

# Operator's manual

Track excavator

ET65  
ET90  
EZ80



<b>Machine models</b>	E14-01/E14-03/E14-04
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**WACKER  
NEUSON**

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Technical data, dimensions and weights are only given as an indication. Non-metric values are rounded off. Responsibility for errors or omissions not accepted.

The cover features the vehicle with possible optional equipment. Not all options in this operator's manual must be available in every destination country.

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



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**EC Compliance Statement**

**Manufacturer**

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



**Product**

Machine designation	<b>Hydraulic excavator</b>
Machine model	<b>E14-01 Tier III</b>
Trade name	<b>ET65</b>
Serial number	--
Engine / output kW	<b>404D-22T / 36.4</b>
Measured sound power level dB (A)	<b>97</b>
Guaranteed sound power level dB (A)	<b>97</b>

**Compliance statement**

Notified body according to Directive 2006/42/EC, appendix XI:  
DGUV Test, Prüf- und Zertifizierungsstelle  
Fachbereich Bauwesen, Landsberger Str. 309, 80687 Munich, Germany  
EU identification 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 3449:2009

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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 vehicle). Applies to EU countries, and countries with legislation similar to that of the EU. Applies to all vehicles with CE marks that have not been modified without authorization since the product was placed on the market.



## EC Compliance Statement

**Manufacturer**

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


**Product**

Machine designation	<b>Hydraulic excavator</b>
Machine model	<b>E14-01 Tier IV</b>
Trade name	<b>ET65</b>
Serial number	--
Engine / output kW	<b>404F-22T / 45.5</b>
Measured sound power level dB (A)	<b>98</b>
Guaranteed sound power level dB (A)	<b>98</b>

**Compliance statement**

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**EC Compliance Statement**

**Manufacturer**

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



**Product**

Machine designation	<b>Hydraulic excavator</b>
Machine model	<b>E14-03 Tier III</b>
Trade name	<b>EZ80</b>
Serial number	--
Engine / output kW	<b>404D-22T / 36.4</b>
Measured sound power level dB (A)	<b>97</b>
Guaranteed sound power level dB (A)	<b>97</b>

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## EC Compliance Statement

**Manufacturer**

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


**Product**

Machine designation	<b>Hydraulic excavator</b>
Machine model	<b>E14-04 DOC</b>
Trade name	<b>ET90</b>
Serial number	--
Output in kW	<b>TCD2.9L4DOC/55.4</b>
Measured sound power level dB (A)	<b>99</b>
Guaranteed sound power level dB (A)	<b>99</b>

**Compliance statement**

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

**Manufacturer**

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



**Product**

Machine designation	<b>Hydraulic excavator</b>
Machine model	<b>E14-04 DPF</b>
Trade name	<b>ET90</b>
Serial number	--
Engine / output kW	<b>TCD2.9L4CRT / 55.4</b>
Measured sound power level dB (A)	<b>99</b>
Guaranteed sound power level dB (A)	<b>99</b>

**Compliance statement**

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

# 1 Foreword

## 1.1 Operator's manual

### Information on this Operator's Manual

The Operator's Manual is stored in the compartment on the left side of the seat.

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

This operator's manual contains important information on how to work safely, correctly and economically with the vehicle. 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 vehicle 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 vehicle.

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

This Operator's Manual will help to familiarize yourself more easily with the vehicle, 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 vehicle or the Operator's Manual.

---

## Explanation of symbols and abbreviations

### Explanation of symbols

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

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

**A** Identifies an alphabetical list

**B** Continuation of an alphabetical list

Cross references: see page [1-1](#) (page)

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

Cross-references: [Fig. 2](#) (Fig. no. 1)

Cross references: – see [chapter "5 Operation" on page 5-1](#)  
(see chapter)

Cross references: – see ["Operation" on page 5-1](#) (-see text)



### **Information**

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



### **Environment**

Failure to observe the instructions identified by this symbol can cause damage to the environment.

---



**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
Hydrau- lic quick- hitch	=	Hydraulic quickhitch (for example Easy Lock)
max.	=	maximum
min.	=	minimum
MSWS	=	Mechanical quickhitch
Item	=	Position
hp	=	Stabilizer blade
ROPS	=	Roll Over Protective Structure (without losing contact with the ground)
TOPS	=	Tip Over Protective Structure
e. g.	=	for example

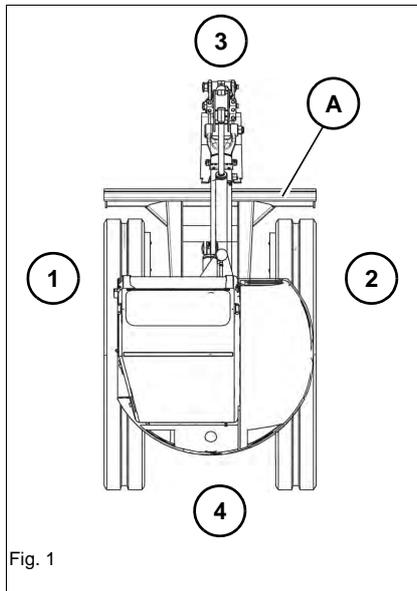


## Glossary

Attachment	All exchangeable equipment (for example buckets) released by Wacker Neuson and developed for work with the vehicle.
Working lights	The lights on the roof, chassis and boom are referred to as working lights.
Towing	The excavator is towed out of an immediate danger zone (railroad crossing or job site, for example).
DOC	Diesel oxidation catalytic converter; removes carbon monoxide and residues of unburned fuel from the exhaust fumes
DPF	Diesel particulate filter; burns soot particles in the exhaust fumes
Operating company/person	A company (or person) operating the vehicle. This can be a job site operating company, for example.
Operators	Person performing vehicle travel or operation.
Vehicle	Unless otherwise specified, the term " <b>machine</b> " refers to the excavator described in this Operator's Manual. In some cases the vehicle is also referred to as excavator to avoid confusion with other vehicles.
Machine operation	All work (for example vehicle travel, moving material, daily maintenance) an operator is allowed to or has to perform in connection with the vehicle. The term " <b>vehicle operation</b> " 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 <b>load diagrams</b> .
Crawling speed	Perform vehicle travel as slowly as possible and jerk free.
Hose rupture	Hydraulic oil under pressure escapes from a hydraulic hose.
Check the threaded fittings for tightness	<ul style="list-style-type: none"> <li>• Operator: Visually check the screwed connections and corresponding elements/sub-assemblies visually or manually (without using tools) for tightness</li> <li>• Authorized service center: if an attachment has to be used in the event of abnormalities for the control procedures, restore the screwed connection with new materials (screws, nuts)</li> </ul>
Visual aids	Visual aids are, for example, rearview mirrors, cameras, but also persons assisting the operator during vehicle operation.
Control lever base	The foldable control lever base on the left.

Tier III/Tier IV/DOC/DPF	The vehicles comply with different exhaust-gas standards depending on optional equipment. Engine variants are described separately if there are engine-specific differences (for example regarding operation).
Load diagram	Specifies the maximum load at a given boom extension with which the upper carriage may be rotated by 360° and the excavator may travel in creep gear with the stabilizer blade raised without tipping over.
Loading weight	The actual weight of the vehicle at the beginning of transportation. This weight refers to vehicles which are equipped exclusively with options approved by Wacker Neuson.
Additional control circuits	Additional control circuits required for certain attachments. <ul style="list-style-type: none"> <li>• AUX I: auxiliary hydraulics (for example for hydraulic hammer or offset bucket)</li> <li>• AUX II: 3rd control circuit (for example for universal grab)</li> <li>• AUX III: for example Powertilt</li> <li>• AUX IV: hydraulic quickhitch (for example Easy Lock)</li> <li>• AUX V: oscillating grab</li> </ul>

### Right/left/front/rear



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

## Target-group definition

This Operator's Manual is intended for professional construction site personnel.

Any operator must have fully read and understood this Operator's Manual completely.

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

## Operator qualification and requirements for safe operation

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

- Machine model and its outfitting
- Machine maintenance
- Work and driving speed
- Nature of ground and work environment

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

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

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

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

Follow the operating procedures and instructions described for the vehicle.

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

**Conversion table**

The rounded imperial values are indicated in brackets, for example 1060 cm<sup>3</sup> (64.7 in<sup>3</sup>).

<b>Volume unit</b>	
1 cm <sup>3</sup>	(0.061 in <sup>3</sup> )
1 m <sup>3</sup>	(35.31 ft <sup>3</sup> )
1 ml	(0.034 US fl.oz.)
1 l	(0.26 gal)
1 l/min	(0.26 gal/min)
<b>Unit of length</b>	
1 mm	(0.039 in)
1 m	(3.28 ft)
<b>Weight</b>	
1 kg	(2.2 lbs)
1 g	(0.035 oz)
<b>Pressure</b>	
1 bar	(14.5 psi)
1 kg/cm <sup>2</sup>	(14.22 lbs/in <sup>2</sup> )
<b>Force/output</b>	
1 kN	(224.81 lbf)
1 kW	(1.34 hp)
1 PS	(0.986 hp)
<b>Torque</b>	
1 Nm	(0.74 ft.lbs.)
<b>Speed</b>	
1 kph	(0.62 mph)
<b>Acceleration</b>	
1 m/s <sup>2</sup>	(3.28 ft/s <sup>2</sup> )

## 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 vehicles 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 that are 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 vehicle can be negatively affected by performing vehicle 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 vehicle. 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 vehicle. Observe all safety instructions and warnings.

## 2 Safety

### 2.1 Safety symbols and signal words

#### Explanation

The following symbol identifies safety instructions. It is used for warning against potential personal risk or danger.

---

 **DANGER**

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

Consequences in case of non-observance.

- ▶ Avoidance of injury or death.

---

 **WARNING**

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

Consequences in case of non-observance.

- ▶ Avoidance of injury or death.

---

 **CAUTION**

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

Consequences in case of non-observance.

- ▶ Avoidance of injury.

---

**NOTICE**

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

- ▶ Avoidance of damage to property.
-

### 2.2 Qualification of operating personnel

#### Owner's duties

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

#### Required knowledge of operator

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

## **Preparatory measures for the operator**

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

## **2.3 Conduct**

### **Prerequisites for operation**

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



## 2.4 Operation

### Preparatory measures

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

## Job site

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

## Danger zone

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



### **Carrying passengers**

- Carrying passengers with the vehicle is PROHIBITED.
- Carrying passengers on/in attachments/tools is PROHIBITED.
- Carrying passengers on/in trailers is PROHIBITED.

### **Mechanical integrity**

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

### **Starting the engine of the vehicle**

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

## **Machine operation**

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

## **Machine travel on public roads/sites**

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



### Stopping the engine of the vehicle

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

### Stopping and securing the vehicle

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

## 2.5 Lifting gear applications

### Requirements

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

## **Fastening, guiding and removing loads**

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



### Lifting gear applications

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

## 2.6 Trailer operation

### Trailer operation

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

## 2.7 Attachment operation

### Attachments

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



### Operating

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

### Removing and fitting attachments

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

## 2.8 Towing, loading and transporting

### Towing

- Seal off the danger zone.
- Ensure that no one is near the towing bar or cable. The safety distance is equal to 1.5 times the length of the towing equipment.  
Use a towing cable for vehicles with a total weight of up to 4.0 tons.  
Use a towing bar for vehicles with a total weight of over 4.0 tons.
- Observe the mandatory transport position, permissible speed and itinerary.
- A tractor vehicle of the same weight category must be used as a minimum. Furthermore, the tractor vehicle must be equipped with a safe braking system and sufficient tractive power.
- Use only towing bars or cables certified by a test/certification body, observe the inspection intervals.
- Do not use any towing bars or cables that are dirty, damaged or not of sufficient size.
- Fasten towing bars or cables only at the defined points.
- Tow away only in accordance with this Operator's Manual to avoid damage to the vehicle.
- Observe the national regulations (for example the light regulations) when towing on public roads/sites.



### Crane-lifting

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

## Transportation

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

## 2.9 Maintenance

### Maintenance

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



### Personal safety measures

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

## **Preparatory measures**

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

## **Measures for performing maintenance**

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

### Modifications and spare parts

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

### Protective structures

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

## 2.10 Measures for avoiding risks

### Tires

- Have repair work on the tires only performed by trained technical personnel.
- Check the tires for correct pressure and visible damage (for example cracks, cuts).
- Tighten the wheel nuts to the specified tightening torque. (see chapter 7.18 Tires/tracks).
- Use only approved tires.
- The machine must have identical tires (for example profile, revolutions per mile).

### Tracks

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

### **Hydraulic and compressed-air system**

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

### **Electrical system**

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



### Battery

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#### **CALIFORNIA**

##### **Proposition 65 Warning**

Battery terminals, battery clamps, and related accessories contain lead and lead compounds. These chemicals are classified in the state of California as a cause for cancer and a reduction of fertility. Wash hands after handling.

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

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## Safety instructions regarding internal combustion engines

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### **CALIFORNIA**

#### **Proposition 65 Warning**

Engine exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

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

#### **Bleeding the fuel system and refueling**

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



### Handling oil, grease and other substances

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

### Fire hazard

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

### **Working near electric supply lines**

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

### **Working near non-electric supply lines**

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



### Behavior during thunderstorm

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

### Noise

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

### Cleaning

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

### 3 Introduction

#### 3.1 Machine overview



Item	Designation	Item	Designation
1	Stabilizer blade	14	Shovel arm
2	Chassis	15	Bucket
3	Tracks	16	Cab
4	Stabilizer blade lifting eyes	17	Tie-down points
5	Mirrors	18	One-piece boom lifting eye
6	Chassis working lights	19	Handhold
7	Rocker cover	20	Door handle
8	Rotating beacon (option)	21	Door arrester
9	Auxiliary hydraulics	22	Exhaust
10	Air conditioning (option)	23	Engine cover
11	Boom	24	Roof lights (option)
12	One-piece boom	25	Counterweight (option)
13	Triple articulation boom (option)	--	--

## Model designations and trade names

Machine model	Trade name	Engine
E14-01 Tier III	ET65	Perkins 404D-22T
E14-01 Tier IV		Perkins 404F-22T
		Perkins 404F-E22TA
E14-03 Tier III	EZ80	Perkins 404D-22T
E14-04 DOC	ET90	Deutz TCD 2.9 DOC
E14-04 DPF		Deutz TCD 2.9 DPF

## 3.2 Brief description of the vehicle

The Wacker Neuson model E14 track excavators are self-propelled work vehicles.

These vehicles are powerful, highly flexible and efficient construction vehicles with minimum environmental impact. They are mainly used for loosening and moving earth, for example for digging and filling up construction pits. A wide range of attachments offers a large number of applications, for example hammer operation or bulk-material handling with a grab.

Other possible applications can be found in chapter [Technical data of attachments on page 9-20](#).



### Information

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

### Cabin

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

- ROPS/TOPS tested cabin.
- Standard protective FOPS structure (category I) integrated in cabin
- Protective FOPS structure category II (option) for driver' cabin; Protective structure against falling objects.
- Front guard category II (option) for driver's cabin; Protective structure to guard against objects from the front (e.g. pipes, tree roots).

### Definition of FOPS/Front Guard categories

#### Category I (FOPS):

Protection against small falling (FOPS) objects (for example bricks, small pieces of concrete, tools) for vehicles 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 vehicles that are used for tasks such as clearance, demolition and forestry work.

#### Superstructure Versions

**ET:** conventional superstructure

**EZ:** Zero tail revolving superstructure; the revolving superstructure does not project over the width of the vehicle with an extended telescopic travel gear **without a rear weight** when rotating.

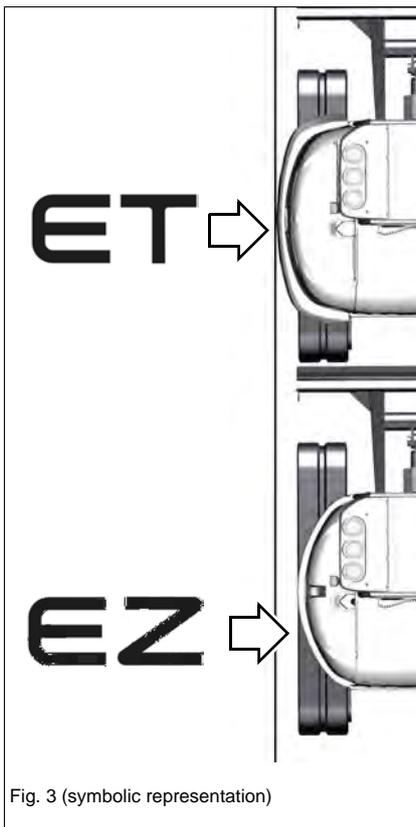


Fig. 3 (symbolic representation)

### 3.3 Information and regulations on use

#### Designated use

The vehicle 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 9-20*.
- Every other use is regarded as not designated for the use of the vehicle. 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 vehicle may not be used on public roads.
- In applications with lifting gear, the vehicle is used according to its designated use only if the mandatory devices are installed and functional.
- Use the quickhitch only with the corresponding attachments.
- A restricted work range applies to work with attachments (for example hammer) that can cause fragments to fly around.

## 3.4 Labels

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### **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.
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### **Information**

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

---

### Type labels



Fig. 4 (symbolic representation)

The vehicle type label is located at the right hand side of the vehicle, behind the swiveling console.



Fig. 5 (symbolic representation)

### Serial number

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

The vehicle type label contains the following information:

Description of attachment	HYDRAULIC EXCAVATOR
Vehicle serial no. / serial no.	Machine serial number
Fahrzeug Modell/model/modèle:	Machine designation
Leistung/performance:	Engine power
Typ/version:	Machine type
Betriebsgewicht/operating weight/poids en charge:	Operating weight
Transportgewicht/ transport weight/ poids en transport:	Transport weight
G. weight / GWR / PTAC:	Gross weight rating (permissible)
Max. Nutzlast/max. payload/max. charge utile:	Maximum payload
Zul. Achslast vorne/front GAWR/PNBE AV:	Front gross axle weight rating
Zul. Achslast hinten/rear GAWR/PNBE AR:	Rear gross axle weight rating
EWG Nr./CEE no.:	EEC check number
Baujahr/model year/année fabr.:	Year of construction



	A				
	S				
	D				
WNC	E	1301	A	PAL	00400
1	2	3	4	5	6

Fig. 6

**17-digit serial number (from 2012)**

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

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

** Information**

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



Fig. 7

#### **Cabin number**

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

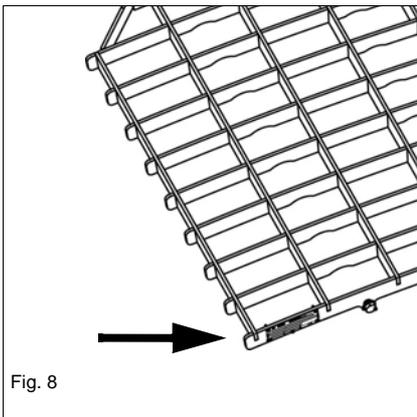


Fig. 8

#### **FOPS screen type label**

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

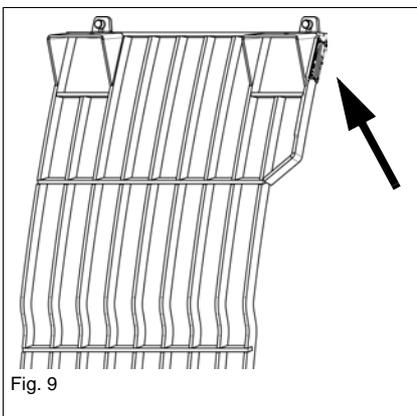


Fig. 9

#### **Front Guard type label**

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

Warning labels

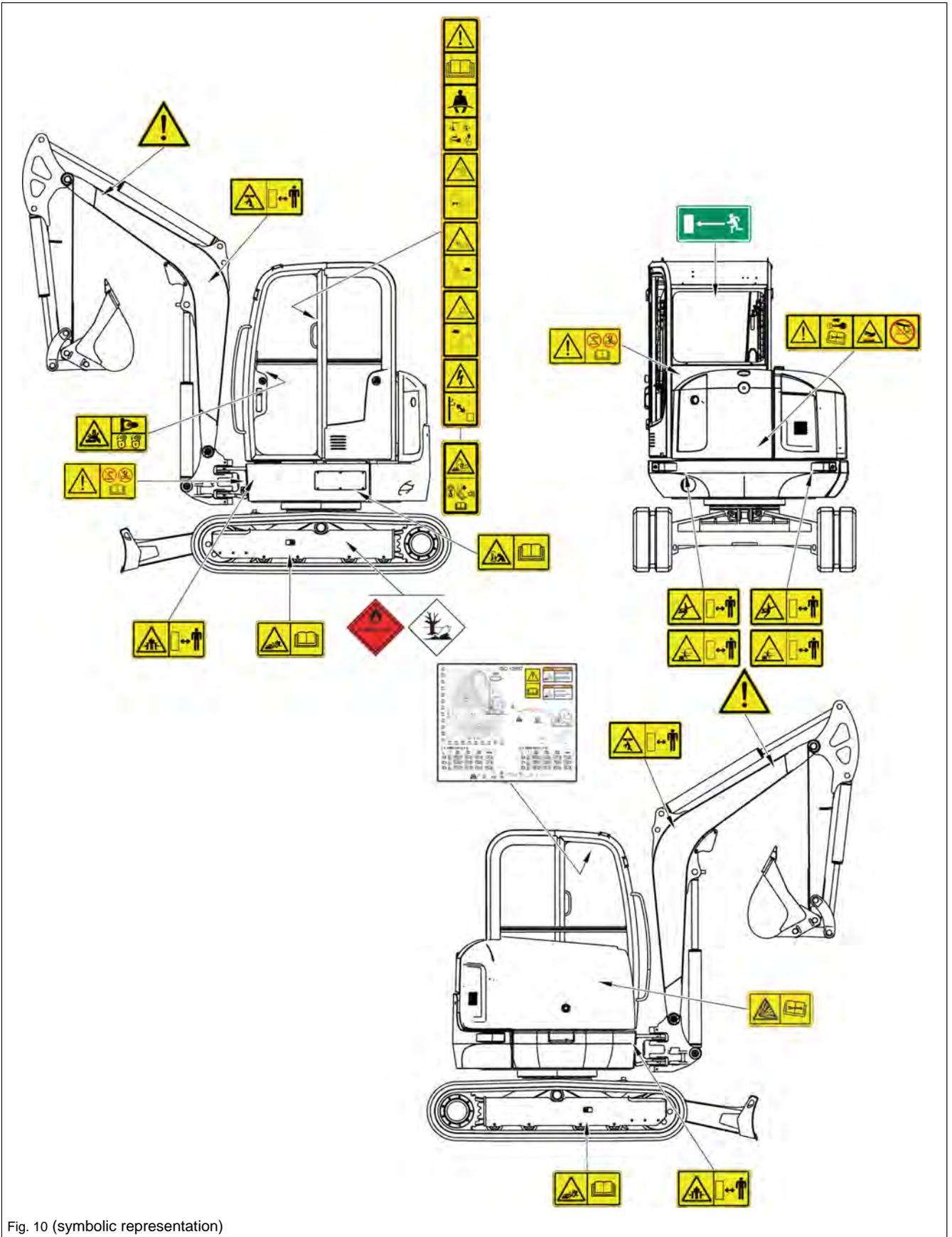


Fig. 10 (symbolic representation)



Fig. 11

**Meaning**

Crush Hazard

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

**Position**

On the left and right side on the lifting arm.



Fig. 12

**Meaning**

Crush Hazard

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

**Position**

At the front left and right of the chassis

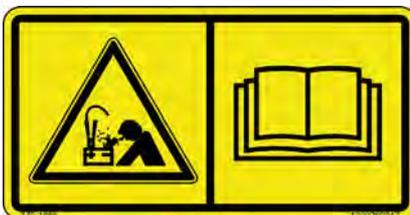


Fig. 13

**Meaning**

Explosion hazard due to wrong connection of battery jump cables

**Position**

Next to the battery

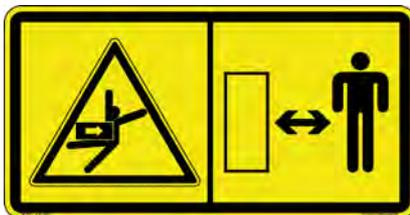


Fig. 14

**Meaning**

Crush Hazard

Do not allow anyone to stay in the swiveling range of the vehicle.

**Position**

On the left and right side of the engine hood

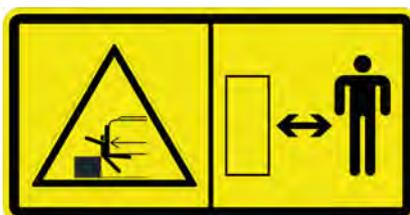


Fig. 15

**Meaning**

Crush Hazard

Do not allow anyone to stay in the swiveling range of the vehicle.

**Position**

On the left and right side on the rear weight



Fig. 16

**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 rear left of the cabin

**Alternative Position**

At middle front of chassis



Fig. 17

**Meaning**

Crush Hazard

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

**Position**

On the window wiper motor



Fig. 18

**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

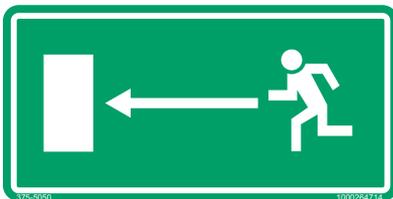


Fig. 19

**Meaning (option)**

Emergency exit if equipped with **Front Guard** option

**Position**

Inside the cabin on the rear window



Fig. 20

**Meaning (option)**

Injury hazard due to grease escaping under pressure

Read the operator's manual before working with the track tensioner.

**Position**

On left and right-hand undercarriage

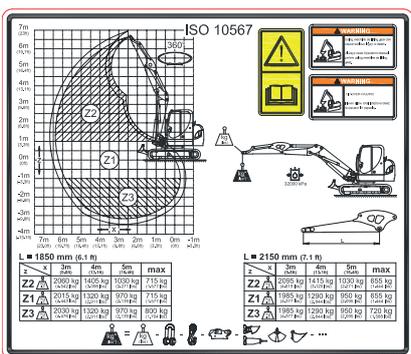


Fig. 21

**Meaning (option)**

Load diagram

**Position**

On the headliner



Fig. 22

**Meaning**

Read the Operator's Manual before starting the vehicle.

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.

**Crush Hazard**

Possible serious vehicle damage.

Keep a safe distance from the cabin.

**Crush Hazard**

Possible serious vehicle damage.

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

Do not drive in speed range 2.

Risk of fatal injuries due to electric shock

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

**Position**

On the B pillar on the left



Fig. 23

**Meaning (option)**

Switch on the safe load indicator during lifting gear applications.

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

Possible serious vehicle damage

Read and understand the Operator's Manual.

**Position**

On the B pillar on the left



Fig. 24

**Meaning**

Read the Operator's Manual before starting the vehicle.

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 surfaces

- 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

**Meaning**

Burn hazard due to hot surfaces (lines, plug connections, hardware, 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

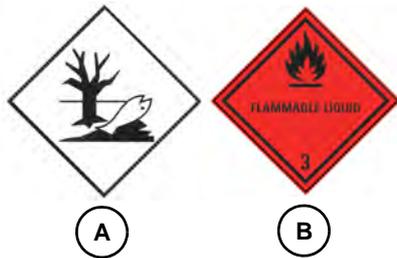


Fig. 26

Labels

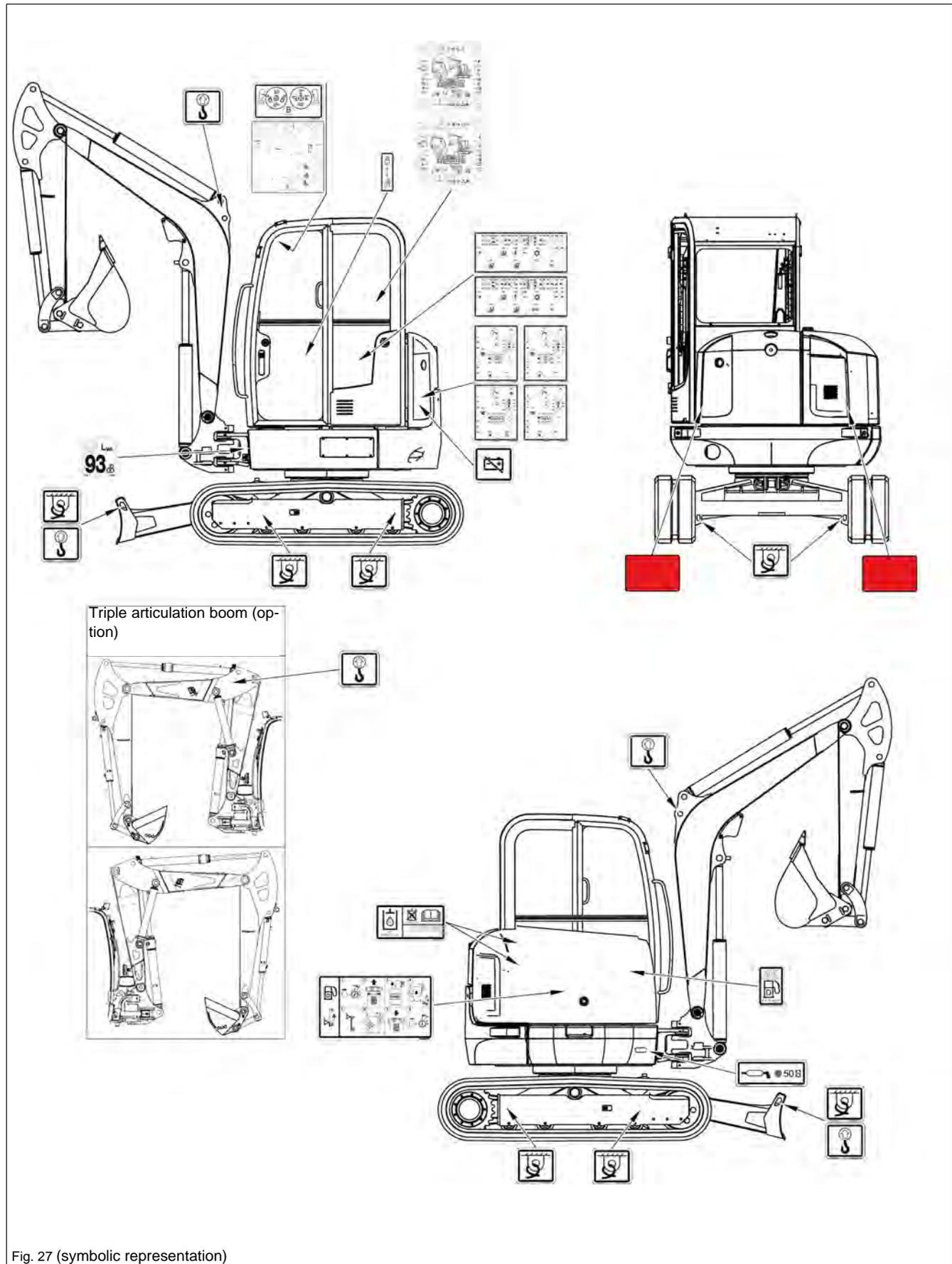




Fig. 29

**Meaning**

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

**Position**

Next to the fuel tank filler inlet

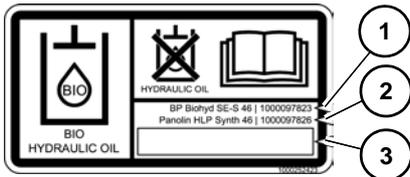


Fig. 30

**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 neck of the hydraulic oil tank



Fig. 31

**Meaning**

Lifting eyes

**Position**

Monobloc boom: right and left side, near lifting eye

Triple articulation boom: left side, near articulated joint

Dozer blade: left and right on lifting eyes



Fig. 32

**Meaning**

Tie-down points

**Position**

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

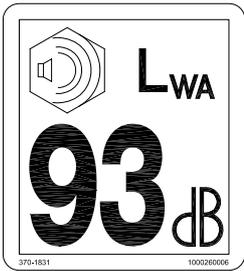


Fig. 33 (symbolic representation)

**Meaning**

Indication of sound power level produced by the vehicle.

$L_{WA}$  = sound power level

ET65 Tier III/EZ80 Tier III: 97 dB

ET65 Tier IV: 98 dB

ET90 DOC/ET90 DPF: 99 dB

**Position**

At the front left of the chassis

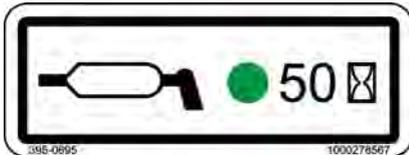


Fig. 34

**Meaning**

Lubrication interval

**Position**

On the right side of the chassis

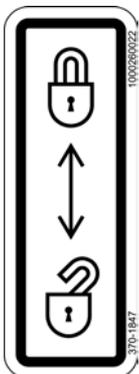


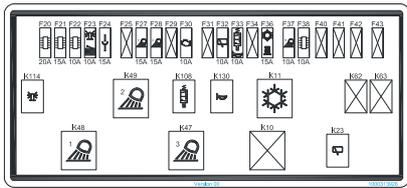
Fig. 35

**Meaning**

Hydraulic functions active or locked.

**Position**

On control lever base



**A**

**Meaning**

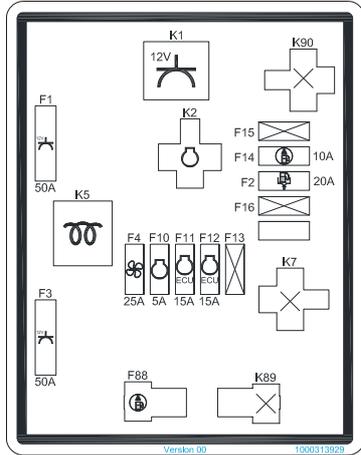
Cabin relays and fuses (**A**)

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

**Position**

**A:** on the outside of the fuse box cover.

**B:** on the partition wall in the engine compartment



**B**

Fig. 36 (symbolic representation)

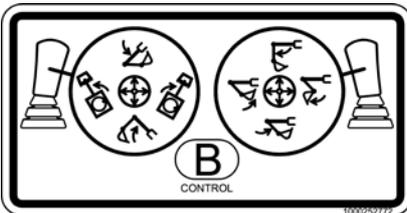


Fig. 37

**Meaning (option)**

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

**Position**

On the roof window on the right



Fig. 38

**Meaning**

Battery master switch

**Position**

At battery master switch

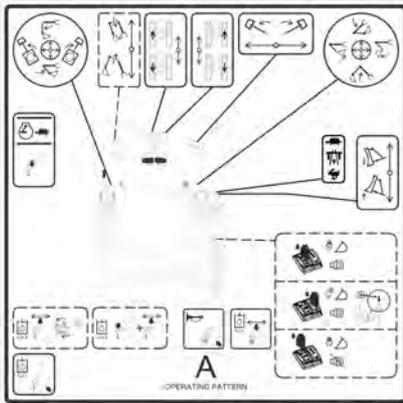


Fig. 39

**Meaning**

Functional overview (ISO controls).

Check the selected control mode before starting the vehicle.

**Position**

On the roof window

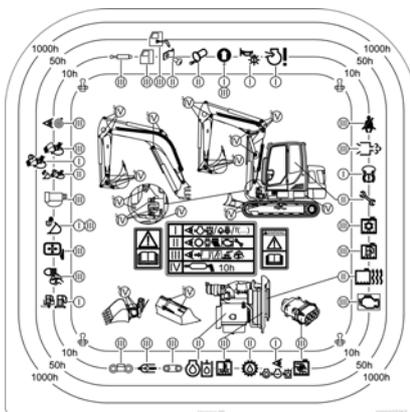


Fig. 40

**Meaning**

Maintenance intervals

**Position**

On the cabin, left side

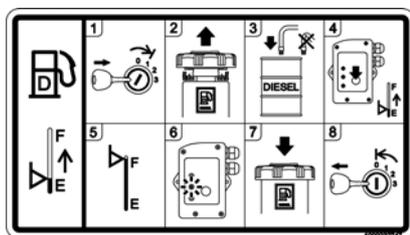


Fig. 41

**Meaning**

Fuel-filling pump

**Position**

Under the valve cover



Fig. 42

**Meaning (option)**

Reflectors

**Position**

At the rear left and right of the vehicle



**Information**

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

ANSI label (option)

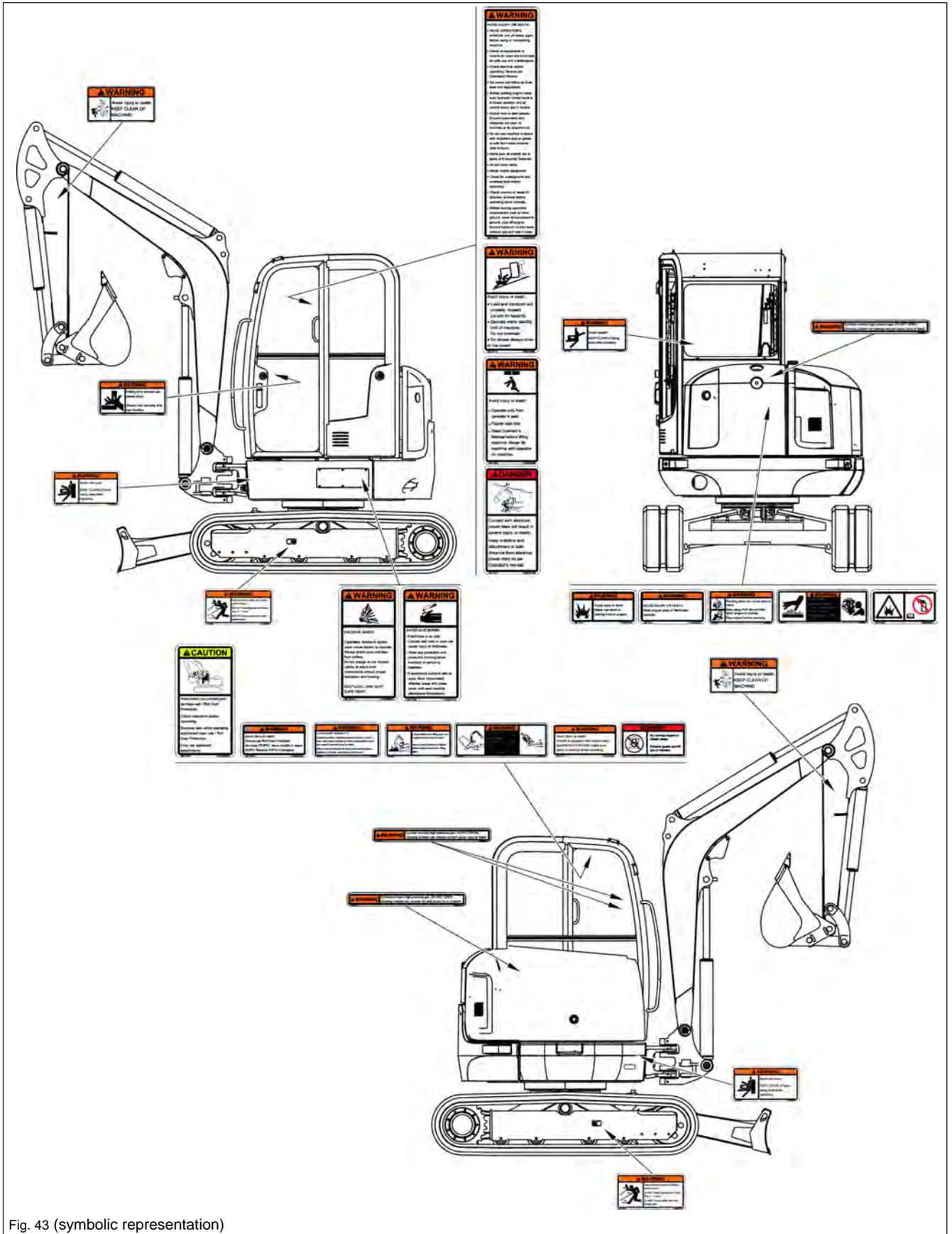


Fig. 43 (symbolic representation)



Fig. 44

**Position**  
On the headliner



Fig. 45

**Position**  
On the headliner

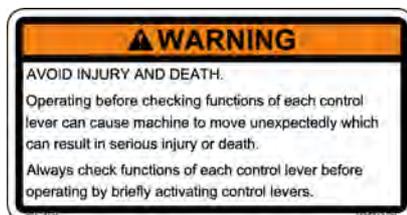


Fig. 46

**Position**  
On the headliner



Fig. 47

**Position**  
On the headliner

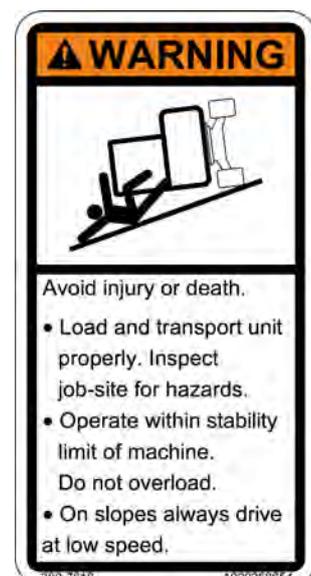


Fig. 48

**Position**  
On the B pillar on the left



Fig. 49

**Position**

On the B pillar on the left

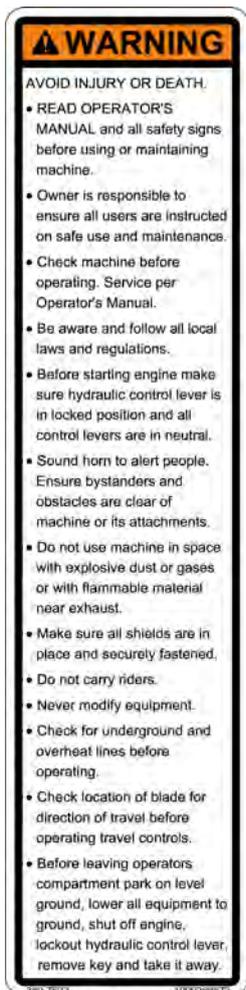


Fig. 50

**Position**

On the B pillar on the left

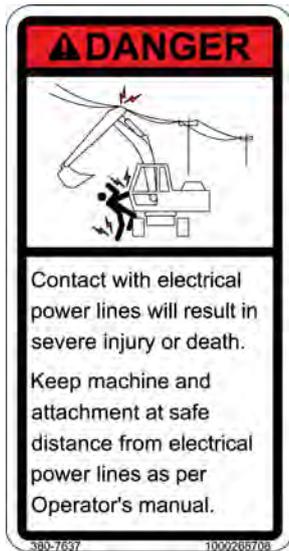


Fig. 51

**Position**

On the B pillar on the left



Fig. 52

**Position**

In the engine compartment on the bulkhead



Fig. 53

**Position**

In the engine compartment on the bulkhead



Fig. 54

**Position**

In the engine compartment on the bulkhead



Fig. 55

**Position**

In the engine compartment on the bulkhead

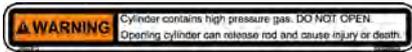


Fig. 56

**Position**

On the gas struts of the engine cover and tank cover



Fig. 57

**Position**

On the right side of the roof



Fig. 58

**Position**

On the right side of the roof



Fig. 59

**Position**

On the boom on the left and right

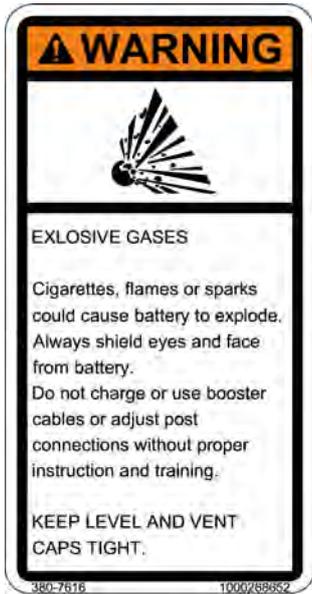


Fig. 60

**Position**  
On the battery cover



Fig. 61

**Position**  
On the battery cover



Fig. 62

**Position**  
At the bottom left of the rear window



Fig. 63

**Position**

At the front left and right of the chassis



Fig. 64

**Position**

On left and right-hand undercarriage



Fig. 65

**Position**

On the front window



Fig. 66

**Position**

On the headliner



Fig. 67

**Meaning**

Do not use starting aid sprays

**Position**

In the engine compartment on the bulkhead



Notes:

## 4 Putting into operation

### 4.1 Cabin/control stand

---

 **CAUTION****Risk of injury when getting on and off!**

Entering or exiting incorrectly can cause injury.

- ▶ Keep the mandatory stages **A** and handhold **B** clean and only use them for entering and exiting.
  - ▶ Face the vehicle as you enter and leave it.
  - ▶ Have damaged stages and handles replaced. Do not operate the vehicle.
- 

 **CAUTION****Crushing hazard due to incorrectly locked 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 the window channel clear.
-

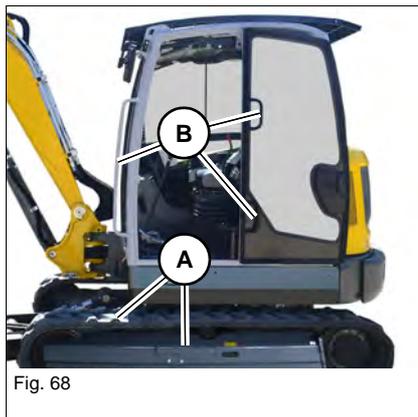


Fig. 68

### Getting on and off

Use footholds **A** and handles **B**. Do support yourself on the control elements.

Two hands and one foot must be always in contact with the vehicle when getting on and off.



### Information

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

### Unlocking and locking the door

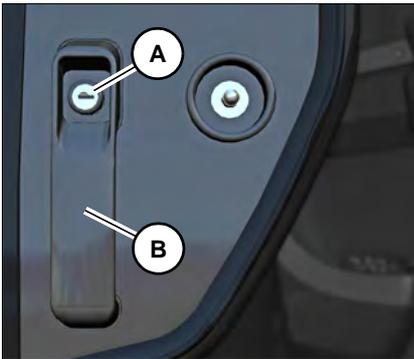


Fig. 69

**Unlocking:**

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

**Locking:**

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

### Opening and closing the door

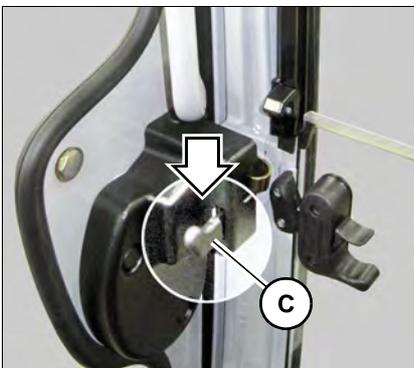


Fig. 70 (symbolic representation)

**Opening:**

Press door lock **A** and pull door handle **B**.

**Closing:**

Close the door applying firm pressure.

**Opening the door from the inside:**

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

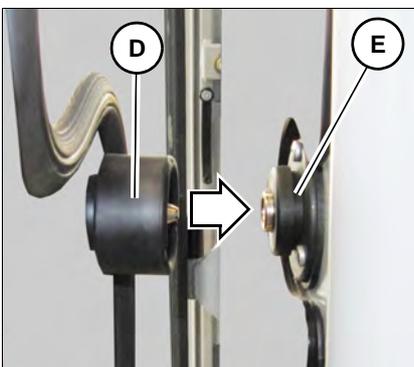


Fig. 71 (symbolic representation)

**Securing an open door**

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

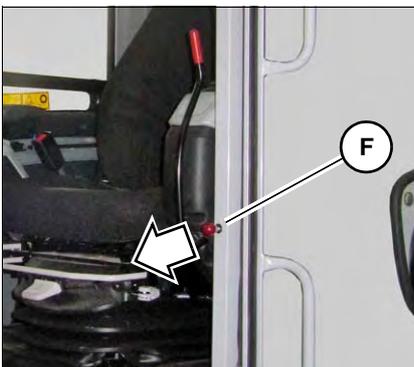


Fig. 72

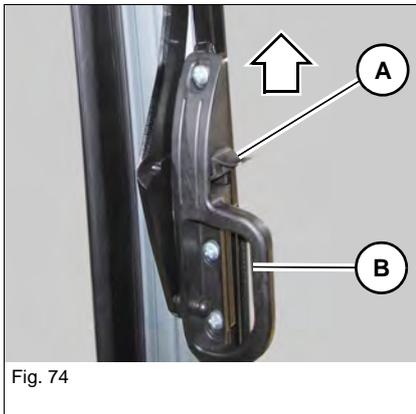
**Releasing the door arrester**

Pull button **F**.

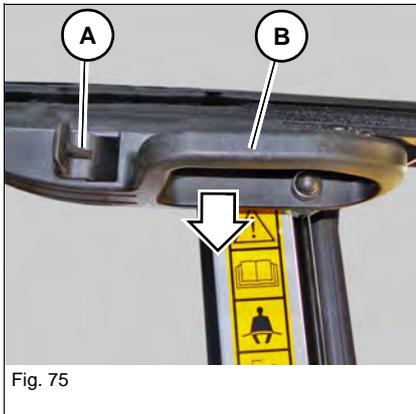
### Opening/closing the front window



#### Opening the upper front window



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.

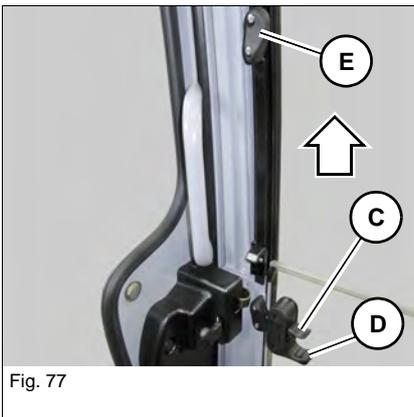


#### Closing the upper front window

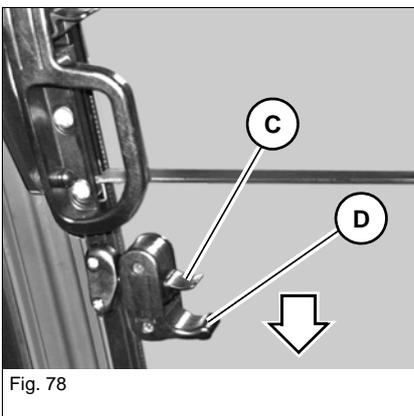
1. Press levers **A** on the left and right, and pull the front window downward with handles **B** on the left and right.
2. Press the front window fully forward and release levers **A**.



### Opening the lower front window



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**.



### 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.



Fig. 79

### Opening the whole front window

1. Open the lower front window as described on page 4-5.
2. Open both windows together as described on page 4-4.

### Closing the whole front window

1. Close both windows together as described on page 4-4.
2. Close the lower front window as described 4-5 on page.

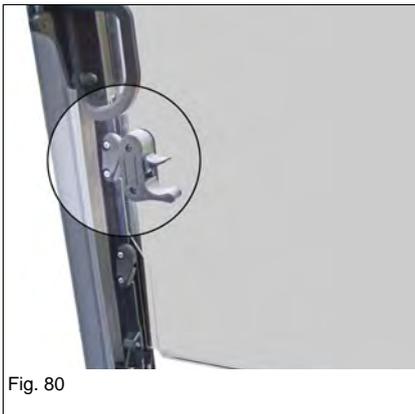


Fig. 80

---

### 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. 80*).
- 



Fig. 81

### Opening the front window to a gap (ventilation position)

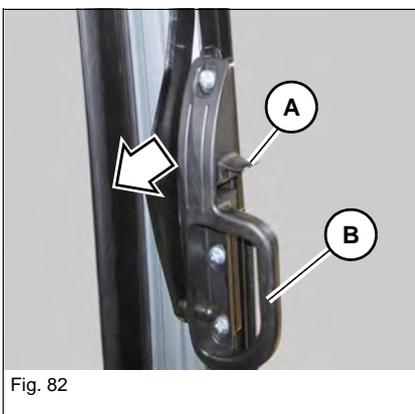


Fig. 82

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.



Fig. 83

### Integrated rain shield

When the entire front window is open, the lower front window can be used as an additional means of protection against rain.

### Information

The rain canopy cannot be used when the Front Guard is mounted.

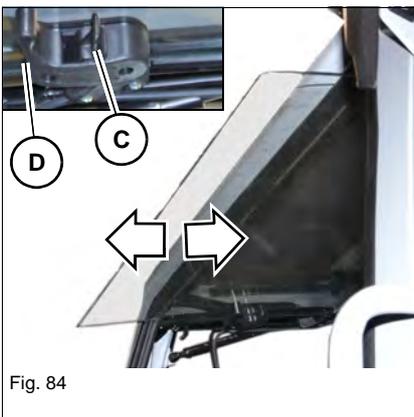


Fig. 84

### Open

1. Press and hold levers **C** on the left and right, and push the front window all the way forward.
2. Pull the front window backward with handles **D** on the left and right until it engages.

### Close

1. Press levers **C** on the left and right and pull the front window backward.
2. Release levers **C** and pull the window all the way backward until it engages.

## Opening/closing the side windows

Both side windows on the right can be opened.

### Open

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

### Close

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

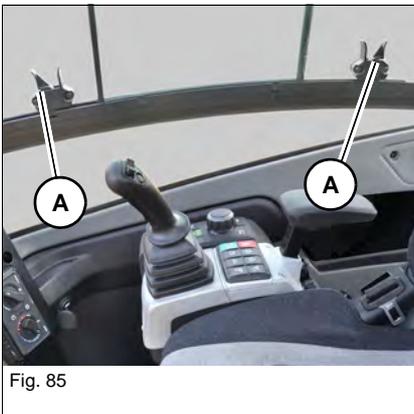


Fig. 85

### Sun blind

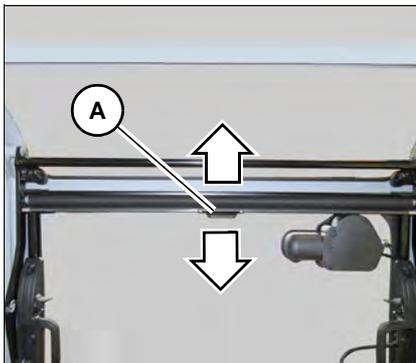


Fig. 86

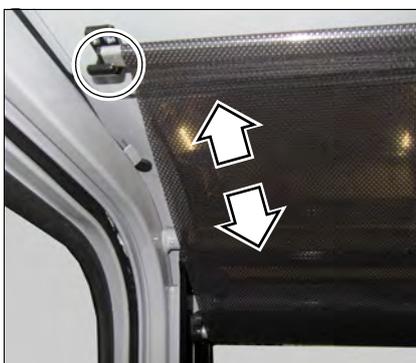


Fig. 87

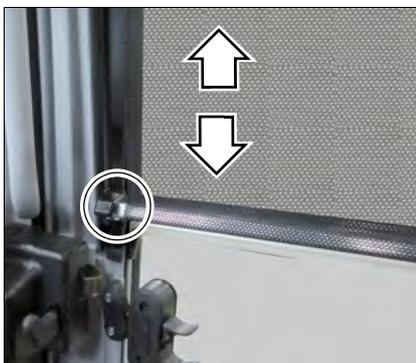


Fig. 88

The sun blind protects the operator against direct sunlight through the front or roof windows.

The sun blind can be fastened at the headliner or front window with flap **A**.

#### Fastening the sun blind at the roof window

Pull the sun blind upward with flap **A** and hitch it on the headliner on the left and right.

#### Removing the sun blind at the roof window

Unhitch and roll up the sun blind.

#### Fastening the sun blind at the front window

Pull the sun blind downward with flap **A** and hitch it on the front window on the left and right.



#### Information

If the front window is raised, the sun blind then protects against the sun shining through the roof window.

#### Removing the sun blind at the front window

Unhitch and roll up the sun blind.

## 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 cabin in an emergency!**

An emergency exit can cause serious injury or death.

- ▶ The front and the right of the vehicle have neither footholds nor handles for safely exiting the cabin.

---

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

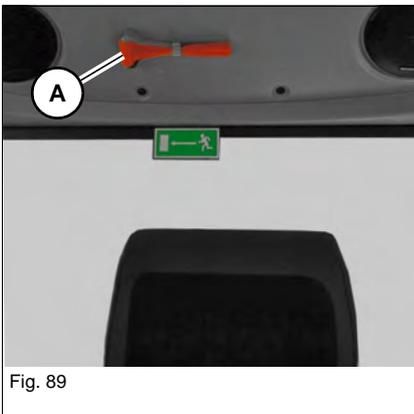
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### **WARNING**

#### **Injury hazard when leaving the cabin 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 vehicle.
- ▶ 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.



---

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.

### Comfort seat

#### **WARNING**

##### **Accident hazard due to seat adjustment during vehicle operation!**

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

- ▶ Adjust the operator seat before putting the vehicle into operation.
- ▶ Ensure that the levers are locked into place.

#### Weight adjustment

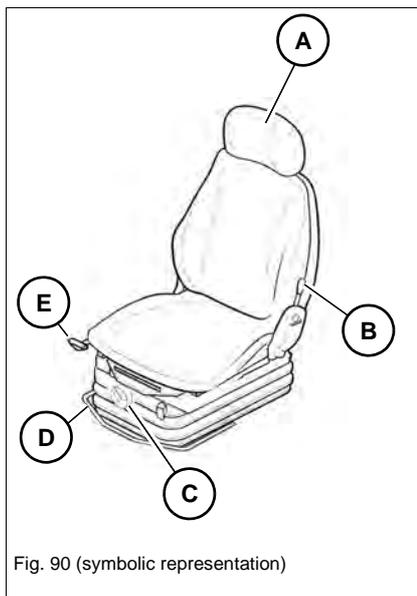
#### **CAUTION**

##### **Spinal cord injury due to incorrect seat adjustment!**

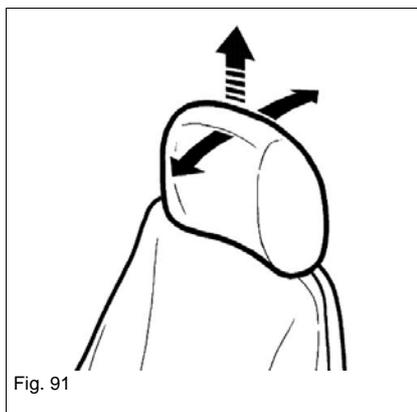
An incorrect weight adjustment can cause injury to the spinal cord.

- ▶ Ensure that the seat is correctly adjusted to the operator's weight before vehicle travel or operation.

The comfort seat can be adjusted as follows:

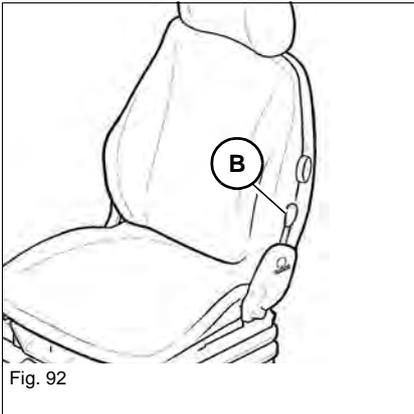


- A Headrest
- B Backrest
- C Weight
- D Horizontal adjustment of seat and control lever console
- E Horizontal seat adjustment

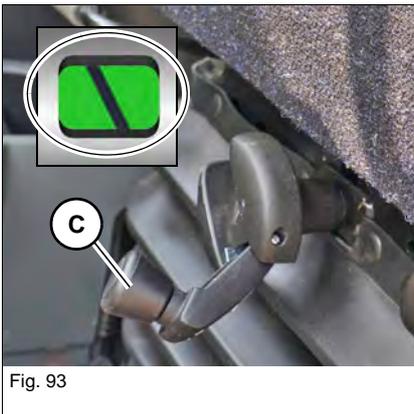


#### Headrest

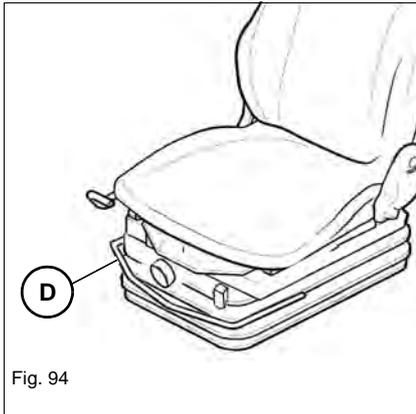
Function	Operation
Height adjustment	Pull up or push down
Inclination adjustment	Push forward or backward

**Backrest**

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

**Adjusting the weight**

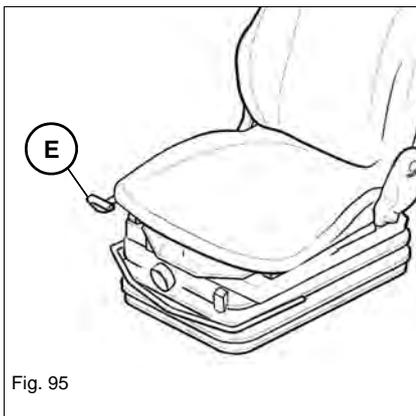
1. Sit down on the operator seat and unfold crank **C**.
2. Rotate crank **C** until the highlighted symbol appears.



### 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 **D** upward and lock seat console into place.



### Horizontal seat adjustment

1. Sit down on the operator seat.
2. Pull lever **E** upward and lock seat console into place.

**Air-suspension comfort seat (option)**

**WARNING**
**Accident hazard due to seat adjustment during vehicle operation!**

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

- ▶ Adjust the operator seat before putting the vehicle 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 vehicle travel or operation.


**Information**

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

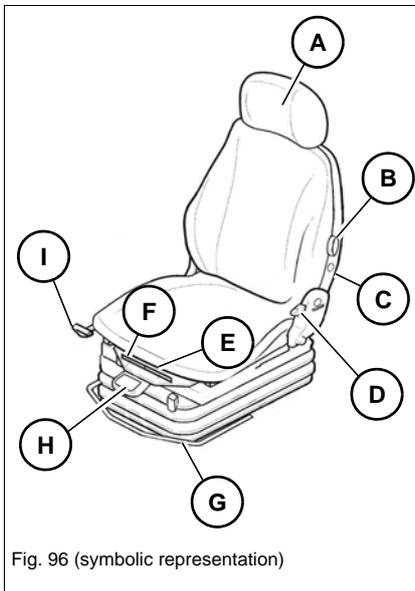
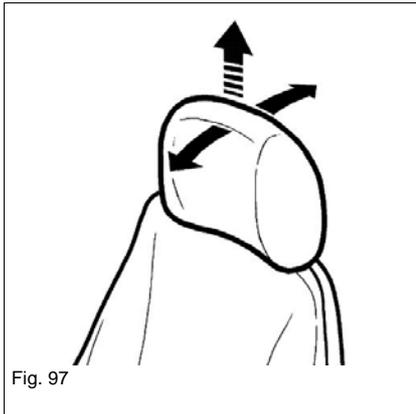


Fig. 96 (symbolic representation)

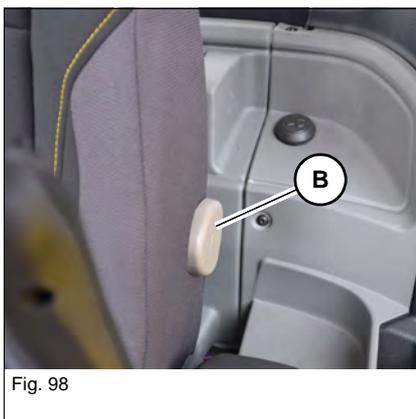
The air-suspension seat can be adjusted as follows:

- A Headrest
- B Lumbar support
- C Heated seat
- 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



### Headrest

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



### Lumbar support

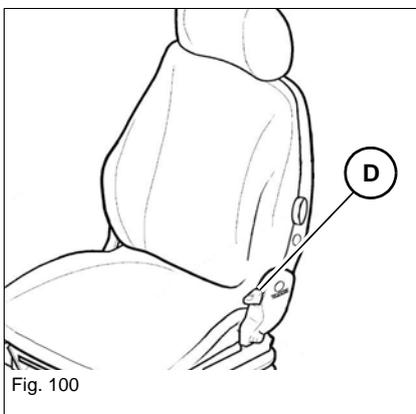
The lumbar support can be adjusted to the natural curvature of the spine. This reduces the load on the spine and ensures a non-fatiguing seating position.

