



WACKER NEUSON

Operator's Manual

Track Excavator

2503, 3503



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
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Technical data, dimensions and weights are only given as an indication. Responsibility for errors or omissions not accepted. Non-metric weights and measurements are approximate. Translation of original Operators's Manual.

The cover features the machine with possible optional equipment.

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The Operator's Manual and any amendments to it must be constantly 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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1 Introduction

1.1 Important information on this Operator's Manual

Please store the Operator's Manual in the storage box at the rear of the seat.

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

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

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

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

Operational safety and readiness of the machine do not only depend on your skill, but also on maintenance and servicing of the machine. This is why regular maintenance and servicing is absolutely necessary. Extensive maintenance and repair work must always be performed by a technician with appropriate training. Insist on using original spare parts when performing maintenance and repair work. This ensures operational safety and readiness of your machine, and maintains its value.

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

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

Abbreviations/symbols

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

 *Identifies an activity*

 Description of the effects or results of an activity

n. s. = not shown

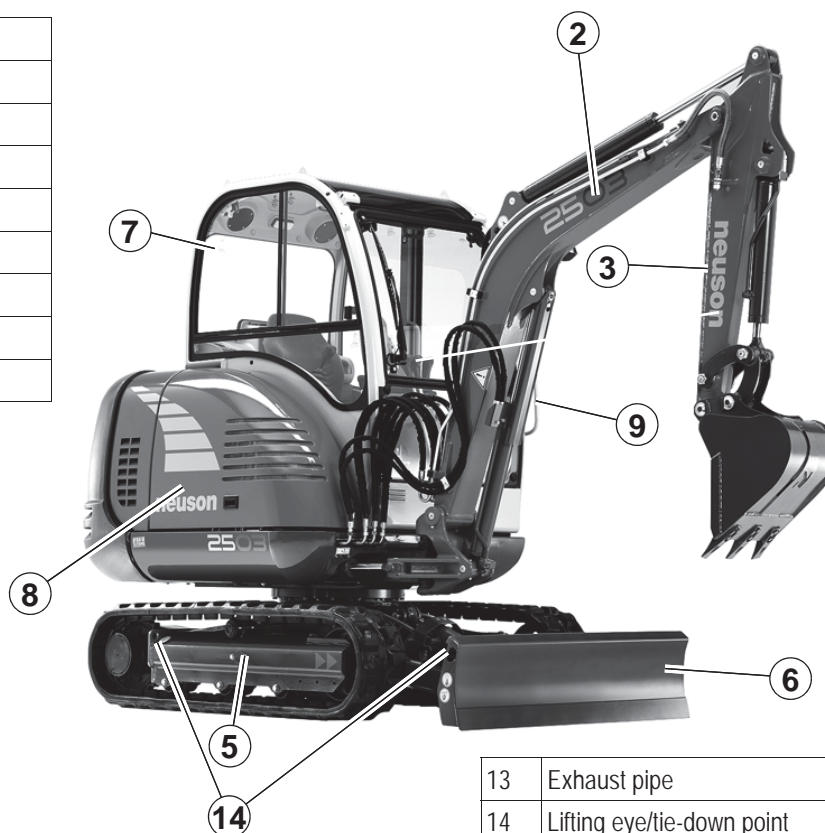
"Opt" = option

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

PMC = particulate matter catalyst

1.2 Machine overview

1	Boom light
2	Boom
3	Stick
4	Rubber tracks
5	Travel gear
6	Stabilizer blade
7	Cabin
8	Valve cover
9	Handhold



13	Exhaust pipe
14	Lifting eye/tie-down point
15	Lubrication point for track tension
16	Engine cover



Fig. 1: Machine outside views

1.3 Brief description

Observe the legal regulations of your country.

The machine can be equipped with a backhoe bucket, shovel bucket or grab for loosening, picking up, transporting and dumping earth, rock and other material that is mostly transported without moving the machine.

A wide range of attachments accounts for the numerous applications of the machine, among others hammer and grab applications. See chapter – see [chapter 1.4 Fields of application, attachments](#) on page 1-4 for further applications.

The main components of the machine are:

- Undercarriage
- Tracked travel gear
- Stabilizer blade
- Live ring
- Upper carriage
 - TOPS (Tip Over Protective Structure) and ROPS (Roll Over Protective Structure) tested canopy (open version) or
 - TOPS (Tip Over Protective Structure) and ROPS (Roll Over Protective Structure) tested cabin (closed version) – option
 - FOPS (Falling Object Protective Structure) – option
- Water-cooled diesel engine
- Hydraulic and electrical components
- Boom



Information!

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

Traveling drive

The diesel engine permanently drives the twin axial variable displacement pump whose oil flow is sent to a hydraulic motor.

Operating hydraulics

The diesel engine also drives the joint gear pump for the operating hydraulics. The oil flow of this pump depends on the diesel engine speed only.

Cooling system

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

Cabin

Modifying or performing improper repair work on the cabin is dangerous. Do not modify the cabin. Repair work may only be performed by a Wacker Neuson service center. If the cabin has been damaged, check it before resuming work and have it repaired if necessary. Please contact your Wacker Neuson dealer for support. Failure to follow this precautionary measure can lead to serious or fatal injury. The cabin has been specially designed for your protection in case of an accident.

Fasten your seatbelt, otherwise you can be thrown around or even outside the cabin and crushed. Therefore always fasten your seat belt as you perform machine travel and operation. Tighten the seatbelt before starting machine operation.

1.4 Fields of application, attachments

The attachments will decide in the first place how the excavator is used.

NOTICE

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

- Please contact your Wacker Neuson dealer if you wish to use other attachments.

Using attachments other than Caterpillar, or using attachments that are to be used with other excavator types, can reduce the machine's output and stability considerably and cause damage to the machine and injury.

Always compare the weight of the attachment and its maximum payload with the indications in the lift capacity table. Never exceed the maximum payload stated in the lift capacity table.



Information!

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

Use: attachment

2503 without quickhitch			
Bucket type	Width	Capacity	Weight
Bucket	260 mm (10 in)	0.036 m ³ (1.27 ft ³)	38 kg (84 lbs)
Bucket	300 mm (12 in)	0.043 m ³ (1.52 ft ³)	41 kg (90 lbs)
Bucket	400 mm (16 in)	0.059 m ³ (2.08 ft ³)	48 kg (106 lbs)
Bucket	500 mm (20 in)	0.075 m ³ (2.65 ft ³)	55 kg (121 lbs)
Bucket	600 mm (24 in)	0.091 m ³ (3.21 ft ³)	63 kg (139 lbs)
Bucket	700 mm (28 in)	0.107 m ³ (3.78 ft ³)	71 kg (157 lbs)
Ditch cleaning bucket	850 mm (33 in)	0.069 m ³ (2.44 ft ³)	66 kg (146 lbs)
Ditch cleaning bucket	1000 mm (39 in)	0.082 m ³ (2.90 ft ³)	66 kg (146 lbs)
Ditch cleaning bucket	1200 mm (47 in)	0.098 m ³ (3.46 ft ³)	75 kg (165 lbs)
Offset bucket	850 mm (33 in)	0.073 m ³ (2.58 ft ³)	92 kg (203 lbs)
Offset bucket	1000 mm (39 in)	0.087 m ³ (3.07 ft ³)	94 kg (207 lbs)



2503 with mechanical Neuson quickhitch			
Bucket type	Width	Capacity	Weight
Bucket	260 mm (10 in)	0.036 m ³ (1.27 ft ³)	38 kg (84 lbs)
Bucket	300 mm (12 in)	0.043 m ³ (1.52 ft ³)	44 kg (97 lbs)
Bucket	400 mm (16 in)	0.059 m ³ (2.08 ft ³)	52 kg (115 lbs)
Bucket	500 mm (20 in)	0.075 m ³ (2.65 ft ³)	58 kg (128 lbs)
Bucket	600 mm (24 in)	0.091 m ³ (3.21 ft ³)	67 kg (148 lbs)
Bucket	700 mm (28 in)	0.107 m ³ (3.78 ft ³)	75 kg (165 lbs)
Ditch cleaning bucket	850 mm (33 in)	0.069 m ³ (2.44 ft ³)	65 kg (143 lbs)
Ditch cleaning bucket	1000 mm (39 in)	0.080 m ³ (2.83 ft ³)	74 kg (163 lbs)
Ditch cleaning bucket	1200 mm (47 in)	0.095 m ³ (3.35 ft ³)	88 kg (194 lbs)
Offset bucket	850 mm (33 in)	0.073 m ³ (2.58 ft ³)	110 kg (243 lbs)
Offset bucket	1000 mm (39 in)	0.087 m ³ (3.07 ft ³)	121 kg (267 lbs)

2503 with hydraulic Easy Lock quickhitch			
Bucket type	Width	Capacity	Weight
Bucket	300 mm (12 in)	0.042 m ³ (1.48 ft ³)	43 kg (95 lbs)
Bucket	400 mm (16 in)	0.056 m ³ (1.98 ft ³)	50 kg (110 lbs)
Bucket	500 mm (20 in)	0.070 m ³ (2.47 ft ³)	60 kg (132 lbs)
Bucket	600 mm (24 in)	0.084 m ³ (2.97 ft ³)	67 kg (148 lbs)
Ditch cleaning bucket	850 mm (33 in)	0.065 m ³ (2.30 ft ³)	63 kg (139 lbs)
Ditch cleaning bucket	1000 mm (39 in)	0.078 m ³ (2.75 ft ³)	72 kg (159 lbs)
Ditch cleaning bucket	1200 mm (47 in)	0.094 m ³ (3.32 ft ³)	84 kg (185 lbs)
Offset bucket	850 mm (33 in)	0.062 m ³ (2.19 ft ³)	103 kg (227 lbs)
Offset bucket	1000 mm (39 in)	0.073 m ³ (2.58 ft ³)	110 kg (243 lbs)
Offset bucket	1200 mm (47 in)	0.088 m ³ (3.11 ft ³)	121 kg (267 lbs)

3503 without quickhitch			
Bucket type	Width	Capacity	Weight
Bucket	300 mm (12 in)	0.050 m ³ (1.77 ft ³)	46 kg (101 lbs)
Bucket	400 mm (16 in)	0.069 m ³ (2.44 ft ³)	54 kg (119 lbs)
Bucket	500 mm (20 in)	0.088 m ³ (3.11 ft ³)	62 kg (137 lbs)
Bucket	600 mm (24 in)	0.107 m ³ (3.78 ft ³)	82 kg (181 lbs)
Bucket	700 mm (28 in)	0.127 m ³ (4.48 ft ³)	90 kg (198 lbs)
Ditch cleaning bucket	1000 mm (39 in)	0.117 m ³ (4.13 ft ³)	87 kg (192 lbs)
Ditch cleaning bucket	1400 mm (55 in)	0.166 m ³ (5.86 ft ³)	130 kg (287 lbs)
Offset bucket	1000 mm (39 in)	0.111 m ³ (3.92 ft ³)	107 kg (236 lbs)
Offset bucket	1400 mm (55 in)	0.158 m ³ (5.58 ft ³)	147 kg (324 lbs)

3503 with mechanical Neuson quickhitch			
Bucket type	Width	Capacity	Weight
Bucket	300 mm (12 in)	0.050 m ³ (1.77 ft ³)	64 kg (141 lbs)
Bucket	400 mm (16 in)	0.069 m ³ (2.44 ft ³)	72 kg (159 lbs)
Bucket	500 mm (20 in)	0.088 m ³ (3.11 ft ³)	82 kg (181 lbs)
Bucket	600 mm (24 in)	0.107 m ³ (3.78 ft ³)	90 kg (198 lbs)
Bucket	700 mm (28 in)	0.127 m ³ (4.48 ft ³)	99 kg (218 lbs)
Ditch cleaning bucket	1000 mm (39 in)	0.116 m ³ (4.10 ft ³)	102 kg (225 lbs)
Ditch cleaning bucket	1400 mm (55 in)	0.164 m ³ (5.79 ft ³)	130 kg (287 lbs)
Offset bucket	1000 mm (39 in)	0.111 m ³ (3.92 ft ³)	142 kg (313 lbs)
Offset bucket	1400 mm (55 in)	0.158 m ³ (5.58 ft ³)	155 kg (342 lbs)



3503 with hydraulic Easy Lock quickhitch			
Bucket type	Width (in)	Capacity	Weight
Bucket	300 mm (12 in)	0.063 m ³ (2.22 ft ³)	56 kg (123 lbs)
Bucket	400 mm (16 in)	0.083 m ³ (2.93 ft ³)	64 kg (141 lbs)
Bucket	500 mm (20 in)	0.102 m ³ (3.60 ft ³)	75 kg (165 lbs)
Bucket	600 mm (24 in)	0.120 m ³ (4.24 ft ³)	85 kg (187 lbs)
Bucket	700 mm (28 in)	0.141 m ³ (4.98 ft ³)	92 kg (203 lbs)
Bucket	800 mm (31 in)	0.160 m ³ (5.65 ft ³)	103 kg (227 lbs)
Ditch cleaning bucket	1000 mm (39 in)	0.113 m ³ (4.00 ft ³)	92 kg (203 lbs)
Ditch cleaning bucket	1200 mm (47 in)	0.135 m ³ (4.77 ft ³)	106 kg (234 lbs)
Ditch cleaning bucket	1400 mm (55 in)	0.158 m ³ (5.58 ft ³)	121 kg (267 lbs)
Offset bucket	1200 mm (47 in)	0.129 m ³ (4.56 ft ³)	142 kg (313 lbs)
Offset bucket	1400 mm (55 in)	0.150 m ³ (5.30 ft ³)	153 kg (337 lbs)

Equipment		
Attachments	Machine	Weight
Mechanical Neuson quickhitch console	2503	14 kg (31 lbs)
Mechanical Neuson quickhitch console	3503	27 kg (60 lbs)
Hydraulic Easy Lock quickhitch console (HS 02)	2503	19 kg (42 lbs)
Hydraulic Easy Lock quickhitch console (HS 03)	3503	34 kg (75 lbs)
Hammer bracket HS 02/NE 16	2503	14 kg (31 lbs)
Hammer bracket HS 03/NE 16	3503	27 kg (60 lbs)
Hammer bracket HS 03/NE 22	3503	30 kg (66 lbs)
Hammer NE 16	2503/3503	150 kg (331 lbs.)
Hammer NE 22	3503	220 kg (485 lbs)
Easy Lock quickhitch console with Powertilt	3503	104 kg (229 lbs)

1.5 Regulations

Requirements to be met by the operator

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

- 18 years or older
- Physically and mentally suited for this work
- Persons have been instructed in driving and servicing the earth moving machine and have proven their qualifications to the contractor
- Persons are expected to perform work reliably.

They have been appointed by the contractor for driving and servicing the earth moving machine.

Observe the legal regulations of your country.

Warranty

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

1.6 EC Declaration of Conformity 2503

EC Declaration of Conformity

Manufacturer

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

**Product**

Machine designation	Hydraulic excavator
Model/version	E03-04
Trade name	2503
Serial number	--
Output in kW	19.4
Measured sound power level dB(A)	93.5
Guaranteed sound power level dB(A)	94

Declaration of conformity

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

Notified body involved in procedure

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

Directives and standards

We hereby declare that this product corresponds to the relevant regulations of the following Directives and standards:
2006/42/EC, 2005/88/EC, 2000/14/EC;
DIN EN ISO 12100-1, DIN EN ISO 12100-2, DIN EN 474-1 and DIN EN 474-5, DIN EN ISO 3471, EN ISO 3744,
DIN EN ISO 3449

Authorized representative for the compilation of technical documentation

Thomas Köck, team leader technical documentation
Flughafenstr. 7
4063 Horsching
Austria

Johannes Mahringer,
Managing director

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

1.7 EC Declaration of Conformity 3503

EC Declaration of Conformity

Manufacturer

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


Product

Machine designation	Hydraulic excavator
Model/version	E03-07
Trade name	3503
Serial number	--
Output in kW	23.7
Measured sound power level dB(A)	94.5
Guaranteed sound power level dB(A)	95

Declaration of conformity

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

Notified body involved in procedure

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

Directives and standards

We hereby declare that this product corresponds to the relevant regulations of the following Directives and standards:
 2006/42/EC, 2005/88/EC, 2000/14/EC;
 DIN EN ISO 12100-1, DIN EN ISO 12100-2, DIN EN 474-1 and DIN EN 474-5, DIN EN ISO 3471, EN ISO 3744,
 DIN EN ISO 3449

Authorized representative for the compilation of technical documentation

Thomas Köck, team leader technical documentation
 Flughafenstr. 7
 4063 HÖRSCHING
 Austria

 Johannes Mahringer,
 Managing director

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

1.8 Type labels and component numbers



Information!

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

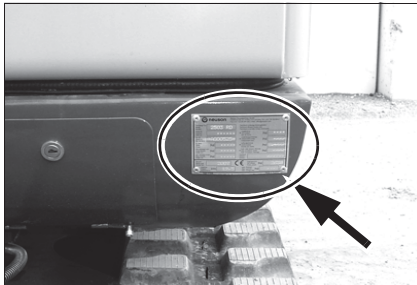


Fig. 1: Type label: location

Wacker Neuson Linz GmbH
Flughafenstraße 7, 4033 HÖrsching
Austria, Tel. +43 (0)7221 93000
office.lin@wackerneuson.com

1000295712

WACKER NEUSON

CE

EWG Nr. / CEE no.

Baujahr / model year / année fab.

Fahrzeug-Modell / model / modèle

Leistung / performance

Typ / version

Leistung in kW

Betriebsgewicht / operating weight / poids en charge

Transportgewicht / transport weight / poids de transport

G. Gew. / GWR / PTAC

Max. Nutzlast / max. payload / max. charge utile

Zul. Achslast vorne / front GAWR / PNBE AV

Zul. Achslast hinten / rear GAWR / PNBE AR

Fig. 2: Type label (symbolic representation)

Serial no. AG00580

The serial number is stamped on the machine chassis. It is also located on the type label. The type label is located at the front right on the machine chassis (at cabin level)

Type label information

Example:

Machine designation: -----

Model: -----

Model year: -----

CEE no.: -----

Output: -----

Serial no.: -----

Max. payload: -----

GWR: -----

Operating weight: -----

Front GAWR: -----

Transport weight: -----

Rear GAWR: -----

Version: -----

Other information – see [chapter 6 Technical data](#) on page 6-1

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

Fig. 3: Symbolic representation

17-digit serial number (from 2012)

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

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


Information!

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

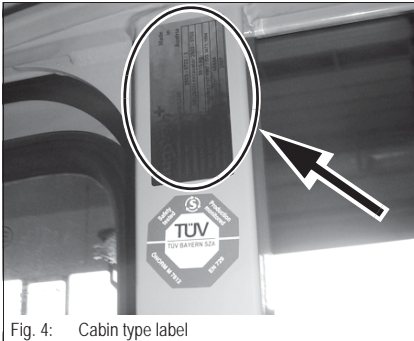


Fig. 4: Cabin type label

Cabin number

The type label (arrow) is located on the chassis of the cabin, at the upper left beside the door.

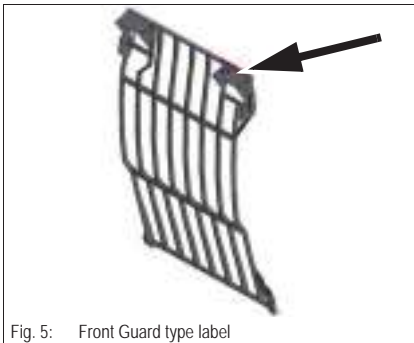


Fig. 5: Front Guard type label

Front Guard type label

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

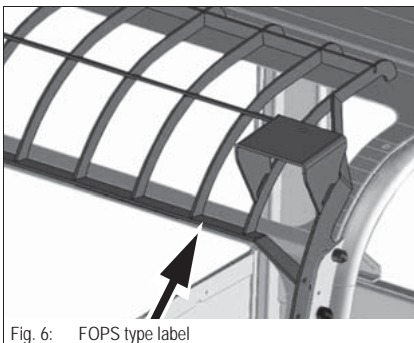


Fig. 6: FOPS type label

FOPS type label (small screen)

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

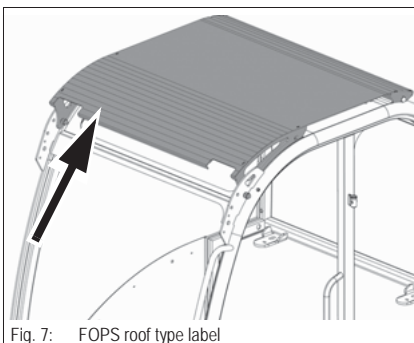


Fig. 7: FOPS roof type label

FOPS roof type label

The type label is located at the upper right on the roof.

1.9 Other signs and symbols (up to AG01597)



Fig. 8: Lifting eyes



Fig. 9: Tie-down points for tying down the machine

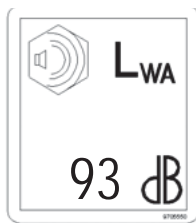


Fig. 10: Noise level indication

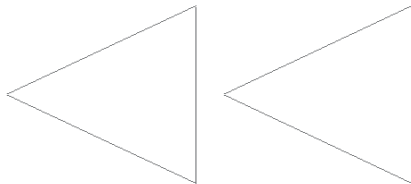


Fig. 11: Direction indicator



Fig. 12: Danger label



Fig. 13: CE mark

The following states signs and symbols which are not unequivocally comprehensible. They do not contain explanatory text and are not explained in the following chapters.

Meaning

Machine is raised by the lifting eyes

– see [chapter 3.38 Crane lifting the machine](#) on page 3-60

Location

On either side of the stabilizer blade, and on either side of the boom.

Meaning

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

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

– see [chapter 3.40 Tying down the machine](#) on page 3-63

Location

On either side of the stabilizer blade, and on either side of the undercarriage.

Meaning

Noise levels produced by the machine.

L_{WA} = sound power level

Other information – see [chapter 6.5 Noise levels](#) on page 6-6

Location

Next to the cabin door

Meaning

This label shows the forward travel direction.

Location

On either side of the undercarriage

Meaning

General indication of danger

This label warns persons standing or working near the excavator of an existing danger within the area of increased danger around the machine.

Location

On either side of the boom

Meaning

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

Location

On the type label



Fig. 14: Hot surface

Meaning

Do not touch hot surfaces, wait for parts to cool down.

Location

In the engine compartment.



Fig. 15: Diesel

Meaning

Add diesel fuel only!

Location

Next to the filler inlet.



Fig. 16: Hydraulic oil

Meaning

The reservoir contains hydraulic oil.

– see [chapter 5.5 Engine and hydraulics cooling system](#) on page 5-7

Location

On the hydraulic oil reservoir



Fig. 17: Read the Operator's Manual

Meaning

Read the Operator's Manual before working with the machine!

Location

Inside the cabin on the trim on the right

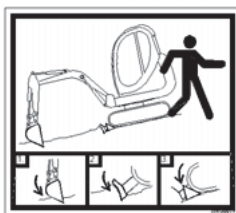


Fig. 18: Parking the machine correctly

Meaning

Press the boom and the stabilizer blade into the ground as you leave the machine, remove the starting key and place chocks on the left and right under the tracks.

– see [Parking checklist](#) on page 3-10

Location

Cabin roof lining

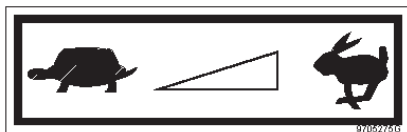


Fig. 19: Engine speed control

Meaning

Describes the throttle lever function.

– see [Throttle](#) on page 3-11

Location

Below the throttle lever

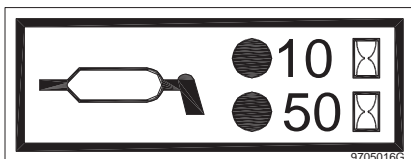


Fig. 20: Lubrication interval

Meaning

Interval at which lubrication point must be lubricated.

Location

On upper carriage



Fig. 21: Warning label

Meaning

Do not loosen the securing screws before the extra weight has been secured.

Location

On the rear left and right of the upper carriage.

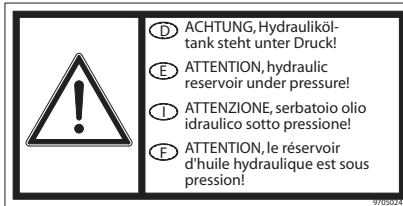


Fig. 22: Hydraulic oil reservoir under pressure

Meaning

Hydraulic oil reservoir under pressure!

Location

On the hydraulic oil reservoir.


Information!

Observe the information given on this safety label UNDER ALL CIRCUMSTANCES!

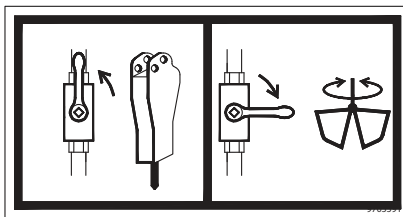


Fig. 23: Ball-type cock

Meaning

Position in which the ball-type cock must be during hammer/normal operation.

Location

On the hydraulic oil reservoir.



Fig. 24: Fan warning label

Meaning

1. CAUTION, danger of being caught up!
2. Stay clear of the engine compartment with the engine running!
3. Perform work in the engine compartment at engine standstill only.

Location

In the engine compartment.

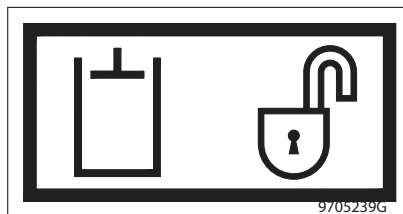


Fig. 25: Opening the valve cover

Meaning

The valve cover is opened with this Bowden cable.

Location

Under the operator seat.



Fig. 26: Opening the engine cover

Meaning

The engine cover is opened with this Bowden cable.

Location

Under the operator seat.

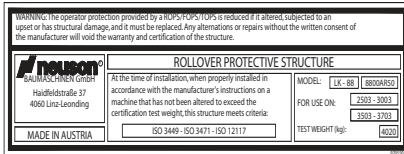


Fig. 27: ROPS/FOPS/TOPS label (symbolic representation)



Fig. 28: Fan label



Fig. 29: Front window label

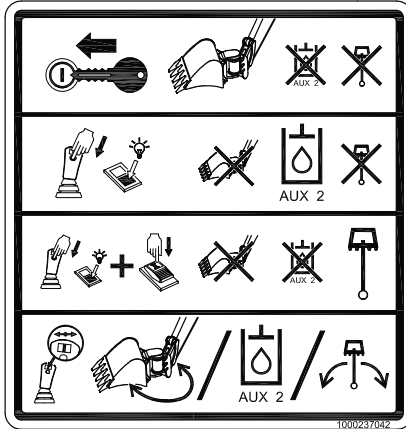


Fig. 30: Powertilt

Meaning

Provides information on the directives this cabin complies with.

Cabin no longer complies with these directives if it is modified

Location

Inside the cabin.

Meaning

1. CAUTION, rotating fan!
2. Stop the engine before opening the engine cover!
3. Stay clear of the engine compartment if the fan is still running!



Information!

ALWAYS follow the instructions on the safety label!

Location

On the engine cover and in the engine compartment

Meaning

1. CAUTION, danger of being caught up!
2. Always use the handles to open and close the front window.
3. Always lock the front window with both locks!

Location

On the front window.

Meaning (option 3503)

- The Powertilt function is enabled once the excavator is started.
- Not assigned.
- Not assigned.
- The unit is operated with the slide switch on the control lever on the left (control lever on the right with auxiliary hydraulics and proportional controls).

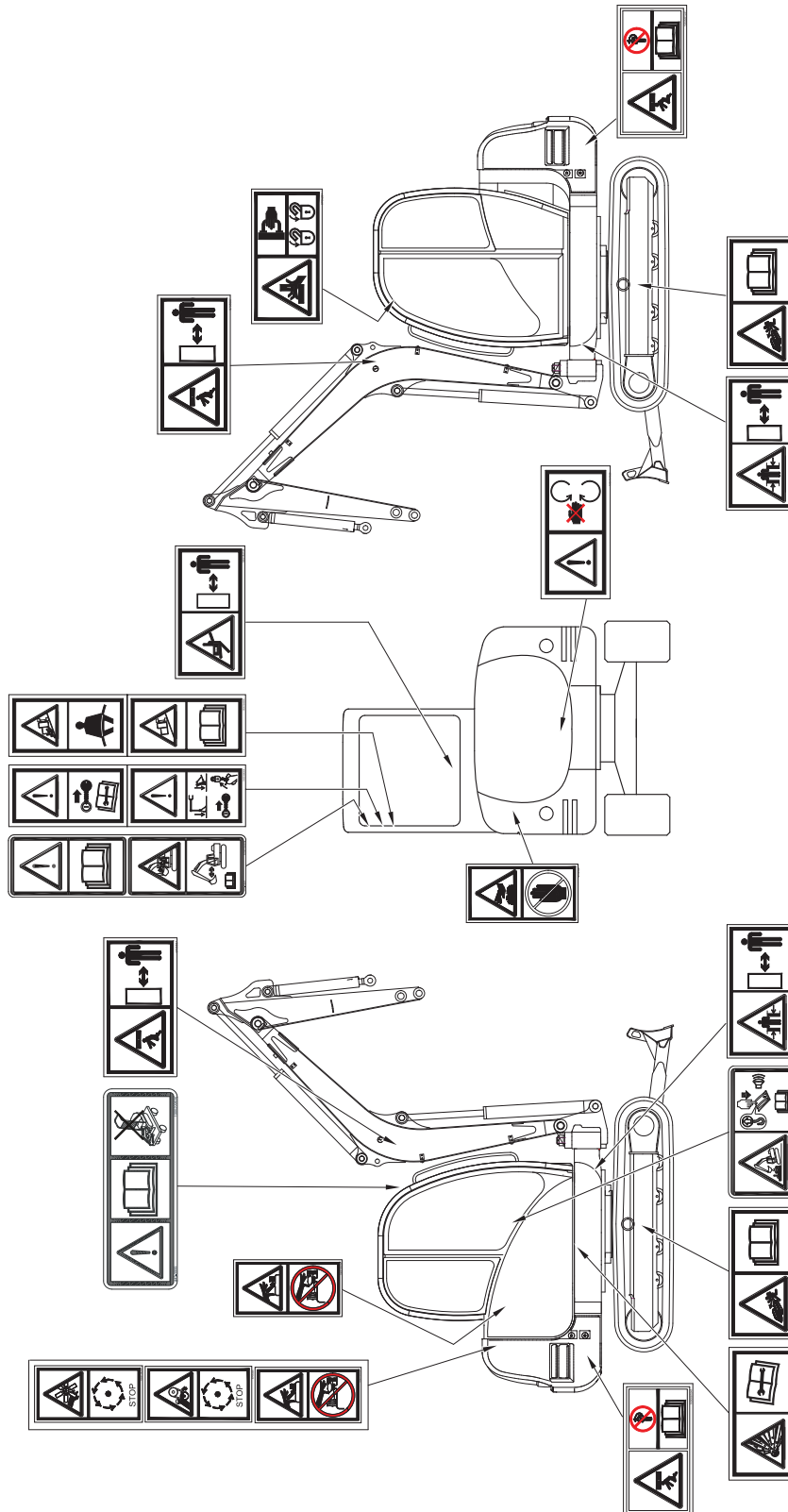
Location

On the headliner

– see [chapter 3.54 Powertilt \(option 3503\)](#) on page 3-97

1.10 Other signs and symbols (from AG01598)

Overview of safety labels:



Symbols

The following symbols are displayed on the machine to provide pictorial information to the operator. The information and explanations are provided to avoid misinterpretation by the operator. The symbols have been chosen to provide important information to those involved with operating, adjusting, maintaining, and repairing this machine.



Fig. 31: Lifting eyes



Fig. 32: Tie-down points



Fig. 33: Noise level indication

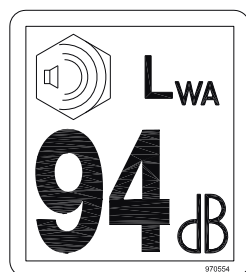


Fig. 34: Noise level indication

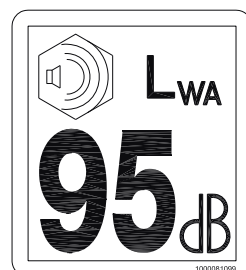


Fig. 35: Noise level indication

Description

Locates the lifting points for hoisting the excavator with lifting devices (slings, chains, or cables).

Location

On either side of the stabilizer blade, and on either side of the boom.

Description

Tie-down points.

Tie-down points during transport to prevent movement during transport.

Location

On either side of the stabilizer blade, and on either side of the undercarriage.

Description

Noise levels produced by the machine.

L_{WA} = sound power level

Location

On the upper carriage next to the swiveling console.

Up to serial no. AG02452 for 2503 and 3503

2503: from serial no. AG02453

3503: from serial no. AG02453

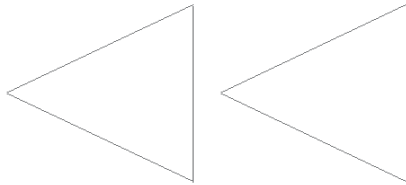


Fig. 36: Direction indicator

Meaning

This label shows the forward travel direction.

Location

On either side of the undercarriage



Fig. 37: CE mark

Meaning

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

Location

On the type label

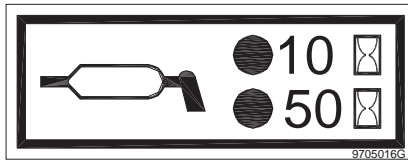


Fig. 38: Lubrication interval

Meaning

Interval at which lubrication point must be lubricated.

Location

On upper carriage

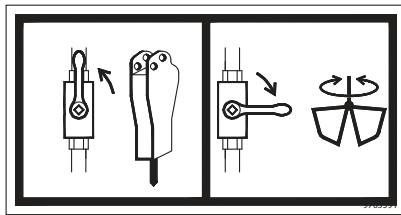


Fig. 39: Ball-type cock

Meaning

Position in which the ball-type cock must be during hammer/normal operation.

Location

On the hydraulic oil reservoir.

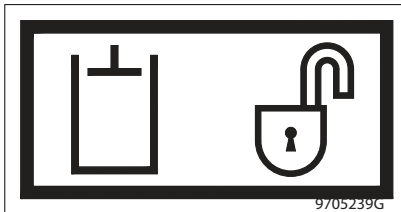


Fig. 40: Opening the valve cover

Meaning

The valve cover is opened with this Bowden cable.

Location

Under the operator seat.



Fig. 41: Opening the engine cover

Meaning

The engine cover is opened with this Bowden cable.

Location

Under the operator seat.



Fig. 42: Diesel

Meaning

Add diesel fuel only!

Location

Next to the filler inlet.



Fig. 43: Hydraulic oil

Meaning

The reservoir contains hydraulic oil.

Location

On the hydraulic oil reservoir.

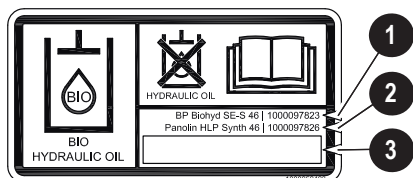


Fig. 44: Biodegradable hydraulic oil (symbolic representation)

Meaning

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

Location

On the hydraulic oil reservoir.

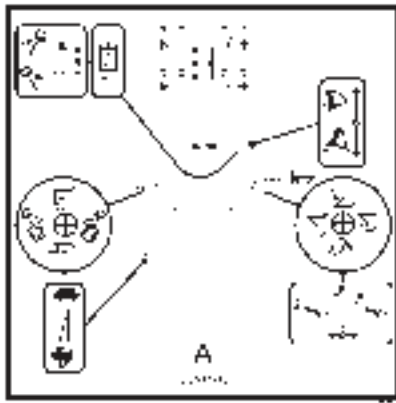


Fig. 45: A/ISO operating pattern functions Tier IV

Description

This label describes the functions of the pedals and control levers (Operating Pattern A – ISO controls (Europe) and Operating Pattern A).

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

– see [chapter 3.46 Changeover valve for SAE/ISO controls \(option\)](#) on page 3-77

Location

On the headliner.

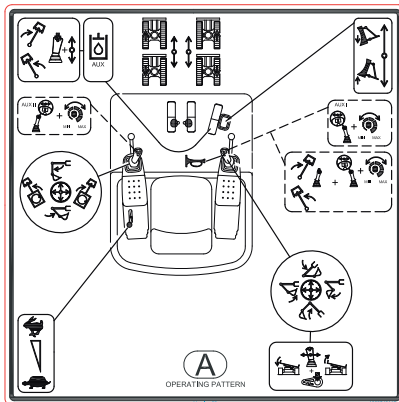


Fig. 46: A/ISO operating pattern functions Tier III

Description

This label describes the functions of the pedals and control levers (Operating Pattern A – ISO controls (Europe) and Operating Pattern A).

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

– see [chapter 3.46 Changeover valve for SAE/ISO controls \(option\)](#) on page 3-77

Location

On the headliner.

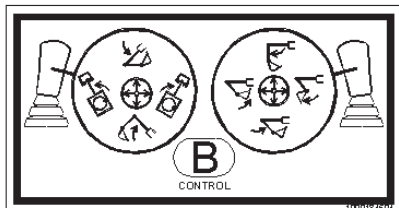


Fig. 47: Operating pattern B/SAE (option)

Description

Explains the joystick functions (operating pattern "B"/SAE).

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

– see [chapter 3.46 Changeover valve for SAE/ISO controls \(option\)](#) on page 3-77

Position (option)

On the headliner.

Safety labels



Information!

Always follow the instructions on the safety labels!



Fig. 48: Tightening the tracks

Description

The label means the following:

- Grease can be ejected under high pressure from the track tensioner.
- Always read the Operator's Manual before loosening or tightening the tracks to avoid potential injury from ejected grease.

