** push button at least 10 seconds in position **3**.

➥ Indicator lights **A** and **B** illuminate during regeneration.

Interrupting manual regeneration

Press and hold the **Regeneration** push button at least 3 seconds in position **1**.

Information

Machine travel or operation is prohibited during manual regeneration.

► The operator may not leave the machine during regeneration.

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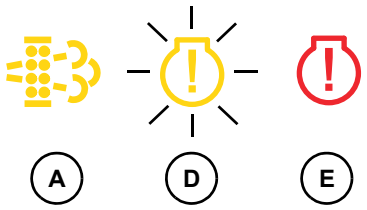


Fig. 281

Regeneration not performed – stopping the machine

Engine output is reduced if indicator lights **A** and **E** illuminate and if indicator light **D** flashes.

Stop the engine immediately and contact a Wacker Neuson service center.

NOTICE

Possible damage to engine or particulate filter.

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Notes:

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8 Malfunctions

8.1 Diesel engine

Information
Troubleshooting may be performed only by a Wacker Neuson service center.

Engine warning lights

Engine warning	Engine stop	Description
Yellow	Red	Indicator light color
		
On	On	All warning and indicator lights illuminate for a few seconds if the starting key is turned to position 1.
Off	Off	No malfunction.
On	Off	The engine runs correctly, but there is an error in the electronic engine management. Contact a Wacker Neuson service center.
Flashes	Off	The engine runs correctly, but a diagnosis or error code is issued causing a reduction of engine output. Contact a Wacker Neuson service center.
Flashes	On	Engine is about to be shut down, or is already shut down. Stop the engine immediately and contact a Wacker Neuson service center.

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Engine and engine oil indicator lights

Engine warning	Engine stop	Oil pressure	Description
Yellow	Red	Red	Indicator light color
			
On	On	On	All warning and indicator lights illuminate for a few seconds if the starting key is turned to position 1. If the engine stop or oil pressure light does not illuminate, stop machine operation immediately and contact a Wacker Neuson service center.
Off	Off	Off	No malfunction.
On	On	On	Low oil pressure (if the oil pressure indicator light illuminates during operation). Check the oil level and add oil if necessary – *see chapter " Adding engine oil" on page 7-30*. If the malfunction is still indicated, stop the engine and contact a Wacker Neuson service center.
Off	Off	Flashes	The engine oil and engine oil filter replacements are due within the next 20 operating hours.
On	Off	Flashes	The engine oil has reached the total operation time.
Flashes	On	Flashes	The engine oil has exceeded the total operation time. Contact a Wacker Neuson service center. The engine performance is reduced since the maintenance interval is exceeded.

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Diesel particulate filter indicator lights

Engine warning	Engine stop	Exhaust-gas temperature	Regeneration required	Regeneration disabled	Description
Yellow	Red	Yellow	Yellow	Yellow	Indicator light color
					
On	On	On	On	On	After switching on the starter, the indicator lights are checked during the first 2 seconds.
Off	Off	Off	Off	Off	No malfunction.
Off	Off	Off	On	Off	Regeneration is performed soon.
Off	Off	On	On	Off	Regeneration is being performed. Increased exhaust-gas temperature.
Off	Off	On	Off	Off	Regeneration is completed. Increased exhaust-gas temperature. The system cools down.
Off	Off	Off	Off	On	Regeneration is disabled or interrupted.
Flashes	Off	Off	On	Off	The soot load has reached the permissible value. Engine performance is reduced. Regeneration is required.
Flashes	On	Off	On	Off	The soot load has exceeded the permissible value. Engine performance is reduced. Travel the machine out of the area with easily-flammable matter and stop the engine immediately. Contact a Wacker Neuson service center.

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8.2 Malfunctions (display element/multifunctional display)

Symbol	Description	See
	**Engine stop** Stop the engine immediately. Contact a Wacker Neuson service center.	--
	**General malfunction** Stop the engine immediately. Contact a Wacker Neuson service center.	--
	**Low Engine Oil Pressure** Stop the engine immediately. Contact a Wacker Neuson service center.	--
	**Engine malfunction** Stop the engine immediately. Contact a Wacker Neuson service center.	--
	**Charge indicator light** Possible alternator or V-belt malfunction. **Note**: Increase the engine speed. The electrical system is in working order if the charge indicator light goes out after about one minute. If the malfunction is still indicated, stop the engine immediately and contact a Wacker Neuson service center.	--
	**Hydraulic oil temperature too high** • Check the hydraulic oil level and add oil if necessary. • Hydraulic oil cooler dirty; clean hydraulic oil cooler if necessary **Note**: If the malfunction is still indicated despite having cleaned hydraulic-oil radiator and added oil, stop the engine and contact a Wacker Neuson service center.	*7-36*, *7-37* *7-33*
	**Replacing the hydraulic oil filter** Contact a Wacker Neuson service center.	--
	**Dirty air filter** Contact a Wacker Neuson service center.	--
SPN 97	Water in fuel system. Empty the water separator.	*7-27*

- Contact a Wacker Neuson service center in case of malfunctions or signs that are not listed in the following tables or that persist after maintenance has been performed correctly.
- Symbols are listed according to priority.
- Additionally an exclamation mark can appear in the display element or the multifunctional display and a buzzer can sound.

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Malfunction/sign	Possible cause	Remedy	See
Engine does not start or is not easy to start	Empty fuel tank	Refueling	*7-23*
	Malfunctioning or empty battery	Replace the battery	--
	Malfunctioning fuse	Check the fuse	*9-5*
Engine starts, but does not run smoothly or faultless	Air in fuel system	Bleeding the engine	*7-28*
	Water in fuel system	Empty the water separator	*7-27*
Machine pulls to the right or left	Wrong track tension	Check track tension	*7-42*
	Foreign bodies stuck in track	Contact a Wacker Neuson service center	--
None of the hydraulic functions can be operated	Control lever base raised	Lower the control lever base	*4-46*
Working light or horn does not work.	Malfunctioning fuse	Check the fuse	*9-5*
Fan does not run	Malfunctioning fuse	Check the fuse	*9-5*
	Electrical fault	Contact a Wacker Neuson service center	--
Reduced or no heat dissipation capacity	Not enough refrigerant in the system	Contact a Wacker Neuson service center	--
	Malfunctioning V-belt		
	Dirty condenser	Clean the condenser	*7-33*
	Temperature controller set to heating	Set the temperature controller to cooling	*5-16*
Reduced heating output or none at all	Malfunctioning thermostat	Contact a Wacker Neuson service center	--
	Temperature controller set to cooling	Set temperature controller to heating	*5-16*
Loss of refrigerant	Loose hose connection	Contact a Wacker Neuson service center	----
	Leak in system		
Machine very loud	Malfunctioning V-belt	Contact a Wacker Neuson service center	--
	Damaged air conditioning compressor		
	Damaged fan motor		

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Service menu/error messages

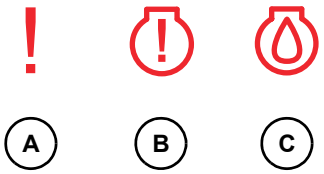


Fig. 282

If one of the symbols **A**, **B** or **C** appears, there is a serious error.

In case of serious errors, stop the machine immediately.

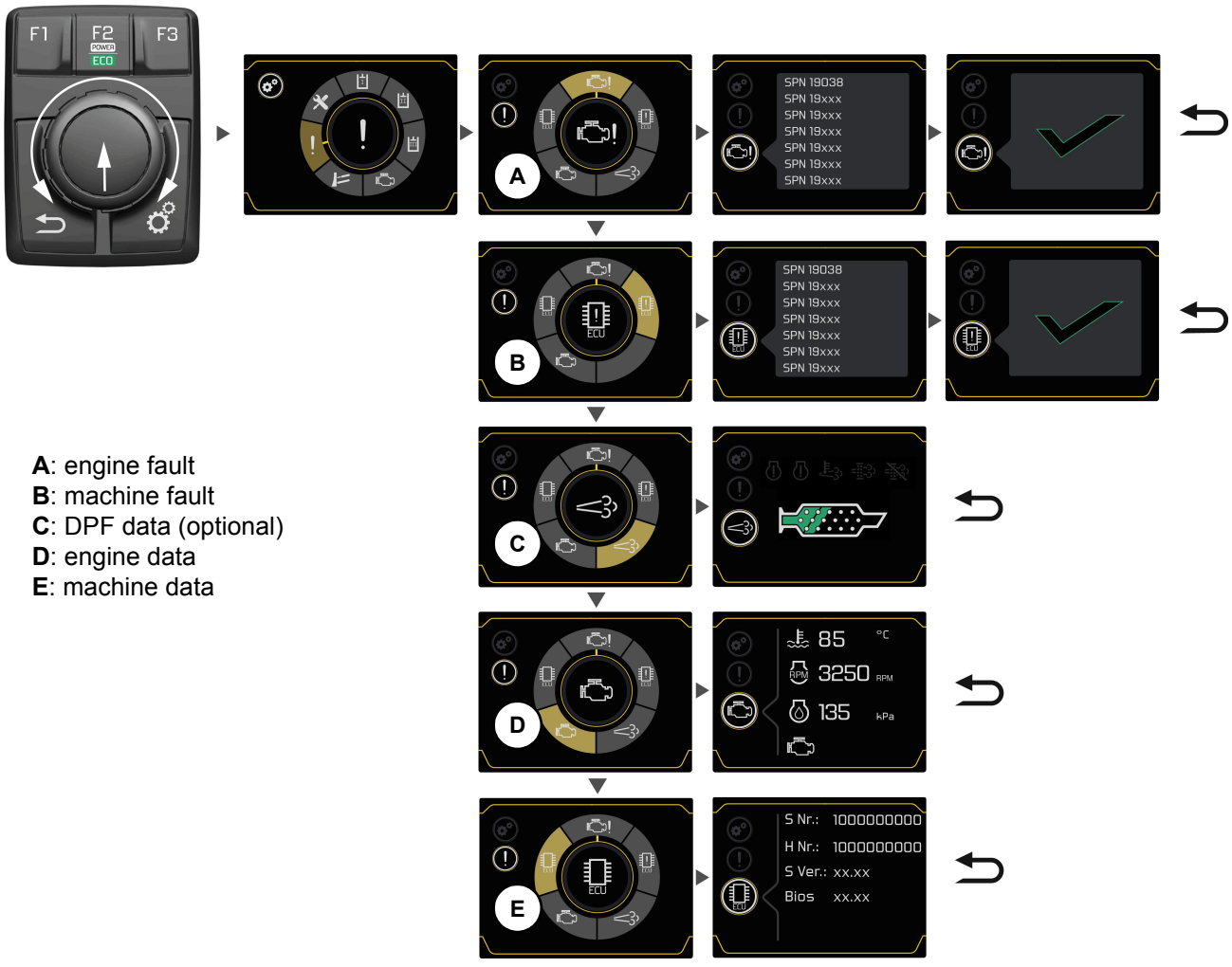
- Engine performance is reduced.
- Stop and park the machine.
- Contact a Wacker Neuson service center and have the malfunction rectified.

Machine travel and operation is possible in case of minor errors.

- Engine performance is not reduced.
- Contact a Wacker Neuson service center and have the malfunction rectified.

Information

Any faults present appear in the multifunctional display for a few seconds after starting the engine.



A: engine fault
B: machine fault
C: DPF data (optional)
D: engine data
E: machine data

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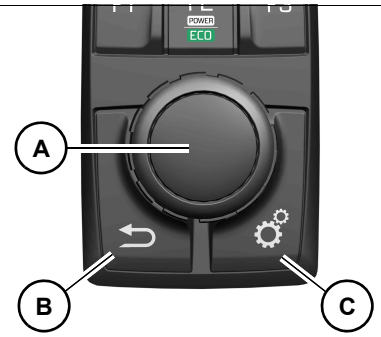


Fig. 283

Performing the adjustments

- Press push button **C** to call the settings.
- The settings are selected (turn) and confirmed (press) with adjustment button **A**.

Push button **B** (return) takes you back to the previous menu level.

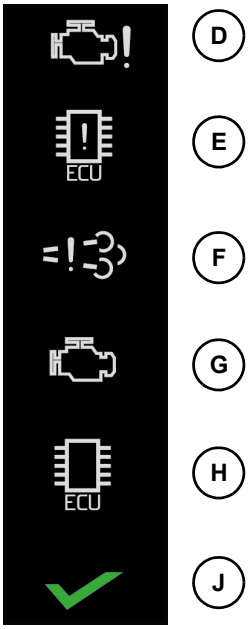


Fig. 284

Symbols

D: engine fault

E: machine fault

F: diesel particulate filter data

G: engine data

H: machine data

J: no faults

Push button **B** (return): back to previous menu item.

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Notes:

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9 Technical data

9.1 Models and trade names

Machine model	Trade name
E11-02	ET145

9.2 Engine

Engine	ET145
Manufacturer	Perkins
Type	854E-E34TAWF
Design	Water-cooled 4 stroke diesel engine
Intake system	Turbo-charging, charge air cooling
Fuel injection system	Direct
Engine management	Electronic
Displacement	3,387 cm^3 (207 in^3)
Nominal bore and stroke	99 mm x 110 mm (3.9 x 4.3 in)
Rated output at rated speed[1]	55 kW at 2,200 rpm (73.8 hp at 2,200 rpm)
Engine output at preset maximum engine speed	55 kW at 2,050 rpm (73.8 hp at 2,050 rpm)
Max. torque	420 Nm at 1,600 rpm (310 ft.lbs.) at 1,600 rpm
Max. engine speed without load	2200 +/− 25 rpm
Lower idling speed	800 +/− 25 rpm
Preheating system	Sheathed-element heater plugs[2]
Exhaust-gas treatment	Diesel particulate filter
Exhaust values according to	EC97/68 according to 2004/26/EC level 4 US EPA 40 CRF Part 1039 Tier IV final

1. Output values can vary by +/− 5 %.
2. Preheating time controlled by engine control unit

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9.3 Traveling drive

	ET145
Traveling drive	Axial-piston motor with planetary drive

9.4 Brakes

See “Drive levers/accelerator pedals”

9.5 Tracks

Type	Width mm (in)	Ground pressure kg/cm^2 (lbs/in^2)	Ground clearance mm (in)
Steel	500 (20)	0.50 (7.1)	480 (19)
Rubber (option)	500 (20)	0.48 (6.8)	
Steel (option)	600 (24)	0.42 (6.0)	
Hybrid (option)	500 (20)	0.49 (7.0)	
Steel (option)	700 (28)	0.37 (5.3)	

9.6 Steering system

See “Drive levers/accelerator pedals”

9.7 Operating hydraulics

	ET145
Max. operating pressure (travel operation)	340 bar (4,931 psi)
Max. operating pressure (operating hydraulics)	320 bar (4,641 psi)
Hydraulic reservoir capacity (middle of sight glass)	110 l (29.1 gal)
Flow rate	305 l/min (80.7 gal/min)
Filter	Return filter
Swivel range of upper carriage	360°
Rotation speed of upper carriage	11.6 rpm

Maximum speed

	ET145
Speed range 1	3 kph (1.9 mph)
Speed range 2	5 kph (3.2 mph)

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9.8 Electrical system

WARNING

Fire hazard in case of incorrect handling of electric components!