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



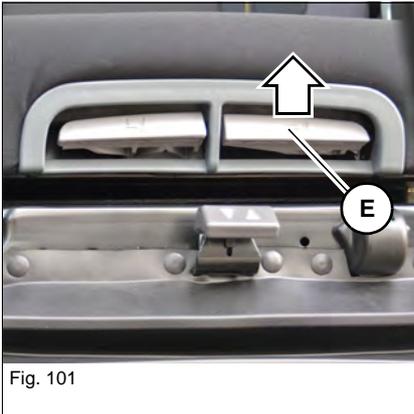
### Heated seat

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

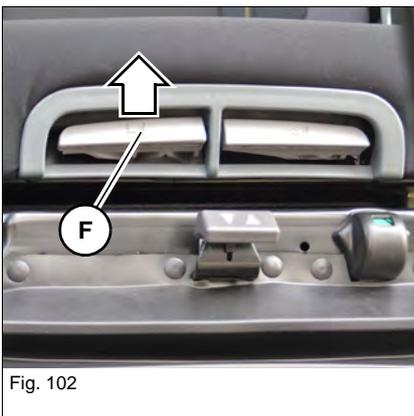


### Backrest

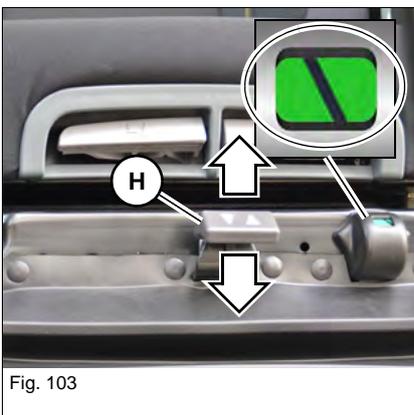
1. Sit down on the operator seat.
2. Pull lever **D** and adjust the backrest.

**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.

**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.

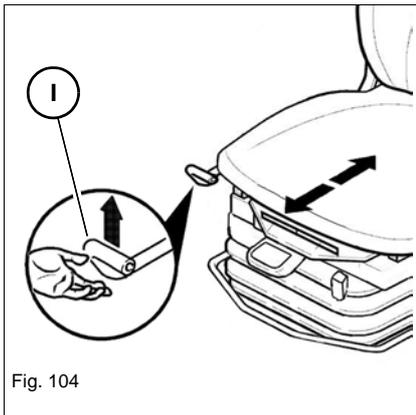
**Weight adjustment**

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

**NOTICE**

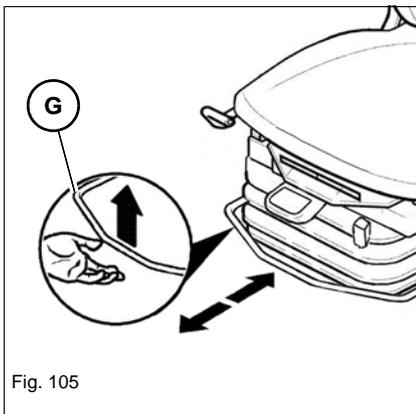
Possible damage to the compressor due to long operation of the switch.

- ▶ Do not hold the push button more than one minute.



### Horizontal seat adjustment

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



### 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.

## 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 vehicle 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 an authorized service center.
  - ▶ Have the seat belt immediately replaced after every accident and the load-bearing capacity of the fastening points and seat fixtures checked by a Wacker Neuson service center.
-

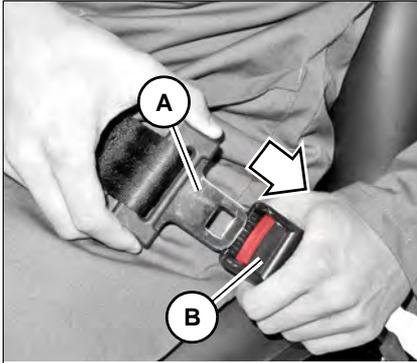


Fig. 106

### Fastening the retracting seat belt

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

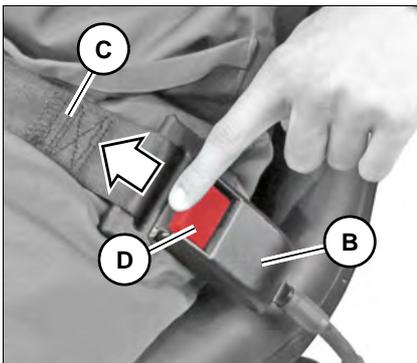


Fig. 107

### Unfastening the retracting seat belt

Press the red touch button **D** on the buckle **B** until the buckle latch comes out.

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

## Visual aids

---

 **WARNING****Risk of injury to persons in the danger zone!**

Persons in the danger area are possibly not seen when reversing the vehicle and 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 (for example a camera, mirrors, guide).
  - ▶ Additional equipment or attachments must not be installed if they impair visibility.
- 

 **WARNING****Accident hazard due to incorrect adjustment of visual aids!**

Incorrectly adjusted visual aids can cause serious injury or death.

- ▶ Before starting work, ensure that all visual aids are clean, functional and adjusted in accordance with the instructions in this Operator's Manual.
  - ▶ If no image appears on the camera monitor, stop vehicle operation. Only put the vehicle back into operation once the damage has been repaired.
  - ▶ 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.
-

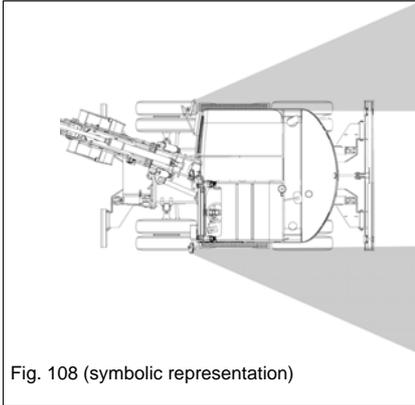


Fig. 108 (symbolic representation)

### Outside rearview mirrors 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 vehicle in the mirror on the left.
- Ensure visibility of the rear right edge of the vehicle in the mirror on the right.

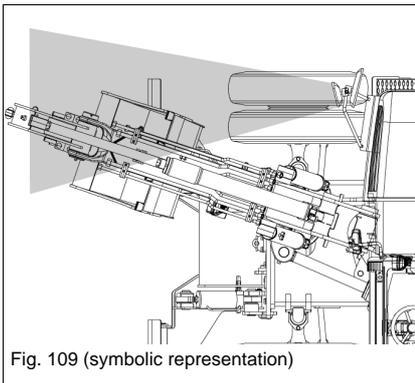


Fig. 109 (symbolic representation)

### Upper carriage mirror on the front

- 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.

---

#### **i** Information

Wacker Neuson recommends adjusting the mirrors with two persons.

---

#### **i** Information

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

---

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

## Reversing camera (option)

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

Toggleing between camera view (1) and status display (2):

1. Press control button **A**.
2. Turn control button **A** to select menu item **camera view** or **status display**.
3. Press control button **A**.

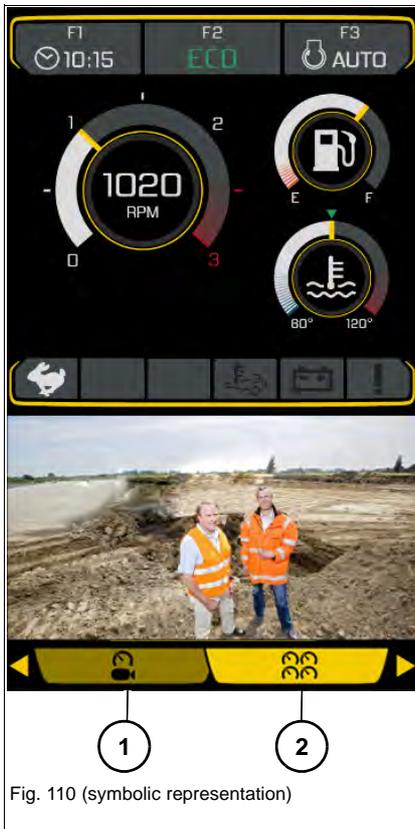


Fig. 110 (symbolic representation)

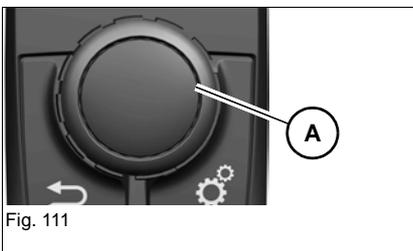


Fig. 111

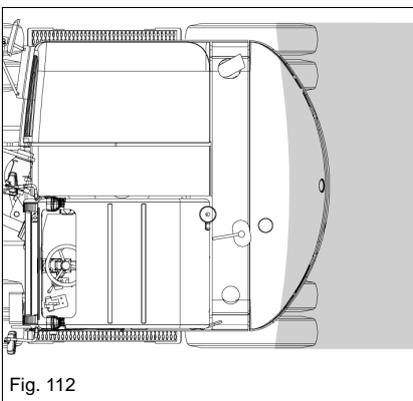


Fig. 112

### 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 vehicle and the outside left and right sides of the stabilizer blade must be visible.

### Armrest

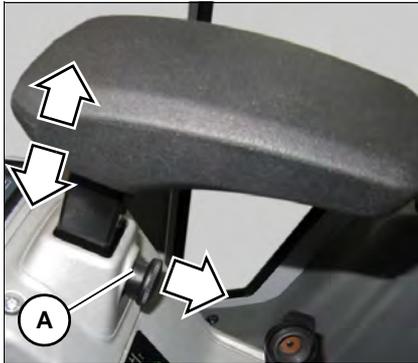


Fig. 113

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

### Fire extinguisher



Fig. 114

A fire extinguisher is not available from Wacker Neuson.  
Contact a Wacker Neuson service center for the installation of a fire extinguisher (DIN-EN 3).

---

#### **i** Information

Ensure the firm and safe installation of the fire extinguisher. Inspect the holder and the fire extinguisher regularly. Observe the manufacturer's indications.

---

## 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 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 vehicle.

---

**Responsibility for vehicle equipped with protective structures**

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

The vehicle 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

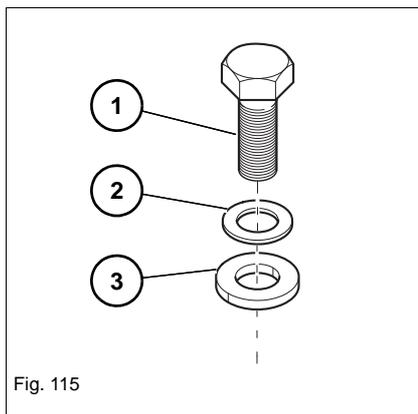


Fig. 115

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.

**Protective FOPS structure category II (option)**

**DANGER**
**Crushing hazard due to falling objects!**

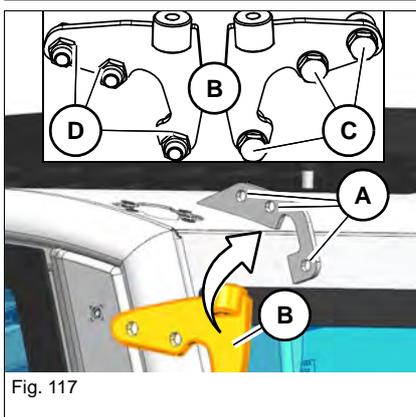
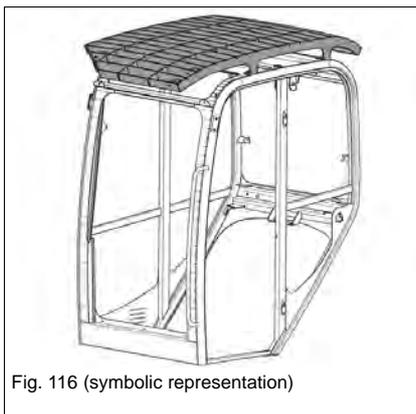
Causes serious injury or death.

- ▶ Install a protective FOPS structure for vehicle 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.

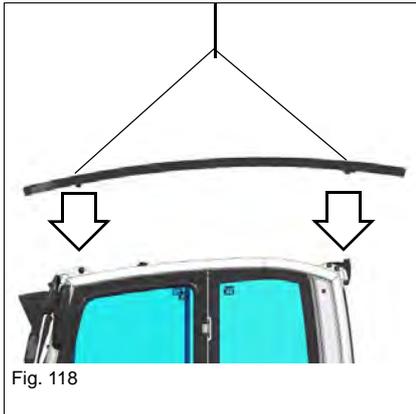
- ▶ The vehicle owner must ensure that the hazard situation is evaluated and that the national regulations are observed.
- ▶ The vehicle owner must ensure that only work is performed that does not require any higher protection.
- ▶ Accidents cannot be fully avoided despite equipping a vehicle with protective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



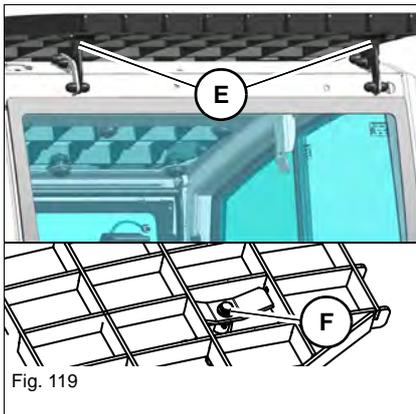
1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication"

**A:** mounting points rear left and right (for vehicles without air conditioning system).

2. Install brackets **B** with screws **C** and lock nuts **D** and tighten to 65 Nm (48 ft.lbs).

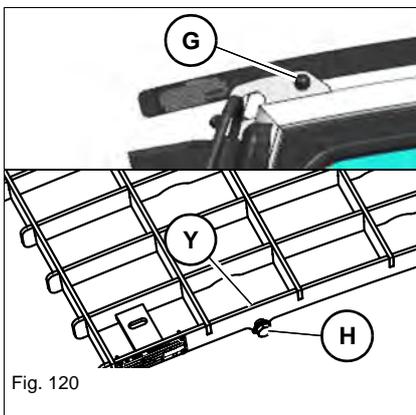


3. Place the FOPS screen on the cabin roof.



**E:** mounting points for brackets **B** left and right.

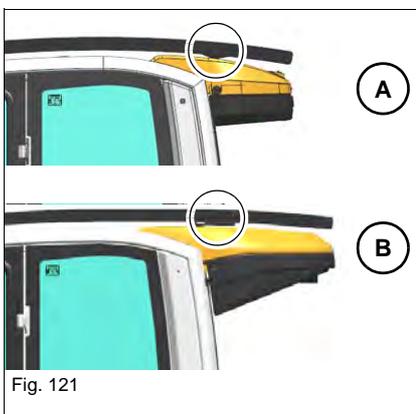
4. Install screws **F** and tighten them to 45 Nm (33 ft.lbs).



**G:** mounting points at the front left and right.

5. Install screws **H** and lock nuts **J** and tighten to 110 Nm (81 ft.lbs.).

6. Put caps on all screws and nuts.




---

### **i** Information

If the vehicle is equipped with air-conditioning, point 2 does not apply. The housing of the air-conditioning system is equipped with mounting bushings for the rear screws.

**A:** housing version 1

**B:** housing version 2

---

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

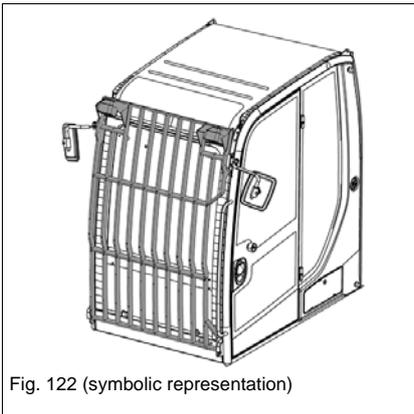


Fig. 122 (symbolic representation)

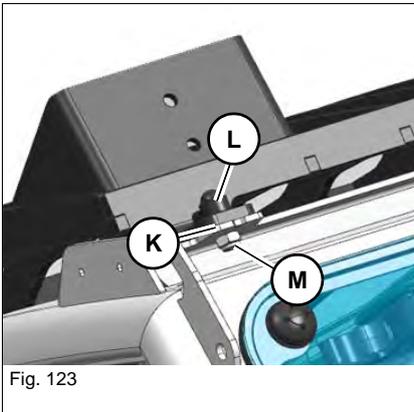


Fig. 123

1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication"

**K:** mounting points top left and right.

2. Install screws **L** and lock nuts **M** and tighten to 110 Nm (81 ft.lbs.).

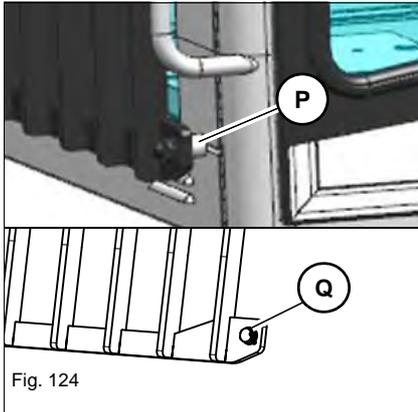


Fig. 124

**P:** mounting points bottom left and right.

3. Install screws **Q** and tighten to 110 Nm (81 ft.lbs.).
4. Put caps on all screws and nuts.

### Document box (option)

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

### 12 V connection



Fig. 125

A 12 V connection is located at the rear right inside the cabin and on the right outside of the cabin.

---

#### Information

Maximum permissible current intensity for both connections: 15A

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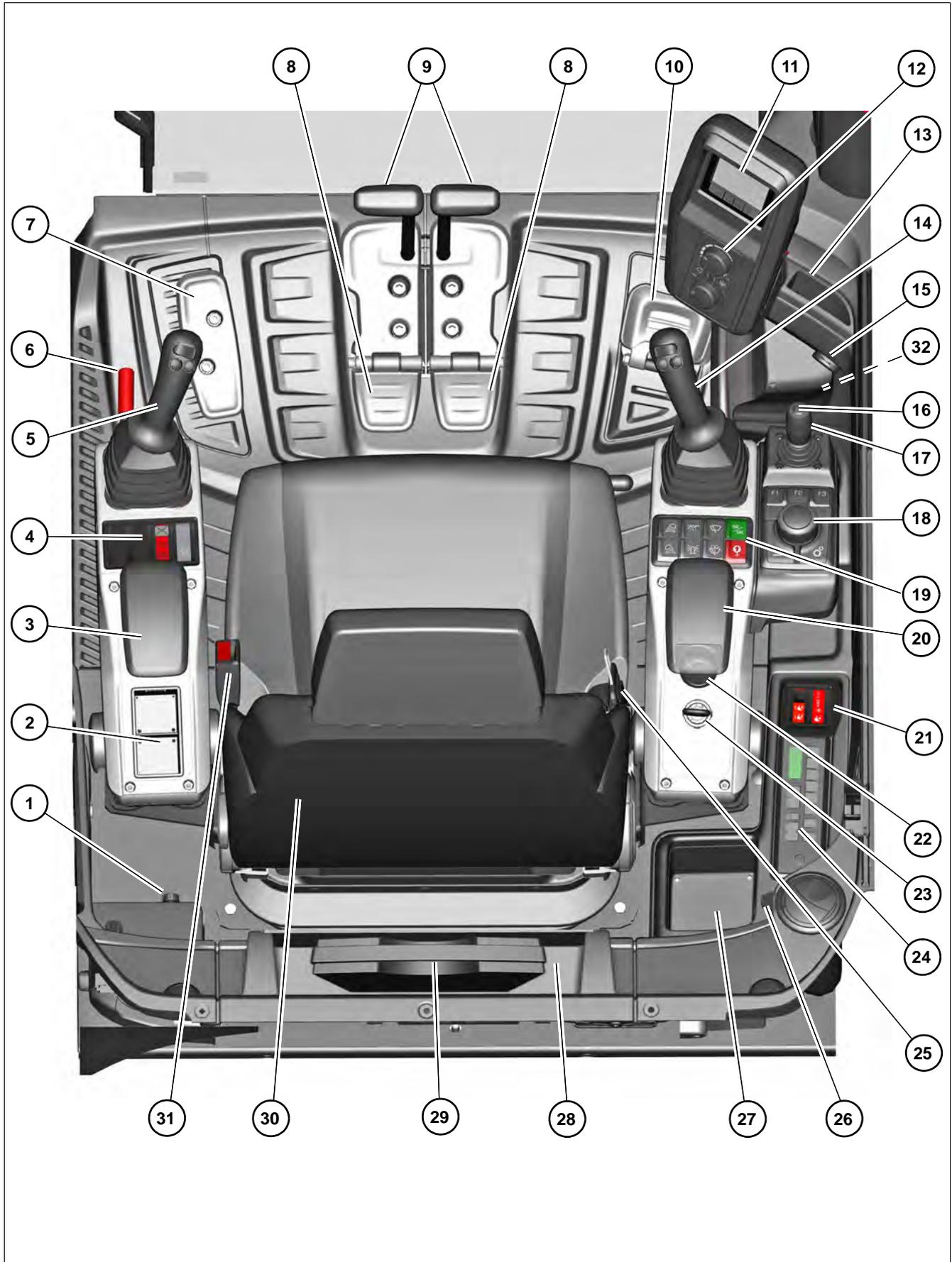
Fig. 126



## **4.2 Overview of control elements**

This chapter describes the controls, and contains information on the function and handling of the indicator lights and controls in the cabin. The pages stated in the table refer to the description of the controls.

Cabin



Designation	See page
1 Cabin fuse box	<a href="#">9-9</a>
2 Left storage compartment	--
3 Armrest (left)	<a href="#">4-22</a>
4 Switch panel	<a href="#">4-32</a>
5 Control lever on the left	<a href="#">5-19</a>
6 Control lever base	<a href="#">4-54</a>
7 Pedal for triple articulation boom (option)	<a href="#">5-32</a>
8 Drive pedals	<a href="#">5-6</a>
9 Drive levers	<a href="#">5-6</a>
10 Boom swivel pedal	<a href="#">5-32</a>
11 Multi-functional display (3.5" standard; 7" with optional reversing camera)	<a href="#">4-36</a> ; <a href="#">4-21</a>
12 Temperature control/automatic air conditioning (option)	<a href="#">4-32</a>
13 Compartment for mobile phone	--
14 Control lever on the right	<a href="#">5-19</a>
15 USB port (see Operator's Manual for radio)	--
16 Speed range selection	<a href="#">5-3</a>
17 Stabilizer-blade lever	<a href="#">5-24</a>
18 Jog dial	<a href="#">4-32</a>
19 Keypad	<a href="#">4-32</a>
20 Right armrest	--
21 Switch panel, right side (option)	<a href="#">5-41</a>
22 Throttle	<a href="#">5-1</a>
23 Ignition lock	<a href="#">4-53</a>
24 Radio (option – see operator's manual for radio)	--
25 Seat belt	<a href="#">4-17</a>
26 12 V power outlet	--
27 Storage compartment, right side	--
28 Rear storage compartment	--
29 Document box (option)	--
30 Operator seat	<a href="#">4-10</a> ; <a href="#">4-13</a>
31 Seat belt buckle	<a href="#">4-17</a>
32 Drinks holder	--

Operation – overview

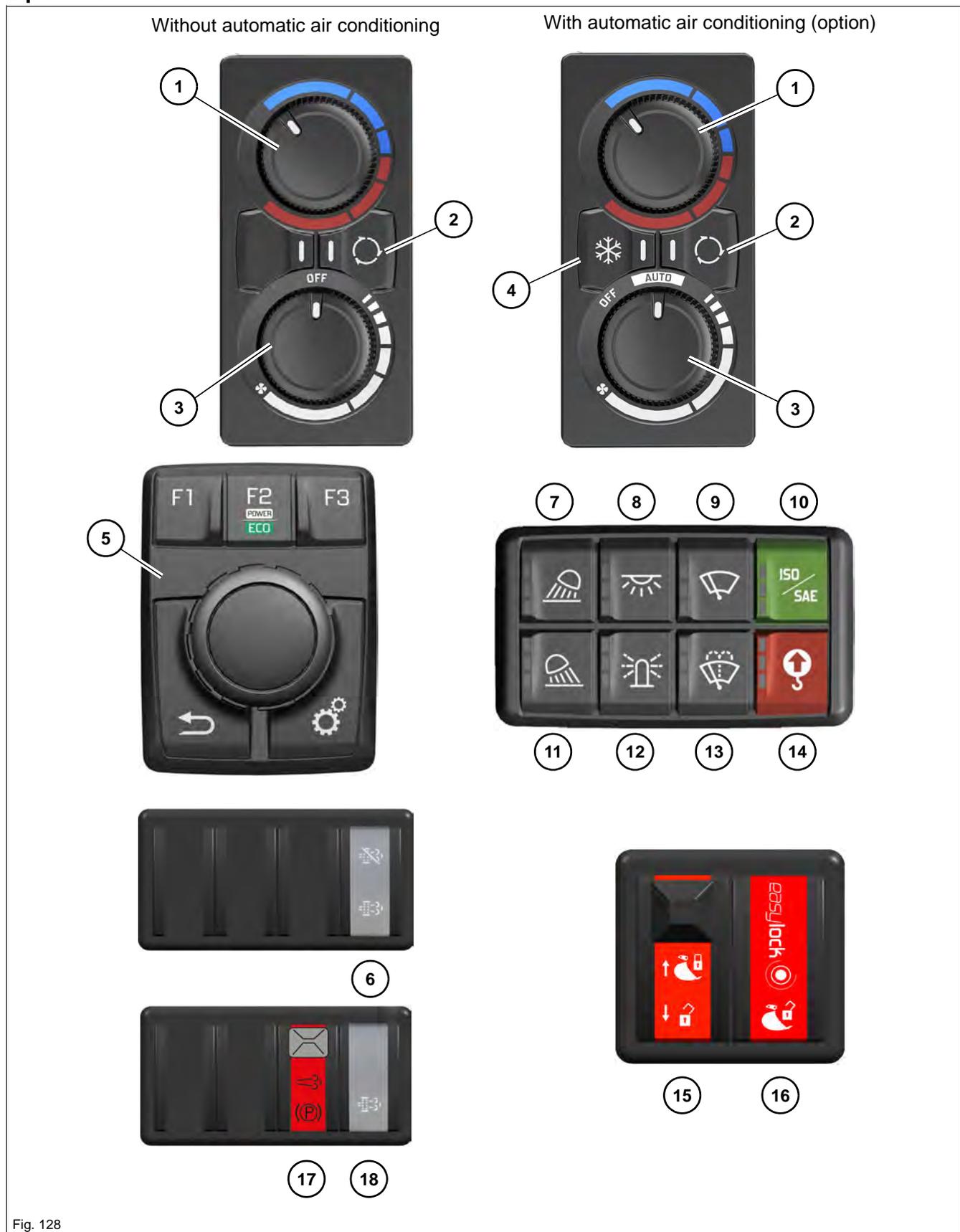


Fig. 128



<b>Designation</b>	<b>See page</b>
1 Temperature setting	<a href="#">5-16</a>
2 Recirculated air mode	<a href="#">5-16</a>
3 Fan	<a href="#">5-16</a>
4 Air conditioning (option)	<a href="#">5-17</a>
5 Jog Dial control unit	<a href="#">4-34</a>
6 Diesel particulate filter regeneration (only ET65/404F-22T)	<a href="#">7-59</a>
7 Boom light	<a href="#">5-11</a>
8 Interior light	<a href="#">5-13</a>
9 Wiper	<a href="#">5-15</a>
10 ISO/SAE changeover (option)	<a href="#">5-20</a>
11 Roof and chassis lights (option)	<a href="#">5-12</a>
12 Rotating beacon (option)	<a href="#">5-14</a>
13 Wiper/wash system	<a href="#">5-15</a>
14 Safe load indicator	<a href="#">5-34</a>
15 Enable/disable hydraulic quickhitch	<a href="#">5-41</a>
16 Open hydraulic quickhitch	<a href="#">5-41</a>
17 Parking brake switch for standstill regeneration (only for ET90/TCD 2.9 DPF)	<a href="#">7-65</a>
18 Diesel particulate filter regeneration (only ET90/TCD 2.9 DPF)	<a href="#">7-59</a>

### Jog dial

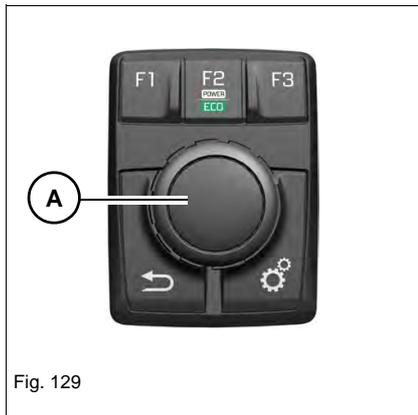


Fig. 129

### Control button

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

Control element		Function	See page
F1		Displaying operating states	<a href="#">4-41</a>
F2		Changing the engine operating mode directly	<a href="#">5-2</a>
F3		Automatic engine speed setting	<a href="#">5-4</a>
Menu button	Press briefly	<ul style="list-style-type: none"> <li>Selecting control circuits</li> <li>Changing the engine operating mode</li> </ul>	<a href="#">5-30</a> <a href="#">5-2</a>
	press and hold	<ul style="list-style-type: none"> <li>Selecting and configuring attachments</li> <li>Stabilizer blade</li> <li>Service menu/error messages</li> <li>Adjusting the multi-functional display</li> <li>Setting date and time</li> <li>Individual menu</li> </ul>	<a href="#">5-30</a> <a href="#">8-5</a> <a href="#">4-43</a>
Return button		Returning to previous menu	--
Control button		Selecting menu items (turn) Confirming menu items (press)	--



Fig. 130

### Daily and total operating hours

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

### 4.3 Indicator lights and warning lights (overview)

#### Display element/multi-functional display<sup>1</sup>

The display element and the multi-functional display inform the operator about operating states, required maintenance procedures and possible vehicle malfunctions.

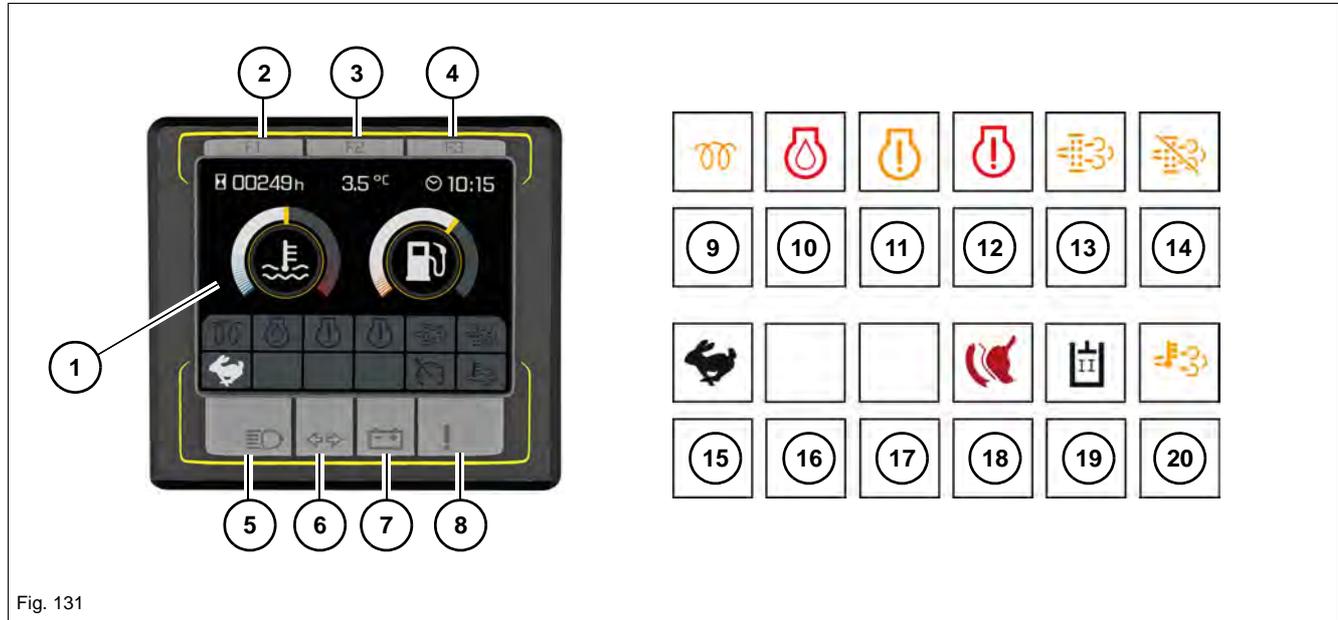


Fig. 131

#### **i** Information

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

#### **i** Information

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

#### **i** Information

The standard equipment of the vehicle includes a 3.5" multi-functional display.

If the **reversing camera** option is selected, a 7" multi-functional display is installed. Any differences between the two displays are indicated separately.

1. The assignment of the indicator lights can vary depending on the equipment.



No.	Symbol	Color	Designation	
1	--	--	Multi-functional display	
2	F1	--	F1 (operating state indicator)	4-40
3	F2	--	F2 (maintenance meter, engine operation mode indicator)	4-40
4	F3	--	F3 (time display, automatic engine speed setting)	4-40
5		Blue	Not assigned.	--
6		Green	Not assigned	--
7		Red	Charge indicator light	8-1
8		Red	General vehicle malfunction	8-1
9		Yellow	Preheating	
10		Red	Engine oil pressure	
11		Yellow	Engine warning	8-1; 7-59
12		Red	Engine stop	8-1; 7-59
13		Yellow	Regeneration required	7-59

## 4 Putting into operation



**WACKER  
NEUSON**

No.	Symbol	Color	Designation	
14		Yellow	Regeneration disabled/interrupted	<a href="#">7-59</a>
15		--	Speed range 2	<a href="#">5-3</a>
		--	Speed range 1	<a href="#">5-3</a>
16		--	Not assigned	--
17		--	Not assigned	--
18		Red	Hydraulic functions locked	<a href="#">4-54</a>
		Red	Hydraulic functions active	<a href="#">4-54</a>
19		--	Additional control circuit AUX II (option)	<a href="#">5-28</a>
		--	Additional control circuit AUX III (option)	<a href="#">5-29</a>
20		Yellow	Increased exhaust-gas temperature	<a href="#">7-59</a>

## Error symbols

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

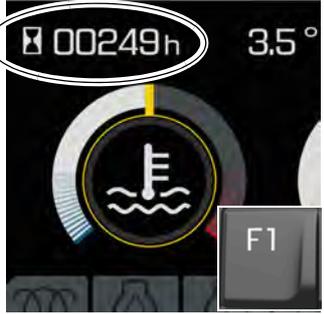
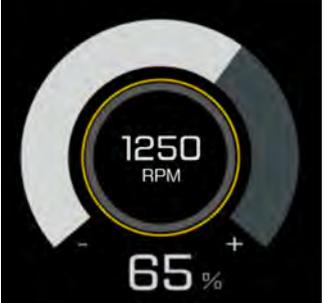
Error symbols are listed according to priority.

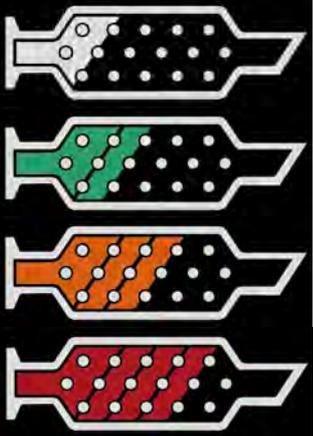
Symbol	Designation	Symbol	Designation
	<b>01 Engine stop (short indication)</b>		<b>05 Charge indicator light (short indication)</b>
	<b>02 General malfunction (short indication)</b>		<b>06 Hydraulic oil temperature (permanent indication)</b>
	<b>03 Engine oil pressure (short indication)</b>		<b>07 Hydraulic oil filter (short indication, appears again upon starting the engine)</b>
	<b>04 Engine malfunction (short indication)</b>		<b>08 Air filter (short indication, appears again upon starting the engine)</b>
	<b>Hydraulic functions active</b>		<b>Hydraulic functions locked</b>

– see chapter “8.2 Malfunctions (display element/multi-functional display)” on page 8-3

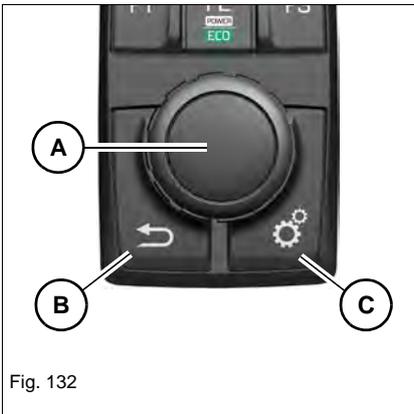
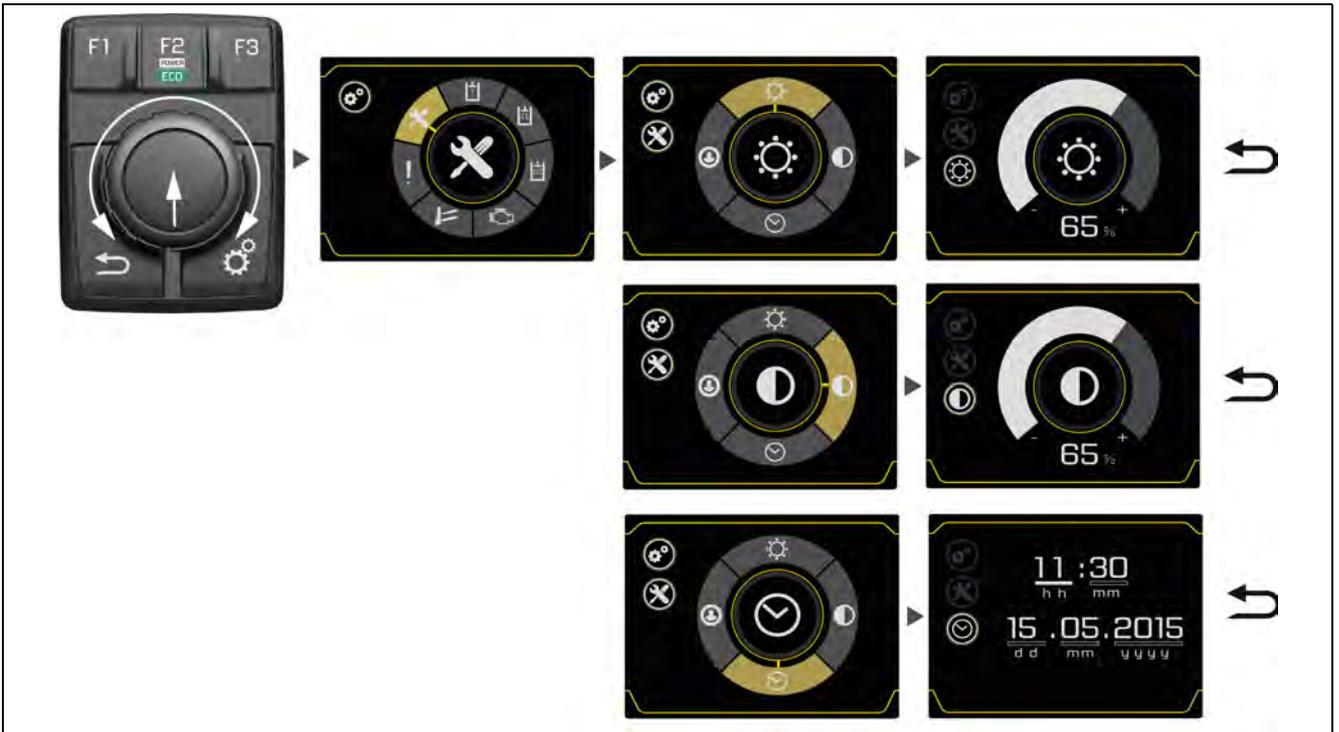
## Status indicators

Symbol	
	<p><b>Starter/engine start</b></p> <ul style="list-style-type: none"> <li>• <b>A:</b> starting key in position 1</li> <li>• <b>B:</b> engine starts</li> </ul>
	<p><b>Engine operating mode</b>  <i>– see chapter “Engine operating mode” on page 5-2</i></p>
	<p><b>Coolant temperature</b></p> <p>If the coolant temperature is too high the symbol shown on the left appears and the buzzer sounds.</p> <ul style="list-style-type: none"> <li>• Let the engine run at high idling speed without any load.</li> <li>• Wait until the temperature drops and the indicator light goes out.</li> <li>• Stop the engine.</li> <li>• Check the coolant level.</li> </ul>
	<p><b>Fuel tank capacity</b></p> <p>Refuel if the symbol shown on the left appears.</p>

Symbol	
	<p><b>Operating states</b></p> <p>Press <b>F1</b> to toggle between the operating state displays:</p> <ul style="list-style-type: none"> <li>• Operating hours</li> <li>• Daily hours of operation</li> <li>• Engine speed</li> <li>• Outside temperature (automatic air-conditioning option)</li> <li>• Hydraulic oil temperature</li> <li>• Time</li> </ul>
	<p><b>Maintenance meter</b></p> <p>Counts the remaining engine operating hours down to the next maintenance work due.</p> <p>If less than 10 hours are displayed, the wrench symbol flashes.</p>
	<p><b>Engine speed</b></p> <p>This symbol appears when the throttle is operated.</p>
	<p><b>No function</b></p> <p>This symbol appears when a control element without function is operated.</p>
	<p><b>high-altitude mode</b></p> <p>This display appears when starting the engine above 800 m (2625 ft.) sea level (only ET65/404F-22T).</p> <p>– see chapter “Measures when operating at great heights (ET65/404F-22T)” on page 7-62</p>

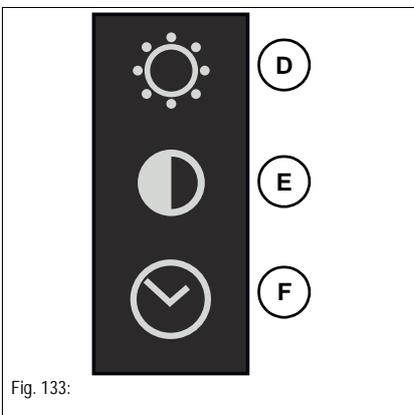
Symbol	
	<p><b>Overload</b></p> <p>The symbol shown on the left appears and the buzzer sounds.</p> <p>The permissible load diagram values are exceeded.</p> <ul style="list-style-type: none"> <li>Reduce the load until both the buzzer and the warning light go out – <a href="#">see chapter “Lifting gear applications” on page 5-33.</a></li> </ul> <p>When the safe load indicator is switched on, the symbol is illuminated and the buzzer sounds as a functional check.</p>
	<p><b>Status indicator for 7” multi-functional display (option)</b></p> <p>Additional status indicators are displayed:</p> <ul style="list-style-type: none"> <li>Battery voltage</li> <li>Engine oil pressure</li> <li>Hydraulic oil temperature</li> <li>Preset maximum flow rate of the additional control circuits AUX I through AUX III</li> </ul> <p>Use the rotary switch of the jog dial control unit to toggle between camera view and status display.</p>
	<p><b>DPF loads</b></p> <p>White: no load Green: low load Yellow: medium load Red: highest load</p> <p>– <a href="#">see chapter “Indication of load condition” on page 7-64</a></p>

**Adjusting the multi-functional display**



**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.



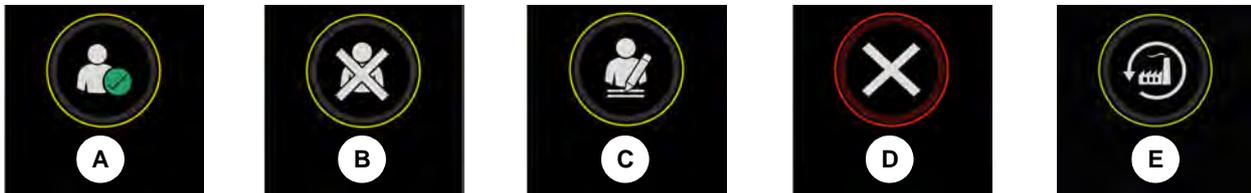
**Symbols**

- D**: Brightness
- E**: Contrast
- F**: Time/Date

### Individual menu for 7" multifunction display (option)

User settings can be made and attachments configured in the individual menu and attachments configured.

#### Pop-ups



- A: Input confirmed
- B: Use factory default settings
- C: Change user settings
- D: Wrong PIN
- E: Return to factory default settings

#### Legend

- J: Selecting menu items (turn)
- K: Confirming menu items (press)
- L: Invoke sub-menu (press and hold)
- M: Accept selection (press)

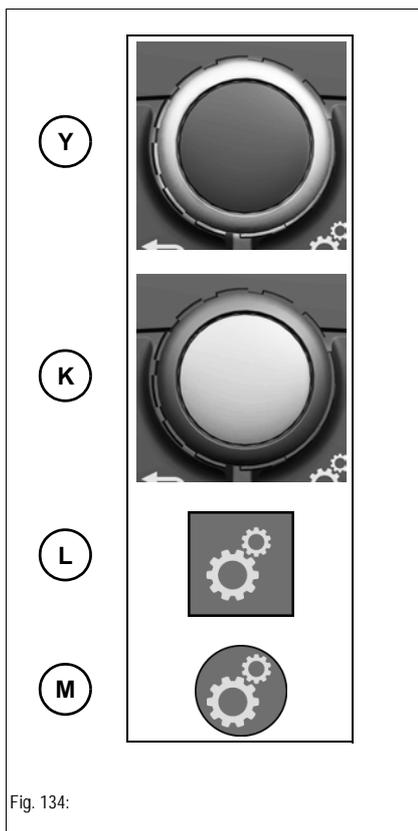
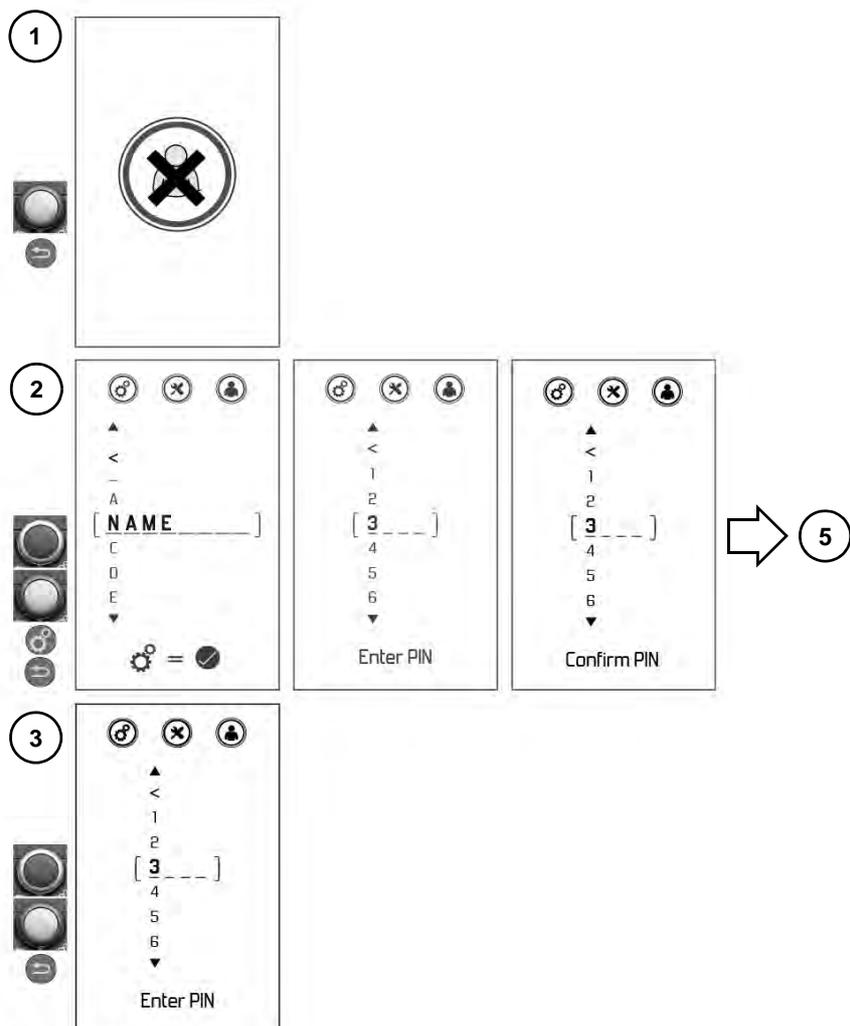
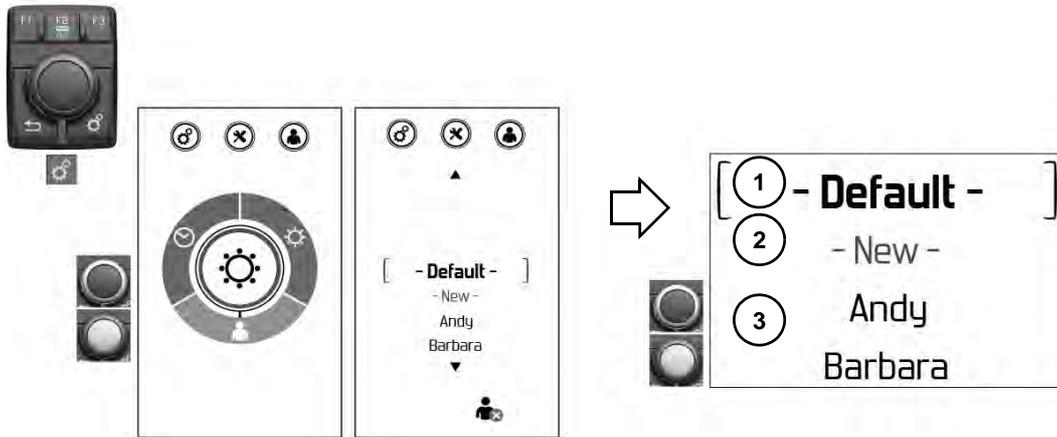


Fig. 134:

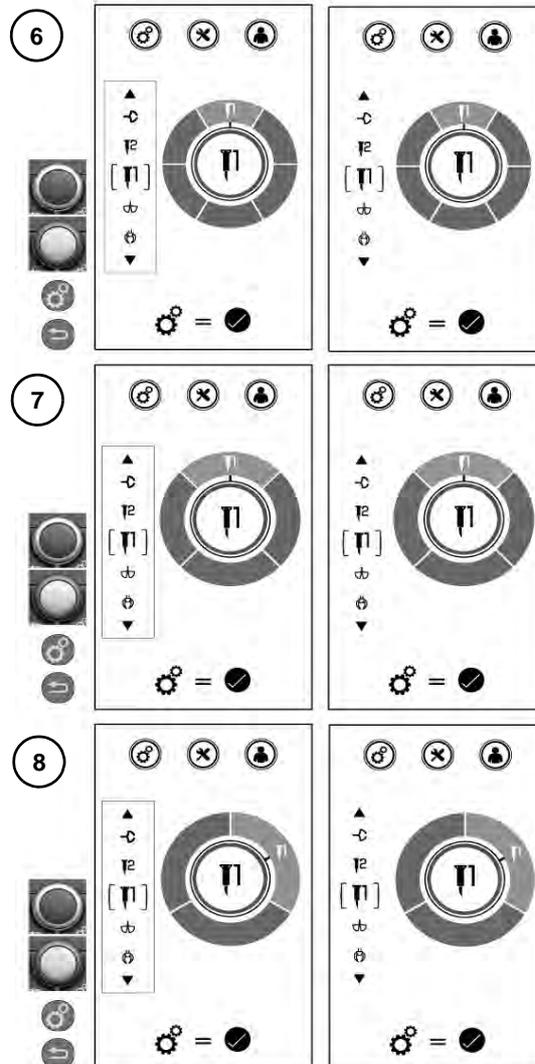
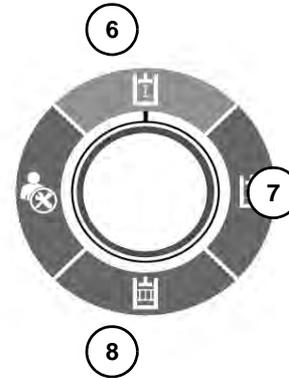
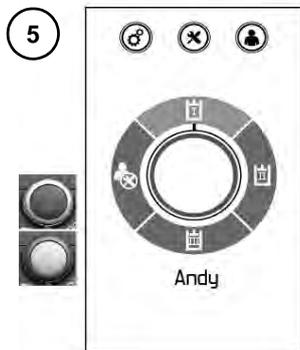
**User Settings**

- Use factory default settings (1)
- Register user (2)
- Log-in user (3)



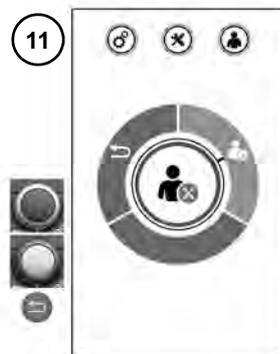
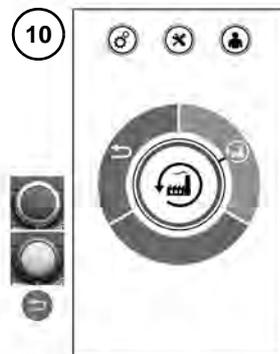
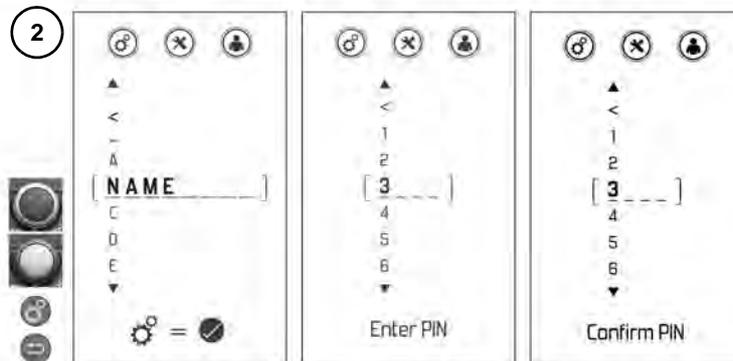
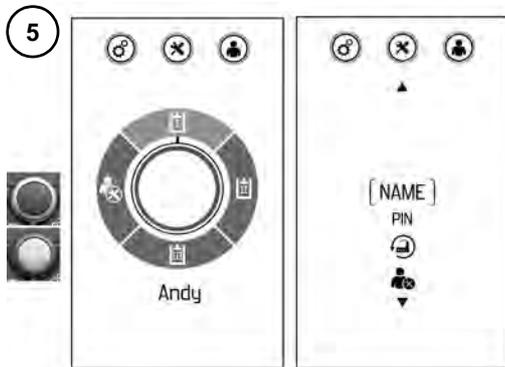
**Attachment Configuration**

- Main menu (5)
- AUX I (6)
- AUX II (7)
- AUX III (8)



**User Settings**

- Main menu (5)
- Change user name/PIN (2)
- Return to factory default settings (10)
- Delete user (11)





### 4.4 Preparatory work

#### Important information before putting the vehicle 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 vehicle into operation, the operator must familiarize himself with the position of the controls and instruments.

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

Before using the vehicle in work operation for the first time, Wacker Neuson recommends trying out the vehicle on open ground without any obstacles.

When using the vehicle, 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 vehicle does not meet the requirements for conformity and registration.

Observe the safety instructions – [see chapter "2.4 Operation" on page 2-4](#).

## Requirements and information for the operating personnel

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

The vehicle may only be put into operation by authorized personnel that has been instructed – *see chapter "2.3 Conduct" on page 2-3.*

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

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

Face the vehicle 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 vehicle, or jump off it.

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

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

## Check lists

The checklists below assist you in checking and monitoring the vehicle 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 vehicle into operation or starting the engine:

No.	Question	Page
1	Enough fuel in the tank?	<a href="#">7-31</a>
2	Water drained from the water separator?	<a href="#">7-36</a>
3	Correct engine oil level?	<a href="#">7-42</a>
4	Coolant level OK?	<a href="#">7-45</a>
5	Correct oil level in the hydraulic oil reservoir?	<a href="#">7-50</a>
6	Glass cleaner in washer reservoir?	<a href="#">7-54</a>
7	Lubrication points greased?	<a href="#">7-9</a>
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 window washing system function correctly?	--
13	Control lever base raised?	--
14	Are other persons required to guide you?	--
15	Attachment safely locked?	<a href="#">5-41</a> <a href="#">5-60</a>
16	Engine cover locked? Filler cap closed tightly?	<a href="#">7-23</a> <a href="#">7-31</a>
17	Tools and other loose objects removed?	--
18	Seating position adjusted correctly?	<a href="#">4-10</a> <a href="#">4-13</a>
19	Are all visual aids functional, clean and adjusted correctly?	<a href="#">4-19</a> <a href="#">4-21</a>
20	Seat belt fastened?	<a href="#">4-17</a>

**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 vehicle?	5-61
2	All indicator lights gone out?	4-36
3	Coolant temperature of engine in normal range?	4-36
4	Do the pedals and control levers work correctly?	--
5	Performed functional check of control lever base?	4-54
6	Functional check of the overload warning device performed?	5-33
7	Braking effect sufficient?	5-5

**Engine shut-off checklist**

Check and observe the following points when parking the vehicle:

No.	Question	Page
1	Attachment lowered to the ground?	5-41 5-60
2	Stabilizer blade lowered to the ground?	5-5
3	Control lever base raised?	4-54
4	Cabin locked?	4-3

**When parking on slopes:**

5	Machine secured with wheel chocks in addition to prevent it from rolling away?	5-10
---	--------------------------------------------------------------------------------	------

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

Before putting the vehicle into operation for the first time, check whether the equipment supplied with the vehicle is complete.

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

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

Handle the vehicle carefully during its first 50 operating hours.

- Do not load a cold engine.
- Warm up the vehicle at low engine speed and little load, do not warm it up at a standstill.
- Do not change engine speed abruptly.
- Avoid using the vehicle 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.*

## 4.5 Starting and stopping the engine

### Preparatory work

#### **WARNING**

##### **Accident hazard due to unintentional operation of the vehicle!**

Unintentional operation can cause serious injury or death.

- ▶ Only operate the vehicle 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 20 seconds.

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

#### **Information**

Provide for sufficient ventilation when operating in enclosed areas.

#### **Information**

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

### Starter

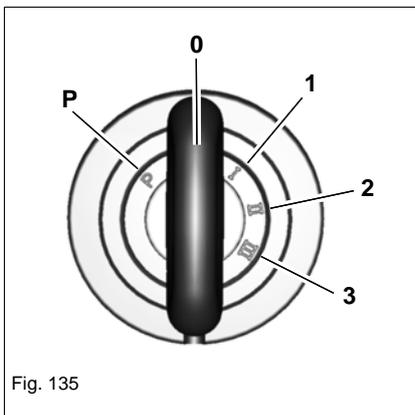


Fig. 135

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

### Starting and stopping the engine

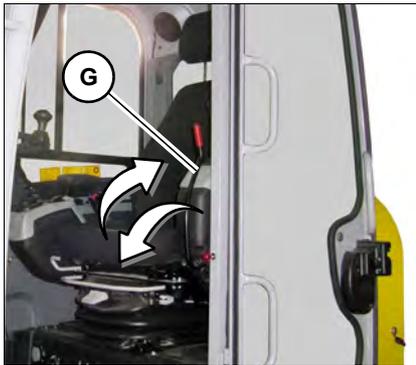


Fig. 136 (symbolic representation)

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 vehicle.
2. Fold the control lever base **G** down.
3. Perform vehicle travel on open terrain.
4. Secure the danger zone.
5. Stop the vehicle.
6. Raise the control lever base **G**.
7. Move all control levers and pedals in all directions.
  - The selected elements do not move:
    - Work may be performed with the vehicle.
  - The selected elements move:
    - Stop operation immediately.

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

#### **NOTICE**

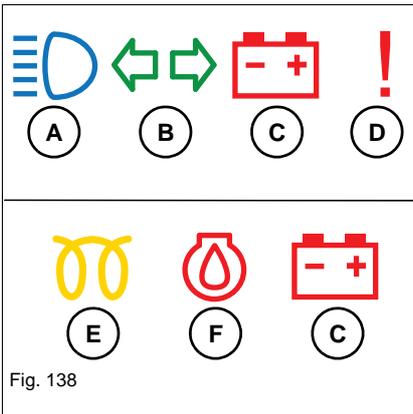
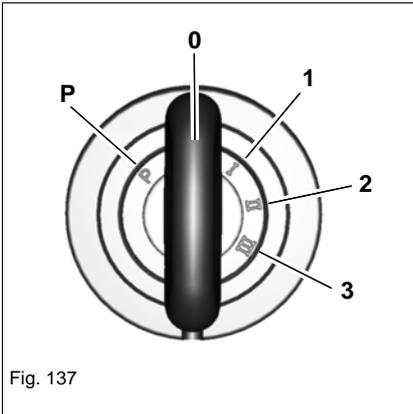
Possible damage if the engine is started again immediately after stopping it.

- ▶ Wait at least two minutes before starting the engine again.

#### **NOTICE**

Possible damage to preheater if the preheating system is operated too long.

- ▶ Do not preheat the engine more than five seconds.



1. Insert the starting key.
2. Turn the starting key to position 1.
3. Indicator lights **A – D** are illuminated for a few seconds.
  - If an indicator light does not function, contact a Wacker Neuson service center.
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 20 seconds:
6. 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.
7. Release the starting key as soon as the engine runs.

#### Warm-up phase of vehicle

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 vehicle warm up at standstill.

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

In case of malfunctions, damage, or leaks:

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



#### Information

Fold up the control lever base after shutting off **G** the engine.

### 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**

**Injury hazard due to rotating parts!**

Rotating parts can cause serious injury or death.

- ▶ Open the engine cover only at engine standstill.
- 

---

 **CAUTION**

**Burn hazard due to hot surfaces!**

Can cause serious burns or death.

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

---

**NOTICE**

Possible damage due to electrical short circuit or over-voltage.

- ▶ 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).
- 

---

**NOTICE**

Possible damage to vehicle 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 national and regional safety requirements.

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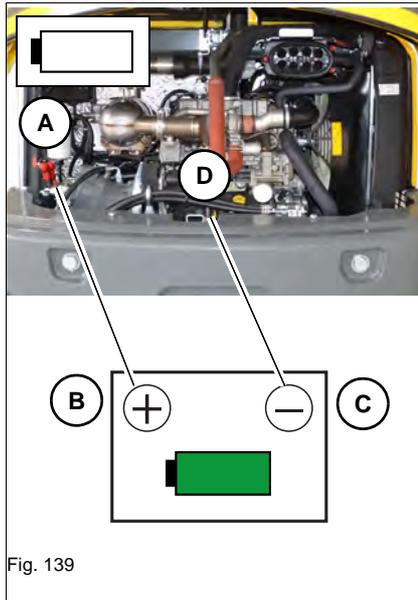


Fig. 139

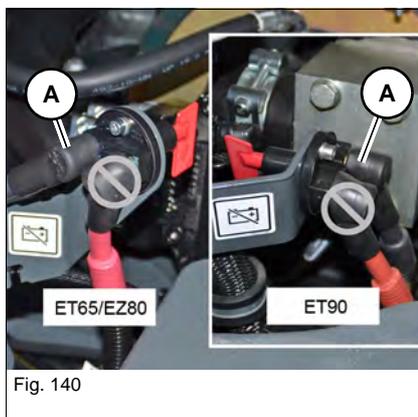


Fig. 140

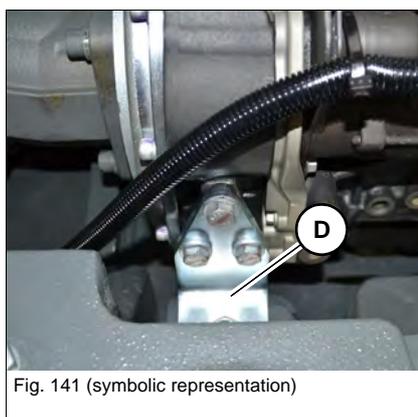
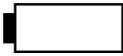


Fig. 141 (symbolic representation)

Designations/symbols	Meaning
<b>X</b>	Machine with empty battery
<b>Y</b>	Vehicle with full battery
<b>A</b>	Positive/vehicle <b>X</b>
<b>B</b>	Positive/vehicle <b>Y</b>
<b>C</b>	Negative/vehicle <b>Y</b>
<b>D</b>	Negative/vehicle <b>X</b>
	Full battery
	Dead battery

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. Engine covers of both vehicles are open.
4. Connect the battery jumper cables in the following order: **A – B – C – D**.
5. Start the engine of vehicle **Y**.
6. Wait five minutes for the empty battery to be charged a little.
7. Start the engine of machine **X**.
8. Switch on the boom light of vehicle **X** in order to avoid voltage peaks and to protect the electronic system.
9. Disconnect the battery jumper cables in the following sequence: **D – C – B – A**.