Location

On the travel gear near the lubrication system.

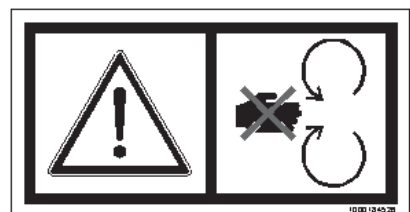


Fig. 49: Stop the engine

Description

Stop the engine before opening or removing the safety devices (for example engine cover, fan guard ...)

Location

On the engine cover.

Description

This safety label warns of the following dangers:

1: Rotating fan.

Stay clear of the engine compartment if the fan is still running!

2: Stay clear of the engine compartment with the engine running!

3: The radiators are hot and under pressure!

Allow the radiators to cool down!

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

Wear safety glasses and protective gloves when opening the cover.

Location

In the engine compartment.



Fig. 50: Warning label



Fig. 51: Hot surface

Description

Do not touch hot surfaces, wait for parts to cool down.

Location

In the engine compartment.



Fig. 52: Warning label

Meaning

Do not loosen the securing screws before the extra weight has been secured.

Location

On the rear left and right of the upper carriage.



Fig. 53: Reservoir under pressure

Description

The tank is hot and under pressure!

- Allow the fluids to cool down!

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

Wear safety glasses and protective gloves when opening the cover.

Location

On the hydraulic oil reservoir.

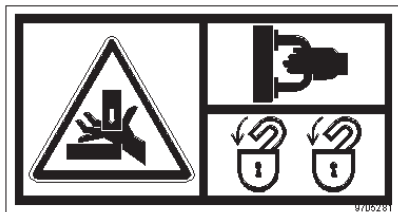


Fig. 54: Front window

Meaning

1. CAUTION, danger of being caught up!
2. Always use the handles to open and close the front window.
3. Always lock the front window with both locks!

Location

On the front window.

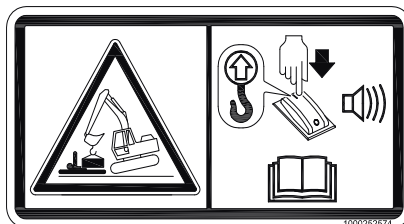


Fig. 55: Overload

Meaning (option)

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

Read and understand the Operator's Manual.

Location

Canopy: on the right near the indicator

Cabin: on the window on the right



Fig. 56: Read the Operator's Manual

Up to serial no. AG04106:

Description

Read the Operator's Manual before starting the machine.

Location

On the B pillar in the cabin.

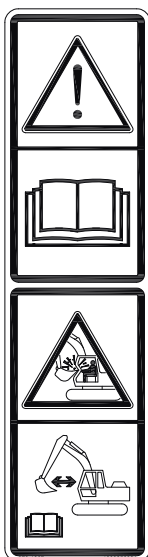


Fig. 57: Read the Operator's Manual

From serial no. AG04107:

Description

Read the Operator's Manual before starting the machine.

Danger of serious crushing.

Keep a safe distance from the boom.

Danger of serious damage to the machine.

Location

On the B pillar in the cabin.



Fig. 58: Keep distance

Description

This label alerts persons standing or working near the machine of an existing danger within the area of increased danger around the machine. Stay clear of machine!

Location

On either side of the boom.

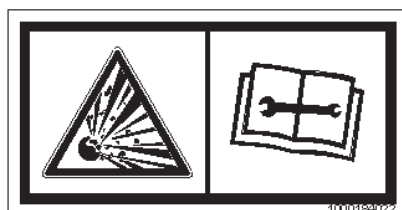


Fig. 59: Under pressure

Description

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

Location

On the upper carriage next to the accumulator.

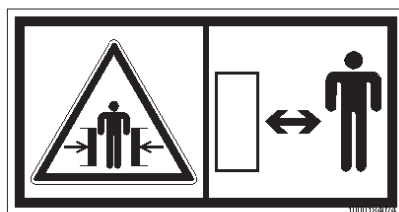


Fig. 60: Keep distance

Description

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

Location

On the valve compartment cover and the upper carriage next to the swiveling console.

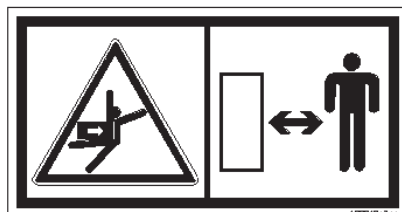


Fig. 61: Keep distance

Description

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

Location

On the rear window.



Fig. 62: Read the manual before performing maintenance or repairs

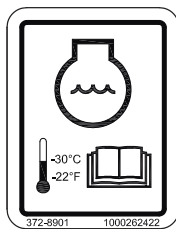


Fig. 63: Keep distance



Fig. 64: Fastening the seat belt

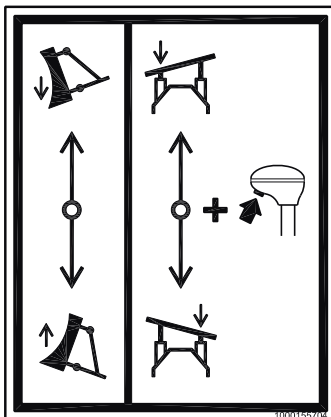


Fig. 65: Operation of slewing stabilizer blade

Description

- 1: Before performing maintenance or repairs on the machine, stop the engine, remove the key, and read and understand the Operator's Manual and the service manual.
- 2: Before leaving the machine lower all equipment to the ground, remove the key and lock the controls.

Location

On the B pillar in the cabin.

Description

The coolant must have a thermal stability of at least $-30\text{ }^{\circ}\text{C}$ ($-22\text{ }^{\circ}\text{F}$).

– see [chapter 6.7 Coolant compound table](#) on page 6-9

Location

In the engine compartment on the expansion tank.

Description

- 1: Operate only from the seat and fasten the seat belt to prevent falling out of the machine.
- 2: Operate within the stability limits of machine, do not overload, use only approved attachments and operate only on solid ground. Follow the instructions in the Operator's Manual.

Location

On the B pillar in the cabin.

Description (option 3503)

This label explains the functions of the slewing stabilizer blade.

Location

On the part on the right next to the stabilizer-blade lever.

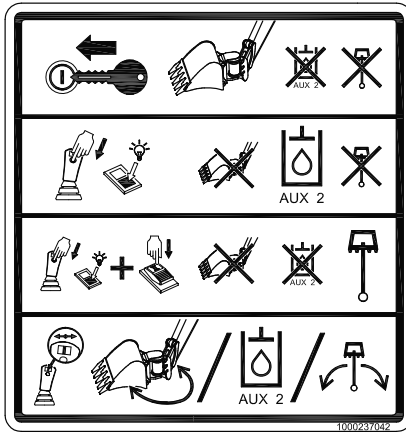


Fig. 66: Powertilt

Meaning (option 3503)

- The Powertilt function is enabled once the excavator is started.
- Not assigned.
- Not assigned.
- The unit is operated with the slide switch on the control lever on the left (control lever on the right with auxiliary hydraulics and proportional controls).

Location

On the headliner

– see chapter 3.54 Powertilt (option 3503) on page 3-97

neuson 2503

HUBKRAFT/LIFTING CAPACITY/FORCE DE LEVAGE ISO 10567

		3,5m		3,0m		2,5m		2,0m	
B	A								
	3.0m	415°	415°		400°	400°			
2.0m	410°	350	410°	380	420°	420°	460°	460°	
1.0m	425°	310	460°	365	540°	460°	670°	595	1000° 815
0.0m	450°	315	505°	355	635°	440	835°	560	1210° 770
-1.0m	475°	380			580°	435	790°	560	1030° 775
-2.0m	445°	445°							435° 435°

Angaben mit Standardarmsystem!
Zubehoren und Druckkräfte (kPa) sind vorhanden.

Fig. 67: Lift capacity table 2503

neuson 3503

HUBKRAFT/LIFTING CAPACITY/FORCE DE LEVAGE ISO 10567

		4,5m		3,5m		2,5m		1,5m	
B	A								
	3.0m	800°	545°		745°	685			
2.0m	840°	480		870°	660	1110°	1105		
1.0m	890°	415	900°	1100°	620	1795°	1000		
0.0m	955°	420	955°	1300°	595	2130°	930		
-1.0m	1045°	475		1310°	590	2100°	960	4200°	2285
-2.0m	1150°	675				1700°	975	3300°	2345

Angaben mit Standardarmsystem!
Zubehoren und Druckkräfte (kPa) sind vorhanden.

Fig. 67: Lift capacity table 3503

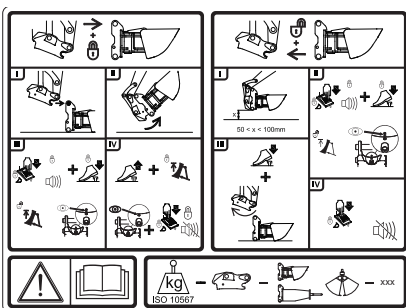


Fig. 68: Hydraulic quickhitch

Meaning (option)

This label describes the functions of the hydraulic quickhitch.

Location

On the headliner

– see chapter 3.53 Hydraulic quickhitch (option) on page 3-92

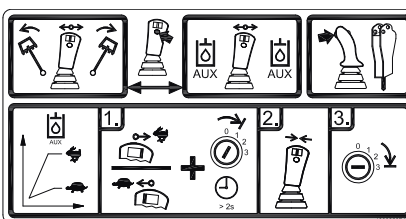


Fig. 69: Control lever functions (proportional controls)

Meaning (option)

This label describes the control lever functions for machines equipped with proportional controls.

Location

On the headliner

– see chapter 3.47 Control lever with proportional controls (option): overview on page 3-79

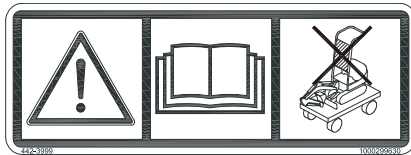


Fig. 70: Removing the shatter protection

Meaning (option)

Remove the shatter protection if the machine is transported on an open platform.

Location

On the shatter protection at the upper left in travel direction.

1.11 Fire extinguisher



Fig. 71: Fire extinguisher (symbolic representation)

The fire extinguisher is neither included in the machine's standard equipment nor is it available as an option from Wacker Neuson.

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

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

**Information!**

Ensure that the fire extinguisher is secured and firmly fastened. Check the fire extinguisher at regular intervals, also ensure that it is safely installed. Observe the manufacturer's indications.



2 Safety instructions

2.1 Safety Symbols Found In This Manual



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

- Obey all safety messages that follow this symbol.



DANGER

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

Potential consequences of the hazard.

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



WARNING

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

Potential consequences of the hazard.

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



CAUTION

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

Potential consequences of the hazard.

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

NOTICE

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



Important

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



Environment

Failure to observe the instructions identified by this symbol can result in damage to the environment. The environment is at risk if environmentally hazardous material, such as waste oil, is not subject to proper use or disposal.

2.2 Warranty

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

2.3 Disposal

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



Environment

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

If the machine is no longer used according to its designated use, ensure that it is decommissioned or put out of operation and disposed of according to applicable regulations.

- Observe all applicable safety regulations during machine disposal.
- Machine disposal must be performed in accordance with state-of-the-art standards that apply at the time of disposal.

2.4 Designated Use

1. In accordance with this designated use, the machine may be used ONLY for moving earth, gravel, coarse gravel or ballast and rubble. It may also be used for working with the attachments approved in the [Chapter 1.7 "EC Declaration of Conformity 3503"](#) chapter.
2. No other applications are designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. The user alone will bear the risk.
3. "Designated use" also includes observing the instructions set forth in the Operator's Manual and observing the maintenance schedule.
4. Machine safety can be negatively affected by performing out machine modifications without proper authority and by using spare parts, equipment, attachments and optional equipment which have not been checked and released by Wacker Neuson. Wacker Neuson will not be liable for damage resulting from unapproved parts or unauthorized modifications.
5. Wacker Neuson shall not be liable for personal injury and/or damage to property caused by failure to observe the safety instructions on labels and in this Operator's Manual, and by the negligence of the duty to exercise due care when:
 - transporting the machine
 - operating the machine
 - servicing the machine and performing maintenance
 - repairing the machine.

This is also applicable when special attention has not been drawn to the duty to exercise due care.
6. Read and understand the Operator's Manual before starting, moving, operating, servicing or repairing the machine. Observe the safety instructions.
7. The machine shall not be used for transport jobs on public roads without a specific certification.
8. In applications with lifting gear, the machine is used according to its designated use only if the prescribed devices are installed and functional.
9. Hammer operation is only allowed in specified areas.

2.5 Preparing To Use The Machine

Conditions for use

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

User training and knowledge

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

Preparing for use

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



Information on visibility

- Before putting the machine into operation, perform a visual check to ensure that there are neither persons nor objects or other sources of risk around the machine.
 - When using the machine, check the surroundings constantly in order to identify potential hazards in time.
 - Before using the machine, before starting work or when changing operators, ensure that all visual aids (mirrors) work correctly, that they are clean and adjusted in accordance with the instructions in this Operator's Manual. The operator must observe the local regulations.
 - Do not make any changes or modifications that impair visibility. Otherwise the machine does not meet the requirements for conformity and licensing.
-

Modifications and spare parts

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

2.6 Operator and Technician Qualifications and Basic Responsibilities

User/Owner responsibility

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

Repair person qualifications

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

2.7 Safety Instructions Regarding Operation

Preparing for use

- Keep the machine clean. This reduces the risk of fire hazards (such as from combustible materials like rags), and reduces the risk of injury or operational accidents that can be caused by dirt build-up on the travel pedals, mirrors or foot rests and steps.
 - Observe all safety, warning, and information signs and labels on the machine.
 - Start and operate the machine from the seat only.
 - The operator must sit in the seat, fasten and adjust the seat belt and check if all mirrors are adjusted correctly before putting the machine into operation.
 - Always adjust the seat position before starting work. Never change the seat position when operating the machine.
 - Make sure that all safety devices are properly installed and functional before starting work.
 - Before putting the machine/attachment into operation (starting/moving), ensure that no one in the immediate vicinity will be at risk.
-

Starting and stopping



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

Work area awareness

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



Danger zone awareness

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

Operating the machine

- Operate the machine ONLY when you are seated and you have fastened your seat belt. Stop the engine before releasing the seat belt.
- During operation on slopes, move or work uphill or downhill. If traveling across a slope cannot be avoided, bear in mind the tilting limit of the machine. Always keep the attachments/work equipment close to the ground. This also applies to traveling downhill. When traveling or working across a slope, the load must be on the uphill side of the machine.
- On sloping terrain, ALWAYS adapt your travel speed to the prevailing ground conditions.
- Never get on or off a moving machine, and do not jump off the machine.
- The travel pedals require practice before a user becomes familiar with the pedal response. Therefore, adjust the travel speed to your abilities and the surroundings.

Carrying passengers

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



Mechanical integrity

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

Traveling

- Before moving the machine always check whether the supplementary equipment and the attachments have been safely stowed away or attached.
- Careful when reversing the machine – risk of accidents.
- Persons in the blind spot of the machine cannot be seen by the driver.
- Ensure that nobody is within the danger zone of the machine when changing the traveling direction.
- Use the rearview mirrors to reverse with the machine.
- When traveling on or in public areas, observe all applicable regulations. Make sure beforehand that the machine is in compliance with these regulations.
- Installed work lights must **NOT** be used for travel.
- When crossing underpasses, gates, bridges and tunnels, or when passing under overhead lines, make sure the clearance height and width are sufficient to avoid contact.
- Empty the bucket and tilt it in until the bucket opening is in the upward horizontal position as a minimum before traveling on public roads.
- Apart from the user, no other persons are allowed to ride on the machine.

2.8 Operator Protection System

TOPS rollbar (up to serial no. AF01416)

ROPS rollbar

The machine can be equipped with an optional lowerable TOPS or ROPS rollbar.



DANGER

Personal injury hazard! In order to ensure the best possible protection for the operator, operate the machine only with a raised rollbar.

Risk of severe personal injury or death.

- Always fasten the seat belt if the rollbar is raised.



WARNING

Personal injury hazard! Do not modify the rollbar.

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

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

Traveling without TOPS rollbar (up to serial no. AF01416)

Traveling without ROPS rollbar



DANGER

Accident hazard! Do not operate the machine with a lowered rollbar.

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

- Traveling with a lowered rollbar is temporarily allowed depending on the situation (e.g. to reduce the transport height in case of low clearance heights) – but only if the following conditions are fulfilled:
 - Obtain the approval of the competent national authority.
 - Machine travel is only allowed on absolutely level ground.
 - Avoid tipping movements of the machine under all circumstances.
 - Fastening the seat belt is not allowed.
 - Wear protective equipment (e.g. protective clothing, safety glasses).

Shatter protection (Option)

The optional shatter protection protects the operator against material falling from the front.


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

Objects will cause serious or deadly injuries.

- When working in areas with a risk of falling or projected objects, an operator safety shield must be installed (option equipment).
- Machine operation is prohibited under these conditions without the operator safety shield installed.


WARNING
Personal injury hazard! Do not modify the shatter protection.

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

- No drilling, cutting or grinding.
- Do not mount any brackets.
- Do not perform any welding/bonding work.
- Replace the complete protective structure if it is damaged, deformed and/or cracked.
- If you are not sure, always contact a Wacker Neuson dealer.
- Repair work may be performed by a Wacker Neuson dealer only.


Important

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

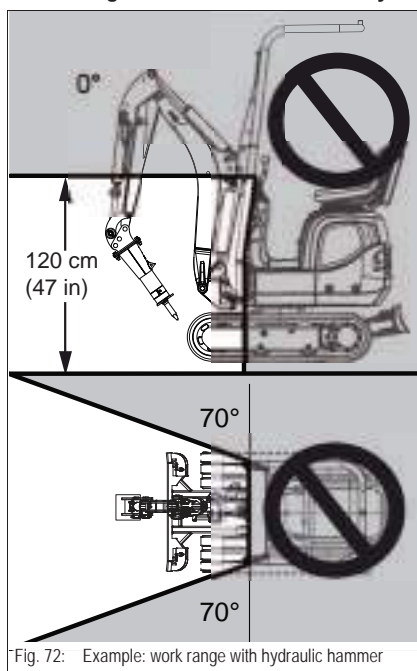
Work range and restricted visibility


Fig. 72: Example: work range with hydraulic hammer


WARNING
Accident hazard! The size of the work range depends on the attachment used.

Risk of injury.

- – see Operator's Manual of attachment
- – see example: work range with hydraulic hammer [Fig. 72](#)
- Do not use the attachment outside the defined work range.

NOTICE

Stop working when visibility is restricted due to rain, snowfall, dust etc.

Resume work only if visibility is no longer restricted.

2.9 Applications with Lifting Gear

General information

- Craning applications are procedures involving raising, transporting and lowering point loads with the help of slings and load-securing devices (for example, ropes and chains). In doing so, the help of persons is necessary for securing and detaching the load. This applies, for example, to lifting and lowering pipes, shaft rings or containers.



Important

Applications with lifting gear with this machine is not permitted.

Operation with lowered TOPS rollbar (up to serial no. AI00966)

Operation with lowered ROPS rollbar



WARNING

Crushing hazard during machine travel with lowered rollbar!

Can cause serious injury or death.

- Depending on the situation, traveling over very short distances with a lowered rollbar is allowed (in case of low clearance heights, for example), however only if the following conditions are fulfilled:
 - Obtain the approval of the competent national authority.
 - Machine operation with a lowered rollbar is not allowed under any circumstances.
 - Machine travel is only allowed on absolutely level ground.
 - Avoid tipping movements of the machine under all circumstances.
 - Operation in areas involving a risk of falling objects is prohibited.
 - Do not fasten the seat belt in order to be able to leave the machine immediately in an emergency.
 - Wear protective equipment (protective clothing, safety glasses, for example).

2.10 Attachments

General information regarding attachments

- Prior to traveling on public roads remove all attachments which cannot be secured in compliance with the legal regulations of your country.
- Attachments and counterweights affect handling and the machine's steering capability.
- Fit the attachments with the specially required devices only.
- Coupling and remove attachments requires special care.
- Confirm that the attachment has been properly and securely attached to the machine according to the instructions. Before using the attachment, the operator shall confirm that the attachment performs correctly in response to control actuation.
- Do not couple the attachment with the engine running and the machine moving.
- Before putting the machine/attachment into operation (starting/moving), make sure that no one in the immediate vicinity will be at risk.
- Before leaving the seat, always secure the machine against unintentional movement and unauthorized use. Lower the attachments to the ground.
- Secure the attachments against unintentional movement.



Installation notes

- Before uncoupling or coupling hydraulic lines (hydraulic quick couplers):
 - Stop the engine
 - Release the pressure in the hydraulic system. In order to do so, move the control levers of the hydraulic control units back and forth a couple of times – *see chapter Releasing pressure* on page 3-88
- Operate the machine only if all protective devices for the attachments have been installed and are functional, and, if all brake, light and hydraulic connections have been connected.
- If optional equipment is installed, all light installations, indicator lights etc. that are required in addition must be installed and functional.
- Prior to fitting attachments to the stick, secure the control lever of the hydraulic control unit against unintentional movement.

2.11 Trailers



Important

Towing a trailer with this machine is not permitted.

2.12 Hammer operation

Safety instructions

- Contact your Wacker Neuson dealer for information on the correct equipment.
- If there is a risk of falling or projected objects, an operator safety shield must be installed.
- During operation, all persons must stay clear of the work area of the machine.
- Do not place the machine directly underneath the workplace during demolition, otherwise parts can fall onto the machine or the building can collapse.
- Do not perform demolition work below the machine, this could cause the machine to tip over.
- The machine can lose its balance and tip over if a hammer or other heavy attachment is used. Proceed as follows to perform work both on level ground and on slopes:
 - Never turn, lower or set down the attachment abruptly.
 - Do not extend or retract the boom abruptly, otherwise the machine can tip over.
- Stop work immediately if a hydraulic hose moves back and forth in an unusual manner. This could be a cause for a pressure accumulator defect. Contact your Wacker Neuson dealer and have the error repaired immediately.

Working with a hammer

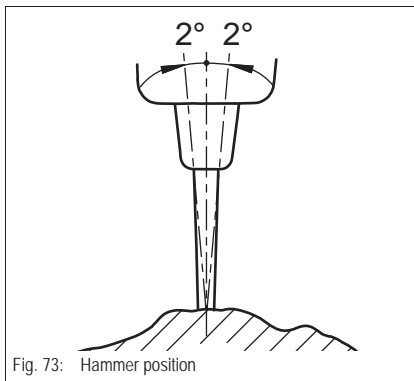


Fig. 73: Hammer position

NOTICE

Always observe the following instructions:

- Do not use the impact force of the attachment to perform demolition work.
- Keep the hammer perpendicular to the surface (max. deviation to all sides is 2°).
- Never move the hammer as you drive it into the material.
- After you have driven the hammer into the material, do not try to fragment the material with movements to the sides.
- Do not operate the hammer in the same spot uninterruptedly for more than 15 seconds.
- If the applied impact force does not break the material, move the hammer to the edge or start again in another place in order to break the material.
- Do not put the hammer into operation if a hydraulic cylinder is fully extended or retracted.
- Never use the hammer horizontally or upward.
- Do not use the hammer for catching or collecting material.
- Press the hammer firmly against the material to avoid hammer operation without any resistance.
- Do not use the hammer to raise loads.
- Do not hit the hammer-body against rocks, concrete, etc.
- Do not raise the machine with the boom.
- Do not perform any movements with the machine during hammer operation.
- Working with the hydraulic cylinders and/or the boom fully extended is not allowed.

2.13 Transport and Towing

Towing

- The machine must be towed according to the procedures described within this Operator's Manual.
 - Observe the prescribed transport position, admissible speed and itinerary.
-

Transporting

- The machine must be loaded and transported according to the procedures described within this Operator's Manual.
- The transporting vehicle must have sufficient load capacity and platform size to safely transport the machine. Refer to Chapter 6 *Technical data* of this manual to determine the physical characteristic of the machine before loading and transporting.
- Use OSHA-approved straps, chains or cables to securely fasten the machine to the surface of the transport.
- Use the tie down points provided on the load surface of the transport.
- Attach the tie down devices to the excavator at the designated tie down points.
- Confirm that the excavator tie down procedures will prevent sideways, forward, rearward and upward motion of the excavator in the event the transport vehicle is involved in an incident or sudden avoidance maneuver.
- The recommissioning procedure must be strictly in accordance with the Operator's Manual.

2.14 Safety Guidelines for Maintenance

General maintenance notes

- Operational readiness and the service life of machines are heavily dependent on maintenance.
 - It is therefore in the interest of the machine owner to perform the prescribed maintenance.
 - The manufacturer requires the owner to perform maintenance under all circumstances. Otherwise warranty shall not be given in full.
 - Adhere to prescribed intervals or those specified in this Operator's Manual for routine checks/inspections and maintenance.
 - For inspection and maintenance, ensure that all tools and service center equipment are capable of performing the tasks prescribed. Do not use malfunctioning or broken tools. Use certified measuring devices that are routinely calibrated for accuracy (torque wrench, pressure gauge, ammeter, etc.).
 - Replace hydraulic hoses within stipulated and appropriate intervals even if no safety-relevant defects have been detected.
 - Recycle scrapped parts and drained fluids according to environmental and hazardous material requirements. To avoid fire and health hazards, dispose of soiled shop towels by approved methods.
 - Always retighten any screws, electrical connections, or hose connections that may have been loosened during maintenance and repair.
 - Any safety devices removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.
-

Personal safety measures



- Brief the technician and the operator before beginning special operations, repair work and maintenance. Appoint a person to supervise the activities.
- Observe the specific safety instructions in the Maintenance section of this Operator's Manual.
- Before taking up work on machine parts risky for life and limb (bruising, cutting), always ensure safe blocking/support of these areas.
- Apply special care when working on the fuel system – increased risk of fire.
- Engine block and muffler system become very hot during operation and require cool-down time after machine is shut off. Avoid contact with hot parts. Wait for the machine to cool before touching components.
- Retainer pins can fly out or splinter when struck with force. Avoid striking the pins during operation, repair or maintenance – risk of personal injury.
- Do not use starting fluid (for example, ether), especially in those cases in which a heater plug (intake air pre-heating) is used at the same time – risk of explosions.

Preparing for maintenance and repair work

- In any work concerning the operation, conversion or adjustment of the machine and its safety-oriented devices, or any work related to maintenance, inspection and repair, observe the starting and stopping procedures set forth in the Operator's Manual, and the information on maintenance.
- Prior to performing assembly work on the machine, ensure that no movable parts will roll away or start moving.
- If required, secure the maintenance area appropriately. In accordance with this Operator's Manual and instructions for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) before performing any maintenance.
- Perform service, maintenance and repair work ONLY if:
 - machine is positioned on firm and level ground
 - all hydraulically movable attachments and working equipment have been lowered to the ground
 - engine is stopped
 - the starting key has been removed
 - pressure accumulator is empty
 - lock lever is folded up
 - machine has been secured against unintentional movement
- Should maintenance or repair be inevitable with the engine running:
 - Lower the stabilizer blade and lock the controls
 - Only work in groups of two
 - Both persons must be authorized for the operation of the machine
 - One person must be seated on the seat and maintain visual contact with the other person
 - Observe the specific safety instructions in the work manual
 - Always keep a safe distance from all rotating and moving parts, for example, fan blades, V-belt drives, PTO shaft drives, etc.
- Prior to performing service, maintenance and repair work, always attach a warning label, such as "Repair work – do not start machine" to the starter lock or to the control elements as a precautionary measure.

- Prior to performing assembly work on the machine, stabilize the area under repair and use proper lifting and support devices to change parts weighing more than 9 kg (20 lbs).
 - Perform maintenance and repair work beneath a raised machine, attachments or additional equipment ONLY if a safe and secure support has been provided. The use of hydraulic cylinders or jacks as the sole method of support does NOT sufficiently secure raised machines or equipment/attachments.
 - Before cleaning the machine with water, steam jet (high-pressure cleaner) or detergents, cover or tape up all openings which – for safety and functional reasons – must be protected against water, steam or detergent penetration. Special care must be taken with the electrical system.
 - Clean the machine, especially connections and threaded unions, of any traces of oil, fuel or preservatives before performing maintenance/repair work. Do not use aggressive detergents. Use lint-free cleaning rags.
 - To avoid the risk of accidents, parts and large assemblies being moved for replacement purposes must be carefully attached and secured to lifting gear. Use only suitable lifting gear and suspension systems in a technically perfect state with adequate load-bearing capacity.
Stay clear of suspended loads.
 - Have loads fastened and crane operators instructed by experienced persons only. The person giving the instructions to the operator must be within sight or sound of him.
-

Performing maintenance and repairs

- After cleaning, remove all covers and tapes applied for that purpose.
- After cleaning, examine all fuel, lubricant and hydraulic oil lines for leaks, chafe marks and damage. Rectify all defects without delay.
- Observe the adjustment, maintenance and inspection activities and intervals set forth in the Operator's Manual, including information on the replacement of parts/partial equipment.
These activities may be performed only by a Wacker Neuson service center.
- Disconnect the negative terminal of the battery if work needs to be performed on the electrical system.
- Do not allow the machine not be serviced, repaired or test-driven by unauthorized personnel.
- Always use specially designed or otherwise safety-oriented ladders and working platforms to perform overhead assembly work. NEVER use machine parts or attachments/superstructures as a climbing aid.
- Wear a safety harness when performing elevated maintenance. Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice.
- Do not use the work equipment as lifting platforms for persons.

2.15 Special Hazards

Electrical energy

- Use only original fuses with the specified current rating.
- In case of electrical system malfunctions, stop the machine immediately, disconnect the battery (for example, by using the battery master switch), and perform troubleshooting procedures.
- Work on the electrical system may only be performed by a technician with appropriate training, in accordance with the applicable electrical engineering codes.
- Inspect and check the electric equipment of the machine at regular intervals. Defects such as loose connections or scorched cables must be repaired immediately.

- Observe the operating voltage of the machine/attachments. The voltages must be compatible (12 volts) and confirm that an appropriate fuse or circuit breaker is incorporated in the system to prevent damage from malfunction or short circuit.
- Always remove the grounding strap from the battery when working on the electrical system or when performing welding work.
- Starting the machine with a battery jumper cable can be risky if performed improperly. Observe the safety instructions regarding the battery.

Underground electric lines

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

Overhead electric lines

DANGER

Personal injury hazard due to electrical shocks!

Will cause severe injuries or death.

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

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

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

Gas, dust, steam, smoke

- Operate the machine only on adequately ventilated premises. Before starting internal combustion engines or operating fuel-operated heating systems on enclosed premises, ensure that there is sufficient ventilation. Observe the regulations in force at the respective site.
- Welding, burning and grinding work on the machine may only be performed by a Wacker Neuson dealer.
- Before performing welding, flame-cutting and grinding work, clean the machine and its surroundings from dust and other inflammable substances, and ensure that the premises are adequately ventilated – risk of explosions.
- In areas with special hazards (for example, toxic gases, caustic vapors, toxic environments), carry appropriate protective equipment (breathing filters, protective clothing).

Safety instructions regarding internal combustion engines**WARNING****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.

- 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 to leaks (loose fuel lines, for example). 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 (carbon monoxide and dioxide, for example).
- Never operate the machine in enclosed premises or areas (pits, for example), if there is no suitable ventilation (exhaust-gas filters, suction systems, for example).
- Do not operate the machine in potentially explosive areas.
- Do not touch the engine, exhaust system and cooling system as long as the engine is still running or has not cooled down yet.
- Do not remove the radiator cap when the engine is running or hot.
- The coolant is hot, under pressure and can cause serious burns.

Hydraulics

- Work on the hydraulic equipment of the machine must be performed only by persons having specific technical knowledge and experience in hydraulic systems.
- Check all lines, hoses, fittings, and threaded couplers regularly for leaks and obvious damage. Repair any damage and leaks immediately. Splashed oil can cause injury and fire.
- In accordance with the Operator's Manual for the respective assembly, release the pressure in all system sections and pressure lines (hydraulic system) to be opened before performing any implementing/repair work.

- Hydraulic and compressed-air lines must be laid and fitted properly. Ensure that no connections are interchanged. The fittings, lengths and quality of the hoses must comply with the technical requirements.
-

Noise

- Close all doors and windows if practical.
 - Removing sound baffles on the machine during operation is not allowed.
 - Wear ear protectors. This is especially important when performing hammer operations or working in enclosed areas.
-

MSDS



- When handling oil, grease and other chemical substances such as battery electrolyte or hydraulic fluid, observe the product-related safety regulations (Material Safety Data Sheet (MSDS)).
 - Be careful when handling hot consumables – risk of burning or scalding.
 - When using the machine in contaminated areas, take appropriate measures for the protection of the operator and the machine.
-

Tracks

- Check track tension at regular intervals.
 - Repair work on the tracks must be performed by technical personnel or by Wacker Neuson dealers only.
 - Damaged or malfunctioning tracks reduce the machine's operational safety. Check the tracks regularly for:
 - Cracks, cuts or other damage.
 - Check track tension at regular intervals.
-

Battery

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

2.16 Safety Guidelines while using Internal Combustion Engines**WARNING****Special hazard during operation and fueling.**

Can cause severe injury or death.

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

Running the engine

When running the engine:

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

Fueling the engine

When fueling the engine:

- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Replace the fuel tank cap after refueling.
- Do not smoke.
- Do not refuel a hot or running engine.

Do not refuel the engine near an open flame

- Use suitable mounting points and load-securing devices.
- The recommissioning procedure must be strictly in accordance with the Operator's Manual.

Dual Power option

Operating radius

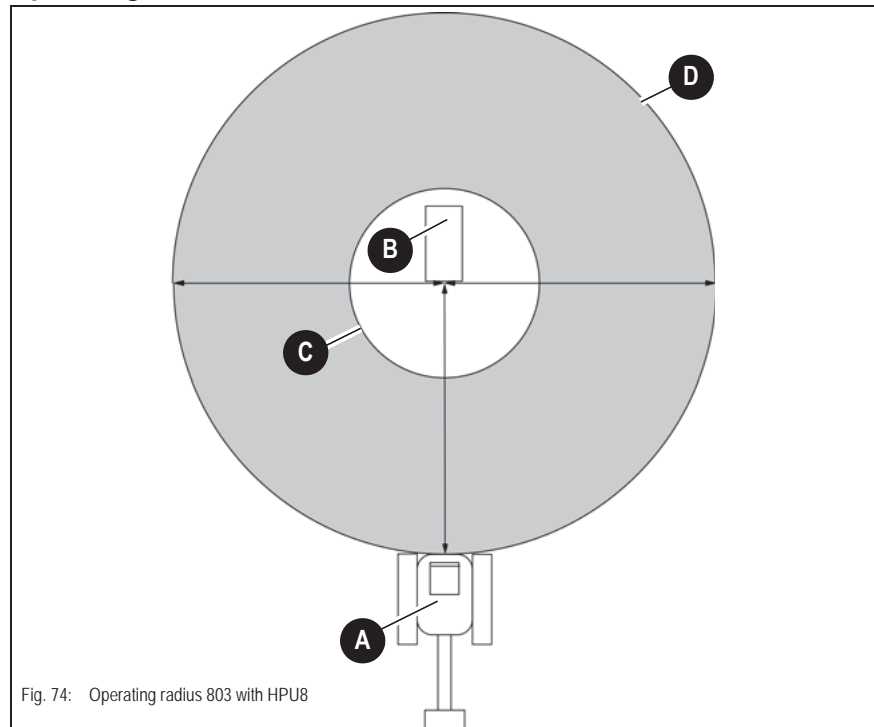


Fig. 74: Operating radius 803 with HPU8

Position	Function
A	Hydraulic excavator 803
B	Electrohydraulic power unit HPU8
C	Minimum operating radius with connected power unit: 1.5 m/59 in
D	Maximum operating radius with connected power unit: 10 m/33 ft
--	Minimum bending radius of Dual Power hydraulic hoses: 30 cm (12 in)

- The power unit must be at the same level as the excavator.
- Do not pull the power unit with the hydraulic hoses.
- The operator must have permanent visual contact with the power unit.
- Do not travel across hydraulic hoses.
- The protective hoses must be located on the excavator side of the hydraulic hose and must not be removed.
- Do not squeeze hydraulic hoses.
- Do not put hydraulic hoses over edges.
- Do not put anything down on the hydraulic hoses.
- Do not put the connecting cable over edges.

3 Operation

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.

A combination of digits, or a combination of digits and letters (for example 40/18 or 40/A) used for identifying the control elements, means:

fig. no. 40/control element no. 18 or position **A** in fig. no. 40

Figures carry no numbers if they are placed to the left of the text.