Can cause serious injury or death.

- ► Use only specified fuses.
- ► Do not repair or bypass fuses.
- ► If a replaced fuse is blown again directly, do not put the machine into operation and contact a Wacker Neuson service center.

NOTICE

Explosion hazard in case of incorrect handling of fuses.

- ► Use only specified fuses.
- ► Do not repair or bypass fuses.
- ► If a replaced fuse is blown again directly, do not put the machine into operation and contact a Wacker Neuson service center.

Electrical components

	ET90
Alternator	12 V 95 A
Starter	12 V 4.0 kW (5.4 hp)
Battery (according to DIN EN 50342, DIN IEC 60095-2)	12 V/120 Ah

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Main fuse box

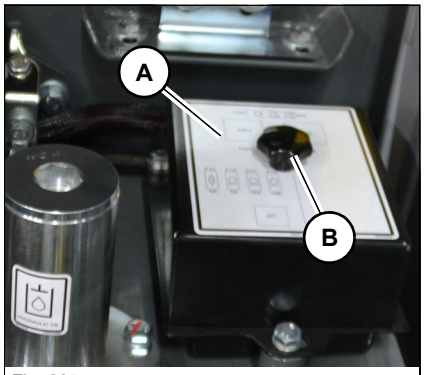


Fig. 285

Main fuse box **A** is located under the valve cover.

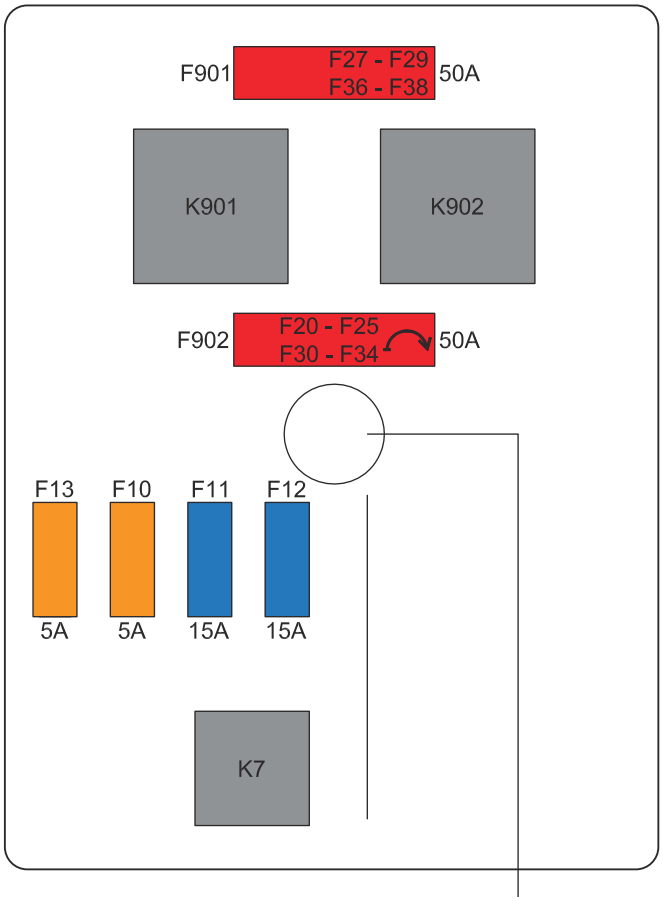
1. Opening:

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Open the valve cover.
3. Loosen screw **B** and remove the cover.

Closing:

1. Install the cover and tighten screw **B**.
2. Close the valve cover.

Assignment:



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Cabin fuse box

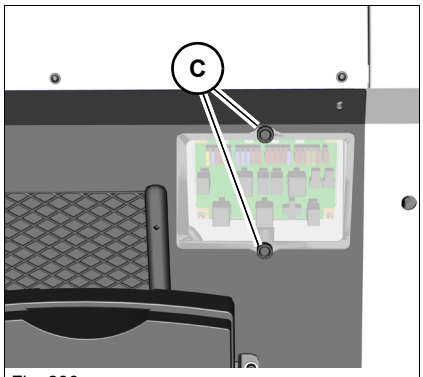


Fig. 286

The cabin fuse box is located at the rear of the cabin.

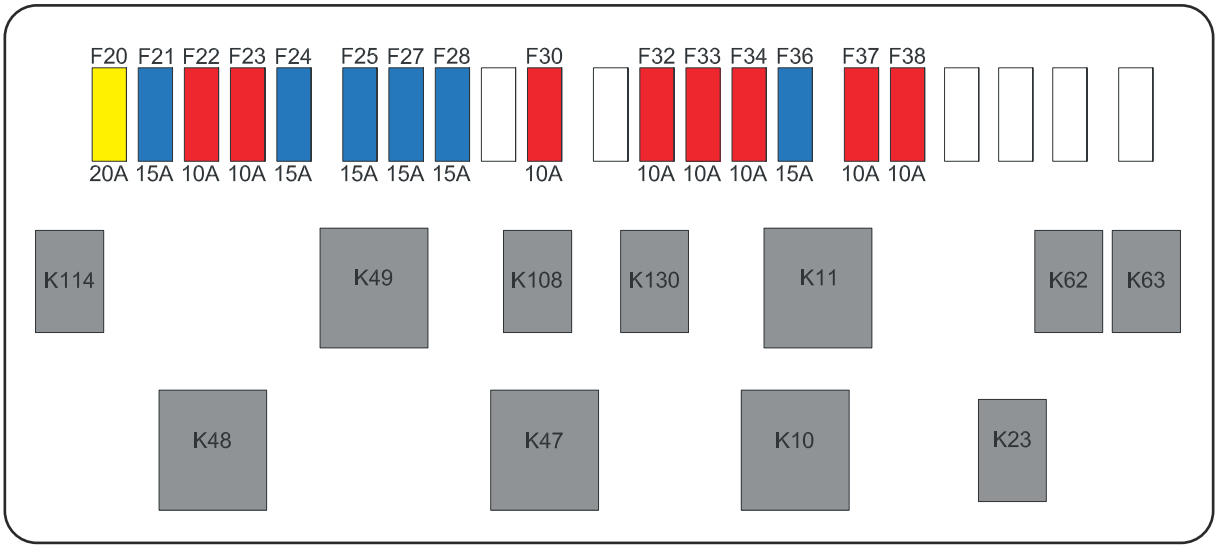
1. Opening:

1. Stop and park the machine. Stop the engine – *see "Preparing lubrication" on page 7-7*.
2. Loosen screw **C** and remove the cover.

Closing:

1. Install the cover and tighten screw **C**.

Assignment:



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Fuse	Ampere	Relays	Protected circuits
F901	50		12V15-1, K901, K7, F27 – F29 and F36 – F38, preheating, fuel-filling pump
F902	50		Engine control unit, F20 – F25 and F30 – F34, starter, 12 V 30, 12 V 15
F10	5	K902	Engine control unit
F11	15		
F12	15		
F13	15		
F20	20	--	Control valve TTC 77
F21	15	--	Control valve TTC 30
F22	10	--	Main controls
F23	10	K114	Rotating beacon, radio, Telematik
F24	15	--	12 V socket valve compartment
F25	15	--	12 V socket (cabin)
F27	15	K48, K901	Working light on chassis
F28	15	K49, K901	Cabin working lights
F29	10	--	Not assigned
F30	10	--	Control terminal 15 (starter plus)
F31	10	--	Not assigned
F32	10	K23	Wiper
F33	10	K108, K130	Hydraulic valves, horn, electric operator seat
F34	10	--	Preheater, crankcase breather, control input
F36	15	K11, K901	Heating, automatic climate control
F37	10	K47, K901	Boom working light
F38	10	K901	IO controller, control input and output
F40	7.5	--	Not assigned
F41	7.5	--	Not assigned
F42	10	--	Not assigned
F43	10	--	Not assigned
--	--	K10	Not assigned

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Lamps

	ET145	
Working lights/roof lights	Halogen lamp	12 V 55 W H3
Interior light	Festoon lamp	10 x 38 12 V/5 W
Rotating beacon	Halogen lamp	12 V 55 W H1

Powertilt (option)

	ET145
Model size	PTS10
Swiveling range	134°
Weight	262 kg (578 lbs)

Oil Quick (Option)

	ET145
Weight	130 kg (287 lbs)

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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)	1,480 (1,092)	1,770 (1,305)	870 (642)	1250 (922)
M30	1,420 (1,047)	2,010 (1,482)	2400 (1770)	1200 (885)	1,700 (1,254)

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)	1,550 (1,143)	1,800 (1,328)	920 (679)	1300 (959)
M30X2.0	1,500 (1,106)	2,150 (1,586)	2,500 (1,844)	1300 (959)	1,850 (1,364)

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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

	ET145
Measured sound power level LwA[1]	99 dB(A)
Guaranteed sound power level LwA[1]	99 dB(A)
Uncertainty factor KpA [2]	
Operator-perceived sound pressure level LpA (with cabin) [3]	

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.

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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.
- Work site: organization, preparation, surroundings, weather conditions and material.
- Machine: version, seat quality, quality of suspension system, attachments and condition of attachments.

Precise indications on the vibration degrees cannot be made for the machine.

Determination of vibration level for the three vibration axes.

- Under typical operating conditions, use the average vibration values measured.
- In order to obtain the estimated vibration value for an experienced operator on level ground, subtract the factors from the average vibration value.
- In case of an aggressive working method or difficult terrain, add the environmental factors to the average vibration level in order to obtain the estimated vibration level.

Note:

For 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.

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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
  - Braking
  - Acceleration
  - Shifting gears
- Move attachments without any jerks.
- Adapt your speed and the itinerary to minimize vibration:
  - Travel around obstacles and uneven ground.
  - Reduce your speed 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 work sites.
- Other risk factors can affect travel comfort negatively. The following measures can improve travel comfort:
  - Adjust the operator seat and the control elements to a relaxed body posture.
  - Adjust the rearview mirrors to ensure optimal visibility so you can adopt an upright seating position.
  - Provide breaks to avoid sitting for long periods.
  - Do not jump off the cabin.
  - Picking up and raising loads repeatedly must be limited to a minimum.

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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.

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9.13 Weights

	Transport weight[1] kg (lbs)	Operating weight[2] kg (lbs)
Short stick, steel tracks	14,917 (32,886)	15,550 (34,282)

1. Transport weight: basic machine (one-piece boom, short stick, rubber tracks) + 10 % fuel tank capacity
2. Operating weight: basic machine + full fuel tank + backhoe bucket (1000 mm) + user (75 kg/165 lbs)

Determining the loading weight

The basis for calculating the loading weight is the transport weight indicated on the machine type label. Add the weights below to the transport weight (fuel depending on tank capacity). Furthermore, add the weight of any attachments (for example empty bucket) or consoles (for example Powertilt).

Option	ET145[1] kg (lbs)
Rubber tracks 500 mm (20 in)	-376 (829)
Steel tracks 600 mm (24 in)	210 (463)
Hybrid tracks 500 mm (20 in)	-68 (150)
Steel tracks 700 mm (28 in)	564 (1,243)
Long stick	46 (101)
FOPS screen	47 (104)
Front Guard	56 (123)
Preparing the Powertilt	27 (60)
Quickhitch-ready	26 (57)
Hydraulic quickhitch Oil Quick installed	170 (375)
Hydraulic quickhitch Oil Quick and Powertilt installed	350 (772)
Full fuel tank (approximate)	169 (373)

1. The weight indications for options exclusively refer to Wacker Neuson original accessories.

Information

Weight indications can vary by +/− 2 %.

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Fields of application and use of attachments

WARNING

Accident hazard due to unauthorized attachments!

If unauthorized attachments are used, the machine can tip over, which can lead to serious injury or death.

► Only use attachments released by Wacker Neuson.

NOTICE

Machine can be damaged due to unreleased attachments.

► Only use the attachments specified in the table.

Compare the weight of the attachment and its maximum payload with the indications in the relevant lift capacity table or load diagram. Never exceed the maximum payload stated in the lift capacity table or load diagram.