## 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 DPF regeneration intervals.

## Stopping the engine

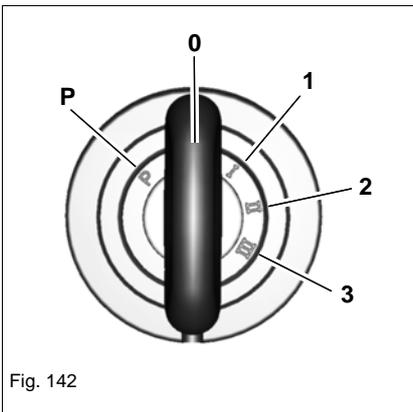
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### **NOTICE**

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

- ▶ Operate the engine at idling. This avoids engine damage and increases the service life.
- 

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



### Battery master switch

#### **NOTICE**

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

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

Actuate the battery isolator switch:

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

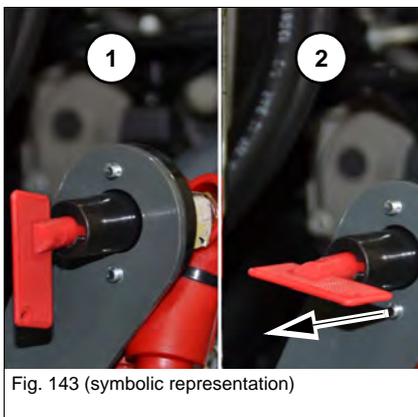


Fig. 143 (symbolic representation)

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

Power supply	Key position
Established	1
Interrupted	2 (key removed)

## 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

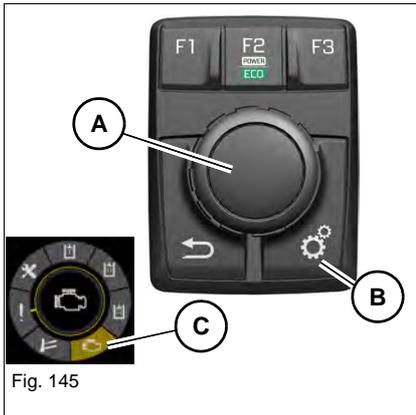


Fig. 144

Engine speed can be set continuously with throttle A.

Engine speed	Position
Idling speed	<b>1</b>
Maximum	<b>2</b>

## Engine operating mode



Engine operating mode	Application
	For powerful and fuel-efficient operation
	Maximum power
	High-altitude mode (only ET65/404F-22T)

### Information

The high-altitude mode is activated automatically. It is not possible to switch over to a different motor operating mode.

### Changing the engine operating mode directly

Press push button **F2**.

### 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.



### Information

The high-altitude mode cannot be preset.

**Speed range selection**

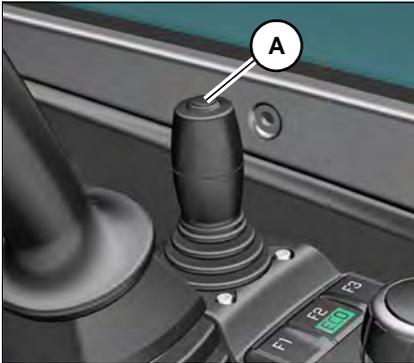


Fig. 147

The vehicle 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 (Auto 2-speed)		

If speed range 2 is selected, the vehicle shifts to **Auto 2-Speed** mode. The vehicle moves at higher speed.

Higher vehicle travel resistance (for example in curves): vehicle automatically shifts down to speed range 1.

Normal vehicle travel resistance: vehicle automatically shifts up to speed range 2.

## Automatic engine speed setting

The diesel engine shifts to idling speed if the hydraulics are not operated for a few seconds.

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

If the hydraulic system is not operational for a few seconds, the diesel engine goes into idling speed

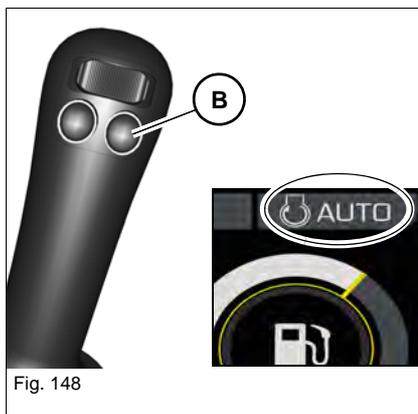
The automatic engine speed setting can be switched on and off with push button **F3** on the jog dial.

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.



## 5.3 Brake

### Hydraulic brake

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

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



#### **Information**

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

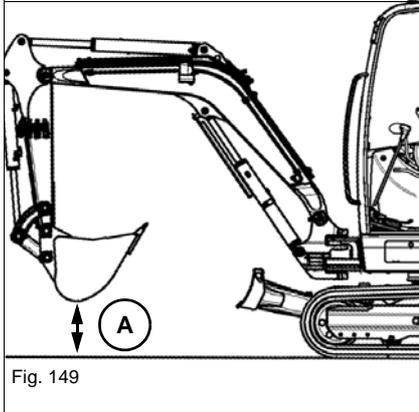
---

### Mechanical brake

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

## 5.4 Machine travel

### Machine travel position



Position the vehicle as shown.

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

- A = 20-30 cm (8-12 in)

### Starting vehicle travel and stopping

#### **WARNING**

##### **Accident hazard due to incorrect vehicle operation!**

The vehicle 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.

#### **WARNING**

##### **Accident hazard due to incorrectly rotated upper carriage!**

If rotated incorrectly, the upper carriage blocks the visibility of the travel path. This may cause serious injury or death.

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

#### **Starting vehicle travel**

Operate the drive levers or accelerator pedals.

- ➔ The vehicle starts moving.

#### **Stopping**

Release the drive levers or accelerator pedals.

- ➔ The vehicle stops.

#### **Information**

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

## Operating temperature range

Operate the vehicle only at ambient temperatures between  $-15\text{ }^{\circ}\text{C}$  ( $5\text{ }^{\circ}\text{F}$ ) and  $+45\text{ }^{\circ}\text{C}$  ( $+113\text{ }^{\circ}\text{F}$ ).

## Machine travel on slopes

---



### **WARNING**

#### **Crushing hazard due to tipping over of vehicle!**

A tipping vehicle can cause serious injury or death.

- ▶ Raise the boom 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the vehicle.
  - ▶ 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 vehicle (maximum gradient angle  $15^{\circ}$ , maximum lateral angle of inclination  $10^{\circ}$ ).
  - ▶ Perform uphill and downhill vehicle travel only in speed range 1.
  - ▶ Never reverse downhill.
  - ▶ Ensure that no parts of the body protrude outside the vehicle.
  - ▶ Do not exceed the permissible payloads.
  - ▶ Do not turn or swivel the upper carriage and the boom during downhill or uphill vehicle operation with a full attachment.
  - ▶ Performing vehicle travel diagonally on slopes is prohibited.
-

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

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

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

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

Observe under all circumstances during uphill or downhill travel:

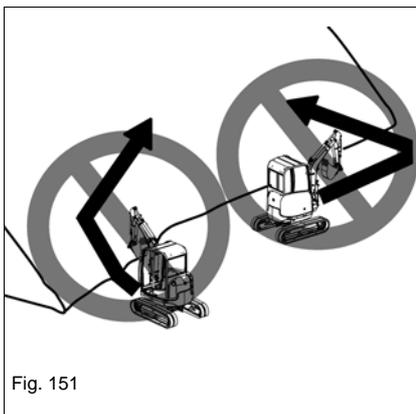
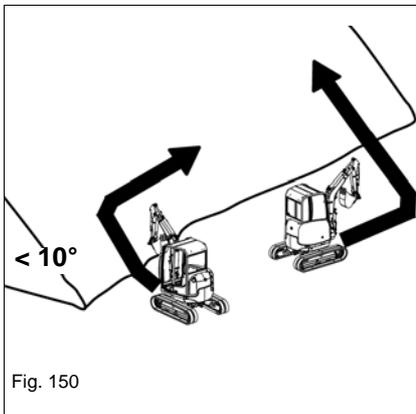
- Keep the drive levers near the neutral position.
- Perform slow and smooth travel movements.
- Avoid sudden travel movements.
- Reduce the engine speed.

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

#### **Preparations for performing vehicle travel on slopes**

Always perform uphill or downhill vehicle 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°.



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

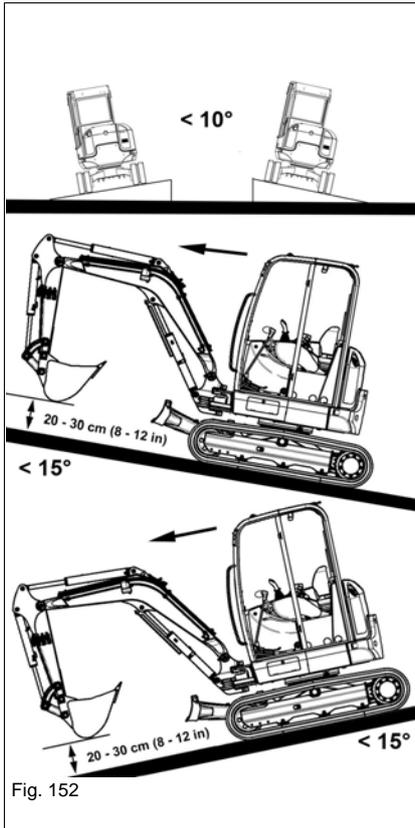


Fig. 152

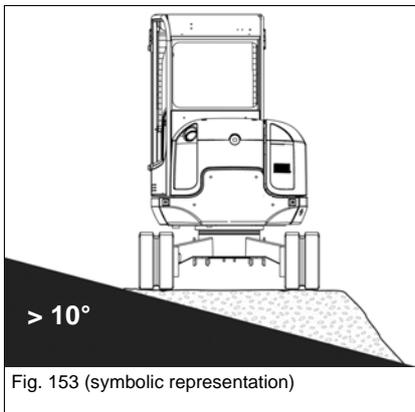


Fig. 153 (symbolic representation)

**Uphill vehicle operation**

- Raise the boom 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the vehicle.
- Do not perform vehicle travel on slopes steeper than  $15^\circ$ .
- Do not perform machine travel on slopes with a lateral angle of inclination over  $10^\circ$ .

**Downhill vehicle operation**

- Raise the boom 20 – 30 cm (8 – 12 in) off the ground and position it straight ahead at the center of the vehicle.
- In order to minimize the risk of tipping over, adapt the travel speed to the circumstances.
- Do not perform vehicle travel on slopes steeper than  $15^\circ$ .
- Do not perform machine travel on slopes with a lateral angle of inclination over  $10^\circ$ .

On lateral inclinations over  $10^\circ$ , pile up material to create a horizontal, firm and level standing surface for the vehicle.

## Parking the vehicle

### **WARNING**

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

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

- ▶ Lower the boom and the stabilizer blade to the ground.
- ▶ Secure the vehicle accordingly (for example with chocks).

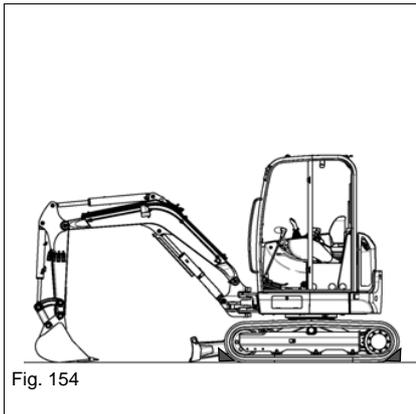


Fig. 154

1. Park the vehicle on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the vehicle.
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 vehicle with wheel chocks (see [Fig. 154](#)).

### **Information**

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

### **Parking the vehicle on slopes**

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

- Position the boom on the downhill side of the vehicle and firmly press the attachment into the ground.
- If the vehicle is equipped with the **triple articulation boom** option, line up the boom at an angle of approx. 120°.
- Place stabilizer blade on the downhill side.
- Press the stabilizer blade against the ground.
- Secure the vehicle with wheel chocks (see [Fig. 155](#)).

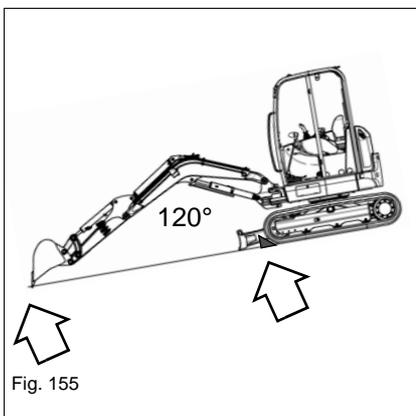


Fig. 155

## 5.5 Differential lock

Not available.

## 5.6 Lights/signaling system

### **WARNING**

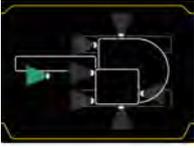
**Motorists can be blinded by bright lights on the job site!**

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

- ▶ Stop vehicle operation if motorists are blinded.
- ▶ Take up operation again only when sufficient illumination of the working area is ensured without blinding motorists.

## Boom light

The push button is located on the right keypad.

Boom light	Push button	Indication
On		
OFF		

## Roof and chassis lights (option)

The vehicle 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.

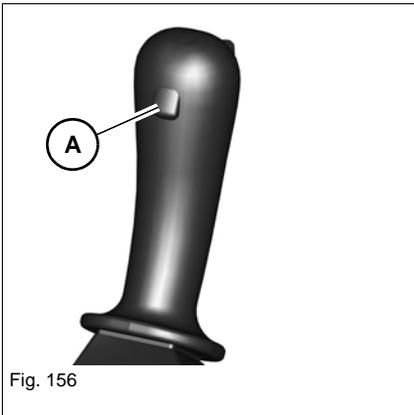
Roof/chassis lights	Push button	Indication
Roof lights ON		
Roof lights ON Chassis lights ON		
Chassis lights ON		
Roof lights off Chassis lights off		



### Information

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

**Horn**



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

**Interior light**

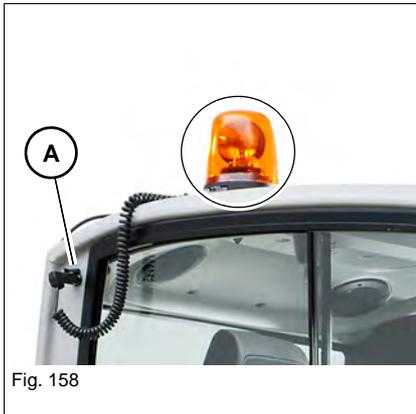


The mechanical switch above the left B-pillar must be in the position on the right so that the interior light can be switched on and off with the help of the switch panel.

The push button is located on the right keypad.

Interior light	Push button	Indication
On		
OFF		

**Rotating beacon (option)**



The rotating beacon has a magnetic base and is attached either to the cabin roof or to the ROPS screen. The electric power supply has a 12-volt connection **A**.

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

Rotating beacon	Push button	Indication
On		
OFF		

**i Information**

Observe the national and regional regulations.

## 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.
- ▶ Check the level in the reservoir and add a cleaning solution (glass cleaner) if necessary.

### **NOTICE**

Damage to wiper if the front window is raised.

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

## 5.8 Heating, Ventilation and Air-conditioning

### CAUTION

**Damage to health due to incorrect operation of air conditioning system.**

Can cause health hazards.

- ▶ Do not direct the air vents directly at the face when the air conditioning system is switched on.

### Operation

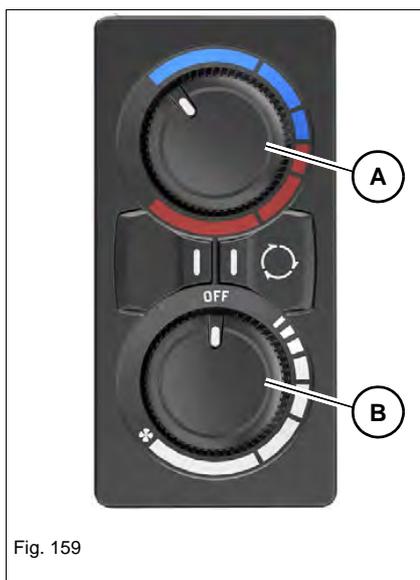


Fig. 159

The regulators and push buttons are located below the multi-functional display. Set the required temperature (regulator **A**) and ventilation (regulator **B**).

### 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.



Fig. 160

### Air conditioning

The automatic air conditioning cools and dehumidifies the air inside the cabin.

Cooling function	Push button	Indication
On		
OFF		

### Automatic mode (AUTO)

The automatic mode automatically controls the temperature and fan to ensure a constant temperature inside the cabin.

In the **OFF** position 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 automatic air conditioning 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.

---



### Traveling signal (option)

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

---

#### **WARNING**

##### **Accident hazard during forward/backward vehicle operation!**

Danger of crushing that may lead to serious injuries or death.

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

## 5.9 Operating hydraulics

### Basic control lever functions (ISO and SAE controls)

Control mode	Required function	ISO controls		SAE controls	
		Control levers <sup>1</sup>		Control lever <sup>1</sup>	
		Left	Right	Left	Right
					
	Rotating the upper carriage to the left		--		--
	Rotating the upper carriage to the right		--		--
	Extend stick		--	--	
	Retract the stick		--	--	
	Lower the boom	--			--
	Raise the boom	--			--
	Tilt in the bucket	--		--	
	Tilt out the bucket	--		--	

1. The control levers shown are symbolic representations.

## ISO/SAE controls (option)

The standard equipment of the vehicle 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.

The push button to change the control mode is located on the switch panel on the right.

Function	Push button	Pop-up window
ISO controls		
SAE controls		

#### **Switching from ISO to SAE controls and vice versa:**

Switching is only possible when the engine is running.

1. Raise the control lever base on the left
2. Press the ISO/SAE button for 5 seconds until the corresponding on-screen display appears.

## Rotating the upper carriage

### **WARNING**

#### **Crushing hazard due to rotating range of vehicle!**

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

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

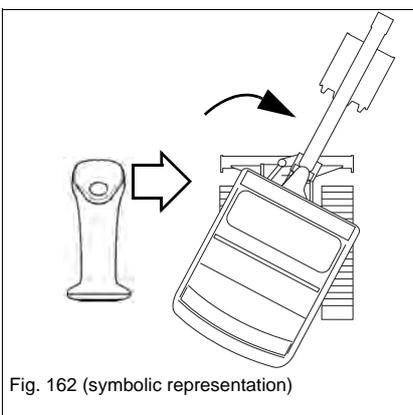
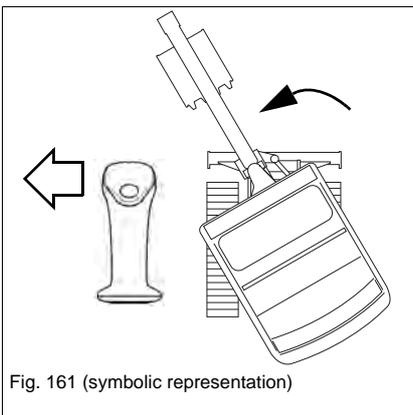
### **NOTICE**

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

- ▶ Ensure that there are no obstacles 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.



Rotating the upper carriage	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

## 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 vehicle after work once a day.

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

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

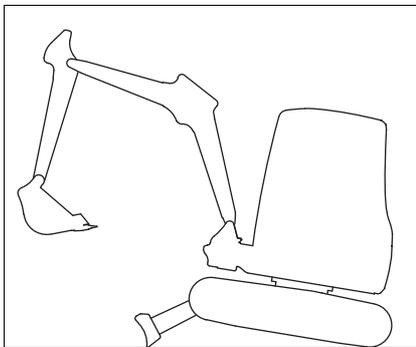


Fig. 163 (symbolic representation)

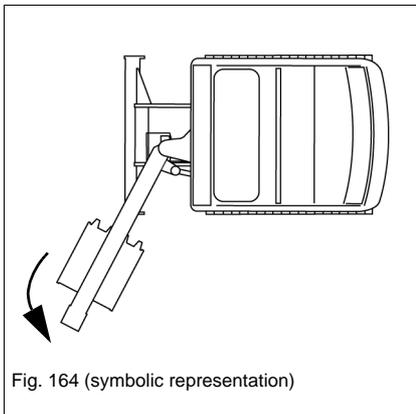
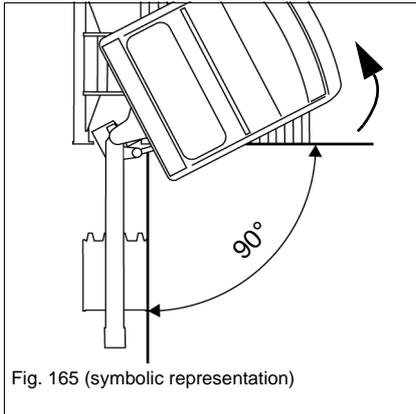
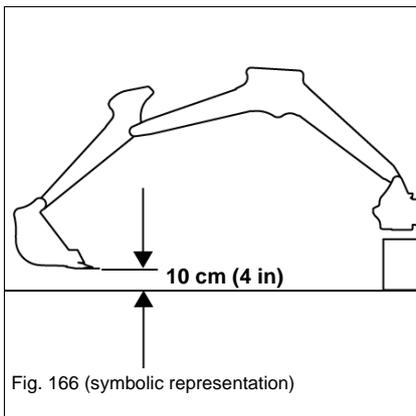


Fig. 164 (symbolic representation)

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



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

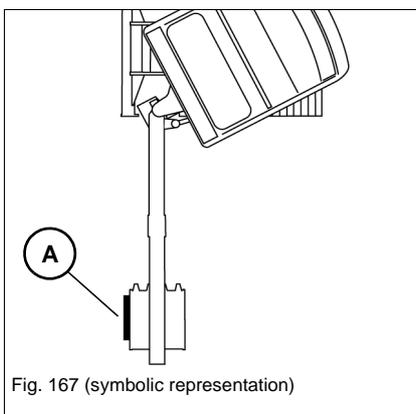


5. Position the boom as shown in [Fig. 166](#).

6. Stop the engine, remove the starting key and carry it with you.

7. Raise the control lever base.

8. Wait one minute.



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.

## 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 vehicle travel.

### **Information**

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

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

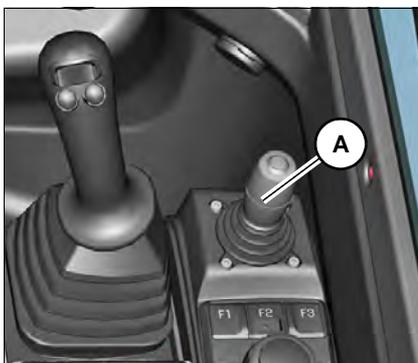


Fig. 168

Stabilizer blade	Position
Raise	Pull lever <b>A</b> backward
Lower	Push lever <b>A</b> forward

---

**Hammer operation**

---

 **WARNING****Danger of piercing/penetration by objects from the front!**

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

- ▶ During operation, all persons must stay clear of the job site of the vehicle.
  - ▶ Do not position the vehicle under the workplace during demolition, since debris could fall onto the vehicle.
  - ▶ Observe the mandatory limits of the work area.
  - ▶ Do not hammer horizontally or upward.
  - ▶ The front window has to be closed.
- 

---

 **WARNING****Accident hazard due to tipping over of vehicle!**

A tipping vehicle can cause serious injury or death.

- ▶ During operation, all persons must stay clear of the job site of the vehicle.
  - ▶ Do not perform any demolition work under the vehicle. This could cause the vehicle to tip over.
  - ▶ The vehicle 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 vehicle standstill.
- 

---

 **Information**

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

---

### Working with a hydraulic hammer

#### NOTICE

In order to avoid damage to the vehicle 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 vehicle with the boom.
- ▶ Do not work with fully extended cylinders or arm system. Do not pivot the Powertilt unit beyond 30° during hammer operation, otherwise the load on the boom increases tremendously.
- ▶ Stop vehicle operation immediately if a hydraulic hose moves back and forth in an unusual manner. The pressure accumulator could be malfunctioning. Contact a Wacker Neuson service center and have the malfunction rectified immediately.
- ▶ Do not use the impact force of the attachment to perform demolition work. Broken or falling pieces can cause damage to the equipment.

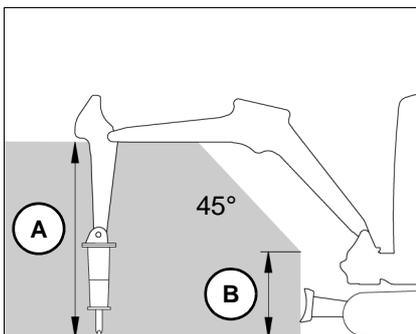


Fig. 169 (symbolic representation)

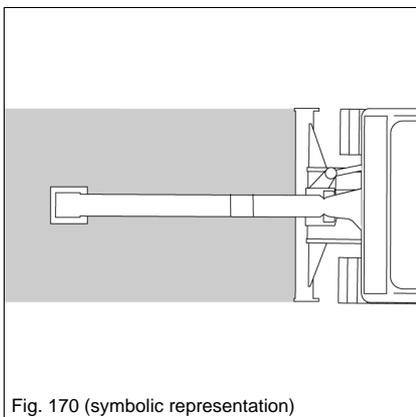


Fig. 170 (symbolic representation)

#### Job site

Work range height **A**: 225 cm (89 in), **B**: 50 cm (20 in)

Figures 169 and 170 refer to work with a Wacker Neuson hydraulic hammer. Working with another tool can result in a different work area.

**NOTICE**

Set the maximum oil flow – see chapter “Adjusting the starting point and maximum required flow rate” on page 5-31.

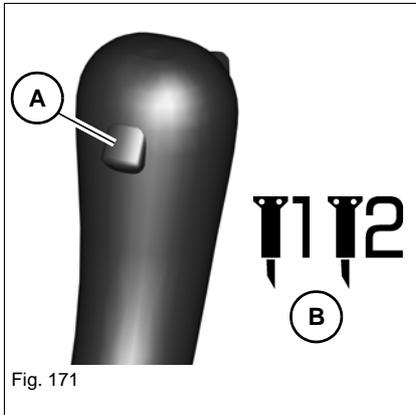


Fig. 171

Hammer operation	Position
On	Press and hold push button <b>A</b> on the control lever on the left
OFF	Release push button <b>A</b>

**NOTICE**

Possible damage to the hydraulic hammer.

- Use the jog dial to select one of the hammer symbols **B** as an attachment in order to activate the reflux line.

**Auxiliary hydraulics – AUX I**

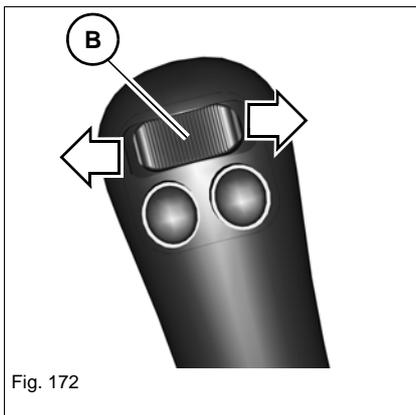


Fig. 172

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 5-31

Oil flow	Position
To the line on the left	Press switch <b>B</b> to the left
To the line on the right	Press switch <b>B</b> to the right

**Additional control circuits**

**AUX II (option)**

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

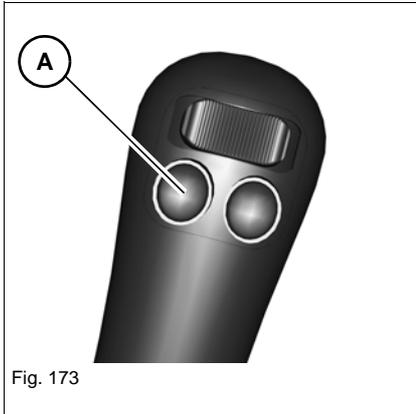


Fig. 173

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

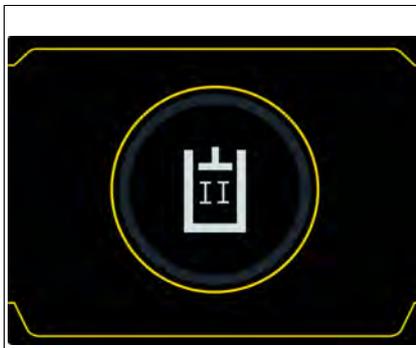


Fig. 174

Set the desired flow rate..

– see chapter “*Adjusting the starting point and maximum required flow rate*” on page 5-31

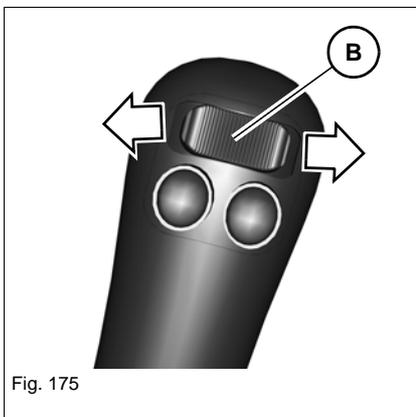


Fig. 175

Oil flow	Position
To the line on the left	Press switch <b>B</b> to the left
To the line on the right	Press switch <b>B</b> to the right

**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.

**i Information**

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

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

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

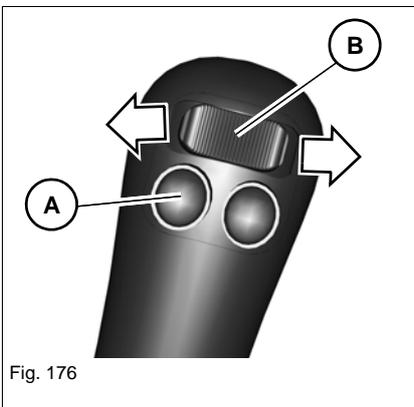


Fig. 176



Fig. 177

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

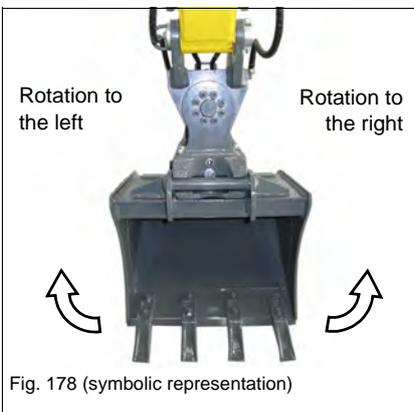


Fig. 178 (symbolic representation)

Adjust the required oil flow.

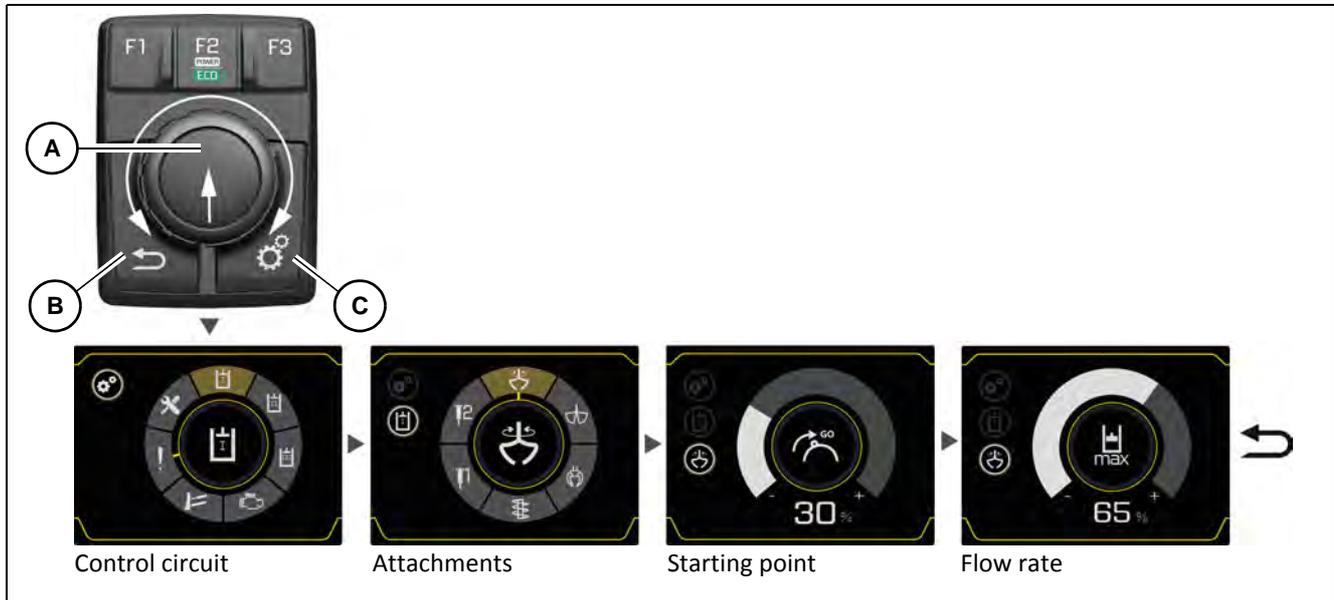
– see chapter “*Adjusting the starting point and maximum required flow rate*” on page 5-31

<b>Powertilt</b>	<b>Position</b>
Rotation to the left	Press switch <b>B</b> to the left
Rotation to the right	Press switch <b>B</b> to the right

## Proportional controls

The proportional controls allow to continuously adjust the oil flow for the attachment.

Additionally the required starting point for the oil flow can be adjusted with the switch.



### Information

Example for AUX I. The operation for AUX II, AUX III and the dozer blade are identical.

### 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.

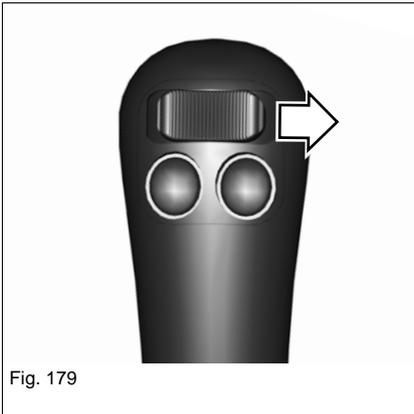


Fig. 179

### 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. 180

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.

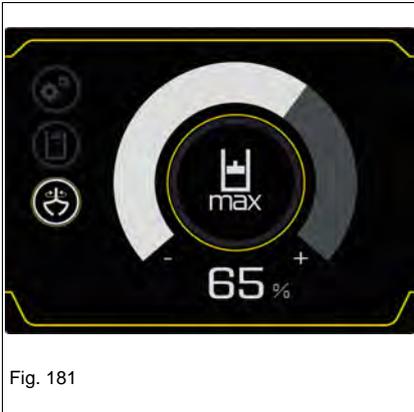


Fig. 181

4. Press the switch as far as it will go and hold it there.
5. Turn adjustment button **A** to select the maximum required flow rate.
6. Press adjustment button **A** to confirm.

### Swiveling the boom

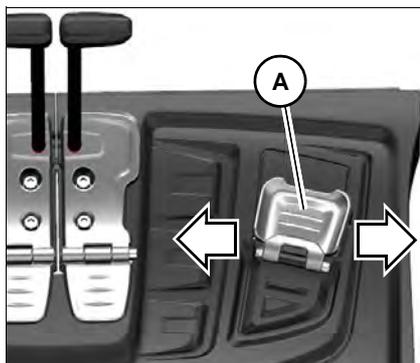


Fig. 182

Boom	Position
Swivel to the left	Push pedal <b>A</b> to the left
Swivel to the right	Push pedal <b>A</b> to the right

### Operating the triple articulation boom (option)

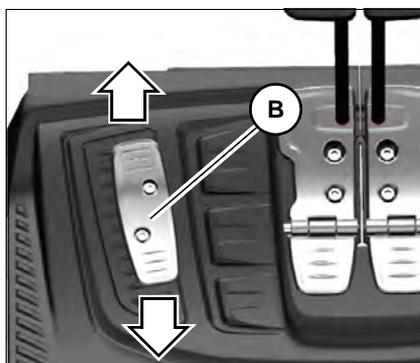


Fig. 183

Triple articulation boom	Position
Extend	Push pedal <b>B</b> forward
Retract	Push pedal <b>B</b> backward

## 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 vehicle!**

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

- ▶ Do not exceed the weights indicated in the load diagrams.
  - ▶ Subtract the weight of the attachment from the weight specified in the relevant load diagram.
  - ▶ Use the vehicle for lifting gear applications only if the mandatory lifting gear and safety equipment is installed, functional and enabled.
  - ▶ The subgrade must be horizontal, even, and have a high load-bearing capacity.
- 

### **WARNING**

#### **Risk of vehicle tipping over due to failure to pay attention to the safe load indicator!**

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

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

**NOTICE**

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

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

**Safe load indicator**

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

There are two versions:

- Safe load indicator **basic** (standard)/**advanced** (option)

Position	basic	advanced
Boom	Hose burst valve	Hose burst valve
Shovel arm	Hose burst valve	Hose burst valve
Stabilizer blade	Hose burst valve	Counterbalance valve

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

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 vehicle.
2. Perform vehicle travel on open terrain.
3. Secure the danger zone.
4. Stop the vehicle.
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.



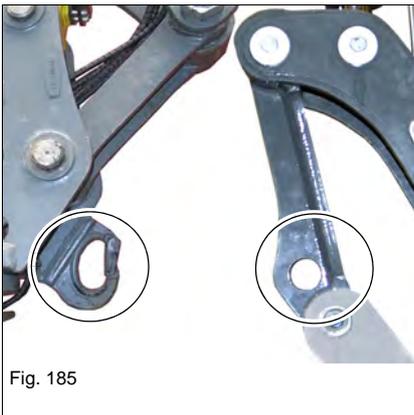
Warning devices	Result
The buzzer sounds and symbol <b>A</b> is displayed	The vehicle may be used for lifting gear applications.
Buzzer does not sound or symbol <b>A</b> is not displayed	The vehicle may not be used for lifting gear applications. Contact a Wacker Neuson service center.

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

– see chapter “*Functional check of control lever base*” on page 4-54

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

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



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.

### Lehnhoff mechanical quickhitch system (optional)

- The quick coupler system and the attachment support must be undamaged and clean.
- Store the Operator's Manual of the mechanical quick coupler system together with the Operator's Manual of the vehicle.
- The described operation does not apply to the face shovel. Contact an authorized workshop for face shovel operation.

#### **WARNING**

##### **Crushing Hazard when picking up Attachments!**

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

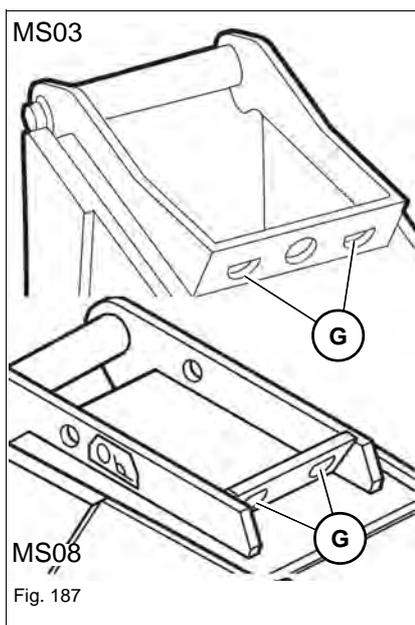
- ▶ Do not allow anyone to stay in the danger zone.
- ▶ During locking and unlocking procedures, make sure that hands and feet are not crushed.
- ▶ Only use undamaged attachments and quick coupler systems.
- ▶ Before starting any work and after every locking process, press the attachment to the ground and quickly move it back and forth over just over the ground a few times to check the secure locking.
- ▶ Only operate the vehicle 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.



#### **Acceptance variants**

ET65: Support for MS03

EZ80/ET90: acceptance of MS08

**G:** Openings for quick coupler system bolts

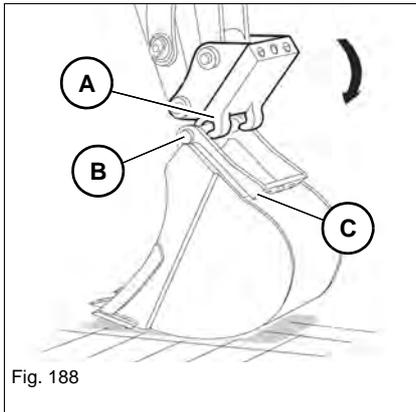
**Picking up an attachment**

Fig. 188

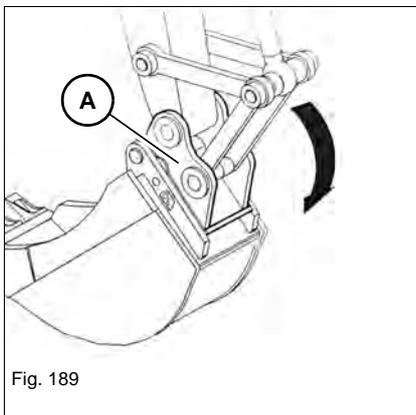
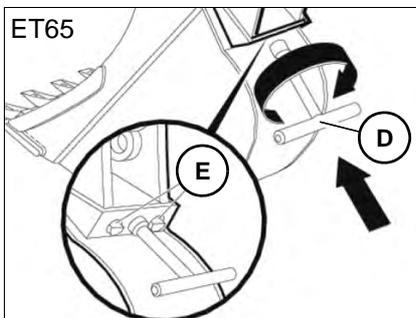


Fig. 189



ET65

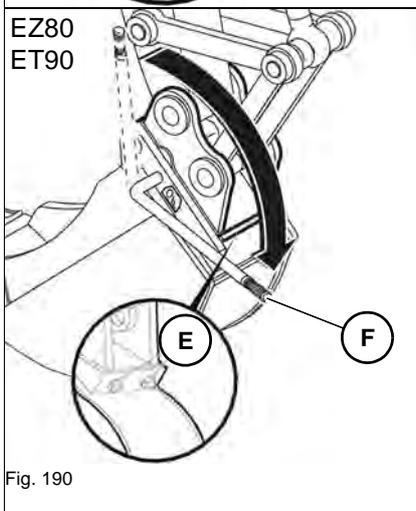
EZ80  
ET90

Fig. 190

1. Hook up the quick coupler system **A** in the attachment bolt **B**.
2. Slightly screw in the quick coupler system **A**, lift the shovel arm until the attachment is suspended about 30 cm (12 in) above the ground.
3. Extend the bucket cylinder so that the edge **C** of the attachment touches the quick coupler system.

4. Screw in the quick coupler system **A** until the attachment lies completely on the quick coupler system **A** due to its weight.
5. Shut off the engine and store the ignition switch key safely.

6. ET65: Turn socket wrench **D** clockwise until the pins **E** fully engage in the openings **G** of the quick coupler system **A**.

➔ The quick coupler system is locked.

EZ80/ET90: Screw socket wrench **F** completely over dead center (approx. 120°), until the pins **E** fully engage in the openings **G** of the quick coupler system **A**. Because of the spring support, hold tightly to the socket wrench when locking.

➔ The quick coupler system is locked.

7. Remove the socket wrench and perform a visual inspection.
8. Start the engine.

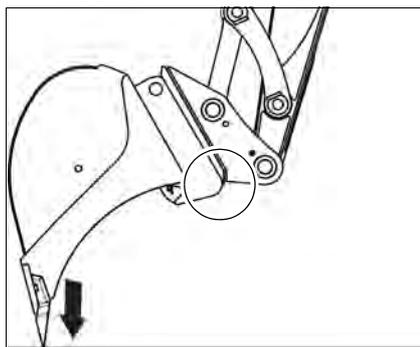


Fig. 191

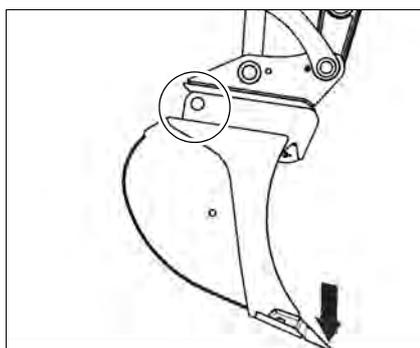


Fig. 192

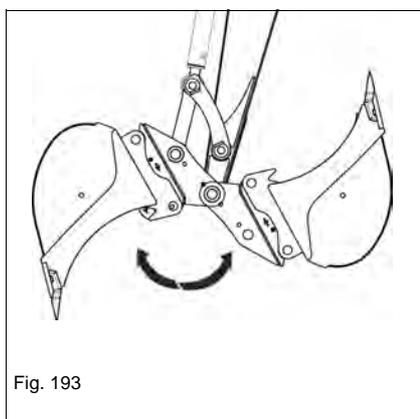


Fig. 193

9. Before starting any work and after every locking process, press the attachment to the ground and quickly move it back and forth over just over the ground a few times.

- The attachment may not detach from the quick coupler system in the process.

**Setting down an attachment**

1. Screw in the attachment and position it at 5–10 cm (2–4 in) above the ground.
2. Shut off the engine and store the ignition switch key safely.

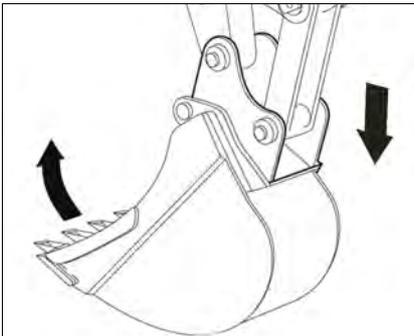


Fig. 194

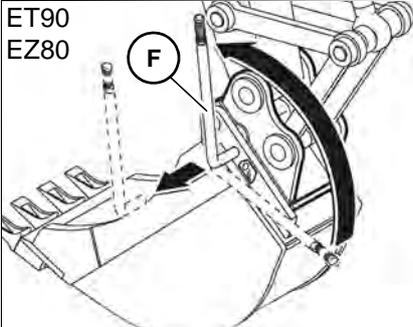
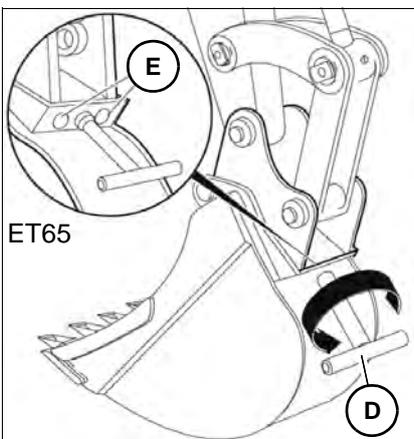


Fig. 195

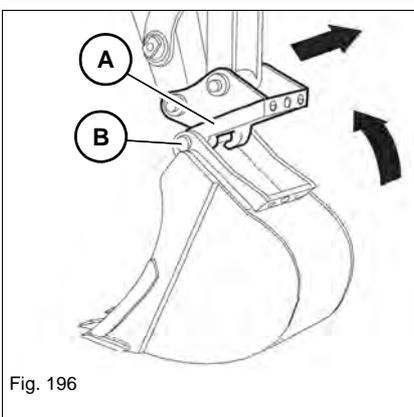


Fig. 196

3. ET65: Turn the socket wrench **D** counter-clockwise until the pins **E** are completely retracted.
  - The quick coupler system is unlocked.
 EZ80/ET90: Screw the socket wrench **F** completely over dead center (ca. 120°), until the pins **E** are fully retracted. Because of the spring support, hold tightly to the socket wrench when unlocking.
  - The quick coupler system is unlocked.
4. Remove the socket wrench.
5. Start the engine.
6. Lower the attachment to level and firm ground ensuring stability.

7. Retract the bucket cylinder and quick coupler system **A** from the attachment bolt **B**.

### Preparation for hydraulic quickhitch (option)

The HSWS preparation is a hydraulic auxiliary control circuit attached to the vehicle boom that was designed, developed and released for the hydraulic quick coupler systems described in this operator's manual.

Wacker Neuson is not liable for injuries or damage if at least one of the following items is not complied with:

- Follow the operator's manual for the hydraulic quickhitch.
- Store the Operator's Manual of the hydraulic quickhitch together with the Operator's Manual of the vehicle.
- For non-released quickhitch systems, there may be differences in the operating functions or the operation of the vehicle. Observe the operator's manual of the quickhitch system or the attachment.

Nevertheless, should a non-released HSWS be used, the following points must also be observed:

- If required, modifications on the vehicle (for example additional adhesive labels) or the Operator's Manual of the vehicle (if operation is different) must be made.
- The intended purpose of the vehicle may be restricted.
- Assembling a hydraulic quick coupler system that does not fit with the vehicle or its interface (e.g. pressure settings) may void the declaration of conformity of the vehicle. Contact a Wacker Neuson service center.
- Assembling a hydraulic quick coupler system to a vehicle that does not fit with the vehicle or its interface (e.g. pressure settings) may void the declaration of conformity of the hydraulic quick coupler. Contact a Wacker Neuson service center.



### **Hydraulic Easy Lock quickhitch (option)**

- Attend specific training before putting into operation. Training must be given by authorized technical personnel and must be understood by the operator.
- For safety reasons, the quickhitch must be operated with two control elements. This avoids opening the quickhitch unintentionally during work operation.
- The quick coupler system and the attachment support must be undamaged and clean.
- For more information, see **Easy Lock/Powerlift with Easy Lock Operator's Manual**.
- Store the **Easy Lock/Powerlift with Easy Lock operator's manual** together with the vehicle's operator's manual.



### **WARNING**

#### **Crushing hazard when picking up attachments!**

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

- ▶ Do not allow anyone to stay in the danger zone.
  - ▶ Only use undamaged attachments and quick coupler systems.
  - ▶ Check pin **D** must be fully retracted. Otherwise repeat the lock cycle until check pin **D** is retracted.
  - ▶ Before starting any work and after every locking process, press the attachment to the ground and quickly move it back and forth over just over the ground a few times to check the secure locking.
  - ▶ Operate the vehicle 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.
-

**Picking up an attachment**

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

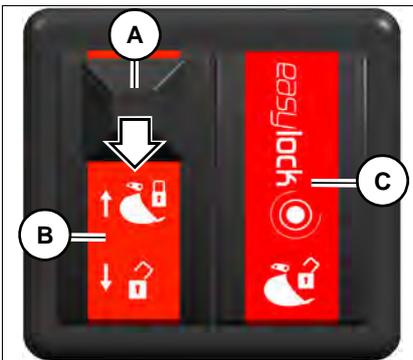


Fig. 197

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



Fig. 198

3. Press push button **C** within 10 seconds.
- The quickhitch opens.



Fig. 199

- Check pin **D** must be fully extended.

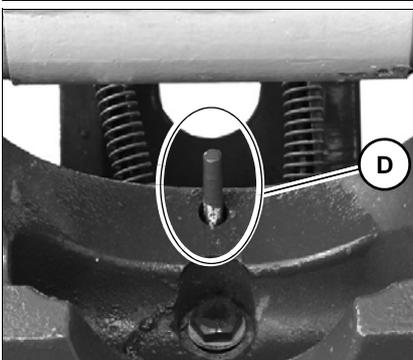
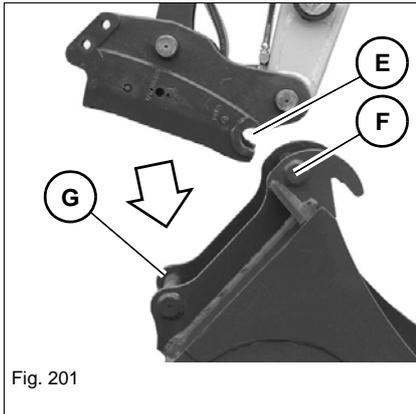


Fig. 200



4. Hook up the quick coupler system **E** in bolt **F** of the attachment receptacle.
5. Extend the bucket cylinder so that pin **G** of the attachment touches the quickhitch.
6. Check whether the attachment touches the quick coupler system with bolt **G**.
7. Move the attachment inward completely.



8. Press switch **B** upward.
  - ➔ The quickhitch closes.
  - ➔ The symbol **Hydraulic quickhitch disabled** appears for a few seconds and the buzzer does not sound any more.

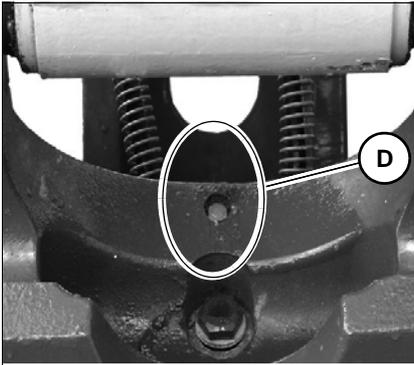


Fig. 203

9. Check pin **D** must be fully retracted.

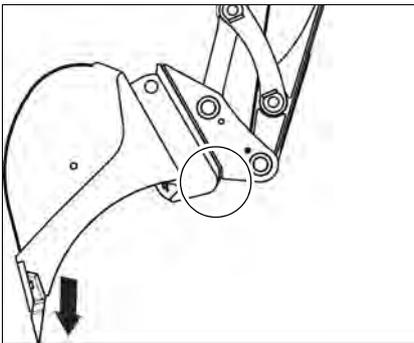


Fig. 204

10. Before starting any work and after every locking process, press the attachment to the ground and quickly move it back and forth over just over the ground a few times to check the secure locking.

➤ The attachment may not detach from the quick coupler system in the process.

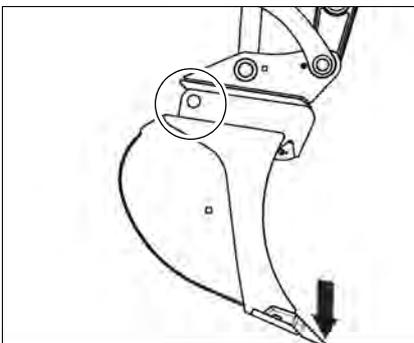


Fig. 205

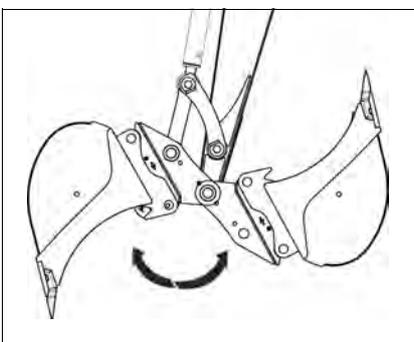


Fig. 206

### Manual HSWS bolt lock

Depending on national provisions, the HSWS must also be manually locked according to the hydraulic locking process.

The locking or unlocking is located to the left on the quick coupler system.

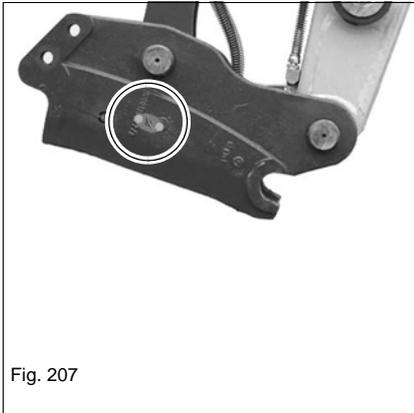


Fig. 207

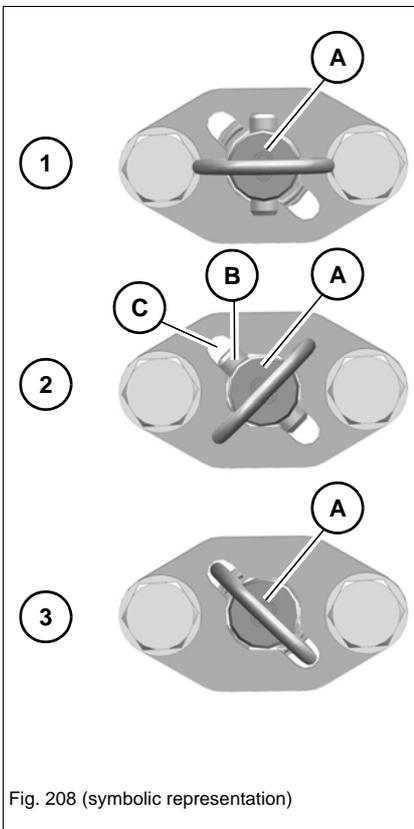


Fig. 208 (symbolic representation)

- Stop the engine and remove the starting key.
- Raise the control lever base.
- Rotate bolt **A** so that the pin **B** fits in the recess **C** (2).
- Press in bolt **A** and turn until it is held in its position by spring (3).  
 ➔ The HSWS is also manually locked.



#### Information

Comply with national provisions.



#### Information

The bolt positions may deviate in their final position from the figures.

**Setting down an attachment****Manual HSWS bolt unlocking**

Depending on national provisions, the HSWS must also be manually unlocked according to the hydraulic unlocking process.

The locking or unlocking is located to the left on the quick coupler system.

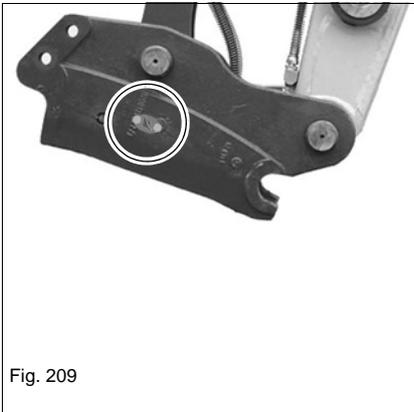


Fig. 209

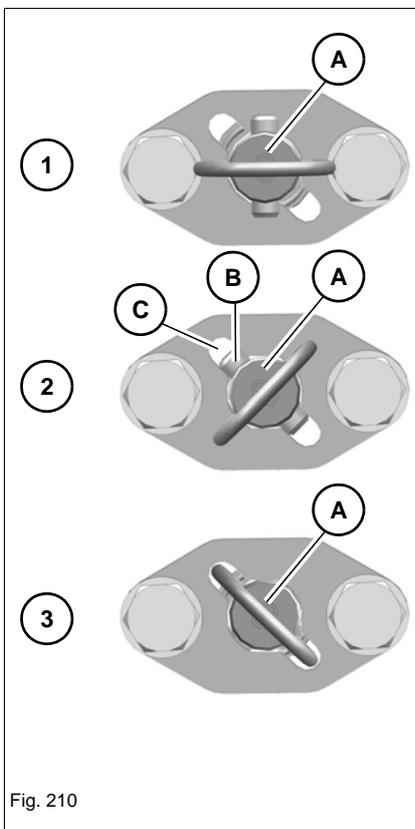


Fig. 210

- Stop the engine and remove the starting key.
- Raise the control lever base.
- Rotate bolt **A** so that the pin **B** fits in the recess **C** (2).
- Pull out the bolt **A** (1).
  - ➔ The HSWS is manually unlocked. The attachment is still hydraulically locked.

**i Information**

Comply with national provisions.

**i Information**

The bolt positions may deviate in their final position from the figures.

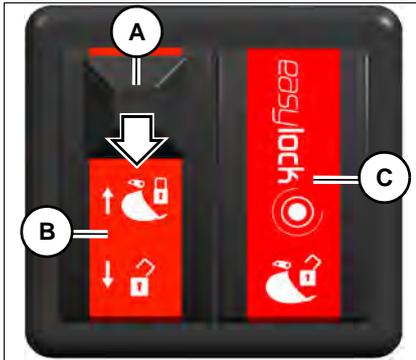


Fig. 211

1. Start engine and lower the control lever base.
2. Move the attachment inward completely and lower it about 5–10 cm (2–4 in) above the ground.
3. Pull lock **A** down.
4. Press switch **B** down.

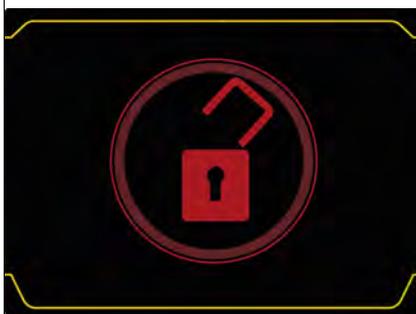


Fig. 212

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



Fig. 213

5. Press push button **C** within 10 seconds.
- ➔ The quickhitch opens.

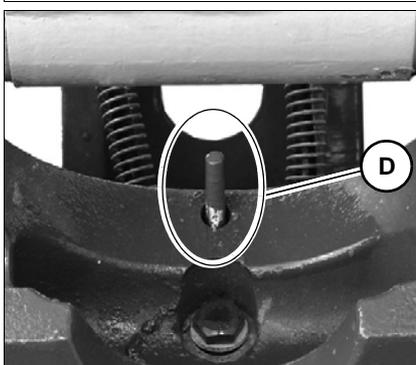
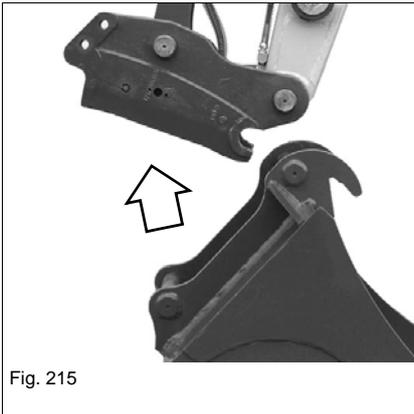


Fig. 214

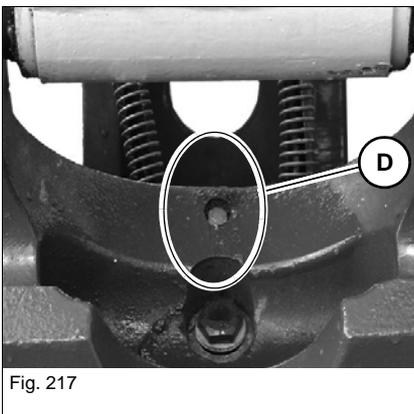
➔ Check pin **D** must be fully extended.



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



9. Press switch **B** upward.
  - The quickhitch closes.
  - The symbol **Hydraulic quickhitch disabled** appears for a few seconds and the buzzer does not sound any more.



10. Check pin **D** must be fully retracted.

## Changing attachments

### Information

Observe manual locking and unlocking.

- see chapter “Manual HSWS bolt lock” on page 5-46;
- see chapter “Manual HSWS bolt unlocking” on page 5-47

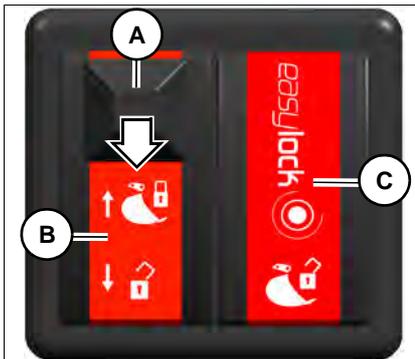


Fig. 218

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. 219

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

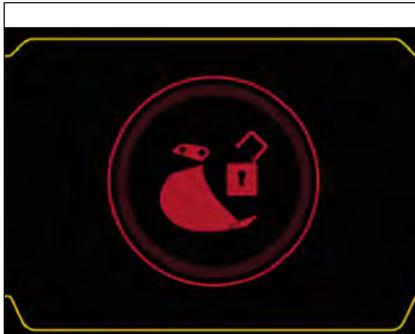


Fig. 220

4. Press push button **C** within 10 seconds.
- ➔ The quickhitch opens.

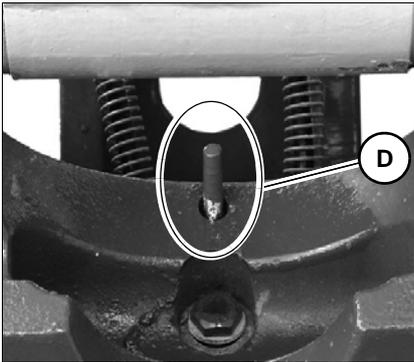


Fig. 221

➔ Check pin **D** must be fully extended.



Fig. 222

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

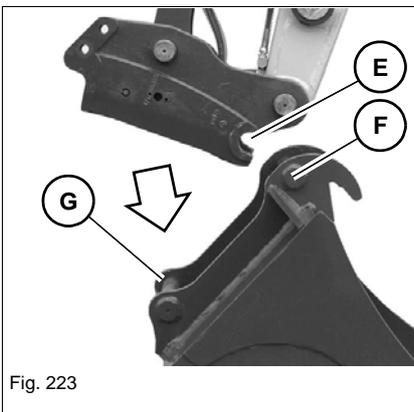


Fig. 223

8. Hook up the quick coupler system **E** in bolt **F** of the attachment receptacle.
9. Extend the bucket cylinder so that pin **G** of the attachment touches the quickhitch.
10. Check whether the attachment touches the quickhitch with the second pin **G**.