The symbols used in the description have the following meanings:

- Identifies a list

•Subdivision within lists or an activity. Follow the steps in the recommended order

 *Identifies an activity*

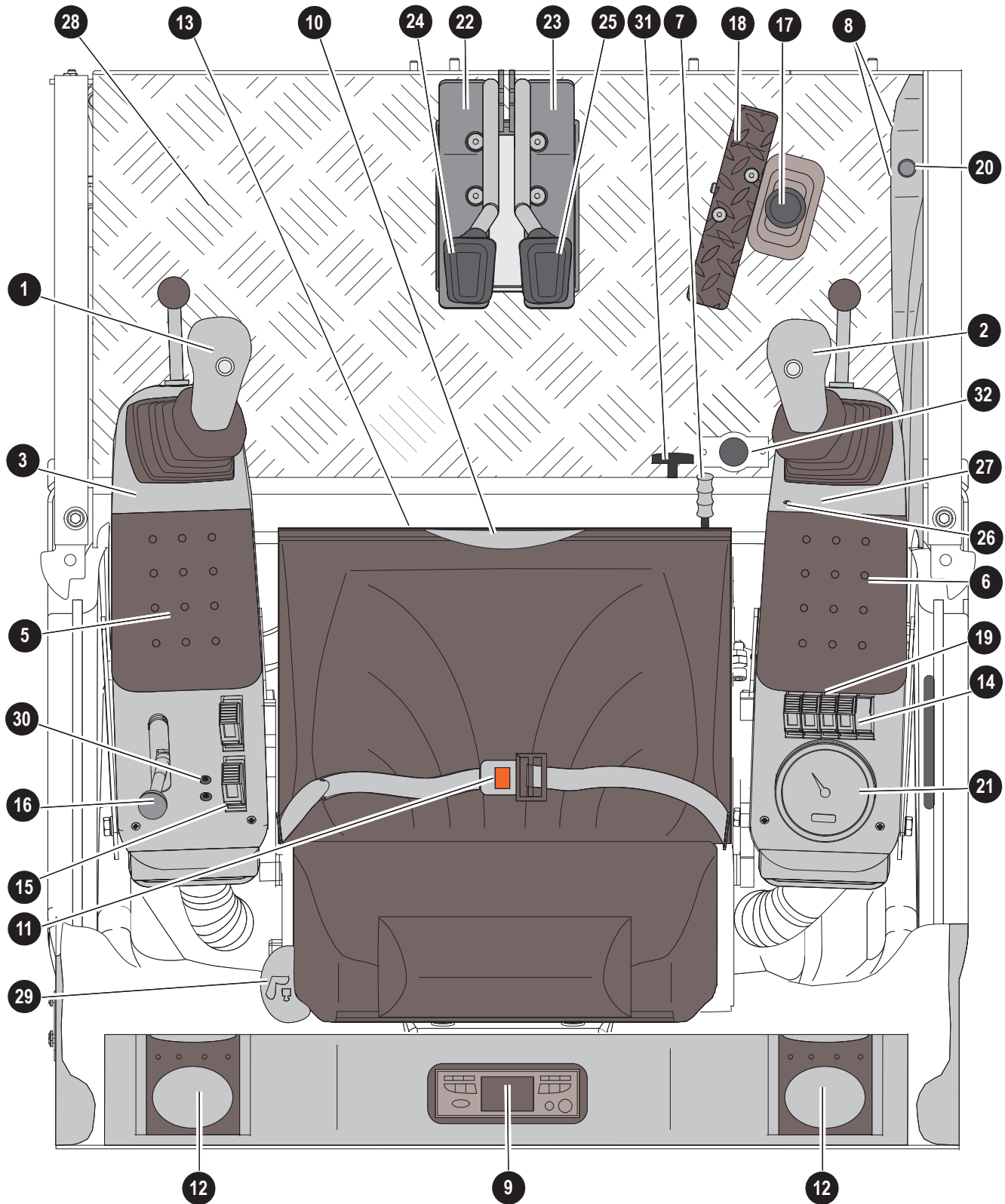
➔ Description of the effects or results of an activity

n. s. = not shown

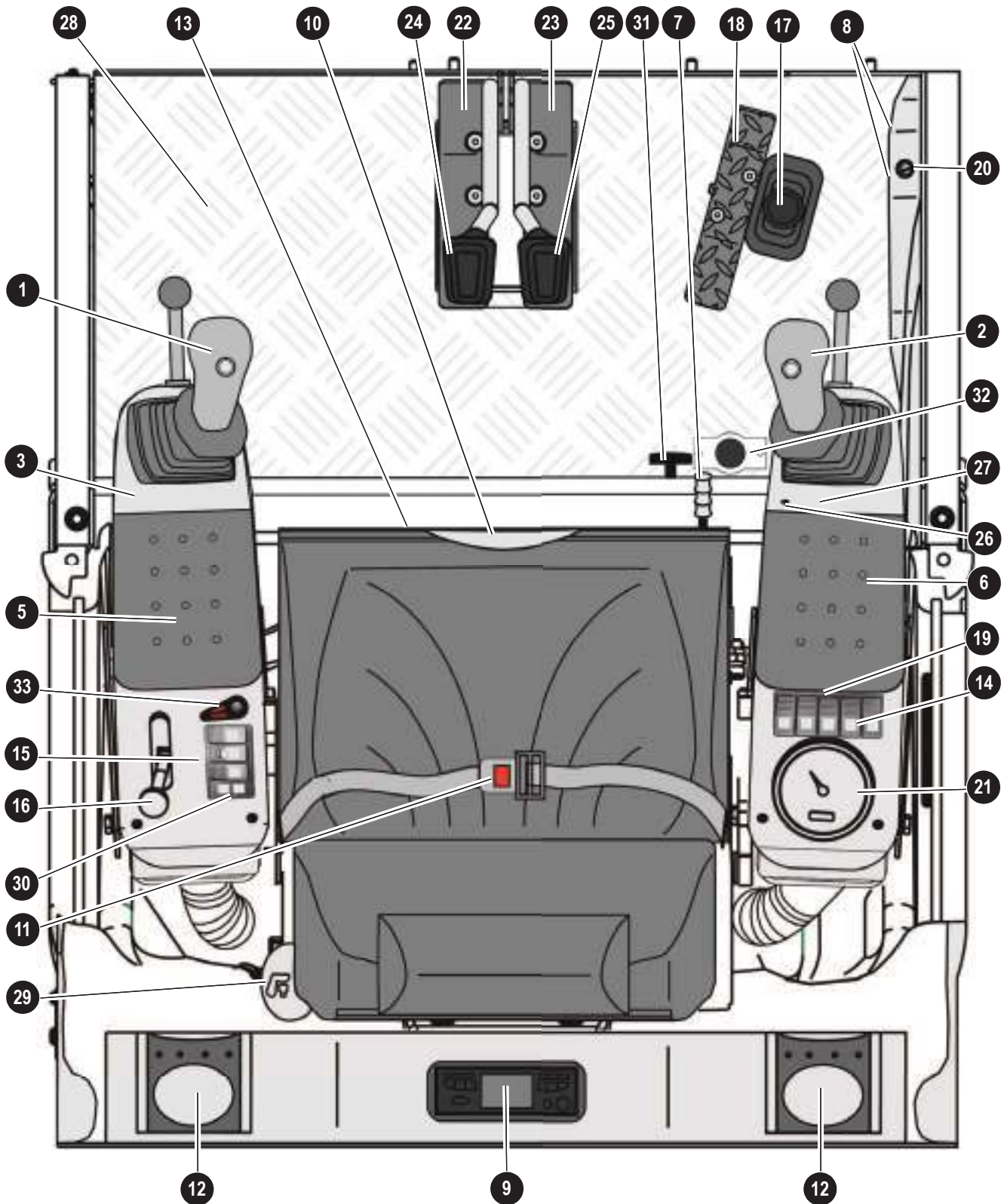
"Opt" = option

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

Cabin top view up to serial no. AG02452



Cabin top view from serial no. AG02453

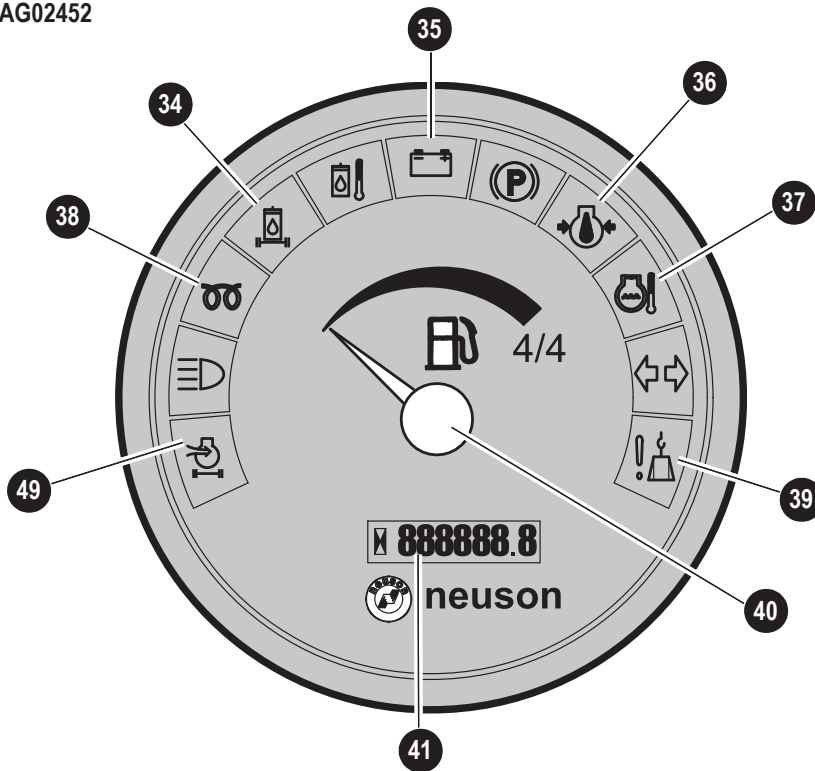


3.1 Cabin overview

Pos.	Description	For more information see page
1	Control lever (left)	3-72
2	Control lever (right)	3-77
3	Control lever base (left)	
4	Control lever base (right)	
5	Armrest (left)	
6	Armrest on the right (not shown)	
7	Lever (horizontal seat adjustment)	3-4
8	Air vents	3-4
9	Radio (option)	
10	Operator seat (backrest adjustment)	3-4
11	Seat belt (lock)	3-4
12	Cup holder	
13	Document storage (underneath the seat console)	
14	Switch panel (right)	3-4
15	Switch panel (left) ¹	3-4
16	Throttle	3-11
17	Stabilizer-blade lever	3-4
18	Auxiliary hydraulics pedal	3-4
19	Preheating start switch	3-11
20	12 V power outlet ²	
21	Display element	3-7
22	Accelerator pedal (left)	3-4
23	Accelerator pedal (right)	3-4
24	Drive lever (left)	3-4
25	Drive lever (right)	3-4
26	Immobilizer status indicator (option)	3-23
27	Immobilizer emitter/receiver unit	3-23
28	Changeover valve for SAE/ISO controls (option, underneath the base plate)	3-77
29	Weight adjustment for seat	3-51
30	Proportional controls indicator (option)	3-80
31	Lever for engine and valve cover	3-58
32	Hydraulic quickhitch pedal (option)	3-92
33	VDS button (upper carriage tilting – option 3503) ³	3-87

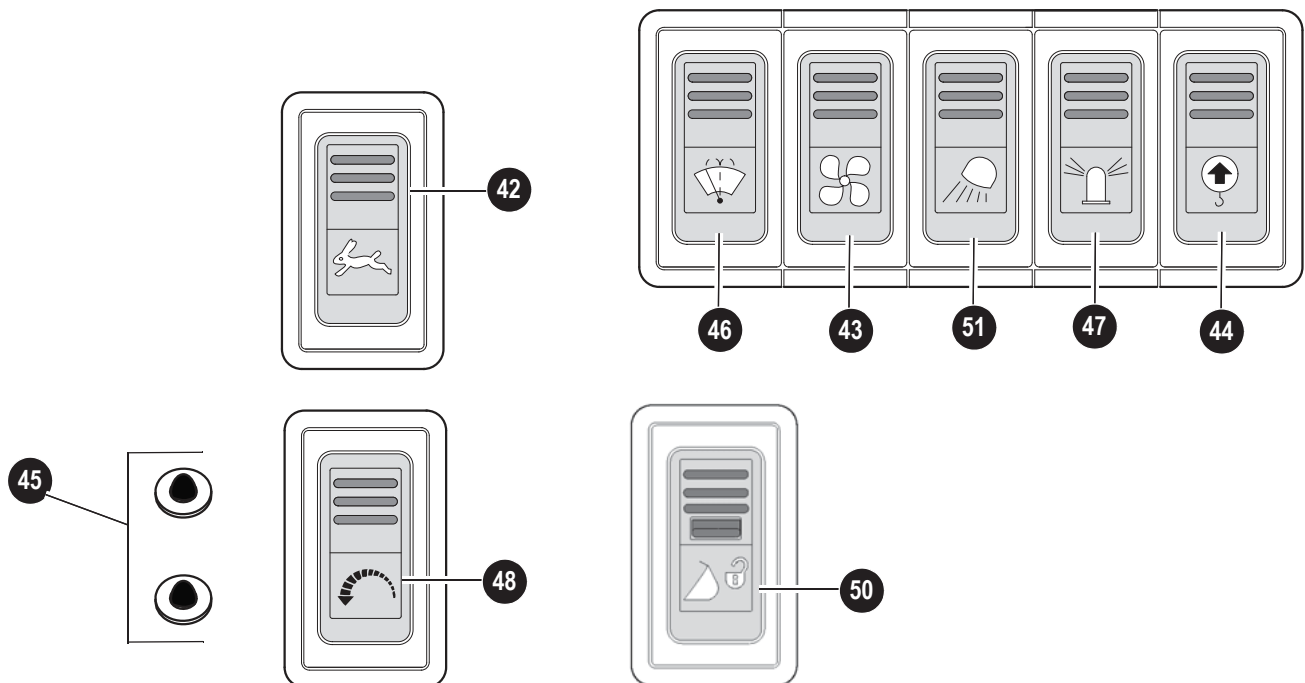
1. Cabin top view up to serial no. AG02452: automatic engine speed setting (from serial no. AG00580) or hydraulic quickhitch (from serial no. AG02027)
 2. Power outlet for cabin version/12 V connection for canopy version: from 1st quarter of 2015 / WNxxxxxxxxxxxxxxxx (2503); WNxxxxxxxxxxxxxxxx (3503)
 3. VDS operation with console switch from serial no. AG02695

Up to serial no. AG02452

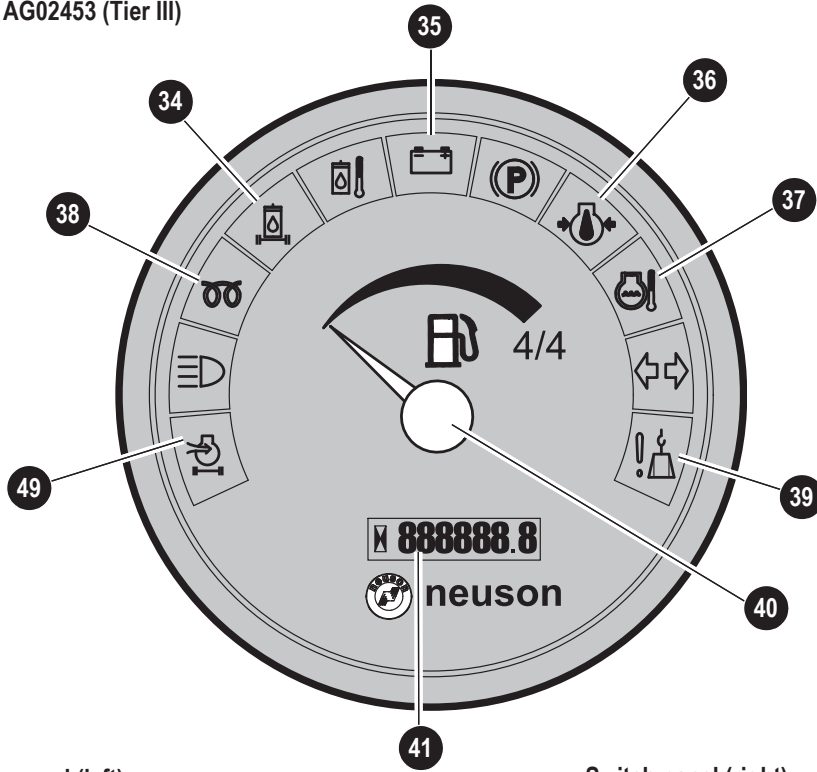


Control elements on the left

Control elements on the right

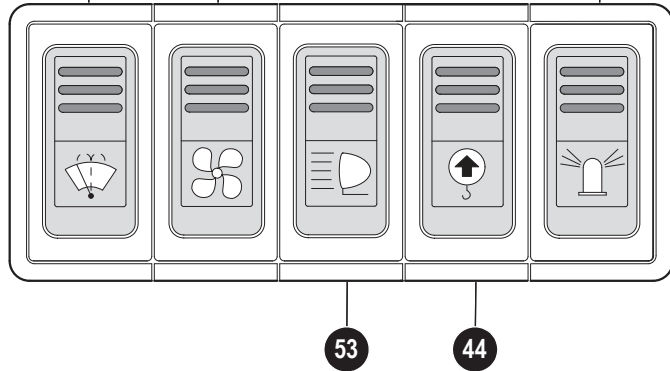
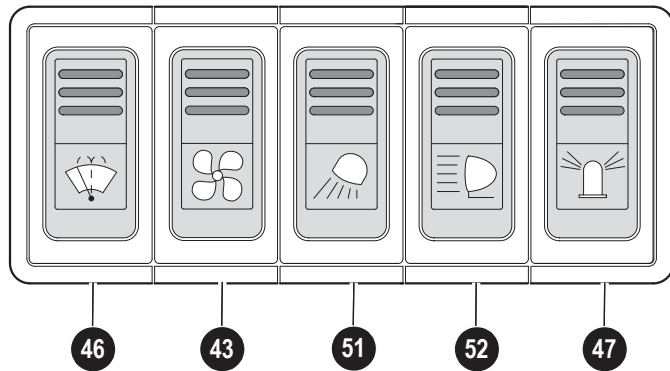
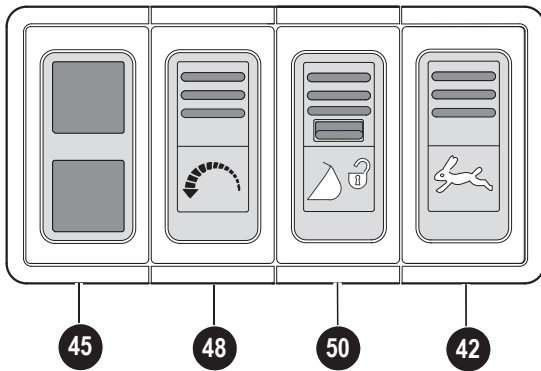


From serial no. AG02453 (Tier III)



Switch panel (left)

Switch panel (right)



3.2 Instrument panel overview

Pos.	Description	For more information see page
34	Indicator light (red) – hydraulic oil filter	3-12
35	Indicator light (red) – alternator charge function	3-12
36	Indicator light (red) – engine oil pressure	3-12
37	Indicator light (red) – coolant temperature	3-13
38	Indicator light (yellow) – cold starter	3-13
39	Safe load indicator light (red) (option)	3-13
40	Fuel level indicator	3-13
41	Hour meter	3-13
42	High speed	3-29
43	Ventilation	3-48
44	Safe load indicator (option) ¹	3-102
45	Proportional controls status indicator (option)	3-82
46	Washer system	3-49
47	Rotating beacon (option)	3-37
48	Automatic engine speed setting (option)	3-12
49	Indicator for air filter contamination	5-11
50	Hydraulic quickhitch (option)	3-92
51	Working lights	3-36
52	Roof lights (option) ²	3-36
53	Work and roof lights (two-stage switch) ³	3-36

1. In case of older machines, the safe load indicator switch can also be located in the position of the rotating beacon switch.

2. If the machine is equipped with a working light and roof lights, but *without* a safe load indicator

3. If the machine is equipped *with* a working light, roof lights and a safe load indicator

3.3 Putting into operation

Safety instructions

- Only use the steps and handholds provided when entering and leaving the cabin
- Never use the controls or movable lines and cables as handholds
- Never get on a moving machine. Never jump off the machine
- Refer to the corresponding load diagrams for the boom

Putting into operation for the first time

Important information

- The machine may only be put into operation by authorized personnel – *see chapter 2.6 Operator and Technician Qualifications and Basic Responsibilities* on page 2-4 and – *see chapter 2 Safety instructions* on page 2-1 of this Operator's Manual.
- The personnel must have read and understood this Operator's Manual before putting the machine into operation
- The machine may only be used in technically perfect condition in accordance with its designated use and the instructions set forth in the Operator's Manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the machine
- Go through the "Start-up" checklist in the following chapter

Running-in period

Handle the machine carefully during its first 50 operating hours.

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

- Do not change engine speed abruptly
- Avoid using the machine under heavy loads and/or at high speeds.
- Avoid abrupt acceleration, braking and changing travel direction.
- Do not run the engine at high speed for extended periods
- Strictly observe the maintenance schedules in the appendix – *see chapter 5.17 Maintenance plan (overview)* on page 5-38

Check lists

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

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

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

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

Start-up checklist

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

No.	Question	✓
1	Enough fuel in the tank? (►► 5-2)	
2	Coolant level OK? (►► 5-8)	
3	Water drained from the water separator? (►► 5-4)	
4	Engine oil level OK? (►► 5-5)	
5	Oil level in hydraulic oil reservoir OK? (►► 5-15)	
6	Water level in washer tank OK? (►► 3-49)	
8	Lubrication points greased? (►► 5-35)	
9	Tracks checked for cracks, cuts, etc.? (►► 5-19)	
10	Lights, signals, indicators, warning lights and indicator lights OK? (►► 3-22)	
11	Windows, mirrors, lights and steps clean?	
12	Control lever base lowered? (►► 3-57)	
13	Attachment safely locked? (►► 3-107)	
14	Engine cover safely locked? (►► 3-58)	
15	Especially after cleaning, maintenance or repair work: ► Rags, tools and other loose objects removed?	
16	Seating position adjusted correctly? (►► 3-50)	
17	Seat belt fastened? (►► 3-52)	
18	Cabin/canopy installed (►► 3-63)	

Operation checklist

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

No.	Question	✓
1	Anyone in the danger zone of the machine?	
2	Indicator lights for engine oil pressure and alternator charge function gone out? (☛ 3-12)	
3	Temperature gage for engine coolant in normal range? (☛ 3-13)	
4	Accelerator pedals working correctly? (☛ 3-27)	

Parking checklist

Check and observe the following points when parking the machine:

No.	Question	✓
1	Attachments lowered to the ground? (☛ 3-76)	
2	Control lever base raised? (☛ 3-57)	
3	Cabin locked, especially if the machine cannot be supervised? (☛ 3-55)	
When parking on public roads:		
4	Machine appropriately secured? Machine also secured with chocks under the tracks to prevent it from rolling away?	
When parking on slopes:		
5	Machine also secured with chocks under the tracks to prevent it from rolling away?	

3.4 Driving the excavator

Preheating start switch

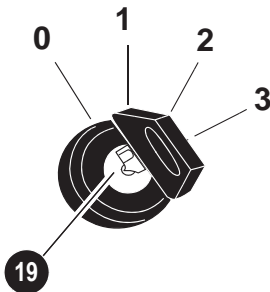


Fig. 75: Preheating start switch

Position	Function	Power consumer
0	Insert or remove the starting key	None
1	ON/machine travel position	All functions are operational <ul style="list-style-type: none"> ➤ Indicator lights illuminate ➤ Shriill sound
2	Preheats the engine (10 – 15 seconds)	
3	Starts the engine	<ul style="list-style-type: none"> ➤ Starter is actuated ➤ Indicator lights must go out

Throttle

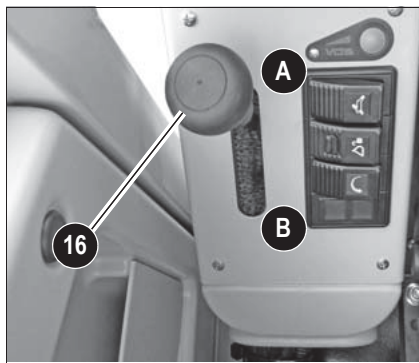


Fig. 76: Engine speed control Tier III

On machines with Tier III engines, the throttle **16** controls the engine speed progressively as follows:

- Push throttle **16** upward **(A)**.
 - Engine speed is reduced.
- Push throttle **16** down **B**.
 - Engine speed is increased.

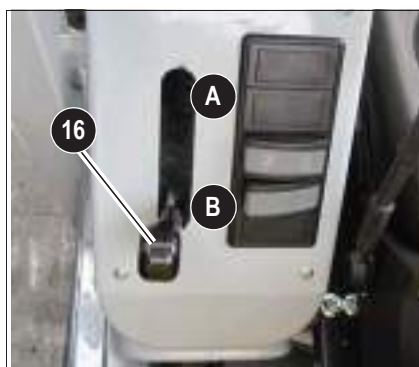


Fig. 77: Engine speed control Tier IV

On machines with Tier IV engines, throttle **16** controls the engine speed progressively as follows:

- Push throttle **16** upward **(A)**.
 - Engine speed is increased.
- Push throttle **16** down **B**.
 - Engine speed is reduced.

3.5 Automatic engine speed setting

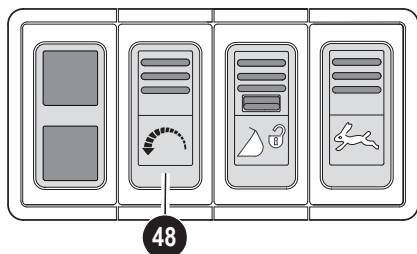


Fig. 78: Automatic engine speed setting

From serial no. AG00580

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

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

Automatic engine speed setting (option)

ON	☞ Press switch 48 down	☞ Indicator light in switch 48 illuminates
OFF	☞ Press switch 48 up	☞ Indicator light in switch 48 goes out

3.6 Indicator lights and warning lights Tier III (overview)



34 Indicator light (red) – hydraulic oil filter

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

- ☞ Have the hydraulic oil return filter checked and, if necessary, replaced by a Wacker Neuson service center



Information!

If the hydraulic oil is cold, the indicator light can illuminate until the operating temperature is reached.



35 Indicator light (red) – alternator charge function

NOTICE

The coolant pump no longer runs if the V-belt is faulty. Risk of engine overheating or breakdown!

If the indicator light illuminates with the engine running:

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

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



36 Indicator light (red) – engine oil pressure

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

- ☞ Stop the machine
- ☞ Stop the engine immediately and check the oil level

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



37 Coolant temperature indicator light (red)



WARNING

Burn hazard due to hot fluid.

Can cause serious injury or death.

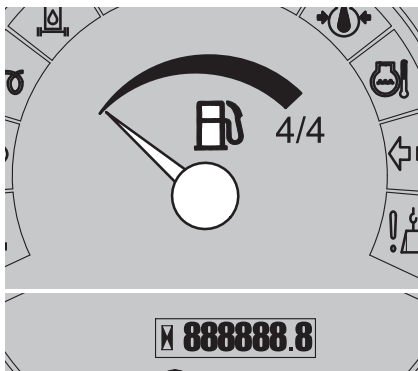
- Wait at least 10 minutes after stopping the engine!
- Wear protective gloves and clothing
- Open the cap to the first notch and release the pressure



38 Cold starter indicator light (yellow)

Illuminates if the key in the preheating start switch is in position **2**.

A glow plug preheats the air in the combustion chamber of the engine when the key is in this position.



40 Fuel level indicator

41 Hour meter

Counts the engine operating hours with the engine running.

44 Safe load indicator (option) light (red)

This optical warning device tells the driver whether he has reached the permissible (pay)load or load moment according to the (pay)load.

Reduce the load until the indicator light goes out



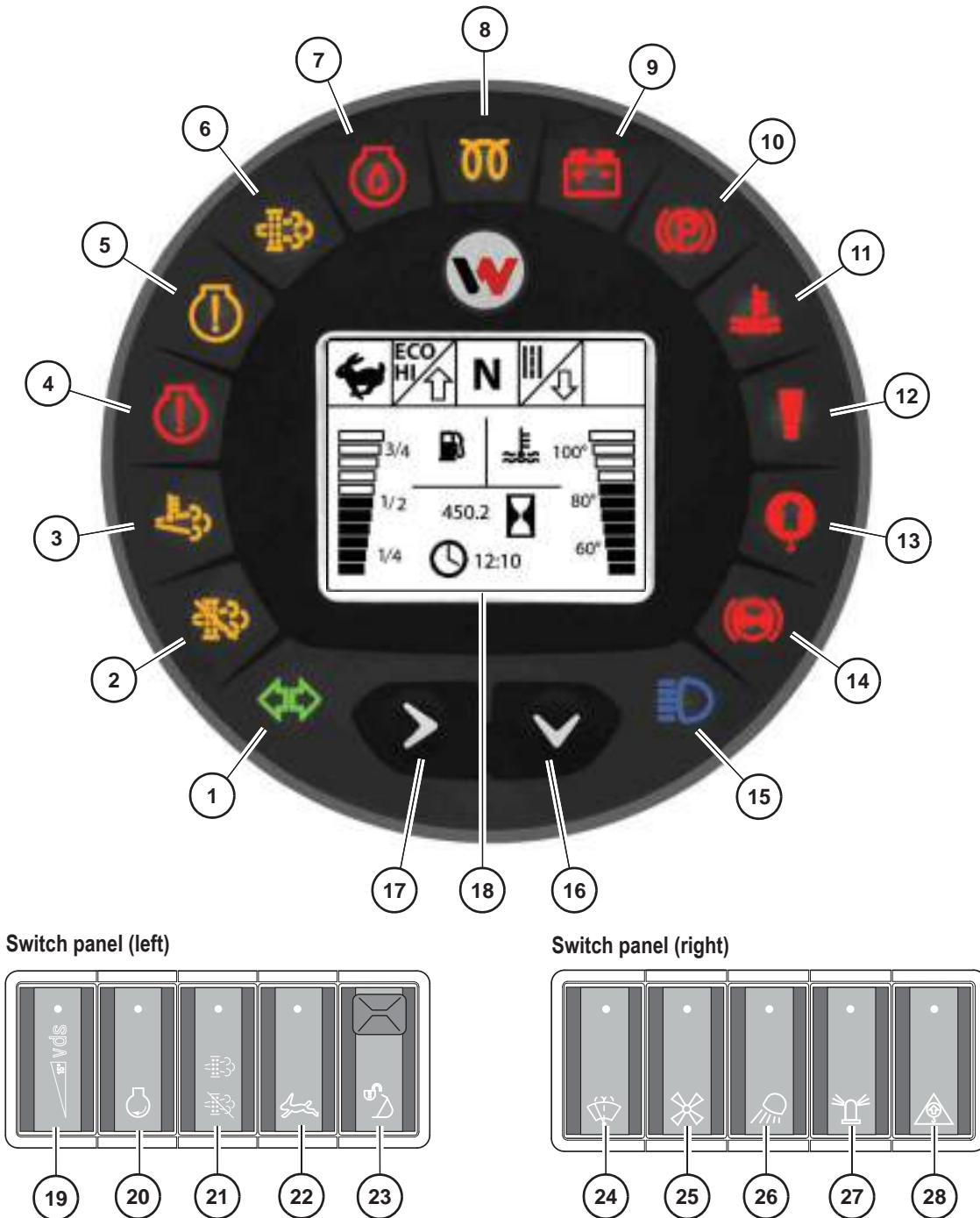
3.7 Display element 3503 Tier IV

The display element and the multifunctional display informs the operator of the operating states, required maintenance or possible machine malfunctions.



Information!

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



No.	Symbol	Color	Designation	See
1		Green	(not assigned)	-
2		Yellow	PMC regeneration disabled/interrupted	3-112; 3-111
3		Yellow	High exhaust-gas temperatures	3-109; 3-111
4		Red	Engine stop	4-4; 3-111
5		Yellow	Engine warning	4-4; 3-111
6		Yellow	PMC regeneration	3-109; 3-111
7		Red	Engine oil pressure	4-4
8		Yellow	Preheating	3-22
9		Red	Charge indicator light	3-22, 4-5
10		Red	(not assigned)	--
11		Red	Coolant temperature	4-5
12		Red	General malfunction	4-5
13		Red	Safe load indicator light	--
14		Red	(not assigned)	--
15		Blue	(not assigned)	--
16		---	Selector button (multifunctional display)	--
17		---	To next menu page/set (multifunctional display)	--
18		---	Multifunctional display	--
19		---	VDS switch (option)	3-87

No.	Symbol	Color	Designation	See
20		---	Automatic engine speed setting switch (option)	3-12
21		---	Regeneration push button	3-112
22		---	2nd speed range switch	3-29
23		---	Hydraulic quickhitch (option) switch	3-92
24		---	Wiper/wash system switch	3-49
25		---	Ventilation/heating switch	3-48
26		---	Working light switch	3-36
27		---	Rotating beacon (option) switch	3-37
28		---	Safe load indicator switch (option)	3-102

Meaning of displays and symbols 3503 Tier IV

Symbol	Designation	Page
	Speed range 1	3-29
	Speed range 2	
450.2	Hour meter	3-18
49.8	Operating hours to next maintenance	
12:10	Time	3-18
800 rpm	Engine speed	
	Fuel tank capacity	3-18
	Coolant temperature	3-13
	Engine error	4-6
ECU	Machine error	
	Engine data	4-6

Symbol	Designation	Page
	PMC (symbol without exclamation mark from software version 3.3)	4-6, 3-109
	No malfunction	4-6
35 °C	Detailed coolant temperatur	3-13
800 rpm	Detailed engine speed	3-18
0 kPa	Detailed engine oil pressure	--
_____	Engine number	4-6
	Setting of display brightness	3-19
	Setting of display contrast	
	Setting of time/date	
	Replace the hydraulic oil filter	--
	Dirty air filter	5-11
	Dirty hydraulic oil radiator	5-8
	Charge indicator light	3-12
	PMC: low load	3-111
	PMC: medium load	
	PMC: highest load	
	Symbol flashes: PMC regeneration required	
	Symbol illuminates: PMC regeneration active	

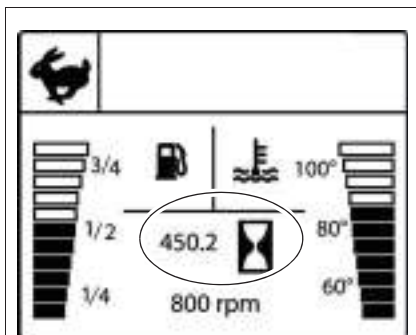


Fig. 79:

Hour meter

Counts the engine operating hours with the engine running.

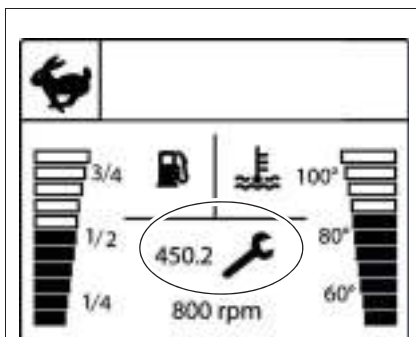


Fig. 80:

Maintenance meter

Counts the engine operating hours until the next maintenance.

The maintenance meter starts at 500.0 hours. It counts down to 0.0 hours. The wrench symbol then starts to flash.

The maintenance meter keeps on counting down (-0.1 hours, -0.2 hours, etc.)



Information!

After 500 operating hours the output of the Tier IV diesel engine is reduced by 25 % if maintenance is not performed.

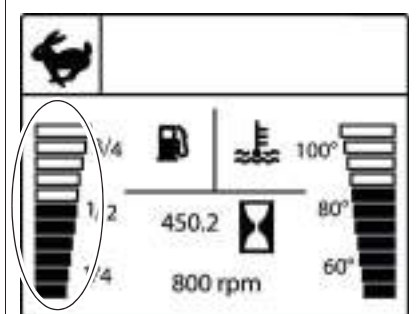


Fig. 81:

Fuel level indicator

Indicates the remaining amount of fuel in the tank.

Refuel if the segments reach the low range.