Information

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

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Technical data of attachments

Oil Quick system				
Bucket type	**Width mm (in)**	**Weight kg (lbs)**	**Capacity m^3 (ft^3)**	**Teeth**
Bucket	400 (16)	315 (694)	0.25 (8.8)	Yes
Bucket	500 (20)	325 (717)	0.30 (10.6)	Yes
Bucket	600 (24)	350 (772)	0.36 (12.7)	Yes
Bucket	700 (28)	390 (860)	0.40 (14.1)	Yes
Bucket	800 (32)	440 (970)	0.48 (17.0)	Yes
Bucket	900 (35)	475 (1,047)	0.56 (19.8)	Yes
Bucket	1000 (39)	505 (1,113)	0.64 (22.6)	Yes
Bucket	1100 (43)	560 (1,235)	0.72 (25.4)	Yes
Bucket	1200 (47)	620 (1,367)	0.80 (28.3)	Yes
Ditch cleaning bucket	1800 (71)	450 (992)	0.50 (17.7)	--
Ditch cleaning bucket	2000 (79)	487 (1,074)	0.56 (19.8)	--
Offset bucket	1800 (71)	675 (1,488)	0.50 (17.7)	--
Offset bucket	2000 (79)	712 (1,570)	0.56 (19.8)	--

ET145 accessories	
Attachments	**Weight kg (lbs)**
Mechanical quickhitch Lehnhoff MS10	170 (375)
Quickhitch console Oil Quick with load hook	130 (287)
Hydraulic hammer NE720	600 (1,323)
Chisel for NE720	62 (137)

Excavator forces

	ET145
Max. tearout force (short stick)[1]	69 kN (15,512 lbf)
Max. tearout force (long stick)[1]	60 kN (13,489 lbf)
Max. breakout force (at bucket tooth)[1]	91 kN (20,458 lbf)

1. According to ISO 6015

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9.14 Lift capacity/load

Safety instructions – lift capacity table

The values of the lift capacity table apply to normal operation (for example excavating).

The values of the load diagram apply to lifting gear applications.

DANGER

Crushing hazard due to tipping over of machine!

The machine causes serious injury or death when it tips over.

- ► If an attachment (for example a bucket) is installed, the weight of the attachment and load must be subtracted from the weight specified in the corresponding column in the table.
- ► Pay attention to the density of the load.
- ► Do not exceed the weight specified in the lift capacity table.

NOTICE

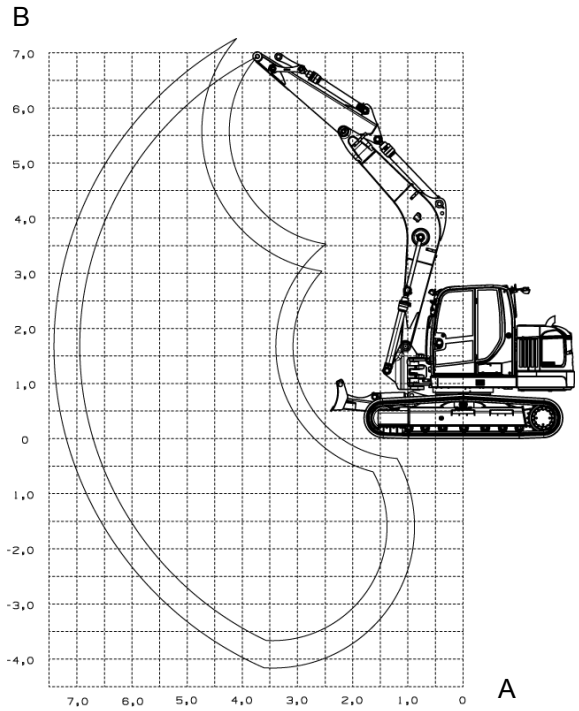
Possible damage to machine if the weight is exceeded.

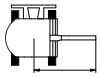
- ► Do not exceed the weight specified in the lift capacity table to prevent the machine from tipping over.

Information

The indications are only approximate values. Uneven ground or poor ground conditions affect machine stability. The operator must take these influences into account.

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Designation	Explanation
A	Reach from live ring center
B	Load hook height
max	Authorized lift capacity with horizontal boom
*	Lift capacity limited by hydraulic system
	With the stabilizer blade in travel direction
	Without the stabilizer blade, 90° to travel direction

All table values are specified in kg (lbs), in horizontal position on firm and level ground without bucket or attachment (for example a hammer).

The machine's lift capacity is restricted by the settings of the pressure limiting valves, 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 29000 kPa (4206 psi).

The lift capacity applies to machines under the following conditions:

- Lubricants and engine/machine fluids at the mandatory levels
- Full fuel tank
- Cabin
- Machine at operating temperature
- Operator weight 75 kg (165 lbs)

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Lift capacity table ET145 with rubber tracks

Short stick

				6.0 m (19'-8")			5.0 m (16'-5")			4.0 m (13'-2")			3.0 m (9'-10")		
B\A	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade
6.0 m (19'-8")	3271* (7211*)	3061 (6748)	2847 (6276)	-	-	-	3234* (7129*)	3133 (6907)	2915 (6426)	-	-	-	-	-	-
4.0 m (13'-2")	3301* (7277*)	2030 (4475)	1886 (4157)	3263* (7193*)	2307 (5086)	2145 (4728)	3349* (7383*)	3079 (6788)	2862 (6309)	3572* (7874*)	3572* (7874*)	3572* (7874*)	-	-	-
2.0 m (6'-7")	3485* (7683*)	1752 (3862)	1632 (3597)	3828* (8439*)	2175 (4795)	2015 (4442)	4543* (10015*)	2818 (6212)	2605 (5743)	6064* (13368*)	3836 (8457)	3528 (7777)	-	-	-
0.0 m (0'-0")	3758* (8284*)	1781 (3926)	1646 (3628)	4303* (9486*)	2060 (4541)	1902 (4193)	5400* (11904*)	2625 (5787)	2417 (5328)	7333* (16166*)	3553 (7833)	3251 (7167)	10898* (24025*)	5465 (12048)	4941 (10893)
−2.0 m (−6'-7")	4094* (9025*)	2239 (4936)	2067 (4556)	-	-	-	4992* (11005*)	2620 (5776)	2412 (5317)	6629* (14614*)	3569 (7868)	3267 (7207)	9238* (20366*)	5562 (12262)	5034 (11098)
−4.0 m (−13'-2")	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Long stick

				6.0 m (19'-8")			5.0 m (16'-5")			4.0 m (13'-2")			3.0 m (9'-10")		
B\A	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade
6.0 m (19'-8")	2879* (6347*)	2544 (5608)	2368 (5220)	-	-	-	2569* (5663*)	2569* (5663*)	2569* (5663*)	-	-	-	-	-	-
4.0 m (13'-2")	2966* (6538*)	1807 (3983)	1677 (3697)	2874* (6336*)	2338 (5154)	2175 (4795)	2866* (6318*)	2866* (6318*)	2866* (6318*)	-	-	-	-	-	-
2.0 m (6'-7")	3152* (6948*)	1580 (3483)	1462 (3223)	3545* (7815*)	2186 (4819)	2026 (4466)	4142* (9131*)	2853 (6289)	2640 (5820)	5370* (11838*)	3931 (8666)	3619 (7978)	-	-	-
0.0 m (0'-0")	3413* (7524*)	1594 (3514)	1471 (3242)	4182* (9219*)	2043 (4504)	1884 (4153)	5234* (11538*)	2617 (5769)	2408 (5308)	7159* (15782*)	3550 (7826)	3247 (7158)	11140* (24559*)	5416 (11940)	4891 (10782)
−2.0 m (−6'-7")	3752* (8271*)	1921 (4235)	1772 (3906)	4029* (8882*)	2016 (4444)	1858 (4096)	5217* (11501*)	2563 (5650)	2355 (5191)	6958* (15339*)	3502 (7720)	3201 (7056)	10030* (22112*)	5453 (12021)	4927 (10862)
−4.0 m (−13'-2")	4038* (8902*)	3837 (8459)	3520 (7760)	-	-	-	-	-	-	-	-	-	5812* (12813*)	5778 (12738)	5240 (11552)

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Lift capacity table ET145 with steel/hybrid tracks

Short stick

				6.0 m (19'-8")			5.0 m (16'-5")			4.0 m (13'-2")			3.0 m (9'-10")		
B\A	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade
6.0 m (19'-8")	3271* (7211*)	3094 (6821)	2878 (6344)	-	-	-	3234* (7129*)	3167 (6982)	2946 (6494)	-	-	-	-	-	-
4.0 m (13'-2")	3301* (7277*)	2055 (4530)	1909 (4208)	3263* (7193*)	2334 (5145)	2170 (4784)	3349* (7383*)	3113 (6862)	2893 (6377)	3572* (7874*)	3572* (7874*)	3572* (7874*)	-	-	-
2.0 m (6'-7")	3485* (7683*)	1775 (3913)	1664 (3668)	3828* (8439*)	2202 (4854)	2040 (4497)	4543* (10015*)	2852 (6287)	2636 (5811)	6064* (13368*)	3882 (8558)	3569 (7868)	-	-	-
0.0 m (0'-0")	3758* (8284*)	1805 (3979)	1668 (3628)	4303* (9486*)	2087 (4601)	1927 (4248)	5400* (11904*)	2659 (5862)	2448 (5396)	7333* (16166*)	3598 (7932)	3293 (7259)	10898* (24025*)	5534 (12200)	5002 (11027)
−2.0 m (−6'-7")	4094* (9025*)	2269 (5002)	2093 (4614)	-	-	-	4992* (11005*)	2654 (5851)	2443 (5385)	6629* (14614*)	3614 (7967)	3308 (7292)	9238* (20366*)	5632 (12416)	5096 (11234)
−4.0 m (−13'-2")	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Long stick

				6.0 m (19'-8")			5.0 m (16'-5")			4.0 m (13'-2")			3.0 m (9'-10")		
B\A	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade	 Low-ered blade		 Raised blade
6.0 m (19'-8")	2879* (6347*)	2572 (5670)	2394 (5277)	-	-	-	2569* (5663*)	2569* (5663*)	2569* (5663*)	-	-	-	-	-	-
4.0 m (13'-2")	2966* (6538*)	1830 (4034)	1698 (3743)	2874* (6336*)	2365 (5113)	2200 (4850)	2866* (6318*)	2866* (6318*)	2866* (6318*)	-	-	-	-	-	-
2.0 m (6'-7")	3152* (6948*)	1601 (3529)	1481 (3265)	3545* (7815*)	2213 (4878)	2050 (4519)	4142* (9131*)	2887 (6364)	2671 (5888)	5370* (11838*)	3977 (8767)	3660 (8068)	-	-	-
0.0 m (0'-0")	3413* (7524*)	1616 (3562)	1491 (3287)	4182* (9219*)	2070 (4563)	1909 (4208)	5234* (11538*)	2651 (5844)	2438 (5374)	7159* (15782*)	3595 (7925)	3289 (7250)	11140* (24559*)	5485 (12092)	4953 (10919)
−2.0 m (−6'-7")	3752* (8271*)	1947 (4292)	1795 (3957)	4029* (8882*)	2044 (4506)	1883 (4151)	5217* (11501*)	2597 (5725)	2368 (5220)	6958* (15339*)	3548 (7821)	3242 (7147)	10030* (22112*)	5522 (12173)	4989 (10998)
−4.0 m (−13'-2")	4038* (8902*)	3884 (8562)	3562 (7852)	-	-	-	-	-	-	-	-	-	5812* (12813*)	5812* (12813*)	5302 (11688)

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Safety instructions (load diagram)

The load diagram values apply to lifting gear applications.

DANGER

Crushing hazard due to tipping over of machine!

The machine causes serious injury or death when it tips over.

- ► Do not exceed the weight specified in the load diagram.
- ► If a joint rod or Powertilt unit with load hook is installed, subtract the weight of the attachment from the weight specified in the table.
- ► Use the machine for lifting gear applications only if the mandatory lifting gear and safety equipment is installed, functional and enabled.

NOTICE

If the weight is exceeded, there is a risk of damage to property if the machine tips over.

- ► Do not exceed the weight specified in the load diagram to prevent the machine from tipping over.

Information

The indications are only approximate values. Attachments, uneven or soft ground, or poor ground conditions affect machine stability. The operator must take these influences into account.

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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 attachment.

The machine's lift capacity is restricted by the settings of the pressure limiting valves, the hydraulic output and the hydraulic system's stabilizing features.

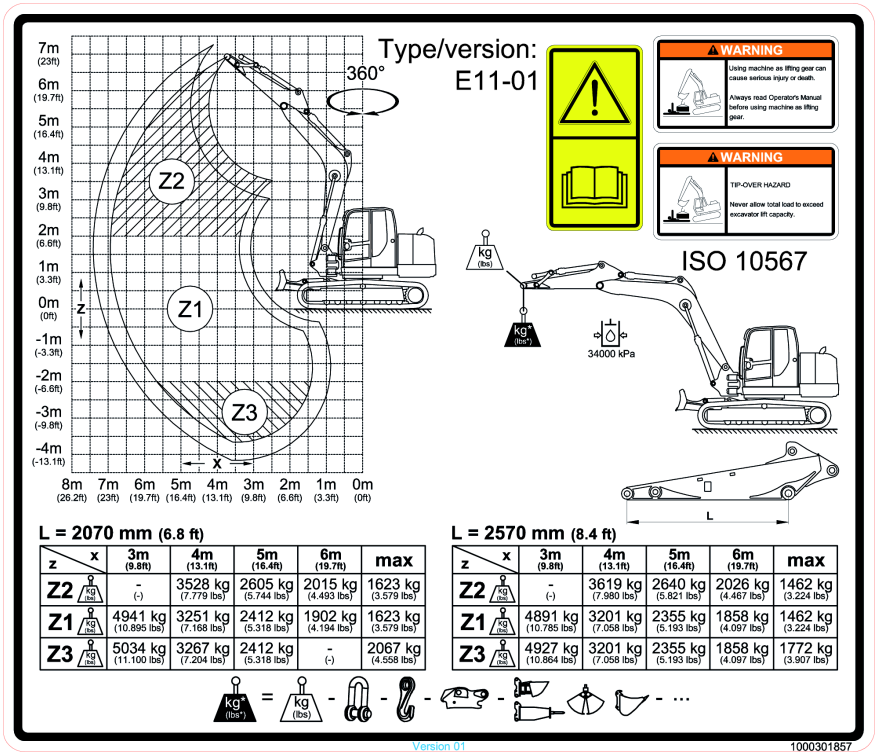
Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

Calculation basis: according to ISO 10567.

Setting pressure on boom cylinder 29000 kPa (4206 psi).