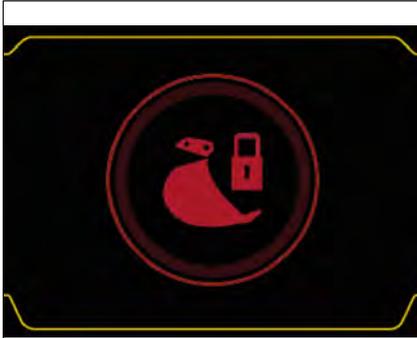


Fig. 224

11. Press switch **B** upward.

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

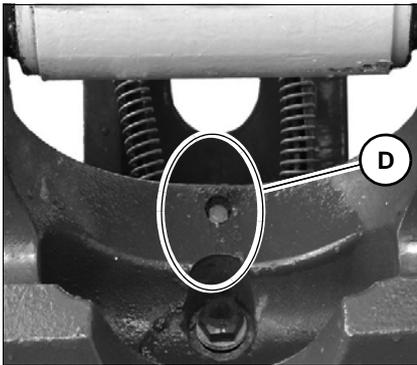


Fig. 225

12. Check pin **D** must be fully retracted.

**AUX V (option)**

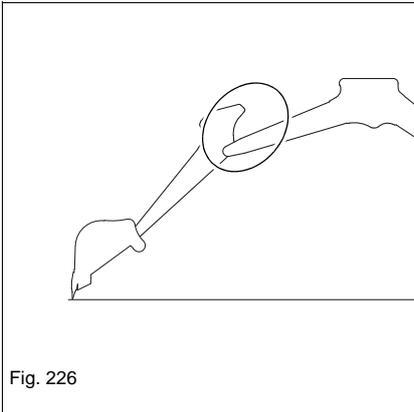


Fig. 226

Changeover is performed on one side of the boom.  
The ball-type cock is located at the end of the boom.  
Position the boom straight ahead at the center of the vehicle (see figure).  
Lower the boom and the stabilizer blade to the ground.

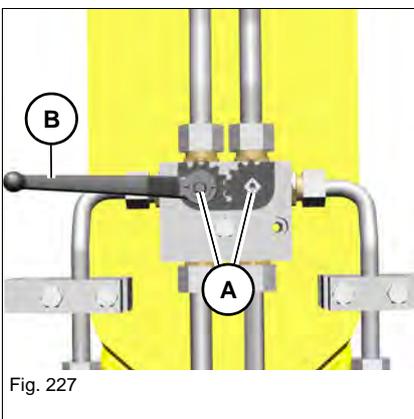


Fig. 227

**Selecting:**

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

Gear wheel position	Operating
	<p>Bucket operation</p>
	<p>Grab operation</p>

**i Information**

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

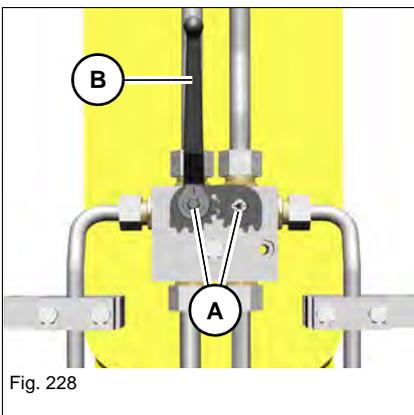


Fig. 228

### Connecting and disconnecting hydraulic couplings

1. Park the vehicle – see chapter “Preparing lubrication” on page 7-9
  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.

### Hydraulic connections

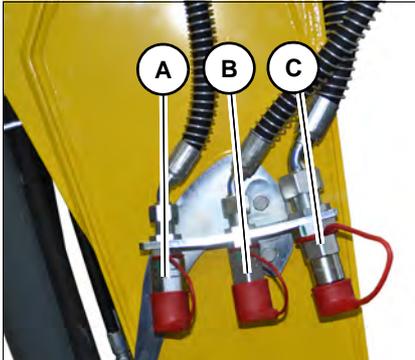


Fig. 229

Connection	Stick (left/right)
A	AUX V
B	AUX II
C	AUX I

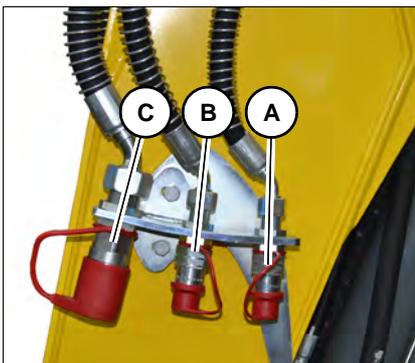


Fig. 230

### Information

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

**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.

- Safe load indicator **basic** (standard)/**advanced** (option)

<b>Load-retaining function</b>	<b>basic</b>	<b>advanced</b>
Boom	Hose burst valve	Hose burst valve
Shovel arm	Hose burst valve	Hose burst valve
Stabilizer blade	Hose burst valve	Counterbalance valve



---

### Proceed as follows after a damage:

1. Stop the vehicle 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 5-69](#)
5. Raise the control lever base.
6. Remove the starting key and lock the cabin.
7. Secure the vehicle 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.

---

## 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 “Release the pressure of the work hydraulics” on page 5-59.*
  - ▶ Wear protective clothes.
  - ▶ Always consult a doctor immediately, even if the wound seems insignificant. Hydraulic oil causes blood poisoning.
- 

 **WARNING**

**Accident hazard when picking up attachments!**

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 vehicle only with a safely locked attachment
-



---

### 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 vehicle 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.
-

## Release the pressure of the work hydraulics

1. Stop the vehicle 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. Release the pressure:
  - **Work hydraulics:** Move the control elements of the respective hydraulic circuit several times in all directions and hold each time as far as it will go for three seconds.
  - **AUX I:** ensure that the hammer return line is deactivated, for example. Select attachment **bucket**.
    - Move the control element of the respective hydraulic circuit several times in all directions and hold each time as far as it will go for three seconds.



Fig. 231



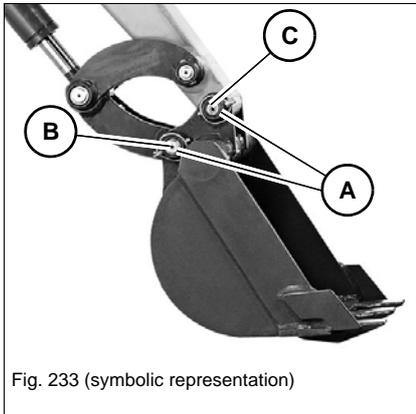
Fig. 232

- **AUX II:** ensure that AUX II is selected.
    - Move the control element of the respective hydraulic circuit several times in all directions and hold each time as far as it will go for three seconds.
8. The pressure reduces. This can be seen by the brief movement the hoses make as the pressure is released.
  9. Turn the starting key to position **0**.
  10. Uncouple the attachment immediately after the pressure has been released, otherwise pressure can be created again.

Removed attachments with hydraulic connections must not be stored in sunlight to ensure pressure does not build in the lines.

Clean the hydraulic quick couplers before connecting to ensure dirt does not penetrate the hydraulic system.

## Re-equipping



### Removing

1. Lower the bucket to level ground with the flat side facing downward.
2. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
3. Remove lynch pins **A**.
4. First remove pin **B**, and then pin **C**. Carefully expel pins that are stuck with a hammer and a brass punch.

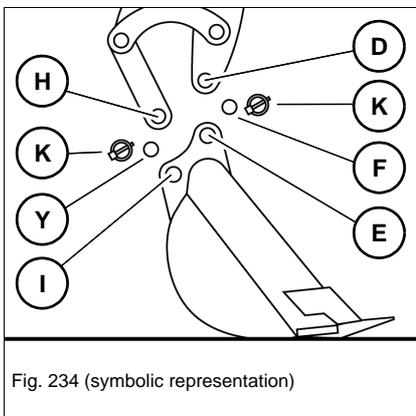
If pin **C** is stuck:

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



### Information

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



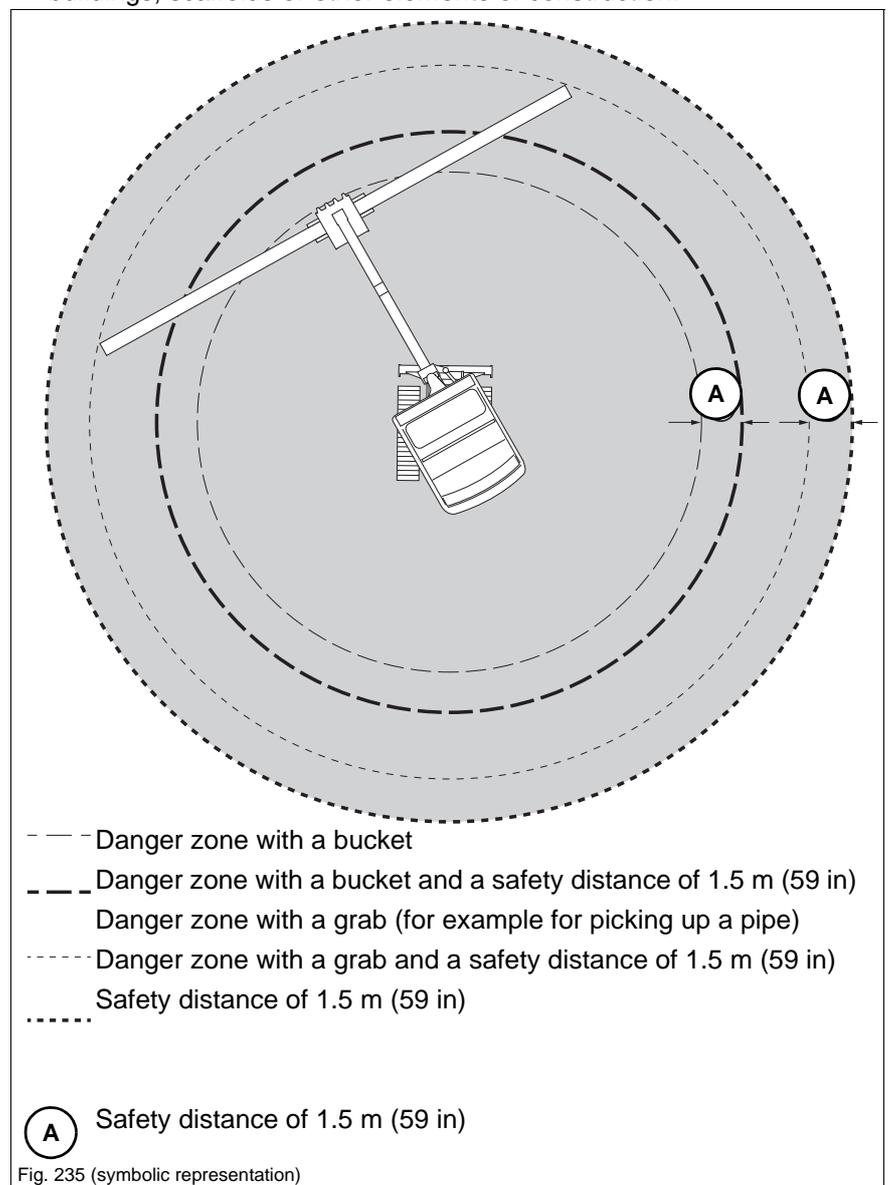
### Mount

1. Install a bucket only if it is positioned on level ground with the flat side facing downward.
2. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
3. Apply grease to the pins and articulations before inserting them.
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 bucket cylinder until bores **H** and **I** are flush.
9. Stop the engine. Raise the control lever base.
10. Insert pin **J**.
11. Install lynch pins **K**.

## 5.11 Work operation

### Danger zone

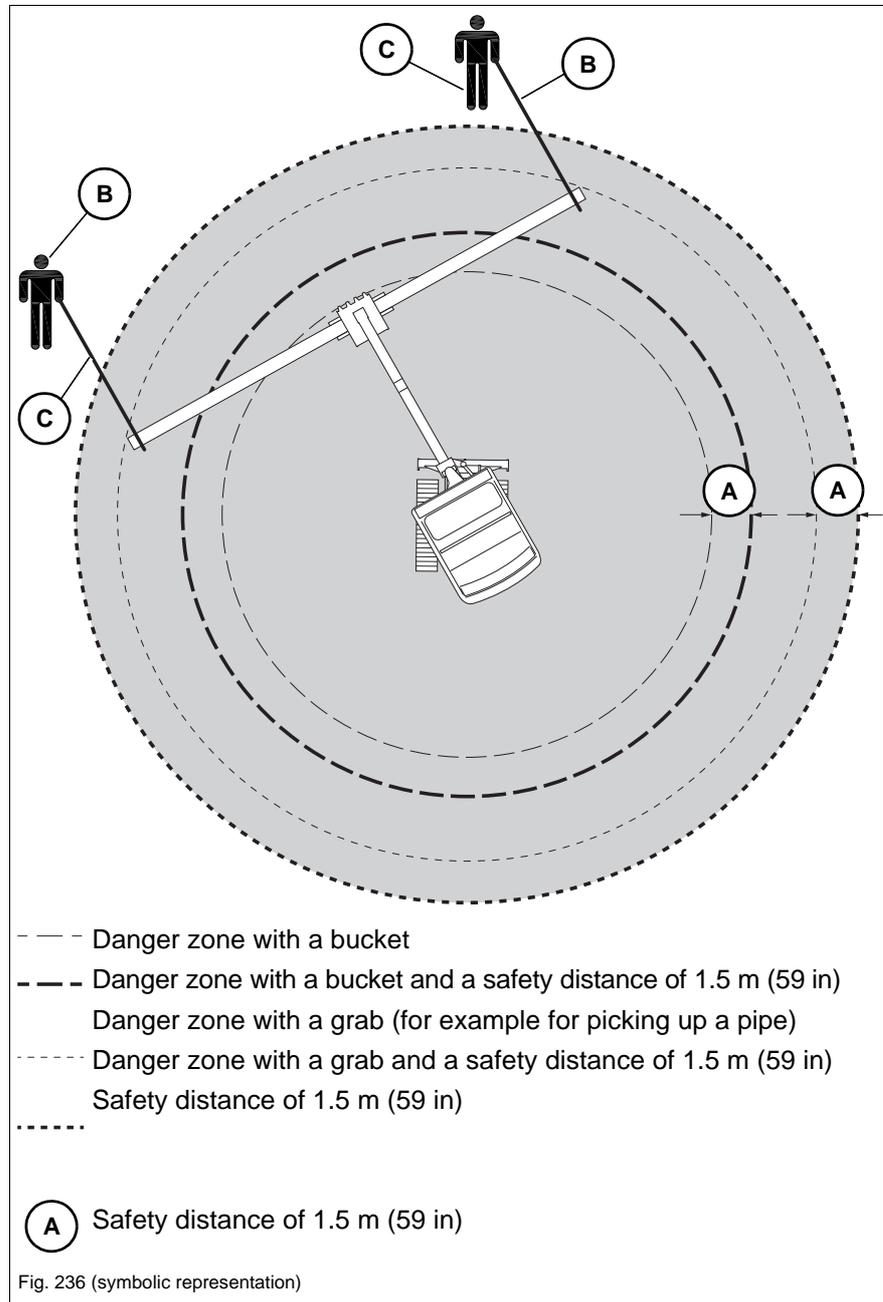
- The danger zone is the area in which persons are in danger due to the movements of the vehicle, attachment or load.
- The danger zone also includes the area that can be affected by falling material, equipment or by parts that are thrown out.
- The danger zone on a slope is different from the one on a level surface (secure the load). See chapter “**Operation, driving on slopes**”.
- Stop vehicle 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 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 5-33.



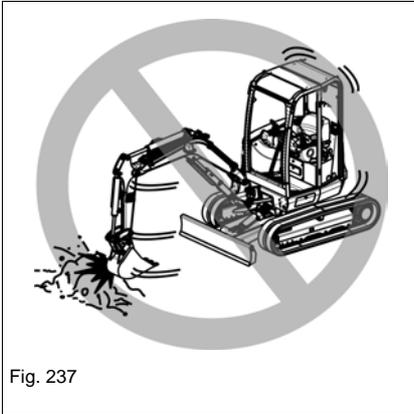
## Inadmissible work procedures

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### **NOTICE**

Inadmissible operation can damage the vehicle or the attachment.

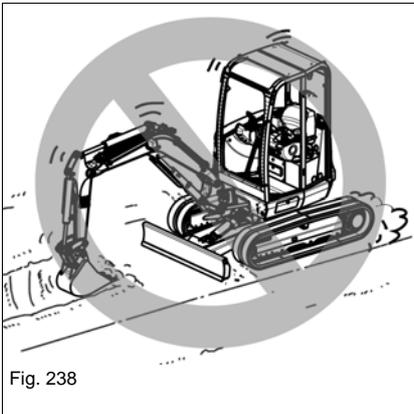
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### **Working with the swivel force**

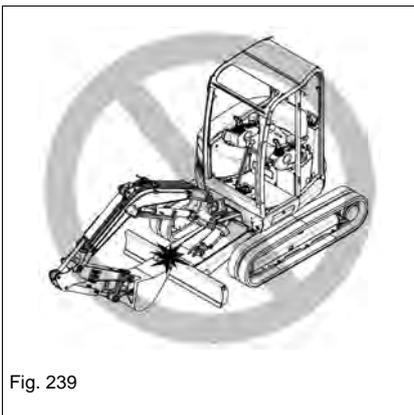
Do not use the swivel force of the upper carriage to tear down walls or to create level surfaces.

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



### **Working with the drive force**

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



### **Retracting the attachment**

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



Fig. 240

**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.

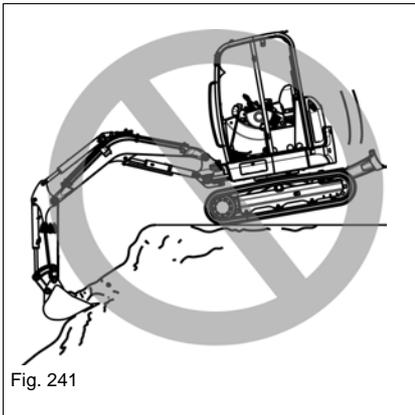


Fig. 241

**Working with the falling force by lowering the vehicle**

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

Use the force of the hydraulic cylinders exclusively.

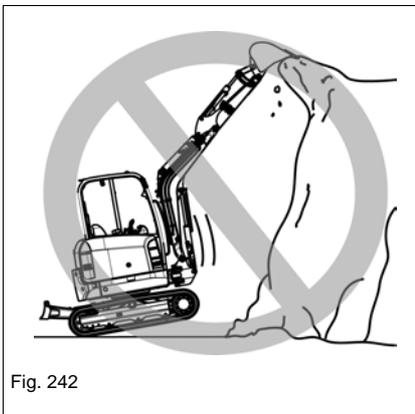


Fig. 242

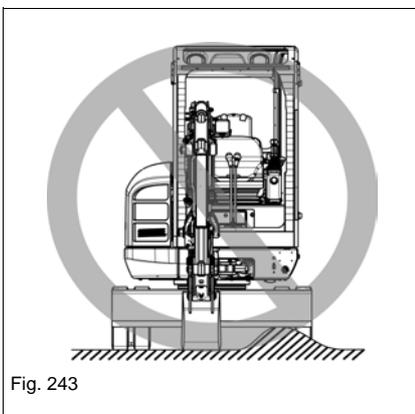


Fig. 243

**Fully lowering the stabilizer blade**

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

**Protecting the stabilizer legs/blade against shocks**

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

## General information regarding work operation

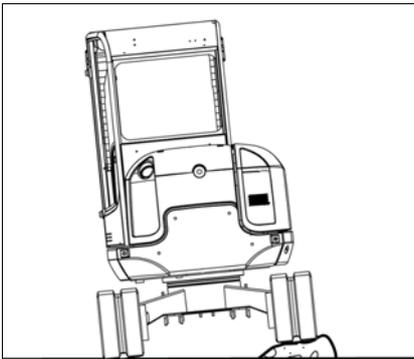


Fig. 244 (symbolic representation)

### Machine travel

Performing vehicle travel over obstacles can put a heavy load on the undercarriage and cause damage. Avoid performing vehicle 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

Avoid starting vehicle travel and stopping abruptly as well as changing direction suddenly on rough terrain.

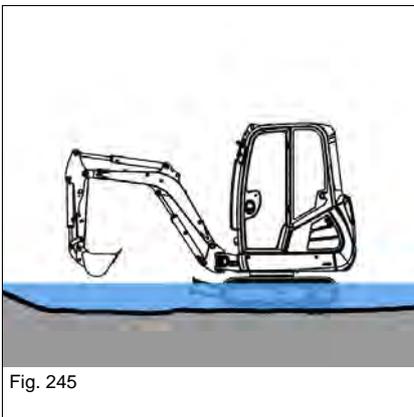


Fig. 245

### 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.

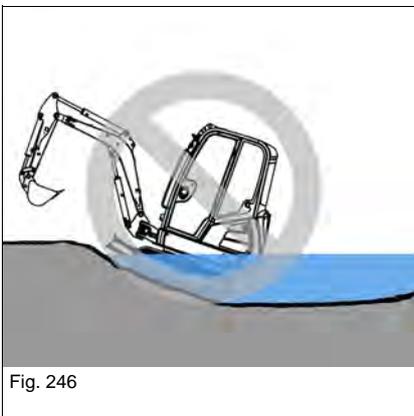


Fig. 246

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

### Operation near the sea

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

See chapter **Cleaning and maintenance**.

## Working with the bucket

The following section describes work operations with the vehicle 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.

### 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 vehicle and tilt in the bucket at the same time.

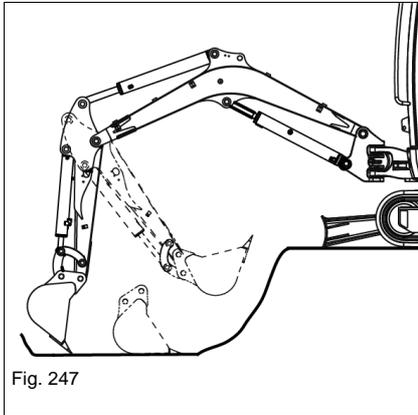


Fig. 247

### 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.

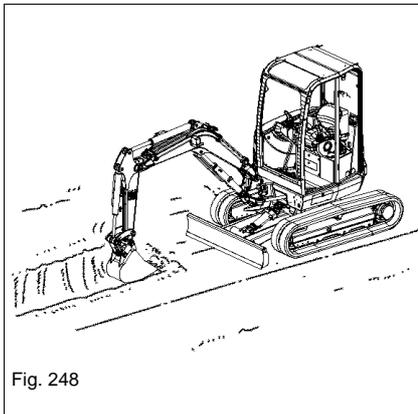


Fig. 248

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

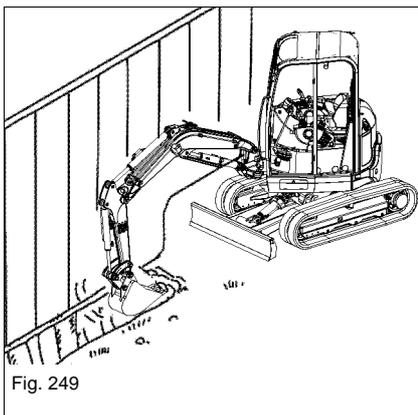


Fig. 249

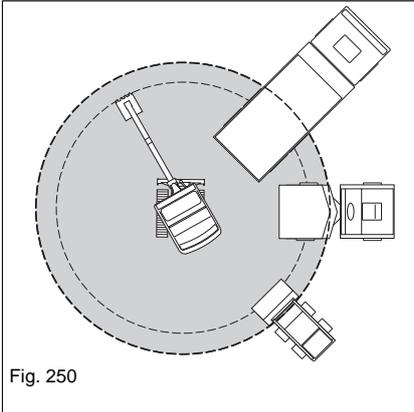


Fig. 250

### 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°.

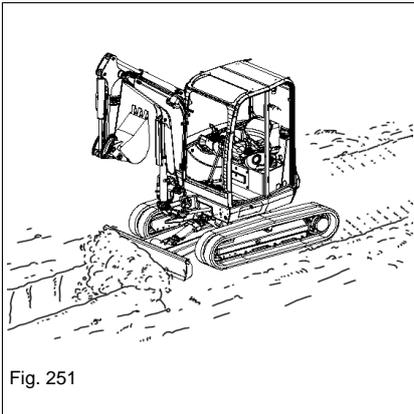


Fig. 251

### 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 vehicle must not be raised by lowering the stabilizer blade.
- ➔ Do not dig in the vehicle or let it sink in.

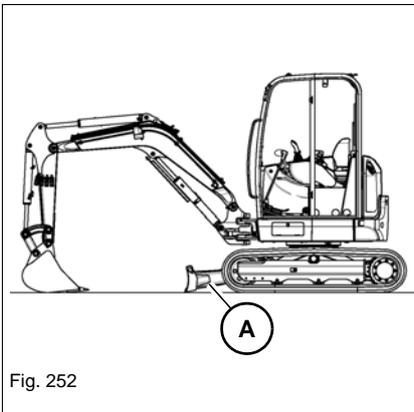


Fig. 252

### Digging position

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

### Working on slopes

#### **WARNING**

##### **Vehicle tipping hazard on slopes!**

A tipping vehicle can cause serious injury or death.

- ▶ Secure slopes before beginning work. Pay attention to ground conditions, vehicle weight, etc.
- ▶ Stabilize the vehicle with the stabilizer blade during excavation work.

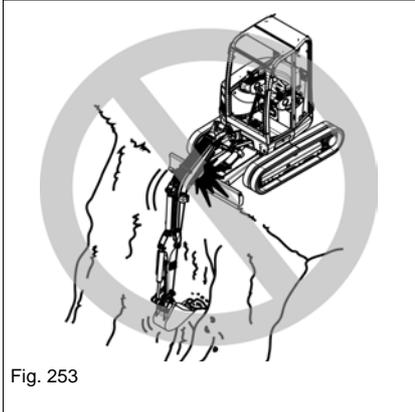


Fig. 253

#### **NOTICE**

Lifting arm cylinders can be damaged by improper operation.

- ▶ 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 drive forward when driving out of the digging area with a fully loaded bucket.
- Perform transport trips downhill with loaded bucket in reverse operation.

#### **Freeing the vehicle**

If the vehicle 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 vehicle is pushed backward.
- Reverse slowly.
- Repeat this procedure until the tracks reach firm ground.
- Reverse the vehicle away.



## 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 vehicle 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.

---

## 5.13 Options

### Immobilizer (option)

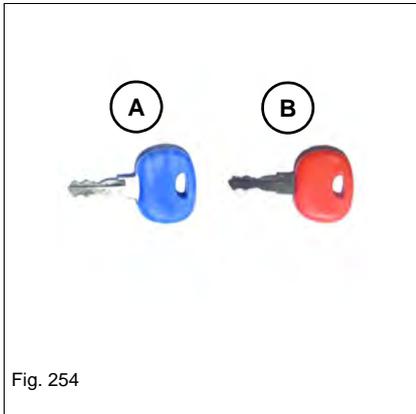


Fig. 254

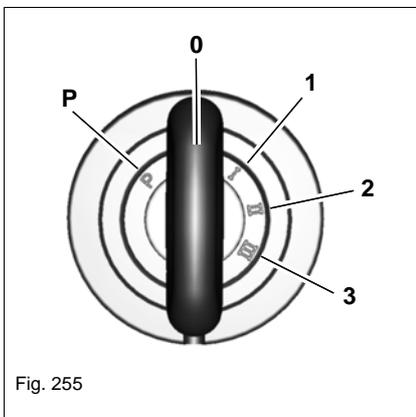


Fig. 255

**A** = starting key (blue)

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

**B** = master key (red)



#### 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.

#### 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 master key **B** 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.
  - With this the coding of the starting keys is completed.

Coding can be performed for a maximum of 10 starting keys.



#### Information

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

#### Deleting coded keys

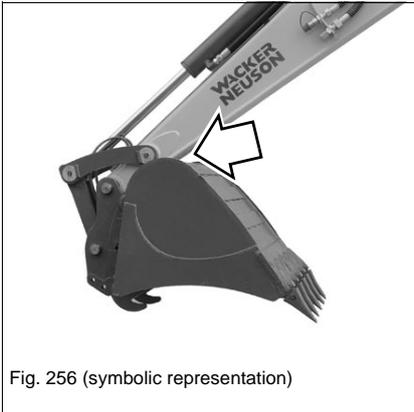
Deleting all coded keys is necessary whenever a coded key is lost.

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.



## Shovel bucket operation



---

### **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 vehicle is not certified for trailer operation!



### 5.14 Putting out of operation/back into operation

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

#### Putting out of operation temporarily

Store the vehicle indoors if possible.

If the vehicle has to be stored outdoors, place it on firm ground if possible (for example on concrete), and cover it with a watertight tarp to protect it against humidity.

1. Park the vehicle – see *"Parking the vehicle" on page 5-10*.
2. Clean the engine with a high-pressure cleaner in a suitable place – see chapter *"7.5 Cleaning and maintenance" on page 7-26*.
3. Check the vehicle for leaks and loose nuts, screws and connections.
4. Carefully clean and dry the entire vehicle.
5. Spray an anti-corrosion agent onto bare metal parts of the vehicle (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.

---

## Putting back into operation

---

### **Information**

If the vehicle 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 anti-corrosion 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 ["Fuel filter" on page 7-36](#)
9. Check the vehicle for leaks.
10. Lubricate the vehicle according to the lubrication plan.
11. Check all engine/vehicle fluids in the units or reservoirs, and add fluids if necessary.
12. If the vehicle 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 vehicle was out of operation for over 6 months.
14. Switch on the starter and check whether there are any malfunctions.  
– see ["Troubleshooting" on page 8-1](#)  
Contact an authorized 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. Stop the engine.
18. Check the oil levels in all units and add oil if necessary.
19. Check the vehicle for leaks.
20. Start the engine and ensure that all functions and warning systems work correctly.

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



### 5.15 Permanently putting out of operation

#### Disposal

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

Disposal may only be performed by a Wacker Neuson service center. Observe the 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 vehicle 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.

## **6 Transportation**

### **6.1 Towing the vehicle**



#### **WARNING**

##### **Accident hazard due to incorrect towing!**

Incorrect towing can cause accidents and serious injury or death.

- ▶ Tow the vehicle away only from the immediate danger zone until it can be loaded.
  - ▶ Only tow the vehicle using suitable towing equipment in connection with suitable towing facilities, such as 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 vehicle if it is stuck or on a slope. Load the vehicle.
  - ▶ Wear protective equipment.
  - ▶ Start vehicle travel and tow away slowly.
- 

#### **NOTICE**

The vehicle can be damaged during towing.

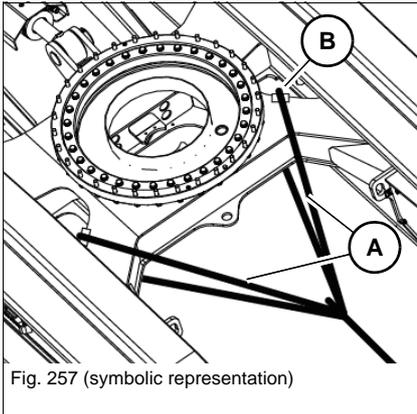
- ▶ Tow the vehicle away only from the immediate danger zone until it can be loaded.
  - ▶ Tow away the vehicle only if the engine is running and if the drive is functional.
  - ▶ Do not tow the vehicle if it is stuck or on a slope. Load the vehicle.
  - ▶ Only tow the vehicle using suitable towing equipment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



#### **Information**

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

---



1. – see chapter “Towing” on page 2-13
2. Ensure that the vehicle can be towed safely.
3. Put a sling **A** around the travel gear as shown in Fig. 257. Use edge guard **B**.
4. Start vehicle travel and tow away slowly.
5. Tow the vehicle only until it reaches a position from where it can be loaded.

### 6.2 Loading the vehicle

---

#### **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 vehicle’s type label.
  - ▶ Tie down the vehicle only at the indicated tie-down points.
  - ▶ Observe the loading weight. Add the weight of subsequently installed accessories to the weight of the vehicle.
-

**Tie-down points**

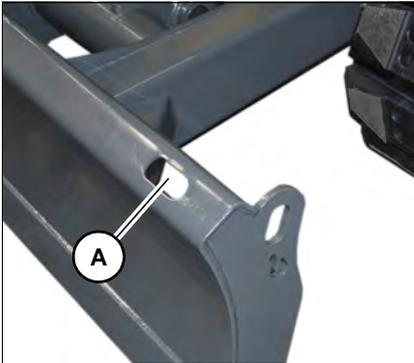


Fig. 258

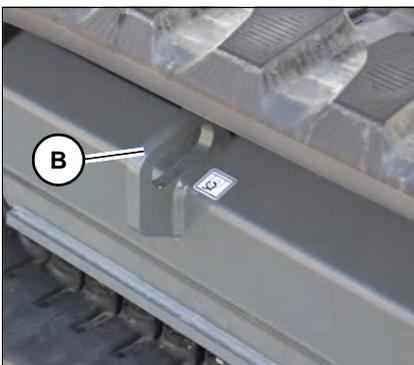


Fig. 259



Fig. 260

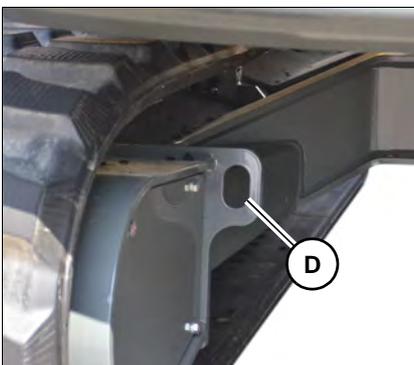


Fig. 261

Position		Quantity
A	Dozer blade <sup>1</sup>	2
B	Front of travel gear	2
C	Rear of travel gear	2
D	Inside of travel gear	2

1. The tie-down hook in the dozer blade can continue to be positioned further below.

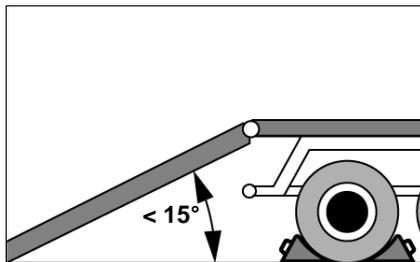


Fig. 262

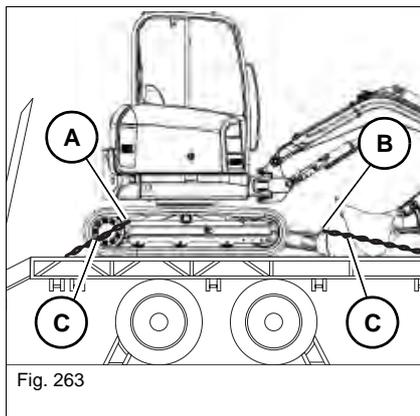


Fig. 263

1. – see chapter “Transportation” on page 2-15
  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 anti-skid 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 drive the vehicle onto the middle of the transport vehicle.
  9. Move the vehicle to transport position:
    - Position the boom straight ahead at the center of the vehicle.
    - 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 vehicle on the loading area with tie-downs **A** and **B** with slings **C** of appropriate size. Observe legal rules and regulations.

## 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 vehicle's type label.
  - ▶ Observe the loading weight. Add the weight of subsequently installed accessories to the weight of the vehicle.
  - ▶ The vehicle may only be raised with suitable lifting gear.
- 

**NOTICE**

Possible damage to the vehicle due to incorrect loading.

- ▶ Bear in mind the transport weight on the vehicle's type label.
  - ▶ Observe the loading weight. Add the weight of subsequently installed accessories to the weight of the vehicle.
  - ▶ The vehicle may only be raised with suitable lifting gear.
-

### Lifting eyes

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

**A:** Left and right lifting eyes on stabilizer blade

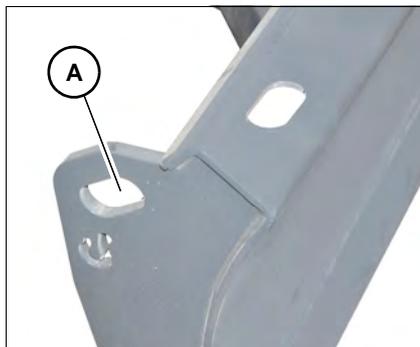


Fig. 264 (symbolic representation)

**B:** boom lifting eye

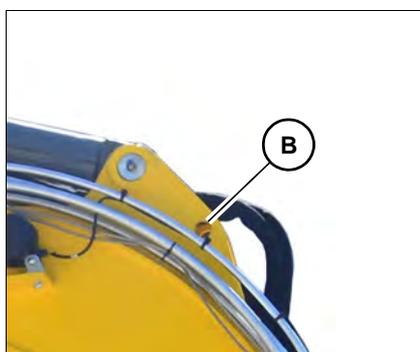


Fig. 265

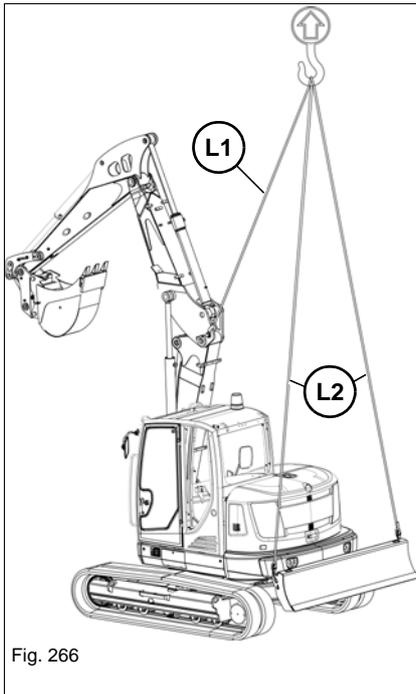


Fig. 266

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

**ET65**

Boom	Length	Dimensions
One-piece boom	<b>L1</b>	3700 mm (12'-2")
	<b>L2</b>	5200 mm (17'-1")
Triple articulation boom	<b>L1</b>	3500 mm (11'-6")
	<b>L2</b>	5200 mm (17'-1")

**EZ80**

Boom	Length	Dimensions
One-piece boom	<b>L1</b>	3225 mm (10'-7")
	<b>L2</b>	5330 mm (17'-6")

**ET90**

Boom	Length	Dimensions
One-piece boom	<b>L1</b>	3500 mm (11'-6")
	<b>L2</b>	6000 mm (19'-8")
Triple articulation boom	<b>L1</b>	3900 mm (12'-10")
	<b>L2</b>	6000 mm (19'-8")

### Loading process

1. Fit an empty bucket and lock it safely.
2. Remove all dirt from the vehicle.
3. Park the vehicle on firm, level, and horizontal ground.
4. Tilt in bucket.
5. Raise the loader unit completely.
6. Pull the stick toward the vehicle.
7. Raise the stabilizer blade completely.
8. Position the boom straight ahead at the center of the vehicle.
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.
17. Slowly raise the vehicle until there is no more contact with the ground.
18. Let the vehicle swing until it comes to rest.
19. If the vehicle balance, and the condition and position of the slings is correct, slowly raise the vehicle to the required height and load it.

### 6.3 Transporting the vehicle

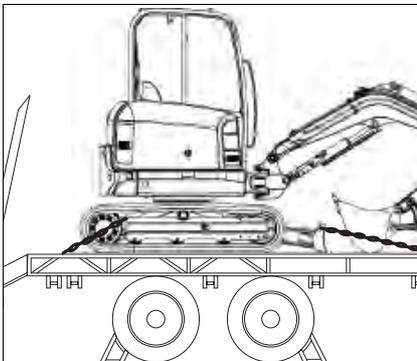


Fig. 267

1. 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.
2. Close the exhaust pipe before transporting the vehicle through wet weather.

---

#### Information

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

---

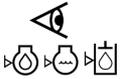
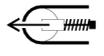
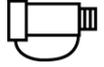
## **7 Maintenance**

### **7.1 Information on maintenance**

- Maintenance and care significantly affect the functionality and service life of the vehicle.
- Daily and weekly maintenance work is to be performed by the driver in accordance with the maintenance plan.
- Maintenance with the note **authorized service center** must be performed only by the trained and qualified personnel of an authorized service center.
- Defective components must be repaired or replaced before putting the vehicle into operation. Safety-relevant components may only be repaired/replaced by an authorized service center.
- Observe all risk indications and safety instructions given 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).
- Attach a warning label to the control elements (for example "**Machine being serviced, do not start**").
- Stop the vehicle (see **Preparing lubrication**).
- In order to avoid damage to electronic components, do not perform welding work on the vehicle, add-on parts or tools.
- Contact a Wacker Neuson service center.



**Maintenance plan**

<b>Daily maintenance (operator)</b>		
<b>Symbol</b>	<b>Inspection work</b> (Check the following fluids and lubricants, check the oil levels after a test run and add oil if necessary)	<b>Page</b>
	Check the fluids and lubricants (engine oil, engine coolant, hydraulic oil)	7-42; 7-45; 7-50
	Check the radiator and hydraulic oil cooler for dirt, clean them if necessary	7-46
	Check the charge-air cooler for dirt, clean it if necessary (ET90/ET65 404F-E22TA)	
	Check the diesel cooler for dirt, clean it if necessary (ET90/ET65 404F-E22TA)	
	Lubricate the vehicle according to the lubrication schedule	7-9
	Check the water separator (pre-filter) and fuel filter on sight glass; drain water if necessary (only ET65/EZ80)	7-36
	Water separator (prefilter) and fuel filter: drain water according to indicating element	
	Check the track tension and retension the tracks if necessary	7-55
	Check the engine air intake	7-47
	Check the pin locks	--
	Check line fixtures	--
	Check the indicator lights and acoustic warning devices	4-36; 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 systems	--
	Safe load indicator: check the acoustic warning system	5-33



Daily maintenance (operator)		
	Hydraulic quickhitch (Easy Lock): check the acoustic warning system	5-41
	Lubricate the Powertilt according to the lubrication schedule	7-14
	Adjust the mirrors correctly, clean them and check them for damage, check the fastening screws and tighten them if necessary	--
--	Clean fresh-air and recirculated-air coarse filters with compressed air (heating, air conditioning)	7-25
Leakage check		
	Check for tightness, leaks and chafing: pipes, flexible lines and screw connections of the following assemblies and components. Repair if necessary	Page
	Engine and hydraulic system	--
	Travel drive	--
	Cooling systems, heating, and hoses (visual check)	--
	Hydraulic quickhitch (Easy Lock) 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	--



<b>Daily maintenance (operator)</b>		
	Check the hydraulic hoses for damage	--
	Check the load hook, joint rod and lifting eyes	--
	Check the hydraulic quickhitch (Easy Lock) for damage	--
	Check the Powertilt for damage	--
<b>Weekly maintenance (every 50 operating hours) (operator)</b>		Page
	Lubricate the vehicle according to the lubrication schedule	<a href="#">7-9</a>
	Check accesses and exits for dirt	--
	Replace the air filter <sup>1</sup>	--
	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 multi-functional 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 multi-functional display. Contact a Wacker Neuson service center.



### 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):

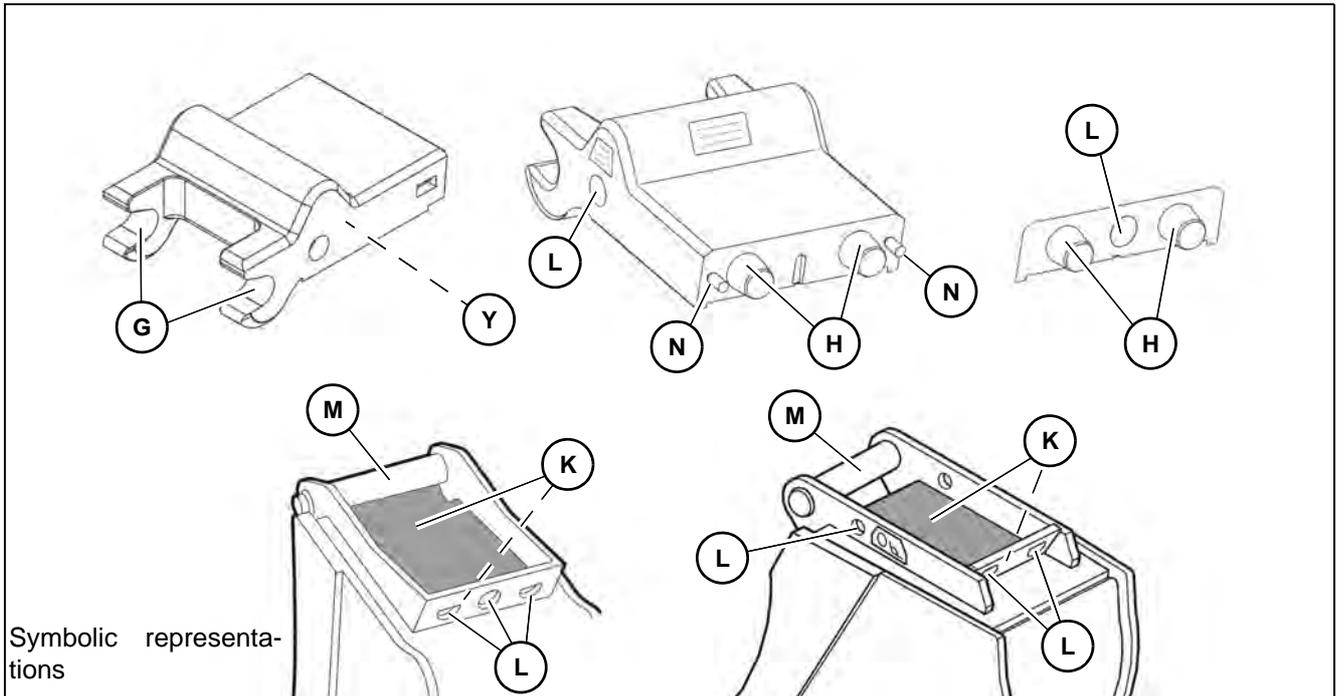
- Every 500 operating hours or annually
- Every 1000 operating hours
- Every 2000 operating hours
- Every 3000 operating hours

For additional details contact a Wacker Neuson service center.



### Information

Maintenance with the note **authorized service center** must be performed only by the trained and qualified personnel of an authorized service center.

**Maintenance schedule of Lehnhoff mechanical quickhitch system**


Quickhitch maintenance MS03/MS08/MS10 (operator)		Interval <sup>1</sup>
Perform visual inspection of the quickhitch system	--	10 hours of operation/daily
Clean bolt guide	G	50 hours of operation/weekly
Clean the bolt contact surface	H	50 hours of operation/weekly
Clean bottom side of the quick coupler system	Y	50 hours of operation/weekly
Clean contact surfaces of the attachment	K	50 hours of operation/weekly
Clean the opening for the socket wrench and bores of the attachment support	L	50 hours of operation/weekly
Clean bolt attachment support	M	50 hours of operation/weekly
Clean centering pins (only MS10)	N	50 hours of operation/weekly

1. For time specifications: the first achieved time specification is decisive. If the situation requires it, perform maintenance if necessary, even if the maintenance interval has not yet been reached.

**Other maintenance intervals (Wacker Neuson service center):**

- Every 250 operating hours or semi-annually (MS03)
- Every 500 operating hours or annually (MS03)
- Every 500 operating hours or semi-annually (MS08/MS10)
- Every 1000 operating hours or annually (MS08/MS10)

For additional details contact a Wacker Neuson service center.

## Permissible Bolt Settings Lehnhoff MSWS

The bolt settings can differ, depending on the condition of the quickhitch and attachment receptacle.

Maximum permissible bolt settings:

Quickhitch	X (inwards) mm (in)	Z (outwards) mm (in)
MS 03	0 (0)	6 (15/64)
MS 08	4 (5/32)	4 (5/32)

Y: outer edge of the attachment support

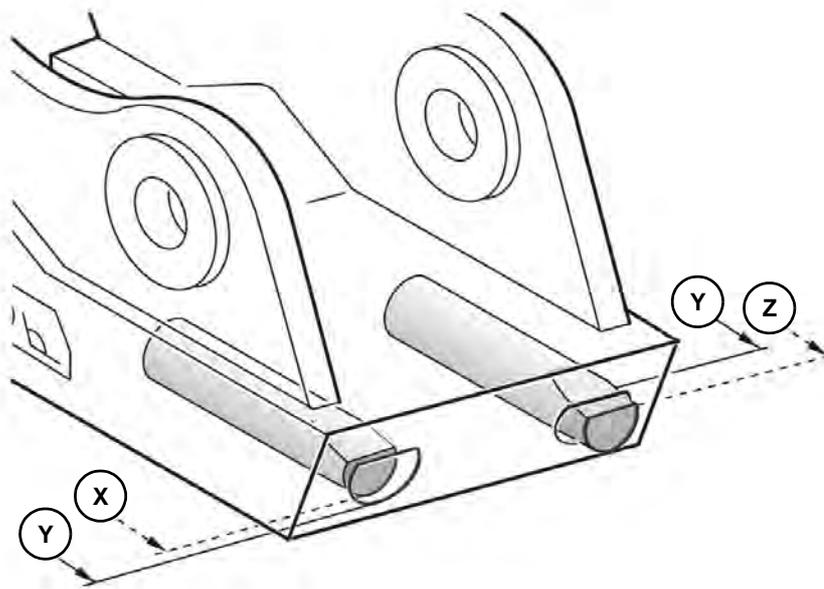


Fig. 269 Symbolic representation

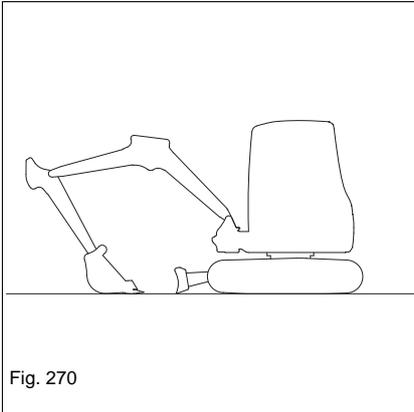
### **i** Information

In the case of deviating bolt settings, do not operate the mechanical quickhitch; contact an authorized service center. Check the bolt settings on a monthly basis.

### **i** Information

The indicated bolt settings only apply to the attachments presented in this Operator's Manual. (System Lehnhoff MSWS).

## Preparing lubrication



1. Stop the vehicle on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the vehicle.
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.

One-piece boom

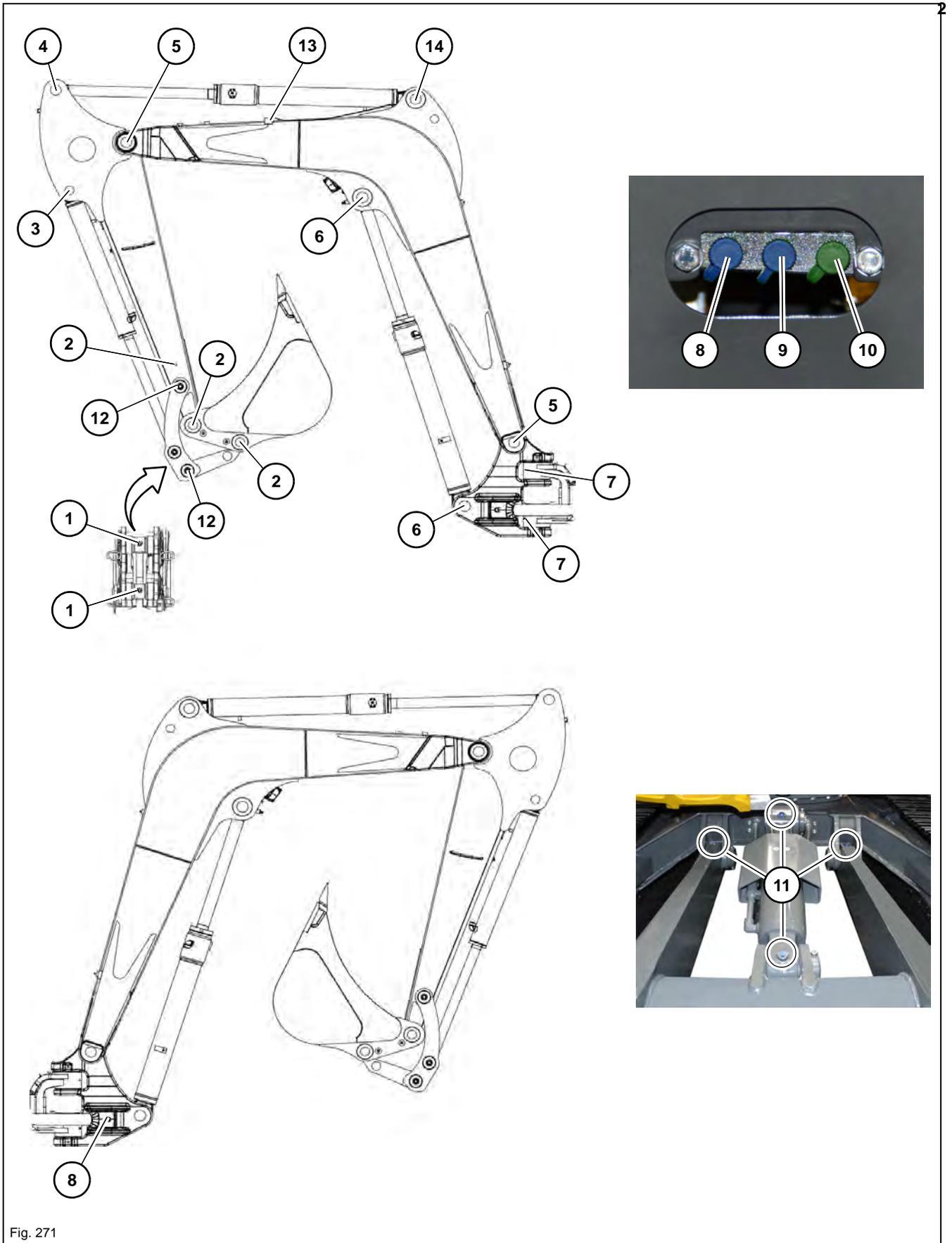


Fig. 271



Position	Lubrication point <sup>1</sup>	Interval	Quantity
1	3-pin pivot plate	Daily	2
2	Shovel arm	Daily	3
3	Bucket cylinder	Daily	1
4	Stick cylinder	Daily	1
5	Boom	Daily	2
6	Boom cylinder	Daily	2
7	Swiveling console	Daily	2
8	Swiveling cylinder	Daily	2
9	Live ring teeth (authorized service center)		1
10	Live ring (ball bearing) – see chapter “Live ring (ball bearing)” on page 7-15	Daily	1
11	Stabilizer blade	Daily	4
12	Stick (EZ80)	Daily	2
13	Stick cylinder (ET65)	Daily	1
14	Stick cylinder (EZ80, ET90)	Daily	1

1. Lubrication on the pins or directly on the cylinders

Triple boom (option ET65/ET90)

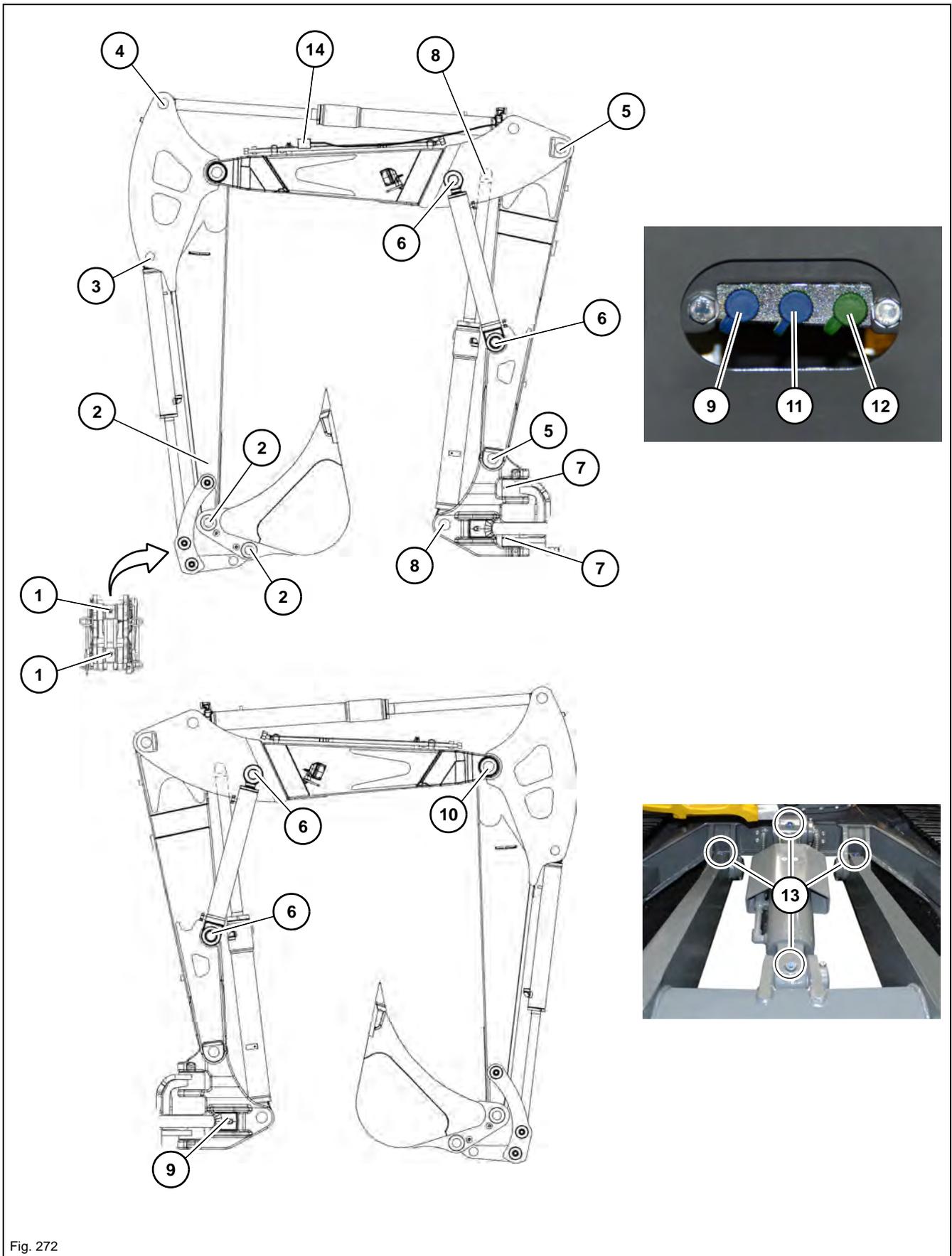


Fig. 272



<b>Position</b>	<b>Lubrication point</b>	<b>Interval</b>	<b>Quantity</b>
1	3-pin pivot plate	Daily	2
2	Shovel arm	Daily	3
3	Bucket cylinder	Daily	1
4	Stick cylinder	Daily	2
5	Boom	Daily	2
6	Triple articulation boom cylinder	Daily	4
7	Swiveling console	Daily	2
8	Boom cylinder	Daily	2
9	Swiveling cylinder	Daily	2
10	Triple articulation boom	Daily	1
11	Live ring teeth (authorized service center)		1
12	Live ring (ball bearing) – see chapter “Live ring (ball bearing)” on page 7-15	Daily	1
13	Stabilizer blade	Daily	4
14	Remote lubrication point stick cylinder	Daily	1

Cabin/attachment mounts

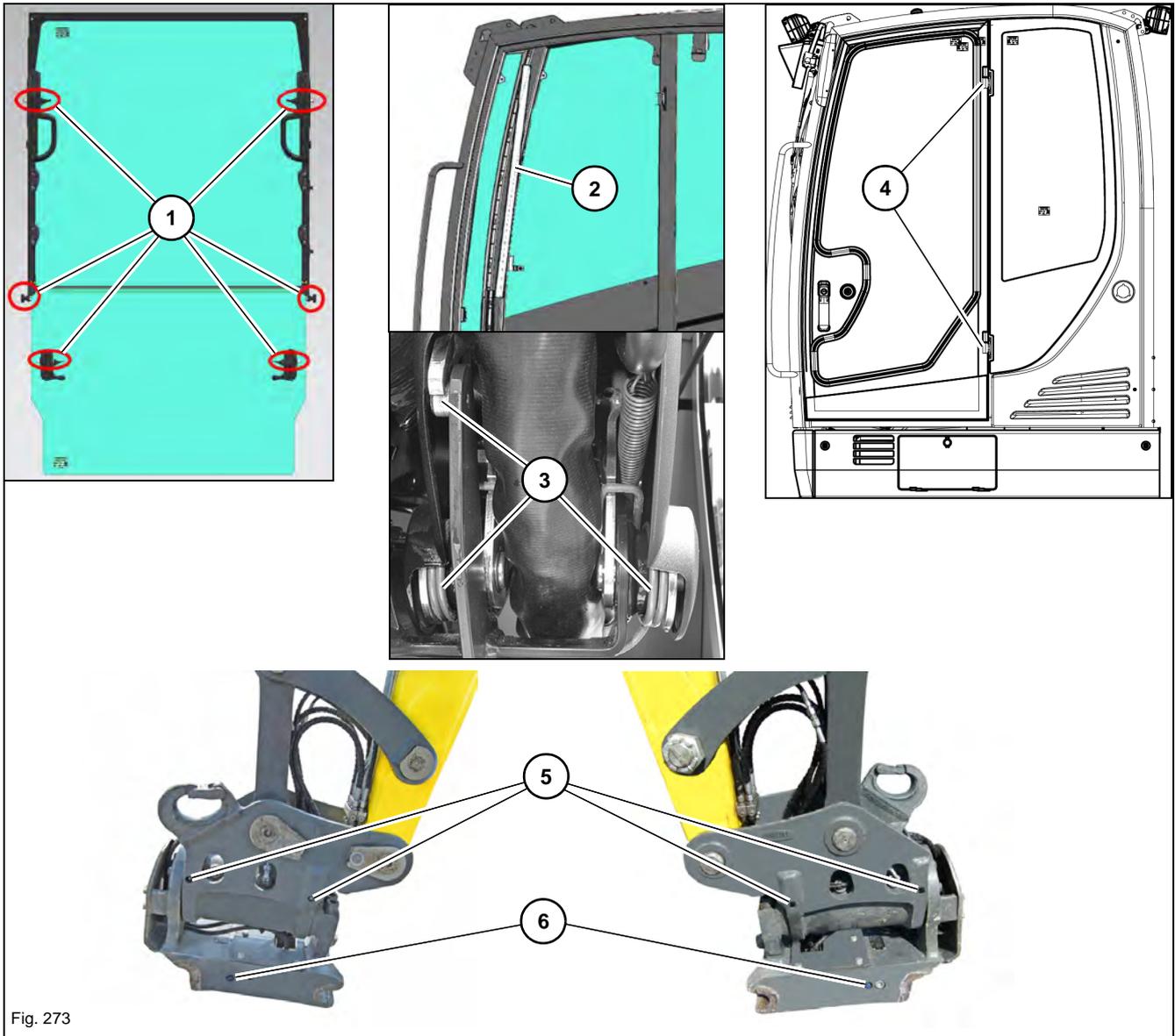


Fig. 273

Position	Lubrication point	Interval	Quantity
1	Front window: pin, lock notches and locks	Every week	6
2	Windshield: guide rails	Every week	2
3	Control lever base – see chapter “Control lever base” on page 7-16	Every week	3
4	Door hinges	Every week	2
5	Powerlift (option)	Daily	4 <sup>1</sup>
6	Hydraulic quickhitch (option)	Once a day/once a week	2 <sup>1</sup>

1. Apply grease to grease zerks twice daily after operation in water to remove all traces of water.

**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.

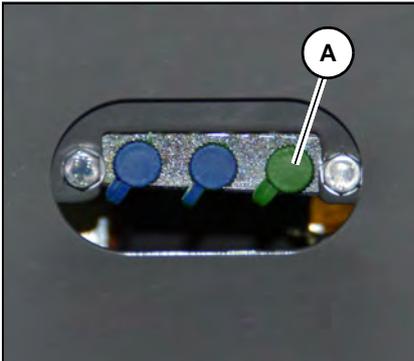


Fig. 274

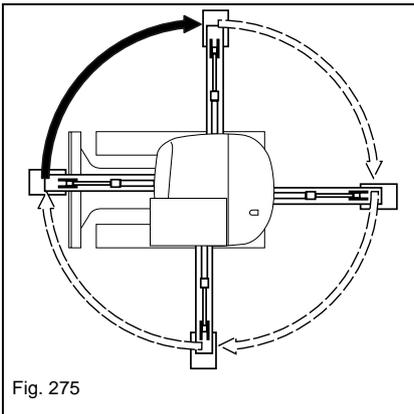


Fig. 275

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

1. Park the vehicle on firm, level, and horizontal ground.
  2. Lower the boom and the stabilizer blade to the ground.
  3. Stop the engine, remove the starting key and carry it with you.
  4. Apply grease to lubrication point **A** with two strokes of the grease gun.
- 
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 revolving upper carriage is back in its initial position.
  8. Rotate the upper carriage several times by 360°.