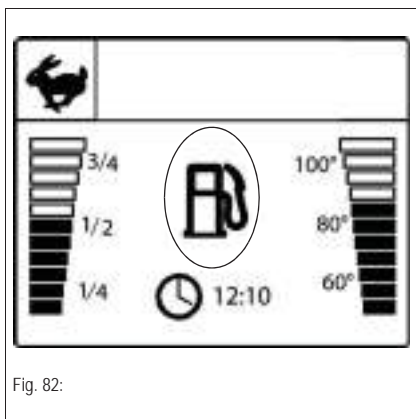
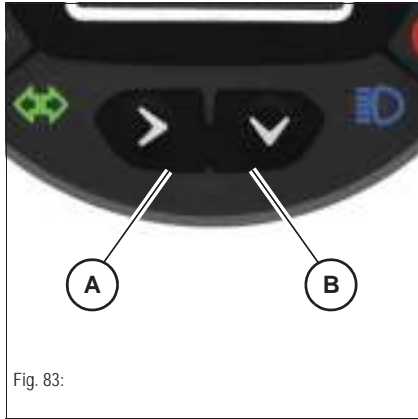
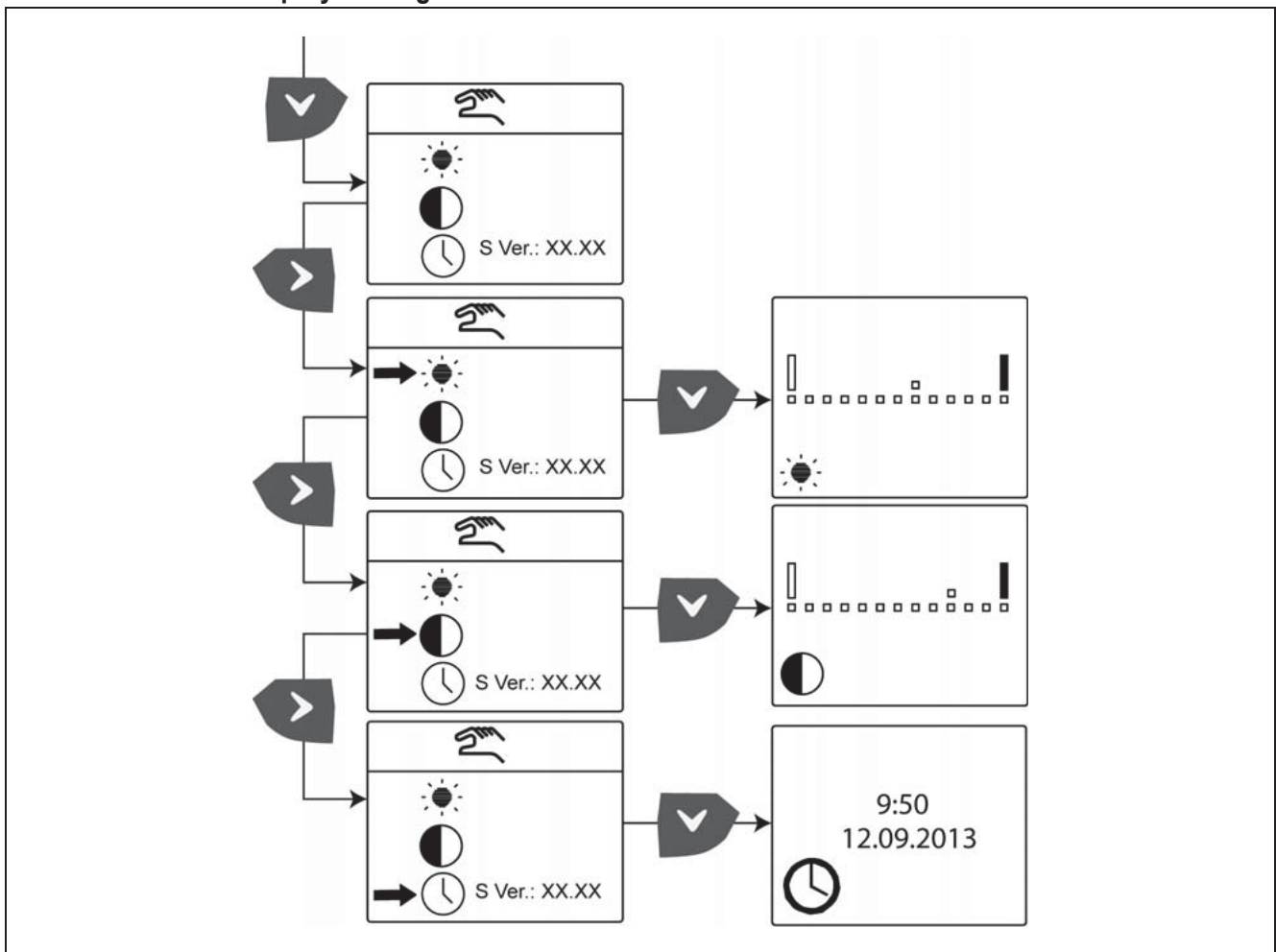


Fig. 82:

Add fuel immediately if the highlighted symbol appears in the main menu.

Multifunctional display (Tier IV only)**Display element buttons**

- A: selection button
- B: to next menu page/set

Menu structure of display setting**Information!**

The software version number is displayed from version 3.3.

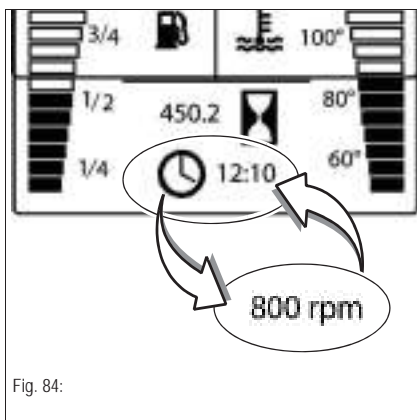


Fig. 84:

Time/engine speed changeover

Change over between engine speed and time with push button **A**.

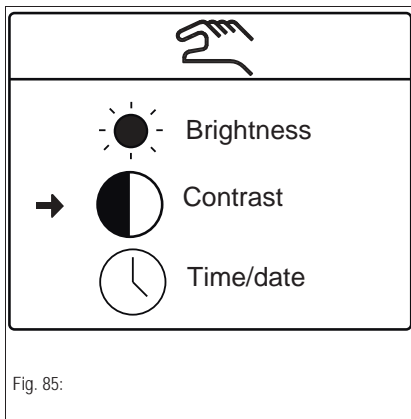


Fig. 85:

Display adjustment menu

The selected menu level is marked with an arrow.

Press push button **A** 1 x: brightness

Press push button **A** 2 x: contrast

Press push button **A** 3 x: time/date

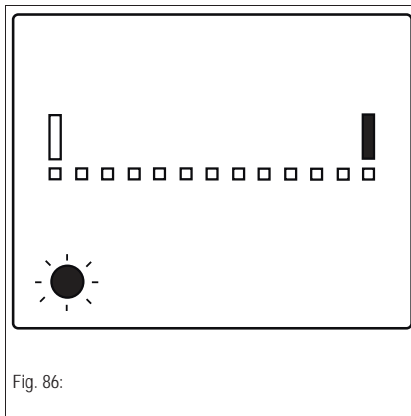


Fig. 86:

Adjusting brightness

Press push button **B** to access the adjustment mode.

Press push button **A** to adjust brightness.

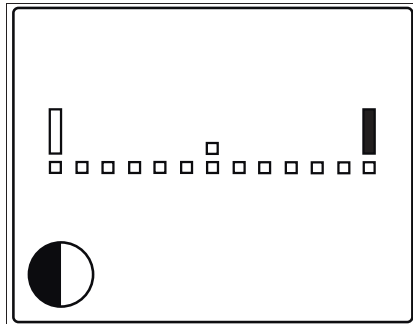


Fig. 87:

Adjusting contrast

Press push button **B** to access the adjustment mode.

Press push button **A** to adjust the contrast.

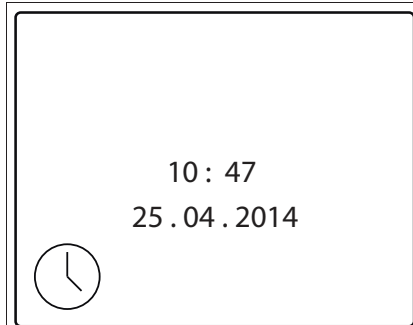


Fig. 88:

Setting the time or date

Adjustment sequence: year/month/day/hours/minutes

Press push button **B** to access the adjustment mode.

Press push button **A** to set or to access the next setting (month, day, etc.).

Press push button **A** until the display adjustment menu appears again. Otherwise the selected modifications are not saved.

3.8 Before starting the engine

- ☞ Operate the machine only on appropriately ventilated premises! Ensure sufficient ventilation on enclosed premises!
- ☞ Adjust seat position and rearview mirror
 - see Seat adjustment on page 3-50



Information!

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

- ☞ Fasten your seat belt
 - see Seat belt on page 3-52
- ☞ Lower the control lever base on the left
- ☞ Check whether all levers and pedals are in neutral position
- ☞ Move the throttle to the center position (between minimum and maximum) if the engine is cold

3.9 Starting the engine

- The starter cannot be actuated if the engine is already running (start repeat interlock)
- Do not run the starter for more than 10 seconds
- Wait about 1 minute so the battery can recover before trying again.

Procedure

NOTICE

Actuating the preheating system too long can damage the preheater.

- Never preheat the engine more than 20 seconds

After you have completed the starting preparations:

- ☞ Insert the starting key in preheating start switch **19**
- ☞ Turn the starting key to position “1”
- ☞ Check whether all indicator lights illuminate:
- ☞ Replace malfunctioning indicator lights immediately.
- ☞ Turn the starting key to position “2” and hold it in this position until indicator light **A** goes out.
- ☞ Turn the starting key to position “3” and hold it in this position until the engine starts
 - ➔ If the engine does not start after 10 seconds
 - ☞ Interrupt the start procedure and try again after about 1 minute
 - ➔ If the engine still does not start after the second try
 - ☞ Contact a Wacker Neuson service center for troubleshooting
 - ➔ As soon as the engine runs:
 - ☞ Release the starting key

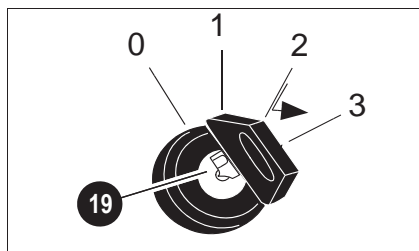


Fig. 89: Preheating start switch

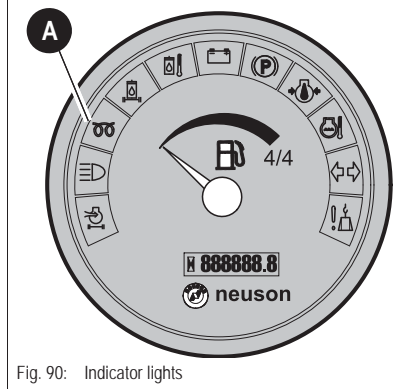


Fig. 90: Indicator lights

3.10 Starting with the immobilizer (option)

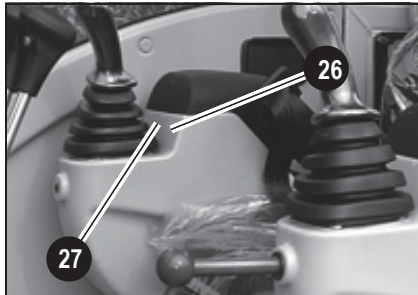


Fig. 91: Immobilizer

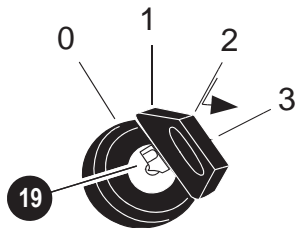


Fig. 91: Preheating start switch

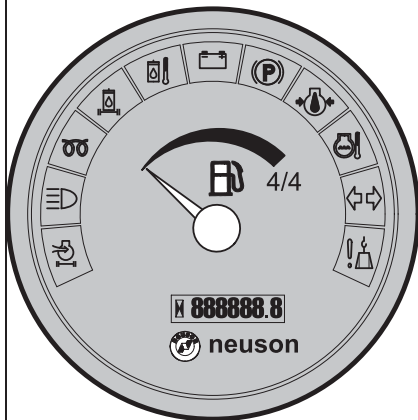


Fig. 91: Indicator lights

After you have completed the starting preparations:

- Approach the transponder key to about 2 cm from the emitter/receiver unit **27**
- The machine can be started as soon as the red indicator light **26** goes out
- Insert the starting key in the preheating start switch **19** within 30 seconds and
- Turn the starting key at least to position “1”
- Check whether all indicator lights illuminate:
- Replace malfunctioning indicator lights immediately.
- Turn the starting key to position “2” and hold it in this position for about 5 seconds
 - The intake air is preheated
- Turn the starting key to position “3” and hold it in this position until the engine starts
 - If the engine does not start after 10 seconds
 - Interrupt the start procedure and try again after about 1 minute
 - If the engine still does not start after the second try
 - Contact a Wacker Neuson service center for troubleshooting
- As soon as the engine runs:
- Release the starting key

3.11 Starting with the immobilizer – internal transponder (option)

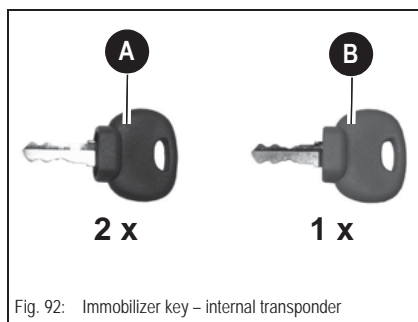


Fig. 92: Immobilizer key – internal transponder

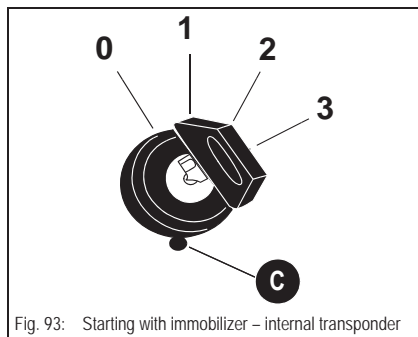


Fig. 93: Starting with immobilizer – internal transponder

A = operator's key (blue key)

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

B = master key (red key)



Information!

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

The flashing LED **C** indicates the active status of the antitheft protection.

The machine can be started without performing any further settings.

Coding a new key

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

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

Deleting coded keys

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

- Insert master key **B** in the starter
- Turn the starting key to position **1** for a minimum 20 seconds
- All coded keys are deleted after 20 seconds, and all existing keys can be re-coded.
- The master key code is not deleted during deletion.

3.12 Starting at low temperatures

- ☞ Turn the starting key to position **2** and hold it in this position for about 5 seconds
 - ➔ Engine is preheated
- ☞ Turn the starting key to position **“3”** and hold it in this position until the engine starts
 - ➔ If the engine does not start after 10 seconds
 - ☞ Interrupt the start procedure and try again after about 1 minute
 - ➔ If the engine still does not start after the second try
- ☞ Contact a Wacker Neuson service center for troubleshooting
- ☞ Release the starting key

When the engine runs smoothly (increased engine speed):



Information!

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

3.13 When the engine has started ...

- ☞ Check whether all indicator lights have gone out:
 - ☞ Let the engine warm up
- At cold temperatures:
- ☞ Increase the engine speed slowly
 - ☞ Do not run the engine at full load until it has reached its operating temperature

Engine warm-up

After the engine has started, allow it to warm up at slightly increased idling speed until it reaches its operating temperature of 70 °C (158 °F) (coolant). Run the engine with no load during the warm-up phase (raise control lever base on the left). During the warm-up phase, check for unusual noise, exhaust color, leaks, malfunctions or damage. In case of malfunctions, damage or leaks, park and secure the machine, and find out the cause for the damage and have it repaired.

3.14 Jump-starting the engine (supply battery)

Safety instructions

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

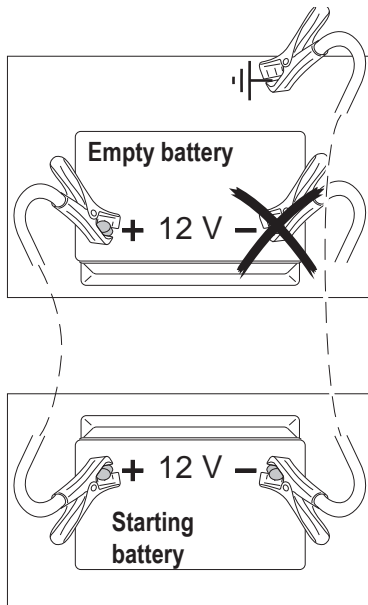


Fig. 94: Starting aid with battery jumper cables

Procedure

- Drive the jump-starting vehicle close enough to the machine so that the jump leads can reach to connect the two batteries
- Let the engine of the jump-starting vehicle run
- First connect one end of the red jump lead (+) to the + terminal of the empty battery, then connect the other end to the + terminal of the starting battery
- Connect one end of the black cable (-) to the - terminal of the starting battery
- Connect the other end of the black cable (-) to a solid metal component firmly screwed on the engine block or onto the engine block itself. Do not connect it to the negative terminal of the empty battery, as otherwise explosive gas emerging from the battery can ignite if sparks are formed!
- Start the engine of the machine with the empty battery

Once the engine has started:

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

3.15 Special instructions for machine travel on public roads

The machine is subject to the:

- Applicable legal regulations of your country

Also observe the applicable regulations for accident prevention of your country.

3.16 Starting machine travel



Information!

The machine will not move off unless the control lever on the left is lowered.

After starting the engine:

☞ The alternator charge indicator light goes out

☞ Press the accelerator pedal slowly

➔ Machine travel starts

3.17 Drive levers



DANGER

Accident hazard due to incorrectly rotated upper carriage!

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

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



DANGER

Accident hazard! The machine moves in the opposite direction if the upper carriage is rotated by 180°!

Causes serious injury or death

- Slowly and carefully actuate the drive levers/pedals.

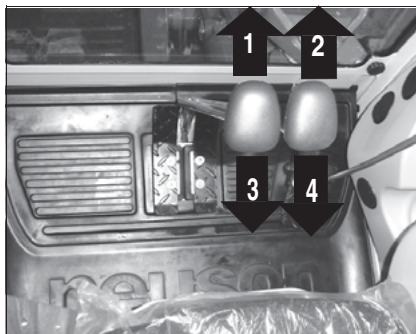


Fig. 95: Drive lever/accelerator pedal

The stabilizer blade side is the front side.

Raise the bucket and the stabilizer blade.

The machine can be moved either with the drive levers or with the pedals. Lock the upper carriage when traveling over longer distances.

Position	Function	
1	Push forward	Track excavator moves forward
2	Push forward	
3	Pull backward	Track excavator moves backward
4	Pull backward	
3	Pull backward	Track excavator turns to the left
2	Push forward	
1	Push forward	Track excavator turns to the right
4	Pull backward	

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



Information!

Ensure that both tracks move as you change direction, otherwise the rubber tracks are subject to increased abrasion.

3.18 High speed

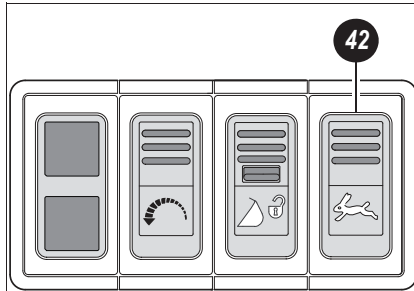


Fig. 96: High speed 2503

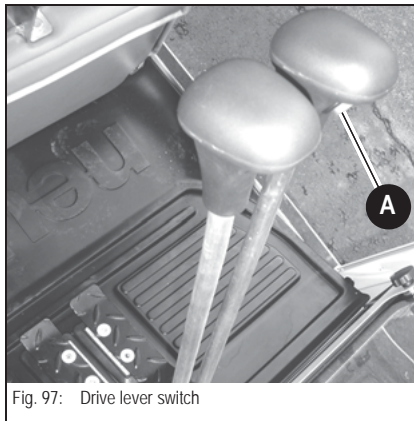


Fig. 97: Drive lever switch

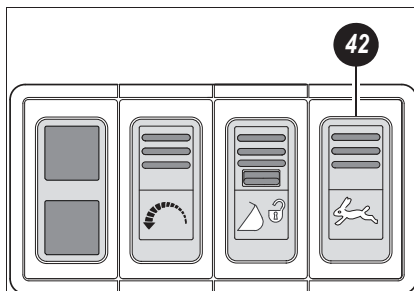


Fig. 98: High speed 3503

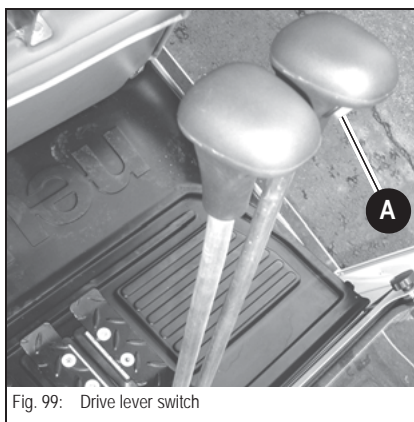


Fig. 99: Drive lever switch

Switch layout shown from serial no. AG02453

High speed 2503

Switch **42** activates high speed. The switch is located on the control lever console on the left. The machine now moves at higher speed.

Brief change-over to high speed:

Press and hold switch **A** on the machine travel (left) lever as you drive the machine.



Information!

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

High speed 3503 (Auto 2-Speed)

Switch **42** activates the Auto 2-Speed function. The switch is located on the control lever console on the left. The machine now moves at higher speed. The machine automatically switches to slow speed if it encounters a higher driving resistance (for example in curves). If the driving resistance is reduced, the machine automatically switches back to high speed.

Brief change-over to high speed:

Press and hold switch **A** on the machine travel (left) lever as you drive the machine.

3.19 Hydraulic brake

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

During downhill machine travel, the automatic hydraulic brake valves prevent the machine from "racing". The machine does not run any faster than the permissible travel speed.



Information!

Use the accelerator pedals to reduce the travel speed as required.

3.20 Mechanical brake

The stop brake and parking brake is designed as a spring-loaded and hydraulically actuated multidisk brake. This brake is automatically applied with a certain delay after having released the drive levers or the accelerator pedals.

Stabilizer blade as a parking brake

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

3.21 Machine travel on slopes



DANGER

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

Can cause serious injury or death.

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

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

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

Newly filled or muddy ground can give away under the weight of the machine, or the tracks can dig into the ground and increase the angle of the machine.

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

Bear in mind the following under all circumstances when driving uphill or downhill:

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

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

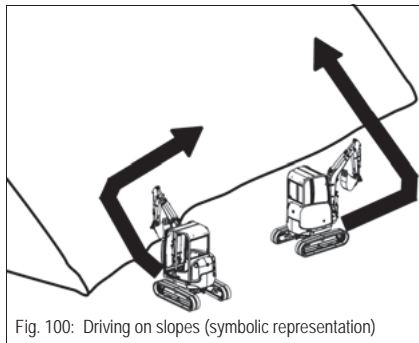


Fig. 100: Driving on slopes (symbolic representation)

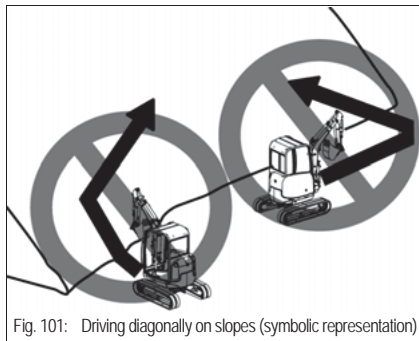


Fig. 101: Driving diagonally on slopes (symbolic representation)

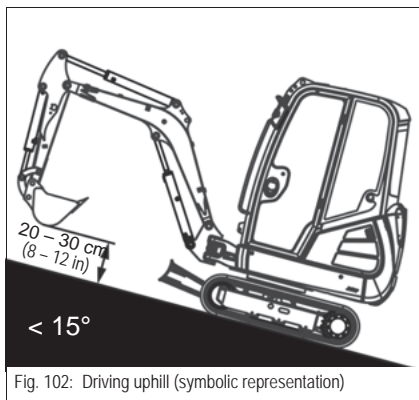


Fig. 102: Driving uphill (symbolic representation)

Preparations for performing machine travel on slopes

Always move straight ahead when performing uphill or downhill machine travel.

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



Information!

Performing machine travel diagonally on slopes is prohibited.

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

Uphill

When driving uphill, the front window of the cabin must face uphill.

Set the stabilizer blade uphill.

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

Do not exceed a maximum gradient angle of 15° .

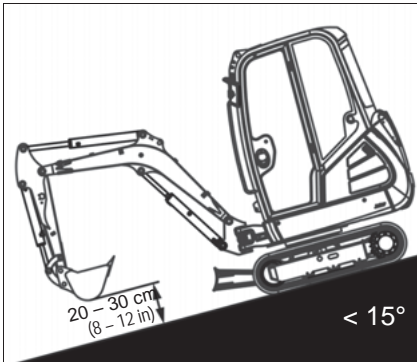


Fig. 103: Driving downhill (symbolic representation)

Downhill

When driving downhill, the front window of the cabin must face downhill.

Set the stabilizer blade downhill.

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

Do not exceed a maximum sloping angle of 15°.

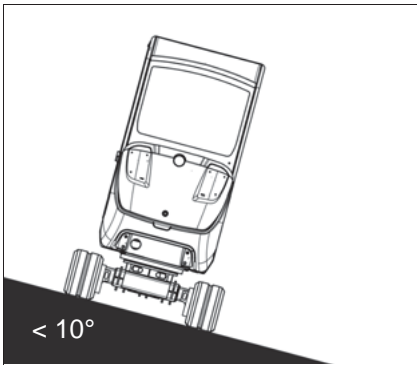


Fig. 104: Driving downhill (symbolic representation)

Lateral angle of inclination

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

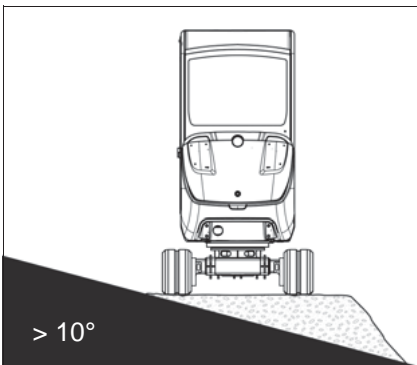


Fig. 105: Driving downhill (symbolic representation)

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

3.22 Stabilizer blade



DANGER

Accident hazard due to unintentional actuation!

Can cause serious injury or death.

- Raise the control lever base.
- Once work with the stabilizer blade is over, lower it to the ground.
- Ensure that no one is in the danger zone when working with the stabilizer blade.



Information!

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

- Slightly raise the stabilizer blade.
- The clearance between the stabilizer blade and the ground should be about 1 cm (0.39 in).
- Check the position of the stabilizer blade before driving the machine.
- Always set the slewing stabilizer blade (option 3503) to the straight position. The only exception that can be made to this is for backfilling and clearing. If necessary, clean the area around the slewing cylinder before beginning work. – *see chapter Slewing stabilizer blade: cleaning the slewing cylinder on page 3-34.*
- When grading, backfilling and clearing, always approach the material carefully to avoid damage.
- In order to ensure maximum stability during work, press the stabilizer blade against the ground.

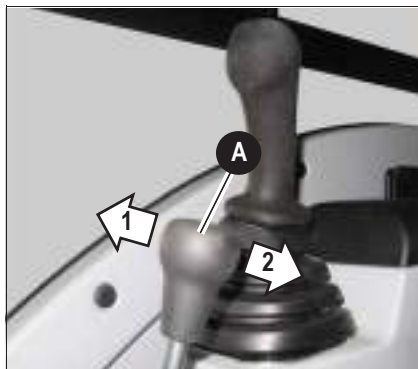


Fig. 106: Stabilizer blade operation

Stabilizer blade operation

The stabilizer blade is operated with lever **A**.

Position	Function
1	Lowers the stabilizer blade.
2	Raises the stabilizer blade.

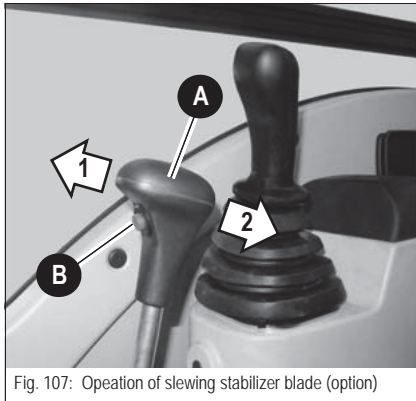


Fig. 107: Operation of slewing stabilizer blade (option)

Operation of slewing stabilizer blade (option 3503)

Position	Press button B	Function
1	No	Lowers the stabilizer blade.
2	No	Raises the stabilizer blade.
1	Yes (keep pressed)	Slews the stabilizer blade to the left.
2	Yes (keep pressed)	Slews the stabilizer blade to the right.

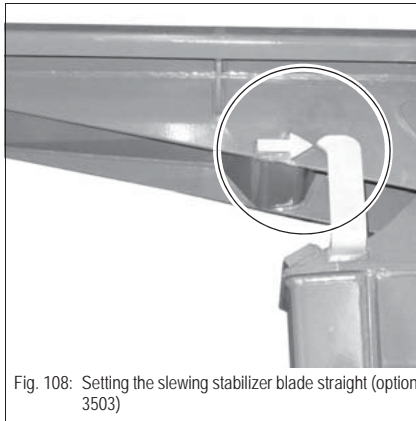


Fig. 108: Setting the slewing stabilizer blade straight (option 3503)

Setting the slewing stabilizer blade straight

Position the stabilizer blade as shown in [Fig. 108](#).

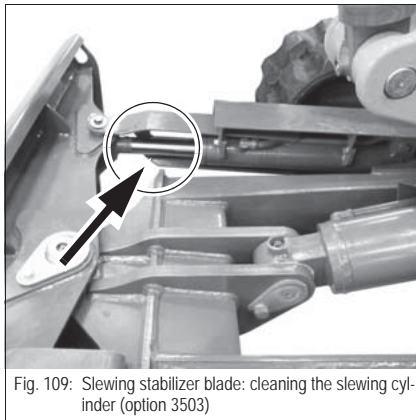


Fig. 109: Slewing stabilizer blade: cleaning the slewing cylinder (option 3503)

Slewing stabilizer blade: cleaning the slewing cylinder

In order to avoid damage, check the area around the slewing cylinder for dirt and clean it if necessary before beginning work.

3.23 Parking the machine



WARNING

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

Can cause serious injury or death.

- Press the boom and the stabilizer blade against the ground.
- Park the machine on level ground
- Secure the tracks accordingly (for example chocks)

- ☞ Stop the machine.
- ☞ Press the bucket and the stabilizer blade against the ground.
- ☞ Reduce engine speed completely.
- ☞ Disengage the starter.
- ☞ Raise the control lever base.

NOTICE

Never stop the engine under full load, otherwise it can be damaged due to overheating. Except in case of an emergency, always ensure that the engine can cool down before it is stopped.

- Let the engine run at idling speed with no load for at least 5 minutes before you switch it off.

**Information!**

Secure the machine against unauthorized operation.

- Remove the starting key.
- Lock the cabin.

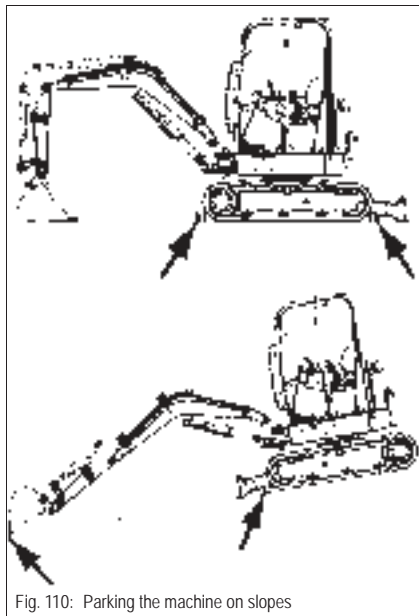
Parking the machine on slopes

Fig. 110: Parking the machine on slopes

- ☞ Avoid stopping the machine abruptly. Always ensure that there is enough space for stopping the machine.
- Park the machine on level ground with sufficient bearing capacity. Never park on slopes. If you cannot avoid parking the machine on a slope:
 - ☞ Place chocks under the tracks and lower the attachment *into* the ground to prevent the machine from moving.
- Serious accidents may be caused by unintentionally actuating the control levers, and hence moving the attachment or the entire machine.
 - ☞ Always raise the control lever base before leaving the seat.
- ☞ Place the stabilizer blade downhill and press it against the ground.

**DANGER****Crushing hazard due to unintentional actuation!**

Can cause serious injury or death.

- Always raise the control lever base before leaving the seat.
-

3.24 Light system

Working lights

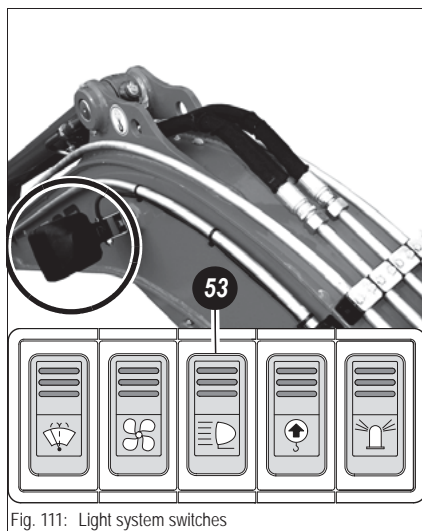


Fig. 111: Light system switches

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

Boom light

ON	Press switch 53 down	Indicator light in switch 53 illuminates
OFF	Press switch 53 up	Indicator light in switch 53 goes out



Information!

The symbol can vary depending on version – see *Switch panel (right)* on page 3-6

Roof lights (option)

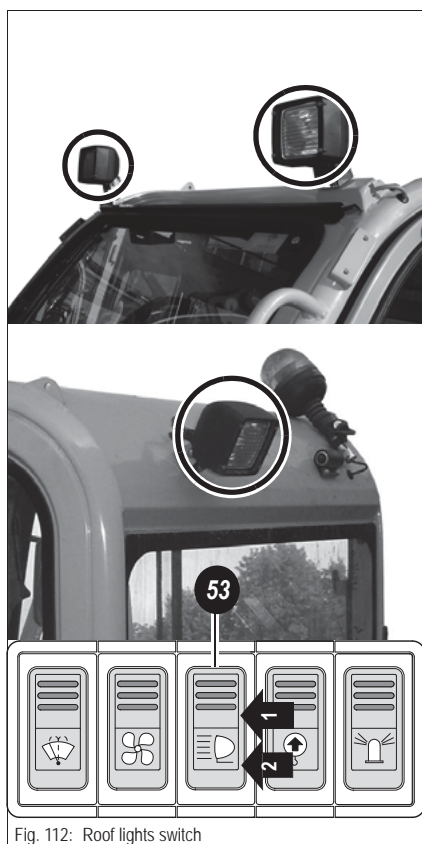


Fig. 112: Roof lights switch



WARNING

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

Can cause serious injury or death.

- Do not switch on the working lights during machine travel on public roads. During machine operation, only switch the working lights on when no one can be blinded by it!

Roof lights

ON	Press switch 53 to the 1st position	Indicator light in switch illuminates
	Press switch 53 to the 2nd position	
OFF	Press switch 53 up	Indicator light in switch goes out

The working light illuminates in the first position, the roof lights illuminate, too, in the second position.



Information!

The symbol can vary depending on version – see *Switch panel (right)* on page 3-6

Interior light



Fig. 113: Switch for interior light

Interior light

ON	☞ Press the switch to the left
OFF	☞ Move switch to center position

Rotating beacon (option)

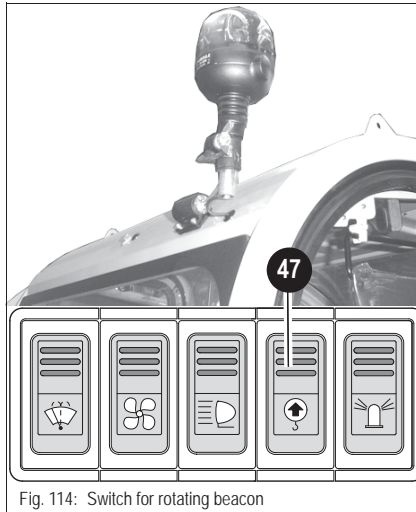


Fig. 114: Switch for rotating beacon

Rotating beacon (option)

ON	☞ Press switch 47 down	☞ Indicator light in switch 47 illuminates
OFF	☞ Press switch 47 up	☞ Indicator light in switch 47 goes out



Information!

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

Travel signal (option)

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



DANGER

Accident hazard during forward/backward machine travel.

Serious crushing hazard causing death or serious injury.

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

Socket

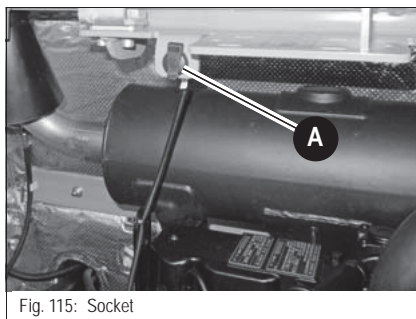


Fig. 115: Socket

A 12 V socket (A) is located under the engine cover.

3.25 Protective structures

Definition of the term “Protective Structure”

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

Mechanical integrity



DANGER

Accident hazard due to modified cabin and protective structures!

Incorrect work on the cabin and protective structures causes serious injury or death.

- ☞ No drilling, cutting or grinding on the cabin and protective structures.
- ☞ Welding, straightening or bending work on the cabin and protective structures is prohibited.
- ☞ Have a damaged cabin or protective structure immediately replaced.



DANGER

Accident hazard during machine travel without cabin/canopy!

Performing machine travel without cabin/canopy causes serious injury or death.

Performing machine travel with a removed cabin/canopy is only allowed for performing machine travel over very short distances.

- Fastening the seat belt is prohibited.
- Do not perform any work without a cabin/canopy.
- Obtain the approval of the appropriate national and regional authority.
- Machine travel is only allowed on level ground.
- Avoid tipping movements of the machine under all circumstances.
- Machine travel in areas involving a risk of falling objects is prohibited.

Check the cabin/canopy/rollbar and all protective structures once a day for damage.
Do not re-use self-locking fasteners.



Definition of FOPS/Front Guard levels

Level I:

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

Level II:

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

Responsibility for machine equipped with protective structures

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

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

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

Option starting cabin no. 78626



DANGER

Crushing hazard! Falling objects.

Causes serious injury or death.

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



Information!

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

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

Assembly

- 1 Stop and park the machine. Stop the engine.
- 2 A minimum 2 persons are required for installing/removing.



Fig. 116: Protective FOPS structure category I (symbolic representation)

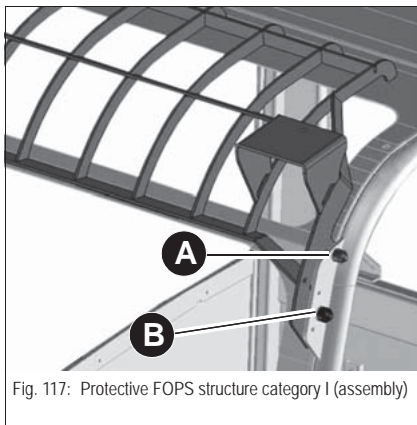




Fig. 117: Protective FOPS structure category I (assembly)

- 3 Tighten screws **A** (M10) and lock nuts on the left and right to 45 Nm (33 ft.lbs.).
- 4 Tighten screws **B** (M12) and lock nuts on the left and right to 87 Nm (64 ft.lbs.).

Protective FOPS structure/canopy – category I (option)

**DANGER****Crushing hazard! Falling objects.**

Causes serious injury or death.