Lift capacities apply to machines under the following conditions:

- Lubricants and engine/machine fluids at the mandatory levels
- Full fuel tank
- Cabin
- Machine at operating temperature
- Operator weight 75 kg (165 lbs)

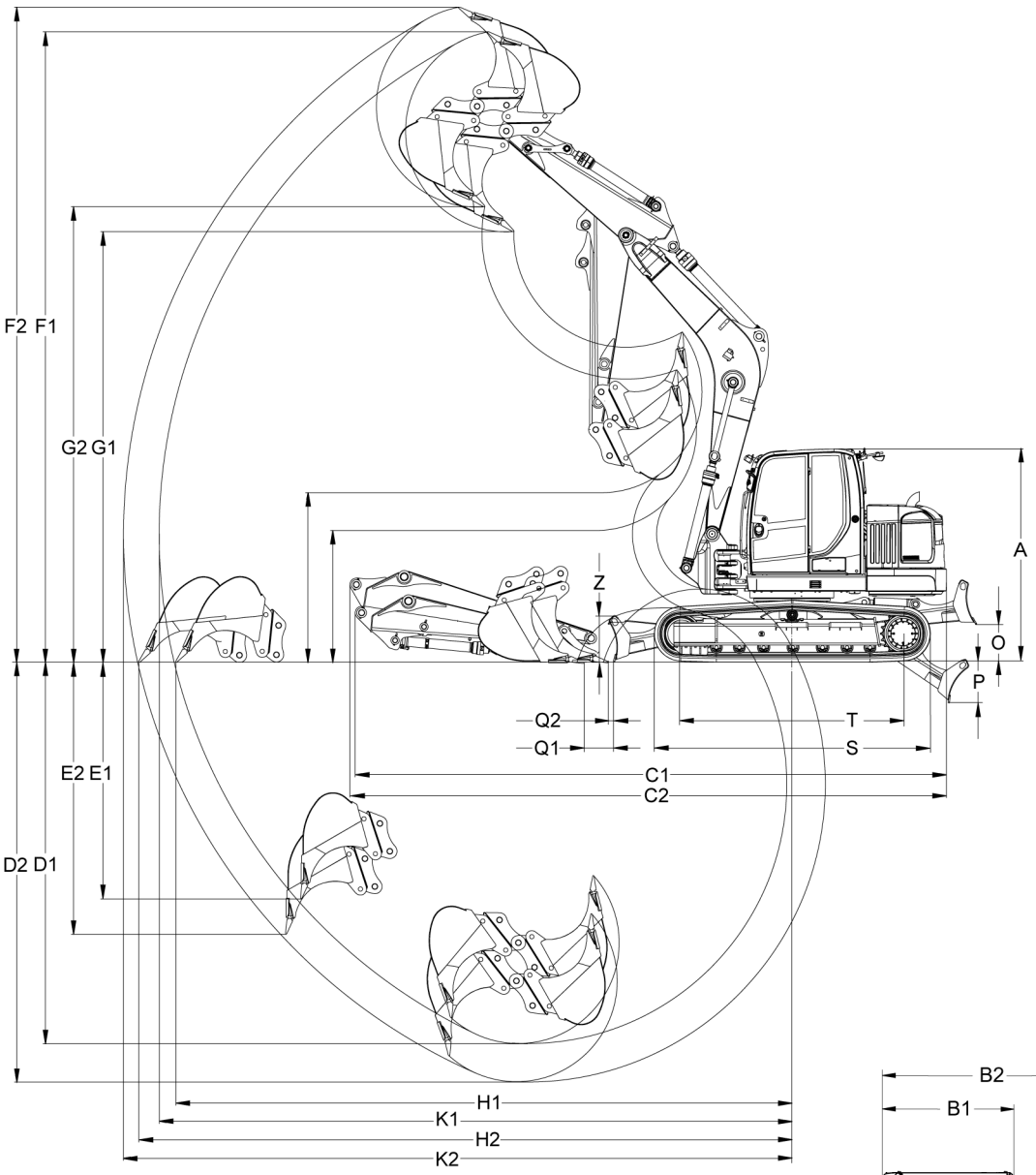


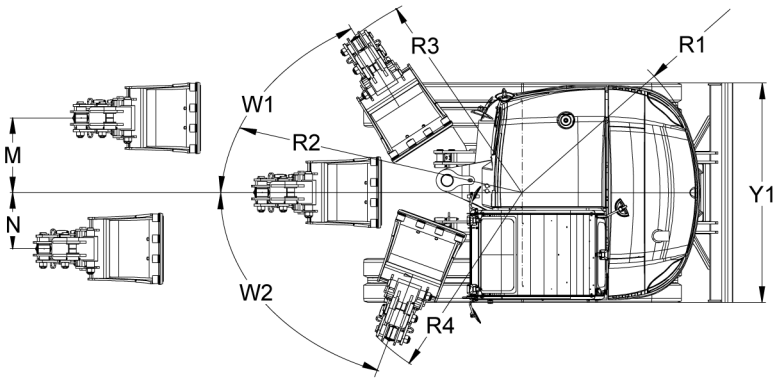
L = 2070 mm (6.8 ft) z \ x	3m (9.8ft)	4m (13.1ft)	5m (16.4ft)	6m (19.7ft)	max
Z2	- (-)	3528 kg (7.779 lbs)	2605 kg (5.744 lbs)	2015 kg (4.493 lbs)	1623 kg (3.579 lbs)
Z1	4941 kg (10.895 lbs)	3251 kg (7.168 lbs)	2412 kg (5.318 lbs)	1902 kg (4.194 lbs)	1623 kg (3.579 lbs)
Z3	5034 kg (11.100 lbs)	3267 kg (7.204 lbs)	2412 kg (5.318 lbs)	- (-)	2067 kg (4.558 lbs)

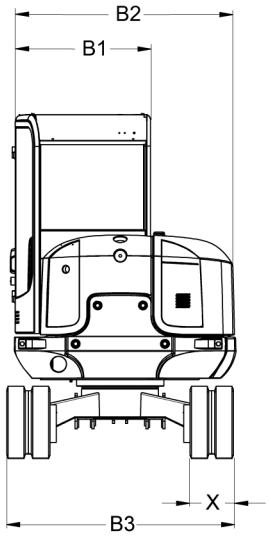
L = 2570 mm (8.4 ft) z \ x	3m (9.8ft)	4m (13.1ft)	5m (16.4ft)	6m (19.7ft)	max
Z2	- (-)	3619 kg (7.980 lbs)	2640 kg (5.821 lbs)	2026 kg (4.467 lbs)	1462 kg (3.224 lbs)
Z1	4891 kg (10.785 lbs)	3201 kg (7.058 lbs)	2355 kg (5.193 lbs)	1858 kg (4.097 lbs)	1462 kg (3.224 lbs)
Z3	4927 kg (10.864 lbs)	3201 kg (7.058 lbs)	2355 kg (5.193 lbs)	1858 kg (4.097 lbs)	1772 kg (3.907 lbs)

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Dimensions







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		mm (in)
A	Height (steel tracks, rubber tracks)	2790 (9'-2")
	Height (hybrid tracks)	2825 (9'-3")
B1	Cabin width	1020 (40)
B2	Upper carriage width	2430 (96)
B3	Travel gear width	2490 (98)
C1	Transport length (short stick)	7720 (25'-4")
C2	Transport length (long stick)	7790 (25'-7")
D1	Max. digging depth (short stick)	5000 (16'-5")
D2	Max. digging depth (long stick)	5500 (18'-1")
E1	Max. vertical digging depth (short stick)	3100 (10'-2")
E2	Max. vertical digging depth (long stick)	3600 (11'-10")
F1	Max. digging height (short stick)	8300 (27'-3")
F2	Max. digging height (long stick)	8600 (28'-3")
G1	Max. tilt-out height (short stick)	5700 (18'-8")
G2	Max. tilt-out height (long stick)	6000 (19'-18")
H1	Max. reach at ground level (short stick)	8100 (26'-7")
H2	Max. reach at ground level (long stick)	8600 (28'-3")
K1	Max. digging radius (short stick)	8300 (27'-3")
K2	Max. digging radius (long stick)	8800 (28'-11")
M	Max. boom displacement to bucket center (right side)	850 (33)
N	Max. boom displacement to bucket center (left side)	640 (25)
O	Max. lift height of stabilizer blade over ground (steel tracks, rubber tracks)	492 (19)
	Max. lift height of stabilizer blade over ground (hybrid tracks)	532 (21)
P	Max. scraping depth of stabilizer blade below ground surface (steel tracks, rubber tracks)	531 (21)
	Max. scraping depth of stabilizer blade below ground surface (hybrid tracks)	493 (19)
Q1	Distance between bucket and stabilizer blade (short stick)	370 (15)
Q2	Distance between bucket and stabilizer blade (long stick)	50 (2)
R1	Min. tail end swiveling radius	2015 (79)
R2	Boom swivel radius center (short stick)	2814 (9'-3")
	Boom swivel radius center (long stick)	2824 (9'-3")
R3	Boom swivel radius (right)	2640 (8'-8")

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		mm (in)
R4	Boom swivel radius (left)	2320 (91)
S	Total running gear length	3605 (11'-10")
T	Running gear length (Turas front idler)	2890 (9'-6")
W1	Max. tilting angle of boom to the right	57°
W2	Max. tilting angle of boom to the left	70°
X	Steel tracks, rubber tracks, hybrid tracks (option)	500 (20)
	Steel track (option)	600 (24)
Y1	Width of stabilizer blade for 500 mm (20 in) tracks	2490 (98)
	Width of stabilizer blade for 600 mm (24 in) tracks	2590 (8'-6")
Z	Stabilizer blade height	600 (24)

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COMPACT EXCAVATOR

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SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL



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Acknowledgment

We wish to acknowledge the contributions of the members of AEM's Compact Loader/Compact Excavator Council to the preparation of this Safety Manual.

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Revised 05/03, 09/10

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Foreword

This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of the machine and to suggest possible ways of dealing with these conditions. This manual is **NOT** a substitute for the compact excavator manufacturer's operator manual(s).

Additional precautions may be necessary, or some instructions may not apply, depending on equipment, attachments and conditions at the worksite or in the service area. The manufacturer has no direct control over equipment application, operation, inspection or maintenance. Therefore, it is **YOUR** responsibility to use safe work practices in these areas.

The information provided in this manual supplements the specific information about the machine that is contained in the manufacturer's manual(s). Other information that may affect the safe operation of the machine may be contained on safety signs or in insurance requirements, employer's safety and training programs, safety codes, local, state/provincial and federal laws, rules and regulations.



Read And Understand Manuals Before Operating

IMPORTANT! Before you operate the compact excavator, make sure you have the manufacturer's manual(s) for this machine and all attachments. If the manufacturer's manuals are missing, obtain replacement manuals from your employer, equipment dealer or directly from the manufacturer. Keep this safety manual and the manufacturer's manuals with the machine at all times. Read and understand all manuals.

Safety videos and other training resources are available from some manufacturers. Operators are encouraged to periodically review the safety video.

Safety Alerts

Symbol

This Safety Alert Symbol means: **"ATTENTION! STAY ALERT! YOUR SAFETY IS INVOLVED!"**



The Safety Alert Symbol identifies important safety messages on equipment, safety signs, in manuals or elsewhere. When you see this symbol, be alert to the possibility of death or personal injury. Carefully read the message that follows and inform other operators. Follow instructions in the safety message.

Signal Words

Signal words are distinctive words that will typically be found on safety signs on the compact excavator and other worksite equipment. These words may also be found in this manual and the manufacturer's manuals. These words are intended to alert the operator to a hazard and the degree of severity of the hazard.

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

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

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

NOTICE indicates a property damage message.

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One-Call First



Call Before You Dig
Dial 811 (USA only)



888-258-0808
(USA and Canada)

Call

Before starting any digging project, contact the local One-Call service by dialing 811 (USA only) to have underground utilities located. A One-Call referral number, **1-888-258-0808**, is also available for both USA and Canada.

One-Call will notify participating utility companies that you intend to dig. You must also call utility companies that do not participate in the One-Call service.

Always inspect the jobsite for evidence of unmarked utilities and contact others if necessary.

Plan The Work

Be aware of the lead time for marking the work area. This time may vary from state to state and county to county. If you do not locate utilities, you may have an accident or suffer injuries, cause service interruptions, damage the environment or experience job delays.

Dig

Most utilities mark their underground facilities using American Public Works Association (APWA) underground color codes. Verify marks before digging.

In the United States, OSHA Standard 29 CFR 1926.651 requires that the estimated location of underground utilities be determined before beginning an excavation. When actual excavation approaches an estimated utility location, the exact location of the underground installation must be determined by a safe, acceptable and dependable method. Other OSHA regulations may also apply to the jobsite.

A Word To The User/Operator

It is **YOUR** responsibility to read and understand the safety manual and the manufacturer's manuals before operating this machine. This safety manual takes you step by step through the working day.

Graphics have been provided to help you understand the text.

IMPORTANT: This manual covers safe practices for Compact Excavators. If the machine is equipped with special attachments, read the manufacturer's operator and safety manuals pertaining to those attachments before using them.



Read And Understand All Safety Signs

Remember that **YOU** are the key to safety. Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's manuals for the specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written only for compact excavators.

Contact the manufacturer of the equipment to answer any questions about safe operation that remain after studying the manufacturer's manual(s) and this safety manual.

Practice all other usual and customary safe working precautions and remember:

SAFE OPERATION IS UP TO YOU!

YOU CAN PREVENT DEATH OR SERIOUS INJURY CAUSED BY UNSAFE WORK PRACTICES!

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Follow A Safety Program

Be Alert!

Know where to get assistance. Know where to find and how to use a first aid kit and fire extinguisher/fire suppression system.

Be Aware!

Take advantage of training programs offered.

Be Careful!

Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, unfamiliarity of the operator with the machine or attachment, drugs, and alcohol to name a few. You can prevent death or serious injury caused by unsafe work practices.

For your safety and the safety of others, encourage fellow workers to act safely.



For Safe Operation

You must be a qualified and authorized operator for safe operation of this machine. You must clearly understand the written instructions supplied by the manufacturer, be trained—including actual operation of the compact excavator—and know the safety rules and regulations for the worksite. It is a good safety practice to point out and explain safety signs and practices and ensure others understand the importance of following these instructions.