## Control lever base

---

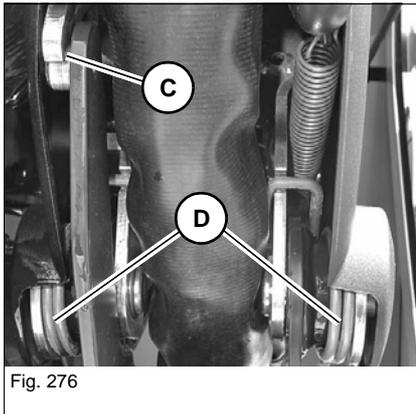
**!** **CAUTION**

**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.

---



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 Easy Lock – 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.

## 7.3 Fluids and lubricants

### Fuel, lubricants and coolants ET65/EZ80

Application	Fluid/lubricant	Specification	Season/temperature	Capacities <sup>1</sup>
Engine	Diesel fuel <sup>2</sup>	ASTM D975 grade 2D S15 (USA) <sup>3</sup>	Year-round <sup>4</sup>	85 liters (22.5 gal)
		EN 590 (EU) <sup>5</sup>		
		BS 2869:2010 class A2 (GB) <sup>6</sup>		
	Coolant	Distilled water and ASTM D6210	Year-round	10.5 l (2.8 gal) <sup>7</sup>
Engine (Tier III)	Engine oil <sup>8</sup>	API CH-4; ACEA E5; EMA-DHD-1	-15 °C (+5 °F)	8.9 liters (2.4 gal)
Engine (Tier IV)		API CJ-4; ACEA E9; ECF-3	+45 °C (+113 °F)	8.6 liters (2.3 gal)
Hydraulic oil reservoir	Hydraulic oil	Eurolub HVLP 46 <sup>9</sup>	Year-round <sup>10</sup>	92 liters (24.3 gal)
	Biodegradable hydraulic oil <sup>11</sup>	Panolin HLP Synth 46		
		BP Biohyd SE-S 46		
Washer system	Cleaning agent	Glass cleaner and anti-freeze	Year-round	1 liters (0.3 gal)
Grease zerks	Grease	KPF 2 K-20 <sup>12</sup> ISO-L-X-BCEB 2 <sup>13</sup>	Year-round	As required
Battery terminals	Acid-proof grease <sup>14</sup>	FINA Marson L2	Year-round	As required
Control lever base	Adhesive fluid grease	Förch S401	Year-round	As required

- The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level.  
Capacities indicated are no system fills
- In regions without exhaust gas regulations the Tier III engine may be operated with a sulfur content of up to 0.4 % (= 4000 ppm).
- Sulfur content up to 0.0015 % (= 15 ppm)
- Summer or winter diesel depending on outside temperatures
- Sulfur content up to 0.0010 % (= 10 ppm)
- Sulfur content up to 0.0010 % (= 10 ppm)
- System fills incl. hoses and diesel engine
- According to DIN 51511 (API CJ-4, ACEA E9, ECF-3) – see chapter "Engine oil types (ET65 Tier III/EZ80 Tier III)" on page 7-21
- According to DIN 51524 section 3, ISO-VG 46
- Depending on local conditions – see chapter "Hydraulic oil types" on page 7-19
- Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES
- KPF 2 K-20 according to DIN 51502 lithium-saponified grease
- ISO-L-X-BCEB 2 according to DIN ISO 6743-9, lithium-saponified grease
- Standard acid-proof grease NGLI category 2



## Fluids and lubricants ET90

Application	Fluid/lubricant	Specification	Season/temperature	Capacities <sup>1</sup>
Engine	Diesel fuel	EN 590 (EU) <sup>2</sup>	Year-round <sup>3</sup>	85 liters (22.5 gal)
		ASTM D975 grade 1D S15 (USA) <sup>4</sup>		
		ASTM D975 grade 2D S15 (USA) <sup>4</sup>		
	Coolant <sup>5</sup>	Variant 1: De-stilled water and Eurolub D-48 Extra (blue) <sup>6</sup>	Year-round	11 l (4 gal) <sup>7</sup>
Variant 2: De-stilled water and Fuchs Maintain Fricofin -35 (green) <sup>8</sup>				
Engine oil <sup>9</sup>	API CJ-4; ACEA E9; ECF-3	-15 °C (+5 °F) +45 °C (+113 °F)	7.5 Liters (2 gal)	
Hydraulic oil reservoir	Hydraulic oil	Eurolub HVLP 46 <sup>10</sup>	Year-round <sup>11</sup>	92 liters (24.3 gal)
	Biodegradable hydraulic oil <sup>12</sup>	Panolin HLP Synth 46		
		BP Biohyd SE-S 46		
Washer system	Cleaning agent	Glass cleaner and anti-freeze	Year-round	1 liters (0.3 gal)
Grease zerks	Grease	KPF 2 K-20 <sup>13</sup> ISO-L-X-BCEB 2 <sup>14</sup>	Year-round	As required
Battery terminals	Acid-proof grease <sup>15</sup>	FINA Marson L2	Year-round	As required
Control lever base	Adhesive fluid grease	Förch S401	Year-round	As required

- The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level.  
Capacities indicated are no system fills
- Sulfur content up to 0.001 % (= 10 ppm)
- Summer or winter diesel depending on outside temperatures
- Sulfur content up to 0.0015 % (= 15 ppm)
- Factory filling. Coolant in accordance with Norm Deutz DQC CA-14. The coolants should not be mixed.
- Up to serial number WNCE1404LPAL00771
- System fills incl. hoses and diesel engine
- From serial no. WNCE1404HPAL00772
- According to DIN 51511 (API CJ-4, ACEA E9, ECF-3) – see chapter “Engine oil types (ET65 Tier III/EZ80 Tier III)” on page 7-21
- According to DIN 51524 section 3, ISO-VG 46
- Depending on local conditions – see chapter “Engine oil types (ET65 Tier III/EZ80 Tier III)” on page 7-21
- Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES
- KPF 2 K-20 according to DIN 51502 lithium-saponified grease
- ISO-L-X-BCEB 2 according to DIN ISO 6743-9, lithium-saponified grease
- Standard acid-proof grease NGLI category 2



## Hydraulic oil types

Viscosity class	Ambient temperature			
	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

### 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 o/h	



### **Important information regarding operation with biodegradable hydraulic oil**

- Use only the biodegradable oils that have been tested and released by Wacker Neuson.
- Add only biodegradable oil of the same type. In order to avoid misunderstandings, attach a clear label to the hydraulic oil filler neck 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 biodegradable oil complies with the national and regional regulations as you replace it. 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 vehicle 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.
- Subsequent change from mineral oil to biodegradable oil may only be performed by a Wacker Neuson service center.

**Engine oil types (ET65 Tier III/EZ80 Tier III)**

Viscosity grade (SAE)	Ambient temperature			
	min. °C	min. °F	max. °C	max. °F
0W20	-40	-40	10	50
0W30	-40	-40	30	86
0W40	-40	-40	40	104
5W30	-30	-22	30	86
5W40	-30	-22	40	104
10W30	-20	-4	40	104
15W40	-10	14	50	122

**Engine oil types ET65 (Tier IV)**

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

**Engine oil types ET90**

Viscosity grade (SAE)	Ambient temperature			
	min. °C	min. °F	max. °C	max. °F
0W30	-35	-31	30	86
0W40	-35	-31	40	104
5W30	-30	-22	30	86
5W40	-30	-22	40	104
10W30	-15	5	30	86
10W40	-15	5	40	104
15W40	-15	5	40	104
20W50	-5	23	>40	>104



### 7.4 Maintenance accesses

---

 **WARNING**

**Injury hazard due to rotating parts!**

Rotating parts can cause serious injury or death.

- ▶ Open the engine cover only at engine standstill.
- 

 **CAUTION**

**Burn hazard due to hot surfaces!**

Can cause serious burns or death.

- ▶ Stop the engine and let hot surfaces cool down.
  - ▶ Wear protective equipment.
- 

 **CAUTION**

**Injury hazard due to open maintenance access!**

Can cause injury.

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

## Opening the engine cover

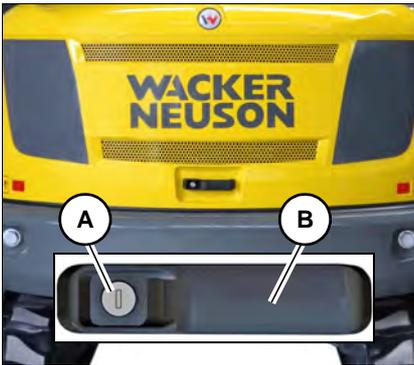


Fig. 277

1. Stop and park the vehicle. Stop the engine.  
- See “**Preparing lubrication**”.
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 with lock **C** (item 1).

## Close the engine cover

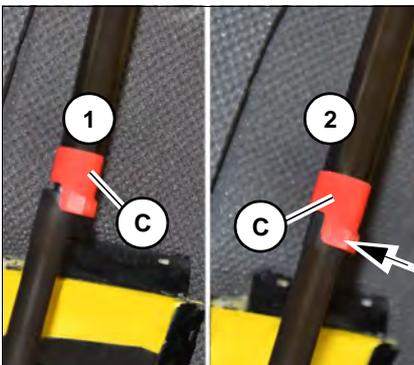


Fig. 278

1. Release lock **C** by applying slight pressure (position **2**).
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.

### Opening the valve cover

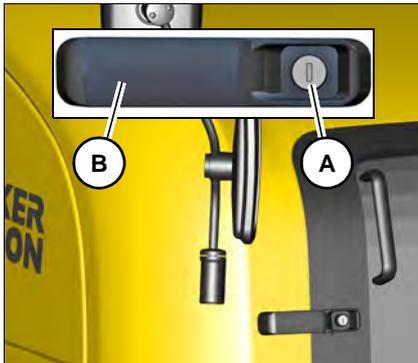


Fig. 279

1. Stop and park the vehicle. Stop the engine.
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

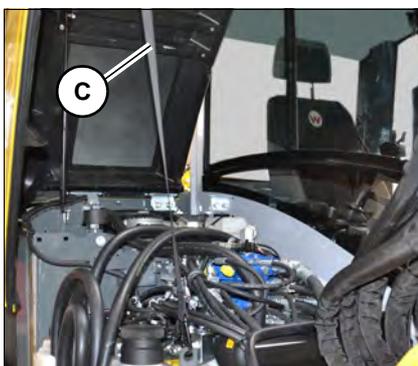


Fig. 280

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 9-6

## Maintenance flap

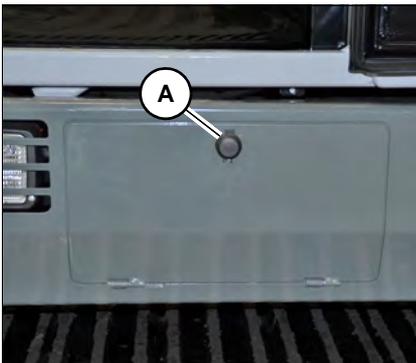


Fig. 281

The service flap is located at the left on the upper carriage. It contains:

- On-board tools
- Prop (for Wacker Neuson service center only)

### Unlocking:

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

### Locking:

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

## Cabin air filter

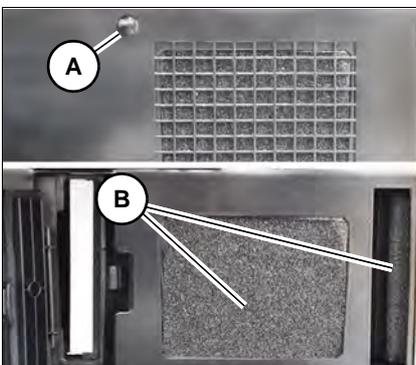


Fig. 282

1. Remove screw **A** and the cover.
2. Clean coarse filter **B** with compressed air daily.
3. Reinstall the cover and fasten it with screw **A**.



### 7.5 Cleaning and maintenance

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---

 **WARNING**

**Injury hazard due to rotating parts!**

Rotating parts can cause serious injury or death.

- ▶ Open the engine cover only at engine standstill.
- 

---

 **WARNING**

**Burn 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 vehicle only in wash bays and places authorized by the authorities.

---



Cleaning the vehicle is divided into three separate areas:

- Inside the cabin
- Exterior of the vehicle
- 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, connector plug at the wiring harness).
  - Control devices and seals.
  - Air intake filters, etc.

### **Volatile and easily flammable anti-corrosion 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

## **On the outside of the vehicle**

Recommended aids:

- High-pressure cleaner
- Steam jet

## **Engine compartment**

1. Park the vehicle in a wash bay or place suitable for washing.
2. Stop the engine. See **"Preparing lubrication"**.
3. Clean the vehicle.

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

## **Loose threaded fittings and attachments**

Contact a Wacker Neuson service center.



### 7.6 Lubrication work

– see chapter “Preparing lubrication” on page 7-9

### 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 **fluids and lubricants** list.
- ▶ Do not use any diesel fuel with additives.

– see “Fluids and lubricants” on page 7-17

## 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.
  - ▶ Do not add gasoline to diesel fuel.
-

---

**!** **CAUTION**
**Slipping/tripping hazard when refueling the vehicle!**

Can cause injury.

- ▶ Use safety-oriented ladders for refueling the vehicle.
  - ▶ Do not use vehicle parts or attachments as a climbing aid.
- 

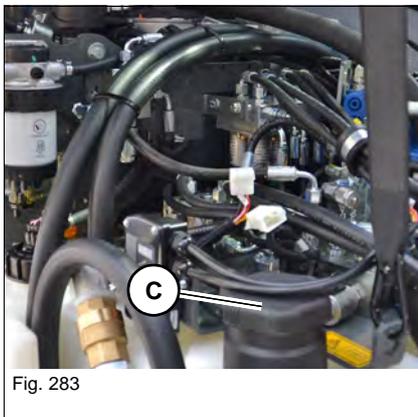
**NOTICE**

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

---

**Refueling with a stationary fuel pump**

The fuel tank is located under the valve cover.



1. Stop the vehicle on firm, level, and horizontal ground.
  2. Position the boom straight ahead at the center of the vehicle.
  3. Lower the boom.
  4. Stop the engine.
  5. Raise the control lever base.
  6. Open tank lock **C** carefully to release the pressure in the fuel tank.
  7. Refuel the vehicle.
  8. Close the tank lock **C**.
- 

**NOTICE**

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 an integral microfilter.
- Keep all refueling containers clean.

## Refueling with a fuel-filling pump (option)

### CAUTION

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

Can cause injury.

- ▶ Keep body parts away from tank hoses.

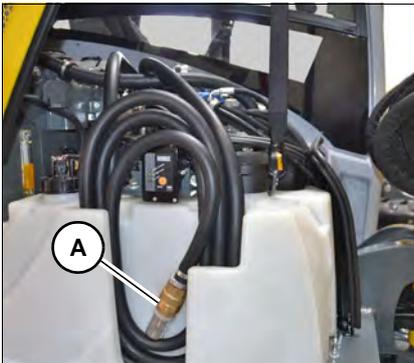


Fig. 284 (Version 1)



Fig. 285 (Version 2)

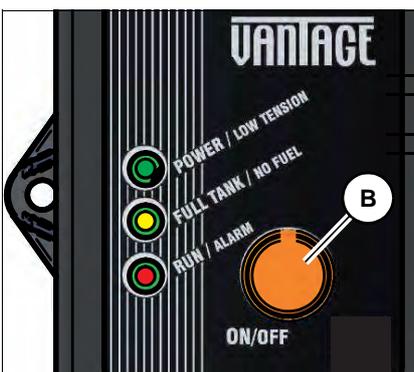


Fig. 286

### Refueling procedure

1. Stop the vehicle on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the vehicle.
3. Lower the boom.
4. Stop the engine.
5. Raise the control lever base.
6. Open tank lock **C** carefully to release the pressure in the fuel tank
7. Turn the starting key to position **1**.

8. Put hose **A** in the fuel tank.
9. Switch on the fuel-filling pump with push button **B**.
  - 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.
10. Switch off the fuel-filling pump with push button **B**.
11. Stow away hose **A**.
12. Close the tank lock **C**.

### Information

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


**Fuel-filling pump status indicators**

LED			Status
Green	Yellow	Red	
<b>POWER</b>	<b>FULL TANK</b>	<b>RUN</b>	
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 **B** 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.



### **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 an integral microfilter.
- Keep all refueling containers clean.

## Fuel filter

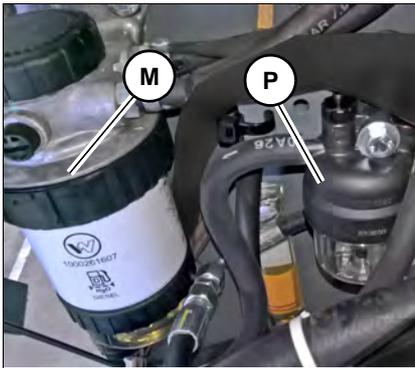


Fig. 287

### ET65/EZ80

The fuel prefilter **P** and fuel main filter **M** are located under the rocker cover. Both are equipped with a water separator.

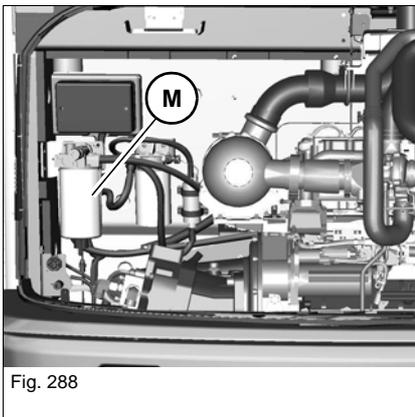


Fig. 288

### ET90

The fuel main filter is located to the left in the engine compartment. It is equipped with a water separator.

## Emptying the water separator (prefilter) (404F-E22TA)

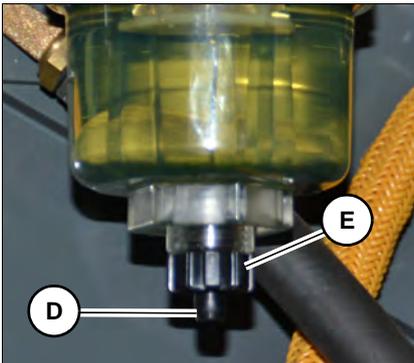


Fig. 289 (symbolic representation)

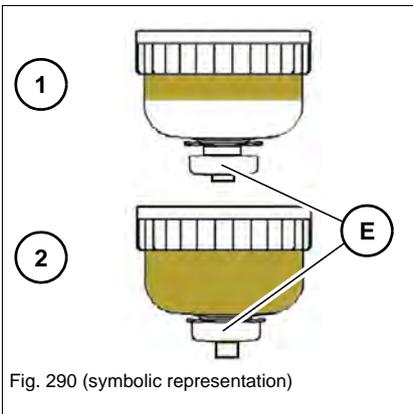


Fig. 290 (symbolic representation)

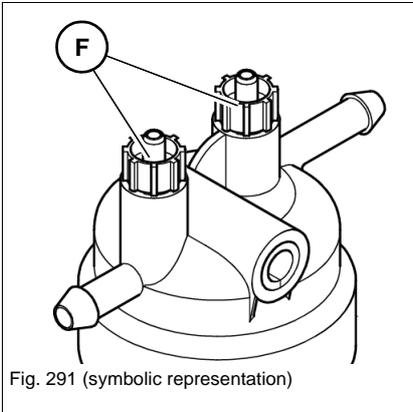


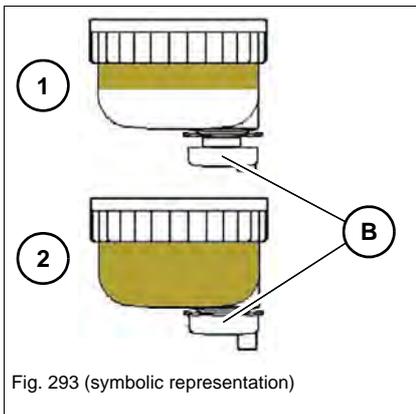
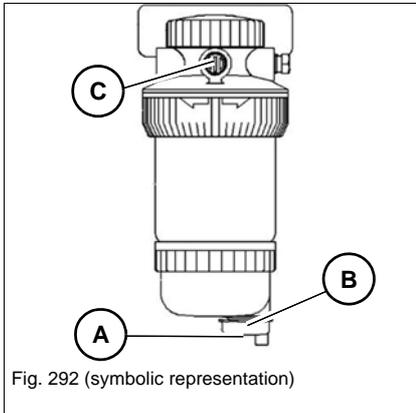
Fig. 291 (symbolic representation)

1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
2. Prepare a suitable container for collecting the fuel/water mixture.
3. Open the valve cover.
4. Connect a suitable hose to the drain device **D**.
5. Open drain valve **E**.
6. Vent screws **F**.
7. Drain the fuel/water mixture into a receptacle (1).
8. Tighten vent screws **F**.
9. Close drain valve **E** if nothing but fuel is visible in the sight glass (2).
10. Remove the hose.
11. Close and lock the valve cover.

## Empty water separator (main filter) (ET65/EZ80)

### Information

Empty the water separator if the error message SPN 97 appears on the multi-functional display.



1. Stop and park the vehicle. Stop the engine. See “**Preparing lubrication**”.
2. Prepare a suitable container for collecting the fuel/water mixture.
3. Open the valve cover.
4. Connect a suitable hose to the drain device **A**.
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 valve cover.

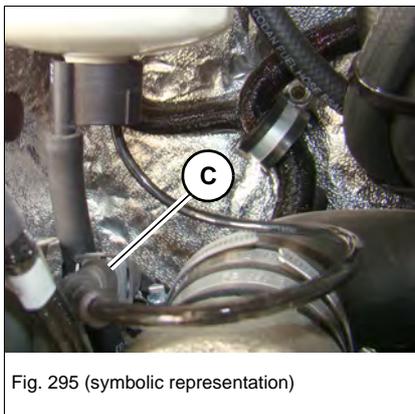
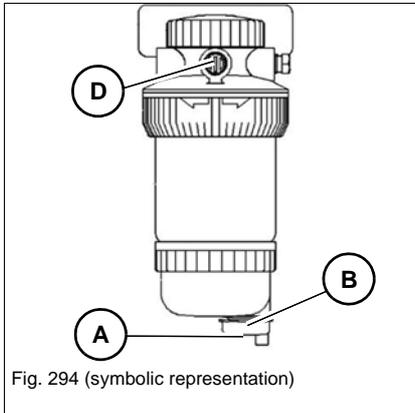
### Environment

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

## Empty water separator (main filter) (ET90)

### Information

Empty the water separator if the error message SPN 97 appears on the multi-functional display.



1. Stop and park the vehicle. Stop the engine. See “**Preparing lubrication**”.
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**.
5. Disconnect electrical connection **C**.
6. Remove the vent screw **D**.
7. Open drain valve **B**.
8. Drain the fuel/water mixture into a receptacle.
9. Close drain valve **B** if nothing but fuel is flowing into the receptacle.
10. Tighten the vent screw **D**.
11. Establish the electrical connection **C**.
12. Remove the hose.
13. 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.

### 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 vehicle is put into operation after having been out of operation for more than 30 days.

#### **Bleed:**

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. Turn the starting key to the first position.
5. Wait about 5 minutes while the fuel system bleeds itself automatically.
6. Start the engine.

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

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

## 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** list.
  - ▶ 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.

---

## Checking the engine oil level

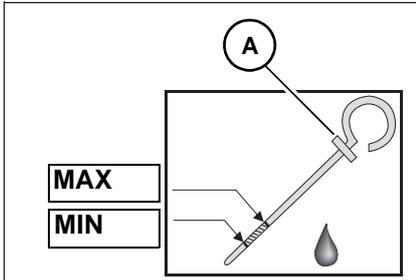


Fig. 296

1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
2. Open the engine cover.
3. Wipe the area around oil dipstick **A** with a lint-free cloth.

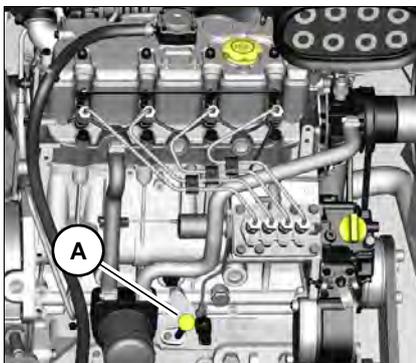


Fig. 297 ET65/EZ80

4. Pull out oil dipstick **A** and wipe it with a lint-free cloth.
5. Slide in oil dipstick **A** completely.
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.

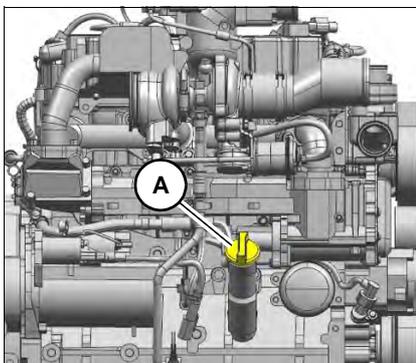


Fig. 298 ET90

## Adding engine oil

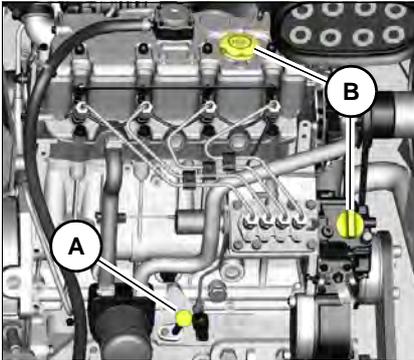


Fig. 299 ET65/EZ80

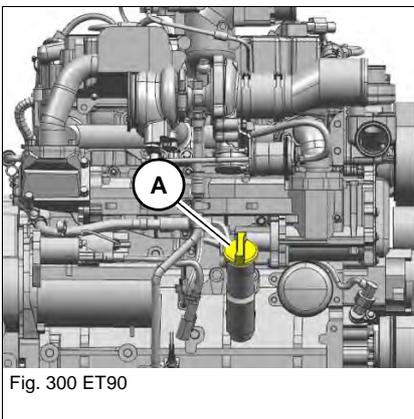


Fig. 300 ET90

1. Stop and park the vehicle. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Wipe the area around the sealing push-in 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 at least 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.



### **Environment**

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

## 7.9 Cooling system

### Important information regarding the cooling system

The radiators are located on the right in the engine compartment.

---

 **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 engine/vehicle fluid table or coolant compound table.
-

---

**NOTICE**

Possible engine damage due to low coolant level.

- ▶ Check the coolant level once a day.
- 

**i** **Information**

Check the coolant level once a day before starting the engine.  
Observe the coolant compound table

---

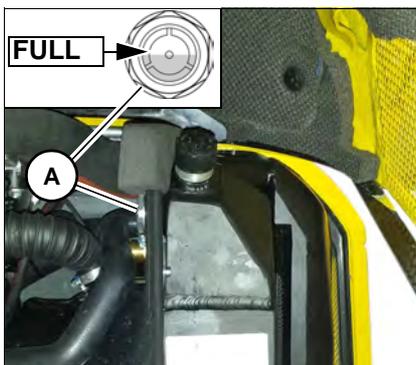
**Checking the coolant level**


Fig. 301

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

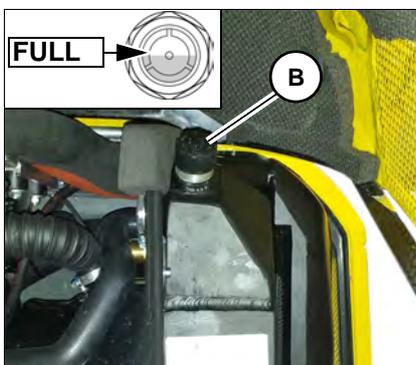
**Adding coolant**


Fig. 302

1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
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.

**i** **Information**

Top off the coolant:

The flow rate for the coolant may be a maximum of 5 liters/min (1.3 gal/min) (404F-E22TA).

---

## 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 engine damage or damage to the hydraulic system from dirty radiator fins.

- ▶ 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.
- 



Radiators **A** are located on the right in the engine compartment.

1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
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.

## 7.10 Air filter

### Checking the air intake

Have maintenance performed only by a Wacker Neuson service center.

#### **NOTICE**

Possible engine damage due to intake of dirty air.

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

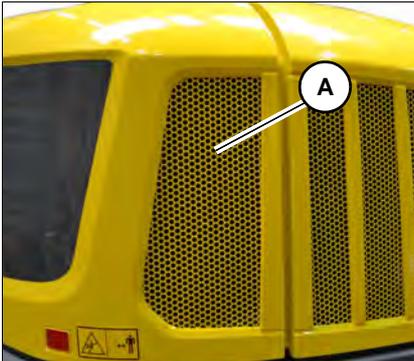


Fig. 304

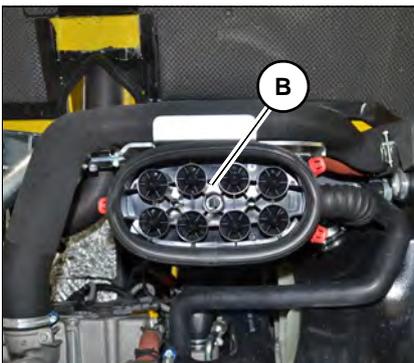


Fig. 305

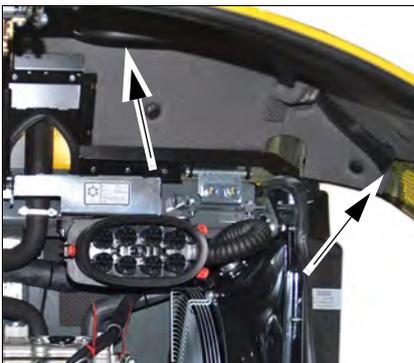


Fig. 306 (symbolic representation)

1. Stop and park the vehicle. Stop the engine. See "Preparing lubrication".
2. Remove the starting key and carry it with you.
3. Check and if necessary clean ventilation grill **A**.

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

6. Check and if necessary clean air duct.
7. Close and lock the engine cover.

#### **Information**

The air duct is located laterally or in the rear depending on the engine version.



### 7.11 V-belt

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

### 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 vehicle with leaking or damaged hydraulic system components.
  - ▶ Open the breather filter carefully to slowly release the pressure inside the reservoir.
  - ▶ Wear protective equipment. If hydraulic oil contacts the eye flush immediately with clean water and seek medical treatment.
  - ▶ Malfunctioning or leaking screw connections, hose connections and pressure lines must be immediately repaired by a Wacker Neuson service center. Search for hydraulic leaks with a piece of cardboard.
  - ▶ Always consult a doctor immediately, even if the wound seems insignificant. Hydraulic oil causes blood poisoning.
-



---

**NOTICE**

Damage due to wrong hydraulic oil.

- ▶ Only use hydraulic oil according to the **fluids and lubricants** list.
  - ▶ Have the hydraulic oil only changed by an authorized 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.
- 

---

**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.
  - ▶ Contact an authorized service center if the filter of the hydraulic system is dirty..
-

## Checking the hydraulic oil level

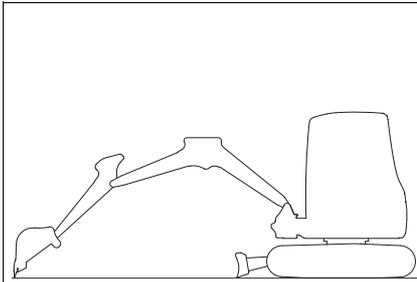


Fig. 307 (symbolic representation)

1. Park the vehicle on firm, level, and horizontal ground.
2. Position the boom straight ahead at the center of the vehicle (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.

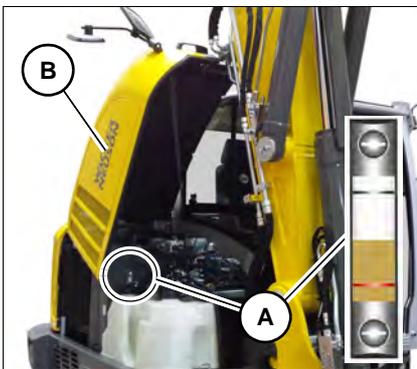


Fig. 308

7. Sight glass **A** is located underneath valve cover **B**.
8. Check the oil level on sight glass **A**.
  - If the engine is warm, the oil level must be approximately at the middle of sight glass **A**.
9. Add hydraulic oil if the oil level is below this mark.

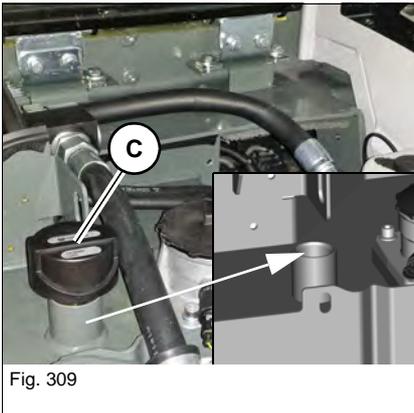
## Adding hydraulic oil

---

 **CAUTION****Slipping/tripping hazard when adding hydraulic oil!**

Can cause injury.

- ▶ Use a safety-oriented ladder to add hydraulic oil.
- ▶ Do not use vehicle parts or attachments as a climbing aid.



1. Open valve cover **B**.
2. Open breather filter **C** slowly to release the pressure inside the hydraulic oil reservoir.
3. Remove breather filter **C**.
4. Add hydraulic oil up to the corresponding mark.
5. Check the hydraulic oil level on sight glass **A**.
6. Add if necessary and check again.
7. Screw in breather filter **C** tightly.
8. Close and lock valve cover **B**.

**Environment**

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

---

### Checking the hydraulic system 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 vehicle 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 vehicle with leaking or damaged hydraulic system components.
- Re-tighten leaking screw connections 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 screw connections, 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 medicine in your country. Also observe DIN 20 066, TI. 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.

## 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 parts of the electrical system must be replaced by an authorized 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.

---

## Fuses and relays

– see chapter “9.8 Electrical system” on page 9-6

## 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

### Checking/changing the cabin air filter

Have maintenance performed only by a Wacker Neuson service center.

## 7.15 Washer system

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

### Checking the fluid level and adding fluid

---

#### CAUTION

##### Burn hazard due to hot surfaces!

Can cause serious burns or death.

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

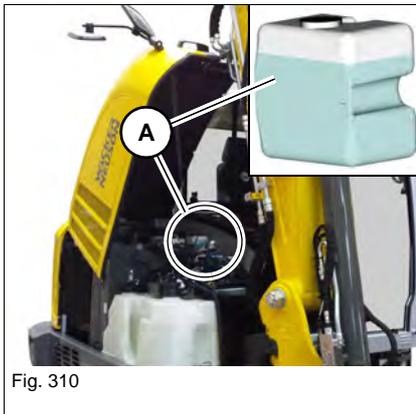


Fig. 310

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

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

## 7.18 Tracks

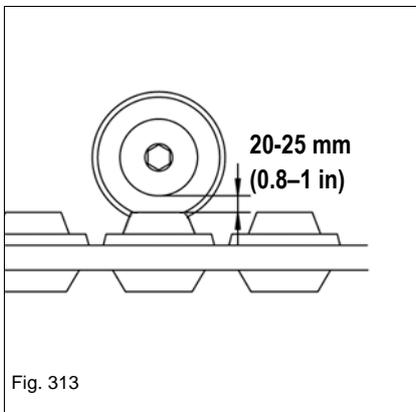
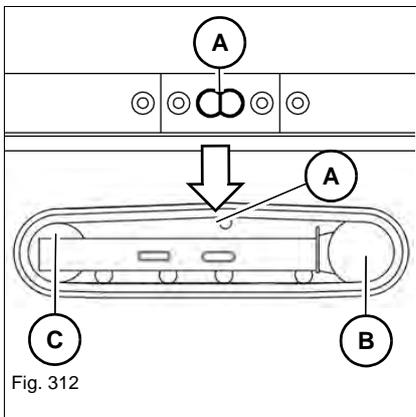
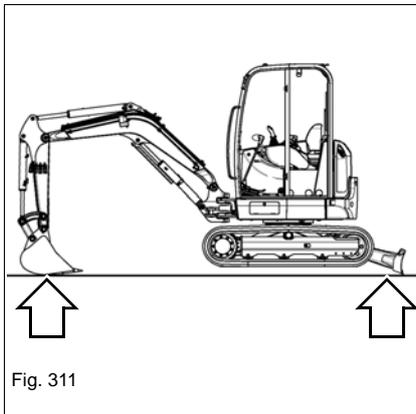
### **WARNING**

#### **Crushing hazard during work under the vehicle!**

Working under the tracks can cause serious injury or death.

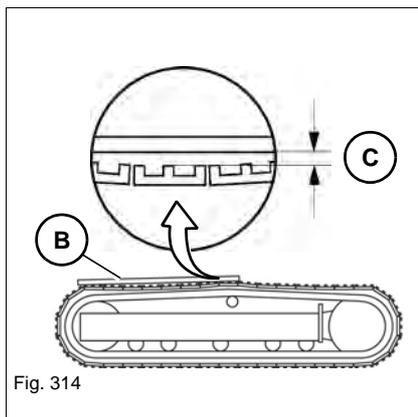
- ▶ Do not allow anyone to stay in the danger zone.

### Checking track tension



#### Rubber tracks

1. Park the vehicle on firm, level, and horizontal ground.
2. Raise the vehicle evenly and horizontally by means of the boom and stabilizer blade.
3. Place the tracks so that mark **A** is in the middle between drive pinion **B** and track tension roller **C**.
4. Stop the engine.
5. 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. Adjust the track tension if the play between the track roller and the track is not 20 – 25 mm (0.8 – 1 in).



### Correcting track tension

#### Steel or hybrid tracks (option)

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

- Adjust the track tension if play **C** between the track roller and the track is not 20 – 30 mm (0.8 – 1.2 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 over-tightening.

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

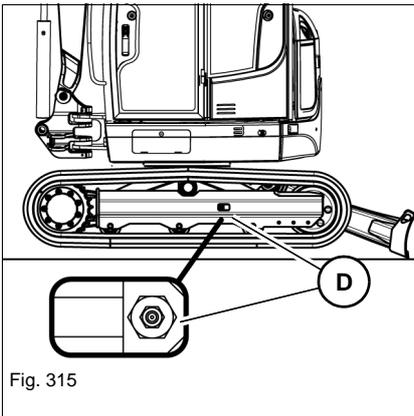


Fig. 315

### Tightening the tracks

1. Park the vehicle on firm, level, and horizontal ground.
2. Raise the vehicle 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 **D**.
6. Start the engine.
7. Lower the vehicle to the ground.
8. In order to check that the tension is correct:
  - Let it run at idling speed without any load
  - Slowly move the vehicle forward and reverse and switch it off again.
9. Check the track tension again.
  - ➔ If it is not correct:
10. Repeat steps 2–9. Contact a Wacker Neuson service center if track tension still is too low after pumping in more grease.

### Reducing tension

1. Place a suitable container underneath to collect the grease.
2. Slowly turn lubricating valve **D** a maximum of one revolution anticlockwise to release the grease.
  - ➔ The grease flows out of the groove of the lubricating valve.
3. Re-tighten lubricating valve **D**.
4. In order to check that the tension is correct:
  - Lower the vehicle to the ground,
  - Start the engine,
  - Let it run at idling speed without any load, then slowly move the vehicle forward and reverse, then turn it off again. Raise the vehicle again by means of the boom and stabilizer blade.
5. Check the track tension again.
  - ➔ If it is not correct:
6. Adjust again.

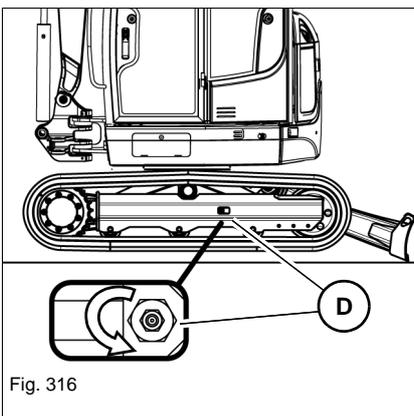


Fig. 316



### Environment

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



### 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

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.

## 7.21 Exhaust gas cleaning system

ET65/404F-22T and ET90 DPF are 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 power is reduced and vehicle operation has to be stopped.

Regeneration is performed only 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 only exhaust-gas suction systems suitable for exhaust-gas temperatures of up to 600 °C (1112 °F).
- ▶ Provide for sufficient ventilation when operating in enclosed areas.



### **WARNING**

#### **Burn hazard at the exhaust system!**

During regeneration, the exhaust system can develop exhaust-gas temperatures of about 600 °C (1112 °F), even if the engine is running at an idle 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 (ET65/404F-22T only).
  - ▶ Do not perform manual regeneration in environments with easily flammable material or standstill regeneration.
  - ▶ Use only exhaust-gas suction systems suitable for exhaust-gas temperatures of up to 600 °C (1112 °F).
-



---

### **NOTICE**

Potential damage to engine and irreparable damage to diesel particulate filter.

- ▶ Only use clean diesel fuel according to the **fluids and lubricants** list. Do not use biodiesel.
  - ▶ Perform the regeneration as early as possible (or have someone do it for you).
  - ▶ Do not ignore the **highest load** indication.
- 

### **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 regeneration in surroundings with easily flammable material.
  - ▶ In environments with easily flammable material, disable the **automatic regeneration** mode (ET65/404F-22T only).
- 



### **Information**

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

- ▶ High engine load = low load.
  - ▶ Low engine load = high load.
-



### **Information**

Wacker Neuson recommends not to influence the automatic regeneration system if possible. Should disabling or interrupting regeneration be necessary, perform the regeneration as soon as possible (ET65/404F-22T only).

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.

The diesel particulate filter is a wear part, as soot and ash particles cannot be completely removed for technical reasons.

---



### **Information**

Disabling/canceling regeneration increases the contamination level in the particulate filter. It may result in the vehicle stopping and requiring service regeneration by an authorized service center.

---

## Measures for increasing intervals between regeneration

- Avoid frequent engine stop-starts.
- Bring engine up to operating temperature.
- Avoid operation under low-load conditions.
- Do not disable or cancel regeneration.
- Re-perform regeneration as soon as possible after being disabled/ canceled.
- Only use clean diesel fuel according to the **fluids and lubricants** list.

### Measures when operating at great heights (ET65/404F-22T)

- At 800 m (2625 ft.) above sea level, the vehicle automatically switches into high-altitude mode. The maximum engine speed increases to 2400 rpm and the adjacent symbol appears during the starting process.
- Operate the vehicle permanently at maximum speed to avoid shorter DPF regeneration intervals.
- When the boundary of 800 m (2625 ft.) is exceeded while driving, stop the engine and start it again after two minutes; this allows the high-altitude mode to switch on.
- The Eco and Power modes cannot be switched to manually when driving in high-altitude mode.



Fig. 317



### Information

The sea level of 800 m (2625 ft.) is a rough estimate and is affected by various environmental factors. The actual value may vary.

## Types of regeneration

Type	Vehicle	Description
Automatic regeneration	ET65/404F-22T ET90/TCD 2.9 DPF	Is automatically performed by engine; work may be performed with the vehicle
Manual regeneration	ET65/404F-22T	Is started by driver; work may be performed with the vehicle
Standstill regeneration	ET90/TCD 2.9 DPF	Is started by driver; vehicle may not be started or used for work
Service regeneration	ET65/404F-22T ET90/TCD 2.9 DPF	May be performed only by an authorized service center

**Indicator lights**

Letter	Indication	Description
D		<b>Regeneration required/enabled</b> <ul style="list-style-type: none"> <li>ET65/404F-22T: Illuminates when regeneration is required or during a regeneration</li> <li>ET90/TCD 2.9 DPF: Flashes when regeneration is required or during a regeneration</li> </ul>
E		<b>Regeneration disabled/interrupted</b> (ET65/404F-22T only)
F		<b>Increased exhaust-gas temperature</b> Illuminates during regeneration or after regeneration, so long as the exhaust temperature is raised.
G		<b>Engine warning</b>
H		<b>Engine stop</b>


**Information**

The arrangement of the indicator lights may deviate depending on vehicle equipment.

## Indication of load condition

Level	Indication	Description/measure
<b>1</b>		<b>No load</b>
<b>2</b>		<b>Low load</b> Warm up the vehicle to operating temperature and perform automatic regeneration.
<b>3</b>		<b>Medium load</b> Warm up the vehicle to operating temperature and perform automatic regeneration. ET65/404F-22T: If necessary, perform a manual regeneration if an automatic regeneration was interrupted. ET90/TCD 2.9 DPF: If indicator light <b>D</b> blinks, perform a standstill regeneration. Do not turn off engine during regeneration.
<b>4</b>		<b>Highest load</b> ET65/404F-22T: Perform manual regeneration. Do not turn off engine during regeneration. ET90/TCD 2.9 DPF: Perform standstill regeneration. Do not turn off engine during regeneration.  If the load does not change, contact an authorized service center.
<b>5</b>		<b>Highest load exceeded</b> Stop the vehicle and contact a Wacker Neuson service center.

### Remarks:

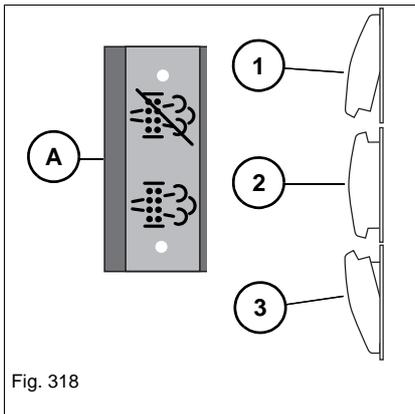
- The indicator lights may illuminate or flash quickly and be in different positions depending on vehicle equipment.
- The engine warning **and** engine stop **indicator lights** may also illuminate if another fault occurs. This does not depend on the current load.
- If the regeneration button is held for 10 seconds, the symbol **Increased exhaust-gas temperature** will appear on the display.
- If the parking brake is actuated during standstill regeneration and loading condition **4**, the loading condition appears automatically in the display (ET90/TCD 2.9 DPF).

**Control elements**
**Regeneration push button**

The push button **A** (ET65/404F-22T) is in the middle position and can be pressed in either direction, but does not lock into place.

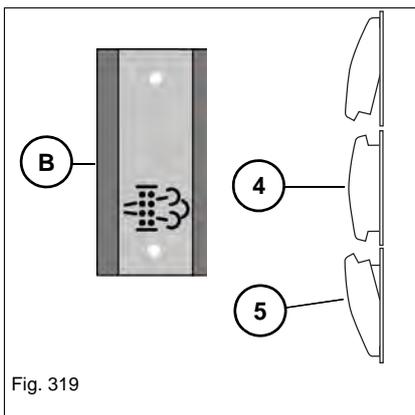
Push button **B** (ET90/TCD 2.9 DPF) can be pressed downward, but does not engage.

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


**ET65/404F-22T**

Push button functions:

- 1:** deactivate/interrupt/reactivate regeneration (ET 65 Tier IV only)
- 2:** **automatic regeneration** mode (middle position)
- 3:** start manual regeneration


**ET90/TCD 2.9 DPF**

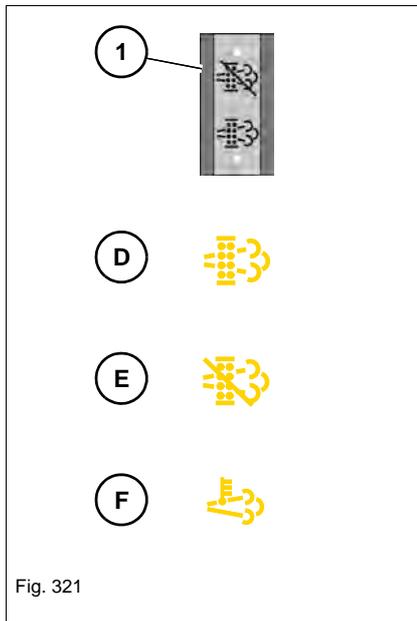
Push button functions:

- 4:** Automatic **regeneration mode**
- 5:** initiate/interrupt standstill regeneration



**C:** Parking brake switch for standstill regeneration ET90 DPF

## Automatic regeneration mode



Indicator lights **D** and **F** illuminate during regeneration.

Disabling the **automatic regeneration** mode (ET65/404F-22T only):

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

➔ Indicator light **E** illuminates.

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

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

➔ Indicator light **E** does not illuminate.

To interrupt automatic regeneration:

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

➔ Indicator light **E** illuminates.

## Manual Regeneration/Standstill regeneration

ET65/404F-22T: Indicator light **D** illuminates.

ET90/TCD 2.9 DPF: Indicator light **D** blinks.

A regeneration must be started.

### Information

To be able to start a regeneration, the coolant temperature must be at least 70°C/158°F (ET65/404F-22T) or at least 60°C/140°F (TCD 2.9 DPF).

The indicator light **G** can blink depending on the loading condition.

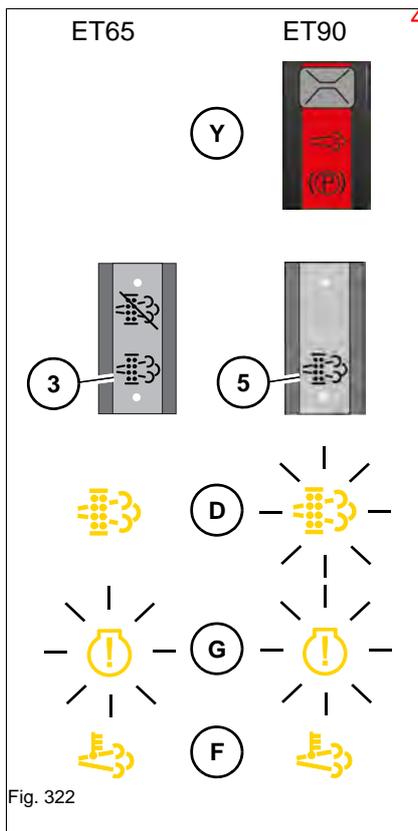


Fig. 322

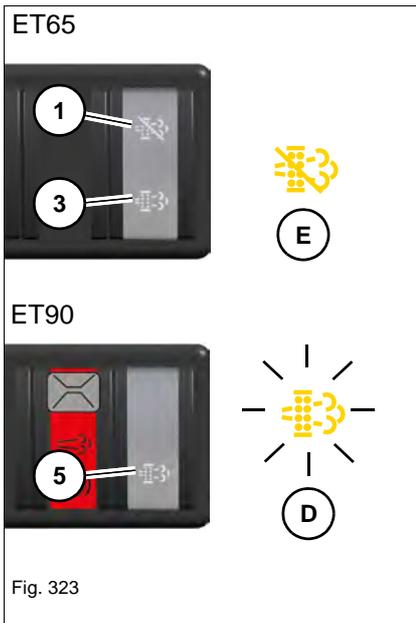
### Start manual regeneration/standstill regeneration

1. Drive the vehicle out of the danger zone and into a safe area.
2. Press the dozer blade against the ground (only ET90/TCD 2.9 DPF).
3. Actuate the parking brake **J** (only ET90/TCD 2.9 DPF).
  - The engine must be at idling speed (only ET90/TCD 2.9 DPF).
4. Hold touch button **Regeneration** pressed down as long in position **3** (ET65/404F-22T) or **5** (TCD 2.9 DPF), until indicator light **D** illuminates.
  - ET90/TCD 2.9 DPF: The engine speed increases to approx. 2000 rpm
  - The indicator light **F** also illuminates during the regeneration.

### Information

Manual regeneration or standstill regeneration has the following effects on vehicle operation:

- ▶ ET65/404F-22T: work may be performed with the vehicle.
- ▶ ET90/TCD 2.9 DPF: vehicle may not be driven or used for work. Do not leave the vehicle during regeneration.



**Interrupting manual regeneration (ET65/404F-22T)**

Press the button **Regeneration** in position **1** until indicator light **E** illuminates.

**Interrupting standstill regeneration (ET90/TCD 2.9 DPF)**

Press the touch button **Regeneration** in position **5** until indicator light **D** illuminates.

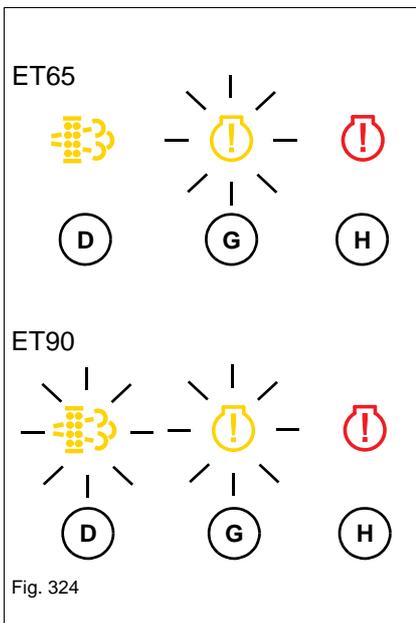
➔ The engine shifts to idling speed.

**Loading position 5 – parking the vehicle**

ET65/404F-22T: Indicator lights **D** and **H** illuminate and the indicator light **G** blinks.

ET90/TCD 2.9 DPF: Indicator lights **D** and **G** blink and indicator light **H** illuminates.

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



**7.22 Machine preservation**

Each vehicle is partly preserved at the plant (for example in the engine compartment). Operation in an aggressive environment (for example salt deposits) is prohibited.

## 8 Troubleshooting

### 8.1 Diesel engine



#### Information

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

#### Engine warning lights ET65 Tier IV/ET90 DOC/ET90 DPF

Engine warning	Engine stop	Description
Yellow	Red	Indicator light color
		
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 power. 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.

**Engine and engine oil indicator lights ET65 Tier IV/ET90 DOC/ET90 DPF**

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 vehicle 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 – <a href="#">see chapter “Adding engine oil” on page 7-43</a> . If the malfunction is still indicated, stop the engine and contact a Wacker Neuson service center.

**Engine oil indicator lights ET65 Tier III**

Engine warning	Engine stop	Oil pressure	Description
Yellow	Red	Red	Indicator light color
			
--	--	On	Low oil pressure (if the oil pressure indicator light illuminates during operation). Check the oil level and add oil if necessary – <a href="#">see chapter “Adding engine oil” on page 7-43</a> . If the malfunction is still indicated, stop the engine and contact a Wacker Neuson service center.

## 8.2 Malfunctions (display element/multi-functional display)

Symbol	Description	See
	<b>Engine stop</b> Stop the engine immediately. Contact a Wacker Neuson service center.	--
	<b>General malfunction</b> Stop the engine immediately. Contact a Wacker Neuson service center.	--
	<b>Low Engine Oil Pressure</b> Stop the engine immediately. Contact a Wacker Neuson service center.	--
	<b>Engine malfunction</b> Stop the engine immediately. Contact a Wacker Neuson service center.	--
	<b>Charge indicator light</b> Possible alternator or V-belt malfunction. <b>Note:</b> 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.	--
	<b>Hydraulic oil temperature too high</b> <ul style="list-style-type: none"> <li>Check the hydraulic oil level and add oil if necessary.</li> <li>Hydraulic oil cooler dirty; clean hydraulic oil cooler if necessary</li> </ul> <b>Note:</b> 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.	7-50, 7-46 7-51
	<b>Replace the hydraulic oil filter</b> Contact a Wacker Neuson service center.	--
	<b>Dirty air filter</b> Contact a Wacker Neuson service center.	--
SPN 97	Water in fuel system. Empty the water separator.	7-36

- Symbols are listed according to priority.
- Additionally an exclamation mark can appear in the display element or the multi-functional display and a buzzer can sound.  
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.



Malfunction/sign	Possible cause	Remedy	See
Engine does not start or is not easy to start	Empty fuel tank	Refueling	<a href="#">7-31</a>
	Malfunctioning or empty battery	Replace the battery	--
	Malfunctioning fuse	Check the fuse	<a href="#">9-9</a>
Engine starts, but does not run smoothly or faultless	Air in fuel system	Let the engine run	<a href="#">7-36</a>
	Water in fuel system	Empty the water separator	<a href="#">7-36</a>
Shortened DPF regenerations intervals	Frequent short starts	Avoid frequent short starts	<a href="#">7-62</a>
	Polluted air filter	Observe Chapter <b>Exhaust Gas Treatment</b>	
	Vehicle is being operated at great heights		
	Regeneration deactivated or interrupted	Perform regeneration	
	Incorrect engine oil	Observe the <b>fuel, lubricants, and coolants</b> list	<a href="#">7-17</a>
	Wrong diesel fuel		<a href="#">7-18</a>
Machine pulls to the right or left	Wrong track tension	Tighten tracks correctly	<a href="#">7-55</a>
	Foreign bodies stuck in track	Remove foreign bodies	--
	Uneven wear of the tracks	Contact a Wacker Neuson service center	--
None of the hydraulic functions can be operated	Control lever base raised	Fold down the control lever base	<a href="#">4-54</a>
Working light or horn does not work.	Malfunctioning fuse	Check the fuse; Check the plug connection at the work light	<a href="#">9-9</a>
Fan does not run	Malfunctioning fuse	Check the fuse	<a href="#">9-9</a>
	Electrical fault	Contact a Wacker Neuson service center	--
Reduced or no cooling capacity	Not enough refrigerant in the system	Contact a Wacker Neuson service center	--
	Malfunctioning V-belt		
	Dirty condenser	Contact a Wacker Neuson service center	--
	Temperature controller set to heating	Set the temperature controller to cooling	<a href="#">5-16</a>
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	<a href="#">5-16</a>
Loss of refrigerant	Loose hose connection	Contact a Wacker Neuson service center	----
	Leak in system		
Very loud system	Malfunctioning V-belt	Contact a Wacker Neuson service center	--
	Damaged air conditioning compressor		
	Damaged fan motor		

**Service menu/error messages**

Observe the following if an error is displayed in the multi-functional display:  
In case of serious errors, stop the vehicle immediately.

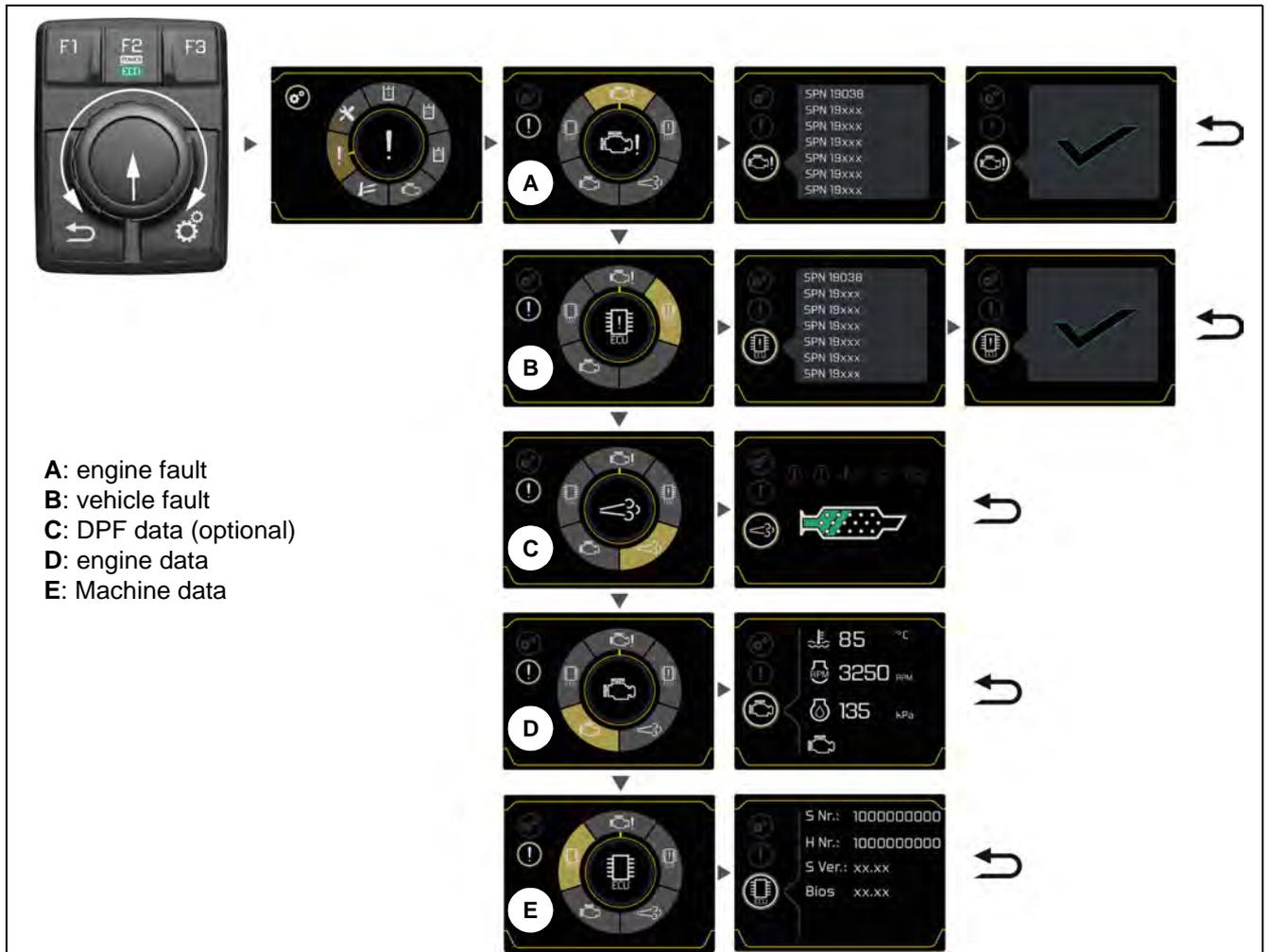
- Engine power is reduced.
- Stop and park the vehicle.
- Contact a Wacker Neuson service center and have the malfunction rectified.

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

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

**i Information**

Any faults present appear in the multi-functional display for a few seconds after starting the engine.