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

**Information!**

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

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

**Information!**

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

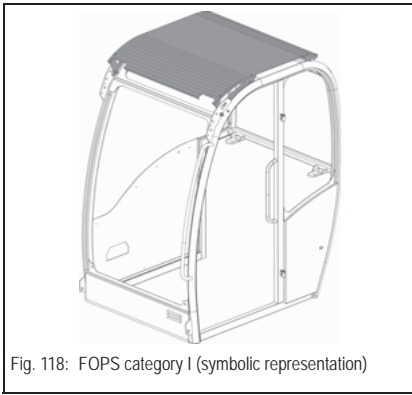


Fig. 118: FOPS category I (symbolic representation)

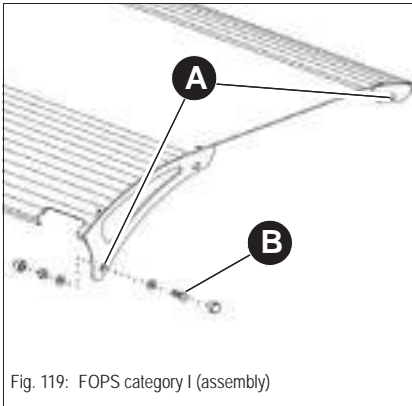


Fig. 119: FOPS category I (assembly)

- 1 Stop and park the machine. Stop the engine.
- 2 A minimum 2 persons are required for installing/removing.
- 3 Front and rear fastening points **A**.
- 4 Tighten screws **B** and lock nuts on the left and right to 45 Nm (33 ft.lbs).

Protective Front Guard structure category I (option)

Option starting cabin no. 78626



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, etc.*
- ☞ *Machine operation is prohibited without a protective Front Guard structure.*



Information!

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

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

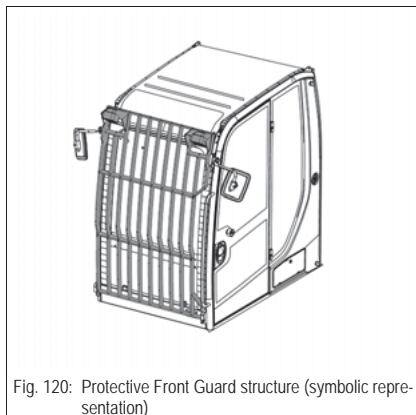


Fig. 120: Protective Front Guard structure (symbolic representation)

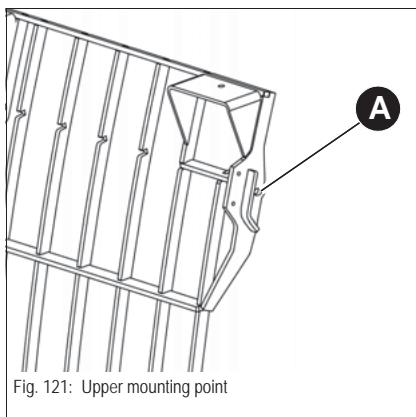


Fig. 121: Upper mounting point

- 1 Stop and park the machine. Stop the engine.
- 2 A minimum 2 persons are required for installing/removing.
- 3 Mounting point **A** (upper).

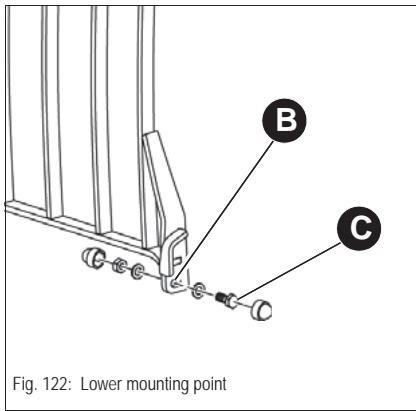


Fig. 122: Lower mounting point

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

Shatter protection (option)**DANGER****Danger of piercing/penetration by objects from the front!**

Causes serious injury or death.

- A shatter protection must be installed on a canopy version if an attachment (for example a hammer) causes fragments to fly around. This shatter protection takes over the function of a front window. If the machine is equipped with a cabin, the front window must be closed during hammer operation.
- Pay attention to the restricted work range (see fig. 117 and 118).
- Machine operation is prohibited without a shatter protection.

**DANGER****Accident hazard in conditions of restricted visibility due to rain, snow-fall, dust, etc.!**

Causes serious injury or death.

Stop machine operation immediately.

**Information!**

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

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

**Information!**

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

**Information!**

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

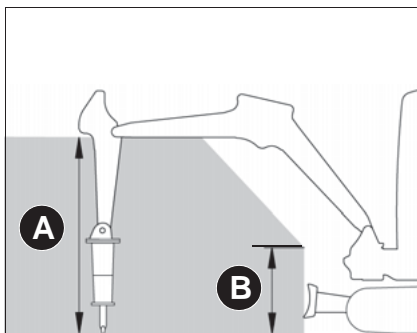


Fig. 123: Job site with shatter protection (symbolic representation)

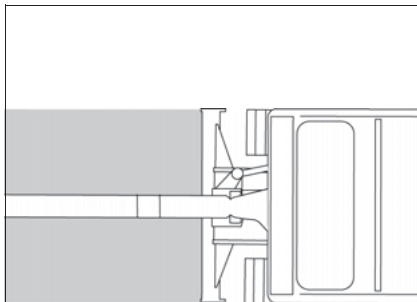


Fig. 124: Job site with shatter protection (top view/symbolic representation)

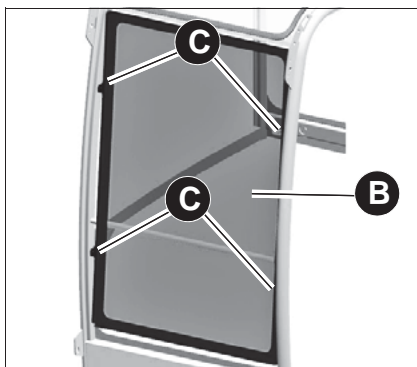


Fig. 125: Installing the shatter protection (symbolic representation)

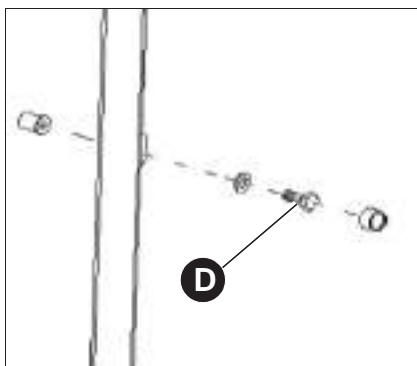


Fig. 126: Installing the shatter protection (detailed view)

Job site with shatter protection

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

Figures 123 and 124 refer to work with a Wacker Neuson hydraulic hammer.



Information!

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

Assembly

- 1 Stop and park the machine. Stop the engine.
- 2 Install/remove shatter protection **B** from the front and fasten/remove it at the fastening points **C** with the fastening material supplied.
- 3 Tighten screws **D** at fastening points **C** to 25 Nm (18 ft.lbs).

3.26 Emergency exits

You can enter and exit the cabin through the front or rear window in an emergency.



WARNING

Injury hazard when leaving the cabin in an emergency!

The machine has no footholds or handles at the front or rear for a safe exit. Therefore injury may arise when exiting in an emergency.

☞ *Exit the machine through the front or rear window only in an absolute emergency.*

Emergency exit for cabin equipped with protective Front Guard structure

The rear window can be smashed and used as an exit in an emergency.



WARNING

Injury hazard due to glass splinters!

Injury hazard due to glass splinters when smashing the window with the emergency hammer.

☞ *Only smash windows in an absolute emergency.*

☞ *Protect your face and eyes from the glass splinters flying around.*

☞ *Remove the glass splinters before leaving the cabin.*



WARNING

Injury hazard when leaving the cabin in an emergency!

The machine has no footholds or handles at the rear for a safe exit. Therefore injury may arise when exiting in an emergency.

☞ *Exit the machine through the rear window only in an absolute emergency.*

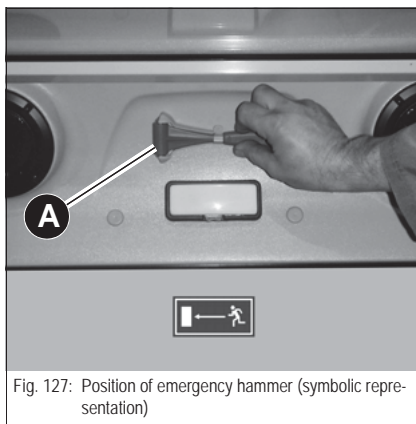


Fig. 127: Position of emergency hammer (symbolic representation)

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

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

3.27 Cabin heating and ventilation

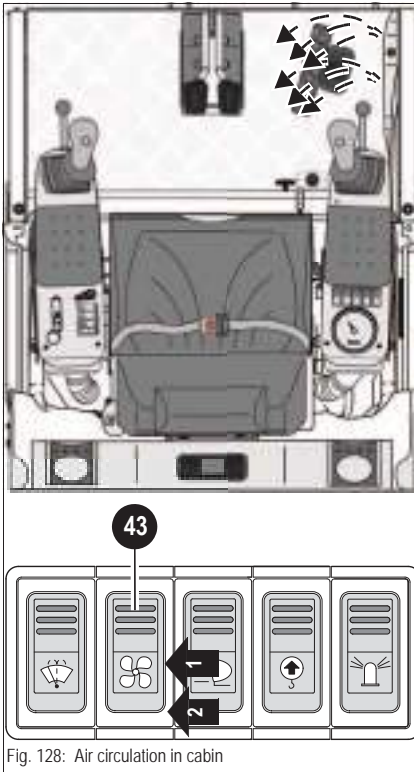


Fig. 128: Air circulation in cabin



Information!

The cabin is fitted with three air nozzles. Each nozzle can be closed and directed separately. In order to achieve best results for defrosting the front window, open both front right nozzles and the leg room nozzle.

- Direct the nozzles to the front window
- Open or close the nozzles as required to vent or heat the cabin.
- Do not place flammable or explosive material or objects near the nozzles.
- Air the cabin from time to time

Ventilation (fresh air)

1st speed	☞ Press switch 43 down one step	☞ Low fan speed
2nd speed	☞ Press switch 43 down two steps	☞ High fan speed
OFF	☞ Press switch 43 all the way up	☞ Fan OFF

3.28 Summer/winter operation



WARNING

Injury hazard due to rotating parts!

Can cause serious injury or death.

- Stop the engine
- Open the engine cover only if the engine is at a standstill

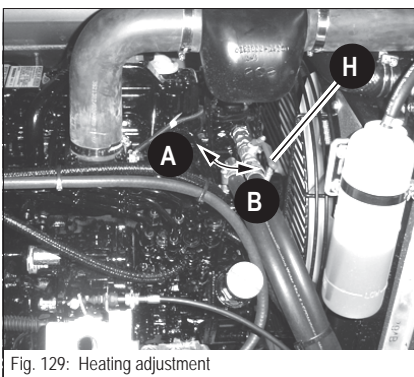


Fig. 129: Heating adjustment

Adjust cabin temperature as follows:

Position	Function	
A	Summer operation	Cooling
B	Winter operation	Heating water circuit open

- ☞ Open the engine compartment
- ☞ Turn ball-type cock **H** as described, to summer or winter operation
- ☞ Close the engine compartment
– see chapter 3.35 Engine cover on page 3-58



Information!

Summer and winter operation does not depend on the season, adjust according to your personal requirements.

3.29 Washer system

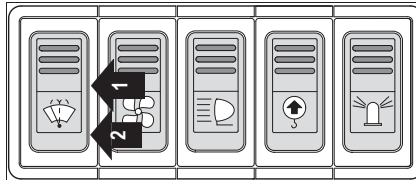


Fig. 130: Front wiper switch

Front window wiper		
On	Press switch 46 down	➔ Front wiper is on
Off	Press switch 46 up	➔ Front wiper returns to base position
1st speed	Press switch 46 to the 1st position (down)	➔ Front wiper is on
2nd speed	Press switch 46 to the 2nd position (down)	➔ Pump sprays washer water on the window



Information!

Do not actuate the washer system with the front window folded up. Do not actuate the washer system if the reservoir is empty, otherwise this can damage the electric pump.

Washer system reservoir

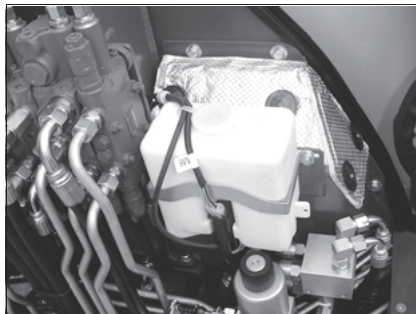


Fig. 131: Washer system reservoir

The tank's filler inlet is located in the engine compartment.



Information!

Add only clean faucet water!

Add a suitable cleaning agent if required.

In winter: add antifreeze for washer systems to the water.

Refer to the antifreeze instructions for further information on concentrations. The rubber diaphragm in the non-return valve in the housing conglutinates **if stored in a dry condition over a longer period of time**. In order to restore this valve's function, moisten this non-return valve, dip it briefly in water and then blow air through it.

3.30 Seat adjustment

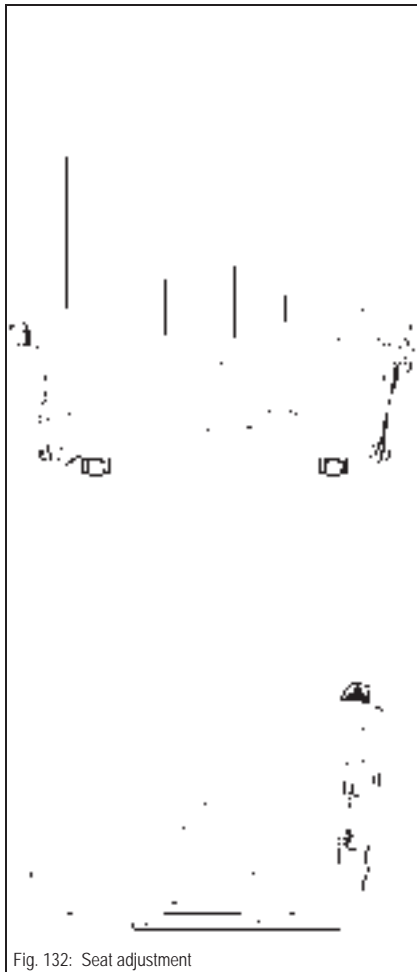


Fig. 132: Seat adjustment



WARNING

Accident hazard when adjusting the operator seat during machine operation!

Can cause serious injury or death.

- Adjust the operator seat before starting machine travel – *see chapter 3.8 Before starting the engine* on page 3-22

NOTICE

Adjusting the backrest can damage the rear window and the removable part of the front window.

- Ensure that the backrest does not touch the rear window or the removable part of the front window as you adjust backrest inclination
- Select a seat position which will not damage the window panels during machine operation

Weight adjustment



Information!

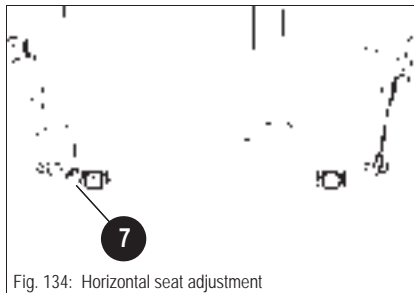
Adjust the seat suspension correctly to ensure a high level of ride comfort. Use the lever to adjust the seat suspension. Adjust the seat only without load!



Adjust the seat to the driver's weight as follows:

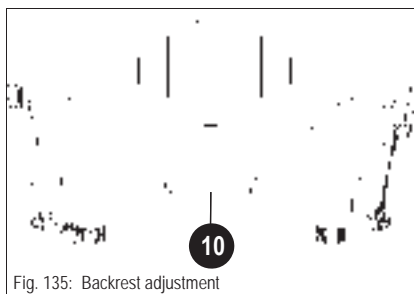
- ➔ Less spring action:
 - ☞ Press the lever down.
- ➔ More spring action:
 - ☞ Press the lever up.

Horizontal adjustment



- ☞ Sit down on the operator seat
- ☞ Pull lever 7 upward and at the same time
- ☞ Move the seat forward or backward

Backrest adjustment



- ☞ Sit down on the operator seat.
- ☞ Pull handle 10 forward and at the same time
- ☞ Lean back to push the backrest into the required position
- ☞ Release handle 10 and allow it to lock into place

3.31 Seat belt



WARNING

Injury hazard due to unfastened seat belt!

Can cause serious injury or death.

- Buckle up before starting machine travel or operation!
 - Seat belt must not be twisted!
 - Seat belt must run over the hips – not over the stomach – and must always be applied tightly!
 - Do not place the seat belt over hard, edged or fragile items (tools, rulers, glasses, pen) carried inside your clothes!
 - Never buckle up 2 persons (children!) with one seat belt!
 - Check seat belts regularly. Have damaged parts immediately replaced by a Wacker Neuson service center!
 - Always keep the seat belt clean, as coarse dirt can impair proper functioning!
 - Seat belt buckle must not be obstructed by foreign bodies (paper or similar); otherwise the buckle latch cannot lock into place!

After an accident the belt strap is stretched and no longer serviceable.
In an accident, the seat belt

Will not provide appropriate protection!

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

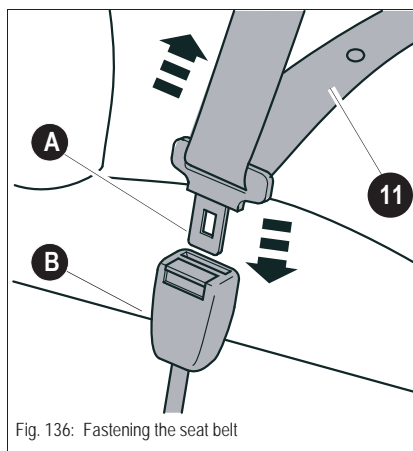


Fig. 136: Fastening the seat belt

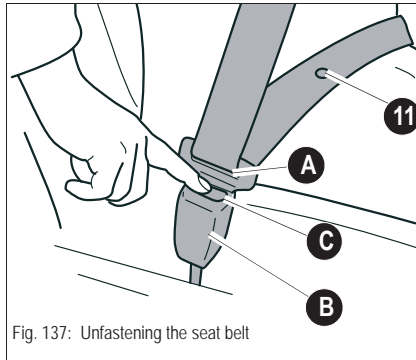
Seat belt **11** is for the operator's safety during work on construction sites and during road travel.

Fastening the seat belt:

☞ *Fasten seat belt 11 as follows before starting machine travel:*

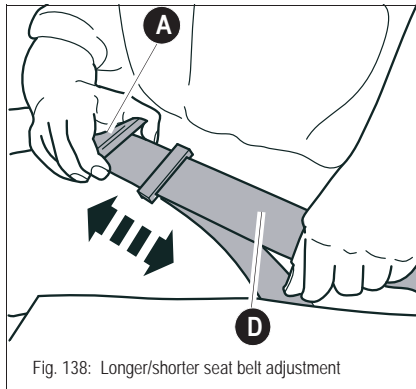
- Hold belt on buckle latch **A** and run it slowly and steadily over the hips to buckle **B**
- Insert buckle latch **A** into buckle **B** with an audible click (**pull test**)
- Tighten the seat belt by pulling at its end

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

**Unfastening the seat belt:**

☞ *Unfasten seat belt 11 as follows:*

- Hold the seat belt
- Press red switch **C** on buckle **B**
- ☞ Latch **A** is released from buckle **B** by spring pressure
- Slowly return the seat belt to the retractor

**Longer/shorter seat belt adjustment:**

☞ *Lengthen the seat belt as follows:*

- Hold buckle latch **A** at a right angle to the seat belt and pull the seat belt to the required length
- To shorten the seat belt, just pull the free end **D** of the belt

3.32 Front window

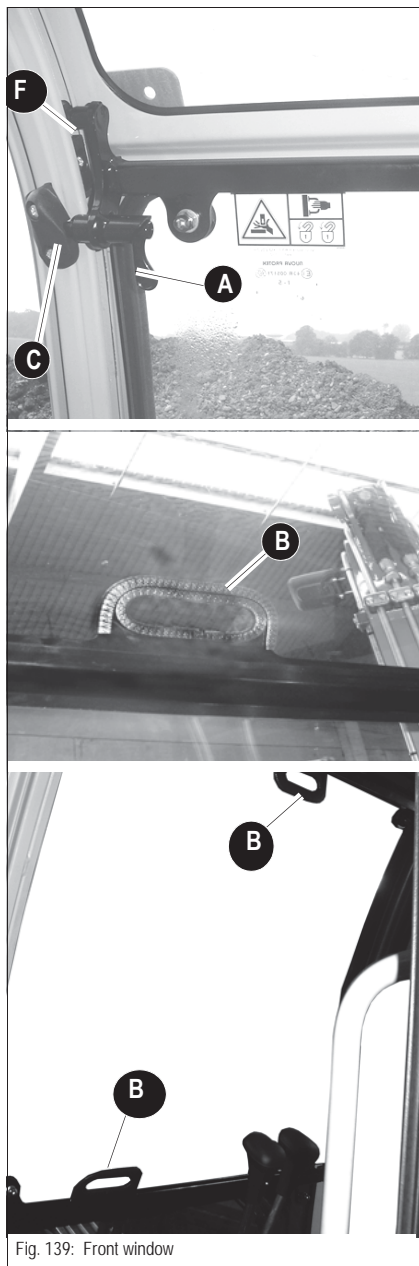


Fig. 139: Front window



WARNING

Crushing hazard when opening the front window!

Can cause serious injury or death.

- Stay clear (extremities, clothing) of the window channel.
- Take care not to hit the front window with your head as you open it!
- Always pull the front window upward with both handles **B**!
- Always let levers **A** lock into place on either side in locks **F** or **C**!



Information!

Raise the control lever base before opening or closing the front window, in order to avoid any unintentional operation or movement of the machine!

Open the front window as follows:

- The front window is fitted with handles and small levers on either side
- Push levers **A** upward on either side
- Pull the front window upward with handles **B**
 - ➔ The front window must lock into rails **C** on either side
- Lock levers **A** on either side in **C**
 - Pull levers **A** to the rear to do this
 - Check whether both levers **A** are actually locked in rails **C**

Lower the front window as follows:

- Push levers **A** forward on either side
- Pull the front window downward with handles **B**
- Lock the front window again by means of levers **A** in lock **F**
 - Pull levers **A** upward to do this
 - Check whether both levers **A** are actually locked in rails **F**

3.33 Door

**WARNING****Injury hazard due to open door or window!**

Can cause serious injury or death.

- Close the door and windows before starting machine travel

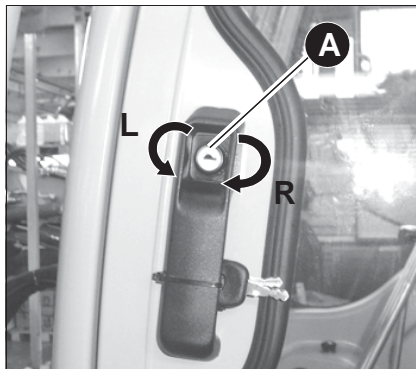


Fig. 140: Outside door opener and lock

Opening the door from the outside:

- ☞ Press door lock A

Locking the door:

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

- ☞ The door is locked

Unlocking the door:

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

- ☞ The door is unlocked

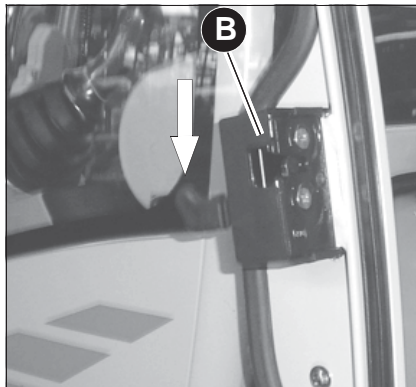


Fig. 141: Inside door opener

Opening the door from the inside:

- ☞ Press the lever on the inside left on door lock B down

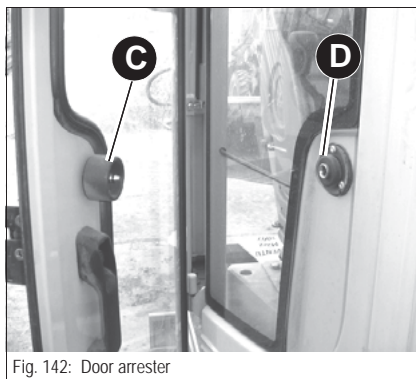


Fig. 142: Door arrester

Securing an open door:

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

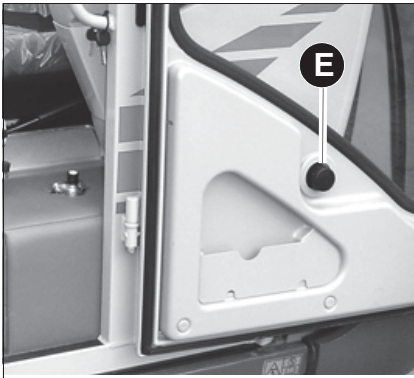


Fig. 143: Releasing the door arrester

Releasing the door opener:

Turn button **E** to the right to release the door from the arrester.

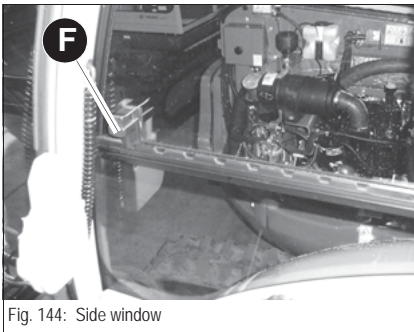


Fig. 144: Side window

Opening the side window:

▣ Press button *F* up

▣ At the same time, move the window to one of the positions marked with seven arrows.

3.34 Entry and exit

Safety instructions regarding entry and exit



WARNING

Injury hazard due to slipping when entering and exiting!

Can cause injury.

- Use the steps and handles.
- Face the machine as you enter and leave it.
- Remove all dirt, snow and ice from climbing aids (for example handles, footholds, handrails).



Information!

Do not use the handle of the control lever base for entering or exiting.

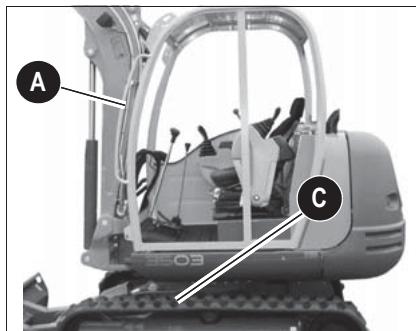


Fig. 145: Canopy

Entry and exit (canopy)

Access:

Use handle **A** on the A pillar.

Use track **C** for access.

Exit:

Park the machine – [see chapter 3.23 Parking the machine](#) on page 3-34

Use handle **A** on the A pillar.

Use track **C** to leave the cabin.

Machines up to serial no. AG04941 do not have a handle **A** on the A pillar.

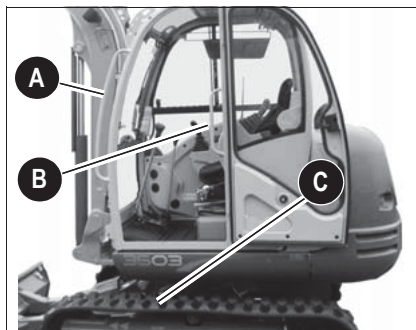


Fig. 146: Cabin

Cabin entry and exit

Access:

Use handles **A** and **B** on the A and B pillars.

Use track **C** for access.

Exit:

Park the machine – [see chapter 3.23 Parking the machine](#) on page 3-34

Use handles **A** and **B** on the A and B pillars.

Use track **C** to leave the cabin.



Information!

Enter and leave the cabin only through the door as a rule. In an emergency, the right, front or rear windows can be used as emergency exits.

3.35 Engine cover

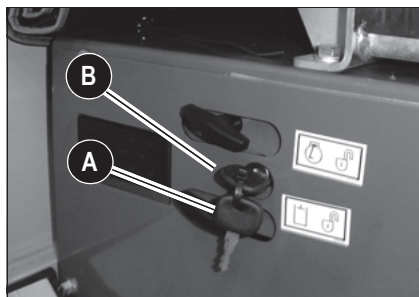


Fig. 147: Engine cover lock (on machine equipped with canopy)

Canopy

Opening:

- ☞ Unlock the lock with starting key **B**
- ☞ Pull out the lower handle **A**
- ☞ Open the engine cover upward

Closing:

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

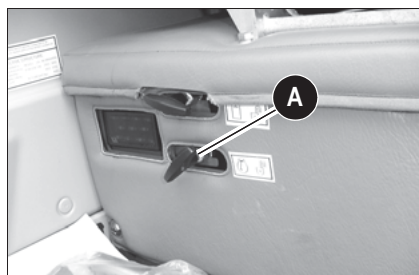


Fig. 148: Engine cover lock (on machine equipped with cabin)

Cabin (option)

Opening:

- ☞ Pull out the lower handle **A**
- ☞ Open the engine cover upward

Closing:

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

3.36 Valve compartment cover

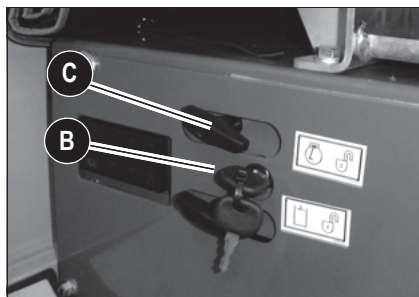


Fig. 149: Valve compartment cover lock (on machine equipped with canopy)

Canopy

Opening:

- ☞ Unlock the lock with starting key **B**
- ☞ Pull out handle **C**
- ☞ Open the valve compartment cover upward

Closing:

- ☞ Firmly close the valve compartment cover until the lock engages with an audible click

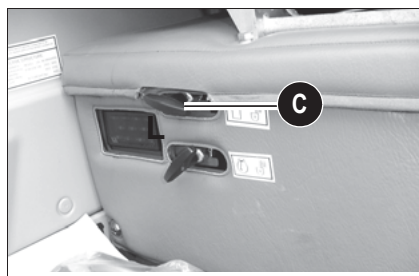


Fig. 150: Valve compartment cover lock

Cabin (option)

Opening:

- ☞ Pull out handle **C**
- ☞ Open the valve compartment cover upward

Closing:

- ☞ Firmly close the valve compartment cover until the lock engages with an audible click

3.37 Towing the machine

Important information regarding towing



DANGER

Accident hazard due to towing!

Can cause serious injury or death.

- The machine may only be towed using suitable towing equipment (towing bar or cable) in connection with suitable towing facilities, such as a towing coupling, hooks and eyes.
- Start machine travel and tow away slowly.
- Ensure that no one is between the vehicles during towing.
- Have a recovery service or a Wacker Neuson service center tow the machine away if necessary.
- See chapter "Safety, section 2.7"
- Ensure that no one is near the towing bar or cable. The lateral safety distance is equal to 1.5 times the length of the towing equipment.



Information!

Only tow the machine if absolutely necessary.

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

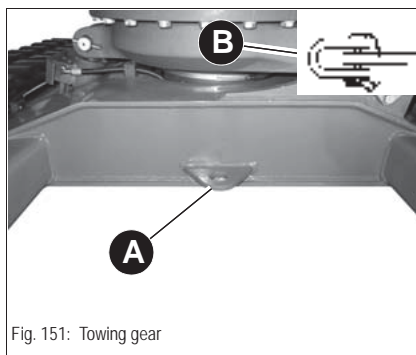


Fig. 151: Towing gear

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



Information!

The manufacturer's warranty shall not apply to accidents or damage caused by towing the machine. Using towing eye A to pull other machines or to tow equipment is prohibited.

3.38 Crane lifting the machine

Important information regarding loading



WARNING

Crushing hazard due to incorrect machine loading with a crane!

Causes serious injury or death.

- Ensure that no one is in the machine!
- All persons must stay clear of the hazard zone when raising the machine.
- See chapter "Safety, section 2.7".
- Do not lift the machine with material in the attachment.
- Ensure that the lifting gear has the required lengths **L1** and **L2**
- Set the slewing stabilizer blade (option 3503) straight.



WARNING

Injury hazard when loading and transporting!

Can cause serious injury or death.

- See chapter "Safety, section 2.7".



Information!

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



Information!

When loading and driving the machine on ramps, the engine can be damaged if the oil level is too low.

- Check the oil level before loading the machine on a truck.
- The oil level must be visible at the MAX mark.



Information!

Check the fastening screws of the cabin/canopy with a torque wrench before raising the machine – *see chapter 3.41 Removing the cabin/canopy* on page 3-63.

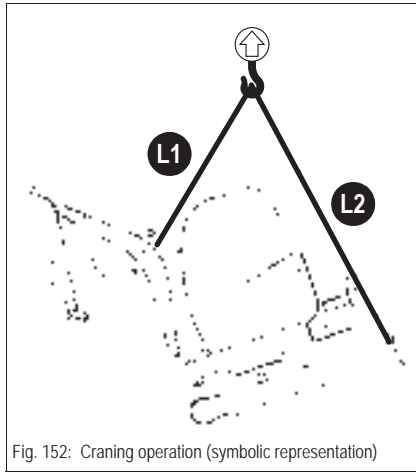


Fig. 152: Craning operation (symbolic representation)

- 1 Read and follow all instructions indicated before.
- 2 Fit an empty standard bucket and lock it safely.
- 3 Remove all dirt from the machine.
- 4 Park the machine on firm, level and horizontal ground.
- 5 Tilt in the standard bucket and lower it to transport position.
- 6 Fully raise the boom.
- 7 Pull the stick toward the machine.
- 8 Raise the stabilizer blade as far as it will go.
- 9 Set the slewing stabilizer blade (option 3503) straight.
- 10 Position the boom straight ahead at the center of the machine.
- 11 Stop the engine.
- 12 Operate the control lever repeatedly to release the pressure in the hydraulic system.
- 13 Raise the control lever base.
- 14 Remove the starting key and carry it with you.
- 15 Remove all loose objects from inside the machine.
- 16 Leave the cabin, close and lock all doors, windows and covers.
- 17 Install suitable slings at the points provided for lifting the machine.
- 18 Slowly raise the machine until there is no more contact with the ground.
- 19 Wait until the machine does not swing any more and is completely steady.
- 20 If the balance, and the condition and position of the slings is correct, slowly raise the machine to the required height and load it.

Mandatory lengths **L1** and **L2** of the lifting gear:

Excavator	Length	Dimension
2503	L1	2240 mm (88 in)
2503	L2	3670 mm (12'-0")
3503	L1	2270 mm (89 in)
3503	L2	4000 mm (13'-1")

Authorized loads	Force
Boom lifting eye	40 kN (8992 lbf)
Stabilizer blade lifting eye	40 kN (8992 lbf)

3.39 Loading and transporting the machine

Safety instructions

- The transport vehicle must be of appropriate size – refer to [Chapter 6 “Technical data”](#) for the machine’s dimensions and weights!
- Remove any mud, snow or ice from the tracks so that the machine can be safely driven onto the ramps
- Secure the machine against unintentional movement
– see [chapter 3.23 Parking the machine](#) on page 3-34!



WARNING

Accident hazard due to incorrect loading!

Can cause serious injury or death.

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

NOTICE

Engine damage due to incorrect engine oil level.

- The oil level must be visible at the MAX mark.



Information!

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

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

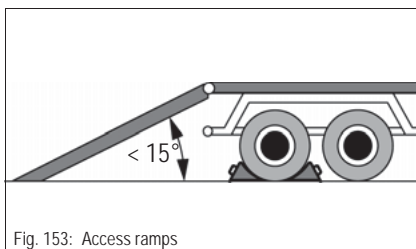


Fig. 153: Access ramps

☞ Load as follows:

- Secure the transport vehicle with chocks to prevent it from rolling.
- Place the access ramps at the smallest possible angle. Ensure that the grade does not exceed 15° (27 %). Use access ramps with an antiskid surface only.
- Ensure that the loading area is clear and access to it is not obstructed – for example by superstructures.
- Ensure that the ramps and the tracks of the excavator are free of oil, grease and ice.
- Start the engine of the excavator.
- Set the slewing stabilizer blade (option 3503) straight.
- Raise the bucket and the stabilizer blade sufficiently so that it will not touch the ramps.
- Carefully drive the excavator onto the middle of the transport vehicle.
- Lower the bucket and the stabilizer blade to the loading area.
- Stop the engine.
- Raise the control lever base.
- Remove the starting key and carry it with you.
- Do not allow anyone to stay in the cabin, and close the door and the engine cover.


Information!

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

3.40 Tying down the machine

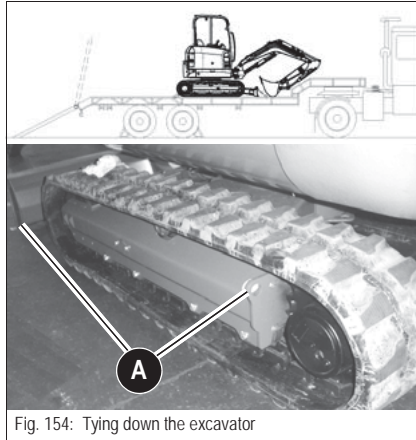


Fig. 154: Tying down the excavator


WARNING
Accident hazard due to incorrect transportation!

Can cause serious injury or death.

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


Information!

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

- Ensure that the authorized maximum height is not exceeded
- Secure the tracks of the excavator at the front, rear and at the sides.
- Lower the stabilizer blade and the boom
- Firmly tie down the excavator at the lifting eyes **A** onto the platform, with belts or chains of appropriate size
- Before transporting the machine through heavy rain: close the outlet of the exhaust silencer with a simple cap or suitable adhesive tape
- Ensure that the driver of the transport vehicle knows the overall height, width and weight of his vehicle (incl. excavator) before departure, as well as the legal transport regulations of the country or countries where transport is to take place!

3.41 Removing the cabin/canopy

Working without cabin or canopy is prohibited. Depending on the situation, machine travel over very short distances with the cabin removed is allowed (for example in case of low clearance heights) .


WARNING
Injury hazard due to removed cabin or canopy

Can cause serious injury or death.