WARNING! Drugs and alcohol affect an operator's alertness and coordination and the operator's ability to safely operate the equipment. **Never operate the compact excavator while impaired by use of alcohol or drugs. Never knowingly allow the operation of this machine when operator alertness or coordination is impaired.** An operator taking prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder the ability to safely operate this equipment.

Follow A Safety Program

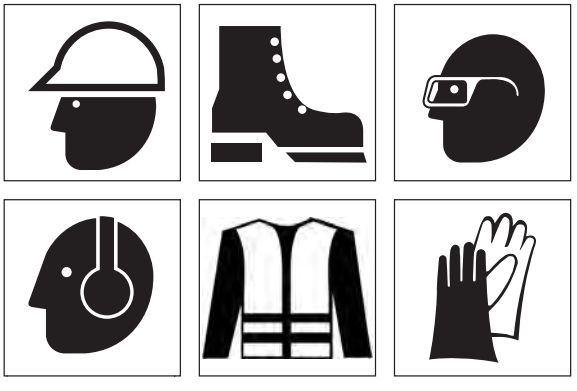
Protect Yourself

Wear personal protective clothing and Personal Protective Equipment (PPE) issued to you or called for by job conditions.

You may need:
— Hard hat
— Safety boots with non-slip soles
— Safety glasses, goggles or face shield
— Heavy-duty gloves
— Hearing protection
— Reflective or high-visibility clothing
— Wet weather gear
— Respirator or filter mask

Wear whatever is needed to protect yourself—do not take chances.





WARNING! Prevent death or serious injury from entanglement. **Do not wear loose clothing or accessories. Restrain long hair. Stay away from all rotating components when the engine is running.** Contact, wrapping or entanglement with rotating or moving parts could result in death or serious injury.

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Follow A Safety Program

Know The Rules

Most employers have rules governing operation and maintenance of equipment. Before you start work at a new location, check with your supervisor or the safety coordinator. Ask about the rules you will be expected to obey.

The Occupational Safety and Health Administration (OSHA) enforces federal laws within the United States that apply to the safe operation, application and maintenance of equipment on a worksite. It is the employer's responsibility to comply with these laws. A federal representative may periodically inspect a worksite to see that these laws are being followed.

There may also be local, state/provincial, federal laws or international regulations that apply to this equipment and its use, along with specific worksite or employer rules. It is important that you know and comply with all applicable laws and rules, including those requiring operator training and certification.



Know And Understand Rules Of Operation

Follow A Safety Program

Some Rules You Must Work By

— Know the limitations and operating characteristics of the compact excavator. Do not overload it.
— Always wear the seat belt, if equipped. If the compact excavator is equipped with a foldable TOPS/ROPS, do not fasten the seat belt when the TOPS/ROPS is in the down position.
— Always have all shields and guards properly installed before operating the machine.
— Inspect the machine and all attachments before each use as specified by the manufacturer and your employer. Ensure the attachment is properly installed. (See page 17, **Quick-coupling Device Safety**.)
— Only use parts and attachments that are approved by the original equipment manufacturer.
— Never modify or remove any part of the equipment (except for service—then make sure it is replaced).
— Read and understand all safety signs installed on the machine.
— Know the location of other personnel and machines and make sure they are a safe distance from the machine.
— Know the worksite. Be aware of possible hazards that you may encounter.

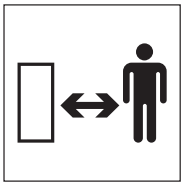


Know Machine Limitations And Operating Characteristics



Inspect The Machine Before Each Workday





Be Aware Of Worksite Hazards, Keep Bystanders Away

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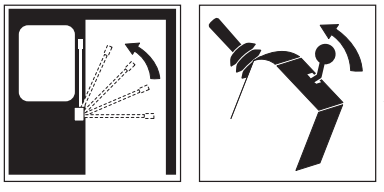
Follow A Safety Program

— Always look in the direction of machine or boom movement. Drive facing the travel direction whenever possible.
— Make sure you understand the rules covering traffic at the worksite. Know what all signs, flags and markings mean.
— Understand hand, flag, horn, whistle, siren and bell signals, if used at the worksite.
— Know when to use lights, turn signals, flashers and horns, if equipped.
— Do not allow riders.
— Keep hands and feet on controls when operating.
— Never lift or swing a load or attachment over anyone.
— Whenever you leave the machine, lower the excavator blade, bucket or other attachments to the ground. Stop the engine. Cycle the hydraulic controls, including auxiliary hydraulic control, to relieve trapped pressure. Engage control lock if equipped, and remove the ignition key. (See page 39, **Machine Shutdown**.)
— When transporting the compact excavator on a trailer, follow the manufacturer's instructions for loading, tying down and unloading the compact excavator.







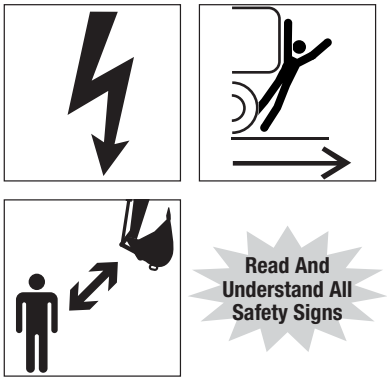


Follow A Safety Program

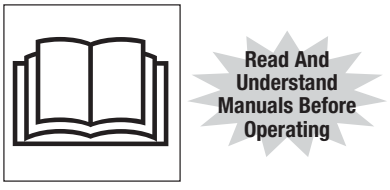
Know The Equipment

Read and understand the DANGER, WARNING, CAUTION and NOTICE safety signs and other informational signs found on the compact excavator and in the manufacturer's operator manual. Ask your supervisor to explain any information you do not understand. Failure to obey safety instructions could result in death or serious injury.

Make sure all the manufacturer's protective structures, guards, shields, screens and panels are in good repair, in place and securely fastened. Damaged, missing or weakened safety components can create a hazardous situation for you as the operator. **Never** remove or modify any safety components on the compact excavator. The excavator can be operated temporarily with a foldable TOPS/ROPS lowered for access through height-restricted openings. Do not fasten the seat belt when the TOPS/ROPS is in the down position.



Know the following about this compact excavator and all attachments.
— Function, purpose and use of controls
— The functions of all gauges, lights, dials, switches
— Slope and uneven terrain capabilities and proper operation – never operate on a slope with a foldable TOPS/ROPS in the down position.
— Braking and steering characteristics
— Turning radius and clearances
— How to quickly stop equipment in an emergency



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Prepare For Safe Operation

Check And Use All Available Protective And Safety Devices

Keep all protective devices in place and tightly fastened. Make certain all guards, screens and panels, manufacturer's operator manuals, and safety signs are installed on the machine and legible as supplied by the manufacturer. See that each item is securely in place and in operating condition.

The machine may be equipped with:

— A seat belt or other type of restraint
— Control locking device
— Safety signs
— Access and egress system (i.e., grab handles, handrails) and protective covers
— Travel alarm and back-up alarm
— Falling object guard structure (FOGS), falling object protective structure (FOPS), roll-over protective structure (ROPS)/tip-over protective structure (TOPS)
— Guards
— Special enclosures or accessories required for task or worksite conditions
— Operator protective structure (OPS) – side, front and rear shields, screens and doors
— Warning lights and devices
— Alternate exits
— Mirrors
— Fire extinguisher
— First aid kit
— Windshield wipers and washers
— Window defroster
— Operating lights
— Horn

Know which devices are required for protection during your specific operation and use them. The excavator can be operated temporarily with the TOPS/ROPS lowered for access through height restricted openings. Do not fasten the seat belt when the TOPS/ROPS is in the down position.

WARNING! NEVER remove or modify safety equipment. Operating a machine without a protective structure (TOPS/ROPS, FOGS/FOPS or OPS) could result in death or serious injury. (See page 44, **Protective Structure Safety**.)



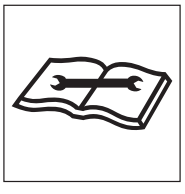
Follow A Checklist

Prepare For Safe Operation

Check The Machine

Before you begin the workday, inspect the machine and have all systems in good operational condition. Do not operate the machine until all problems are corrected.

— Perform daily and periodic service procedures as instructed by the equipment manufacturer.
— Check that no safety switches or interlocks have been bypassed and that no warning tags have been placed on the machine.
— Check that safety signs, special instructions, lift capacity charts and operator manuals are legible and in the proper location.
— Check condition and operation of the seat belt and its mounts, if equipped.
— Make sure that the foldable TOPS/ROPS, if equipped, is properly secured in the raised position.
— Check condition and operation of the attachment quick-coupling device, if equipped. Perform daily cleaning and maintenance following the manufacturer's instructions. (See page 17, **Quick-coupling Device Safety**.)
— Inspect steps, guardrails, platforms and handholds for damage or loose parts.



Maintain Machine



Check Manuals And Safety Signs



Check Seat Belt And Its Mounts



Check That TOPS/ROPS Is Raised And Properly Secured

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Prepare For Safe Operation

— Check the fuel and hydraulic systems. Have leaks repaired and fill to proper level.
— Check all exposed hydraulic components for leaks, routing problems or damage. Report worn or damaged components.

WARNING! Diesel fuel and hydraulic fluid under pressure can penetrate the skin or eyes and cause serious injury, blindness or death. Fluid leaks under pressure may not be visible. **Use a piece of cardboard or wood to find leaks, not your hand. Wear a face shield or safety goggles for eye protection.** If fluid is injected into the skin, it must be removed within a few hours by medical personnel familiar with this type of injury. (See page 46, **Hydraulic System Hazards**.)

— Check the cooling system.

WARNING! Prevent possible injury from explosive release of hot fluids. **Allow the radiator to cool before checking the fluid level**. (See page 45, **Cooling System Hazards.**)

— Keep radiators and coolers clean and free of oil, grease, dirt, debris and moisture.
— Make sure all doors, guards and covers are in place and secured properly.



Prepare For Safe Operation

Check The Machine (continued)

— Check the tracks for broken or damaged pins, bushings, and other parts.
— Check the tracks for proper tension adjustment according to manufacturer's instructions.
— Check the tracks for damage or wear. Replace badly worn or damaged tracks.
— Check the slew/swing brake for proper operation.
— Inspect working and other lights for proper operation.
— Inspect boom, arm and attachment for wear and damage.
— Make sure fire extinguishers are fully charged and in good working order.

Check Attachment And Coupler Installation

When changing buckets or installing attachments, follow the manufacturer's instructions for proper maintenance and coupling. Make sure all connectors are securely fastened. Tighten all bolts, nuts and screws to torques recommended.

Check the attachment coupler and the attachment for wear and hydraulic leaks before coupling the attachment.

Before operating, ensure that quick-coupler pins or wedges are fully engaged and visibly locked to the attachment.

WARNING! Avoid possible crushing injury. **Failure to properly secure the attachment to the machine coupler can allow the attachment to come off and could result in death or serious injury.** (See page 17, **Quick-coupling Device Safety**.)

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Prepare For Safe Operation

Quick-coupling Device Safety

Before using a quick-coupling device you must know and understand proper installation, maintenance and operation.

WARNING! Failure to read and follow manufacturer's instructions for the correct operation and maintenance of the quick-coupler can allow the attachment to come off and cause death or serious injury.

Protect yourself from injury:
- — Install and maintain equipment, attachments and their operating systems according to manufacturers' instructions.
- — Securely latch attachments before work begins.
- — Follow the manufacturer's instructions for using positive locks on quick-coupling equipment.
- — Make frequent visual inspections of quick-coupling systems—especially after changing attachments.
- — Always check for interference limits of the coupler or tool with the carrier before operating.

Do not operate the machine if:
- — there exists an incompatibility among components.
- — there are broken, damaged or badly worn components.
- — the lock/secure feature of the quick-coupler is impaired.
- — the engaging lever or device is not fully engaged in a lock/secure condition.



Read And Understand Manuals Before Operating

WARNING! A quick-coupler that is not properly locked/secured could result in death or serious injury. **Perform all steps to lock/secure the device.** The steps to confirm that the device is properly locked/secured may include any or all of the following:
- — Manually installing a locking pin, actuating a lever or other device.
- — Movement of the attached work tool to confirm its engaged lock/secure condition.
- — A visual check of the components as instructed by the quick-coupler manufacturer.

WARNING! A quick-coupler that is disengaged when the attachment is in an unstable position could result in death or serious injury. **Place the attachment in a stable position, as instructed by the manufacturer, whenever coupling or uncoupling the attachment.**

Prepare For Safe Operation

Clean Up

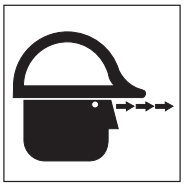
Clean windshields, mirrors and all lights. Use water and a clean cloth. Know and follow the manufacturer's recommendations for using cleaning agents other than clean water on polycarbonate glazing.

Clean out the operator's area. Steps and handholds must be clean and functional. Oil, grass, leaves, needles, snow, ice or mud in these areas can cause you to slip and fall.

Clean your boots before getting on the machine.

Clean out trash and debris buildup promptly, especially in the engine compartment, the battery box, around exhaust components, under the machine and around rotating components.

Remove all loose personal items or other objects from the operator's compartment. Secure these items in a fixed tool box or remove them from the machine. Do not store any flammable material such as ether/cold-start fluid or oily rags in the operator's compartment.



Maintain Vision – Clean Up



Avoid Falls – Clean Slippery Surfaces



Avoid Fire – Clean Out Debris



Put Away Tools And Loose Items

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Prepare For Safe Operation

Check The Work Area

Know—beforehand—as much about the worksite as possible. Locate all ground workers near the worksite and make sure clothing worn is easily seen. Be aware of weather conditions that can affect visibility, ground stability and traction.

Check for:
- Location of steep slopes, slide areas, drop-offs and overhangs
- Adequate traction on slopes
- Traffic locations and movement
- Thick dust, smoke and fog
- Soil conditions—look for signs of instability such as cracks or settlement
- Standing water and marshy areas
- Rocks and stumps
- Holes, obstructions, mud or ice
- Location of open trenches
- Exact location of any buried and/or overhead electrical, gas, telephone, water, sewer or other utility lines

Have the utility company mark, shut off or relocate the utility before you begin working.