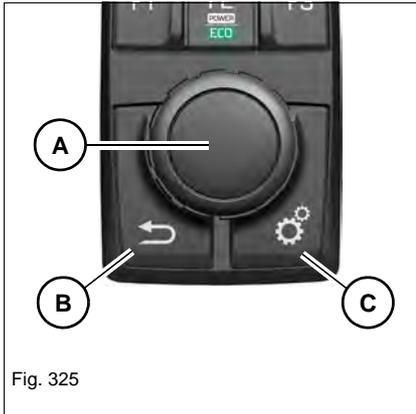


Fig. 325

### 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.

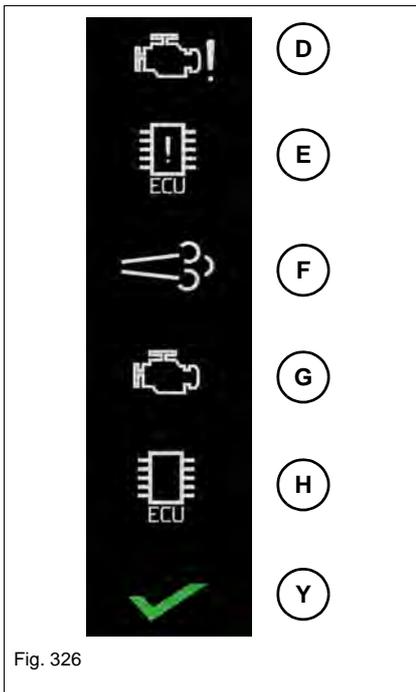


Fig. 326

### Symbols

**D:** engine fault

**E:** vehicle fault

**F:** diesel particulate filter data

**G:** engine data

**H:** Machine data

**J:** no faults

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

## 9 Technical data

### 9.1 Models and trade names

– see chapter “Model designations and trade names” on page 3-2

### 9.2 Engine

#### ET65/EZ80

Engine <sup>1</sup>	ET65 Tier III/EZ80 Tier III	ET65 Tier IV
Manufacturer	Perkins	
Type	404D-22T	404F-22T
Design	Water-cooled 4-cylinder diesel engine	
Intake system	Turbo-charging	
fuel injection system	Indirect	
Engine management	Electronic	
Displacement	2216 cm <sup>3</sup> (135 in <sup>3</sup> )	
Nominal bore and stroke	84 mm x 100 mm (3.3 x 4 in)	
Rated output at rated speed	36.4 kW at 2500 min <sup>-1</sup> (48.8 hp at 2500 rpm)	45.5 kW at 3000 min <sup>-1</sup> (61 hp at 3000 rpm)
Engine power at preset maximum engine speed (Power)	36.3 kW at 2000 rpm (48.7 hp at 2000 rpm)	43.7 kW at 2400 min <sup>-1</sup> (58.6 hp at 2400 rpm)
Engine power at preset maximum engine speed (High-altitude mode)	--	43.7 kW at 2400 min <sup>-1</sup> (58.6 hp at 2400 rpm)
Engine power at preset maximum engine speed (Eco)	ET65: 35.1 kW at 1800 rpm (47 hp at 1800 rpm)	42.1 kW at 2200 min <sup>-1</sup> (56.5 hp at 2200 rpm)
	EZ80: 35.9 kW at 1900 rpm (48.1 hp at 1900 rpm)	
Max. torque	190 Nm at 1700 rpm (140 ft.lbs. at 1700 rpm)	192 Nm at 1800 rpm (142 ft.lbs. at 1800 rpm)
Max. engine speed without load	2000 rpm	2400 min <sup>-1</sup> (rpm)
Lower idling speed	1200 min <sup>-1</sup> (rpm)	
Preheating system	Glow plugs	
Exhaust-gas treatment	--	Diesel particulate filter
Exhaust values according to	EC97/68 Tier 3a, 77/537/EEC, ECE-R120	US EPA 40 CFR Part 1039 Tier 4 final

1. Output values can vary by +/- 5 %.



Engine <sup>1</sup>	ET65 Tier IV
Manufacturer	Perkins
Type	404F-E22TA
Design	Water-cooled 4-cylinder diesel engine
Intake system	Turbo-charging, charge air cooling
fuel injection system	Direct
Engine management	Electronic
Displacement	2216 cm <sup>3</sup> (129 in <sup>3</sup> )
Nominal bore and stroke	84 mm x 100 mm (3.3 x 4 in)
Rated output at rated speed	50 kW at 2800 min <sup>-1</sup> (67.1 hp at 2800 rpm)
Engine power at preset maximum engine speed	
ECO	39.2 kW at 1800 min <sup>-1</sup> (52.6 hp at 1800 rpm)
PWR	43.5 kW at 2000 rpm (58.3 hp at 2000 rpm)
Max. torque	208 Nm at 1800 rpm (153 ft.lbs. at 1800 rpm)
Max. engine speed without load	2000 rpm
Lower idling speed	1200 min <sup>-1</sup> (rpm)
Preheating system	Glow plugs
Exhaust-gas treatment	Diesel oxidation catalyst
Exhaust values according to	EU NRMM 97/68/EC Level 3B US EPA 40 CFR Part 89 Tier IV final

1. Output values can vary by +/- 5 %.

**ET90**

Engine	ET90 DOC	ET90 DPF
Manufacturer	Deutz	
Type	TCD 2.9 DOC (L4)	TCD 2.9 DPF (L4CRT)
Design	Water-cooled 4-cylinder diesel engine	
Intake system	Turbo-charging, charge air cooling	
fuel injection system	Common rail direct injection	
Engine management	Electronic	
Displacement	2920 cm <sup>3</sup> (178 in <sup>3</sup> )	
Nominal bore and stroke	92 x 110 mm (3.6 x 4.3 in)	
Rated output at rated speed	55.4 kW at 2300 rpm (74.3 hp at 2300 rpm)	
Engine power at preset maximum engine speed (Power)	55 kW at 1850 min <sup>-1</sup> (73.8 hp at 1850 rpm)	
Engine power at preset maximum engine speed (Eco)	52 kW at 1650 min <sup>-1</sup> (70 hp at 1650 rpm)	
Max. torque	300 Nm at 1600 rpm (221 ft.lbs. at 1600 rpm)	
Max. engine speed without load	1850 rpm	
Lower idling speed	1000 min <sup>rpm</sup>	
Preheating system	Glow plugs	
Exhaust-gas treatment	Diesel oxidation catalyst	Diesel particulate filter
Exhaust values according to	97/68/EC (2012/46/EC) 97/68/EC (2012/46/EC)	97/68/EC (2012/46/EU) 97/68/EC (2012/46/EU)

### 9.3 Traveling drive

	ET65/EZ80/ET90
Travel drive	Axial piston motor

### 9.4 Brake

See "Drive levers/accelerator pedals"

### 9.5 Tracks

#### ET65

Type	Width mm (in)	Ground pressure kg/cm <sup>2</sup> (lbs/in <sup>2</sup> )	Ground clearance mm (in)
Rubber	400 (16)	0.35 (5)	284 (11)
Steel	400 (16)	0.35 (5)	284 (11)
Hybrid	400 (16)	0.35 (5)	284 (11)

#### EZ80

Type	Width mm (in)	Ground pressure kg/cm <sup>2</sup> (lbs/in <sup>2</sup> )	Ground clearance mm (in)
Rubber	450 (18)	0.36 (5.1)	357 (14)
Steel	450 (18)	0.37 (5.3)	357 (14)
Steel	600 (24)	0.29 (4.1)	357 (14)
Hybrid	450 (18)	0.37 (5.3)	357 (14)

#### ET90

Type	Width mm (in)	Ground pressure kg/cm <sup>2</sup> (lbs/in <sup>2</sup> )	Ground clearance mm (in)
Rubber	450 (18)	0.40 (5.7)	370 (15)
Steel	450 (18)	0.41 (5.8)	370 (15)
Steel	600 (24)	0.31 (4.4)	370 (15)
Hybrid	450 (18)	0.40 (5.7)	370 (15)

### 9.6 Steering system

See "Drive levers/accelerator pedals"



## 9.7 Working hydraulics

### ET65

	<b>ET65</b>
Max. operating pressure	240 ±5 bar (3481 ±72 psi)
Hydraulic reservoir capacity	92 liters (24 gal)
Flow rate	144 l/min (38 gal/min)
Filter	Suction and return filter
Swivel range of upper carriage	360°
Rotation speed of upper carriage	9 rpm

### EZ80

	<b>EZ80</b>
Max. operating pressure	300 ±5 bar (3481 ±72 psi)
Hydraulic reservoir capacity	92 liters (24 gal)
Flow rate	160 l/min (42 gal/min)
Filter	Suction and return filter
Swivel range of upper carriage	360°
Rotation speed of upper carriage	9 rpm

### ET90

	<b>ET90</b>
Max. operating pressure	300 ±5 bar (3481 ±72 psi)
Hydraulic reservoir capacity	92 liters (24 gal)
Flow rate	175.75 l/min (47.7 gal/min)
Filter	Suction and return filter
Swivel range of upper carriage	360°
Rotation speed of upper carriage	9 rpm

### Maximum speed

	<b>ET65<sup>1</sup></b>	<b>EZ80</b>	<b>ET90</b>
Speed range 1	2.4 km/h (1.5 mph)	2.9 km/h (1.8 mph)	3.1 km/h (1.9 mph)
Speed range 2	4.8 km/h (3 mph)	4.4 km/h (2.7 mph)	5.0 km/h (3.1 mph)

1. From WNCE1401APAL00757. Up to WNCE1401VPAL00756 maximum speed 3.1 km/h (1.9 mph) in speed 1 or 5.2 km/h (3.2 mph) in speed 2



## 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 vehicle 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 vehicle into operation and contact a Wacker Neuson service center.

## Electrical components

	<b>ET65</b>
Alternator	12 V/85 A
Alternator (404F-E22TA)	12 V/120 A
Starter (Tier III)	12 V/2 kW (2.7 hp)
Starter (404F-22T)	12 V/2.2 kW (3 hp)
Starter (404F-E22TA)	12V/2 kW (2.7 hp)
Battery (according to DIN EN 50342, DIN IEC 60095-2)	12 V/88 Ah

	<b>EZ80</b>
Alternator	12 V/85 A
Starter	12 V/2 kW (2.7 hp)
Battery (according to DIN EN 50342, DIN IEC 60095-2)	12 V/88 Ah

	<b>ET90</b>
Alternator	12 V/120 A
Starter	12 V/2.6 kW (3.5 hp)
Battery (according to DIN EN 50342, DIN IEC 60095-2)	12 V/110 Ah

**Main fuse box**

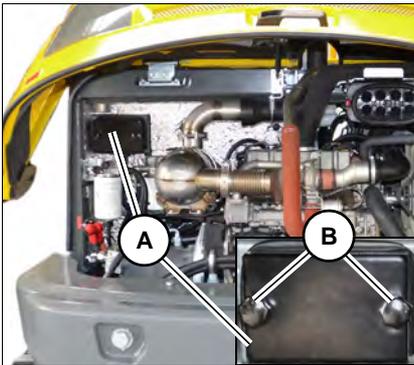


Fig. 327

The main fuse box **A** is located on the partition wall in the engine compartment.

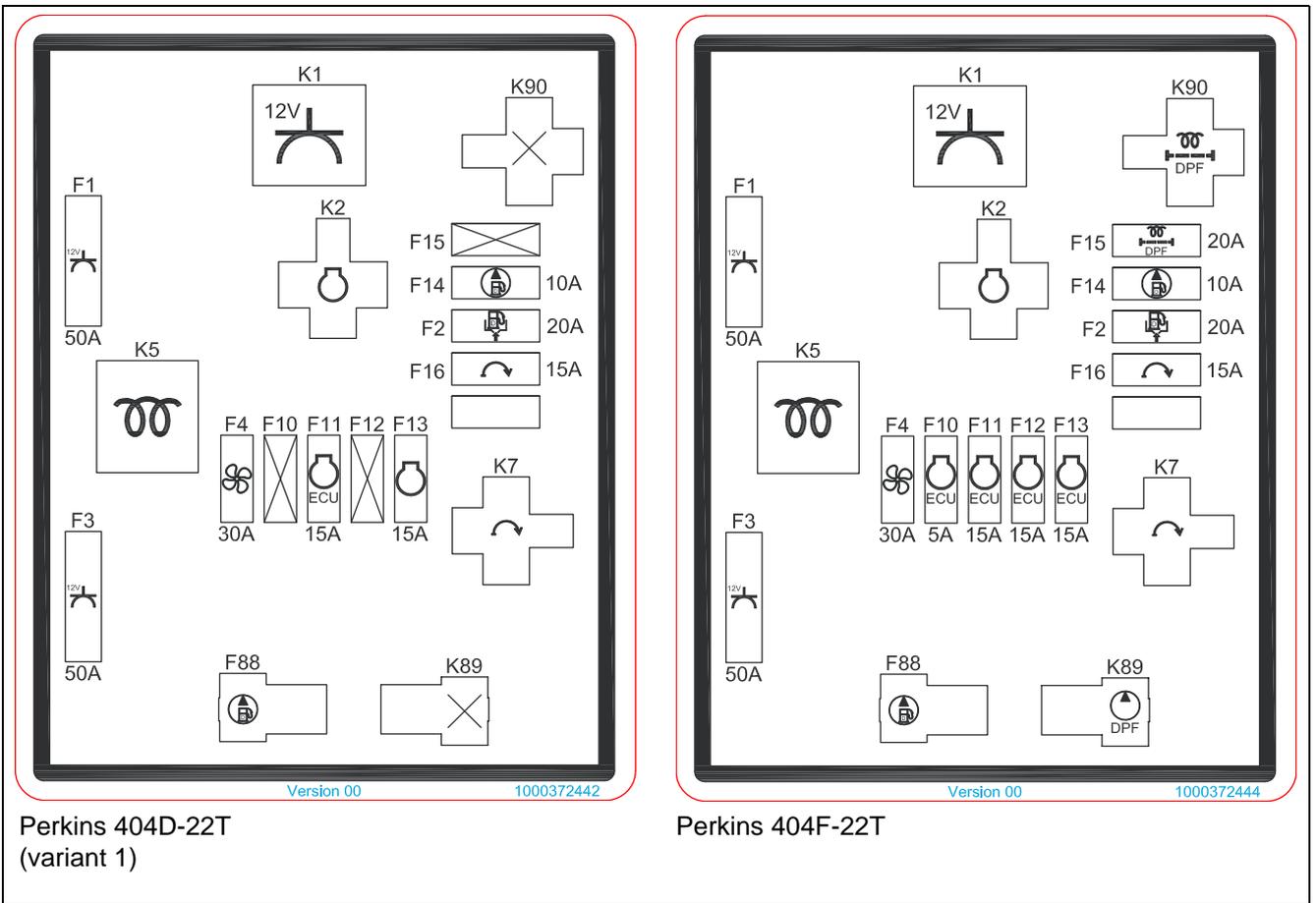
**1. Opening:**

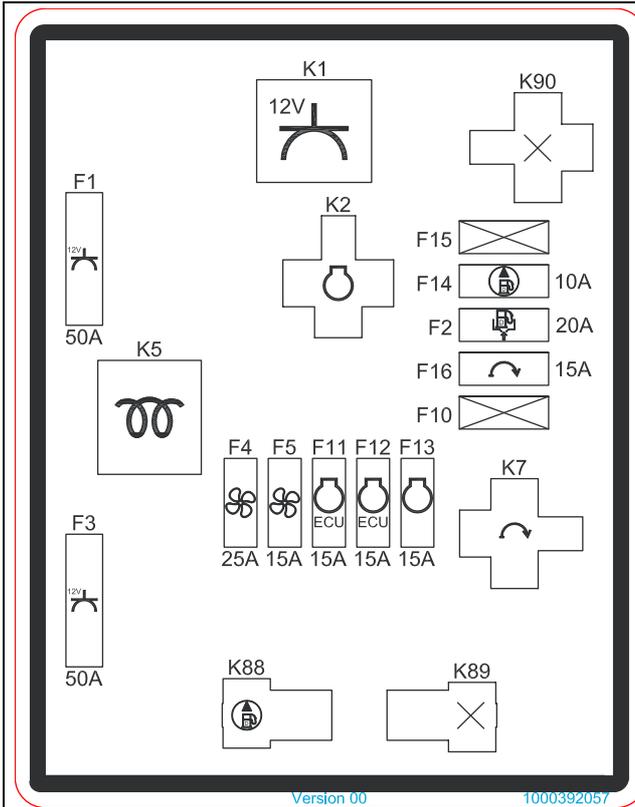
1. Stop and park the vehicle. Stop the engine.
  - See **“Preparing lubrication”**.
2. Open the engine cover.
3. Loosen screws **B** and remove the cover.

**Closing:**

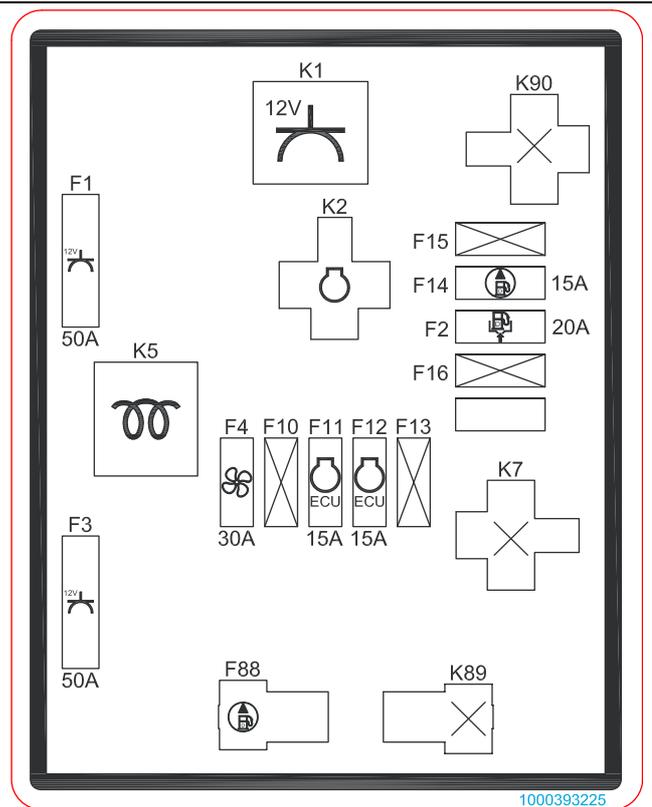
1. Install the cover and tighten screws **B**.

**Assignment:**

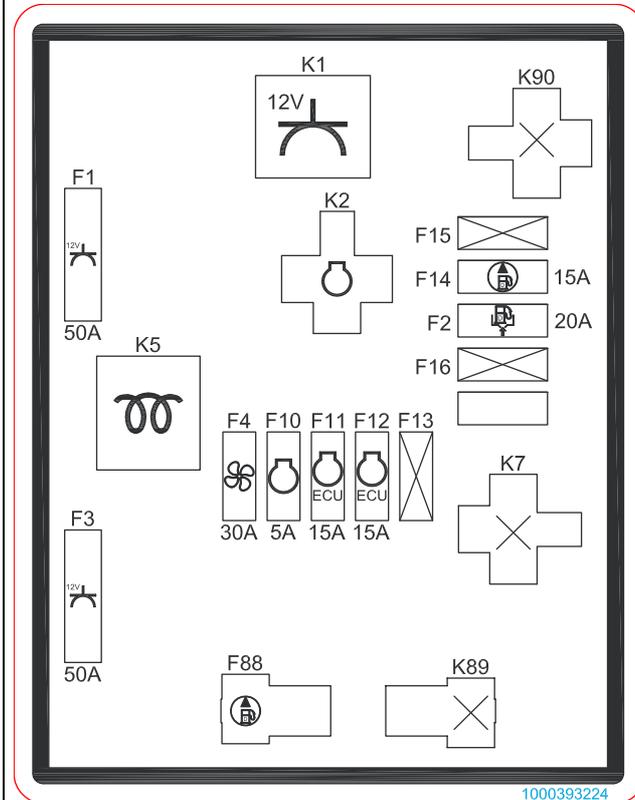




Perkins 404F-E22TA  
Perkins 404D-22T  
(variant 2)



Deutz 2.9 DOC



Deutz 2.9 DPF

**Cabin fuse box**



Fig. 328

The cabin fuse box is located on the left of the operator seat.

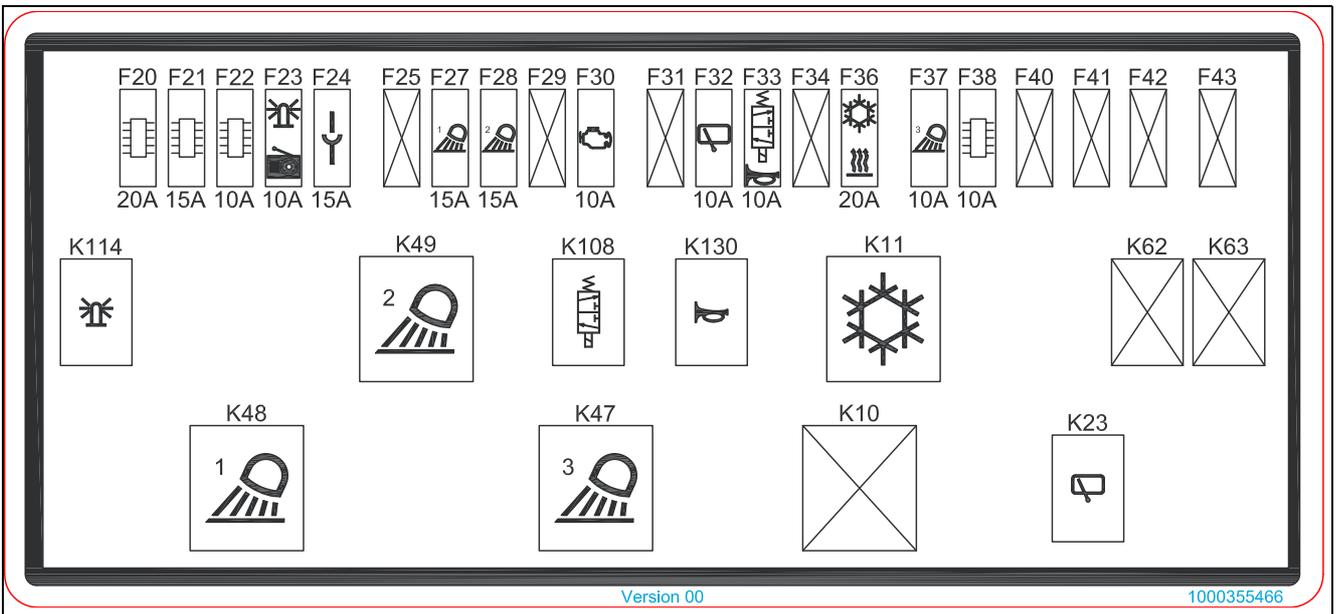
**Opening:**

1. Stop and park the vehicle. Stop the engine.
  - See “**Preparing lubrication**”.
2. Loosen screw **C** and remove the cover.

**Closing:**

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

**Assignment:**



Version 00

1000355466



Fuse	Relays	Protected circuits
F001	K001	12 V 15-1
F002	--	Fuel-filling pump
F003	--	12 V 30-1
F004	--	Air-conditioning fan
F004	--	Air-conditioning fan
F005	--	Air-conditioning fan
F010	--	Engine control unit
F011	--	Engine control unit
F012	--	Not assigned
F013	--	Engine control unit
F014	K088, K089	Fuel pump, DPF pump
F015	K90	DPF glow plug (ET90: cable bridge)
F016	K7	Starter terminal 50
F020	--	Control valve TTC 77
F021	--	Control valve TTC 30
F022	--	Control valve
F023	K114	Rotating beacon, radio, Telematic
F024	--	12 V connection
F025	--	Not assigned
F027	K048	Working light on chassis
F028	K049	Roof light
F029	--	Not assigned
F030	--	Control terminal 15
F031	--	Heated seat
F032	K023	Wiper
F033	K108, K130	Hydraulic valves, horn, air-suspension comfort seat
F034	--	Traveling drive (not assigned)
F036	K011	Heating, air conditioning
F037	K047	Boom working light
F038	--	IO controller IO, starter
F040	--	Not assigned
F041	--	Not assigned
F042	K062	Not assigned
F043	K063	Not assigned
--	K010	Not assigned
--	K005	Preheating
--	K002	Main relay

**Illuminates**

	Type	
Working lights (standard)	Halogen lamp	12V/55W H3
Working lights (option)	LED lamp	12V/22W
Interior light	Festoon lamp	C5W 12 V/5 W
Rotating beacon	Halogen lamp	12V/55W H1

**Powertilt (option)**
**ET65**

	ET65
Type	Powertilt ET65
Swiveling range	180°

**EZ80**

	EZ80
Type	Powertilt EZ80
Swiveling range	180°

**ET90**

	ET90
Type	Powertilt ET90
Swiveling range	180°



## 9.9 Tightening torques

### General tightening torques

Property class	8.8	10.9	12.9	8.8	10.9
Screw dimensions	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)
M5	5.5 (4)	8 (6)	10 (7)	5 (4)	7 (5)
M6	10 (7)	14 (10)	17 (13)	8.5 (6)	12 (9)
M8	25 (18)	35 (26)	42 (31)	20 (15)	30 (22)
M10	45 (33)	65 (48)	80 (59)	40 (30)	59 (44)
M12	87 (64)	110 (81)	147 (108)	69 (51)	100 (74)
M14	135 (100)	180 (133)	230 (170)	110 (81)	160 (118)
M16	210 (155)	275 (203)	350 (258)	170 (125)	250 (184)
M18	280 (207)	410 (302)	480 (354)	245 (181)	345 (254)
M20	410 (302)	570 (420)	690 (509)	340 (251)	490 (361)
M22	550 (406)	780 (575)	930 (686)	460 (339)	660 (487)
M24	710 (524)	1000 (738)	1190 (878)	590 (435)	840 (620)
M27	1040 (767)	1480 (1092)	1770 (1305)	870 (642)	1250 (922)
M30	1420 (1047)	2010 (1482)	2400 (1770)	1200 (885)	1700 (1254)

Tightening torques/fine-pitch thread					
Property class	8.8	10.9	12.9	8.8	10.9
Screw dimensions	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)
M8X1.0	25 (18)	37 (28)	43 (32)	22 (16)	32 (24)
M10X1.0	50 (37)	75 (55)	88 (65)	43 (32)	65 (48)
M10X1.25	49 (36)	71 (52)	83 (61)	42 (31)	62 (46)
M12X1.25	87 (64)	130 (96)	150 (111)	75 (55)	110 (81)
M12X1.5	83 (61)	125 (92)	145 (107)	72 (53)	105 (77)
M14X1.5	135 (100)	200 (148)	235 (173)	120 (89)	175 (129)
M16X1.5	210 (155)	310 (229)	360 (266)	180 (133)	265 (195)
M18X1.5	315 (232)	450 (332)	530 (391)	270 (199)	385 (284)
M20X1.5	440 (325)	630 (465)	730 (538)	375 (277)	530 (391)
M22X1.5	590 (435)	840 (620)	980 (723)	500 (369)	710 (524)
M24X2.0	740 (546)	1070 (789)	1250 (922)	630 (465)	900 (664)
M27X2.0	1100 (811)	1550 (1143)	1800 (1328)	920 (679)	1300 (959)
M30X2.0	1500 (1106)	2150 (1586)	2500 (1844)	1300 (959)	1850 (1364)

## 9.10 Coolant

### Compound table

Outside temperature <sup>1</sup>	Distilled water	Coolant <sup>2</sup>
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

	ET65 Tier III	EZ80 Tier III	ET65 Tier IV	ET90 DOC, DPF
Sound power level (measured) L <sub>wA</sub> <sup>1</sup>	97 dB(A)	97 dB(A)	98 dB(A)	99 dB(A)
Sound power level (guaranteed) L <sub>wA</sub> <sup>1</sup>	97 dB(A)	97 dB(A)	98 dB(A)	99 dB(A)

1. According to ISO 6395 (EC Directives 2000/14/EC and 2005/88/EC)



### Information

Measurements performed on asphalted surface.

## 9.12 Vibrations

Vibration	
Effective acceleration value for the upper extremities of the body (hand-arm vibration)	< Trigger value < 2.5 m/s <sup>2</sup>
Effective acceleration value for the body (whole-body vibration)	< 0.5 m/s <sup>2</sup>

Vibration values indicated in m/s<sup>2</sup>.

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/s<sup>2</sup> during correct vehicle operation.

### Indications on whole-body vibration

Whole-body vibration is less than 0.5 m/s<sup>2</sup> during correct vehicle operation.

Uncertainty of measurement K has been taken into account for the specified values.

The degree of vibration is influenced by various parameters.

Some of them are listed below:

- Operator: training, behavior, working method, and strain.
- Job site: organization, preparation, surroundings, weather conditions, and material.
- Machine: version, seat quality, quality of suspension system, attachments, and condition of attachments.

Precise indications on the vibration degrees cannot be made for the vehicle.  
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 vehicles. This publication uses measuring values of international institutes, organizations and manufacturers. It contains information on whole-body vibration for operators in earth moving vehicles. For more information on the vibration values of the vehicle, refer to Directive 2002/44/EC of European Parliament and Council on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

It explains the values for vertical vibration under heavy operating conditions.

### **Directives on reduction of vibration values in earth moving vehicles:**

- Perform correct adjustments and maintenance on the vehicle.
- Avoid jerky movements during vehicle operation.
- Keep slopes in a perfect condition.

Whole-body vibration can be reduced with the following guidelines:

- Use a vehicle 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 vehicle and enough time to keep the job site in good condition.
- Use an operator seat according to the ISO 7096 requirements. Keep the operator seat in good condition and adjust it correctly:
  - Adjust the operator seat and suspension to the operator's weight and size.
  - Check and maintain the seat adjustment and suspension.
- Perform the following activities smoothly without any jerks.
  - Steering
  - Brakes
  - Acceleration
  - Shifting gears
- Move attachments without any jerks.

- Adapt your speed and the itinerary to minimize vibration:
  - Travel around obstacles and uneven ground.
  - Reduce your speed during vehicle travel across rough terrain.
- Reduce vibration to a minimum during long work cycles or during vehicle operation over long distances:
  - Use a vehicle with a suspension system (for example on the operator seat).
  - Enable the hydraulic oscillation damping if the vehicle is equipped with tracks.
  - If the vehicle is not equipped with hydraulic oscillation damping, reduce your speed to avoid bumps and jolts.
  - Load the vehicle on a truck or trailer to move between job sites.
- Other risk factors can affect drive comfort negatively. The following measures can improve drive comfort:
  - Adjust the operator seat and the control elements to a relaxed body posture.
  - Adjust the rearview mirrors to ensure optimal visibility so you can adopt an upright seating position.
  - Provide breaks to avoid sitting for long periods.
  - Do not jump off the cabin.
  - Picking up and raising loads repeatedly must be limited to a minimum.

**Reference:**

The vibration values and calculations are based on the indications made in ISO/TR 25398 Mechanical Vibrations – Guidelines for assessment of exposure to whole-body vibration during operation of earth moving vehicles.

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 vehicles. This method is based on vibration measurements under real operating conditions for all vehicles. 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 vehicle functions reducing vibration and on safe operation.

## 9.13 Weights

ET65	Transport weight <sup>1</sup> kg (lbs)	Operating weight <sup>2</sup> kg (lbs)
<b>One-piece boom</b> (short stick, rubber track)	5806 (12,800)	6079 (13,402)
EZ80	Transport weight <sup>1</sup> kg (lbs)	Operating weight <sup>2</sup> kg (lbs)
<b>One-piece boom</b> (short stick, rubber track)	7588 (16,729)	7919 (17,459)
ET90	Transport weight <sup>1</sup> kg (lbs)	Operating weight <sup>2</sup> kg (lbs)
<b>One-piece boom</b> (short stick, rubber track)	8348 (18,404)	8711 (19,204)

1. Transport weight: basic vehicle (one-piece boom, short stick, rubber tracks) + 10 % fuel tank capacity

2. Operating weight: basic vehicle + full fuel tank + backhoe bucket 700 mm (ET65)/backhoe bucket 800 mm (EZ80/ET90) + user (75 kg/165 lbs)



### Information

Weight indications can vary by +/- 2 %.

## Determining the loading weight

The basis for calculating the loading weight is the shipping weight indicated on the vehicle nameplate. Add subsequently installed options and attachments (e.g. bucket, Easy Lock, breaker console) to the shipping weight. Add fuel depending on the tank capacity.

Option	ET65 <sup>1</sup> kg (lbs)	EZ80 <sup>1</sup> kg (lbs)	ET90 <sup>1</sup> kg (lbs)
Rear weight	376 (823)	376 (823)	267 (589)
FOPS screen	55 (122)	55 (122)	55 (122)
Front Guard	48 (106)	48 (106)	48 (106)
Long stick	24 (53)	21(47)	31 (69)
3rd control circuit with proportional controls	41 (91)	23 (51)	23 (51)
Grab control circuit	16 (36)	23 (51)	23 (51)
Preparing the Powertilt	20 (44)	20 (44)	20 (44)
Quickhitch-ready	11 (25)	16 (36)	16 (36)
Fuel-filling pump	16 (36)	16 (36)	16 (36)
Attachments	<i>– see chapter “Technical data of attachments” on page 9-20</i>		
Full fuel tank	70 (154)		

1. The weight indications for options exclusively refer to Wacker Neuson original accessories.

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## Fields of application and use of attachments

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### **WARNING**

#### **Accident hazard due to unauthorized attachments!**

If unauthorized attachments are used, the vehicle 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.

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### **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**
**Attachments ET65**

<b>ET65 (System Lehnhoff MSWS)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	112 (4.0)	90 (199)	MS03
Bucket	500 (20)	146 (5.2)	102 (225)	MS03
Bucket	600 (24)	180 (6.4)	113 (250)	MS03
Bucket	700 (28)	214 (7.6)	125 (276)	MS03
Bucket	800 (31)	248 (8.8)	138 (305)	MS03
Bucket	900 (35)	282 (10)	146 (322)	MS03
Bucket	400 (16)	112 (4.0)	86 (190)	MS03
Bucket	500 (20)	146 (5.2)	97 (214)	MS03
Bucket	600 (24)	180 (6.4)	107 (236)	MS03
Ditch cleaning bucket	1400 (55)	184 (6.5)	144 (318)	MS03
Bucket	400 (16)	112 (4.0)	92 (203)	MS03
Bucket	500 (20)	146 (5.2)	105 (231)	MS03
Bucket	600 (24)	180 (6.4)	115 (254)	MS03
Bucket	700 (28)	214 (7.6)	127 (280)	MS03
Bucket	800 (31)	248 (8.8)	139 (306)	MS03
Bucket	900 (35)	316 (11.2)	150 (331)	MS03
Bucket	400 (16)	118 (4.2)	86 (190)	MS03
Bucket	500 (20)	152 (5.4)	97 (214)	MS03
Bucket	600 (24)	186 (6.6)	107 (236)	MS03
Ditch cleaning bucket	1400 (55)	184 (6.5)	148 (326)	MS03
Offset bucket	1400 (55)	184 (6.5)	214 (472)	MS03
Ditch cleaning bucket	1400 (55)	233 (8.2)	167 (368)	MS03
Offset bucket	1400 (55)	230 (8.1)	201 (443)	MS03



<b>ET65 (Easy Lock system)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	112 (4.0)	92 (203)	HS06
Bucket	500 (20)	146 (5.2)	109 (241)	HS06
Bucket	600 (24)	180 (6.4)	119 (263)	HS06
Bucket	700 (28)	214 (7.6)	132 (292)	HS06
Bucket	800 (31)	248 (8.8)	145 (320)	HS06
Bucket	900 (35)	282 (10)	153 (338)	HS06
Bucket	400 (16)	112 (4.0)	93 (206)	HS06
Bucket	500 (20)	146 (5.2)	103 (228)	HS06
Bucket	600 (24)	180 (6.4)	114 (252)	HS06
Ditch cleaning bucket	1400 (55)	184 (6.5)	161 (355)	HS06
Bucket	400 (16)	112 (4.0)	104 (229)	HS06
Bucket	500 (20)	146 (5.2)	117 (258)	HS06
Bucket	600 (24)	180 (6.4)	127 (280)	HS06
Bucket	700 (28)	214 (7.6)	140 (309)	HS06
Bucket	800 (31)	248 (8.8)	151 (333)	HS06
Bucket	900 (35)	316 (11.2)	162 (357)	HS06
Bucket	400 (16)	118 (4.2)	98 (216)	HS06
Bucket	500 (20)	152 (5.4)	109 (240)	HS06
Bucket	600 (24)	186 (6.6)	119 (262)	HS06
Ditch cleaning bucket	1400 (55)	184 (6.5)	160 (353)	HS06
Offset bucket	1400 (55)	184 (6.5)	226 (498)	HS06
Ditch cleaning bucket	1400 (55)	233 (8.2)	179 (395)	HS06
Offset bucket	1400 (55)	230 (8.1)	225 (496)	HS06

<b>ET65 accessories</b>	
	<b>Weight kg (lbs)</b>
Easy Lock HS06 3 BGL (perspiration absorption)	88 (195)
Easy Lock HS06 3 BGL + Powertilt	187 (423)
Easy Lock HS06 3 BGL + Powertilt + load hook	192 (412)



<b>ET65 accessories</b>	
	<b>Weight kg (lbs)</b>
Power tilt	101 (223)
Power tilt + load hook	106 (234)
HS06/08-universal receptacle	61 (135)
HS06/08-perspiration absorption	48 (106)
HS06/08-grab receptacle	70 (155)
Lehnhoff quickhitch MS03	42 (93)

**Attachments EZ80**

<b>EZ80 (System Lehnhoff MSWS)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	136 (4.8)	128 (283)	MS08
Bucket	500 (20)	176 (6.2)	142 (314)	MS08
Bucket	600 (24)	218 (7.7)	160 (353)	MS08
Bucket	700 (28)	259 (9.1)	174 (384)	MS08
Bucket	800 (31)	299 (10.6)	188 (415)	MS08
Bucket	900 (35)	339 (12.0)	207 (457)	MS08
Bucket	1000 (40)	380 (13.4)	221 (488)	MS08
Bucket	400 (16)	136 (4.8)	118 (261)	MS08
Bucket	500 (20)	176 (6.2)	132 (292)	MS08
Bucket	600 (24)	218 (7.7)	146 (322)	MS08
Ditch cleaning bucket	1500 (59)	279 (9.9)	214 (472)	MS08

<b>EZ80 (System Easy Lock)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quick- hitch</b>
Bucket	400 (16)	136 (4.8)	126 (278)	HS08
Bucket	500 (20)	176 (6.2)	140 (309)	HS08
Bucket	600 (24)	218 (7.7)	158 (349)	HS08
Bucket	700 (28)	259 (9.1)	172 (380)	HS08
Bucket	800 (31)	299 (10.6)	186 (411)	HS08
Bucket	900 (35)	339 (12.0)	205 (452)	HS08
Bucket	1000 (40)	380 (13.4)	219 (483)	HS08
Bucket	400 (16)	136 (4.8)	116 (256)	HS08
Bucket	500 (20)	176 (6.2)	130 (287)	HS08
Bucket	600 (24)	218 (7.7)	144 (318)	HS08
Ditch cleaning bucket	1500 (59)	279 (9.9)	212 (468)	HS08



<b>EZ80/ET90 (system Lehnhoff MSWS)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	136 (4.8)	132 (291)	MS08
Bucket	500 (20)	176 (6.2)	146 (322)	MS08
Bucket	600 (24)	218 (7.7)	165 (364)	MS08
Bucket	700 (28)	259 (9.1)	180 (397)	MS08
Bucket	800 (31)	299 (10.6)	194 (428)	MS08
Bucket	900 (35)	339 (12.0)	213 (470)	MS08
Bucket	1000 (40)	380 (13.4)	228 (503)	MS08
Bucket	400 (16)	146 (5.2)	124 (273)	MS08
Bucket	500 (20)	186 (6.6)	134 (295)	MS08
Bucket	600 (24)	228 (8.1)	151 (333)	MS08
Ditch cleaning bucket	1500 (59)	250 (8.8)	220 (485)	MS08
Ditch cleaning bucket	1600 (63)	267 (9.4)	336 (741)	MS08
Offset bucket	1500 (59)	250 (8.8)	232 (511)	MS08
Offset bucket	1600 (63)	267 (9.4)	347 (765)	MS08
Ditch cleaning bucket	1500 (59)	276 (9.7)	199 (439)	MS08
Ditch cleaning bucket	1600 (63)	295 (10.4)	210 (463)	MS08
Offset bucket	1500 (59)	279 (9.9)	330 (728)	MS08
Offset bucket	1600 (63)	298 (10.5)	345 (761)	MS08

<b>EZ80/ET90 (Easy Lock system)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	136 (4.8)	129 (284)	HS08
Bucket	500 (20)	176 (6.2)	143 (315)	HS08
Bucket	600 (24)	218 (7.7)	162 (357)	HS08
Bucket	700 (28)	259 (9.1)	177 (390)	HS08
Bucket	800 (31)	299 (10.6)	191 (421)	HS08
Bucket	900 (35)	339 (12.0)	210 (463)	HS08



<b>EZ80-accessories</b>	
	<b>Weight kg (lbs)</b>
Easy Lock HS08 (perspiration absorption)	92 (283)
Easy Lock HS08 + Powertilt	220 (485)
Easy Lock HS08 + Powertilt + load hook	227 (500)
Powertilt	132 (291)
Powertilt + load hook	139 (306)
HS06/08-universal receptacle	61 (135)
HS06/08-perspiration absorption	48 (106)
HS06/08-grab receptacle	70 (155)
Hydraulic hammer kit NE36	365 (772)
Lehnhoff quickhitch MS08	75 (166)


**Attachments ET90**

<b>ET90 (system Lehnhoff MSWS)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	164 (5.8)	145 (320)	MS08
Bucket	500 (20)	213 (7.5)	163 (360)	MS08
Bucket	600 (24)	263 (9.3)	187 (413)	MS08
Bucket	700 (28)	312 (11)	203 (448)	MS08
Bucket	800 (31)	396 (14)	219 (483)	MS08
Bucket	900 (35)	451 (16)	247 (545)	MS08
Bucket	1000 (40)	460 (16.2)	264 (583)	MS08
Bucket	400 (16)	164 (5.8)	136 (300)	MS08
Bucket	500 (20)	213 (7.5)	149 (329)	MS08
Bucket	600 (24)	263 (9.3)	165 (364)	MS08
Ditch cleaning bucket	1500 (59)	300 (10.6)	240 (530)	MS08
Bucket	400 (16)	164 (5.8)	148 (326)	MS08
Bucket	500 (20)	213 (7.5)	164 (362)	MS08
Bucket	600 (24)	263 (9.3)	184 (406)	MS08
Bucket	700 (28)	313 (11.1)	195 (430)	MS08
Bucket	800 (31)	362 (12.8)	218 (481)	MS08
Bucket	900 (35)	411 (14.5)	239 (527)	MS08
Bucket	1000 (40)	460 (16.2)	256 (564)	MS08
Bucket	400 (16)	171 (6)	136 (300)	MS08
Bucket	500 (20)	223 (7.9)	152 (335)	MS08
Bucket	600 (24)	275 (9.7)	170 (375)	MS08
Ditch cleaning bucket	1500 (59)	300 (10.6)	244 (538)	MS08
Ditch cleaning bucket	1600 (63)	320 (11.3)	257 (567)	MS08
Offset bucket	1500 (59)	300 (10.6)	356 (785)	MS08
Offset bucket	1600 (63)	320 (11.3)	367 (809)	MS08
Ditch cleaning bucket	1500 (59)	316 (11.2)	252 (556)	MS08
Ditch cleaning bucket	1600 (63)	338 (11.9)	265 (584)	MS08
Offset bucket	1500 (59)	317 (11.2)	340 (750)	MS08
Offset bucket	1600 (63)	339 (12)	356 (785)	MS08



<b>ET90 (system Easy Lock)</b>				
<b>Bucket type</b>	<b>Width mm (in)</b>	<b>Capacity L (ft<sup>3</sup>)</b>	<b>Weight kg (lbs)</b>	<b>Quickhitch</b>
Bucket	400 (16)	164 (5.8)	139 (307)	HS08
Bucket	500 (20)	213 (7.5)	157 (347)	HS08
Bucket	600 (24)	263 (9.3)	177 (391)	HS08
Bucket	700 (28)	312 (11)	194 (428)	HS08
Bucket	800 (31)	396 (14)	210 (463)	HS08
Bucket	900 (35)	451 (16)	230 (508)	HS08
Bucket	1000 (40)	460 (16.2)	247 (545)	HS08
Bucket	400 (16)	164 (5.8)	129 (285)	HS08
Bucket	500 (20)	213 (7.5)	147 (325)	HS08
Bucket	600 (24)	263 (9.3)	164 (362)	HS08
Ditch cleaning bucket	1500 (59)	300 (10.6)	238 (525)	HS08
Bucket	1000 (40)	380 (13.4)	225 (496)	HS08
Bucket	400 (16)	146 (5.2)	121 (267)	HS08
Bucket	500 (20)	186 (6.6)	131 (289)	HS08
Bucket	600 (24)	228 (8.1)	148 (326)	HS08
Ditch cleaning bucket	1500 (59)	250 (8.8)	218 (481)	HS08
Ditch cleaning bucket	1600 (63)	267 (9.4)	333 (734)	HS08
Offset bucket	1500 (59)	250 (8.8)	230 (507)	HS08
Offset bucket	1600 (63)	267 (9.4)	344 (758)	HS08
Ditch cleaning bucket	1500 (59)	276 (9.7)	197 (434)	HS08
Ditch cleaning bucket	1600 (63)	295 (10.4)	208 (459)	HS08
Offset bucket	1500 (59)	279 (9.9)	328 (723)	HS08
Offset bucket	1600 (63)	298 (10.5)	343 (756)	HS08
Bucket	400 (16)	164 (5.8)	145 (320)	HS08
Bucket	500 (20)	213 (7.5)	151 (333)	HS08
Bucket	600 (24)	263 (9.3)	181 (399)	HS08
Bucket	700 (28)	313 (11.1)	192 (423)	HS08
Bucket	800 (31)	362 (12.8)	215 (474)	HS08
Bucket	900 (35)	411 (14.5)	236 (520)	HS08
Bucket	1000 (40)	460 (16.2)	253 (558)	HS08

ET90 (system Easy Lock)				
Bucket type	Width mm (in)	Capacity L (ft <sup>3</sup> )	Weight kg (lbs)	Quickhitch
Bucket	400 (16)	171 (6)	133 (293)	HS08
Bucket	500 (20)	223 (7.9)	149 (328)	HS08
Bucket	600 (24)	275 (9.7)	167 (368)	HS08
Ditch cleaning bucket	1500 (59)	300 (10.6)	242 (534)	HS08
Ditch cleaning bucket	1600 (63)	320 (11.3)	354 (780)	HS08
Offset bucket	1500 (59)	300 (10.6)	356 (562)	HS08
Offset bucket	1600 (63)	320 (11.3)	365 (805)	HS08
Ditch cleaning bucket	1500 (59)	316 (11.2)	251 (553)	HS08
Ditch cleaning bucket	1600 (63)	338 (11.9)	264 (582)	HS08
Offset bucket	1500 (59)	317 (11.2)	339 (747)	HS08
Offset bucket	1600 (63)	339 (12)	364 (802)	HS08

ET90 accessories	
	Weight kg (lbs)
Easy Lock HS08 3 BGL (perspiration absorption)	93 (205)
Easy Lock HS08 3 BGL + Powertilt	225 (496)
Easy Lock HS08 3 BGL + Powertilt + load hook	231 (509)
Powertilt	136 (300)
Powertilt + load hook	143 (315)
HS06/08-universal receptacle	61 (135)
HS06/08-perspiration absorption	48 (106)
HS06/08-grab receptacle	70 (155)
Hydraulic hammer kit NE36	365 (772)
Lehnhoff quickhitch MS08	75 (166)

**Excavator power**

	<b>ET65</b>
Max. tearout force (short stick)	30.8 kN (6924 lbf)
Max. tearout force (long stick)	27.4 kN (6160 lbf)
Max. breakout force (at bucket tooth) <sup>1</sup>	46 kN (10,341 lbf)
Max. breakout force (at bucket tooth) <sup>2</sup>	50.7 kN (11,398 lbf)

	<b>EZ80</b>
Max. tearout force (short stick)	43.7 kN (9824 lbf)
Max. tearout force (long stick)	40 kN (8992 lbf)
Max. breakout force (at bucket tooth) <sup>1</sup>	64.7 kN (14,545 lbf)
Max. breakout force (at bucket tooth) <sup>2</sup>	68 kN (15,287)

	<b>ET90</b>
Max. tearout force (short stick)	46 kN (10,341 lbf)
Max. tearout force (long stick)	41.5 kN (9330 lbf)
Max. breakout force (at bucket tooth) <sup>1</sup>	70.4 kN (15,827 lbf)
Max. breakout force (at bucket tooth) <sup>2</sup>	73.8 kN (16,591 lbf)

1. According to DIN 24086
2. According to ISO 6015

## 9.14 Lift capacity/load

### Safety instructions lift capacity tables

Observe the values of the lift capacity tables in normal operation (for example excavating).

Observe the values of the load diagrams in lifting gear applications.

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#### **DANGER**

##### **Crushing hazard due to tipping over of vehicle!**

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

- ▶ 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 weights indicated in the lift capacity tables.
- 

#### **NOTICE**

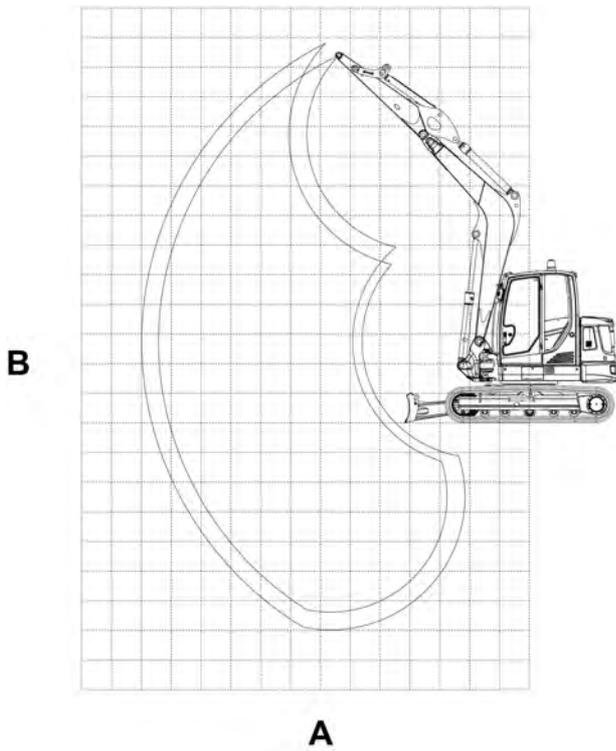
If the weight is exceeded, there is a risk of damage to property if the vehicle tips over.

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

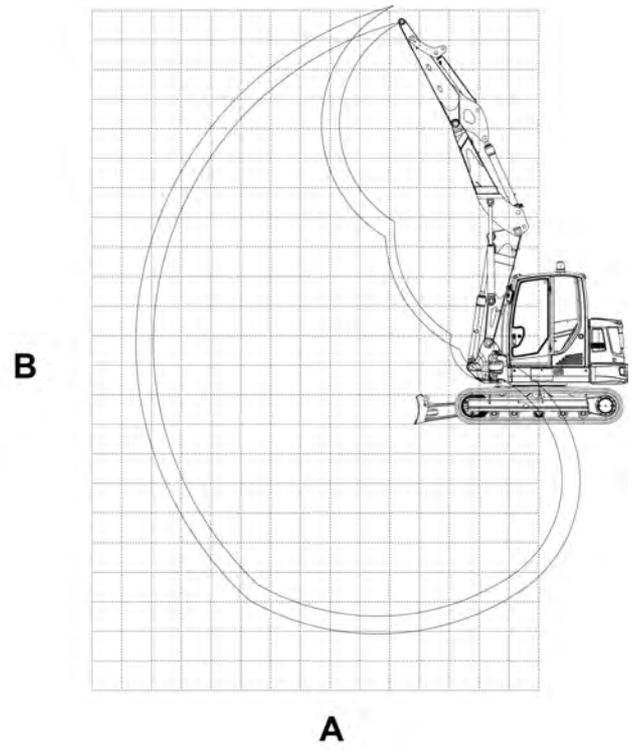
#### **Information**

The indications are only approximate values. Uneven ground or poor ground conditions affect vehicle stability. The operator must take these influences into account.

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One-piece boom



Triple articulation boom

Designation	Explanation
A	Reach from live ring center
B	Load hook height
max	Authorized lift capacity with horizontal boom
I	Machine in travel direction with stabilizer blade, tipping with the help of stabilizer blade
II	Machine 90° to travel direction without stabilizer blade
III	Machine in travel direction without stabilizer blade, tipping with the help of front axle

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 vehicle'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:

ET65: 24 000 kPA (3481 psi)

EZ80: 30 000 kPA (4351 psi)

ET90: 30 000 kPA (4351 psi)

The lift capacity applies to vehicles under the following conditions:

- Lubricants and engine/vehicle fluids at the mandatory levels
- Full fuel tank
- Cab
- Machine at operating temperature
- Operator weight 75 kg (165 lbs)

## Lift capacity tables ET65

### 01 Monobloc boom/rubber tracks/short stick

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1244 (2,744)	1067 (2,354)	1244 (2,744)	-	-	-	1291 (2,847)	959 (2,116)	1159 (2,555)
3 m (9' - 10")	-	-	-	-	-	-	1264 (2,786)	1054 (2,323)	1264 (2,786)	-	-	-	1280 (2,823)	746 (1,645)	903 (1,992)
2 m (6' - 7")	-	-	-	1879 (4,142)	1562 (3,445)	1879 (4,142)	1474 (3,251)	1001 (2,207)	1219 (2,687)	1313 (2,896)	699 (1,541)	849 (1,872)	1301 (2,870)	653 (1,439)	794 (1,750)
1 m (3' - 3")	-	-	-	2549 (5,621)	1412 (3,114)	1774 (3,912)	1738 (3,831)	938 (2,068)	1152 (2,539)	1401 (3,089)	673 (1,484)	822 (1,813)	1339 (2,953)	618 (1,363)	755 (1,665)
0 m (0' - 0")	-	-	-	2856 (6,298)	1332 (2,937)	1687 (3,719)	1908 (4,206)	891 (1,965)	1103 (2,431)	1441 (3,178)	653 (1,440)	801 (1,767)	1387 (3,059)	630 (1,389)	773 (1,704)
-1 m (-3' - 3")	4672 (10,302)	2549 (5,619)	3466 (7,643)	2766 (6,099)	1315 (2,900)	1669 (3,679)	1878 (4,141)	876 (1,931)	1086 (2,395)	-	-	-	1437 (3,169)	703 (1,550)	864 (1,906)
-2 m (-6' - 7")	3643 (8,033)	2612 (5,760)	3541 (7,808)	2275 (5,015)	1344 (2,963)	1699 (3,747)	-	-	-	-	-	-	1456 (3,211)	912 (2,011)	1126 (2,484)

### 02 Monobloc boom/rubber tracks/long stick

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1060 (2,338)	1060 (2,338)	1060 (2,338)	-	-	-	1165 (2,570)	837 (1,846)	1011 (2,230)
3 m (9' - 10")	-	-	-	-	-	-	1115 (2,458)	1065 (2,348)	1115 (2,458)	1149 (2,533)	720 (1,587)	872 (1,922)	1168 (2,574)	670 (1,478)	813 (1,793)
2 m (6' - 7")	-	-	-	1621 (3,575)	1596 (3,519)	1621 (3,575)	1341 (2,957)	1009 (2,225)	1228 (2,708)	1215 (2,679)	699 (1,542)	850 (1,875)	1192 (2,629)	592 (1,305)	722 (1,593)
1 m (3' - 3")	-	-	-	2350 (5,182)	1431 (3,155)	1799 (3,966)	1633 (3,601)	936 (2,064)	1155 (2,546)	1332 (2,937)	668 (1,473)	817 (1,802)	1231 (2,714)	561 (1,238)	688 (1,518)
0 m (0' - 0")	5419 (11,948)	2497 (5,506)	3409 (7,517)	2784 (6,138)	1330 (2,932)	1686 (3,717)	1852 (4,084)	885 (1,950)	1096 (2,418)	1417 (3,123)	641 (1,414)	790 (1,741)	1279 (2,820)	569 (1,255)	701 (1,545)
-1 m (-3' - 3")	5007 (11,041)	2502 (5,516)	3414 (7,529)	2812 (6,201)	1296 (2,857)	1649 (3,636)	1894 (4,176)	859 (1,893)	1069 (2,357)	1360 (2,999)	633 (1,397)	781 (1,723)	1332 (2,936)	625 (1,379)	771 (1,701)
-2 m (-6' - 7")	4125 (9,096)	2554 (5,631)	3476 (7,664)	2461 (5,427)	1310 (2,890)	1665 (3,671)	1639 (3,615)	869 (1,916)	1080 (2,382)	-	-	-	1373 (3,028)	778 (1,715)	961 (2,119)

### 03 Monobloc boom/rubber tracks/rear weight/short stick

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1244 (2,744)	1244 (2,744)	1244 (2,744)	-	-	-	1291 (2,847)	1136 (2,505)	1291 (2,847)
3 m (9' - 10")	-	-	-	-	-	-	1264 (2,786)	1244 (2,742)	1264 (2,786)	-	-	-	1280 (2,823)	895 (1,974)	1071 (2,362)
2 m (6' - 7")	-	-	-	1879 (4,142)	1839 (4,056)	1879 (4,142)	1474 (3,251)	1191 (2,626)	1436 (3,165)	1313 (2,896)	843 (1,860)	1012 (2,231)	1301 (2,870)	790 (1,743)	949 (2,092)
1 m (3' - 3")	-	-	-	2549 (5,621)	1658 (3,656)	2099 (4,629)	1738 (3,831)	1098 (2,421)	1369 (3,018)	1401 (3,089)	817 (1,802)	985 (2,172)	1339 (2,953)	753 (1,661)	907 (2,000)
0 m (0' - 0")	-	-	-	2856 (6,298)	1609 (3,548)	2012 (4,436)	1908 (4,206)	1081 (2,384)	1320 (2,910)	1441 (3,178)	798 (1,759)	964 (2,126)	1387 (3,059)	770 (1,698)	930 (2,051)
-1 m (-3' - 3")	4672 (10,302)	3062 (6,751)	4116 (9,076)	2766 (6,099)	1592 (3,511)	1994 (4,397)	1878 (4,141)	1065 (2,349)	1303 (2,873)	-	-	-	1437 (3,169)	857 (1,890)	1039 (2,290)
-2 m (-6' - 7")	3643 (8,033)	3125 (6,891)	3643 (8,033)	2275 (5,015)	1621 (3,574)	2025 (4,465)	-	-	-	-	-	-	1456 (3,211)	1103 (2,433)	1345 (2,966)

**04 Monobloc boom/rubber tracks/rear weight/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1060	936	1060	-	-	-	1165	997
3 m (9' - 10")	-	-	-	-	-	-	1115	1115	1115	1149	864	1034	1168	808	969
2 m (6' - 7")	-	-	-	1621	1431	1621	1341	1199	1341	1215	844	1013	1192	721	867
1 m (3' - 3")	-	-	-	2350	1711	2124	1633	1130	1372	1332	812	980	1231	688	831
0 m (0' - 0")	5419	3010	4059	2784	1607	2011	1852	1074	1313	1417	786	952	1279	700	848
-1 m (-3' - 3")	5007	3015	4064	2812	1573	1974	1894	1049	1286	1360	778	944	1332	768	932
-2 m (-6' - 7")	4125	3067	4125	2461	1588	1990	1639	1059	1297	-	-	-	1373	948	1154
	(9,096)	(6,762)	(9,096)	(5,427)	(3,501)	(4,388)	(3,615)	(2,335)	(2,860)	-	-	-	(3,028)	(2,090)	(2,546)

**05 Monobloc boom/steel or hybrid tracks/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1244	1074	1244	-	-	-	1291	965
3 m (9' - 10")	-	-	-	-	-	-	1264	1060	1264	-	-	-	1280	751	910
2 m (6' - 7")	-	-	-	1879	1571	1879	1474	1007	1227	1313	704	855	1301	657	800
1 m (3' - 3")	-	-	-	2549	1422	1786	1738	944	1160	1401	678	828	1339	622	761
0 m (0' - 0")	-	-	-	2856	1341	1699	1908	898	1111	1441	658	807	1387	635	778
-1 m (-3' - 3")	4672	2565	3490	2766	1324	1681	1878	882	1094	-	-	-	1437	708	871
-2 m (-6' - 7")	3643	2629	3565	2275	1353	1711	-	-	-	-	-	-	1456	918	1134
	(8,033)	(5,797)	(7,860)	(5,015)	(2,983)	(3,774)	-	-	-	-	-	-	(3,211)	(2,025)	(2,501)

**06 Monobloc boom/steel or hybrid tracks/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1060	1060	1060	-	-	-	1165	842
3 m (9' - 10")	-	-	-	-	-	-	1115	1071	1115	1149	724	878	1168	675	819
2 m (6' - 7")	-	-	-	1621	1605	1621	1341	1015	1236	1215	704	856	1192	596	728
1 m (3' - 3")	-	-	-	2350	1443	1811	1633	946	1163	1332	673	823	1231	565	694
0 m (0' - 0")	5419	2514	3433	2784	1339	1698	1852	891	1104	1417	646	796	1279	574	706
-1 m (-3' - 3")	5007	2518	3438	2812	1305	1661	1894	865	1077	1360	638	787	1332	630	777
-2 m (-6' - 7")	4125	2571	3499	2461	1320	1677	1639	875	1088	-	-	-	1373	783	968
	(9,096)	(5,668)	(7,716)	(5,427)	(2,910)	(3,697)	(3,615)	(1,930)	(2,399)	-	-	-	(3,028)	(1,727)	(2,135)



**07 Monobloc boom/steel or hybrid tracks/rear weight/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	1244	1244	1244	-	-	-	1291	1142	1291
(13' - 1")	-	-	-	-	-	-	(2,744)	(2,744)	(2,744)	-	-	-	(2,847)	(2,518)	(2,847)
3 m	-	-	-	-	-	-	1264	1250	1264	-	-	-	1280	900	1078
(9' - 10")	-	-	-	-	-	-	(2,786)	(2,756)	(2,786)	-	-	-	(2,823)	(1,984)	(2,376)
2 m	-	-	-	1879	1848	1879	1474	1197	1444	1313	848	1018	1301	795	955
(6' - 7")	-	-	-	(4,142)	(4,076)	(4,142)	(3,251)	(2,640)	(3,183)	(2,896)	(1,870)	(2,244)	(2,870)	(1,753)	(2,105)
1 m	-	-	-	2549	1699	2111	1738	1134	1377	1401	822	991	1339	758	913
(3' - 3")	-	-	-	(5,621)	(3,746)	(4,656)	(3,831)	(2,500)	(3,035)	(3,089)	(1,813)	(2,185)	(2,953)	(1,671)	(2,013)
0 m	-	-	-	2856	1618	2024	1908	1087	1328	1441	802	970	1387	775	936
(0' - 0")	-	-	-	(6,298)	(3,568)	(4,463)	(4,206)	(2,398)	(2,927)	(3,178)	(1,769)	(2,139)	(3,059)	(1,708)	(2,064)
-1 m	4672	3078	4140	2766	1602	2006	1878	1072	1311	-	-	-	1437	862	1045
-(3' - 3")	(10,302)	(6,788)	(9,129)	(6,099)	(3,531)	(4,423)	(4,141)	(2,363)	(2,891)	-	-	-	(3,169)	(1,902)	(2,305)
-2 m	3643	3142	3643	2275	1630	2037	-	-	-	-	-	-	1456	1110	1353
-(6' - 7")	(8,033)	(6,928)	(8,033)	(5,015)	(3,594)	(4,491)	-	-	-	-	-	-	(3,211)	(2,447)	(2,984)

**08 Monobloc boom/steel or hybrid tracks/rear weight/long stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	1060	1060	1060	-	-	-	1165	1002	1165
(13' - 1")	-	-	-	-	-	-	(2,338)	(2,338)	(2,338)	-	-	-	(2,570)	(2,210)	(2,570)
3 m	-	-	-	-	-	-	1115	1115	1115	1149	869	1040	1168	813	975
(9' - 10")	-	-	-	-	-	-	(2,458)	(2,458)	(2,458)	(2,533)	(1,916)	(2,294)	(2,574)	(1,793)	(2,149)
2 m	-	-	-	1621	1621	1621	1341	1205	1341	1215	848	1019	1192	725	873
(6' - 7")	-	-	-	(3,575)	(3,575)	(3,575)	(2,957)	(2,657)	(2,957)	(2,679)	(1,871)	(2,247)	(2,629)	(1,600)	(1,924)
1 m	-	-	-	2350	1720	2136	1633	1136	1380	1332	817	986	1231	693	836
(3' - 3")	-	-	-	(5,182)	(3,792)	(4,710)	(3,601)	(2,505)	(3,042)	(2,937)	(1,801)	(2,175)	(2,714)	(1,527)	(1,844)
0 m	5419	3027	4083	2784	1616	2023	1852	1081	1321	1417	790	958	1279	705	853
(0' - 0")	(11,948)	(6,675)	(9,003)	(6,138)	(3,563)	(4,460)	(4,084)	(2,383)	(2,914)	(3,123)	(1,743)	(2,113)	(2,820)	(1,553)	(1,881)
-1 m	5007	3031	4088	2812	1582	1986	1894	1055	1294	1360	782	950	1332	773	938
-(3' - 3")	(11,041)	(6,684)	(9,014)	(6,201)	(3,488)	(4,380)	(4,176)	(2,326)	(2,853)	(2,999)	(1,725)	(2,095)	(2,936)	(1,704)	(2,068)
-2 m	4125	3084	4125	2461	1597	2002	1639	1065	1305	-	-	-	1373	953	1162
-(6' - 7")	(9,096)	(6,799)	(9,096)	(5,427)	(3,521)	(4,415)	(3,615)	(2,349)	(2,878)	-	-	-	(3,028)	(2,102)	(2,561)

09 Triple boom/rubber tracks/short stick

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	1230	1042	1230	-	-	-	1212	754	926
(13' - 1")	-	-	-	-	-	-	(2,712)	(2,297)	(2,712)	-	-	-	(2,673)	(1,663)	(2,043)
3 m	-	-	-	1580	1580	1580	1308	1002	1230	1168	669	825	1150	597	740
(9' - 10")	-	-	-	(3,484)	(3,484)	(3,484)	(2,883)	(2,210)	(2,712)	(2,574)	(1,476)	(1,820)	(2,535)	(1,316)	(1,631)
2 m	2751	2751	2751	2090	1433	1811	1489	923	1145	1219	639	794	1121	521	652
(6' - 7")	(6,066)	(6,066)	(6,066)	(4,607)	(3,160)	(3,993)	(3,284)	(2,035)	(2,526)	(2,688)	(1,409)	(1,750)	(2,472)	(1,149)	(1,438)
1 m	4597	2508	3447	2516	1241	1602	1665	838	1056	1279	600	753	1105	491	618
(3' - 3")	(10,135)	(5,529)	(7,601)	(5,549)	(2,736)	(3,532)	(3,672)	(1,847)	(2,328)	(2,819)	(1,322)	(1,660)	(2,435)	(1,082)	(1,363)
0 m	4632	2297	3200	2539	1163	1518	1724	781	996	1279	571	722	1086	496	628
(0' - 0")	(10,213)	(5,064)	(7,056)	(5,598)	(2,564)	(3,346)	(3,800)	(1,722)	(2,195)	(2,820)	(1,258)	(1,593)	(2,395)	(1,095)	(1,385)
-1 m	3240	2305	3210	2273	1156	1510	1605	763	976	1131	566	717	1047	547	693
(-3' - 3")	(7,145)	(5,083)	(7,079)	(5,012)	(2,548)	(3,329)	(3,539)	(1,682)	(2,153)	(2,494)	(1,247)	(1,582)	(2,308)	(1,207)	(1,527)
-2 m	2363	2363	2363	1744	1191	1549	1227	786	1000	-	-	-	937	685	865
(-6' - 7")	(5,210)	(5,210)	(5,210)	(3,846)	(2,627)	(3,414)	(2,705)	(1,732)	(2,206)	-	-	-	(2,065)	(1,510)	(1,907)