- Fastening the seat belt is prohibited.
- Obtain the approval of the appropriate national or regional authority.
- Do not perform any work without a cabin/canopy.
- Machine travel is only allowed on level ground.
- Avoid tipping movements of the machine under all circumstances.
- Machine travel in areas involving a risk of falling objects is prohibited.

- ☞ Follow the safety instructions for assembly
– see chapter 3.39 Loading and transporting the machine on page 3-62.
- ☞ Lower the boom slightly.
- ☞ Stop the engine.
- ☞ Remove the starting key.
- ☞ Raise the control levers.
- ☞ Install the lifting gear at the points on the cabin provided for lifting the machine.
- ☞ Required lengths **L1** of the lifting gear.

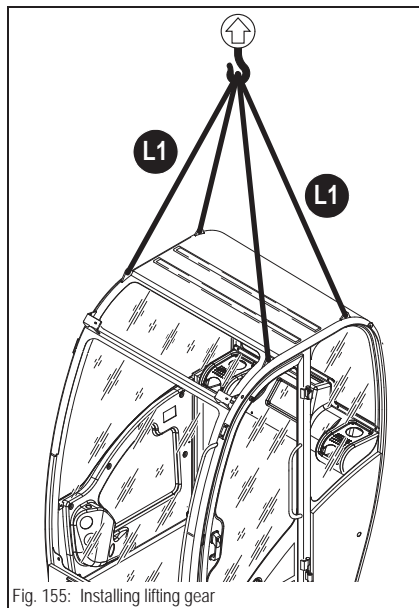


Fig. 155: Installing lifting gear

Length	Dimension
L1	1000 mm (39 in)

- ☞ Raise the cabin until the lifting gear is taut.

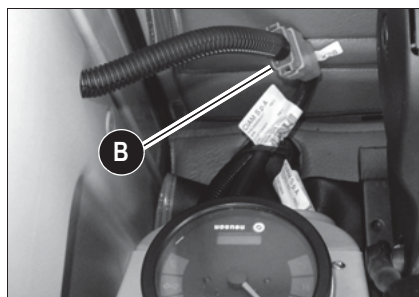


Fig. 156: Central plug

- ☞ Remove central plug **B** (X28) from the cabin wiring.
 - ➔ Central plug **B** is located at the rear right next to the seat in the cabin.

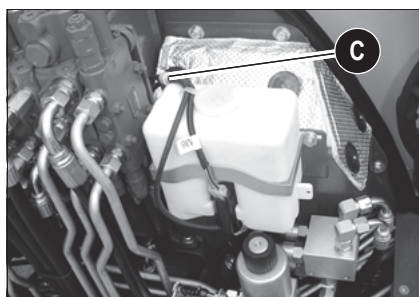


Fig. 157: Washer fluid tank hose

- ☞ Remove the hose of the washer fluid tank from non-return valve **C**.
 - ➔ Non-return valve **C** is located at the front right under the engine cover.



Information!

Removing non-return valve **C** is not necessary if the machine is equipped with a canopy. Depending on options, central plug **B** must also be removed.

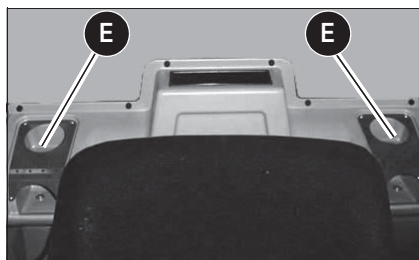


Fig. 158: Cabin attachment

- ☞ Remove both screws **E**.

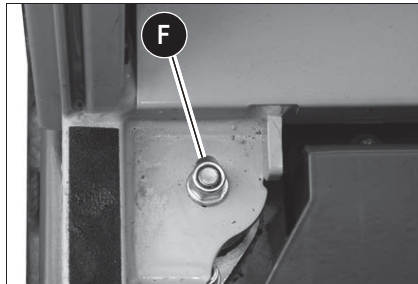


Fig. 159: Left cabin attachment

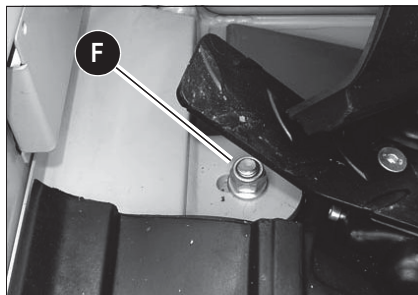


Fig. 160: Right side cabin attachment

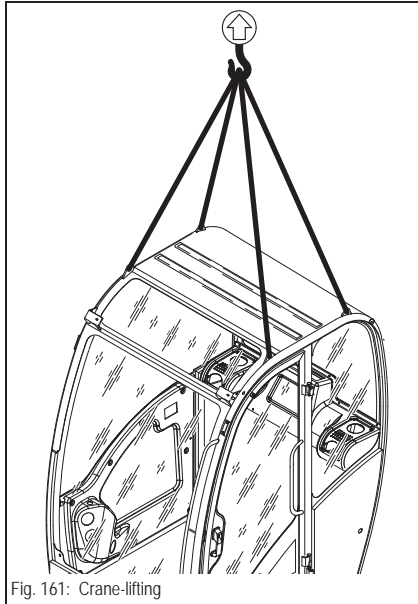


Fig. 161: Crane-lifting

- ☞ Raise the floor mat on either side.
- ☞ Remove screws **F** on either side.

Raise the machine as follows:

- ☞ Do not allow anyone to stay in the cabin, and close the doors and the engine cover.
- ☞ Slowly raise the cabin.

NOTICE

Inspect the cabin for damage as you raise it.

- ☞ Set down the cabin safely and ensure that it cannot tip over.

3.42 Installing the cabin/canopy

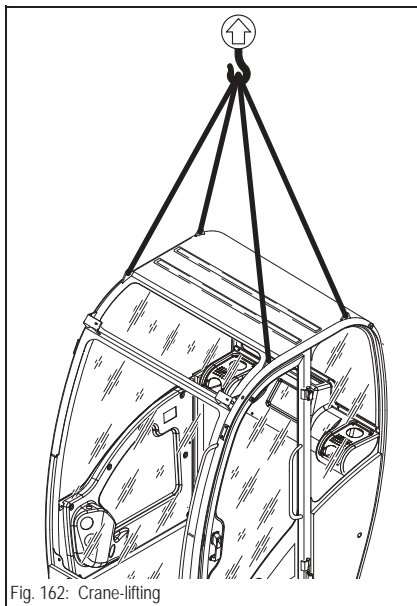


Fig. 162: Crane-lifting

☞ Install the cabin carefully

NOTICE

Inspect the cabin for damage as you install it.

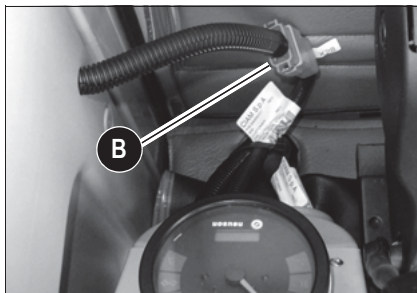


Fig. 163: Central plug

☞ Connect central plug **B** (X28) with the cabin wiring.

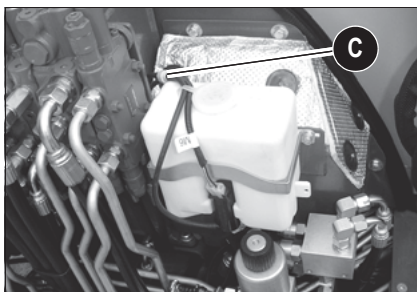


Fig. 164: Washer fluid tank hose

☞ Connect the hose of the washer fluid tank with non-return valve **C**.



Information!

Installing non-return valve **C** is not necessary if the machine is equipped with a canopy.

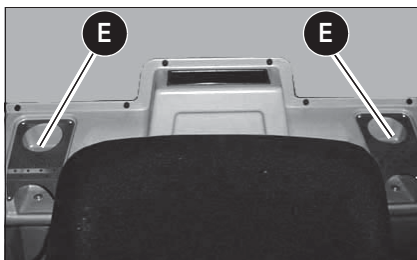


Fig. 165: Cabin attachment

☞ Tighten both screws **E** to 87 Nm (64 ft.lbs).

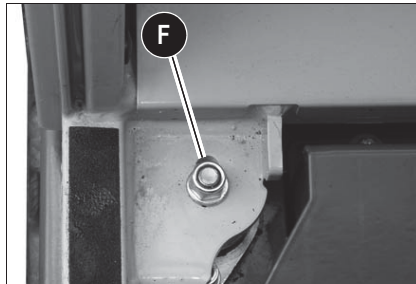


Fig. 166: Left cabin attachment

- ☞ Raise the floor mat on either side.
- ☞ Tighten screws **F** to 87 Nm (64 ft.lbs).
- ☞ Put the floor mat back in place on either side.

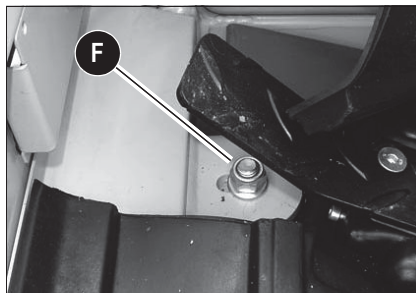


Fig. 167: Right side cabin attachment

3.43 Machine operation

General safety instructions

- Never drive up to the edge of a pit from outside – risk of cave-in!
- Never undermine the foundations of walls – danger of collapse!
- Do not dig under projecting ground. Stones or the projecting earth can fall onto the machine.
- Do not excavate deeply under the front side of the machine. The ground under the machine could collapse and cause it to tip over.
- In order to leave the cabin more easily under especially difficult circumstances, position the tracks perpendicularly to the roadside or to the uphill slope with the drive pinion behind the driver.
- When working on roofs or similar structures, check the resistance and the structure itself before starting work. The building can collapse, causing serious injury and damage.
- In general the machine is more liable to tilt if the attachment is positioned laterally than if it is positioned at the front or rear of the machine.
- Do not raise the bucket over the heads of other workers or over the driver seats of trucks or of other means of transport. The material can tip over, or the bucket can knock against the truck and cause serious injury or damage.
- Operation of the machine by unauthorized personnel is prohibited!
- Look out for high-voltage cables, underground cables, gas and water pipes during excavation work!
- The hydraulic system of the machine is still pressurized even when the engine is not running! Release the pressure in the sections of the system and hydraulic lines that are to be opened before starting setup or repair work, for example fitting/removing an attachment with hydraulic functions
 - *see Lowering the boom with the engine stopped on page 3-76*

3.44 Wacker Neuson Vario (option)



WARNING

Accident hazard in case of incorrect operation!

Can cause serious injury or death.

- Support the machine with the excavator arm when using the Vario feature.

Using the Wacker Neuson Vario feature

The following steps must be followed under all circumstances when changing the eccentric position

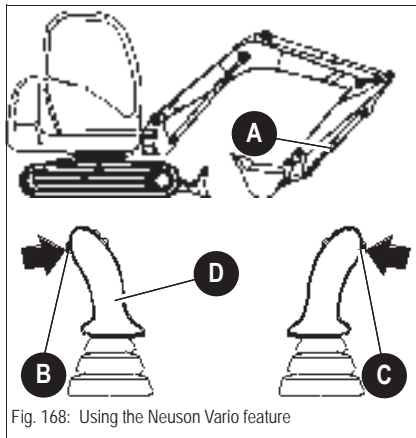


Fig. 168: Using the Neuson Vario feature

- ☞ Excavator arm **A** must be lowered to the ground.
- ☞ To unlock the Wacker Neuson Vario feature, press and hold both front switches on the joystick on the left **B** and right **C**.
 - ☞ Press and hold both buttons **B** and **C** about 5 seconds without moving the joysticks to unlock.

The Wacker Neuson Vario feature has four lock positions at offset positions of 90° each (0°/360°, 90°, 180°, 270°).

- ☞ Press the joystick on the left **D** to the left or right for a 90° rotation, press and hold buttons **B** and **C** as you do so.
 - ☞ Both buttons **B** and **C** can be released once the excavator moves.
 - ➔ The Wacker Neuson Vario feature automatically engages after a 90° rotation.
- ☞ If repositioning beyond 90° is required with the Wacker Neuson Vario feature, press buttons **B** and **C** beyond the 90° lock position.
 - ➔ As soon as buttons **B** and **C** are released, the Wacker Neuson Vario feature engages in the next possible lock position.



Information!

Always check whether the lock position is engaged!

Driving across slopes with the Wacker Neuson Vario feature



WARNING

Crushing hazard due to machine tipping over!

Can cause serious injury or death.

- Only select the eccentric position shown in [Fig. 169](#).

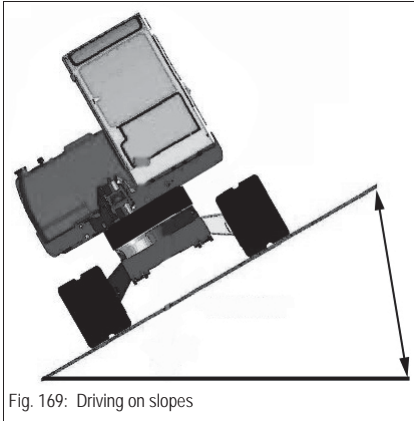


Fig. 169: Driving on slopes

For increased stability for driving across slopes, position the excavator with respect to the slope as shown in [Fig. 169](#).

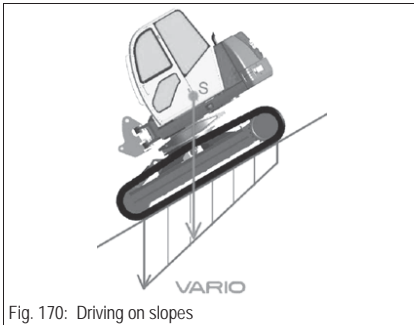


Fig. 170: Driving on slopes

For improved driving features on slopes, reposition the center of gravity toward the slope with the Wacker Neuson Vario feature.

Danger zone of the Wacker Neuson Vario feature



WARNING

Crushing hazard in the danger zone of the Vario feature!

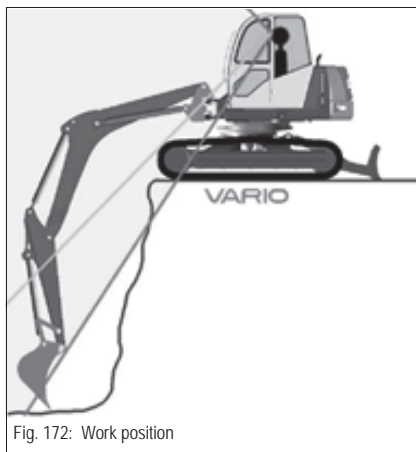
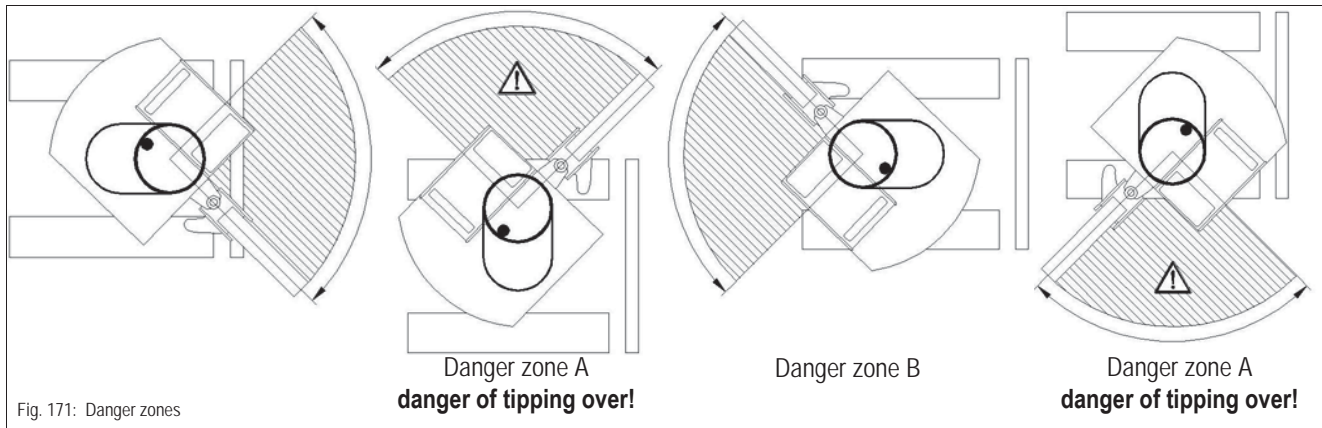
Can cause serious injury or death.

- Do not allow anyone to stay in the danger zone – see [Fig. 171](#)

Depending on the position of the Vario feature, stability is higher or lower with respect to a standard excavator. Observe the lift capacity table and the danger zones shown in [Fig. 171](#).

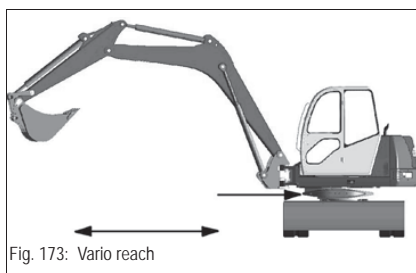
Danger zones:

A	B
Crosswise excavation	Lengthwise excavation
Reduced stability	Upper carriage not in proper range with respect to Vario feature, no modification of stability (hydraulically limited)



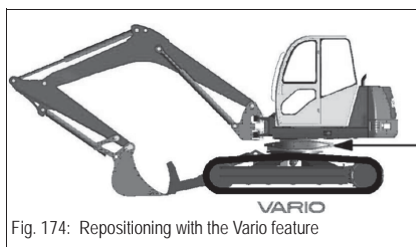
Working with the Wacker Neuson Vario feature

The upper carriage can be rotated to the side with the stabilizer blade for excavating pits. This ensures increased stability when excavating on the side opposite the stabilizer blade, with perfect visibility of the pit.



Improved reach with the Wacker Neuson Vario feature

Reach can be improved with the Wacker Neuson Vario feature.



The bucket can be moved up to the stabilizer blade by repositioning the upper carriage to the side opposite the blade.

3.45 Control levers/ISO controls: overview



Information!

Fast actuation of the control lever for the attachment moves the attachment fast. Slow actuation of the control lever moves the attachment slowly.

Control lever on the left

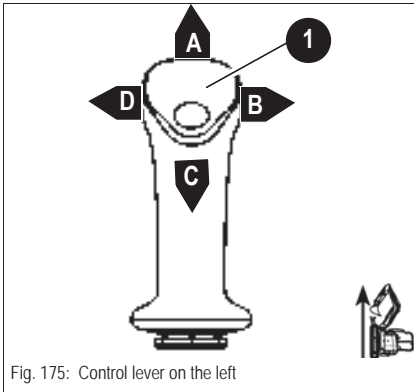


Fig. 175: Control lever on the left

Position	Lever	Function
• A	➡ Forward	➡ Stick is extended
• B	➡ To the right	➡ Upper carriage rotates to the right
• C	➡ Backward	➡ Stick is retracted
• D	➡ To the left	➡ Upper carriage rotates to the left



Information!

Always perform smooth control movements.

Auxiliary hydraulics

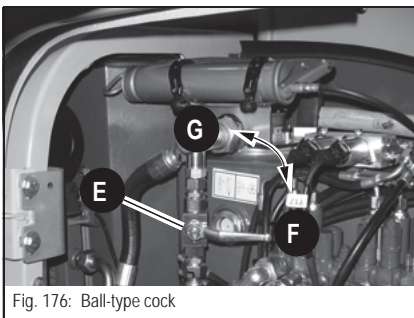


Fig. 176: Ball-type cock

NOTICE

Ball-type cock **E** (under the valve compartment cover) must be in the correct position to ensure optimal functionality.

- Turn the handle of ball-type cock **E** toward **F** when using the auxiliary hydraulics.

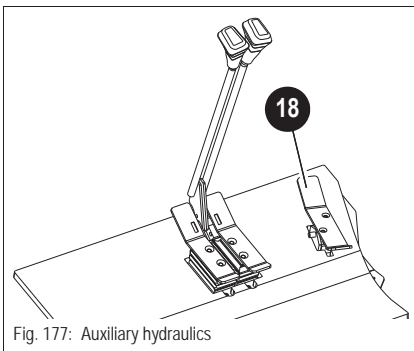


Fig. 177: Auxiliary hydraulics

Actuating the auxiliary hydraulics:

Oil flow (left):

- ➡ Press hammer pedal **18** backward.

Oil flow (right):

- ➡ Press hammer pedal **18** forward.

Boom swivel controls

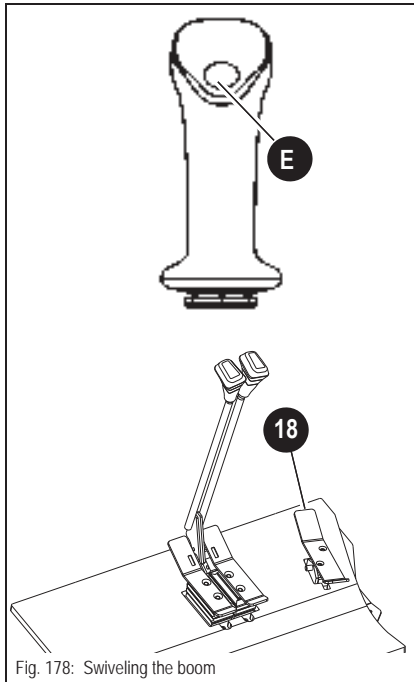


Fig. 178: Swiveling the boom

Swiveling the boom to the left:

☞ Press and hold button **E** on the control lever on the left and at the same time, press hammer pedal **18** to the rear.

Swiveling the boom to the right:

☞ Press and hold button **E** on the control lever on the left and at the same time, press hammer pedal **18** to the front.

Hammer operation (option)

Important information regarding hammer operation

Use the canopy version only with a shatter protection during hammer operation – see [chapter Shatter protection \(option\)](#) on page 3-45.

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



WARNING

Danger of piercing/penetration by objects from the front!

Can cause serious injury or death.

- During operation, all persons must stay clear of the job site of the machine.
- Do not position the machine directly underneath the workplace during demolition, otherwise debris can fall onto the machine or the building can collapse.
- Only work in the job site.
- Operate the canopy version only with a shatter protection. If the machine is equipped with a cabin (option), the front window must be closed.

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

Can cause serious injury or death.

- Do not perform any demolition work under the machine. This could cause the machine to tip over.
- The machine can lose its balance and tip over if a hammer or other heavy attachment is used.
- Never turn, lower or set down the attachment abruptly.
- Do not extend or retract the boom abruptly.
- Do not use the impact force of the attachment to perform demolition work. Broken or falling pieces can cause serious injury.
- Machine travel is prohibited during hammer operation.

**Information!**

If several sizes of hydraulic hammers are available for the machine, the following applies when the Powertilt unit is used:

- Always use the smallest possible hydraulic hammer.
- Contact your dealer for information on the correct equipment.

Working with a hydraulic hammer

NOTICE

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

- Observe the Operator's Manual of the hydraulic hammer.
 - Never use the hammer horizontally or upward.
 - Do not use the hammer to raise loads.
 - Do not hit the hammer against rocks, concrete, etc..
 - Do not hammer in the same spot uninterruptedly for more than 15 seconds.
 - Do not raise the machine with the boom.
 - Working with the cylinders or the boom fully extended is prohibited.
 - Do not swivel the Powertilt unit beyond 30° during hammer operation, otherwise the load on the boom increases enormously.
 - Stop machine operation immediately if a hydraulic hose moves back and forth in an unusual manner. The pressure accumulator could be malfunctioning. Contact a Wacker Neuson service center and have the malfunction rectified immediately.
 - Do not use the impact force of the attachment to perform demolition work. Broken or falling pieces can cause damage to the equipment.
-

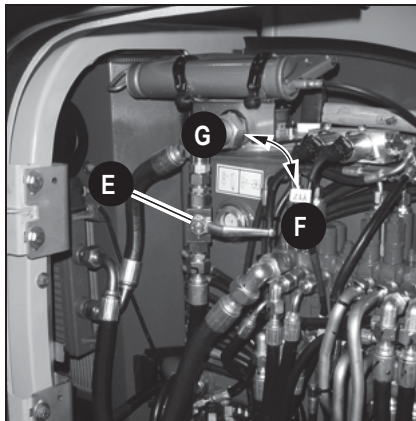


Fig. 179: Ball-type cock

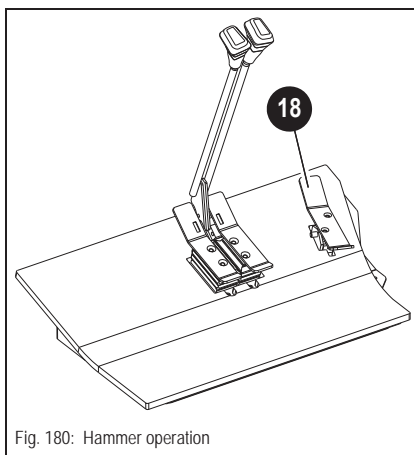


Fig. 180: Hammer operation

NOTICE

In order to ensure optimal functionality and to prevent the excavator from overheating, take the following measure:

- Turn the handle of ball-type cock **E** (under the valve compartment cover) toward **G**.
-

Switching on hammer operation:

*Press hammer pedal **18** backward.*

Control lever on the right

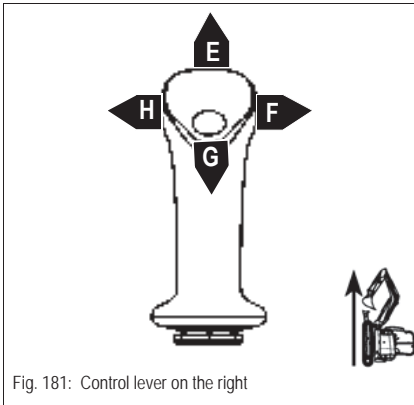


Fig. 181: Control lever on the right

Position	Lever	Function
• E	☞ Forward	☞ Boom is lowered
• F	☞ To the right	☞ Bucket is tilted out
• G	☞ Backward	☞ Boom is raised
• H	☞ To the left	☞ Tilt in the bucket

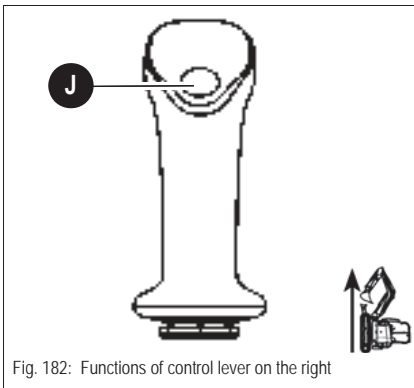


Fig. 182: Functions of control lever on the right

Button	Function
☞ J	☞ Horn

Lowering the boom with the engine stopped

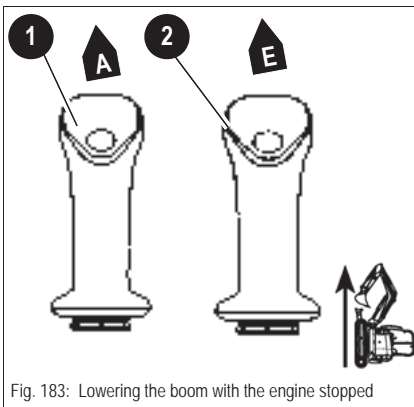


Fig. 183: Lowering the boom with the engine stopped

Lower the boom as follows:

- ☞ Ensure that no one is in the danger zone of the machine
- ☞ Turn the starting key to position "1"
- ☞ Press forward and hold the control lever (**A** and **E**)
 - ☞ Until the boom is completely lowered
- ☞ Return the control lever to neutral

3.46 Changeover valve for SAE/ISO controls (option)


WARNING
Accident hazard due to modified control lever operation!

Can cause serious injury or death.

- Check the control mode that has been selected before starting work
- Always secure wing nut **J** on the changeover lever of the directional valve

Control lever on the left

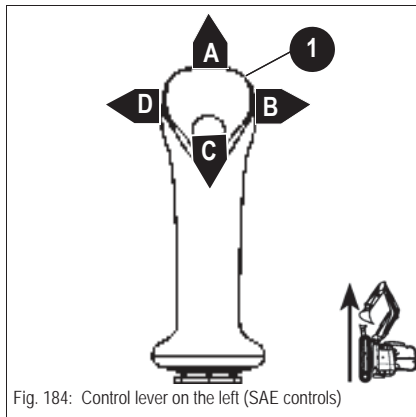


Fig. 184: Control lever on the left (SAE controls)

SAE controls

Position	Lever	Function
• A	☞ <i>Forward</i>	☞ Boom is lowered
• B	☞ <i>To the right</i>	☞ Upper carriage rotates to the right
• C	☞ <i>Backward</i>	☞ Boom is raised
• D	☞ <i>To the left</i>	☞ Upper carriage rotates to the left

Control lever on the right

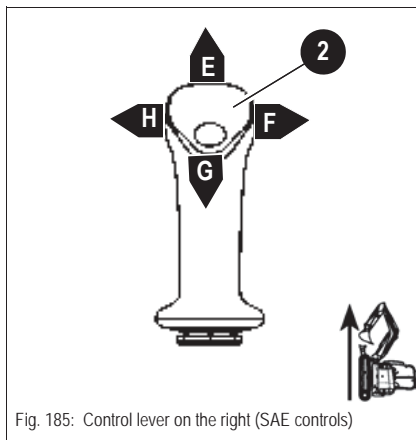


Fig. 185: Control lever on the right (SAE controls)

SAE controls

Position	Lever	Function
• E	☞ <i>Forward</i>	☞ Stick is extended
• F	☞ <i>To the right</i>	☞ Bucket is tilted out
• G	☞ <i>Backward</i>	☞ Stick is retracted
• H	☞ <i>To the left</i>	☞ Tilt in the bucket

Directional valve position

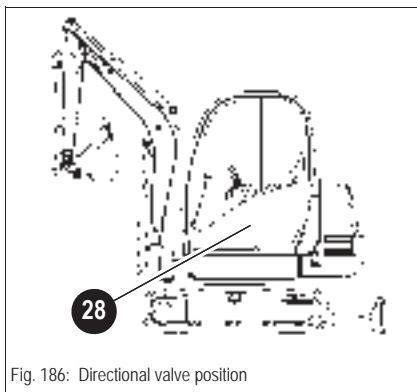


Fig. 186: Directional valve position

Directional valve **28** is located at the left behind the seat.

Directional valve

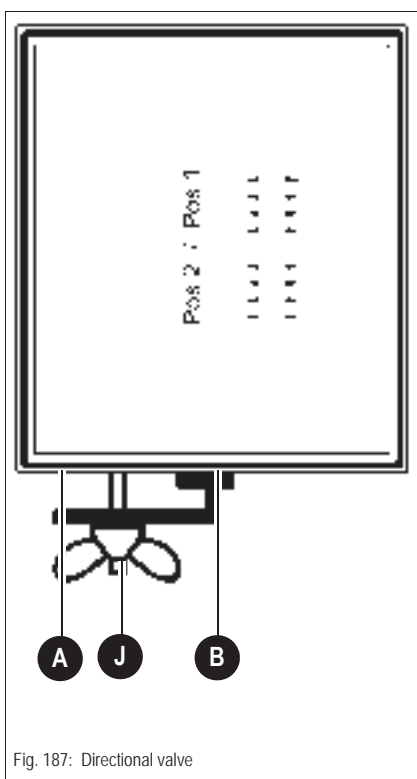


Fig. 187: Directional valve

The changeover valve switches from ISO to SAE controls and vice versa.

Position	Function
• A	➡ ISO controls
• B	➡ SAE controls

Changing over:

- ☞ Loosen the wing nut and set the valve to the required position.
- ☞ Retighten the wing nut after changing over.

NOTICE

No machine travel or operation if wing nut **J** is malfunctioning!

- Immediately contact a Wacker Neuson service center to replace a malfunctioning wing nut.

3.47 Control lever with proportional controls (option): overview



Information!

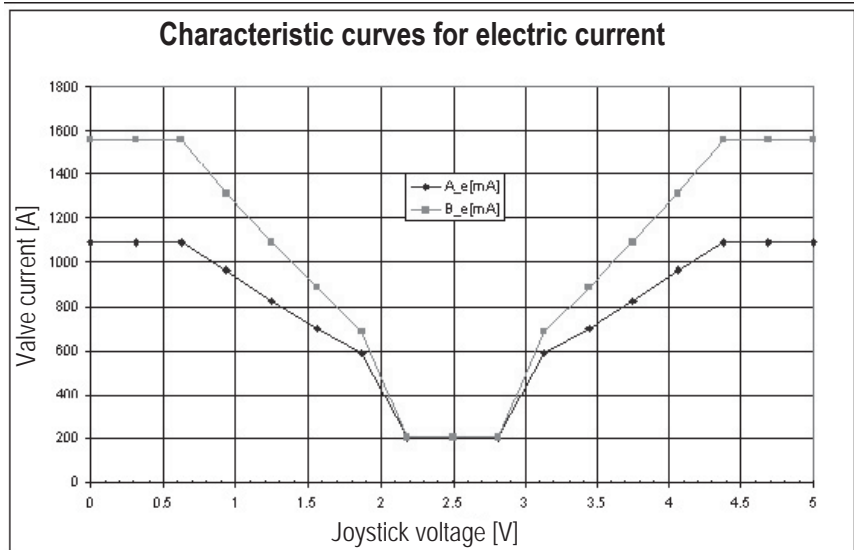
Fast actuation of the rocker switch for the attachment moves the attachment fast. Slow actuation of the control lever moves the attachment slowly.

Function

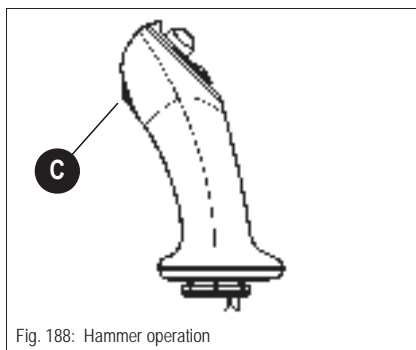
This control mode offers proportional operation of the auxiliary hydraulics circuit depending on the position of slide switch **B** on the joystick.

You can also modify the properties of the characteristic curve. Precision work, for example with the offset bucket, does not require the full throughput of the auxiliary hydraulics. Therefore we recommend setting the controls to the low characteristic curve 1 (slow movements).

The slide switch is not pressed fully in this position and you can move the machine more smoothly (flat characteristic curve).



If you require the full throughput then characteristic curve 2 will be the choice to make (slide switch pressed as far as it will go)



NOTICE

Always use button **C** on the joystick for hammer operation.

- Do not use characteristic curve 1 for hammer operation since as described above, oil throughput is not set to maximum in this case and therefore the hydraulic output is not fully available for hammer operation.

Pressing button **C** ensures full throughput irrespective of the characteristic curve that has been selected!

Measures to be taken in case of malfunctions

NOTICE

The system still works correctly if only one component breaks down. However, if more than one component breaks down, the pressure regulating valves possibly run uncontrollably!

NOTICE

System breakdowns can never be excluded, therefore:

- Disconnect the electric controls from the power supply before performing repair work or maintenance on the hydraulic system!
- Stay clear of areas with crushing hazard!
- Stay clear of areas between moving hydraulic components and fixed obstacles! Crushing hazard!
- The operator of the machine or hydraulic system must be aware of possible machine or system errors.



Information!

Proportional controls and Powertilt with proportional controls: the hammer pedal has no function.

Diagnosis display

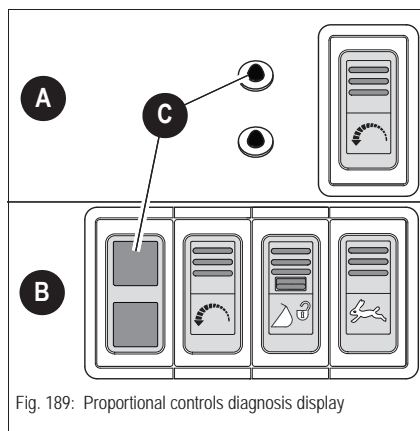


Fig. 189: Proportional controls diagnosis display

The system runs correctly if status indicator **C** of the proportional controls does not flash. If status indicator **C** flashes, contact a Wacker Neuson service center and have the malfunction rectified.

The proportional controls are switched off automatically if a critical error is detected.

A: diagnosis display up to serial no. AG02452

B: diagnosis display from serial no. AG02453

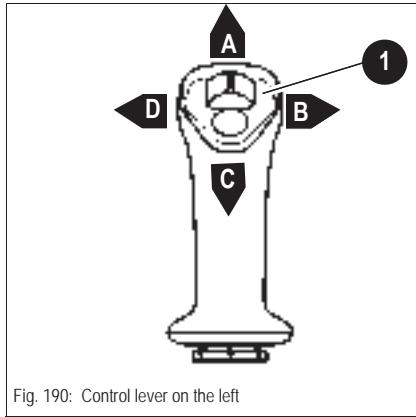
Control lever on the left


Fig. 190: Control lever on the left

Position	Lever	Function
• A	☞ <i>Forward</i>	☞ Stick is extended
• B	☞ <i>To the right</i>	☞ Upper carriage rotates to the right
• C	☞ <i>Backward</i>	☞ Stick is retracted
• D	☞ <i>To the left</i>	☞ Upper carriage rotates to the left


Information!

Always perform smooth control movements.

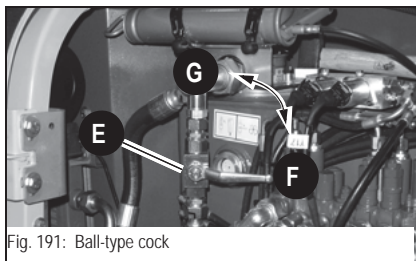
Auxiliary hydraulics (proportionally controlled)


Fig. 191: Ball-type cock

NOTICE

 Ball-type cock **E** (under the valve compartment cover) must be in the correct position to ensure optimal functionality.