Know the location and work plan for other machines on the worksite.

Correct unsafe conditions. Avoid operating in problem areas that cannot be corrected.

When operating the machine inside a building, know what clearances you will encounter—overhead, doorway, aisles, etc. Also, know the weight limitations of floors and ramps. Make sure there is sufficient ventilation for inside operation.



Walk Around The Worksite



Be Seen – Wear Visible Clothing

Prepare For Safe Operation

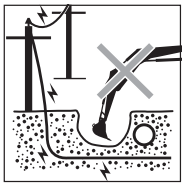
Check The Work Area (continued)

Know the exact location of electrical, telephone, gas or other utility lines. (See page 5, **One-Call First**.)

DANGER! Death or serious injury will result from touching or being near a machine that is in contact with or near an energized electrical source. **Never approach power lines with any part of the machine or load unless all local, state/provincial and federal (OSHA) required safety precautions have been taken.** Use extreme caution because high voltage sources can arc without contact.

When working near power lines, you must assume all lines are energized.

Maintain a safe distance from all utilities.
(See page 31, **Utilities—Overhead And Underground**.)



Locate All Utilities, Maintain A Safe Distance

Use Caution When Fueling

IMPORTANT! Always use approved fuel containers and dispensing equipment.

Fuels are flammable, so observe these practices to reduce the possibility of a serious accident.
- Shut off engine and ignition during refueling.
- Always ground the fuel nozzle against the filler neck to avoid sparks.
- Keep sparks and open flames away from fuel.
- Do not use a cell phone or two-way radio while fueling or handling fuel—they could cause sparks.
- Do not smoke while refueling or when handling fuel containers.
- Do not overfill the tank or spill fuel. Clean up spilled fuel immediately.

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Prepare For Safe Operation

Mount And Dismount Properly

When you enter or leave the machine:

— Maintain a three-point contact with the machine. Three-point contact is defined as maintaining contact with at least one hand and two feet, or two hands and one foot, at all times.
— Face the machine when either mounting or dismounting.
— Use handholds, handrails, ladders or steps (as provided).
— The upperstructure and undercarriage must be oriented to align the access system.
— Never use control levers as handholds.
— Never step on foot controls when entering or leaving.
— Clean your boots and wipe your hands before mounting or dismounting.
— Never jump on or off the machine.
— Never attempt to mount or dismount a moving machine.
— Never mount or dismount while carrying tools or objects that prevent three-point contact.







Start Safely

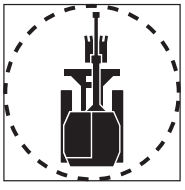
Look Out For Others

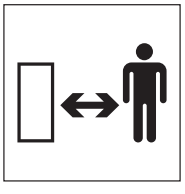
Before starting, walk completely around the machine operating area. Make sure no one is under it, on it or close to it. Do not start the engine until everyone is clear of the operating area.

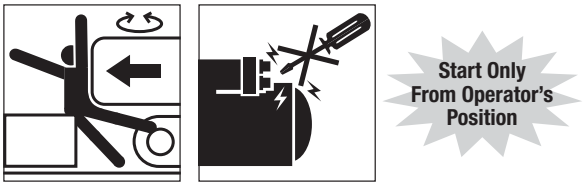
Starting The Engine

Do not start the engine or move any of the controls if there is a “DO NOT OPERATE” or similar warning tag attached to the start switch or controls. Check with your supervisor.

WARNING! Start the engine only from the operator’s seat. Never attempt to start the engine by shorting across starter terminals or reaching for the key from outside the cab. This could result in the machine moving suddenly and unexpectedly and cause death or serious injury.







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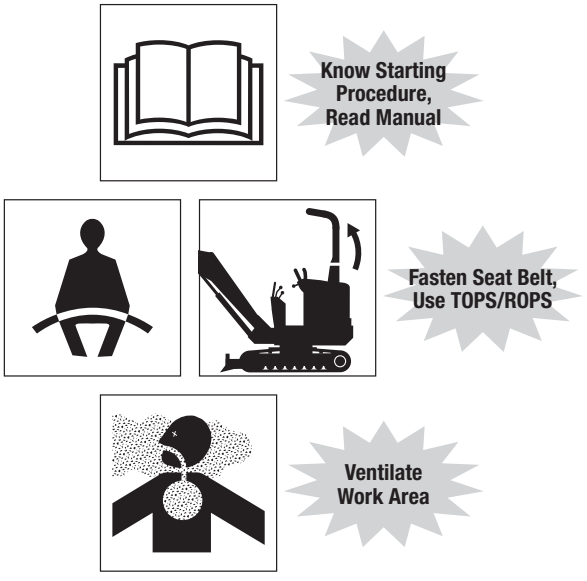
Start Safely

Know the exact starting procedures for this machine. See the manufacturer's manual(s) for starting procedures.

— Clear the area of all persons.
— Sit in the operator's seat and adjust the seat so you can operate all the controls properly.
— Familiarize yourself with warning devices, gauges and operating controls.
— Close or secure the cab door, if equipped.
— Fasten the seat belt, if equipped. If the compact excavator is equipped with a foldable TOPS/ROPS, do not fasten the seat belt when the TOPS/ROPS is in the down position.
— Put all controls, including those for auxiliary equipment, in the neutral/park position.
— Activate controls by releasing the control lock, if equipped.
— Start the engine following the instructions in the manufacturer's manual(s).

If it is necessary to run the engine or operate the machine within an enclosed area, be sure there is adequate ventilation.

WARNING! Never operate any type of engine without proper ventilation—exhaust fumes can kill.



Start Safely

Starting Aids

Do not use ether/cold-start fluid if the engine is equipped with glow plugs or intake manifold preheater.

Ether/cold-start fluid is HIGHLY FLAMMABLE. Before using it, always read the instructions on the ether/cold-start fluid container and the instructions in the manufacturer's manual(s). **Do not** carry loose cans of starting fluid on the machine while operating.

If booster cables are used, follow the instructions in the manufacturer's manual(s). The operator must be in the operator's seat when boost-starting the engine so that the machine will be under control when the engine starts. Boost-starting is a two-person operation. A battery explosion or a run-away machine could result from improper starting procedures.

Never boost-start a frozen battery. (See page 48, **Avoid Battery Explosion**.)

After Starting The Engine

Observe gauges, instruments, and warning lights to ensure that they are functioning and their readings are within the operating range.

With the control levers or joysticks in neutral, test engine speed control.

Run An Operating Check

Do not use a machine that is not in proper operating condition. It is the **operator's responsibility** to check the condition of all systems, and to run the check in a safe area.

WARNING! Do not allow anyone to stand within the operating work radius of the machine and load. Contact with moving parts of the compact excavator or load can cause death or serious injury.



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Start Safely

Test All Controls

Follow the manufacturer's recommended warm-up procedures and bring all machine systems to operating temperature.

Machines come equipped with various control configurations, patterns and operating modes. Some have selectable or configurable controls that allow operation to suit personal preferences or specific applications. Make sure that you know which control pattern has been selected and understand how the machine will operate.

Make sure the engine is operating correctly. Operate each machine control to check all functions.

Check for possible interference between the attachment and the cab and operate appropriately.

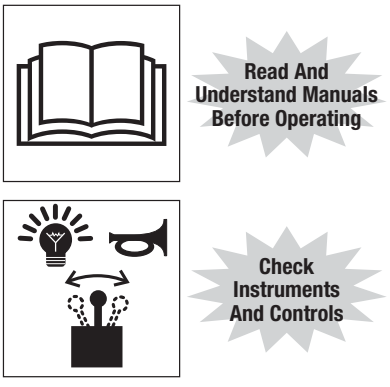
Make sure the attachment quick-coupling device (if equipped) is operating properly, fully engaged and visibly locked. (See page 17, **Quick-coupling Device Safety**.)

Check the blade location before traveling. When the blade is in the rear, operate the steering levers in the opposite direction as when the blade is in the front. See the machine manufacturer's manual.

Operate the control(s) to ensure correct operation in forward, neutral and reverse.

Test steering—right and left—while moving slowly.

WARNING! Prevent possible injury from loss of control. **Know and understand the selected control pattern and operating mode before operating. Be certain you can control speed, direction, braking and boom motion before operating the machine.**



Operate Safely

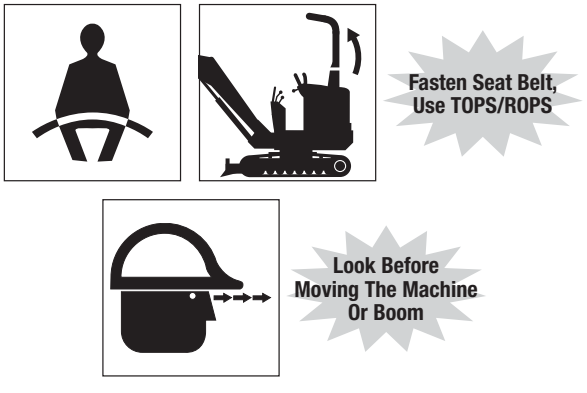
Remember

— Stay in the operator's seat, with the seat belt fastened, if equipped. If the compact excavator is equipped with a foldable TOPS/ROPS, do not fasten the seat belt when the TOPS/ROPS is in the down position.
— Understand the machine's limitations. Be in control of the machine at all times.
— Assure yourself that the work area is clear of all bystanders and other machines. Stop the machine immediately if anyone approaches.
— If a failure that causes loss of control occurs, stop all machine motion as quickly as possible. Shut the machine down and remove the key. Correct or report the problem immediately.

Remember The Other Person

WARNING! Never allow an untrained or unqualified person to operate this machine. Handled improperly, this machine could cause death or serious injury.

Do not allow anyone within the operating work radius of the compact excavator.



Never use a bucket or other attachment as a work platform or personnel carrier.

WARNING! Prevent possible injury from fall or runover. The compact excavator is a one-person machine. **NEVER PERMIT RIDERS.**

Always look around before you travel or move the boom. Look in the direction of machine movement.

Awareness on your part can prevent accidents.

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Operate Safely

Traveling On The Worksite

Know and understand the worksite traffic flow patterns and obey signalmen, road signs and flagmen.

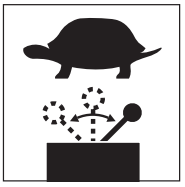
Check blade location before traveling. When blade is positioned to the rear, operate the steering levers in the opposite direction as when the blade is in the front.

The retractable track frame, if equipped, should be extended for traveling on the worksite. The track frame can be retracted to access narrow areas. Read and know manufacturer's instructions before operation.

Know the maximum height and width of the machine. Do not obstruct your vision when traveling. Always look in the direction of travel. Drive facing the travel direction when possible.

Operate the controls smoothly and slowly. Rapid and jerky movement of the controls can cause loss of both machine stability and control of the load.

When moving the machine, watch that enough clearance is available on both sides and above the boom and cab. Be especially careful to allow extra clearance on uneven ground.



Operate Controls Smoothly And Slowly



Know Weight Limits

Check for hazards or obstructions before entering an underpass or other area with restricted clearance. Check height and side clearances.

WARNING! Avoid possible injury. The weight of the machine may cause the ground, dock, ramp or floor to give way, causing loss of control, fall or tipover. **Know weight limits and stay clear of the edges of excavations and drop-offs.** Failure to know and observe weight limits and use caution could result in death or serious injury.

Operate Safely

Traveling On The Worksite (continued)

Make sure all surfaces will support the weight of the machine.

Do not cross ditches, creeks or wet draws without an adequate fill or bridge crossing.

Match travel speed to the traffic, weather and ground conditions. Take it slow and easy when traveling. Travel cautiously over rough or slippery ground and on slopes. Reduce speed when travelling over a rise.

Always give the right of way to loaded machines. Maintain a safe distance from other machines.

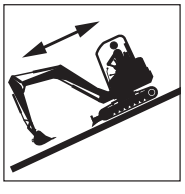
If you encounter a blind corner, stop and then proceed with caution.

Avoid traveling over obstacles (logs, tree stumps, rough terrain, ditches, curbs, railroad tracks) whenever possible. If you must cross an obstacle, do so slowly and with caution.

Avoid steep slopes or unstable surfaces. If it is necessary to travel on a slope, follow manufacturer's specific instructions. When on a slope, keep the boom centered and attachment as low and as close to the machine as possible. Proceed with extreme caution. Do not drive **ACROSS** a steep slope under any circumstances. Drive straight up and down a slope.



Travel Slowly Over Rough, Hazardous Terrain



Drive Straight Up And Down – NOT ACROSS – Steep Slopes

Avoid turning on a slope. If it is necessary, use extreme caution and make the turn **WIDE and SLOW** with the boom centered and attachment as low and as close to the machine as possible.

Avoid sudden movement of the travel controls.

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Operate Safely

Safety Precautions

Never reach into the compact excavator and attempt to operate the controls from outside the cab.

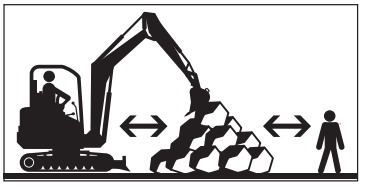
Before starting to excavate, set up safety barriers to the sides and rear area of the swing pattern to prevent anyone from walking into the working area.

Read and know manufacturer's instructions before operation.

Make sure you are aware of personnel or machines that may be hidden in blind spots on the worksite, such as piles or stacks of material.

Make sure the machine has sufficient clearance from other machines or material on the worksite to prevent contact during machine or attachment movement.

WARNING! Prevent death or serious injury. **Never lift, move or swing a load over any person or any machine cab.**





Know and use the hand signals required for particular jobs. Know who has the responsibility for signaling. Take signals from one person only.

Do not operate during storms with high winds or lightning strikes. Do not mount or dismount during a period of lightning strikes. If you are on the machine, stay on it. Warn others to stay clear of the machine in case of a lightning strike.