10 Triple boom/rubber tracks/long stick

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	1109	1062	1109	1095	683	840	1099	663	817
(13' - 1")	-	-	-	-	-	-	(2,445)	(2,342)	(2,445)	(2,414)	(1,505)	(1,852)	(2,423)	(1,462)	(1,802)
3 m	-	-	-	-	-	-	1200	1020	1200	1086	678	835	1053	535	667
(9' - 10")	-	-	-	-	-	-	(2,645)	(2,248)	(2,645)	(2,396)	(1,495)	(1,842)	(2,322)	(1,180)	(1,471)
2 m	-	-	-	1895	1484	1867	1394	937	1161	1157	642	797	1032	471	593
(6' - 7")	-	-	-	(4,179)	(3,272)	(4,118)	(3,075)	(2,066)	(2,561)	(2,551)	(1,415)	(1,758)	(2,276)	(1,038)	(1,307)
1 m	4277	2550	3500	2401	1271	1636	1600	844	1063	1238	597	751	1021	443	562
(3' - 3")	(9,432)	(5,623)	(7,718)	(5,295)	(2,802)	(3,607)	(3,527)	(1,861)	(2,345)	(2,729)	(1,316)	(1,655)	(2,251)	(977)	(1,240)
0 m	4754	2237	3133	2550	1160	1515	1703	776	991	1271	561	713	1009	446	569
(0' - 0")	(10,483)	(4,933)	(6,909)	(5,623)	(2,557)	(3,341)	(3,755)	(1,710)	(2,185)	(2,802)	(1,237)	(1,572)	(2,226)	(984)	(1,254)
-1 m	3757	2235	3130	2376	1132	1486	1642	746	959	1190	545	697	984	486	619
(-3' - 3")	(8,284)	(4,927)	(6,902)	(5,238)	(2,497)	(3,276)	(3,621)	(1,645)	(2,116)	(2,625)	(1,203)	(1,537)	(2,169)	(1,071)	(1,365)
-2 m	2874	2300	2874	1936	1155	1510	1361	755	969	-	-	-	911	589	749
(-6' - 7")	(6,338)	(5,072)	(6,338)	(4,269)	(2,546)	(3,330)	(3,001)	(1,665)	(2,137)	-	-	-	(2,009)	(1,300)	(1,651)

11 Triple boom/rubber tracks/rear weight/short stick

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	1230	1230	1230	-	-	-	1212,2	909	1102
(13' - 1")	-	-	-	-	-	-	(2,712)	(2,712)	(2,712)	-	-	-	(2,673)	(2,005)	(2,430)
3 m	-	-	-	1580	1580	1580	1308	1192	1308	1168	814	988	1150	732	892
(9' - 10")	-	-	-	(3,484)	(3,484)	(3,484)	(2,883)	(2,629)	(2,883)	(2,574)	(1,794)	(2,179)	(2,535)	(1,614)	(1,967)
2 m	2751	2751	2751	2090	1710	2090	1489	1113	1362	1219	783	956	1121	648	794
(6' - 7")	(6,066)	(6,066)	(6,066)	(4,607)	(3,771)	(4,607)	(3,284)	(2,453)	(3,004)	(2,688)	(1,727)	(2,109)	(2,472)	(1,429)	(1,752)
1 m	4597	3021	4097	2516	1518	1927	1665	1028	1273	1279	744	916	1105	615	758
(3' - 3")	(10,135)	(6,661)	(9,034)	(5,549)	(3,347)	(4,250)	(3,672)	(2,266)	(2,806)	(2,819)	(1,641)	(2,019)	(2,435)	(1,357)	(1,672)
0 m	4632	2810	3850	2539	1440	1843	1724	971	1213	1279	715	885	1086	625	772
(0' - 0")	(10,213)	(6,195)	(8,489)	(5,598)	(3,175)	(4,064)	(3,800)	(2,141)	(2,674)	(2,820)	(1,577)	(1,952)	(2,395)	(1,378)	(1,703)
-1 m	3240	2818	3240	2273	1433	1835	1605	953	1193	1131	710	880	1047	687	850
(-3' - 3")	(7,145)	(6,215)	(7,145)	(5,012)	(3,159)	(4,046)	(3,539)	(2,100)	(2,631)	(2,494)	(1,566)	(1,941)	(2,308)	(1,514)	(1,873)
-2 m	2363	2363	2363	1744	1469	1744	1227	976	1217	-	-	-	937	850	937
(-6' - 7")	(5,210)	(5,210)	(5,210)	(3,846)	(3,238)	(3,846)	(2,705)	(2,151)	(2,684)	-	-	-	(2,065)	(1,873)	(2,065)

**12 Triple boom/rubber tracks/rear weight/long stick**

A \ B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1109 (2,445)	1109 (2,445)	1109 (2,445)	1095 (2,414)	827 (1,823)	1003 (2,211)	1099 (2,423)	805 (1,776)	978 (2,156)
3 m (9' - 10")	-	-	-	-	-	-	1200 (2,645)	1200 (2,645)	1200 (2,645)	1086 (2,396)	822 (1,813)	998 (2,201)	1053 (2,322)	662 (1,459)	809 (1,784)
2 m (6' - 7")	-	-	-	1895 (4,179)	1761 (3,883)	1895 (4,179)	1394 (3,075)	1127 (2,485)	1378 (3,039)	1157 (2,551)	786 (1,733)	960 (2,117)	1032 (2,276)	590 (1,302)	726 (1,602)
1 m (3' - 3")	4277 (9,432)	3063 (6,755)	4150 (9,151)	2401 (5,295)	1548 (3,413)	1961 (4,325)	1600 (3,527)	1034 (2,280)	1280 (2,823)	1238 (2,729)	741 (1,635)	913 (2,014)	1021 (2,251)	561 (1,237)	694 (1,531)
0 m (0' - 0")	4754 (10,483)	2750 (6,064)	3783 (8,342)	2550 (5,623)	1437 (3,168)	1841 (4,059)	1703 (3,755)	966 (2,129)	1208 (2,664)	1271 (2,802)	705 (1,555)	876 (1,931)	1009 (2,226)	567 (1,251)	704 (1,553)
-1 m (-3' - 3")	3757 (8,284)	2748 (6,059)	3757 (8,284)	2376 (5,238)	1410 (3,108)	1811 (3,994)	1642 (3,621)	936 (2,063)	1176 (2,594)	1190 (2,625)	690 (1,521)	860 (1,896)	984 (2,169)	615 (1,357)	765 (1,686)
-2 m (-6' - 7")	2874 (6,338)	2813 (6,203)	2874 (6,338)	1936 (4,269)	1432 (3,157)	1835 (4,047)	1361 (3,001)	945 (2,084)	1186 (2,615)	-	-	-	911 (2,009)	739 (1,630)	911 (2,009)

**13 Triple boom/steel or hybrid tracks/short stick**

A \ B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1230 (2,712)	1048 (2,311)	1230 (2,712)	-	-	-	1212 (2,673)	759 (1,674)	933 (2,057)
3 m (9' - 10")	-	-	-	1580 (3,484)	1580 (3,484)	1580 (3,484)	1308 (2,883)	1009 (2,224)	1238 (2,729)	1168 (2,574)	674 (1,486)	831 (1,833)	1150 (2,535)	601 (1,326)	745 (1,643)
2 m (6' - 7")	2751 (6,066)	2751 (6,066)	2751 (6,066)	2090 (4,607)	1442 (3,180)	1823 (4,020)	1489 (3,284)	929 (2,048)	1153 (2,543)	1219 (2,688)	644 (1,419)	800 (1,763)	1121 (2,472)	525 (1,158)	657 (1,449)
1 m (3' - 3")	4597 (10,135)	2524 (5,566)	3471 (7,654)	2516 (5,549)	1250 (2,756)	1614 (3,559)	1665 (3,672)	844 (1,861)	1064 (2,345)	1279 (2,819)	604 (1,333)	759 (1,673)	1105 (2,435)	495 (1,091)	623 (1,375)
0 m (0' - 0")	4632 (10,213)	2314 (5,101)	3224 (7,109)	2539 (5,598)	1172 (2,584)	1530 (3,373)	1724 (3,800)	787 (1,736)	1004 (2,213)	1279 (2,820)	575 (1,269)	728 (1,606)	1086 (2,395)	501 (1,104)	633 (1,397)
-1 m (-3' - 3")	3240 (7,145)	2322 (5,120)	3234 (7,131)	2273 (5,012)	1165 (2,568)	1522 (3,355)	1605 (3,539)	769 (1,695)	984 (2,170)	1131 (2,494)	570 (1,258)	723 (1,595)	1047 (2,308)	552 (1,217)	698 (1,540)
-2 m (-6' - 7")	2363 (5,210)	2363 (5,210)	2363 (5,210)	1744 (3,846)	1201 (2,647)	1560 (3,441)	1227 (2,705)	792 (1,746)	1008 (2,224)	-	-	-	937 (2,065)	690 (1,521)	872 (1,922)

**14 Triple boom/steel or hybrid tracks/long stick**

A \ B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1109 (2,445)	1068 (2,356)	1109 (2,445)	1095 (2,414)	687 (1,515)	846 (1,865)	1099 (2,423)	668 (1,472)	823 (1,815)
3 m (9' - 10")	-	-	-	-	-	-	1200 (2,645)	1026 (2,262)	1200 (2,645)	1086 (2,396)	683 (1,506)	841 (1,855)	1053 (2,322)	539 (1,190)	672 (1,482)
2 m (6' - 7")	-	-	-	1895 (4,179)	1493 (3,292)	1879 (4,144)	1394 (3,075)	943 (2,080)	1169 (2,579)	1157 (2,551)	647 (1,426)	803 (1,772)	1032 (2,276)	475 (1,047)	598 (1,318)
1 m (3' - 3")	4277 (9,432)	2567 (5,660)	3524 (7,771)	2401 (5,295)	1280 (2,822)	1648 (3,634)	1600 (3,527)	850 (1,875)	1071 (2,362)	1238 (2,729)	602 (1,327)	757 (1,668)	1021 (2,251)	447 (986)	567 (1,251)
0 m (0' - 0")	4754 (10,483)	2254 (4,970)	3157 (6,961)	2550 (5,623)	1169 (2,577)	1527 (3,368)	1703 (3,755)	782 (1,724)	999 (2,203)	1271 (2,802)	566 (1,247)	719 (1,585)	1009 (2,226)	450 (993)	574 (1,265)
-1 m (-3' - 3")	3757 (8,284)	2251 (4,964)	3154 (6,955)	2376 (5,238)	1142 (2,517)	1498 (3,303)	1642 (3,621)	752 (1,658)	967 (2,133)	1190 (2,625)	550 (1,213)	703 (1,550)	984 (2,169)	490 (1,080)	624 (1,377)
-2 m (-6' - 7")	2874 (6,338)	2317 (5,109)	2874 (6,338)	1936 (4,269)	1164 (2,566)	1522 (3,356)	1361 (3,001)	761 (1,679)	977 (2,154)	-	-	-	911 (2,009)	594 (1,310)	755 (1,665)

15 Triple boom/steel or hybrid tracks/rear weight/short stick

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	1230	1230	1230	-	-	-	1212	914	1108
(13' - 1")	-	-	-	-	-	-	(2,712)	(2,712)	(2,712)	-	-	-	(2,673)	(2,016)	(2,444)
3 m	-	-	-	1580	1580	1580	1308	1199	1308	1168	818	994	1150	737	897
(9' - 10")	-	-	-	(3,484)	(3,484)	(3,484)	(2,883)	(2,643)	(2,883)	(2,574)	(1,805)	(2,192)	(2,535)	(1,624)	(1,979)
2 m	2751	2751	2751	2090	1719	2090	1489	1119	1370	1219	788	962	1121	652	800
(6' - 7")	(6,066)	(6,066)	(6,066)	(4,607)	(3,791)	(4,607)	(3,284)	(2,467)	(3,022)	(2,688)	(1,738)	(2,122)	(2,472)	(1,438)	(1,763)
1 m	4597	3038	4121	2516	1527	1939	1665	1034	1281	1279	749	922	1105	620	763
(3' - 3")	(10,135)	(6,698)	(9,087)	(5,549)	(3,367)	(4,276)	(3,672)	(2,280)	(2,824)	(2,819)	(1,651)	(2,032)	(2,435)	(1,366)	(1,683)
0 m	4632	2827	3874	2539	1449	1855	1724	977	1221	1279	720	891	1086	629	778
(0' - 0")	(10,213)	(6,233)	(8,542)	(5,598)	(3,196)	(4,090)	(3,800)	(2,155)	(2,691)	(2,820)	(1,587)	(1,965)	(2,395)	(1,387)	(1,715)
-1 m	3240	2835	3240	2273	1442	1847	1605	959	1201	1131	715	886	1047	691	855
(-3' - 3")	(7,145)	(6,252)	(7,145)	(5,012)	(3,179)	(4,072)	(3,539)	(2,114)	(2,649)	(2,494)	(1,576)	(1,954)	(2,308)	(1,524)	(1,886)
-2 m	2363	2363	2363	1744	1478	1744	1227	982	1225	-	-	-	937	855	937
(-6' - 7")	(5,210)	(5,210)	(5,210)	(3,846)	(3,258)	(3,846)	(2,705)	(2,165)	(2,702)	-	-	-	(2,065)	(1,885)	(2,065)

16 Triple boom/steel or hybrid tracks/long stick

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	1109	1109	1109	1095	832	1009	1099	810	983
(13' - 1")	-	-	-	-	-	-	(2,445)	(2,445)	(2,445)	(2,414)	(1,834)	(2,224)	(2,423)	(1,786)	(2,169)
3 m	-	-	-	-	-	-	1200	1200	1200	1086	827	1004	1053	666	814
(9' - 10")	-	-	-	-	-	-	(2,645)	(2,645)	(2,645)	(2,396)	(1,824)	(2,214)	(2,322)	(1,469)	(1,795)
2 m	-	-	-	1895	1770	1895	1394	1133	1386	1157	791	966	1032	594	731
(6' - 7")	-	-	-	(4,179)	(3,903)	(4,179)	(3,075)	(2,498)	(3,057)	(2,551)	(1,744)	(2,130)	(2,276)	(1,310)	(1,613)
1 m	4277	3080	4174	2401	1557	1973	1600	1040	1288	1238	746	919	1021	565	699
(3' - 3")	(9,432)	(6,792)	(9,204)	(5,295)	(3,433)	(4,351)	(3,527)	(2,294)	(2,841)	(2,729)	(1,645)	(2,027)	(2,251)	(1,246)	(1,542)
0 m	4754	2767	3807	2550	1446	1853	1703	972	1216	1271	710	882	1009	571	709
(0' - 0")	(10,483)	(6,101)	(8,394)	(5,623)	(3,188)	(4,085)	(3,755)	(2,143)	(2,681)	(2,802)	(1,565)	(1,944)	(2,226)	(1,259)	(1,564)
-1 m	3757	2764	3757	2376	1419	1823	1642	942	1184	1190	695	866	984	620	770
(-3' - 3")	(8,284)	(6,096)	(8,284)	(5,238)	(3,128)	(4,020)	(3,621)	(2,077)	(2,612)	(2,625)	(1,531)	(1,909)	(2,169)	(1,367)	(1,698)
-2 m	2874	2830	2874	1936	1441	1847	1361	951	1194	-	-	-	911	744	911
(-6' - 7")	(6,338)	(6,240)	(6,338)	(4,269)	(3,177)	(4,073)	(3,001)	(2,097)	(2,633)	-	-	-	(2,009)	(1,641)	(2,009)

**Lift capacity tables EZ80**
**01 Monobloc boom/rubber tracks/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	2043	1558	1713	2074	1048	1143	2094	993	1082
(13' - 1")	-	-	-	-	-	-	(4,504)	(3,435)	(3,777)	(4,574)	(2,312)	(2,521)	(4,617)	(2,189)	(2,386)
3 m	-	-	-	-	-	-	2340	1496	1648	2131	1030	1124	2079	830	904
(9' - 10")	-	-	-	-	-	-	(5,160)	(3,299)	(3,633)	(4,699)	(2,271)	(2,479)	(4,584)	(1,829)	(1,993)
2 m	-	-	-	4164	2155	2441	2859	1392	1538	2336	983	1076	2098	750	818
(6' - 7")	-	-	-	(9,182)	(4,752)	(5,383)	(6,303)	(3,070)	(3,392)	(5,150)	(2,168)	(2,372)	(4,625)	(1,654)	(1,804)
1 m	-	-	-	5275	1929	2196	3346	1288	1429	2546	932	1022	2134	722	789
(3' - 3")	-	-	-	(11,632)	(4,253)	(4,842)	(7,378)	(2,841)	(3,151)	(5,614)	(2,055)	(2,254)	(4,705)	(1,592)	(1,739)
0 m	-	-	-	5416	1847	2108	3561	1222	1359	2637	894	983	2176	740	810
(0' - 0")	-	-	-	(11,943)	(4,073)	(4,648)	(7,853)	(2,695)	(2,997)	(5,814)	(1,972)	(2,168)	(4,799)	(1,632)	(1,786)
-1 m	8173	3794	4687	4975	1839	2099	3415	1200	1336	2470	882	971	2206	819	899
(-3' - 3")	(18,022)	(8,367)	(10,335)	(10,970)	(4,055)	(4,628)	(7,530)	(2,646)	(2,945)	(5,447)	(1,946)	(2,140)	(4,864)	(1,806)	(1,981)
-2 m	6240	3876	4783	4000	1876	2140	2780	1221	1358	-	-	-	2165	1026	1132
(-6' - 7")	(13,759)	(8,546)	(10,546)	(8,820)	(4,138)	(4,718)	(6,131)	(2,691)	(2,993)	-	-	-	(4,774)	(2,263)	(2,496)

**02 Monobloc boom/rubber tracks/long stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	-	-	-	1900	1059	1156	1949	905	987
(13' - 1")	-	-	-	-	-	-	-	-	-	(4,191)	(2,336)	(2,548)	(4,298)	(1,996)	(2,176)
3 m	-	-	-	-	-	-	2140	1511	1664	1996	1034	1129	1946	766	834
(9' - 10")	-	-	-	-	-	-	(4,720)	(3,331)	(3,670)	(4,401)	(2,279)	(2,489)	(4,291)	(1,688)	(1,840)
2 m	-	-	-	3752	2205	2497	2677	1403	1551	2224	983	1076	2069	729	797
(6' - 7")	-	-	-	(8,273)	(4,862)	(5,505)	(5,903)	(3,095)	(3,421)	(4,903)	(2,167)	(2,372)	(4,562)	(1,608)	(1,758)
1 m	-	-	-	5041	1948	2219	3217	1290	1432	2467	926	1017	2008	668	731
(3' - 3")	-	-	-	(11,115)	(4,296)	(4,893)	(7,094)	(2,844)	(3,157)	(5,439)	(2,042)	(2,242)	(4,428)	(1,474)	(1,611)
0 m	-	-	-	5417	1832	2094	3513	1211	1349	2607	881	970	2054	682	747
(0' - 0")	-	-	-	(11,944)	(4,041)	(4,617)	(7,747)	(2,671)	(2,974)	(5,748)	(1,943)	(2,140)	(4,529)	(1,503)	(1,646)
-1 m	9014	3712	4594	5131	1807	2066	3462	1178	1314	2530	861	949	2094	746	819
(-3' - 3")	(19,875)	(8,185)	(10,130)	(11,313)	(3,985)	(4,557)	(7,635)	(2,598)	(2,897)	(5,578)	(1,899)	(2,094)	(4,618)	(1,645)	(1,806)
-2 m	7144	3791	4686	4311	1834	2095	2979	1188	1324	-	-	-	2092	909	1002
(-6' - 7")	(15,753)	(8,358)	(10,333)	(9,506)	(4,043)	(4,619)	(6,569)	(2,619)	(2,919)	-	-	-	(4,612)	(2,004)	(2,209)

**03: Monobloc boom/rubber tracks/rear weight/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7")			(9' - 10")			(13' - 1")			(16' - 5")					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	2043	1752	1933	2074	1195	1307	2094	1134	1240
(13' - 1")	-	-	-	-	-	-	(4,504)	(3,864)	(4,262)	(4,574)	(2,634)	(2,881)	(4,617)	(2,501)	(2,734)
3 m	-	-	-	-	-	-	2340	1690	1867	2131	1176	1287	2079	956	1044
(9' - 10")	-	-	-	-	-	-	(5,160)	(3,727)	(4,118)	(4,699)	(2,594)	(2,839)	(4,584)	(2,108)	(2,302)
2 m	-	-	-	4164	2444	2777	2859	1587	1758	2336	1130	1239	2098	871	951
(6' - 7")	-	-	-	(9,182)	(5,390)	(6,124)	(6,303)	(3,498)	(3,877)	(5,150)	(2,491)	(2,732)	(4,625)	(1,920)	(2,098)
1 m	-	-	-	5275	2218	2532	3346	1483	1649	2546	1078	1185	2134	842	921
(3' - 3")	-	-	-	(11,632)	(4,890)	(5,583)	(7,378)	(3,269)	(3,635)	(5,614)	(2,377)	(2,614)	(4,705)	(1,856)	(2,031)
0 m	-	-	-	5416	2136	2444	3561	1417	1579	2637	1041	1146	2176	864	948
(0' - 0")	-	-	-	(11,943)	(4,710)	(5,388)	(7,853)	(3,123)	(3,482)	(5,814)	(2,294)	(2,528)	(4,799)	(1,906)	(2,090)
-1 m	8173	4360	5401	4975	2128	2435	3415	1394	1555	2470	1029	1134	2206	955	1050
(-3' - 3")	(18,022)	(9,615)	(11,909)	(10,970)	(4,692)	(5,369)	(7,530)	(3,074)	(3,430)	(5,447)	(2,268)	(2,500)	(4,864)	(2,106)	(2,316)
-2 m	6240	4442	5496	4000	2166	2476	2780	1415	1577	-	-	-	2165	1190	1316
(-6' - 7")	(13,759)	(9,794)	(12,119)	(8,820)	(4,775)	(5,459)	(6,131)	(3,120)	(3,478)	-	-	-	(4,774)	(2,625)	(2,902)

**04: Monobloc boom/rubber tracks/rear weight/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	-	-	-	1900	1206	1319	1949	1038
3 m (9' - 10")	-	-	-	-	-	-	2140	1705	1884	1996	1180	1292	1946	886	967
2 m (6' - 7")	-	-	-	3752	2494	2833	2677	1598	1771	2224	1129	1239	2069	850	931
1 m (3' - 3")	-	-	-	5041	2238	2555	3217	1484	1651	2467	1072	1180	2008	783	857
0 m (0' - 0")	-	-	-	5417	2122	2430	3513	1406	1569	2607	1028	1134	2054	800	877
-1 m (-3' - 3")	9014	4278	5308	5131	2096	2402	3462	1372	1534	2530	1007	1113	2094	874	962
-2 m (-6' - 7")	(19,875)	(9,433)	(11,703)	(11,313)	(4,623)	(5,297)	(7,635)	(3,026)	(3,382)	(5,578)	(2,221)	(2,454)	(4,618)	(1,928)	(2,120)
	7144	4357	5400	4311	2123	2431	2979	1382	1544	-	-	-	2092	1060	1170
	(15,753)	(9,606)	(11,907)	(9,506)	(4,681)	(5,360)	(6,569)	(3,047)	(3,404)	-	-	-	(4,612)	(2,336)	(2,581)

**05: Monobloc boom/steel or hybrid tracks/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	2043	1588	1750	2074	1071	1171	2094	1015
3 m (9' - 10")	-	-	-	-	-	-	2340	1526	1685	2131	1053	1152	2079	849	927
2 m (6' - 7")	-	-	-	4164	2200	2498	2859	1422	1575	2336	1006	1103	2098	769	841
1 m (3' - 3")	-	-	-	5275	1973	2253	3346	1318	1466	2546	955	1050	2134	741	811
0 m (0' - 0")	-	-	-	5416	1892	2164	3561	1252	1396	2637	917	1011	2176	759	833
-1 m (-3' - 3")	8173	3882	4808	4975	1884	2156	3415	1230	1373	2470	905	998	2206	840	924
-2 m (-6' - 7")	(18,022)	(8,560)	(10,601)	(10,970)	(4,153)	(4,753)	(7,530)	(2,712)	(3,027)	(5,447)	(1,996)	(2,201)	(4,864)	(1,852)	(2,038)
	6240	3963	4903	4000	1921	2196	2780	1251	1395	-	-	-	2165	1052	1163
	(13,759)	(8,739)	(10,811)	(8,820)	(4,236)	(4,843)	(6,131)	(2,758)	(3,075)	-	-	-	(4,774)	(2,319)	(2,565)

**06: Monobloc boom/steel or hybrid tracks/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	-	-	-	1900	1082	1183	1949	926
3 m (9' - 10")	-	-	-	-	-	-	2140	1541	1701	1996	1056	1156	1946	784	857
2 m (6' - 7")	-	-	-	3752	2250	2553	2677	1434	1588	2224	1005	1103	2069	748	820
1 m (3' - 3")	-	-	-	5041	1993	2276	3217	1320	1469	2467	949	1044	2008	686	752
0 m (0' - 0")	-	-	-	5417	1877	2150	3513	1241	1386	2607	904	998	2054	700	769
-1 m (-3' - 3")	9014	3800	4714	5131	1852	2123	3462	1208	1351	2530	884	977	2094	766	843
-2 m (-6' - 7")	(19,875)	(8,378)	(10,395)	(11,313)	(4,084)	(4,681)	(7,635)	(2,664)	(2,979)	(5,578)	(1,949)	(2,154)	(4,618)	(1,689)	(1,859)
	7144	3878	4807	4311	1878	2152	2979	1218	1361	-	-	-	2092	932	1030
	(15,753)	(8,552)	(10,599)	(9,506)	(4,142)	(4,744)	(6,569)	(2,685)	(3,001)	-	-	-	(4,612)	(2,055)	(2,272)

**07: Monobloc boom/steel or hybrid tracks/rear weight/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7'')			(9' - 10'')			(13' - 1'')			(16' - 5'')			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	2043	1782	1970	2074	1217	1334	2094	1156	1266
(13' - 1'')	-	-	-	-	-	-	(4,504)	(3,930)	(4,344)	(4,574)	(2,684)	(2,942)	(4,617)	(2,549)	(2,793)
3 m	-	-	-	-	-	-	2340	1720	1905	2131	1199	1315	2079	976	1068
(9' - 10'')	-	-	-	-	-	-	(5,160)	(3,793)	(4,199)	(4,699)	(2,644)	(2,899)	(4,584)	(2,151)	(2,355)
2 m	-	-	-	4164	2489	2834	2859	1617	1795	2336	1152	1266	2098	889	974
(6' - 7'')	-	-	-	(9,182)	(5,489)	(6,249)	(6,303)	(3,565)	(3,959)	(5,150)	(2,541)	(2,792)	(4,625)	(1,961)	(2,147)
1 m	-	-	-	5275	2263	2589	3346	1513	1686	2546	1101	1213	2134	860	944
(3' - 3'')	-	-	-	(11,632)	(4,989)	(5,708)	(7,378)	(3,336)	(3,717)	(5,614)	(2,427)	(2,675)	(4,705)	(1,897)	(2,081)
0 m	-	-	-	5416	2181	2500	3561	1447	1616	2637	1063	1174	2176	884	971
(0' - 0'')	-	-	-	(11,943)	(4,809)	(5,513)	(7,853)	(3,190)	(3,564)	(5,814)	(2,344)	(2,588)	(4,799)	(1,948)	(2,141)
-1 m	8173	4448	5521	4975	2173	2492	3415	1424	1592	2470	1051	1161	2206	976	1076
-(3' - 3'')	(18,022)	(9,808)	(12,174)	(10,970)	(4,791)	(5,494)	(7,530)	(3,140)	(3,511)	(5,447)	(2,318)	(2,561)	(4,864)	(2,153)	(2,372)
-2 m	6240	4529	5617	4000	2211	2532	2780	1445	1614	-	-	-	2165	1216	1347
-(6' - 7'')	(13,759)	(9,987)	(12,385)	(8,820)	(4,874)	(5,584)	(6,131)	(3,186)	(3,560)	-	-	-	(4,774)	(2,681)	(2,971)

**08: Monobloc boom/steel or hybrid tracks/rear weight/long stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7'')			(9' - 10'')			(13' - 1'')			(16' - 5'')			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	-	-	-	1900	1228	1346	1949	1059	1159
(13' - 1'')	-	-	-	-	-	-	-	-	-	(4,191)	(2,708)	(2,969)	(4,298)	(2,334)	(2,556)
3 m	-	-	-	-	-	-	2140	1735	1921	1996	1203	1320	1946	904	990
(9' - 10'')	-	-	-	-	-	-	(4,720)	(3,826)	(4,236)	(4,401)	(2,652)	(2,910)	(4,291)	(1,994)	(2,183)
2 m	-	-	-	3752	2539	2889	2677	1628	1808	2224	1152	1267	2069	868	953
(6' - 7'')	-	-	-	(8,273)	(5,598)	(6,371)	(5,903)	(3,589)	(3,987)	(4,903)	(2,539)	(2,793)	(4,562)	(1,915)	(2,102)
1 m	-	-	-	5041	2282	2612	3217	1514	1688	2467	1095	1207	2008	800	878
(3' - 3'')	-	-	-	(11,115)	(5,033)	(5,759)	(7,094)	(3,339)	(3,723)	(5,439)	(2,414)	(2,662)	(4,428)	(1,765)	(1,937)
0 m	-	-	-	5417	2167	2486	3513	1436	1606	2607	1050	1161	2054	818	900
(0' - 0'')	-	-	-	(11,944)	(4,777)	(5,483)	(7,747)	(3,166)	(3,540)	(5,748)	(2,316)	(2,560)	(4,529)	(1,804)	(1,983)
-1 m	9014	4366	5428	5131	2141	2459	3462	1403	1571	2530	1030	1140	2094	894	986
-(3' - 3'')	(19,875)	(9,626)	(11,968)	(11,313)	(4,722)	(5,422)	(7,635)	(3,093)	(3,463)	(5,578)	(2,271)	(2,514)	(4,618)	(1,972)	(2,173)
-2 m	7144	4444	5520	4311	2168	2488	2979	1412	1581	-	-	-	2092	1083	1199
-(6' - 7'')	(15,753)	(9,800)	(12,172)	(9,506)	(4,780)	(5,485)	(6,569)	(3,114)	(3,486)	-	-	-	(4,612)	(2,388)	(2,643)

**09: Monobloc boom/steel tracks 600 mm (24 in)/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7'')			(9' - 10'')			(13' - 1'')			(16' - 5'')			I	II	III
	I	II	III	I	II	III	I	II	III	I	II	III			
4 m	-	-	-	-	-	-	2043	1662	1840	2074	1126	1238	2094	1068	1174
(13' - 1'')	-	-	-	-	-	-	(4,504)	(3,664)	(4,058)	(4,574)	(2,484)	(2,730)	(4,617)	(2,355)	(2,588)
3 m	-	-	-	-	-	-	2340	1600	1775	2131	1108	1219	2079	897	985
(9' - 10'')	-	-	-	-	-	-	(5,160)	(3,527)	(3,914)	(4,699)	(2,443)	(2,687)	(4,584)	(1,978)	(2,172)
2 m	-	-	-	4164	2309	2636	2859	1496	1666	2336	1061	1170	2098	814	895
(6' - 7'')	-	-	-	(9,182)	(5,092)	(5,812)	(6,303)	(3,298)	(3,673)	(5,150)	(2,340)	(2,580)	(4,625)	(1,796)	(1,974)
1 m	-	-	-	5275	2083	2391	3346	1392	1556	2546	1010	1117	2134	786	866
(3' - 3'')	-	-	-	(11,632)	(4,592)	(5,272)	(7,378)	(3,069)	(3,431)	(5,614)	(2,227)	(2,463)	(4,705)	(1,733)	(1,908)
0 m	-	-	-	5416	2001	2302	3561	1326	1487	2637	972	1078	2176	806	890
(0' - 0'')	-	-	-	(11,943)	(4,412)	(5,077)	(7,853)	(2,923)	(3,278)	(5,814)	(2,144)	(2,376)	(4,799)	(1,778)	(1,962)
-1 m	8173	4096	5101	4975	1993	2294	3415	1303	1463	2470	960	1065	2206	892	986
-(3' - 3'')	(18,022)	(9,032)	(11,247)	(10,970)	(4,394)	(5,057)	(7,530)	(2,874)	(3,226)	(5,447)	(2,118)	(2,349)	(4,864)	(1,966)	(2,175)
-2 m	6240	4177	5196	4000	2031	2334	2780	1324	1485	-	-	-	2165	1114	1239
-(6' - 7'')	(13,759)	(9,211)	(11,457)	(8,820)	(4,477)	(5,147)	(6,131)	(2,920)	(3,274)	-	-	-	(4,774)	(2,456)	(2,732)

**10: Monobloc boom/steel tracks 600 mm (24 in)/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	-	-	-	1900 (4,191)	1137 (2,508)	1250 (2,757)	1949 (4,298)	976 (2,152)
3 m (9' - 10")	-	-	-	-	-	-	2140 (4,720)	1614 (3,559)	1792 (3,950)	1996 (4,401)	1112 (2,451)	1223 (2,698)	1946 (4,291)	829 (1,829)	911 (2,010)
2 m (6' - 7")	-	-	-	3752 (8,273)	2359 (5,201)	2691 (5,934)	2677 (5,903)	1507 (3,323)	1679 (3,701)	2224 (4,903)	1061 (2,339)	1170 (2,581)	2069 (4,562)	794 (1,750)	875 (1,929)
1 m (3' - 3")	-	-	-	5041 (11,115)	2102 (4,636)	2414 (5,322)	3217 (7,094)	1393 (3,072)	1559 (3,437)	2467 (5,439)	1004 (2,213)	1111 (2,450)	2008 (4,428)	729 (1,608)	804 (1,773)
0 m (0' - 0")	-	-	-	5417 (11,944)	1987 (4,380)	2288 (5,046)	3513 (7,747)	1315 (2,899)	1476 (3,255)	2607 (5,748)	959 (2,115)	1065 (2,348)	2054 (4,529)	744 (1,642)	822 (1,813)
-1 m (-3' - 3")	9014 (19,875)	4013 (8,850)	5007 (11,041)	5131 (11,313)	1961 (4,325)	2261 (4,986)	3462 (7,635)	1282 (2,826)	1441 (3,178)	2530 (5,578)	939 (2,071)	1044 (2,302)	2094 (4,618)	814 (1,796)	902 (1,988)
-2 m (-6' - 7")	7144 (15,753)	4092 (9,023)	5100 (11,245)	4311 (9,506)	1988 (4,383)	2290 (5,049)	2979 (6,569)	1291 (2,847)	1451 (3,200)	-	-	-	2092 (4,612)	989 (2,181)	1100 (2,424)

**11: Monobloc boom/steel tracks 600 mm (24 in)/rear weight/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	2043 (4,504)	1856 (4,092)	2043 (4,504)	2074 (4,574)	1273 (2,806)	1401 (3,090)	2094 (4,617)	1210 (2,667)
3 m (9' - 10")	-	-	-	-	-	-	2340 (5,160)	1794 (3,955)	1995 (4,399)	2131 (4,699)	1254 (2,765)	1382 (3,047)	2079 (4,584)	1023 (2,257)	1126 (2,482)
2 m (6' - 7")	-	-	-	4164 (9,182)	2599 (5,730)	2972 (6,553)	2859 (6,303)	1690 (3,727)	1886 (4,158)	2336 (5,150)	1207 (2,662)	1333 (2,940)	2098 (4,625)	935 (2,061)	1029 (2,268)
1 m (3' - 3")	-	-	-	5275 (11,632)	2372 (5,230)	2727 (6,013)	3346 (7,378)	1586 (3,497)	1776 (3,916)	2546 (5,614)	1156 (2,549)	1280 (2,823)	2134 (4,705)	906 (1,997)	998 (2,201)
0 m (0' - 0")	-	-	-	5416 (11,943)	2290 (5,050)	2638 (5,818)	3561 (7,853)	1520 (3,352)	1706 (3,763)	2637 (5,814)	1118 (2,466)	1241 (2,736)	2176 (4,799)	930 (2,052)	1027 (2,266)
-1 m (-3' - 3")	8173 (18,022)	4662 (10,280)	5814 (12,820)	4975 (10,970)	2282 (5,032)	2630 (5,798)	3415 (7,530)	1498 (3,302)	1683 (3,711)	2470 (5,447)	1107 (2,440)	1229 (2,709)	2206 (4,864)	1028 (2,266)	1138 (2,509)
-2 m (-6' - 7")	6240 (13,759)	4743 (10,459)	5910 (13,031)	4000 (8,820)	2320 (5,115)	2670 (5,888)	2780 (6,131)	1518 (3,348)	1705 (3,759)	-	-	-	2165 (4,774)	1278 (2,817)	1423 (3,138)

**12: Monobloc boom/steel tracks 600 mm (24 in)/rear weight/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	-	-	-	1900 (4,191)	1284 (2,830)	1413 (3,117)	1949 (4,298)	1109 (2,444)
3 m (9' - 10")	-	-	-	-	-	-	2140 (4,720)	1808 (3,988)	2011 (4,435)	1996 (4,401)	1258 (2,774)	1387 (3,058)	1946 (4,291)	950 (2,094)	1045 (2,303)
2 m (6' - 7")	-	-	-	3752 (8,273)	2648 (5,839)	3027 (6,675)	2677 (5,903)	1701 (3,751)	1898 (4,186)	2224 (4,903)	1207 (2,661)	1334 (2,941)	2069 (4,562)	914 (2,015)	1008 (2,223)
1 m (3' - 3")	-	-	-	5041 (11,115)	2392 (5,274)	2750 (6,063)	3217 (7,094)	1588 (3,501)	1779 (3,922)	2467 (5,439)	1150 (2,536)	1275 (2,810)	2008 (4,428)	843 (1,860)	930 (2,051)
0 m (0' - 0")	-	-	-	5417 (11,944)	2276 (5,018)	2624 (5,787)	3513 (7,747)	1509 (3,327)	1696 (3,739)	2607 (5,748)	1105 (2,438)	1228 (2,708)	2054 (4,529)	863 (1,902)	953 (2,102)
-1 m (-3' - 3")	9014 (19,875)	4579 (10,098)	5721 (12,615)	5131 (11,313)	2251 (4,963)	2597 (5,727)	3462 (7,635)	1476 (3,254)	1661 (3,663)	2530 (5,578)	1085 (2,393)	1207 (2,662)	2094 (4,618)	943 (2,078)	1044 (2,302)
-2 m (-6' - 7")	7144 (15,753)	4658 (10,271)	5813 (12,819)	4311 (9,506)	2277 (5,021)	2626 (5,790)	2979 (6,569)	1485 (3,275)	1671 (3,685)	-	-	-	2092 (4,612)	1140 (2,514)	1268 (2,796)

**Lift capacity tables ET90**
**01: Monobloc boom/rubber tracks/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7'')			(9' - 10'')			(13' - 1'')			(16' - 5'')					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	1961	1961	1961	1857	1438	1628	1847	1207	1367
(13' - 1'')	-	-	-	-	-	-	(4,325)	(4,325)	(4,325)	(4,096)	(3,170)	(3,590)	(4,073)	(2,661)	(3,013)
3 m	-	-	-	-	-	-	2260	1987	2260	1964	1400	1589	1818	1045	1186
(9' - 10'')	-	-	-	-	-	-	(4,983)	(4,382)	(4,983)	(4,331)	(3,087)	(3,503)	(4,008)	(2,305)	(2,614)
2 m	-	-	-	3943	2832	3338	2681	1863	2142	2145	1340	1527	1814	964	1096
(6' - 7'')	-	-	-	(8,693)	(6,245)	(7,361)	(5,912)	(4,108)	(4,723)	(4,730)	(2,955)	(3,366)	(3,999)	(2,126)	(2,416)
1 m	-	-	-	4625	2602	3089	3032	1748	2021	2309	1280	1464	1821	936	1066
(3' - 3'')	-	-	-	(10,197)	(5,737)	(6,811)	(6,685)	(3,854)	(4,456)	(5,091)	(2,822)	(3,228)	(4,015)	(2,063)	(2,350)
0 m	-	-	-	4601	2525	3006	3155	1677	1946	2369	1236	1418	1828	956	1091
(0' - 0'')	-	-	-	(10,144)	(5,568)	(6,628)	(6,956)	(3,697)	(4,290)	(5,224)	(2,726)	(3,127)	(4,032)	(2,107)	(2,405)
-1 m	6092	5163	6092	4206	2518	2998	3011	1651	1919	2251	1218	1400	1820	1037	1187
-(3' - 3'')	(13,433)	(11,384)	(13,433)	(9,274)	(5,551)	(6,610)	(6,640)	(3,640)	(4,230)	(4,963)	(2,686)	(3,086)	(4,013)	(2,288)	(2,616)
-2 m	4920	4920	4920	3484	2551	3034	2558	1665	1933	1778	1238	1421	1756	1232	1413
-(6' - 7'')	(10,849)	(10,849)	(10,849)	(7,681)	(5,626)	(6,691)	(5,639)	(3,671)	(4,262)	(3,920)	(2,730)	(3,132)	(3,872)	(2,716)	(3,115)

**02: Monobloc boom/rubber tracks/long stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7'')			(9' - 10'')			(13' - 1'')			(16' - 5'')					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	1769	1769	1769	1712	1449	1641	1706	1098	1244
(13' - 1'')	-	-	-	-	-	-	(3,902)	(3,902)	(3,902)	(3,776)	(3,196)	(3,619)	(3,762)	(2,421)	(2,744)
3 m	-	-	-	2488	2488	2488	2073	2010	2073	1840	1407	1597	1688	961	1092
(9' - 10'')	-	-	-	(5,487)	(5,487)	(5,487)	(4,572)	(4,432)	(4,572)	(4,057)	(3,102)	(3,521)	(3,722)	(2,120)	(2,407)
2 m	-	-	-	3585	2902	3416	2515	1881	2162	2041	1343	1530	1690	890	1013
(6' - 7'')	-	-	-	(7,904)	(6,399)	(7,532)	(5,547)	(4,148)	(4,768)	(4,501)	(2,961)	(3,374)	(3,726)	(1,962)	(2,234)
1 m	-	-	-	4450	2632	3124	2919	1754	2029	2235	1276	1461	1701	863	985
(3' - 3'')	-	-	-	(9,812)	(5,805)	(6,888)	(6,436)	(3,868)	(4,473)	(4,929)	(2,813)	(3,221)	(3,752)	(1,904)	(2,173)
0 m	-	-	-	4636	2514	2996	3118	1668	1938	2340	1224	1407	1715	878	1004
(0' - 0'')	-	-	-	(10,222)	(5,543)	(6,605)	(6,874)	(3,678)	(4,273)	(5,159)	(2,699)	(3,102)	(3,782)	(1,937)	(2,214)
-1 m	6906	5064	6531	4368	2485	2964	3057	1629	1897	2286	1197	1379	1719	944	1081
-(3' - 3'')	(15,229)	(11,166)	(14,401)	(9,631)	(5,479)	(6,537)	(6,740)	(3,593)	(4,183)	(5,042)	(2,639)	(3,040)	(3,791)	(2,082)	(2,384)
-2 m	5692	5133	5692	3757	2506	2987	2708	1631	1899	1973	1202	1384	1687	1096	1258
-(6' - 7'')	(12,552)	(11,317)	(12,552)	(8,283)	(5,525)	(6,586)	(5,971)	(3,597)	(4,187)	(4,352)	(2,650)	(3,051)	(3,720)	(2,418)	(2,775)

**03: Monobloc boom/rubber tracks/rear weight/short stick**

A B	2 m			3 m			4 m			5 m			max		
	(6' - 7'')			(9' - 10'')			(13' - 1'')			(16' - 5'')					
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m	-	-	-	-	-	-	1961	1961	1961	1857	1559	1762	1847	1314	1485
(13' - 1'')	-	-	-	-	-	-	(4,325)	(4,325)	(4,325)	(4,096)	(3,438)	(3,886)	(4,073)	(2,898)	(3,274)
3 m	-	-	-	-	-	-	2260	2149	2260	1964	1521	1723	1818	1144	1293
(9' - 10'')	-	-	-	-	-	-	(4,983)	(4,738)	(4,983)	(4,331)	(3,354)	(3,799)	(4,008)	(2,522)	(2,852)
2 m	-	-	-	3943	3072	3615	2681	2024	2323	2145	1462	1661	1814	1058	1199
(6' - 7'')	-	-	-	(8,693)	(6,775)	(7,970)	(5,912)	(4,464)	(5,122)	(4,730)	(3,223)	(3,662)	(3,999)	(2,333)	(2,643)
1 m	-	-	-	4625	2842	3365	3032	1909	2202	2309	1401	1598	1821	1029	1169
(3' - 3'')	-	-	-	(10,197)	(6,266)	(7,420)	(6,685)	(4,210)	(4,854)	(5,091)	(3,090)	(3,524)	(4,015)	(2,270)	(2,577)
0 m	-	-	-	4601	2765	3282	3155	1838	2126	2369	1357	1553	1828	1052	1197
(0' - 0'')	-	-	-	(10,144)	(6,097)	(7,237)	(6,956)	(4,052)	(4,688)	(5,224)	(2,993)	(3,423)	(4,032)	(2,321)	(2,639)
-1 m	6092	5633	6092	4206	2758	3274	3011	1812	2099	2251	1339	1534	1820	1142	1301
-(3' - 3'')	(13,433)	(12,420)	(13,433)	(9,274)	(6,081)	(7,220)	(6,640)	(3,996)	(4,629)	(4,963)	(2,953)	(3,382)	(4,013)	(2,518)	(2,869)
-2 m	4920	4920	4920	3484	2792	3311	2558	1826	2114	1778	1360	1555	1756	1352	1546
-(6' - 7'')	(10,849)	(10,849)	(10,849)	(7,681)	(6,155)	(7,300)	(5,639)	(4,026)	(4,661)	(3,920)	(2,998)	(3,428)	(3,872)	(2,982)	(3,409)

**04: Monobloc boom/rubber tracks/rear weight/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1769 (3,902)	1769 (3,902)	1769 (3,902)	1712 (3,776)	1571 (3,464)	1712 (3,776)	1706 (3,762)	1199 (2,643)
3 m (9' - 10")	-	-	-	2488 (5,487)	2488 (5,487)	2488 (5,487)	2073 (4,572)	2073 (4,572)	2073 (4,572)	1840 (4,057)	1528 (3,370)	1731 (3,817)	1688 (3,722)	1054 (2,325)	1193 (2,631)
2 m (6' - 7")	-	-	-	3585 (7,904)	3142 (6,929)	3585 (7,904)	2515 (5,547)	2043 (4,504)	2343 (5,167)	2041 (4,501)	1464 (3,228)	1664 (3,670)	1690 (3,726)	979 (2,159)	1111 (2,450)
1 m (3' - 3")	-	-	-	4450 (9,812)	2873 (6,334)	3400 (7,498)	2919 (6,436)	1916 (4,224)	2209 (4,872)	2235 (4,929)	1397 (3,081)	1595 (3,517)	1701 (3,752)	952 (2,100)	1083 (2,387)
0 m (0' - 0")	-	-	-	4636 (10,222)	2754 (6,072)	3272 (7,214)	3118 (6,874)	1829 (4,034)	2119 (4,671)	2340 (5,159)	1346 (2,967)	1541 (3,398)	1715 (3,782)	970 (2,138)	1104 (2,435)
-1 m (-3' - 3")	6906 (15,229)	5534 (12,202)	6906 (15,229)	4368 (9,631)	2725 (6,009)	3241 (7,146)	3057 (6,740)	1791 (3,948)	2078 (4,581)	2286 (5,042)	1318 (2,907)	1513 (3,336)	1719 (3,791)	1042 (2,298)	1189 (2,621)
-2 m (-6' - 7")	5692 (12,552)	5603 (12,354)	5692 (12,552)	3757 (8,283)	2746 (6,054)	3263 (7,195)	2708 (5,971)	1793 (3,953)	2080 (4,586)	1973 (4,352)	1323 (2,918)	1518 (3,347)	1687 (3,720)	1207 (2,662)	1381 (3,044)

**05: Monobloc boom/steel or hybrid tracks/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1961 (4,325)	1961 (4,325)	1961 (4,325)	1857 (4,096)	1460 (3,220)	1656 (3,651)	1847 (4,073)	1227 (2,705)
3 m (9' - 10")	-	-	-	-	-	-	2260 (4,983)	2017 (4,448)	2260 (4,983)	1964 (4,331)	1423 (3,137)	1616 (3,564)	1818 (4,008)	1064 (2,346)	1208 (2,663)
2 m (6' - 7")	-	-	-	3943 (8,693)	2877 (6,344)	3395 (7,486)	2681 (5,912)	1893 (4,174)	2179 (4,805)	2145 (4,730)	1363 (3,005)	1554 (3,427)	1814 (3,999)	982 (2,164)	1117 (2,463)
1 m (3' - 3")	-	-	-	4625 (10,197)	2646 (5,836)	3145 (6,936)	3032 (6,685)	1778 (3,921)	2058 (4,538)	2309 (5,091)	1303 (2,872)	1491 (3,289)	1821 (4,015)	953 (2,102)	1087 (2,397)
0 m (0' - 0")	-	-	-	4601 (10,144)	2570 (5,667)	3063 (6,753)	3155 (6,956)	1707 (3,763)	1983 (4,372)	2369 (5,224)	1259 (2,776)	1446 (3,188)	1828 (4,032)	974 (2,147)	1113 (2,453)
-1 m (-3' - 3")	6092 (13,433)	5250 (11,577)	6092 (13,433)	4206 (9,274)	2562 (5,650)	3055 (6,735)	3011 (6,640)	1681 (3,707)	1956 (4,312)	2251 (4,963)	1241 (2,736)	1427 (3,147)	1820 (4,013)	1057 (2,331)	1210 (2,668)
-2 m (-6' - 7")	4920 (10,849)	4920 (10,849)	4920 (10,849)	3484 (7,681)	2596 (5,725)	3091 (6,816)	2558 (5,639)	1695 (3,737)	1970 (4,344)	1778 (3,920)	1261 (2,780)	1448 (3,193)	1756 (3,872)	1254 (2,766)	1440 (3,175)

**06: Monobloc boom/steel or hybrid tracks/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1769 (3,902)	1769 (3,902)	1769 (3,902)	1712 (3,776)	1472 (3,246)	1669 (3,679)	1706 (3,762)	1117 (2,463)
3 m (9' - 10")	-	-	-	2488 (5,487)	2488 (5,487)	2488 (5,487)	2073 (4,572)	2040 (4,498)	2073 (4,572)	1840 (4,057)	1429 (3,152)	1624 (3,582)	1688 (3,722)	979 (2,158)	1113 (2,453)
2 m (6' - 7")	-	-	-	3585 (7,904)	2947 (6,498)	3472 (7,657)	2515 (5,547)	1911 (4,215)	2199 (4,850)	2041 (4,501)	1365 (3,011)	1558 (3,435)	1690 (3,726)	907 (1,999)	1033 (2,278)
1 m (3' - 3")	-	-	-	4450 (9,812)	2677 (5,903)	3181 (7,013)	2919 (6,436)	1784 (3,935)	2066 (4,555)	2235 (4,929)	1299 (2,863)	1488 (3,282)	1701 (3,752)	880 (1,941)	1005 (2,217)
0 m (0' - 0")	-	-	-	4636 (10,222)	2559 (5,642)	3052 (6,730)	3118 (6,874)	1698 (3,745)	1975 (4,355)	2340 (5,159)	1247 (2,749)	1434 (3,163)	1715 (3,782)	895 (1,974)	1025 (2,260)
-1 m (-3' - 3")	6906 (15,229)	5152 (11,359)	6651 (14,666)	4368 (9,631)	2530 (5,578)	3021 (6,662)	3057 (6,740)	1659 (3,659)	1934 (4,265)	2286 (5,042)	1220 (2,689)	1406 (3,100)	1719 (3,791)	962 (2,122)	1103 (2,433)
-2 m (-6' - 7")	5692 (12,552)	5220 (11,511)	5692 (12,552)	3757 (8,283)	2550 (5,624)	3043 (6,711)	2708 (5,971)	1661 (3,663)	1936 (4,269)	1973 (4,352)	1225 (2,700)	1411 (3,112)	1687 (3,720)	1117 (2,463)	1283 (2,830)

**07: Monobloc boom/steel or hybrid tracks/rear weight/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1961	1961	1961	1857	1582	1790	1847	1335	1509
3 m (9' - 10")	-	-	-	-	-	-	2260	2179	2260	1964	1544	1750	1818	1162	1316
2 m (6' - 7")	-	-	-	3943	3117	3671	2681	2054	2360	2145	1484	1689	1814	1076	1220
1 m (3' - 3")	-	-	-	4625	2887	3422	3032	1939	2239	2309	1424	1626	1821	1047	1190
0 m (0' - 0")	-	-	-	4601	2810	3339	3155	1868	2163	2369	1380	1580	1828	1070	1219
-1 m (-3' - 3")	6092	5720	6092	4206	2803	3331	3011	1842	2136	2251	1362	1561	1820	1161	1325
-2 m (-6' - 7")	4920	4920	4920	3484	2836	3367	2558	1856	2151	1778	1382	1582	1756	1375	1574
	(10,849)	(10,849)	(10,849)	(7,681)	(6,254)	(7,425)	(5,639)	(4,093)	(4,742)	(3,920)	(3,048)	(3,489)	(3,872)	(3,032)	(3,470)

**08: Monobloc boom/steel or hybrid tracks/rear weight/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1769	1769	1769	1712	1594	1712	1706	1217	1377
3 m (9' - 10")	-	-	-	2488	2488	2488	2073	2073	2073	1840	1551	1759	1688	1072	1214
2 m (6' - 7")	-	-	-	3585	3187	3585	2515	2073	2380	2041	1487	1692	1690	996	1131
1 m (3' - 3")	-	-	-	4450	2917	3457	2919	1946	2246	2235	1420	1622	1701	969	1103
0 m (0' - 0")	-	-	-	4636	2799	3328	3118	1860	2156	2340	1368	1569	1715	987	1125
-1 m (-3' - 3")	6906	5622	6906	4368	2770	3297	3057	1821	2115	2286	1341	1540	1719	1060	1211
-2 m (-6' - 7")	5692	5690	5692	3757	2791	3320	2708	1823	2117	1973	1346	1546	1687	1228	1406
	(12,552)	(12,547)	(12,552)	(8,283)	(6,153)	(7,320)	(5,971)	(4,019)	(4,667)	(4,352)	(2,968)	(3,408)	(3,720)	(2,708)	(3,100)

**09: Monobloc boom/steel tracks 600 mm (24 in)/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
4 m (13' - 1")	-	-	-	-	-	-	1961	1961	1961	1857	1516	1723	1847	1276	1450
3 m (9' - 10")	-	-	-	-	-	-	2260	2091	2260	1964	1478	1683	1818	1108	1262
2 m (6' - 7")	-	-	-	3943	2986	3533	2681	1967	2269	2145	1418	1621	1814	1024	1168
1 m (3' - 3")	-	-	-	4625	2756	3283	3032	1852	2148	2309	1358	1559	1821	996	1138
0 m (0' - 0")	-	-	-	4601	2679	3201	3155	1780	2073	2369	1314	1513	1828	1018	1166
-1 m (-3' - 3")	6092	5464	6092	4206	2672	3193	3011	1754	2046	2251	1296	1494	1820	1104	1267
-2 m (-6' - 7")	4920	4920	4920	3484	2705	3229	2558	1768	2060	1778	1316	1515	1756	1309	1507
	(10,849)	(10,849)	(10,849)	(7,681)	(5,966)	(7,120)	(5,639)	(3,899)	(4,543)	(3,920)	(2,902)	(3,341)	(3,872)	(2,887)	(3,322)

**10: Monobloc boom/steel tracks 600 mm (24 in)/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1769 (3,902)	1769 (3,902)	1769 (3,902)	1712 (3,776)	1527 (3,368)	1712 (3,776)	1706 (3,762)	1163 (2,564)
3 m (9' - 10")	-	-	-	2488 (5,487)	2488 (5,487)	2488 (5,487)	2073 (4,572)	2073 (4,572)	2073 (4,572)	1840 (4,057)	1485 (3,274)	1691 (3,729)	1688 (3,722)	1021 (2,251)	1163 (2,565)
2 m (6' - 7")	-	-	-	3585 (7,904)	3056 (6,739)	3585 (7,904)	2515 (5,547)	1985 (4,376)	2290 (5,049)	2041 (4,501)	1421 (3,132)	1625 (3,582)	1690 (3,726)	947 (2,089)	1082 (2,386)
1 m (3' - 3")	-	-	-	4450 (9,812)	2787 (6,144)	3319 (7,318)	2919 (6,436)	1858 (4,097)	2156 (4,754)	2235 (4,929)	1354 (2,985)	1555 (3,429)	1701 (3,752)	921 (2,030)	1054 (2,324)
0 m (0' - 0")	-	-	-	4636 (10,222)	2668 (5,883)	3190 (7,034)	3118 (6,874)	1772 (3,906)	2065 (4,554)	2340 (5,159)	1302 (2,871)	1501 (3,311)	1715 (3,782)	937 (2,066)	1075 (2,370)
-1 m (-3' - 3")	6906 (15,229)	5365 (11,831)	6906 (15,229)	4368 (9,631)	2639 (5,819)	3159 (6,966)	3057 (6,740)	1733 (3,821)	2024 (4,464)	2286 (5,042)	1275 (2,811)	1473 (3,248)	1719 (3,791)	1007 (2,220)	1157 (2,551)
-2 m (-6' - 7")	5692 (12,552)	5434 (11,982)	5692 (12,552)	3757 (8,283)	2660 (5,865)	3181 (7,015)	2708 (5,971)	1735 (3,825)	2026 (4,468)	1973 (4,352)	1280 (2,822)	1478 (3,260)	1687 (3,720)	1168 (2,575)	1344 (2,965)

**11: Monobloc boom/steel tracks 600 mm (24 in)/rear weight/short stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1961 (4,325)	1961 (4,325)	1961 (4,325)	1857 (4,096)	1637 (3,610)	1857 (4,095)	1847 (4,073)	1383 (3,051)
3 m (9' - 10")	-	-	-	-	-	-	2260 (4,983)	2252 (4,966)	2260 (4,983)	1964 (4,331)	1599 (3,526)	1818 (4,008)	1818 (4,008)	1207 (2,661)	1369 (3,019)
2 m (6' - 7")	-	-	-	3943 (8,693)	3226 (7,114)	3809 (8,399)	2681 (5,912)	2128 (4,692)	2450 (5,402)	2145 (4,730)	1540 (3,395)	1756 (3,871)	1814 (3,999)	1119 (2,466)	1272 (2,804)
1 m (3' - 3")	-	-	-	4625 (10,197)	2996 (6,606)	3560 (7,849)	3032 (6,685)	2013 (4,438)	2329 (5,135)	2309 (5,091)	1479 (3,262)	1693 (3,733)	1821 (4,015)	1089 (2,402)	1241 (2,736)
0 m (0' - 0")	-	-	-	4601 (10,144)	2919 (6,437)	3477 (7,667)	3155 (6,956)	1941 (4,281)	2254 (4,969)	2369 (5,224)	1435 (3,165)	1647 (3,632)	1828 (4,032)	1114 (2,457)	1272 (2,804)
-1 m (-3' - 3")	6092 (13,433)	5934 (13,085)	6092 (13,433)	4206 (9,274)	2912 (6,421)	3469 (7,649)	3011 (6,640)	1916 (4,224)	2227 (4,910)	2251 (4,963)	1417 (3,125)	1628 (3,591)	1820 (4,013)	1209 (2,665)	1382 (3,048)
-2 m (-6' - 7")	4920 (10,849)	4920 (10,849)	4920 (10,849)	3484 (7,681)	2946 (6,495)	3484 (7,681)	2558 (5,639)	1929 (4,255)	2241 (4,941)	1778 (3,920)	1438 (3,170)	1649 (3,637)	1756 (3,872)	1430 (3,153)	1640 (3,617)

**12: Monobloc boom/steel tracks 600 mm (24 in)/rear weight/long stick**

A B	2 m (6' - 7")			3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			max		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
	4 m (13' - 1")	-	-	-	-	-	-	1769 (3,902)	1769 (3,902)	1769 (3,902)	1712 (3,776)	1649 (3,636)	1712 (3,776)	1706 (3,762)	1263 (2,785)
3 m (9' - 10")	-	-	-	2488 (5,487)	2488 (5,487)	2488 (5,487)	2073 (4,572)	2073 (4,572)	2073 (4,572)	1840 (4,057)	1606 (3,542)	1826 (4,025)	1688 (3,722)	1114 (2,456)	1265 (2,789)
2 m (6' - 7")	-	-	-	3585 (7,904)	3296 (7,269)	3585 (7,904)	2515 (5,547)	2146 (4,732)	2470 (5,447)	2041 (4,501)	1542 (3,400)	1759 (3,878)	1690 (3,726)	1037 (2,286)	1180 (2,601)
1 m (3' - 3")	-	-	-	4450 (9,812)	3027 (6,674)	3595 (7,927)	2919 (6,436)	2019 (4,452)	2337 (5,152)	2235 (4,929)	1475 (3,253)	1690 (3,725)	1701 (3,752)	1009 (2,226)	1151 (2,538)
0 m (0' - 0")	-	-	-	4636 (10,222)	2908 (6,412)	3466 (7,644)	3118 (6,874)	1933 (4,262)	2246 (4,952)	2340 (5,159)	1423 (3,139)	1636 (3,607)	1715 (3,782)	1028 (2,268)	1175 (2,591)
-1 m (-3' - 3")	6906 (15,229)	5835 (12,867)	6906 (15,229)	4368 (9,631)	2879 (6,349)	3435 (7,575)	3057 (6,740)	1894 (4,177)	2205 (4,862)	2286 (5,042)	1396 (3,079)	1607 (3,544)	1719 (3,791)	1105 (2,436)	1264 (2,788)
-2 m (-6' - 7")	5692 (12,552)	5692 (12,552)	5692 (12,552)	3757 (8,283)	2900 (6,394)	3458 (7,624)	2708 (5,971)	1896 (4,181)	2207 (4,866)	1973 (4,352)	1401 (3,090)	1613 (3,556)	1687 (3,720)	1279 (2,820)	1467 (3,234)