- Turn the handle of ball-type cock **E** toward **F** when using the auxiliary hydraulics.

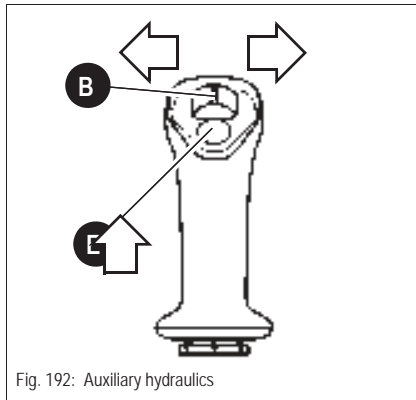


Fig. 192: Auxiliary hydraulics

Changing over to auxiliary hydraulics

 Pressing button **E** changes over between the auxiliary hydraulics and the swivel controls

Actuating the auxiliary hydraulics:
Oil flow (left):

 ☞ Move slide switch **B** to the left.

Oil flow (right):

 ☞ Move slide switch **B** to the right.

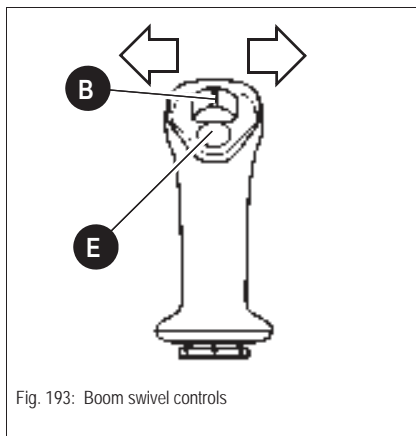
Boom swivel controls (proportionally controlled)


Fig. 193: Boom swivel controls

Changing over to swivel controls

 Pressing button **E** changes over between the auxiliary hydraulics and the swivel controls

Swiveling the boom to the left:

 ☞ Move slide switch **B** to the left.

Swiveling the boom to the right:

 ☞ Move slide switch **B** to the right.

Hammer operation (proportionally controlled)

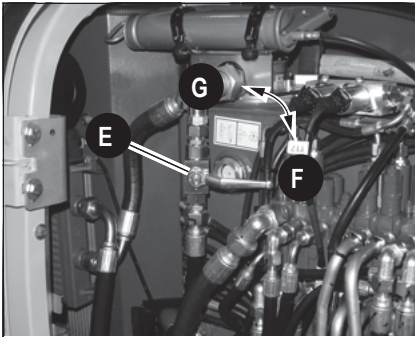


Fig. 194: Ball-type cock

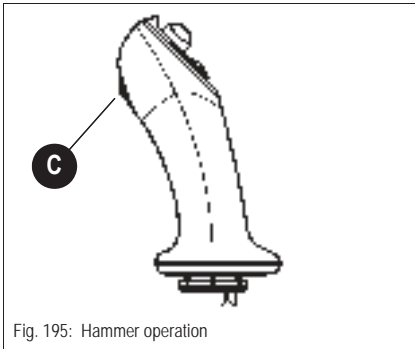


Fig. 195: Hammer operation

NOTICE

In order to ensure optimal functionality and to prevent the excavator from overheating, take the following measure:

- Turn the handle of ball-type cock **E** (under the valve compartment cover) toward **G**.

Switching on hammer operation:

- ☞ Press and hold button **C** on the control lever

Switching off hammer operation:

- ☞ Release button **C** on the control lever

Adjusting control response

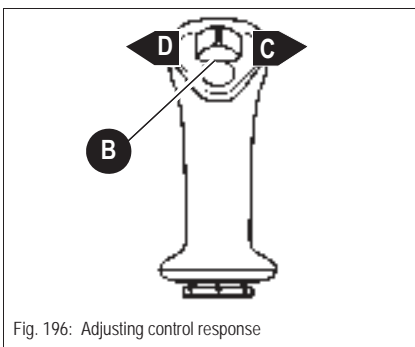


Fig. 196: Adjusting control response

Characteristic curve 1 (slow movements):

- ☞ Disengage the starter
- ☞ Then move slide switch **B** to the left **D**
- ☞ Hold slide switch **B** to the left **D** and switch on the starter at the same time
- ☞ Then release slide switch **B**
 - ➔ Indicator light **1** flashes once.

Characteristic curve 2 (fast movements – maximum throughput):

- ☞ Disengage the starter
- ☞ Then move slide switch **B** to the right **C**
- ☞ Hold slide switch **B** to the right **C** and switch on the starter at the same time
- ☞ Then release slide switch **B**
 - ➔ Indicator light **1** flashes twice

Characteristic curve status indicator

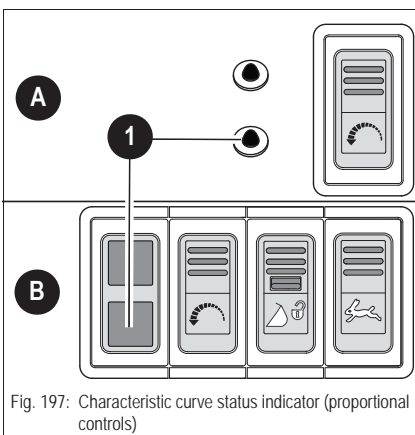


Fig. 197: Characteristic curve status indicator (proportional controls)

Displays the characteristic curve that has been selected for the control valve.

Characteristic curve 1 (slow movements):

- ☞ Indicator light **1** flashes once after engaging the starter

Characteristic curve 2 (fast movements – maximum throughput):

- ☞ Indicator light **1** flashes twice after engaging the starter



Information!

The characteristic curve that has been set last is active after the machine is started again.

A: characteristic curve status indicator up to serial no. AG02452

B: characteristic curve status indicator from serial no. AG02453

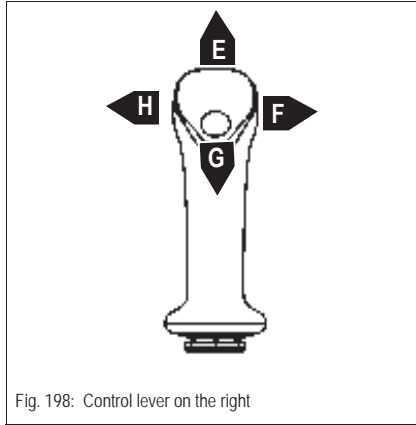
Control lever on the right


Fig. 198: Control lever on the right

Position	Lever	Function
• E	☞ Forward	☞ Boom is lowered
• F	☞ To the right	☞ Bucket is tilted out
• G	☞ Backward	☞ Boom is raised
• H	☞ To the left	☞ Tilt in the bucket

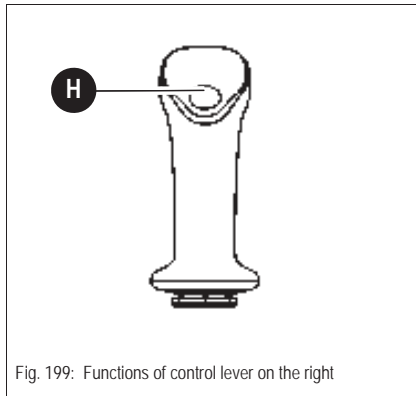


Fig. 199: Functions of control lever on the right

Button	Function
☞ H	☞ Horn

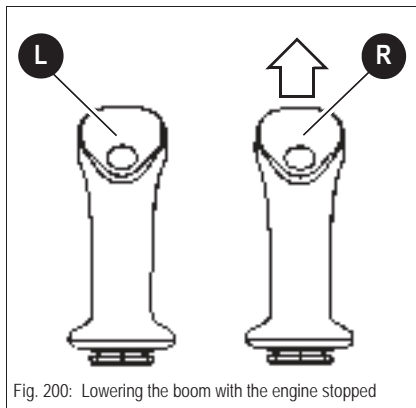
Lowering the boom with the engine stopped


Fig. 200: Lowering the boom with the engine stopped

- ☞ Ensure that no one is in the danger zone of the machine
- ☞ Turn the starting key to position 1
- ☞ Press and hold the control lever on the left (L) and right (R) forward until the boom is completely lowered.
- ☞ Return the control levers on the left (L) and right (R) to neutral position

3.48 Rotating the upper carriage

Rotating the upper carriage is described with standard ISO controls.

Specific safety instructions:

- The upper carriage can rotate a little bit further if the machine has not yet reached its operating temperature.
- Fast actuation of the control lever rotates the upper carriage fast, slow actuation of the control lever rotates the upper carriage slowly.
- If the upper carriage needs to be rotated on a slope, let the engine run at idling speed and actuate the control lever very slowly. Proceed with extreme care and avoid abrupt movements if the bucket is full.

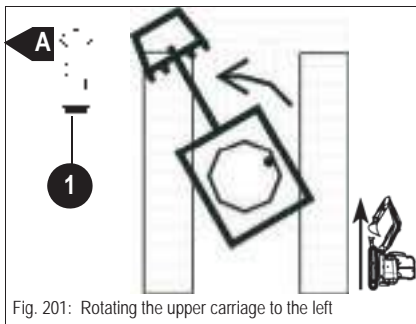


Fig. 201: Rotating the upper carriage to the left

Rotate the upper carriage to the left as follows:

- ☞ *Push the control lever on the left 1 to the left A*
 - ➔ The upper carriage rotates to the left

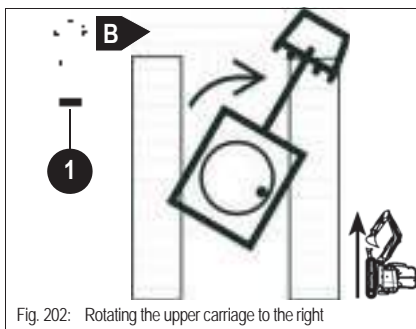


Fig. 202: Rotating the upper carriage to the right

Rotate the upper carriage to the right as follows:

- ☞ *Push the control lever on the left 1 to the right B*
 - ➔ The upper carriage rotates to the right

Swivel unit brake

Hydraulic swivel unit brake:

The upper carriage's rotation is sufficiently braked by moving control lever 1 back to initial position. Moving the control lever in the opposite direction (counteraction) brakes the upper carriage with maximum hydraulic output.

Mechanical stop brake:

A multidisk brake integrated in the rotation drive has an additional mechanical brake effect with time delay. This negative-effect brake is used as a stop brake and parking brake for the swivel unit. The upper carriage can be stopped in any position.



Information!

Do not use the brake as a service brake but only as a stop brake and parking brake for the swivel unit.

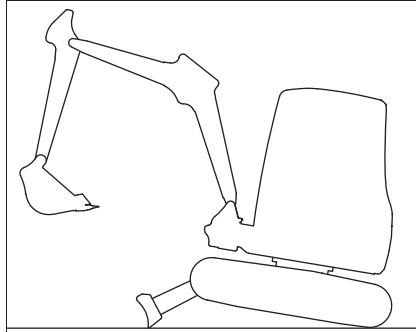
Functional check of swivel unit brake

Fig. 203: Raising the machine

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

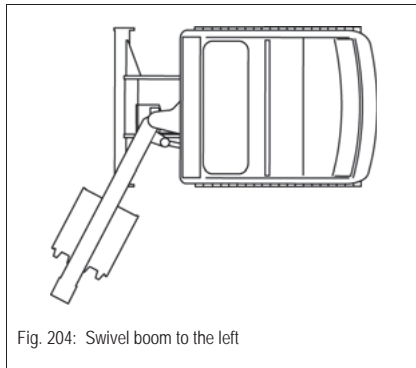


Fig. 204: Swivel boom to the left

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

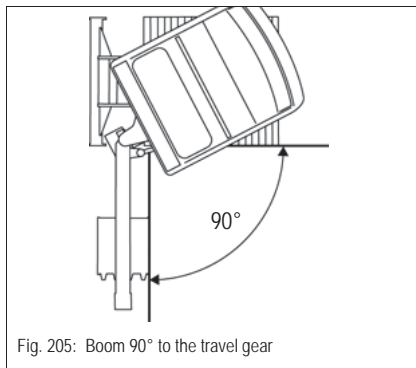


Fig. 205: Boom 90° to the travel gear

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

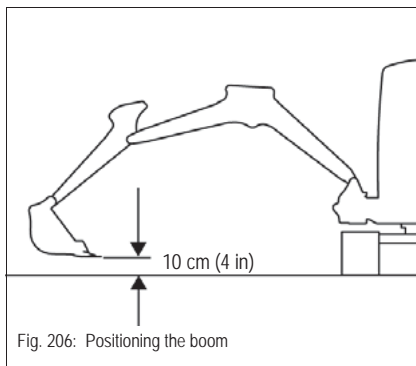
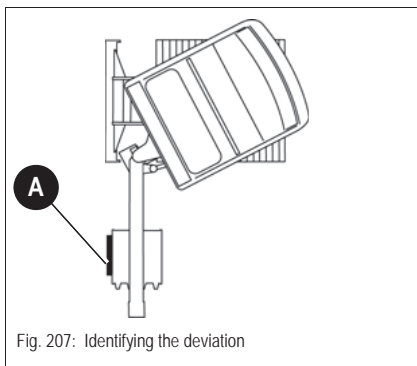


Fig. 206: Positioning the boom

- 5 Position the boom as shown in [Fig. 206](#).
- 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 piece of wood **A** against the attachment.

10 Wait one minute.

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

➔ Machine is operational.

If the attachment moves away from the piece of wood:

➔ Stop operation immediately.

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

3.49 Tilting the upper carriage (option 3503)

Vertical digging on slopes is possible by tilting the upper carriage hydraulically by 15° with the VDS.

Bear in mind the following during machine operation:



WARNING

Crushing hazard when tilting the cabin!

Can cause serious injury or death.

- All persons must stay clear of the hazard zone when tilting the cabin.

NOTICE

- Tilt the machine only on firm ground.
- Tilt the machine only if it is at a standstill and if the attachment is empty.
- All doors and covers must be closed when tilting the machine.
- Never turn, lower or set down the attachment abruptly.
- Do not extend or retract the boom abruptly. Otherwise there is danger of tipping over!
- When working in the immediate vicinity of a wall or parts of a building, ensure that the upper carriage does not touch anything when it is tilted.
- On a slope, position the machine so that the upper carriage is tilted toward the slope. Otherwise there is danger of tipping over!

– see [chapter General safety instructions](#) on page 3-68

– see [chapter 2.15 Special Hazards](#) on page 2-15

– see [chapter 3.58 Working with the excavator](#) on page 3-103

Operation (up to serial no. AG02694)

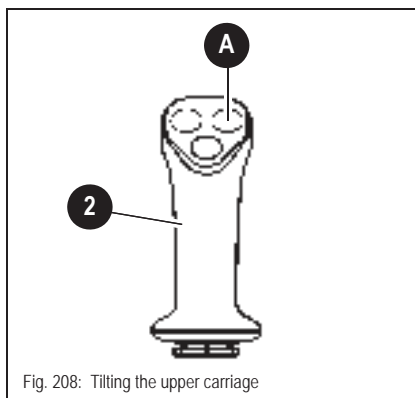


Fig. 208: Tilting the upper carriage

Tilting the upper carriage:

☞ Press and hold button **A** on control lever **2**

☞ Press control lever **2** to the right

➡ The upper carriage is tilted

☞ If the required tilt angle is reached, return control lever **2** to the neutral position and release button **A**.

Lowering the upper carriage:

☞ Press and hold button **A** on control lever **2**

☞ Press control lever **2** to the left

➡ The upper carriage is lowered

☞ If the required tilt angle is reached, return control lever **2** to the neutral position and release button **A**.

Operation (from serial no. AG02695)

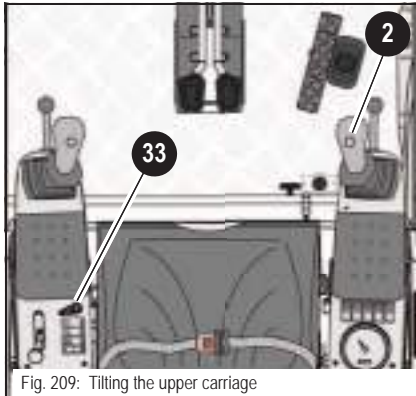


Fig. 209: Tilting the upper carriage

Tilting the upper carriage:

- ☞ Press and hold button 33
- ☞ Press control lever to the right
- ➔ The upper carriage is tilted

Lowering the upper carriage:

- ☞ Press and hold button 33
- ☞ Push control lever to the left
- ➔ The upper carriage is lowered

3.50 Releasing the pressure on the operating hydraulics

NOTICE

Before connecting or removing hydraulic lines from the attachment, ensure that the operating hydraulics is not under pressure!



Information!

The hydraulic system of the machine is still pressurized even when the engine is not running! The hydraulic quick couplers can be released, however they cannot be re-attached due to the residual pressure in the lines.

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

Releasing pressure

Release the pressure as follows:

- ☞ Park the machine on firm and level ground.
- ☞ Lower the attachment completely to the ground.
- ☞ Stop the engine.
- ☞ Turn the starting key to position "1".
- ☞ Move the control lever or the pedal of the hydraulic circuit in all directions repeatedly.
 - ➔ The pressure in the system sections that have been actuated is released. This can be seen by the brief movement the hoses make as the pressure is actually released.
 - ➔ Uncouple the attachment immediately after the pressure has been released, otherwise pressure can be created again!

Pressure release with proportional controls (option)

Release the pressure as follows:

- ☞ Park the machine on level and horizontal ground
- ☞ Lower the attachment completely to the ground!
- ☞ Stop the engine
- ☞ Turn the starting key to position "1"

- ➔ Release the load only after you have engaged the starter and waited 2 seconds (otherwise if actuated too early, the characteristic curve is shifted and the load is not released)!
 - ☞ *Release the pressure on the auxiliary hydraulics by pressing the rocker switch connected with the left or right proportional joystick to the left and right*
 - ➔ The pressure in the system sections that have been actuated is released. This can be seen by the brief movement the hoses make as the pressure is actually released.
- Uncouple the attachment immediately after the pressure has been released, otherwise pressure can be created again!

3.51 Re-equipping attachments

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

Specific safety instructions

- Driving in pins with a hammer can cause them to splinter, which can cause serious injury.
 - ☞ Always wear safety glasses, helmets, gloves and other protective equipment.
- Do not stand behind the bucket when removing pins.
 - ☞ Do not place your foot underneath the bucket.
- Pay special attention to your fingers when removing and reinserting pins.
- Never insert fingers in the bores of the pins as you align them.



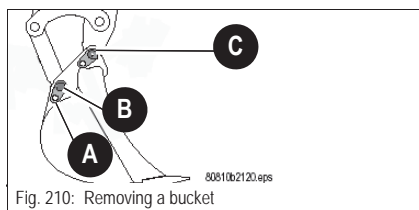
WARNING

Injury hazard when installing attachments!

Can cause serious injury or death.

- Avoid accidents and injury by following the information below:
 - Stop the engine
 - Raise the control lever base
 - Re-equip attachments only with suitable tools
 - Do not align components with your fingers or your hands but use suitable tools – crushing hazard!
 - Once you have re-equipped the attachments, or before starting work, ensure that the attachment is safely locked with the stick and the tilt rod, or with the quickhitch (option).
-

Removing a bucket



☞ *Re-equip as follows:*

- Lower the bucket to the ground with its flat side facing down
- Stop the engine
- Remove linch pin **A**
- 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:

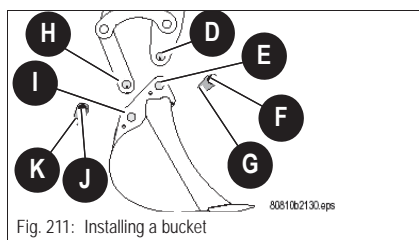
- Start the engine
- Slightly raise and lower the boom to take the load off the pin
- Stop the engine



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.

Installing a bucket



☞ *Proceed as follows:*

- Lower the bucket to the ground with its flat side facing down
- Grease the joints and the pins before inserting them
- Start the engine
- Straighten the stick so that bores **D** and **E** are flush
- Insert greased pin **F**
- Tighten lock screw **G**
- Actuate the stick cylinder until bores **H** and **I** are flush
- Insert the greased pin **J**
- Lock linch pin **K**

3.52 Mechanical quickhitch (option)

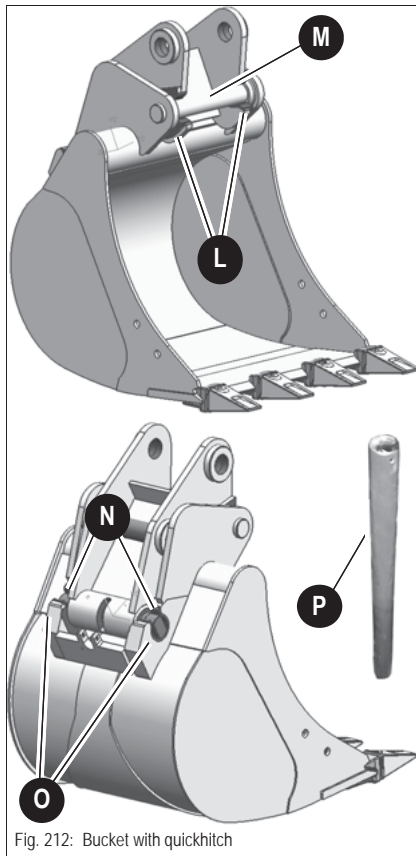


Fig. 212: Bucket with quickhitch

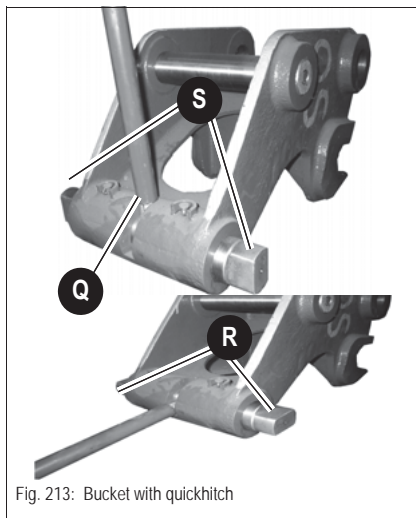


Fig. 213: Bucket with quickhitch



WARNING

Accident hazard due to unlocked attachment!

Can cause serious injury or death.

- Before starting work, ensure that the attachment is securely locked onto the quickhitch by means of the lock mechanism. You must be able to see the lock on either side of the mounting bore of the attachment.

Re-equip as follows:

- Approach the machine to the attachment
- Hitch coupling bar **M** onto coupling claws **L** of the quickhitch to pick up the bucket
- Engage lock mechanism **N** in mounting bores **O**
- Place the bucket on level ground

Lock as follows:

- Stop the engine
- Insert tube **P** (included in scope of delivery) in clamping sleeve **Q**
- Press the tube downward
- The lock pins must be in position **R**

Unlock as follows:

- Stop the engine
- Insert tube **P** (included in scope of delivery) in clamping sleeve **Q**
- Press the tube upward
- The lock pins must be in position **S**

3.53 Hydraulic 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.
- Both hitch claws must be clean before hitching.
- For more information, see **Easy Lock/Powertilt with Easy Lock** Operator's Manual.
- Store the Operator's Manual of the hydraulic quickhitch together with the Operator's Manual of the machine.



DANGER

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.*
- ☞ *Do not use damaged attachments.*
- ☞ *Check pin **F** must be fully retracted. Otherwise repeat the lock cycle until check pin **F** is retracted.*
- ☞ *Ensure safe locking with a rapid succession of stick and bucket movements as close as possible to the ground.*
- ☞ *Operate the machine only with a safely locked attachment.*



DANGER

Crushing hazard when attachments are removed!

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

- ☞ *Do not allow anyone to stay in the danger zone.*
- ☞ *Lower the attachment to level and firm ground ensuring stability.*

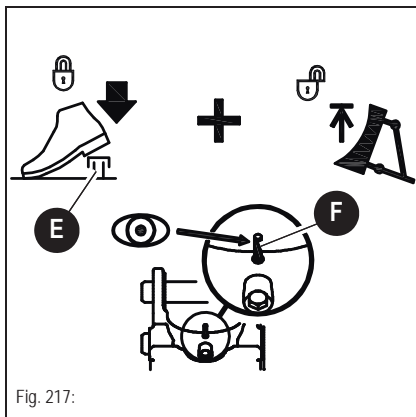
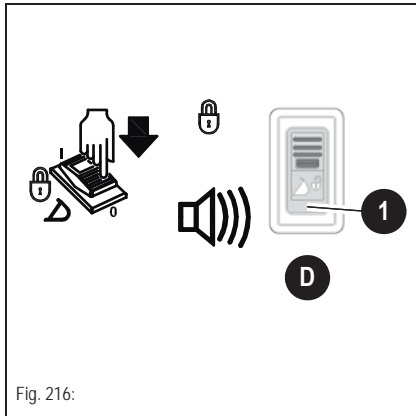
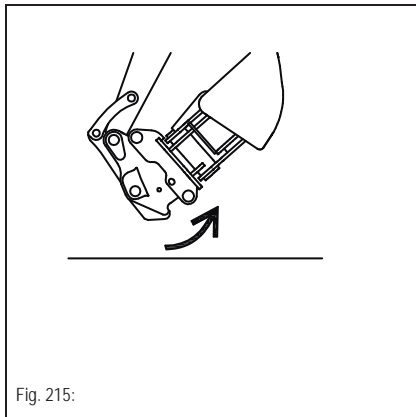
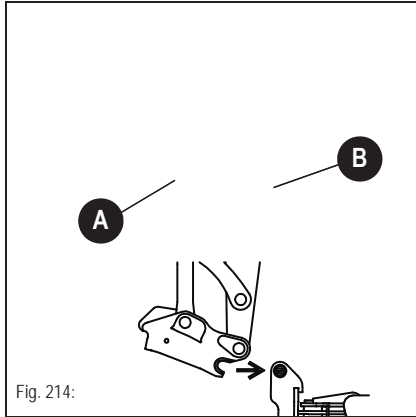


DANGER

Injury hazard due to incorrect operation of the hydraulic quickhitch!

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

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

Picking up an attachment

- 1 Hitch claws **A** (on the side of the machine) into pins **B** of the attachment mount.
- 2 Extend the bucket cylinder so that pin **C** of the attachment touches the quickhitch.

- 3 Move the attachment inward completely.

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

- 5 Press and hold the foot-operated push button **E** and pull the stabilizer-blade lever backward at the same time.
➔ The quickhitch opens.
➔ Check pin **F** must be fully extended.
➔ The attachment engages.

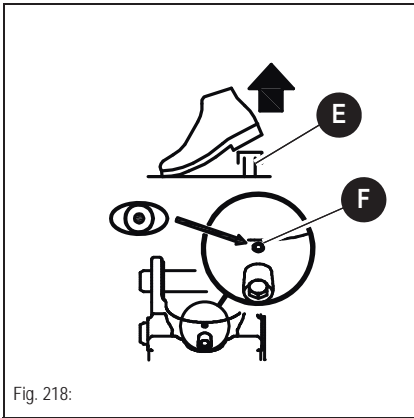


Fig. 218:

- 6 Release the stabilizer-blade lever and foot-operated push button **E**.
 - ➔ The quickhitch closes.
 - ➔ Check pin **F** must be fully retracted.

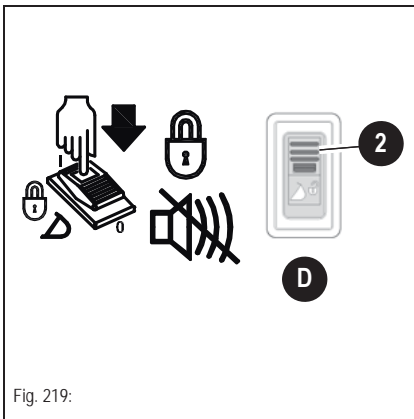
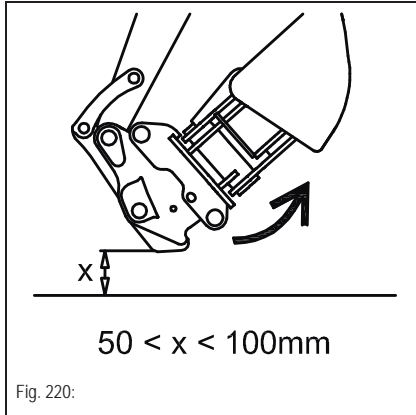
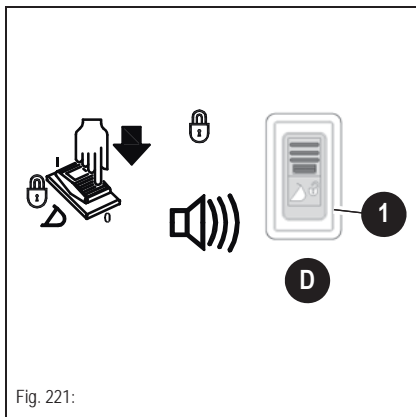


Fig. 219:

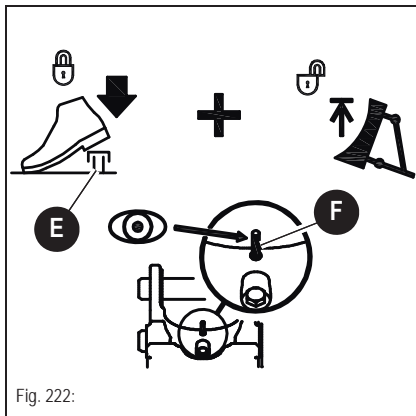
- 7 Press switch **D** to position **2**.
 - ➔ The quickhitch is disabled and the buzzer does not sound any longer.

Setting down an attachment

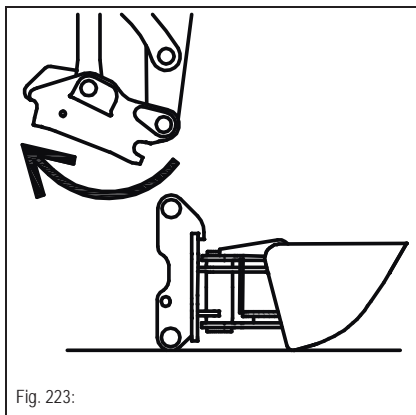
- 1 Move the attachment inward completely and position it at 5 – 10 cm (2 – 4 in) above the ground.



- 2 Press switch **D** to position 1.
➔ The quickhitch is enabled and the buzzer sounds.



- 3 Press and hold the foot-operated push button **E** and pull the stabilizer-blade lever backward at the same time.
➔ The quickhitch opens.
➔ Check pin **F** must be fully extended.



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

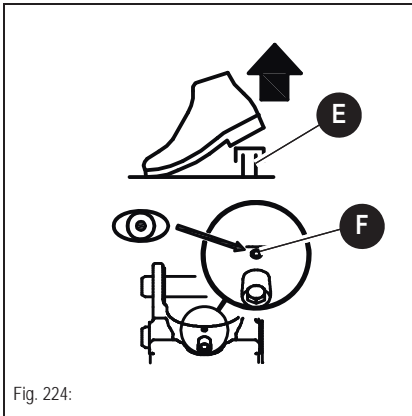


Fig. 224:

- 5 Release the stabilizer-blade lever and foot-operated push button **E**.
 - ➔ The quickhitch closes.
 - ➔ Check pin **F** must be fully retracted.

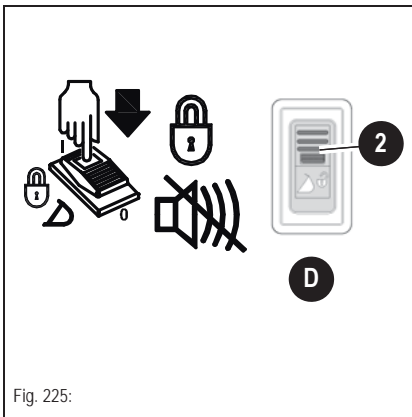


Fig. 225:

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

Shovel bucket operation

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



Fig. 226: Possible damage

NOTICE

Do not tilt the bucket fully back in shovel bucket operation (see [Fig. 226](#)), otherwise the bucket base can touch and damage the stick.

3.54 Powertilt (option 3503)

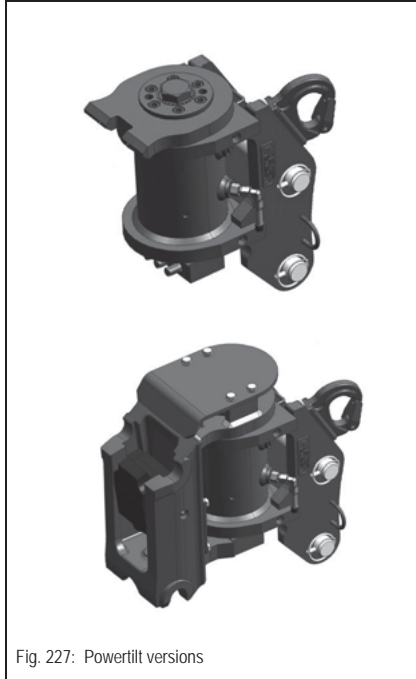


Fig. 227: Powertilt versions

Two versions are available:

- Powertilt with hydraulic quickhitch (option) – *see chapter 3.53 Hydraulic quickhitch (option)* on page 3-92
- Powertilt welded onto an attachment.



WARNING

Crushing hazard due to rotating movements of the Powertilt unit!

Can cause serious injury or death.

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

Do not put the Powertilt unit into operation unless:

- The machine is equipped with an acoustic or optical warning device – *see chapter 3.57 Safe load indicator (option)* on page 3-102
- The machine is equipped with a hose burst valve – *see chapter Safety feature “Hose burst valve” (option)* on page 3-102
- You read, understand and follow the instructions in the following chapter – *see chapter 2.9 Applications with Lifting Gear* on page 2-10.



Information!

When using the Powertilt unit, the maximum bucket width is limited to 1000 mm (39 in).

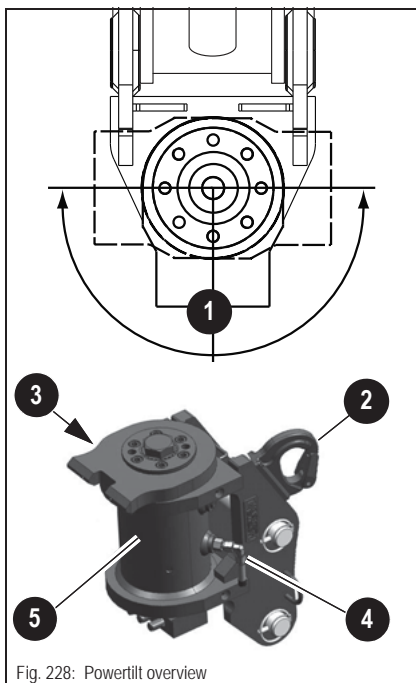


Fig. 228: Powertilt overview

- 1 Swiveling range 180°
- 2 Load hook (option)
- 3 Hydraulic connection 1/4"
- 4 Hydraulic connection 1/4"
- 5 Type label

NOTICE

Welding work may only be performed by a Wacker Neuson service center or customer service!

Re-equipping



WARNING

Injury hazard due to modification work!

Can cause serious injury or death.

- Observe the following instructions:
 - Stop the engine
 - Raise the control lever base
 - Re-equip attachments only with suitable tools
 - Do not align components with your fingers or your hands but use suitable tools – crushing hazard!
- Once you have re-equipped the attachments, or before starting work, ensure that the attachment is safely locked with the stick and the tilt rod, or with the Powertilt unit (option).
- Release the pressure – see [chapter 3.50 Releasing the pressure on the operating hydraulics](#) on page 3-88
- Follow the safety instructions – see [chapter 3.51 Re-equipping attachments](#) on page 3-89

Installing the Powertilt unit

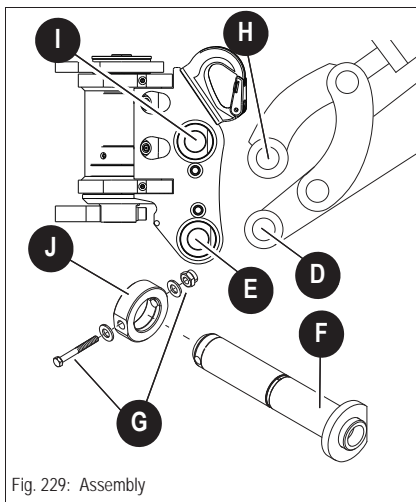


Fig. 229: Assembly

Proceed as follows:

- ☞ Lower the Powertilt unit to the ground with its flat side facing down
- ☞ Grease the joints and the pins before inserting them
- ☞ Start the engine
- ☞ Straighten the stick so that bores **D** and **E** are flush
- ☞ Insert greased pin **F**
- ☞ Install ring **J** and tighten the securing elements **G**
- ☞ Actuate the stick cylinder until bores **H** and **I** are flush
- ☞ Insert greased pin **F**
- ☞ Install ring **J** and tighten the securing elements **G**

Removing the Powertilt unit

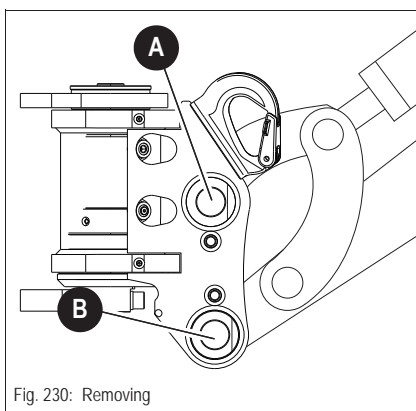


Fig. 230: Removing

Re-equip as follows:

- ☞ Lower the Powertilt unit to the ground with its flat side facing down
 - ☞ Stop the engine
 - ☞ Raise the control lever base
 - ☞ Remove the ring and the securing elements
 - ☞ First remove pin **A**, and then pin **B**. Carefully expel pins that are stuck with a hammer and a brass punch
- If pin **A** is stuck:
- ☞ Start the engine
 - ☞ Slightly raise and lower the boom to take the load off the pin
 - ☞ Stop the engine
 - ☞ Raise the control lever base


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.