Operate Safely

Load Lifting

Consult the rated lift capacity chart. Do not overload this machine. Know the exact lifting capacity of the machine as equipped. Make sure you have and know how to use a current lift capacity chart for the machine. Changing conditions such as slopes, wind, ice, mud, soft ground, type of load or the weight of attachments will affect the capacity and operating characteristics of the machine.

Consult your lift chart. Lifting and handling loads over the end of the machine, rather than over either side, will improve the lifting performance of the machine.

The retractable track frame, if equipped, should be fully extended for increased lifting performance.

Attach loads only to the manufacturer's designated lifting points, if equipped.

If equipped, keep blade lowered for increased lifting performance. If ground is soft, place pads or timbers under the blade.

Operate the controls smoothly and slowly. Rapid and jerky movement of the controls can cause loss of both machine stability and control of the load.



When lifting, be sure the load is properly balanced. Move slowly so the load does not sway or swing around. Use a tag line for control.

If tracks or blade leave the ground, slowly lower the load to return the machine to the ground. Do not drop the load suddenly, because this can lead to loss of control.

Do not exceed rated lift capacity. Excessive load can cause tipping or loss of control.

Carry the load/attachment low and as close to the machine as possible. You must allow for movement in all directions. Be careful to maintain clearance of the attachment and load from the cab.

Keep all guards in place and windows closed or locked open. Keep cab doors closed or otherwise secured, if equipped.

Never leave the operator's seat with a load suspended. (See page 39, **Machine Shutdown.**)

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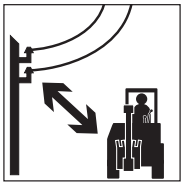
Operate Safely

Utilities – Overhead And Underground

DANGER! Electrocution or serious injury will result from CONTACTING or APPROACHING power lines or apparatus. Maintain Minimum Approach Distance. (See chart.)

DANGER! Death or serious injury will result from touching or being near a machine that is in contact with or near an energized electrical source. **Never approach power lines with any part of the machine or load unless all local, state/provincial and federal (OSHA) required safety precautions have been taken.** Use extreme caution because high voltage sources can arc without contact.

REQUIRED CLEARANCE FOR OPERATION NEAR HIGH VOLTAGE POWER LINES		
Normal Voltage, kV (Phase to Phase)	Minimum Approach Distance [Note (1)] ft	(m)
to 50	10	(3.0)
Over 50 to 200	15	(4.6)
Over 200 to 350	20	(6.1)
Over 350 to 500	25	(7.6)
Over 500 to 750	35	(10.7)
Over 750 to 1,000	45	(13.7)
NOTE: (1) Environmental conditions such as fog, smoke or precipitation may require increased clearances.		



Maintain Minimum Approach Distance



Stay Clear Of Energized Equipment

Check overhead clearances. If possible, have power to the lines de-energized and visibly grounded. If not possible, request a signal person for guidance to maintain at least the Minimum Approach Distance. (See chart.)

If the machine or load contacts an energized line, stay in the machine and attempt to break contact. Warn others to stay away from the machine. If machine catches fire and you are forced to leave, jump clear of the machine with both feet together and hop or shuffle away. **DO NOT** touch machine and ground at the same time.

Operate Safely

Locate All Underground Utilities

Confirm that One-Call has been contacted. Confirm that any utilities not subscribing to One-Call have been contacted. Confirm that the site has been marked or cleared. (See page 5, **One-Call First**.)

Obtain all information pertaining to the locate request, including the One-Call confirmation code or ticket number. If the facility owner has provided a locate sketch, obtain a copy. Review any engineering drawings provided by utilities. This information should be retained.

Personally verify One-Call utility marks. There are variations from state to state.

Take a copy of the locate sketch to the job site. Confirm all of the locates. Review the site for signs of unmarked utilities. These signs may include pedestals, pole risers, meters, trench lines, manhole covers, sewer drain outlets, etc. Review not only the immediate area, but also the perimeter of the area for utility markers.

Additionally, the area should be swept by an experienced operator using a device to locate utilities and large metal objects.

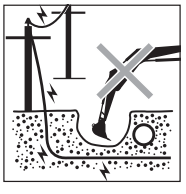
Any inconsistencies with line locations or any inaccurate locates must be resolved.

When excavating near underground services, expose the service by hand-digging or by using soft excavation, such as vacuum excavation, if permitted by local utilities.

When gas lines are present on the site, do not smoke or do anything to cause a spark in the vicinity of a gas line.

Make plans to restrict working area access—with cones and tape, barriers, warning signs, fences, etc.—until the job is complete.

Make certain that you are in compliance with all local, state/provincial, national and other requirements and regulations, including those regarding open excavations, or “potholes.”



Locate All Utilities, Maintain A Safe Distance

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Operate Safely

Trenching Safety Precautions

Follow the worksite plan for proper construction of the trench. Check with your supervisor if you are unsure of correct trench construction or if operating conditions change.

Stay alert to changes in soil conditions. Trench collapse is hazardous to all workers in the area and could cause the machine to slide into the trench.

Keep heavy loads and equipment as far from the trench as possible.

Keep spoil and stored materials such as pipe at least two feet from the edge of the trench.

Keep personnel away from the equipment and attachments.

Never swing a load or attachment over anyone.

Do not undercut the machine.

WARNING! Do not dig under the machine or blade. A resulting cave-in could cause death or serious injury.

WARNING! Avoid possible death or serious injury from trench wall collapse. **Before backfilling, see the manufacturer's manual for any specific instructions. Do not get too close to the edge of the cut.** The weight of the machine plus the fill could cause the trench wall to collapse.



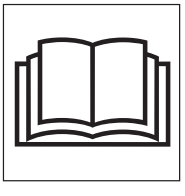
Keep Personnel Away From Equipment And Attachments

Operate Safely

Slope And Uneven Terrain Operation

Compact excavator stability and load capacity are greatly reduced on slopes. Ensure the operation can be done safely. Prevent overturns and maintain stability control:

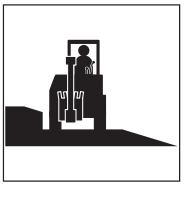
- Use machines equipped with TOPS/ROPS and a seat belt. Make sure folding TOPS/ROPS is raised and locked in place—always use the seat belt.
- The retractable track frame, if equipped, should be extended for operating on slopes or uneven terrain. Read and know manufacturer's instructions before operation.
- Review the manufacturer's manual for specific instructions and limitations, including those for proper operation of alternate/emergency exits.
- Avoid extremely steep slope operation.
- Keep machine movements slow and smooth.
- Level the working area and machine as much as possible.
- Avoid working with the tracks across a slope. This will reduce stability and increase the tendency of the machine to slide. Position the machine with the tracks running up and down the slope—blade downhill and lowered.
- Avoid slippery ground conditions.



Always Check Manuals For Specific Instructions



Fasten Seat Belt, Use TOPS/ROPS



Level The Work Area If Possible

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Operate Safely

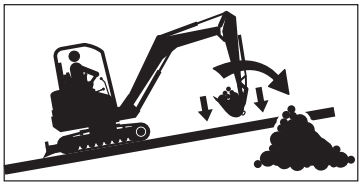
— Travel straight up and down the slope with the attachment low and close to the machine. Do not move the boom while travelling.
— Avoid swinging to the downhill side of a slope. Always keep the boom and attachment as low and close to the machine as possible.

If the machine begins to tip, roll or slide, stay in the machine with the seat belt securely fastened. Lower the attachment immediately. Hold on firmly and brace your feet on the floor. Lean away from the point of impact.

When operating the compact excavator on a slope, swing to the uphill side to dump load, if possible. If downhill dumping is necessary, swing only as far as required to dump the bucket. Use extreme caution. Always drop spoil a sufficient distance from a trench to prevent cave-ins.

If possible, avoid working with the tracks across a slope.

Before moving the machine, raise the blade sufficiently to clear the ground, and then drive the machine forward or backward as required. Lower the blade to level the machine.



Swing Load Uphill When On A Slope

Operate Safely

Hazardous Conditions

When working in hazardous areas, be extremely alert.

Always consult the manufacturer's operator manual for specific instructions.

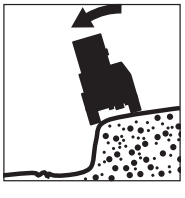
Extreme caution is required when working near the edge of an excavation. Keep the machine a safe distance away from the edge. Avoid undercutting.

WARNING! Never undercut a high bank. The edges could collapse or a slide could occur, resulting in death or serious injury.

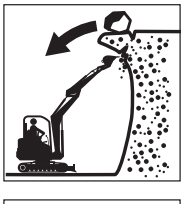
Work the jobsite in a manner that avoids creating overhangs or the need to be on top of banks or slopes. Never operate the machine close to the edge of an overhang or stockpile.

Extreme caution should be used when working along the top of banks and slopes. Keep as far back from the edge as possible. Level the area if possible. Keep the machine tracks perpendicular to the edge so that if part of the edge collapses, the machine can be moved back.

Immediately move the machine back at any indication the edge may be unstable.



Use Caution – Stay Safely Away From Bank Or Excavation Edge



Never Undercut A High Bank

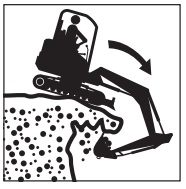


Operate Perpendicular To Banks – Stay Back From The Edge

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Operate Safely

WARNING! Do not dig under the machine. A cave-in could result and the machine could fall into the excavation, resulting in death or serious injury.



Use Caution Near Excavation Edge – Do Not Undercut Machine

Avoid Silica Dust

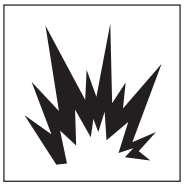
Cutting or drilling concrete or rock containing quartz may result in exposure to silica dust. **Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other worksite rules and regulations.** Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to cause cancer.



Avoid Silica Dust

Operation In Flammable/Explosive Atmosphere

WARNING! Avoid possible death or serious injury. **Never operate an excavator in these areas. Use of these excavators in explosive atmospheres can result in fires and explosions, causing death or serious injury.**



Do Not Operate In Explosive/Flammable Atmosphere

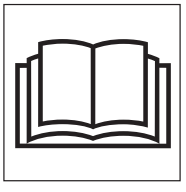
.

Operate Safely

Towing

Many compact excavators may not be towed. Refer to the manufacturer's manual(s) for specific towing instructions.

Never straddle a tow line or stand near a tow line under tension.



Consult Manufacturer's Manual Before Towing

Parking

Park the machine in a designated area out of traffic, preferably on level ground. (See page 39, **Machine Shutdown**.)

If freezing conditions are expected, the tracks should be first cleared of mud and dirt and the machine parked on planks or suitable debris.

Public roads are not suitable for parking. If the machine is disabled or you must park on a public road, barricade and mark the machine according to local and worksite regulations.

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Shut Down Safely

Machine Shutdown

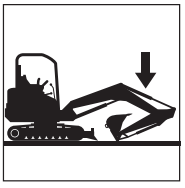
Properly shutting down a compact excavator can help prevent accidents when the machine is left unattended. Shut down the excavator following the specific procedures in the manufacturer's operator manual.

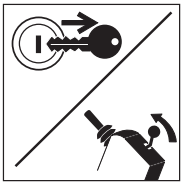
A typical list includes:
— Stop the machine.
— Make sure the area around the machine is clear of personnel.
— Slew the machine to align the upperstructure with the undercarriage, if possible.
— Return controls to neutral, including the auxiliary hydraulic controls.
— Lower the attachment and blade to the ground with slight down-pressure.
— Idle engine for a short cool-down period.
— Stop the engine.
— Cycle all hydraulic controls to relieve system pressure.
— Engage the control locking device, if equipped.
— Remove ignition key.
— Block the tracks if on a slope or incline.
— Check for and clean out trash build-up, especially in the engine compartment, battery box, around exhaust components, in confined spaces, under the machine and around rotating components.

Safe Dismounting

Never dismount from moving equipment. Observe proper shutdown practices before dismounting. Check for slippery steps and handholds.

Dismount carefully using three-point contact facing the machine. (See page 21, **Mount And Dismount Properly**.)





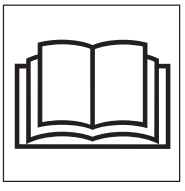
Load And Unload The Machine Safely

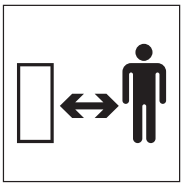
Loading And Unloading For Transport

All machines are not loaded in the same way, and the procedures given in the manufacturer's manual(s) should always be followed.

Some precautions apply to all machines:
— Keep bystanders away.
— Wear the seat belt, if equipped.
— If the compact excavator is equipped with a foldable TOPS/ROPS, make sure it is properly secured in the raised position.
— Place transport vehicle on a firm, level surface.
— Block or support the rear of the trailer.
— Secure the parking brake and block transport vehicle so it cannot move.
— Use ramps with slip-resistant surfaces, adequate size and strength, low angle (15 degrees or less) and proper height.
— Keep trailer bed and ramps clear of mud, oil, ice, snow, leaves and other debris.
— Position the attachment to the front of the machine.
— Drive forward up the ramps, raising the blade high enough for clearance.
— Cover or remove any SMV (Slow-Moving Vehicle) emblem.
— Secure the cab door, attachment and accessories in the transport position.
— Engage upperstructure slew lock, if equipped.
— Chain and block the excavator securely for transport. Refer to the manufacturer's operator manual for tie-down procedures.

Measure the transport height and width of the loaded machine to avoid overhead and width obstructions. Make sure clearance flags, all lights and warning signs are in place and visible.

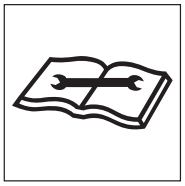




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Perform Maintenance Safely

Maintain Equipment



Be sure to maintain equipment according to manufacturer's instructions. Regularly check the operation of the protective and safety devices.

Do not perform any work on the compact excavator unless you are authorized and qualified to do so.

If you have been authorized to maintain the equipment, **read the operator, maintenance and service manuals.** Study the instructions, check the lubrication charts and examine all the instruction messages on the machine. Maintenance can be dangerous unless performed properly. Be sure you have the necessary skill, information, tools and equipment to do the job correctly.