**13 Triple boom/rubber tracks/short stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10")			(13' - 1")			(16' - 5")			(19' - 8")					
	I	II	III	I	II	III									
4 m	-	-	-	2016	2016	2016	1823	1409	1511	-	-	-	1754	1058	1131
(13' - 1")	-	-	-	(4,446)	(4,446)	(4,446)	(4,019)	(3,107)	(3,332)	-	-	-	(3,869)	(2,333)	(2,494)
3 m	3028	3028	3028	2294	1942	2109	1927	1358	1459	1715	993	1061	1685	922	986
(9' - 10")	(6,678)	(6,678)	(6,678)	(5,058)	(4,283)	(4,649)	(4,249)	(2,995)	(3,216)	(3,782)	(2,190)	(2,341)	(3,715)	(2,034)	(2,173)
2 m	3608	2813	3139	2654	1790	1948	2080	1285	1383	1753	964	1031	1638	853	912
(6' - 7")	(7,955)	(6,203)	(6,921)	(5,852)	(3,947)	(4,296)	(4,587)	(2,834)	(3,049)	(3,866)	(2,125)	(2,273)	(3,612)	(1,882)	(2,011)
1 m	4294	2546	2850	2916	1657	1808	2201	1214	1309	1778	930	996	1597	830	888
(3' - 3")	(9,467)	(5,614)	(6,284)	(6,429)	(3,653)	(3,986)	(4,853)	(2,678)	(2,887)	(3,920)	(2,050)	(2,196)	(3,521)	(1,831)	(1,958)
0 m	4209	2385	2676	2948	1580	1727	2215	1165	1258	1718	906	972	1545	850	910
(0' - 0")	(9,281)	(5,260)	(5,901)	(6,501)	(3,484)	(3,808)	(4,884)	(2,570)	(2,774)	(3,789)	(1,998)	(2,143)	(3,408)	(1,874)	(2,006)
-1 m	3707	2389	2680	2736	1557	1703	2060	1147	1239	-	-	-	1461	922	989
(-3' - 3")	(8,173)	(5,267)	(5,909)	(6,033)	(3,434)	(3,755)	(4,542)	(2,530)	(2,733)	-	-	-	(3,222)	(2,034)	(2,181)
-2 m	2955	2437	2732	2252	1580	1727	1614	1170	1263	-	-	-	1294	1086	1169
(-6' - 7")	(6,515)	(5,375)	(6,025)	(4,965)	(3,483)	(3,807)	(3,558)	(2,581)	(2,785)	-	-	-	(2,853)	(2,395)	(2,577)

**14 Triple boom/rubber tracks/long stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10")			(13' - 1")			(16' - 5")			(19' - 8")					
	I	II	III	I	II	III									
4 m	-	-	-	1850	1850	1850	1702	1425	1529	1621	1013	1083	1624	960	1026
(13' - 1")	-	-	-	(4,080)	(4,080)	(4,080)	(3,753)	(3,142)	(3,371)	(3,574)	(2,234)	(2,387)	(3,581)	(2,117)	(2,262)
3 m	2708	2708	2708	2134	1973	2134	1823	1370	1471	1633	999	1069	1567	845	903
(9' - 10")	(5,972)	(5,972)	(5,972)	(4,704)	(4,351)	(4,704)	(4,019)	(3,020)	(3,244)	(3,601)	(2,204)	(2,356)	(3,454)	(1,863)	(1,990)
2 m	3402	2864	3196	2516	1816	1977	1995	1291	1390	1695	962	1030	1528	784	839
(6' - 7")	(7,502)	(6,316)	(7,048)	(5,549)	(4,004)	(4,358)	(4,399)	(2,847)	(3,065)	(3,738)	(2,122)	(2,272)	(3,368)	(1,729)	(1,849)
1 m	4166	2559	2866	2831	1667	1820	2145	1213	1308	1747	922	988	1493	763	816
(3' - 3")	(9,185)	(5,642)	(6,319)	(6,243)	(3,676)	(4,013)	(4,729)	(2,674)	(2,884)	(3,851)	(2,032)	(2,179)	(3,293)	(1,682)	(1,800)
0 m	4295	2366	2657	2937	1572	1720	2200	1154	1247	1733	890	956	1452	778	833
(0' - 0")	(9,470)	(5,216)	(5,858)	(6,477)	(3,467)	(3,792)	(4,851)	(2,545)	(2,750)	(3,821)	(1,963)	(2,108)	(3,201)	(1,715)	(1,837)
-1 m	3912	2349	2639	2801	1534	1680	2104	1126	1218	1574	881	946	1377	832	892
(-3' - 3")	(8,626)	(5,180)	(5,818)	(6,176)	(3,382)	(3,704)	(4,639)	(2,482)	(2,685)	(3,470)	(1,942)	(2,087)	(3,035)	(1,834)	(1,967)
-2 m	3246	2384	2676	2408	1543	1689	1778	1134	1226	-	-	-	1257	968	1040
(-6' - 7")	(7,157)	(5,257)	(5,902)	(5,309)	(3,402)	(3,724)	(3,919)	(2,500)	(2,703)	-	-	-	(2,772)	(2,134)	(2,293)

**15 Triple boom/rubber tracks/rear weight/short stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10")			(13' - 1")			(16' - 5")			(19' - 8")					
	I	II	III	I	II	III									
4 m	-	-	-	2016	2016	2016	1823	1530	1646	-	-	-	1754	1159	1242
(13' - 1")	-	-	-	(4,446)	(4,446)	(4,446)	(4,019)	(3,374)	(3,628)	-	-	-	(3,869)	(2,556)	(2,739)
3 m	3028	3028	3028	2294	2104	2289	1927	1480	1593	1715	1091	1168	1685	1016	1088
(9' - 10")	(6,678)	(6,678)	(6,678)	(5,058)	(4,638)	(5,048)	(4,249)	(3,263)	(3,512)	(3,782)	(2,405)	(2,576)	(3,715)	(2,239)	(2,398)
2 m	3608	3053	3415	2654	1951	2129	2080	1407	1517	1753	1061	1138	1638	943	1010
(6' - 7")	(7,955)	(6,733)	(7,531)	(5,852)	(4,303)	(4,694)	(4,587)	(3,102)	(3,345)	(3,866)	(2,340)	(2,509)	(3,612)	(2,080)	(2,227)
1 m	4294	2786	3126	2916	1818	1988	2201	1336	1443	1778	1027	1103	1597	920	986
(3' - 3")	(9,467)	(6,143)	(6,893)	(6,429)	(4,008)	(4,384)	(4,853)	(2,946)	(3,183)	(3,920)	(2,264)	(2,431)	(3,521)	(2,028)	(2,174)
0 m	4209	2626	2952	2948	1741	1908	2215	1287	1392	1718	1004	1079	1545	942	1010
(0' - 0")	(9,281)	(5,789)	(6,510)	(6,501)	(3,840)	(4,206)	(4,884)	(2,837)	(3,070)	(3,789)	(2,213)	(2,378)	(3,408)	(2,077)	(2,228)
-1 m	3707	2629	2956	2736	1719	1884	2060	1269	1373	-	-	-	1461	1021	1097
(-3' - 3")	(8,173)	(5,797)	(6,518)	(6,033)	(3,790)	(4,154)	(4,542)	(2,798)	(3,029)	-	-	-	(3,222)	(2,251)	(2,419)
-2 m	2955	2678	2955	2252	1741	1907	1614	1292	1397	-	-	-	1294	1198	1292
(-6' - 7")	(6,515)	(5,904)	(6,515)	(4,965)	(3,839)	(4,206)	(3,558)	(2,848)	(3,081)	-	-	-	(2,853)	(2,642)	(2,848)

**16 Triple boom/rubber tracks/rear weight/long stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10'')			(13' - 1'')			(16' - 5'')			(19' - 8'')					
	I	II	III	I	II	III									
4 m	-	-	-	1850	1850	1850	1702	1546	1663	1621	1110	1189	1624	1055	1130
(13' - 1'')	-	-	-	(4,080)	(4,080)	(4,080)	(3,753)	(3,410)	(3,667)	(3,574)	(2,448)	(2,623)	(3,581)	(2,326)	(2,491)
3 m	2708	2708	2708	2134	2134	2134	1823	1491	1606	1633	1097	1175	1567	933	999
(9' - 10'')	(5,972)	(5,972)	(5,972)	(4,704)	(4,704)	(4,704)	(4,019)	(3,288)	(3,540)	(3,601)	(2,418)	(2,592)	(3,454)	(2,057)	(2,203)
2 m	3402	3105	3402	2516	1977	2157	1995	1413	1524	1695	1060	1137	1528	869	932
(6' - 7'')	(7,502)	(6,845)	(7,502)	(5,549)	(4,359)	(4,757)	(4,399)	(3,115)	(3,361)	(3,738)	(2,337)	(2,508)	(3,368)	(1,917)	(2,054)
1 m	4166	2799	3142	2831	1828	2001	2145	1334	1442	1747	1019	1095	1493	848	909
(3' - 3'')	(9,185)	(6,172)	(6,928)	(6,243)	(4,032)	(4,411)	(4,729)	(2,942)	(3,180)	(3,851)	(2,247)	(2,415)	(3,293)	(1,869)	(2,005)
0 m	4295	2606	2933	2937	1733	1901	2200	1275	1381	1733	988	1063	1452	865	928
(0' - 0'')	(9,470)	(5,746)	(6,467)	(6,477)	(3,822)	(4,191)	(4,851)	(2,812)	(3,046)	(3,821)	(2,178)	(2,344)	(3,201)	(1,907)	(2,047)
-1 m	3912	2589	2915	2801	1695	1860	2104	1247	1352	1574	978	1053	1377	924	993
(-3' - 3'')	(8,626)	(5,709)	(6,427)	(6,176)	(3,738)	(4,102)	(4,639)	(2,750)	(2,981)	(3,470)	(2,157)	(2,322)	(3,035)	(2,037)	(2,189)
-2 m	3246	2624	2953	2408	1704	1870	1778	1255	1360	-	-	-	1257	1071	1154
(-6' - 7'')	(7,157)	(5,786)	(6,511)	(5,309)	(3,758)	(4,123)	(3,919)	(2,768)	(2,999)	-	-	-	(2,772)	(2,361)	(2,544)

**17 Triple boom/steel or hybrid tracks/short stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10'')			(13' - 1'')			(16' - 5'')			(19' - 8'')					
	I	II	III	I	II	III									
4 m	-	-	-	2016	2016	2016	1823	1432	1539	-	-	-	1754	1077	1154
(13' - 1'')	-	-	-	(4,446)	(4,446)	(4,446)	(4,019)	(3,157)	(3,393)	-	-	-	(3,869)	(2,374)	(2,544)
3 m	3028	3028	3028	2294	1972	2146	1927	1381	1486	1715	1011	1083	1685	940	1006
(9' - 10'')	(6,678)	(6,678)	(6,678)	(5,058)	(4,349)	(4,731)	(4,249)	(3,045)	(3,277)	(3,782)	(2,230)	(2,389)	(3,715)	(2,072)	(2,219)
2 m	3608	2858	3196	2654	1820	1985	2080	1308	1410	1753	982	1053	1638	870	932
(6' - 7'')	(7,955)	(6,302)	(7,046)	(5,852)	(4,014)	(4,378)	(4,587)	(2,884)	(3,110)	(3,866)	(2,165)	(2,322)	(3,612)	(1,919)	(2,055)
1 m	4294	2591	2907	2916	1687	1845	2201	1237	1337	1778	948	1018	1597	847	908
(3' - 3'')	(9,467)	(5,713)	(6,409)	(6,429)	(3,719)	(4,068)	(4,853)	(2,728)	(2,947)	(3,920)	(2,090)	(2,244)	(3,521)	(1,868)	(2,002)
0 m	4209	2430	2733	2948	1610	1764	2215	1188	1286	1718	924	994	1545	867	930
(0' - 0'')	(9,281)	(5,359)	(6,026)	(6,501)	(3,550)	(3,890)	(4,884)	(2,620)	(2,835)	(3,789)	(2,038)	(2,191)	(3,408)	(1,912)	(2,052)
-1 m	3707	2434	2737	2736	1588	1740	2060	1170	1267	-	-	-	1461	941	1011
(-3' - 3'')	(8,173)	(5,366)	(6,034)	(6,033)	(3,500)	(3,837)	(4,542)	(2,580)	(2,793)	-	-	-	(3,222)	(2,074)	(2,230)
-2 m	2955	2482	2789	2252	1610	1764	1614	1193	1291	-	-	-	1294	1107	1194
(-6' - 7'')	(6,515)	(5,473)	(6,150)	(4,965)	(3,550)	(3,889)	(3,558)	(2,631)	(2,846)	-	-	-	(2,853)	(2,441)	(2,632)

**18 Triple boom/steel or hybrid tracks/long stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10'')			(13' - 1'')			(16' - 5'')			(19' - 8'')					
	I	II	III	I	II	III									
4 m	-	-	-	1850	1850	1850	1702	1448	1556	1621	1031	1104	1624	978	1047
(13' - 1'')	-	-	-	(4,080)	(4,080)	(4,080)	(3,753)	(3,192)	(3,432)	(3,574)	(2,274)	(2,435)	(3,581)	(2,156)	(2,309)
3 m	2708	2708	2708	2134	2003	2134	1823	1392	1499	1633	1018	1090	1567	861	922
(9' - 10'')	(5,972)	(5,972)	(5,972)	(4,704)	(4,418)	(4,704)	(4,019)	(3,070)	(3,305)	(3,601)	(2,244)	(2,404)	(3,454)	(1,899)	(2,034)
2 m	3402	2909	3253	2516	1846	2014	1995	1314	1417	1695	981	1052	1528	800	858
(6' - 7'')	(7,502)	(6,415)	(7,173)	(5,549)	(4,070)	(4,440)	(4,399)	(2,897)	(3,125)	(3,738)	(2,162)	(2,320)	(3,368)	(1,764)	(1,891)
1 m	4166	2604	2922	2831	1697	1857	2145	1235	1336	1747	940	1010	1493	779	835
(3' - 3'')	(9,185)	(5,741)	(6,444)	(6,243)	(3,742)	(4,095)	(4,729)	(2,724)	(2,945)	(3,851)	(2,072)	(2,227)	(3,293)	(1,717)	(1,842)
0 m	4295	2411	2713	2937	1602	1757	2200	1177	1275	1733	909	978	1452	794	853
(0' - 0'')	(9,470)	(5,315)	(5,983)	(6,477)	(3,533)	(3,874)	(4,851)	(2,595)	(2,811)	(3,821)	(2,003)	(2,156)	(3,201)	(1,751)	(1,880)
-1 m	3912	2394	2695	2801	1564	1717	2104	1148	1245	1574	899	968	1377	849	913
(-3' - 3'')	(8,626)	(5,278)	(5,943)	(6,176)	(3,449)	(3,785)	(4,639)	(2,532)	(2,745)	(3,470)	(1,982)	(2,135)	(3,035)	(1,872)	(2,012)
-2 m	3246	2429	2733	2408	1573	1726	1778	1156	1254	-	-	-	1257	987	1063
(-6' - 7'')	(7,157)	(5,355)	(6,026)	(5,309)	(3,468)	(3,806)	(3,919)	(2,550)	(2,764)	-	-	-	(2,772)	(2,176)	(2,345)

**19 Triple boom/steel or hybrid tracks/rear weight/short stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10")			(13' - 1")			(16' - 5")			(19' - 8")					
	I	II	III	I	II	III									
4 m	-	-	-	2016	2016	2016	1823	1553	1673	-	-	-	1754	1178	1265
(13' - 1")	-	-	-	(4,446)	(4,446)	(4,446)	(4,019)	(3,424)	(3,689)	-	-	-	(3,869)	(2,597)	(2,789)
3 m	3028	3028	3028	2294	2134	2294	1927	1502	1620	1715	1109	1190	1685	1033	1109
(9' - 10")	(6,678)	(6,678)	(6,678)	(5,058)	(4,705)	(5,058)	(4,249)	(3,313)	(3,573)	(3,782)	(2,445)	(2,624)	(3,715)	(2,278)	(2,444)
2 m	3608	3098	3472	2654	1981	2166	2080	1429	1545	1753	1079	1160	1638	960	1030
(6' - 7")	(7,955)	(6,831)	(7,655)	(5,852)	(4,369)	(4,776)	(4,587)	(3,152)	(3,406)	(3,866)	(2,380)	(2,557)	(3,612)	(2,116)	(2,272)
1 m	4294	2831	3183	2916	1848	2025	2201	1359	1471	1778	1045	1124	1597	936	1006
(3' - 3")	(9,467)	(6,242)	(7,018)	(6,429)	(4,075)	(4,466)	(4,853)	(2,996)	(3,243)	(3,920)	(2,304)	(2,479)	(3,521)	(2,065)	(2,218)
0 m	4209	2670	3009	2948	1771	1945	2215	1309	1420	1718	1022	1100	1545	959	1031
(0' - 0")	(9,281)	(5,888)	(6,635)	(6,501)	(3,906)	(4,288)	(4,884)	(2,887)	(3,131)	(3,789)	(2,253)	(2,426)	(3,408)	(2,114)	(2,274)
-1 m	3707	2674	3013	2736	1749	1921	2060	1291	1401	-	-	-	1461	1039	1119
-(3' - 3")	(8,173)	(5,896)	(6,643)	(6,033)	(3,856)	(4,235)	(4,542)	(2,848)	(3,089)	-	-	-	(3,222)	(2,291)	(2,468)
-2 m	2955	2722	2955	2252	1771	1944	1614	1314	1425	-	-	-	1294	1219	1294
-(6' - 7")	(6,515)	(6,003)	(6,515)	(4,965)	(3,905)	(4,287)	(3,558)	(2,898)	(3,142)	-	-	-	(2,853)	(2,688)	(2,853)

**20 Triple boom/steel or hybrid tracks/rear weight/long stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10")			(13' - 1")			(16' - 5")			(19' - 8")					
	I	II	III	I	II	III									
4 m	-	-	-	1850	1850	1850	1702	1569	1691	1621	1128	1211	1624	1072	1151
(13' - 1")	-	-	-	(4,080)	(4,080)	(4,080)	(3,753)	(3,460)	(3,728)	(3,574)	(2,488)	(2,671)	(3,581)	(2,365)	(2,538)
3 m	2708	2708	2708	2134	2134	2134	1823	1514	1633	1633	1115	1197	1567	949	1019
(9' - 10")	(5,972)	(5,972)	(5,972)	(4,704)	(4,704)	(4,704)	(4,019)	(3,338)	(3,601)	(3,601)	(2,458)	(2,640)	(3,454)	(2,093)	(2,246)
2 m	3402	3149	3402	2516	2007	2194	1995	1435	1552	1695	1078	1159	1528	885	951
(6' - 7")	(7,502)	(6,944)	(7,502)	(5,549)	(4,426)	(4,838)	(4,399)	(3,165)	(3,421)	(3,738)	(2,377)	(2,556)	(3,368)	(1,952)	(2,096)
1 m	4166	2844	3199	2831	1858	2038	2145	1357	1470	1747	1037	1117	1493	864	928
(3' - 3")	(9,185)	(6,271)	(7,053)	(6,243)	(4,098)	(4,493)	(4,729)	(2,992)	(3,241)	(3,851)	(2,287)	(2,463)	(3,293)	(1,904)	(2,046)
0 m	4295	2651	2990	2937	1764	1938	2200	1298	1409	1733	1006	1085	1452	881	948
(0' - 0")	(9,470)	(5,845)	(6,592)	(6,477)	(3,889)	(4,272)	(4,851)	(2,862)	(3,107)	(3,821)	(2,218)	(2,392)	(3,201)	(1,943)	(2,090)
-1 m	3912	2634	2972	2801	1725	1897	2104	1270	1379	1574	996	1075	1377	941	1013
-(3' - 3")	(8,626)	(5,808)	(6,552)	(6,176)	(3,805)	(4,184)	(4,639)	(2,800)	(3,041)	(3,470)	(2,197)	(2,370)	(3,035)	(2,075)	(2,234)
-2 m	3246	2669	3009	2408	1734	1907	1778	1278	1388	-	-	-	1257	1090	1177
-(6' - 7")	(7,157)	(5,885)	(6,636)	(5,309)	(3,824)	(4,204)	(3,919)	(2,818)	(3,060)	-	-	-	(2,772)	(2,404)	(2,595)

**21: Triple boom/steel tracks 600 mm (24 in)/short stick**

A B	3 m			4 m			5 m			6 m			max		
	(9' - 10")			(13' - 1")			(16' - 5")			(19' - 8")					
	I	II	III	I	II	III									
4 m	-	-	-	2016	2016	2016	1823	1487	1606	-	-	-	1754	1123	1209
(13' - 1")	-	-	-	(4,446)	(4,446)	(4,446)	(4,019)	(3,278)	(3,541)	-	-	-	(3,869)	(2,476)	(2,666)
3 m	3028	3028	3028	2294	2046	2236	1927	1436	1553	1715	1056	1137	1685	982	1057
(9' - 10")	(6,678)	(6,678)	(6,678)	(5,058)	(4,511)	(4,930)	(4,249)	(3,167)	(3,425)	(3,782)	(2,328)	(2,506)	(3,715)	(2,166)	(2,332)
2 m	3608	2967	3334	2654	1894	2076	2080	1363	1477	1753	1026	1106	1638	911	981
(6' - 7")	(7,955)	(6,543)	(7,351)	(5,852)	(4,175)	(4,577)	(4,587)	(3,006)	(3,258)	(3,866)	(2,263)	(2,439)	(3,612)	(2,009)	(2,164)
1 m	4294	2700	3045	2916	1760	1935	2201	1292	1404	1778	992	1071	1597	888	957
(3' - 3")	(9,467)	(5,954)	(6,713)	(6,429)	(3,881)	(4,267)	(4,853)	(2,850)	(3,095)	(3,920)	(2,187)	(2,362)	(3,521)	(1,957)	(2,110)
0 m	4209	2539	2871	2948	1684	1854	2215	1243	1353	1718	969	1047	1545	909	981
(0' - 0")	(9,281)	(5,600)	(6,330)	(6,501)	(3,712)	(4,089)	(4,884)	(2,741)	(2,982)	(3,789)	(2,136)	(2,309)	(3,408)	(2,004)	(2,163)
-1 m	3707	2543	2875	2736	1661	1830	2060	1225	1334	-	-	-	1461	986	1065
-(3' - 3")	(8,173)	(5,607)	(6,338)	(6,033)	(3,662)	(4,036)	(4,542)	(2,702)	(2,941)	-	-	-	(3,222)	(2,173)	(2,349)
-2 m	2955	2592	2927	2252	1683	1854	1614	1248	1358	-	-	-	1294	1158	1255
-(6' - 7")	(6,515)	(5,714)	(6,454)	(4,965)	(3,711)	(4,088)	(3,558)	(2,752)	(2,994)	-	-	-	(2,853)	(2,554)	(2,768)

**22: Monobloc boom/steel tracks 600 mm (24 in)/long stick**

A B	3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			6 m (19' - 8")			max		
	I	II	III	I	II	III									
	4 m (13' - 1")	-	-	-	1850 (4,080)	1850 (4,080)	1850 (4,080)	1702 (3,753)	1503 (3,314)	1624 (3,580)	1621 (3,574)	1075 (2,371)	1158 (2,553)	1624 (3,581)	1021 (2,251)
3 m (9' - 10")	2708 (5,972)	2708 (5,972)	2708 (5,972)	2134 (4,704)	2077 (4,579)	2134 (4,704)	1823 (4,019)	1448 (3,192)	1566 (3,453)	1633 (3,601)	1062 (2,341)	1144 (2,522)	1567 (3,454)	901 (1,987)	971 (2,140)
2 m (6' - 7")	3402 (7,502)	3018 (6,656)	3391 (7,477)	2516 (5,549)	1919 (4,232)	2104 (4,639)	1995 (4,399)	1369 (3,019)	1484 (3,273)	1695 (3,738)	1025 (2,260)	1106 (2,438)	1528 (3,368)	839 (1,850)	904 (1,993)
1 m (3' - 3")	4166 (9,185)	2713 (5,982)	3060 (6,748)	2831 (6,243)	1771 (3,904)	1947 (4,294)	2145 (4,729)	1291 (2,846)	1403 (3,093)	1747 (3,851)	984 (2,170)	1063 (2,345)	1493 (3,293)	817 (1,802)	882 (1,944)
0 m (0' - 0")	4295 (9,470)	2520 (5,556)	2851 (6,287)	2937 (6,477)	1676 (3,695)	1847 (4,073)	2200 (4,851)	1232 (2,716)	1342 (2,958)	1733 (3,821)	953 (2,101)	1031 (2,274)	1452 (3,201)	834 (1,839)	900 (1,985)
-1 m (-3' - 3")	3912 (8,626)	2503 (5,519)	2833 (6,247)	2801 (6,176)	1637 (3,611)	1807 (3,984)	2104 (4,639)	1203 (2,654)	1312 (2,893)	1574 (3,470)	943 (2,080)	1022 (2,252)	1377 (3,035)	891 (1,964)	963 (2,123)
-2 m (-6' - 7")	3246 (7,157)	2538 (5,596)	2871 (6,331)	2408 (5,309)	1646 (3,630)	1816 (4,005)	1778 (3,919)	1212 (2,672)	1321 (2,912)	-	-	-	1257 (2,772)	1034 (2,280)	1120 (2,470)

**23: Monobloc boom/steel tracks 600 mm (24 in)/rear weight/short stick**

A B	3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			6 m (19' - 8")			max		
	I	II	III	I	II	III									
	4 m (13' - 1")	-	-	-	2016 (4,446)	2016 (4,446)	2016 (4,446)	1823 (4,019)	1608 (3,546)	1740 (3,837)	-	-	-	1754 (3,869)	1224 (2,699)
3 m (9' - 10")	3028 (6,678)	3028 (6,678)	3028 (6,678)	2294 (5,058)	2207 (4,866)	2294 (5,058)	1927 (4,249)	1558 (3,435)	1687 (3,721)	1715 (3,782)	1153 (2,542)	1244 (2,742)	1685 (3,715)	1075 (2,371)	1160 (2,557)
2 m (6' - 7")	3608 (7,955)	3207 (7,072)	3608 (7,955)	2654 (5,852)	2055 (4,531)	2256 (4,975)	2080 (4,587)	1485 (3,274)	1612 (3,554)	1753 (3,866)	1124 (2,477)	1213 (2,675)	1638 (3,612)	1001 (2,206)	1079 (2,380)
1 m (3' - 3")	4294 (9,467)	2940 (6,483)	3321 (7,322)	2916 (6,429)	1921 (4,237)	2116 (4,665)	2201 (4,853)	1414 (3,117)	1538 (3,391)	1778 (3,920)	1089 (2,402)	1178 (2,597)	1597 (3,521)	977 (2,154)	1055 (2,325)
0 m (0' - 0")	4209 (9,281)	2780 (6,129)	3147 (6,939)	2948 (6,501)	1845 (4,068)	2035 (4,487)	2215 (4,884)	1365 (3,009)	1487 (3,278)	1718 (3,789)	1066 (2,351)	1154 (2,544)	1545 (3,408)	1001 (2,207)	1081 (2,384)
-1 m (-3' - 3")	3707 (8,173)	2783 (6,137)	3151 (6,948)	2736 (6,033)	1822 (4,018)	2011 (4,435)	2060 (4,542)	1347 (2,969)	1468 (3,237)	-	-	-	1461 (3,222)	1084 (2,390)	1173 (2,587)
-2 m (-6' - 7")	2955 (6,515)	2832 (6,244)	2955 (6,515)	2252 (4,965)	1844 (4,067)	2035 (4,486)	1614 (3,558)	1370 (3,020)	1492 (3,290)	-	-	-	1294 (2,853)	1270 (2,800)	1294 (2,853)

**24: Monobloc boom/steel tracks 600 mm (24 in)/rear weight/long stick**

A B	3 m (9' - 10")			4 m (13' - 1")			5 m (16' - 5")			6 m (19' - 8")			max		
	I	II	III	I	II	III									
	4 m (13' - 1")	-	-	-	1850 (4,080)	1850 (4,080)	1850 (4,080)	1702 (3,753)	1624 (3,582)	1702 (3,753)	1621 (3,574)	1173 (2,586)	1265 (2,788)	1624 (3,581)	1115 (2,459)
3 m (9' - 10")	2708 (5,972)	2708 (5,972)	2708 (5,972)	2134 (4,704)	2134 (4,704)	2134 (4,704)	1823 (4,019)	1569 (3,460)	1700 (3,749)	1633 (3,601)	1159 (2,556)	1251 (2,758)	1567 (3,454)	989 (2,181)	1067 (2,352)
2 m (6' - 7")	3402 (7,502)	3259 (7,185)	3402 (7,502)	2516 (5,549)	2081 (4,588)	2285 (5,038)	1995 (4,399)	1491 (3,287)	1619 (3,569)	1695 (3,738)	1122 (2,475)	1212 (2,673)	1528 (3,368)	924 (2,037)	997 (2,198)
1 m (3' - 3")	4166 (9,185)	2953 (6,511)	3337 (7,357)	2831 (6,243)	1932 (4,260)	2128 (4,692)	2145 (4,729)	1412 (3,113)	1537 (3,389)	1747 (3,851)	1081 (2,384)	1170 (2,580)	1493 (3,293)	902 (1,989)	974 (2,148)
0 m (0' - 0")	4295 (9,470)	2760 (6,086)	3128 (6,897)	2937 (6,477)	1837 (4,050)	2028 (4,471)	2200 (4,851)	1353 (2,984)	1476 (3,254)	1733 (3,821)	1050 (2,316)	1138 (2,509)	1452 (3,201)	921 (2,030)	995 (2,195)
-1 m (-3' - 3")	3912 (8,626)	2743 (6,049)	3110 (6,857)	2801 (6,176)	1799 (3,966)	1988 (4,383)	2104 (4,639)	1325 (2,921)	1446 (3,189)	1574 (3,470)	1041 (2,295)	1128 (2,488)	1377 (3,035)	983 (2,167)	1064 (2,345)
-2 m (-6' - 7")	3246 (7,157)	2778 (6,126)	3147 (6,940)	2408 (5,309)	1808 (3,986)	1997 (4,403)	1778 (3,919)	1333 (2,939)	1455 (3,208)	-	-	-	1257 (2,772)	1137 (2,508)	1234 (2,720)



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## **Safety instructions load diagrams**

Observe the values of the load diagrams in lifting gear applications.

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### **DANGER**

#### **Crushing hazard due to tipping over of vehicle!**

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

- ▶ Do not exceed the weights indicated in the load diagrams.
  - ▶ Subtract the weight of the attachment from the weight specified in the relevant load diagram.
  - ▶ Use the vehicle 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 vehicle tips over.

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

### **Information**

The indications are only approximate values. Attachments, uneven ground and soft or bad ground conditions affect the vehicle's stability, and thus the weight and mass it can handle. 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 exchangeable attachment.

The vehicle'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.

ET65: 24 000 kPA (3481 psi)

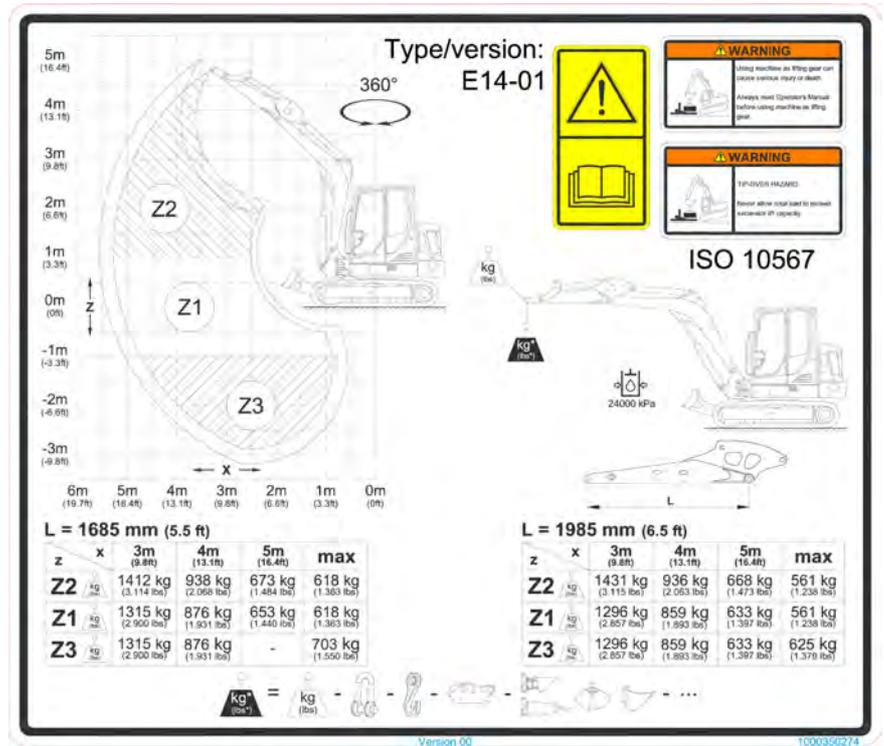
EZ80: 30 000 kPA (4351 psi)

ET90: 30 000 kPA (4351 psi)

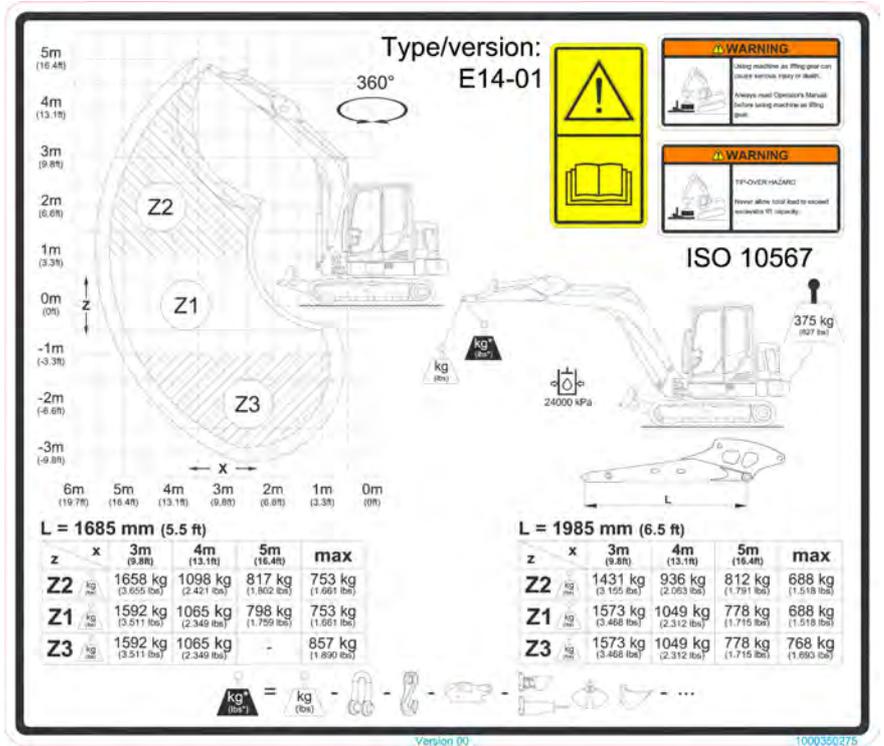
Lift capacities apply to vehicles under the following conditions:

- Lubricants and engine/vehicle fluids at the mandatory levels
- Full fuel tank
- Cab
- Machine at operating temperature
- Operator weight 75 kg (165 lbs.)

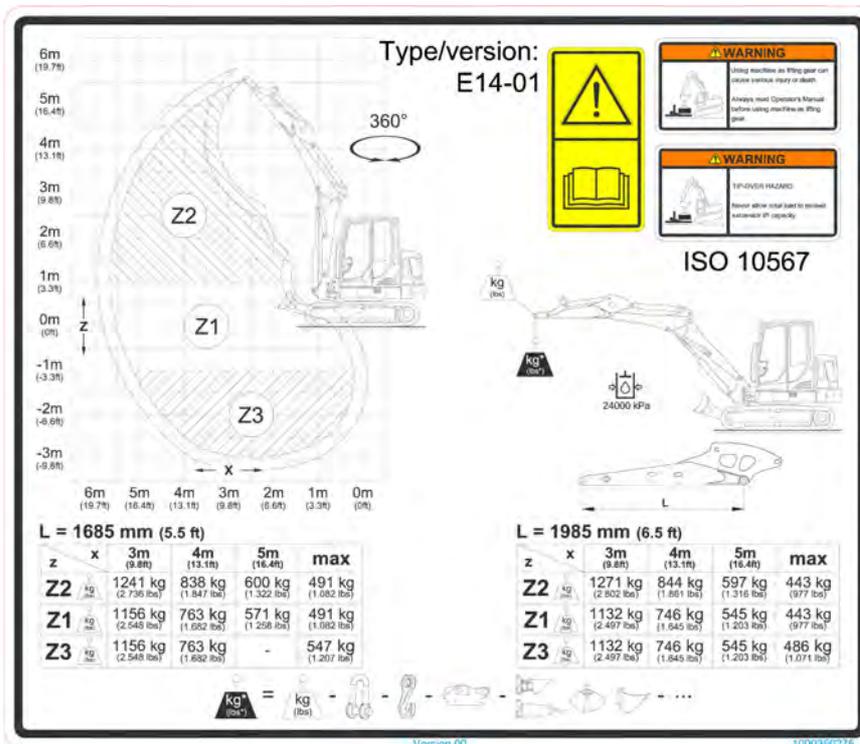
ET65: one-piece boom



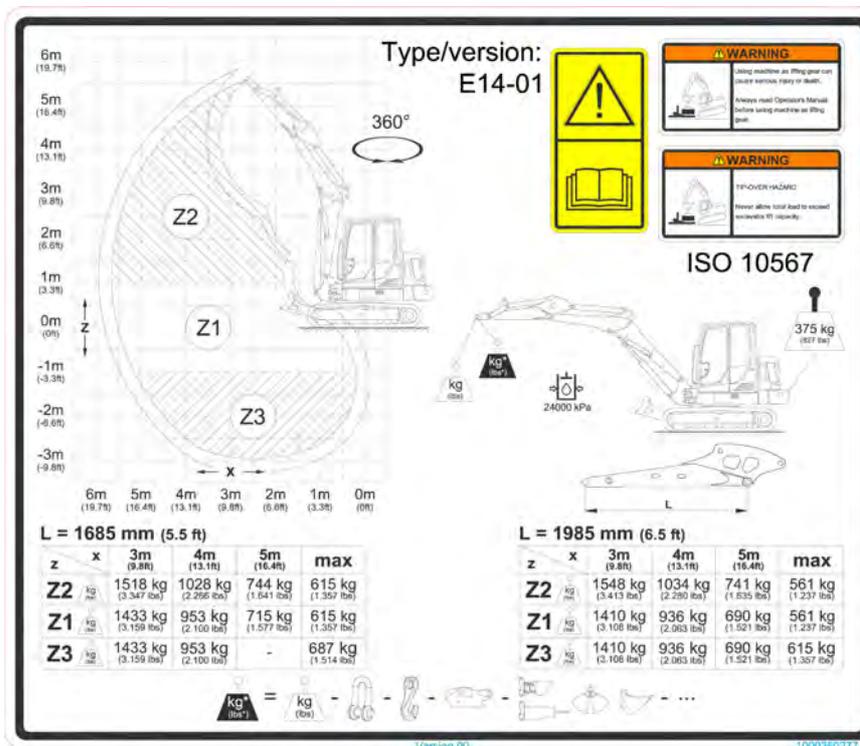
ET65: one-piece boom/counterweight



ET65: triple articulation boom



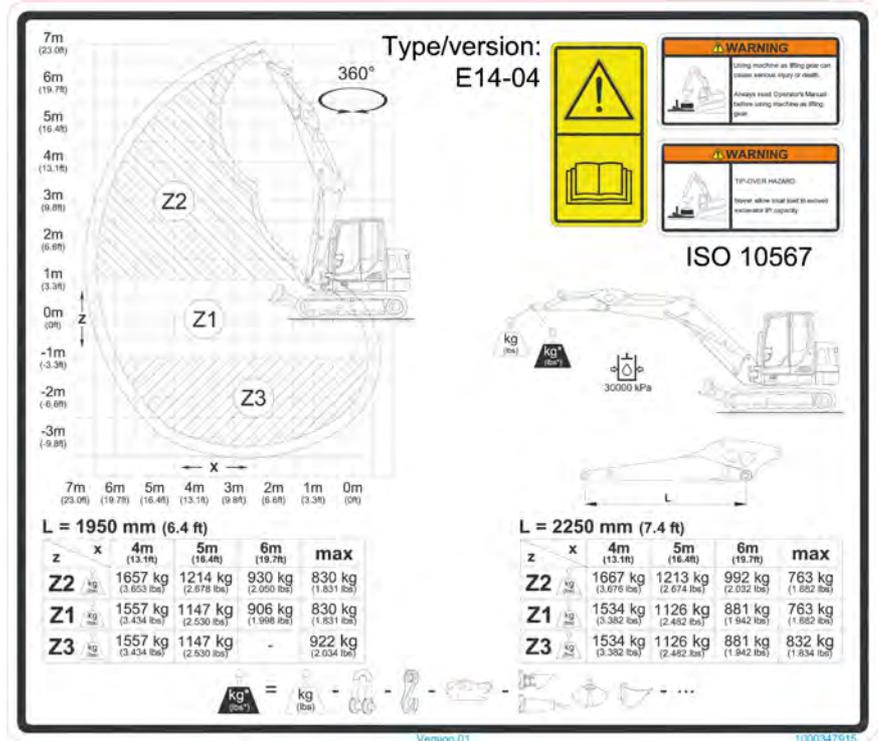
ET65: triple articulation boom/counterweight



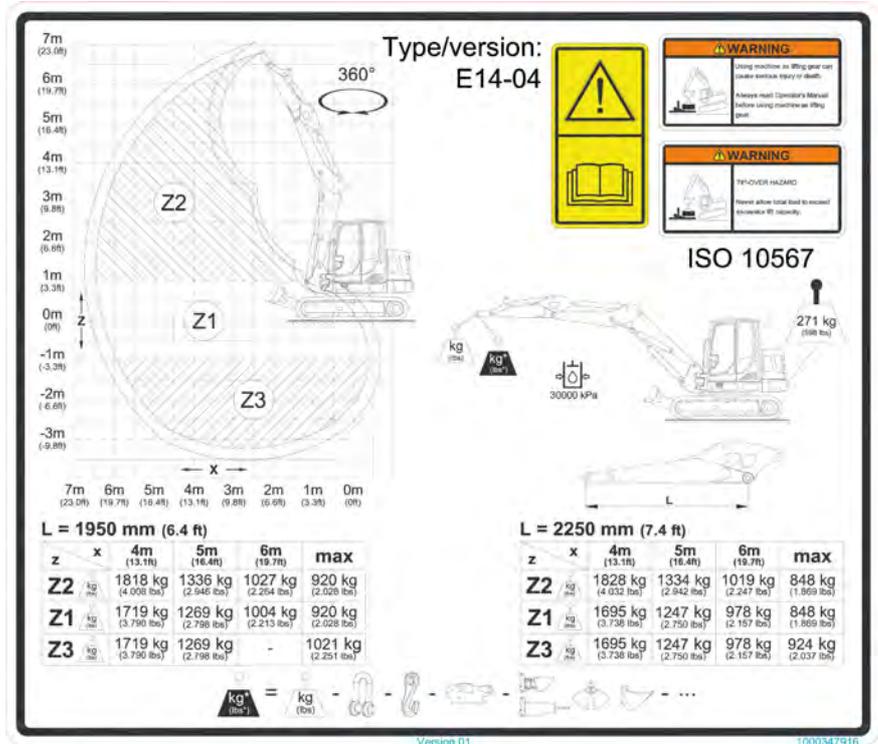




ET90: triple articulation boom

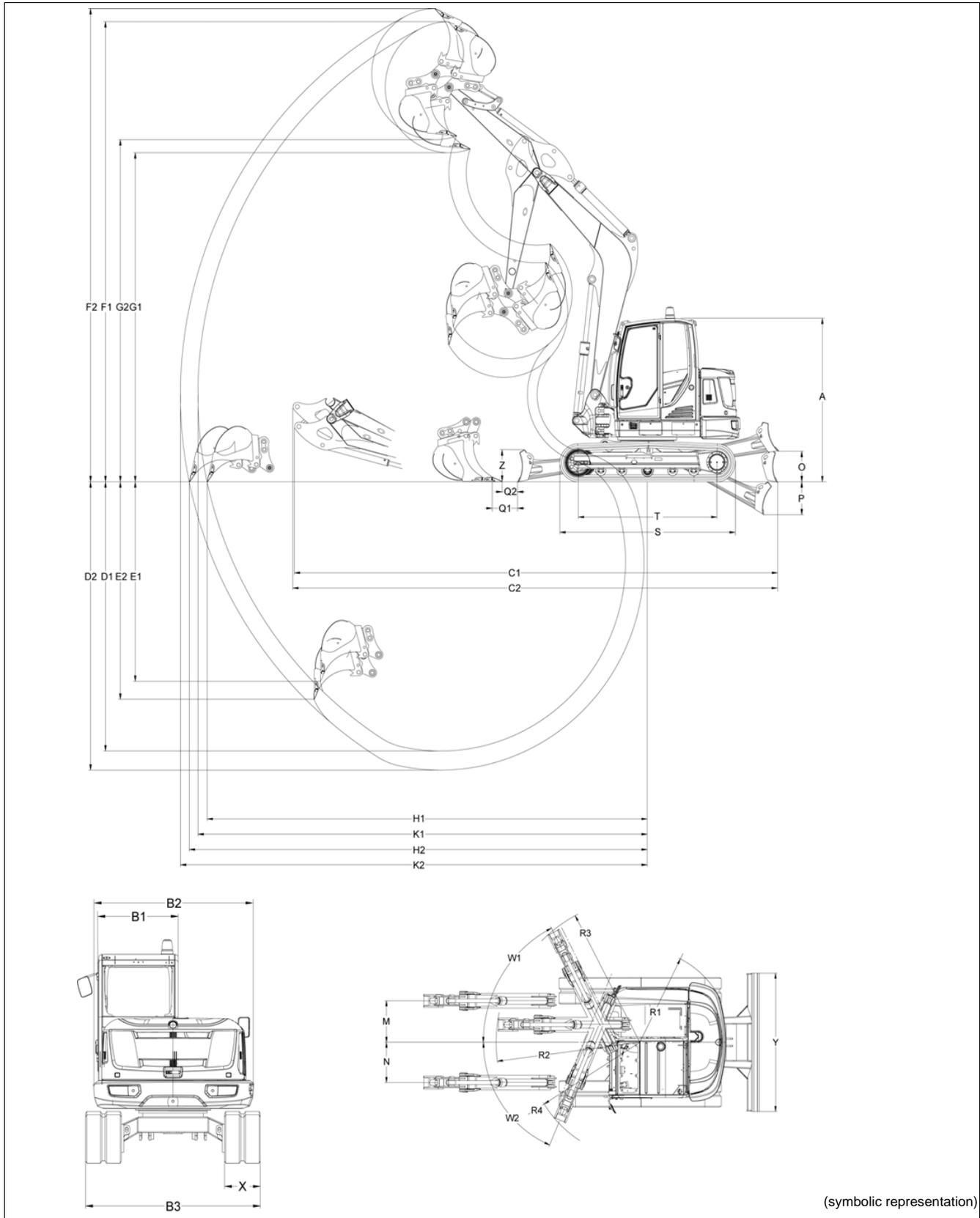


ET90: triple articulation boom/counterweight



## 9.15 Dimensions

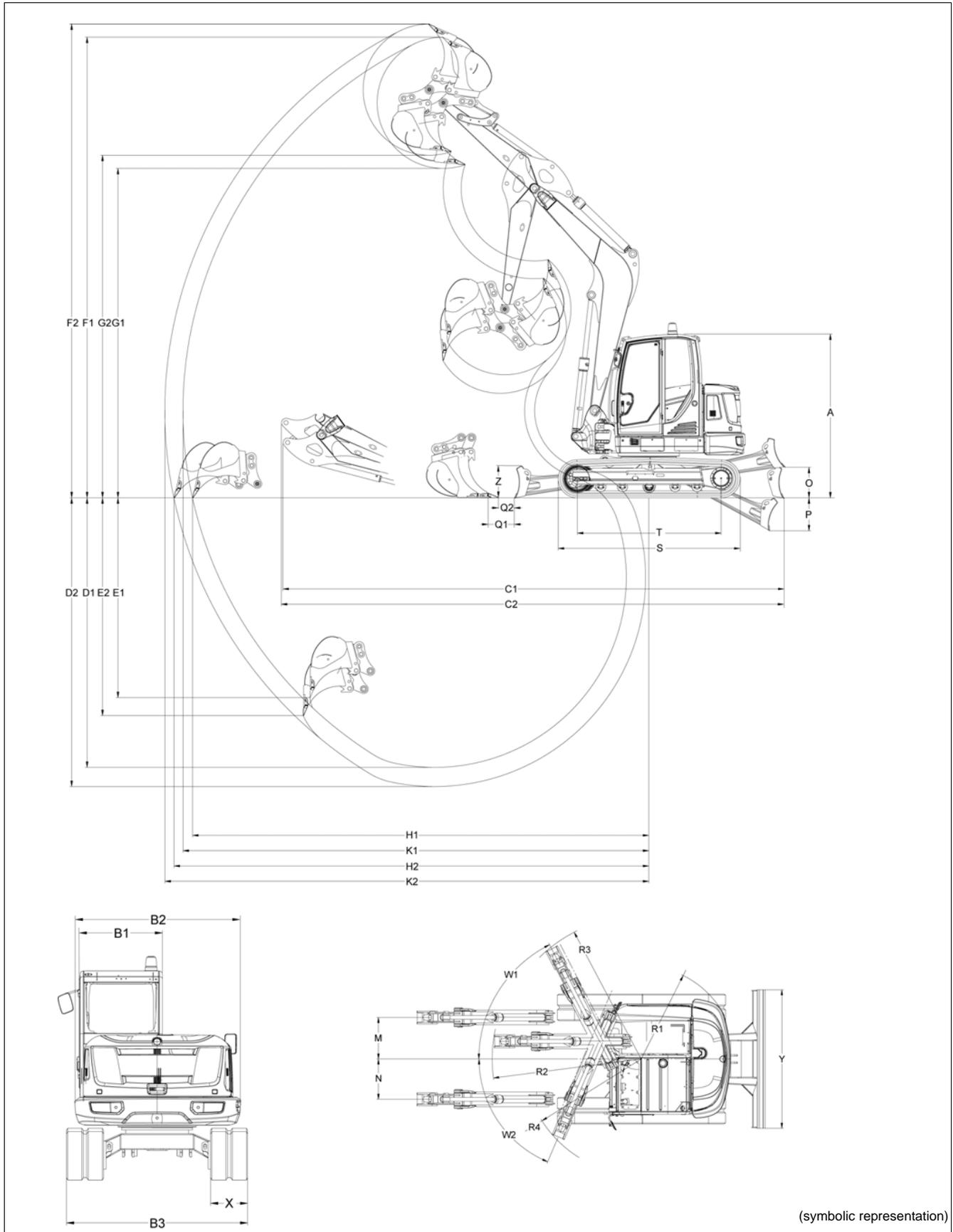
### Overview ET65/EZ80 (boom)





	<b>One-piece boom</b>	<b>ET65 Dimensions mm (in)</b>	<b>EZ80 Dimensions mm (in)</b>
A	Height	2478 (98)	2562 (8'-5")
B1	Cabin width	1000 (39)	1000 (39)
B2	Upper carriage width	1891 (74)	1892 (74)
B3	Travel gear width	1950 (77)	2250 (89)
	Wide travel gear (EZ80 with 600 mm/24in steel chain)	--	2400 (95)
C1	Transport length with stabilizer blade (short stick)	6128 (21'-1")	6939 (22'-9")
C2	Transport length with stabilizer blade (long stick)	6137 (21'-2")	6944 (22'-9")
D1	Max. digging depth (short stick)	3826 (12'-7")	3919 (12'-10")
D2	Max. digging depth (long stick)	4126 (13'-6")	4169 (13'-8")
E1	Max. vertical digging depth (short stick)	2383 (94)	1915 (75)
E2	Max. vertical digging depth (long stick)	2656 (8'-9")	2124 (84)
F1	Max. digging height (short stick)	5773 (18'-11")	6620 (21'-9")
F2	Max. digging height (long stick)	5955 (19'-6")	6782 (22'-3")
G1	Max. tilt-out height (short stick)	3912 (12'-10")	4587 (15'-1")
G2	Max. tilt-out height (long stick)	4094 (13'-5")	4749 (15'-7")
H1	Max. reach at ground level (short stick)	6097 (20'-0")	6795 (22'-4")
H2	Max. reach at ground level (long stick)	6387 (20'-11")	7036 (23'-1")
K1	Max. digging radius (short stick)	6220 (20'-5")	6955 (22'-9")
K2	Max. digging radius (long stick)	6504 (21'-4")	7190 (23'-7")
M	Max. boom displacement to bucket center (right side)	766 (30)	705 (28)
N	Max. boom displacement to bucket center (left side)	492 (19)	683 (27)
O	Max. lift height of stabilizer blade over ground	403 (16)	474 (19)
P	Max. scraping depth of stabilizer blade below ground surface	427 (17)	523 (21)
Q1	Distance between bucket and stabilizer blade (short stick)	290 (11)	429 (17)
Q2	Distance between bucket and stabilizer blade (long stick)	163 (6)	336 (13)
R1	Min. tail end swiveling radius	1363 (54)	1228 (48)
R1	Min. tail end swiveling radius with rear weight	1481 (58)	1341 (53)
R2	Boom swivel radius (center)	2453 (97)	2869 (9'-5")
R3	Boom swivel radius (right)	2372 (93)	2724 (8'-11")
R4	Boom swivel radius (left)	1902 (75)	2273 (90)
S	Total running gear length	2516 (99)	2826 (9'-3")
T	Running gear length (Turas front idler)	1989 (78)	2233 (88)
W1	Max. tilting angle of boom to the right	63°	63°
W2	Max. tilting angle of boom to the left	67°	67°
X	Track width	400 (16)	450 (18)
	Chain width (option)	--	600 (24)
Y	Stabilizer blade width	1950 (77)	2250 (89)
Z	Stabilizer blade height	423 (17)	504 (20)

**Overview of ET65 (triple boom)**



	<b>ET65 (triple articulation boom)</b>	<b>Dimensions mm (in)</b>
A	Height	2478 (98)
B1	Cabin width	1000 (39)
B2	Upper carriage width	1891 (74)
B3	Travel gear width	1950 (77)
C1	Transport length with stabilizer blade (short stick)	6065 (19'-11")
C2	Transport length with stabilizer blade (long stick)	6194 (20'-4")
D1	Max. digging depth (short stick)	3893 (12'-9")
D2	Max. digging depth (long stick)	4193 (13'-9")
E1	Max. vertical digging depth (short stick)	2764 (9'-1")
E2	Max. vertical digging depth (long stick)	3036 (9'-12")
F1	Max. digging height (short stick)	6537 (21'-5")
F2	Max. digging height (long stick)	6770 (22'-3")
G1	Max. tilt-out height (short stick)	4664 (15'-4")
G2	Max. tilt-out height (long stick)	4898 (16'-1")
H1	Max. reach at ground level (short stick)	6475 (21'-3")
H2	Max. reach at ground level (long stick)	6772 (22'-3")
K1	Max. digging radius (short stick)	6590 (21'-7")
K2	Max. digging radius (long stick)	6877 (22'-7")
M	Max. boom displacement to bucket center (right side)	766 (30)
N	Max. boom displacement to bucket center (left side)	492 (19)
O	Max. lift height of stabilizer blade over ground	403 (16)
P	Max. scraping depth of stabilizer blade below ground surface	427 (17)
Q1	Distance between bucket and stabilizer blade (short stick)	699 (28)
Q2	Distance between bucket and stabilizer blade (long stick)	574 (23)
R1	Min. tail end swiveling radius	1363 (54)
R1	Min. tail end swiveling radius with rear weight	1481 (58)
R2	Boom swivel radius (center)	3159 (10'-4")
R3	Boom swivel radius (right)	3097 (10'-2")
R4	Boom swivel radius (left)	2732 (8'-12")
S	Total running gear length	2516 (99)
T	Running gear length (Turas front idler)	1989 (78)
W1	Max. tilting angle of boom to the right	63°
W2	Max. tilting angle of boom to the left	67°
X	Track width	400 (16)
Y	Stabilizer blade width	1950 (77)
Z	Stabilizer blade height	423 (17)

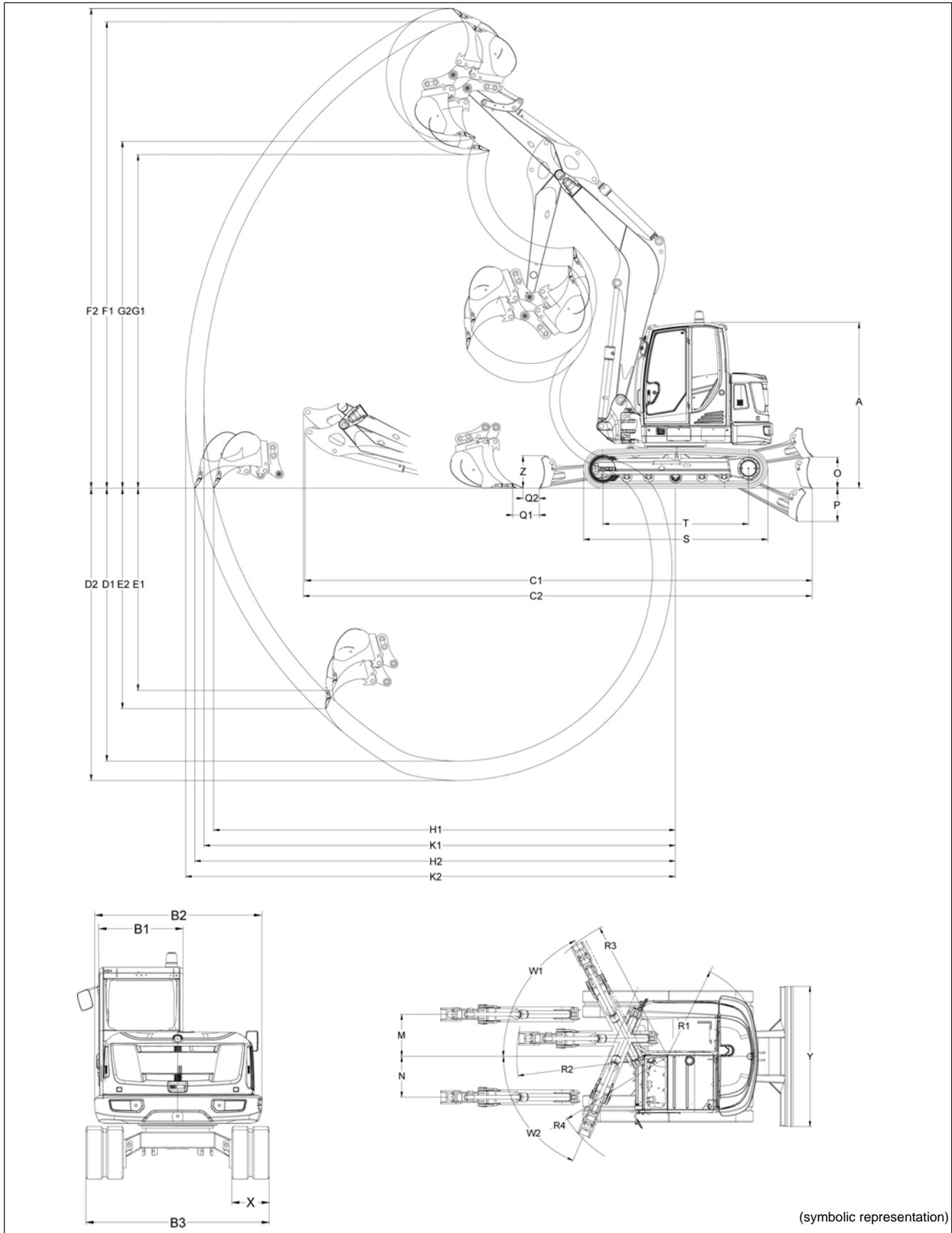




	<b>ET90 (one-piece boom)</b>	<b>Dimensions mm (in)</b>
A	Height	2562 (8'-5")
B1	Cabin width	1000 (39)
B2	Upper carriage width	2017 (79)
B3	Travel gear width	2250 (89) <sup>1</sup>
	Wide travel gear (steel chain 600mm/24 in)	2400 (95)
C1	Transport length with stabilizer blade (short stick)	7117 (23'-4")
C2	Transport length with stabilizer blade (long stick)	7139 (23'-5")
D1	Max. digging depth (short stick)	4325 (14'-2")
D2	Max. digging depth (long stick)	4625 (15'-2")
E1	Max. vertical digging depth (short stick)	3192 (10'-6")
E2	Max. vertical digging depth (long stick)	3474 (11'-5")
F1	Max. digging height (short stick)	7322 (24'-0")
F2	Max. digging height (long stick)	7529 (24'-8")
G1	Max. tilt-out height (short stick)	5066 (16'-7")
G2	Max. tilt-out height (long stick)	5272 (17'-4")
H1	Max. reach at ground level (short stick)	7179 (23'-7")
H2	Max. reach at ground level (long stick)	7474 (24'-6")
K1	Max. digging radius (short stick)	7331 (24'-1")
K2	Max. digging radius (long stick)	7620 (25'-0")
M	Max. boom displacement to bucket center (right side)	705 (28)
N	Max. boom displacement to bucket center (left side)	683 (27)
O	Max. lift height of stabilizer blade over ground	479 (16)
P	Max. scraping depth of stabilizer blade below ground surface	518 (20)
Q1	Distance between bucket and stabilizer blade (short stick)	369 (15)
Q2	Distance between bucket and stabilizer blade (long stick)	208 (8)
R1	Min. tail end swiveling radius	1583 (62)
R1	Min. tail end swiveling radius with rear weight	1655 (65)
R2	Boom swivel radius (center)	2503 (99)
R3	Boom swivel radius (right)	2427 (96)
R4	Boom swivel radius (left)	1969 (78)
S	Total running gear length	2826 (9'-3")
T	Running gear length (Turas front idler)	2233 (88)
W1	Max. tilting angle of boom to the right	63°
W2	Max. tilting angle of boom to the left	67°
X	Track width	450 (18)
	Chain width (option)	600 (24)
Y	Stabilizer blade width	2250 (89) <sup>1</sup>
Z	Stabilizer blade height	501 (20)

1. From serial no. WNCE1404CPAL00161 to serial no. WNCE1404KPAL00181: 2200 mm (87 in)

**Overview ET90 (triple articulation boom)**



	<b>ET90 (triple articulation boom)</b>	<b>Dimensions mm (in)</b>
A	Height	2562 (8'-5")
B1	Cabin width	1000 (39)
B2	Upper carriage width	2017 (79)
B3	Travel gear width	2250 (89) <sup>1</sup>
	Wide travel gear (steel chain 600mm/24 in)	2400 (95)
C1	Transport length with stabilizer blade (short stick)	6468 (21'-3")
C2	Transport length with stabilizer blade (long stick)	6690 (21'-11")
D1	Max. digging depth (short stick)	4379 (14'-4")
D2	Max. digging depth (long stick)	4679 (15'-4")
E1	Max. vertical digging depth (short stick)	3198 (10'-6")
E2	Max. vertical digging depth (long stick)	3456 (11'-4")
F1	Max. digging height (short stick)	7931 (26'-0")
F2	Max. digging height (long stick)	8196 (26'-11")
G1	Max. tilt-out height (short stick)	5674 (18'-7")
G2	Max. tilt-out height (long stick)	5940 (19'-6")
H1	Max. reach at ground level (short stick)	7463 (24'-6")
H2	Max. reach at ground level (long stick)	7751 (25'-5")
K1	Max. digging radius (short stick)	7596 (24'-11")
K2	Max. digging radius (long stick)	7889 (25'-11")
M	Max. boom displacement to bucket center (right side)	705 (28)
N	Max. boom displacement to bucket center (left side)	683 (27)
O	Max. lift height of stabilizer blade over ground	479 (16)
P	Max. scraping depth of stabilizer blade below ground surface	518 (20)
Q1	Distance between bucket and stabilizer blade (short stick)	567 (22)
Q2	Distance between bucket and stabilizer blade (long stick)	441 (17)
R1	Min. tail end swiveling radius	1583 (62)
R1	Min. tail end swiveling radius with rear weight	1655 (65)
R2	Boom swivel radius (center)	2840 (9'-4")
R3	Boom swivel radius (right)	2759 (9'-1")
R4	Boom swivel radius (left)	2280 (90)
S	Total running gear length	2826 (9'-3")
T	Running gear length (Turas front idler)	2233 (88)
W1	Max. tilting angle of boom to the right	63°
W2	Max. tilting angle of boom to the left	67°
X	Track width	450 (18)
	Chain width (option)	600 (24)
Y	Stabilizer blade width	2250 (89) <sup>1</sup>
Z	Stabilizer blade height	501 (20)

1. From serial no. WNCE1404EPAL00160 to serial no. WNCE1404PPAL00180: 2200 mm (87 in)



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