If adjustments must be made with the engine running, always work as a 2-person team with one person sitting in the operator's seat while the other works on the machine.

IMPORTANT! Do not modify equipment or add components not approved by the manufacturer. Use parts, lubricants and service techniques recommended by the manufacturer.

Protect Yourself

Wear personal protective clothing and Personal Protective Equipment (PPE) issued to you or called for by job conditions.

You may need:
— Hard hat
— Safety boots with non-slip soles
— Safety glasses, goggles or face shield
— Apron and heavy-duty gloves
— Hearing protection
— Welding helmet or goggles
— Respirator or filter mask

Wear whatever is needed to protect yourself—do not take chances.

Perform Maintenance Safely

WARNING! Prevent death or serious injury from entanglement. **Do not wear loose clothing or accessories. Restrain long hair. Stay away from all rotating components when the engine is running.** Contact with or entanglement in rotating or moving parts could result in death or serious injury.

Wear a rubber apron and rubber gloves when working with corrosives. Wear gloves and safety shoes when handling wooden blocks, wire rope or sharp-edged metal.

Always use safety glasses, goggles or a face shield. They provide eye protection from fluids under pressure, during grinding and while servicing batteries. Protection is also needed from flying debris, liquids and loose material produced by equipment, tools and pressurized air/water/oil/fuel.

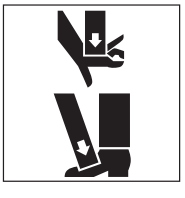
Wear a face shield when you disassemble spring-loaded components or work with battery acids. Wear a welding helmet or goggles with a shaded filter when you weld or cut with a torch.

Do not sand, grind, flame-cut, braze or weld without an approved respirator or appropriate ventilation. If welding is required on the machine, refer to the manufacturer's manuals or consult the equipment dealer for proper procedures. Make sure all flammable material is cleared from the area.

Keep pockets free of all objects that could fall out and drop into machinery.

Handle tools and heavy parts sensibly, with regard for yourself and other persons. Lower items—do not drop them.





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Perform Maintenance Safely

Prepare The Work Area

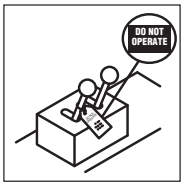
— Position the compact excavator in a level area out of the way of other working equipment.
— Make sure there is adequate light, ventilation and clearance.
— Remove oil, grease, ice and snow or water to eliminate any slippery surfaces.
— Clean around the machine and work area to minimize contamination. Clean up oil or fuel spills promptly and dispose of the material properly.

Prepare The Machine

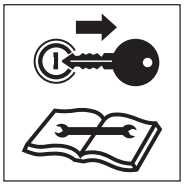
— Attach a “DO NOT OPERATE” warning tag to the control levers and remove the ignition key if the machine should not be started.
— Block the tracks.
— Release all hydraulic, water and air pressure. Lower, lock or block all hydraulically supported components.

WARNING! Disconnecting or loosening any hydraulic component or a part failure can cause unsupported equipment to drop. **Do not go under or near raised equipment unless supported by a manufacturer-approved support device(s).** Death or serious injury could result from falling equipment.

— Remove only guards or covers that provide access to the area being serviced. Replace all guards and covers when work is complete.



Use Warning Tags



Remove Key And Read Maintenance Manual



Use Approved Support Device

Perform Maintenance Safely

Use Approved Ventilation

If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

WARNING! Prevent possible injury. **Never work on machinery with the engine running unless instructed by the manufacturer’s manuals for specific service.**

WARNING! Never operate any type of engine without approved ventilation—EXHAUST FUMES CAN KILL.



Ventilate Work Area

Use Jacks And Hoists Carefully

If you must work beneath raised equipment, use solid wood blocks, jack-stands or other rigid and stable supports. Never use concrete blocks. When using jacks or hoists, always be sure they are adequately supported and of adequate capacity.

Make sure the hoists or jacks you use are in good repair. Never use jacks with cracked, bent or twisted parts. Never use frayed, twisted or pinched cables. Never use bent, worn or distorted hooks.

Protective Structure Safety

Do not remove or modify a protective structure (TOPS/ROPS, FOGS/FOPS OPS) except for service. Reinstall with manufacturer-approved fasteners before further machine operation.

Replace a damaged protective structure. Refer to the manufacturer’s manual for specific instructions and inspection requirements.

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Perform Maintenance Safely

Common Maintenance Safety Practices

Fuel Hazards

IMPORTANT! Always use approved fuel containers and dispensing equipment.

Fuels are flammable, so observe these practices to reduce the possibility of a serious accident.
- — Shut off engine and ignition before refueling.
- — Always ground the fuel nozzle against the filler neck to avoid sparks.
- — Keep sparks and open flames away from fuel.
- — Do not use a cell phone or two-way radio while fueling or handling fuel—they could cause sparks.
- — Do not smoke while refueling or when handling fuel containers.
- — Do not cut or weld on or near fuel lines, tanks or containers.
- — Do not overfill the tank or spill fuel. Clean up spilled fuel immediately.

Always use a nonflammable solvent when you clean parts. Do not use gasoline, diesel fuel or other flammable fluids.

Store all flammable fluids and materials away from work areas in suitable containers, per local regulations.

Cooling System Hazards

Liquid cooling systems build up pressure as the liquid gets hot, so **use extreme caution** before removing the radiator or tank cap. Be sure to:
- — Stop the engine and wait for the system to cool.
- — Wear protective clothing and safety glasses.
- — Turn the radiator or tank cap slowly to the first stop to allow the pressure to escape before removing the cap completely.



Perform Maintenance Safely

Hydraulic System Hazards

The hydraulic system is under pressure whenever the engine is running and may hold pressure even after the engine is shut off. Cycle all hydraulic controls, including auxiliary controls, after the engine is shut down to relieve trapped pressure in the lines.

During inspection of the hydraulic system:
- — Wait for fluid to cool before disconnecting the lines. Hot hydraulic fluid can cause SEVERE BURNS.
- — **Do not** use your hand to check for leaks.
- — Wear appropriate eye protection. Hydraulic fluid can cause permanent eye injury.

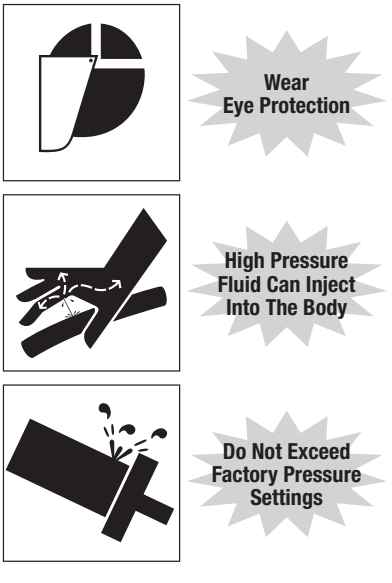
WARNING! Diesel fuel and hydraulic fluid under pressure can penetrate the skin or eyes and cause serious injury, blindness or death. Fluid leaks under pressure may not be visible. **Use a piece of cardboard or wood to find leaks, not your hand. Wear a face shield or safety goggles for eye protection.** If fluid is injected into the skin, it must be removed within a few hours by medical personnel familiar with this type of injury.

When venting or filling the hydraulic system, loosen the filler cap slowly and remove it gradually.

Never reset any relief valve in the hydraulic system to a pressure higher than recommended by the manufacturer.

Follow manufacturer's instructions when taking oil samples.

Do not permit an open flame around the hydraulic system.



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Perform Maintenance Safely

Electrical System Hazards

Before working on the electrical system, disconnect the battery cable(s).

— Remove the battery negative (-) cable(s) first.
— When reconnecting the battery, connect the battery negative (-) cable(s) last.

Battery electrolyte contains acid, which is a POISON and can cause SEVERE CHEMICAL BURNS.

Avoid Injury

— Wear a face shield to prevent electrolyte contact with your eyes.
— Wear chemical-resistant gloves and clothing to keep electrolyte off your skin and regular clothing.

WARNING! Electrolyte will damage eyes or skin on contact. **Always wear a face shield to avoid getting electrolyte in eyes.** If electrolyte contacts eyes, flush immediately with clean water and get medical attention. **Wear rubber gloves and protective clothing to keep electrolyte off skin.** If electrolyte contacts exposed skin or clothing, wash off immediately with clean water.

If electrolyte is ingested, seek MEDICAL ATTENTION IMMEDIATELY. NEVER give fluids that would induce vomiting.



Perform Maintenance Safely

Avoid Battery Explosion

WARNING! Avoid possible death or serious injury from explosion. Lead-acid batteries produce extremely explosive gases, especially when being charged. **Keep arcs, sparks, flames and lighted tobacco away.**

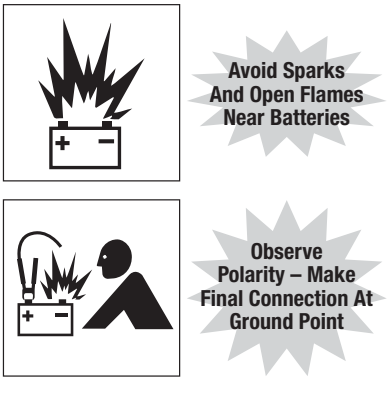
— **Do not** smoke near batteries.
— Check battery cables for worn or damaged insulation.
— Keep arcs, sparks and open flames away from batteries.
— Provide adequate ventilation.

Never check the battery by placing a metal object across the battery posts; the resulting spark could cause an explosion.

WARNING! Avoid possible death or serious injury from battery explosion. **Do not charge a battery or boost-start the engine if the battery is frozen. Warm to 60°F (15.5°C) or the battery may explode.**

Safety rules during battery boost-starting:

— Follow the instructions for proper “battery boost-starting” as specified in the manufacturer’s manual.
— Be sure the machines are not touching.
— Observe the polarity of the batteries and connections.
— Make the final cable connection to the engine or the ground point farthest from the battery and away from fuel lines. Never make the final connection at the starter or dead battery—sparks may ignite the explosive gases present at the battery.
— When disconnecting cables after boost-starting, remove the cables in reverse order of connection (i.e., final connection first).



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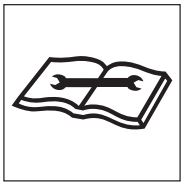
Perform Maintenance Safely

Track Maintenance And Adjustment

Check the tracks daily because the stability of the compact excavator can be dramatically affected by damage to tracks.

Check for:
— Damage or wear
— Correct tension according to manufacturer's instructions
— Proper lubrication of track rollers and idlers—refer to the manufacturer's manuals.

Track tension is important for good performance, reducing excessive track wear and preventing the tracks from coming off. Track and roller wear varies with working conditions and soil conditions. Special tools and procedures may be needed to check or adjust track tension. Follow manufacturer's specific service procedure(s) when removing and installing tracks.





WARNING! Track tensioning systems have compressed springs or pressurized fluid (oil or grease). Improperly releasing track tension forces can result in death or serious injury. **Always follow the manufacturer's warnings and instructions for track adjustment and other maintenance and servicing procedures.**

WARNING! Avoid possible death or serious injury. **Never strike or pound on track tension springs.** They may be under very high compression and could shatter explosively.

Perform Maintenance Safely

Complete Service And Repairs Before Machine Is Released

Tighten all bolts, fittings and connections to torques specified by the manufacturer.

Clean or replace all damaged, missing or painted-over signs, plates and decals that cannot be read.

Inspect and install all guards, covers and shields after servicing. Replace or repair any damaged parts. Refill and recharge pressure systems only with manufacturer-approved or recommended fluids.

Check readiness of fire extinguishers, if so equipped. Do not paint over or otherwise interfere with fire detectors or fire extinguisher access points.

Follow the instructions in the manufacturer's manual(s) for proper service of any fire suppression equipment on the machine.

Air conditioning service is limited to approved service personnel. Refer to the manufacturer's manual(s).



Start the engine and check for leaks. (See page 46, **Hydraulic System Hazards**.) Operate all controls to make sure the machine is functioning properly. Test the machine if necessary. After testing, shut down and check the work you performed. Are there any missing cotter pins, washers, locknuts, etc.? Recheck all fluid levels before releasing the compact excavator for operation.

All parts should be inspected during repair and replaced if worn, cracked or damaged. Excessively worn or damaged parts can fail and cause death or injury.

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Final Word To The User

You have just finished reading the AEM Compact Excavator Safety Manual. It is impossible for this manual to cover every safety situation you may encounter on a daily basis. Knowledge of these safety precautions and your application to the basic rules of safety will help to build good judgment in all situations. Our objective is to help you develop, establish and maintain good safety habits to make operating a Compact Excavator easier and safer for you.

This manual is another in a series on the safe operation of machinery published by AEM.
Many pictorials in this safety manual can be found and downloaded at http://pictorials.aem.org.
For additional publications visit our website at www.safetymaterials.org.

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Важно! Для ознакомления с информацией о запасных частях, пожалуйста, обратитесь к местному торговому представителю компании Wacker Neuson или посетите веб-сайт http://www.wackerneuson.com/.

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Važno : Za rezervne dijelove obratite se svom Wacker Neuson prodavaču ili posjetite mrežne stranice tvrtke Wacker Neuson: http://www.wackerneuson.com/.

Önemli : Yedek parça bilgileri için Wacker Neuson Bayinize bakın veya Wacker Neuson web sitesini ziyaret edin. http://www.wackerneuson.com/

重要 交換部品の情報については、ワッカーノイソンディーラーにお問い合わせ頂くか、ワッカーノイソンウェブサイト http://www.wackerneuson.com/ をご覧ください。

重要 有关备件信息，请咨询您的威克诺森经销商或访问威克诺森网站：http://www.wackerneuson.com/。

Important : Pentru informaţii referitoare la piesele de schimb, vă rugăm să vă adresaţi distribuitorului Wacker Neuson sau să vizitaţi site-ul web Wacker Neuson la adresa http://www.wackerneuson.com/.

Важно : За информация относно резервни части, моля, обърнете се към местния дилър на Wacker Neuson или посетете уебсайта на Wacker Neuson на адрес http://www.wackerneuson.com/.

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