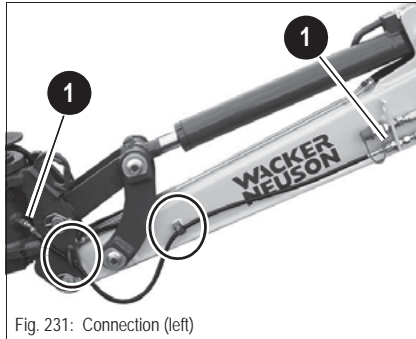
Connection


Fig. 231: Connection (left)

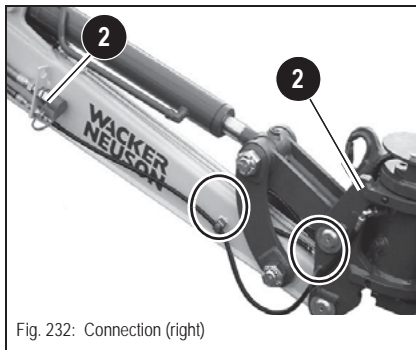


Fig. 232: Connection (right)

☞ Remove the covers on connections **1** and **2** on the boom and the Powertilt unit

☞ The following connections are possible:

- 3rd control circuit with quick-connect coupling
- Two different connection sizes each

☞ Connection of line between boom **1** and connection **1** on the Powertilt unit

☞ Connection of line between boom **2** and connection **2** on the Powertilt unit

Route the hydraulic line through the duct and fasten it with a clamp.


Information!

In order to avoid possible damage to the lines, check the Powertilt unit in all positions before putting it into operation.

Operation



Information!

The Powertilt function is enabled once the machine is started. The auxiliary hydraulics and boom swivel are disabled.

Control lever on the left (Powertilt)

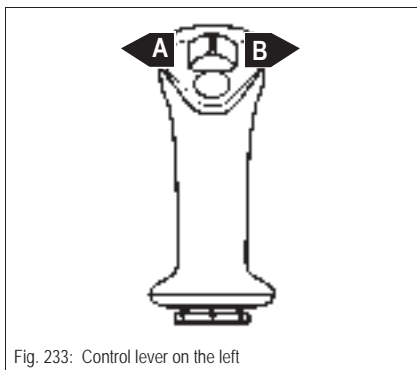


Fig. 233: Control lever on the left

The Powertilt functions are operated with the control lever on the left.

Position	Lever	Function
• A	☞ To the left	☞ Powertilt turns to the left
• B	☞ To the right	☞ Powertilt turns to the right

Control lever on the right (if equipped with auxiliary hydraulics and proportional controls)

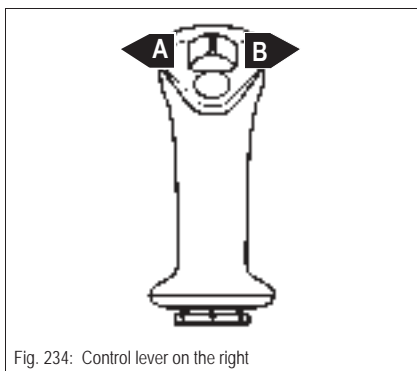


Fig. 234: Control lever on the right

The Powertilt functions are operated with the control lever on the right.

Position	Lever	Function
• A	☞ To the left	☞ Powertilt turns to the left
• B	☞ To the right	☞ Powertilt turns to the right



Information!

The auxiliary hydraulics pedal is locked. The auxiliary hydraulics is operated via the control lever on the left – see [chapter Control lever on the left](#) on page 3-81.

3.55 Connections for auxiliary hydraulics

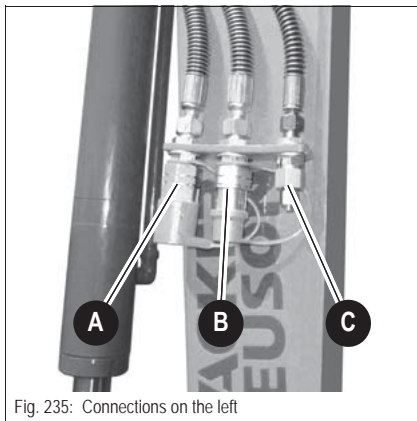


Fig. 235: Connections on the left

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

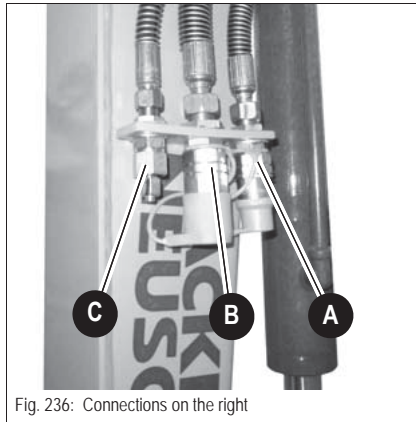


Fig. 236: Connections on the right


Information!

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

3.56 Grab operation

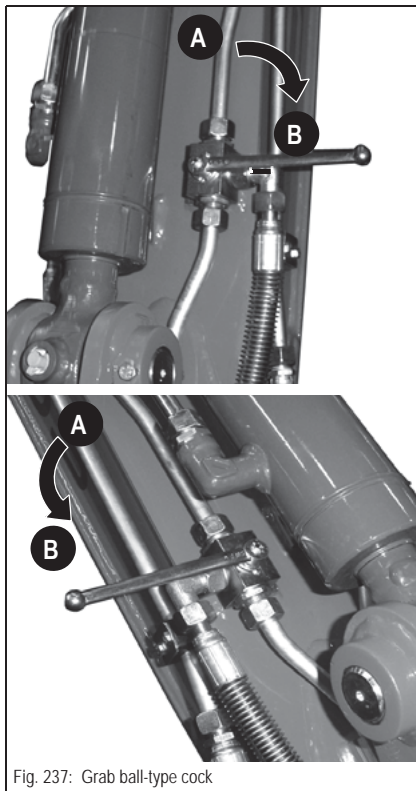


Fig. 237: Grab ball-type cock

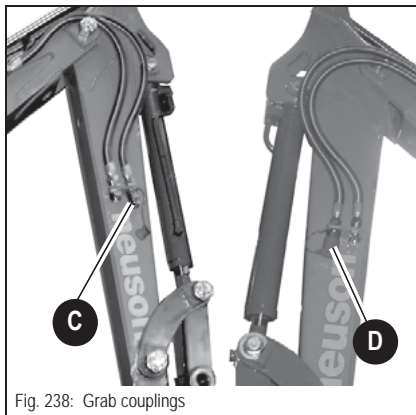


Fig. 238: Grab couplings

Bucket operation:

- ☞ Set the ball-type cocks to position **A**

Grab operation:

- ☞ Set the ball-type cocks to position **B**

Coupling:

- ☞ Park the machine on level and horizontal ground.
- ☞ Extend stick cylinder **A** halfway through.
- ☞ Stop the engine.
- ☞ Set the ball-type cocks to position **B**
- ☞ Release the pressure in the hydraulic system – see [chapter 3.50](#) Releasing the pressure on the operating hydraulics on page 3-88.
- ☞ The grab can now be coupled onto couplings **C** and **D**.

Uncoupling:

- ☞ Park the machine on level and horizontal ground.
- ☞ Extend stick cylinder **A** halfway through.
- ☞ Stop the engine.
- ☞ Release the pressure in the hydraulic system – see [chapter 3.50](#) Releasing the pressure on the operating hydraulics on page 3-88.
- ☞ The grab can now be uncoupled from couplings **C** and **D**.

- ☞ Set the ball-type cocks to position **A**

3.57 Safe load indicator (option)

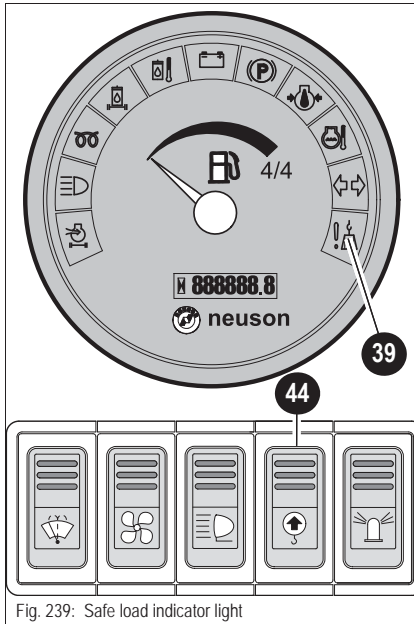


Fig. 239: Safe load indicator light



WARNING

Crushing hazard due to tipping over of machine!

Can cause serious injury or death.

- Always switch on the safe load indicator!
- Contact a Wacker Neuson dealer should the safe load indicator not be adjusted correctly

Switch on the safe load indicator as follows:

- ☞ Press switch **44** on the instrument panel
 - ➔ Indicator light **39** on the round indicating instrument illuminates in case of overload

The safe load indicator light illuminates, and an acoustic warning is given, to warn the driver he has reached the maximum permissible load-carrying capacity. Any further increase of the load moment can cause the machine to overturn in this situation. Therefore the operator must immediately reduce the load moment as follows:

- ☞ Reduce reach until both the acoustic signal and the indicator light in the display element go out

The switch position can vary depending on version – see *Switch panel (right)* on page 3-14

Safety feature “Hose burst valve” (option)

The “Hose burst valve” safety feature prevents the boom from being lowered without being braked, in the event of a bursting hose or pipe.

Proceed as follows in case of damage:

- 1 Stop the machine immediately.
- 2 Perform emergency lowering if possible.
- 3 Raise the control lever base on the left.
- 4 Stop the engine.
- 5 Remove the starting key and lock the cabin.
- 6 Secure the machine and the attachment.
- 7 Contact a Wacker Neuson service center and have the malfunction rectified.



Environment!

Collect the drained hydraulic oil in a suitable container.

- ☞ Dispose of drained hydraulic oil by an ecologically safe method
- ☞ Always contact the relevant authorities or commercial establishments in charge of oil disposal before disposing of biodegradable oil

3.58 Working with the excavator

Inadmissible work procedures

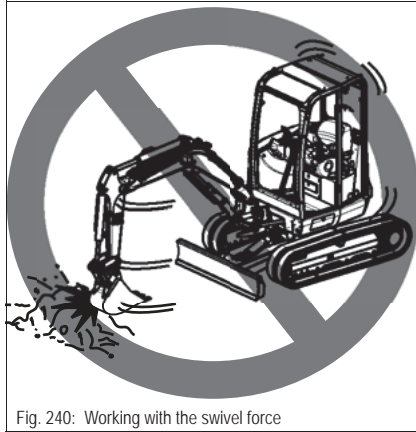


Fig. 240: Working with the swivel force

Working with the swivel force

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

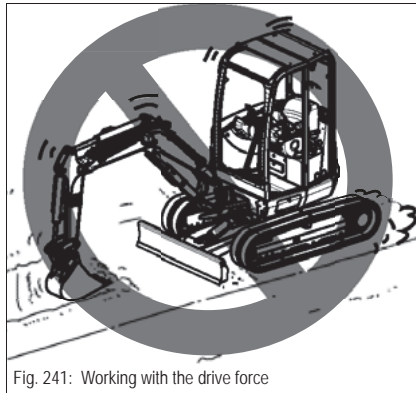


Fig. 241: Working with the drive force

Working with the drive force

- ⚠ Never ram the attachment into the ground to dig during machine travel.
 - ➔ This can damage the machine and/or the attachment.

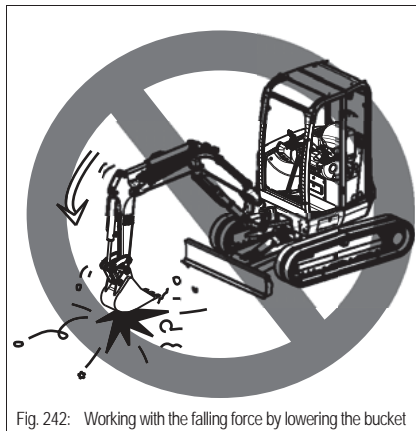


Fig. 242: Working with the falling force by lowering the bucket

Working with the falling force by lowering the bucket

- ⚠ Do not use the falling force of the attachment as a hoe, hammer or pile-driver.
 - ➔ This can damage the machine and/or the attachment.

Working with the falling force by lowering the machine

⚠ Do not use the machine's falling force for excavating.

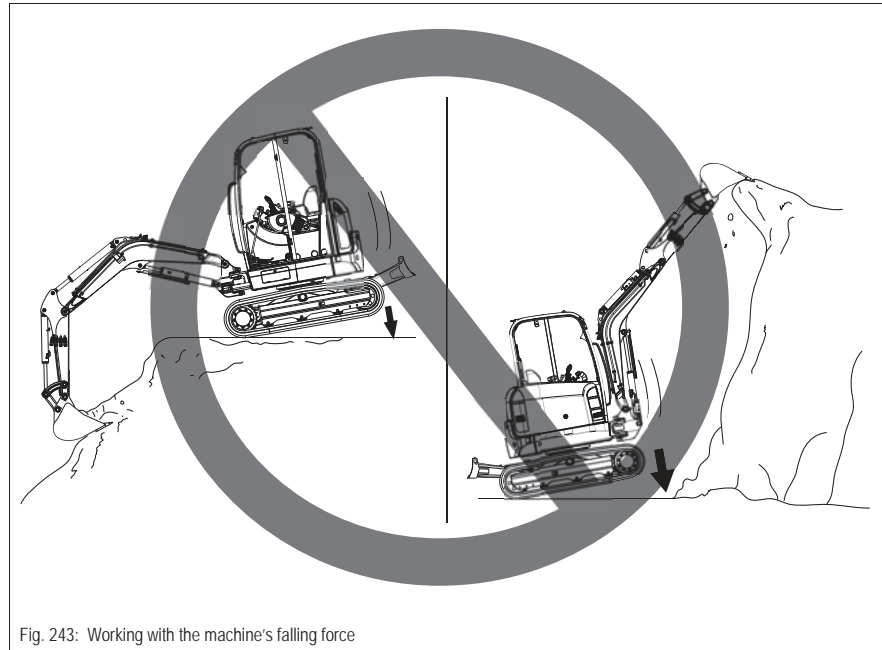


Fig. 243: Working with the machine's falling force

Retracting attachments

⚠ Ensure that the bucket does not hit the stabilizer blade as you retract attachments for driving or transport.

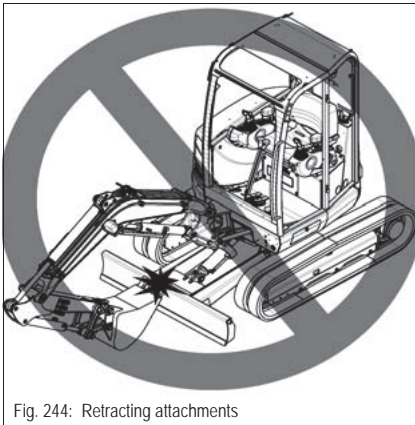


Fig. 244: Retracting attachments

Fully lowering the stabilizer blade

⚠ Fully lower the stabilizer blade when using it on the side opposite the excavation side.

No thrusting the stabilizer blade

⚠ Do not thrust the stabilizer blade against rocks or blocks to avoid damage to the cylinders and the blade itself.

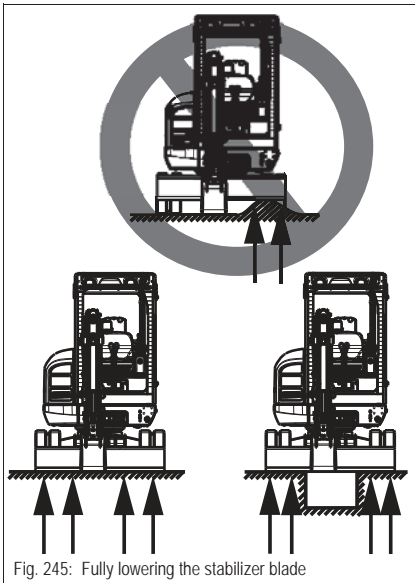


Fig. 245: Fully lowering the stabilizer blade

Excavator work position

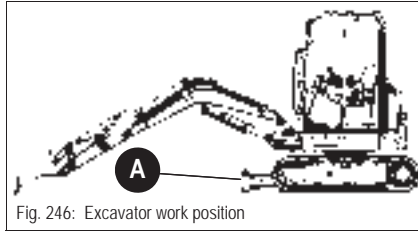


Fig. 246: Excavator work position

Proceed as follows:

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

Bucket position when digging

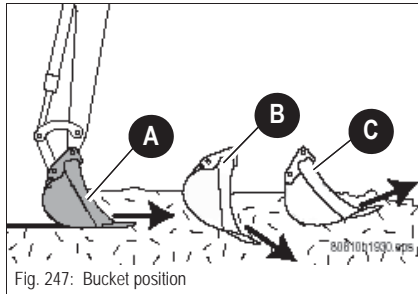


Fig. 247: Bucket position

- ☞ Move the bucket as shown in **A**.

➔ Move the flat side of the bucket parallel to the ground.



Information!

Position **B** causes the bucket to penetrate into the ground. Work slows down, and the engine and the hydraulic pump are subject to overload if this position is used over a longer period of time!

Position **C** causes the bucket to be forced upward and not to be filled completely. This slows down work, too.

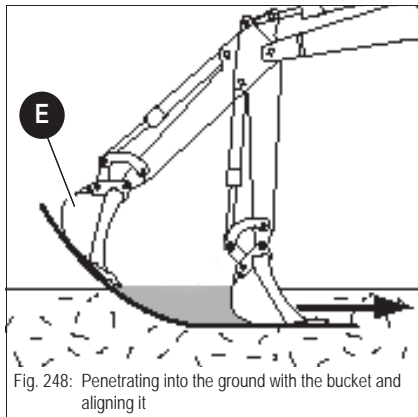


Fig. 248: Penetrating into the ground with the bucket and aligning it

- ☞ Dig as follows:

- Penetrate into the ground with the bucket **E**
- Lower the stick and at the same time align bucket **E** until
- reaching the required digging depth and
- the flat side of the bucket is parallel to the ground (see bucket position)

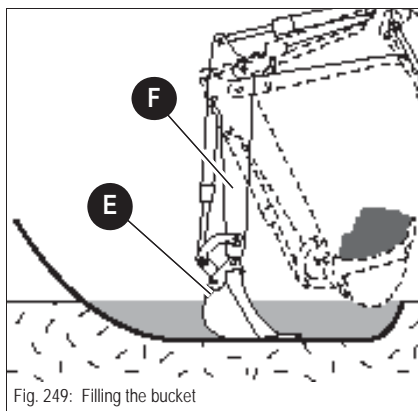


Fig. 249: Filling the bucket

- ☞ Pull bucket **E** parallel to the ground toward the excavator. At the same time, if possible:

- Move stick **F** toward the excavator
- Lower the boom

- ☞ With a sufficiently full bucket **E**:

- Keep on moving the stick toward the excavator and at the same time
- Tilt in stick **F**

Excavating trenches

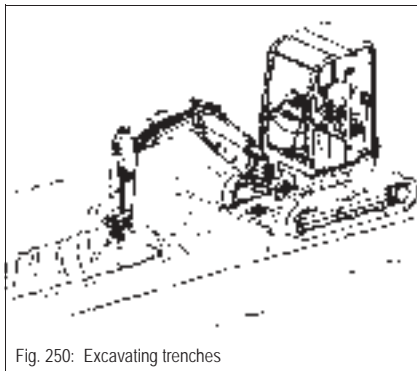


Fig. 250: Excavating trenches

- Excavating trenches is more efficient
 - ☞ by using a suitable bucket for this work and positioning the tracks parallel to the limit line of the trench.
 - ☞ In case of large trenches, first excavate the side sections and then the center section.

Loading

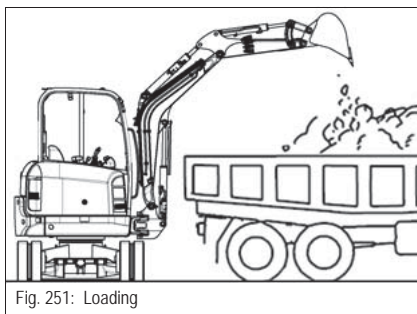


Fig. 251: Loading

- Loading in confined areas with a limited angle of rotation is more efficient
 - ☞ by positioning the truck so as to ensure maximum visibility for the driver of the excavator.
- Loading material on trucks is easier and faster
 - ☞ if the hydraulic excavator is placed at the rear end of the truck and not at the sides.

Grading

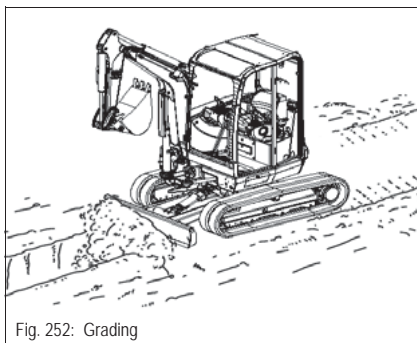


Fig. 252: Grading

- Use the stabilizer blade to fill in trenches and to grade surfaces.



Information!

Work on level ground. Grade with the stabilizer blade first in case of sloping ground

Excavating trenches sideways

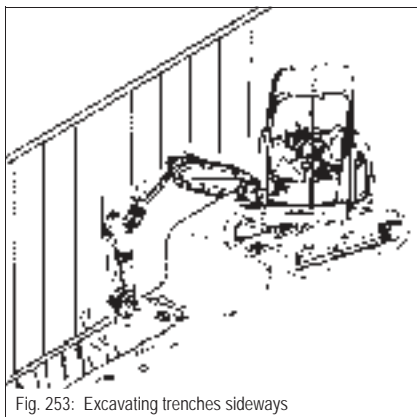


Fig. 253: Excavating trenches sideways

- The machine can be used for excavating trenches sideways in confined areas
 - ☞ by rotating the upper carriage and swiveling the main boom (combined position and movement of both).

Working alongside trenches

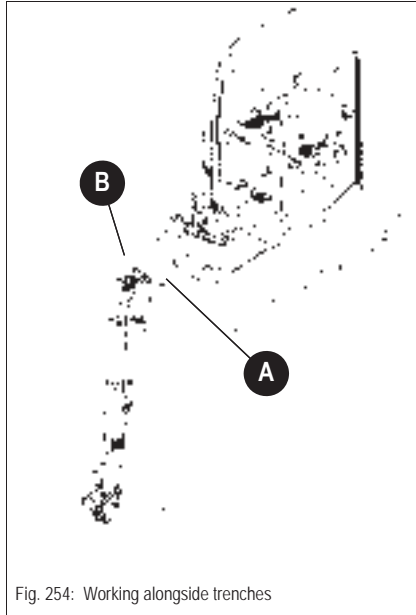


Fig. 254: Working alongside trenches

Stabilizer blade at rear

NOTICE

Danger of damaging piston rod **A** of the boom cylinder when working alongside trenches, slopes, etc. and operating the stabilizer blade and the boom incorrectly.

- Always use stabilizer blade **B** for stabilization during excavation work
 - Ensure that stabilizer blade **B** never touches piston rod **A** (Fig. 254).
 - If you perform deep excavations with stabilizer blade **B** at the front, ensure that piston rod **A** does not touch or rest on stabilizer blade **B** (Fig. 254).
-



WARNING

Tipping hazard of machine alongside trenches!

Can cause serious injury or death.

- Use this work position only in an extreme emergency since the machine can tip over forward into the trench.
 - We recommend using the first work position (Fig. 254) described above and to ensure that piston rod **A** does not touch stabilizer blade **B** under any circumstances.
-

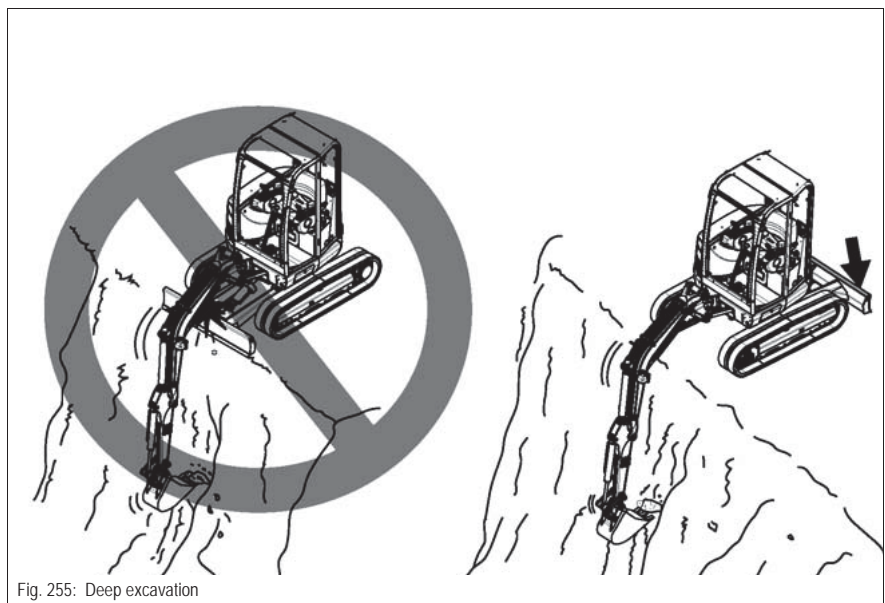


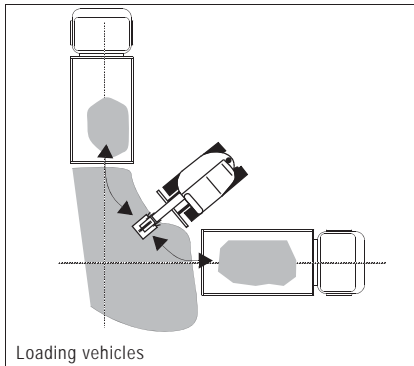
Fig. 255: Deep excavation

Further recommendations for digging

When planning and performing digging work, we recommend 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
- Whenever possible, perform reverse machine travel when transporting a full bucket down a steep slope

Loading vehicles



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

- If possible, the vehicle and the working direction of the bucket should form an angle of 45°
- Raise the full bucket to dump height only as you rotate toward the vehicle
- If possible tilt out with the wind behind you to keep the dust away from your eyes, air filters and fans

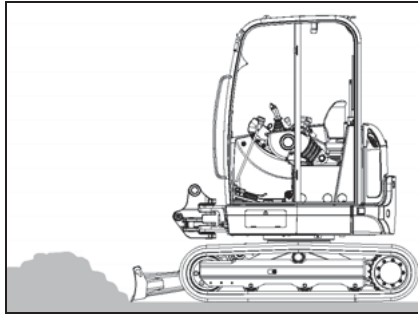
Freeing the machine

If your machine gets stuck in the ground:

- ☞ *Dump out the bucket until the blade is vertical above the ground*
- ☞ *Lower the boom all the way*
- ☞ *Slowly dump out the bucket*
 - ➔ The machine is pushed backward
- ☞ *Reverse slowly*
- ☞ *Repeat this procedure until the tracks reach firm ground*
- ☞ *Reverse the machine away*

3.59 Grading

Grading



☞ Lower the stabilizer blade to the ground

– see [chapter 3.22 Stabilizer blade](#) on page 3-33

☞ Set the depth of the layer you want to remove with the stabilizer blade lever

➔ The machine must not be raised by lowering the stabilizer blade

➔ The clearance between the stabilizer blade and the ground should be about 1 cm (0.39 in)

3.60 Exhaust gas treatment (Tier IV)

The machine is equipped with a particulate matter catalyst for cleaning the exhaust gas (only Tier IV).

The soot produced by burning diesel fuel is collected and burned in the particulate matter catalyst 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 particulate matter catalyst reaches a critical value, engine power is reduced and machine operation has to be stopped.

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



WARNING

Health hazard due to exhaust gases!

Can cause serious health hazards or death.

- Do not inhale exhaust gases.
- Use exhaust gas suction systems.
- Ensure sufficient ventilation during operation in enclosed premises.



WARNING

Burn hazard at the exhaust system!

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

- Keep a safe distance from the exhaust system.
-

**WARNING****Fire hazard during regeneration!**

Hot exhaust gases in easily flammable environments cause serious injury and death.

- In environments with easily flammable material, disable the **automatic regeneration** mode.
- Do not perform manual regeneration in environments with easily flammable material.
- Use only exhaust-gas suction systems suitable for exhaust-gas temperatures of up to 600 °C (1,112 °F).

NOTICE

Possible damage to the engine.

- Only use clean diesel fuel according to the engine/machine fluids and lubricants.
- Using biodegradable diesel fuel is prohibited.

NOTICE

Possibly irreparable damage of the particulate matter catalyst.

- Perform regeneration as early as possible
- Do not ignore the **highest load** indication.

**Information!**

The load is the contamination level of the particulate matter catalyst. 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 if possible. Should it be necessary to disable or interrupt regeneration, perform it again as soon as possible. This increases the service life of the particulate matter catalyst and avoids unscheduled stops at the service center, for example with shorter engine-oil replacement intervals. The particulate matter catalyst is a maintenance part since soot and ash particles cannot be completely removed for technical reasons.

**Information!**

Have the particulate matter catalyst cleaned or replaced by a Wacker Neuson service center every 3000 operating hours.

Indication of load

Symbol ¹	Description	Effect
	Low load	Full engine power Automatic regeneration possible
	Medium load	Full engine power Automatic or manual regeneration is possible
	Highest load	Reduced engine power Only manual regeneration is possible
	Symbol flashes: PMC regeneration required	
	Symbol illuminates: PMC regeneration active	

1. The symbols are displayed from software version 3.3. In earlier software versions status messages (SPN 3701-001/3701-010/3701-011 or 3700-010/SPN 3700-001) appear in the multifunctional display.

Particulate matter catalyst indicator lights

Engine warning	Engine stop	Exhaust-gas temperature	Regeneration required	Regeneration disabled	Description
Yellow	Red	Yellow	Yellow	Yellow	
On	On	On	On	On	After switching on the starter, the indicator lights are checked during the first two seconds.
Off	Off	Off	Off	Off	No malfunction.
Off	Off	Off	On	Off	Regeneration is required.
Off	Off	On	On	Off	Active regeneration. Increased exhaust-gas temperature.
Off	Off	On	Off	Off	Regeneration is completed. Increased exhaust-gas temperature. System is being cooled. The indicator light goes out one minute after the end of regeneration.
Off	Off	Off	Off	On	Regeneration is disabled or interrupted.
Flashes	Off	Off	On	Off	The load has reached the permissible value. Reduced engine power. Regeneration is required.
Flashes	On	Off	On	Off	The load has exceeded the permissible value. Reduced engine power. Drive the machine out of the area with easily-flammable matter. Stop the engine immediately. Contact a Wacker Neuson service center.

Regeneration push button

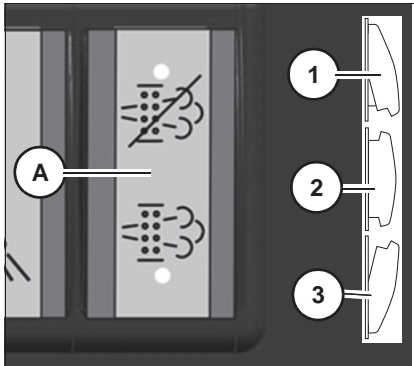


Fig. 256

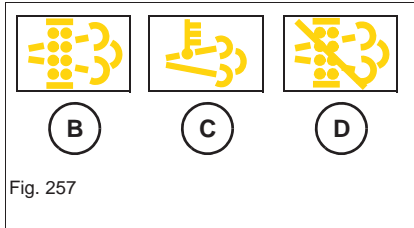


Fig. 257

Push button **A** is located on the control element on the left.

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

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

Push button functions

- 1:** disable/interrupt/re-enable regeneration
- 2: automatic regeneration** mode (middle position)
- 3:** re-activation of automatic regeneration

Indicator lights

Three indicator lights indicate the regeneration status.

B: Regeneration required

This indicator light illuminates if the contamination level reaches a specific value.

C: Increased exhaust-gas temperature

This indicator light illuminates during regeneration. It goes out once regeneration is over and the system has cooled down.

D: Regeneration disabled/interrupted

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

Automatic regeneration mode

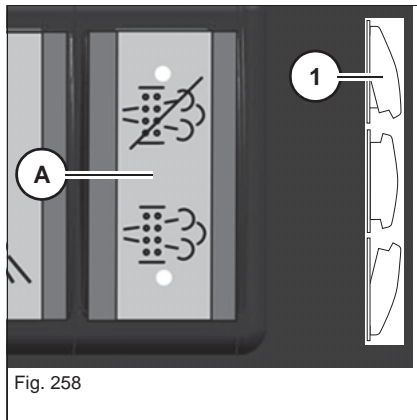


Fig. 258

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

NOTICE

Fire hazard in the exhaust system

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

If the particulate matter catalyst has reached a certain contamination level, indicator light **B** illuminates and an automatic regeneration is performed soon.

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



Information!

The machine can be operated as usual during regeneration.

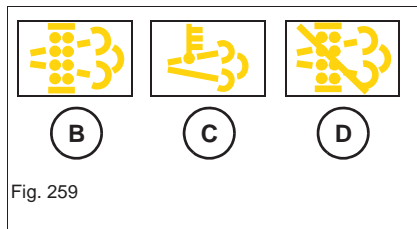


Fig. 259

Disabling/interrupting the **automatic regeneration** mode:

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

- ➔ Indicator light **D** illuminates.

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

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

- ➔ Indicator light **D** goes out.



Information!

Disabling regeneration increases the contamination level in the particulate filter.

Manual regeneration

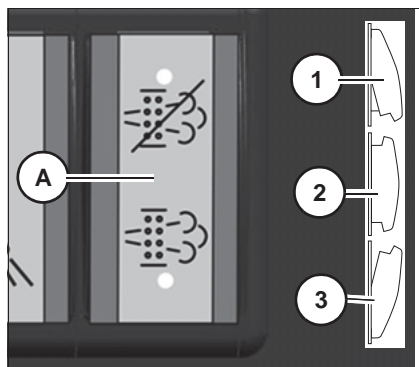


Fig. 260

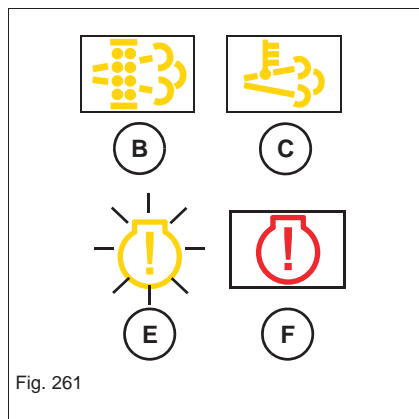


Fig. 261

Starting manual regeneration

Indicator light **B** illuminates and indicator light **E** flashes.

- ➔ Manual regeneration is possible only in this case and has to be started.
- ☞ Drive the machine out of the danger zone and into a safe area.
- ☞ Apply the parking brake.
- ☞ Press and hold push button **A** at least 10 seconds in position **3**.
- ➔ Indicator lights **B** and **C** illuminate during regeneration.

Interrupting manual regeneration

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

NOTICE

Possible damage to engine or particulate filter.

- Perform a complete regeneration cycle
-

NOTICE

Fire hazard in the exhaust system.

- There must be no easily flammable material in the direct vicinity of the exhaust system, in particular near the end pipe.
 - Do not perform manual regeneration in environments with easily flammable material.
-

Regeneration not performed – stopping the machine

Engine power is reduced if indicator lights **B** and **F** illuminate and if indicator light **E** flashes.

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

4 Malfunctions

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

Repairs must only be performed by authorized personnel.

Problem	Possible causes	See
Engine does not start or is not easy to start	Wrong SAE grade of engine lubrication oil	5-35
	Empty fuel tank	5-2
	Fuel grade does not comply with specifications	5-35
	Malfunctioning or empty battery	5-24
	Loose or oxidized cable connections in starter circuit	--
	Malfunctioning starter, or pinion does not engage	--
	Wrong valve clearance	--
	Malfunctioning fuel injector	--
	Malfunctioning cutoff solenoid	--
	Malfunctioning fuse	6-6
Engine starts, but does not run smoothly or faultless	Fuel grade does not comply with specifications	5-35
	Dirty fuel filter	--
	Wrong valve clearance	--
	Injection line leaks	--
	Malfunctioning fuel injector	--
Engine overheats. Temperature warning system responds	Oil level too low	5-5
	Oil level too high	5-5
	Dirty air filter	5-11
	Dirty radiator fins	5-7
	Coolant level too low	5-8
	Cooling system leaks	--
	Malfunctioning fan, torn or loose V-belt	--
	Resistance in cooling system too high, flow capacity too low	--
Insufficient engine power	Oil level too high	5-5
	Fuel grade does not comply with specifications	5-35
	Dirty fuel filter	--
	Dirty air filter	5-11
	Wrong valve clearance	--
	Injection line leaks	--
	Malfunctioning fuel injector	--
	Admissible soot load value exceeded (Tier IV only)	3-109
Engine does not run on all cylinders	Malfunctioning fuel injection pump	--
	Injection line leaks	--
	Malfunctioning fuel injector	--

Problem		Possible causes	See
Insufficient or no engine oil pressure		Oil level too low	5-5
		Machine inclination too high	3-30
		Wrong SAE grade of engine lubrication oil	5-35
Engine oil consumption too high		Oil level too high/wrong oil	5-5
		Worn oil scraper ring	--
		Machine inclination too high	3-30
Engine smoke	Blue	Oil level too high/wrong oil	5-5
		Machine inclination too high	3-30
	White	Engine starting temperature too low	--
		Fuel grade does not comply with specifications	5-35
		Wrong valve clearance	--
		Malfunctioning fuel injector	--
		Malfunctioning cylinder-head gasket	--
	Black	Dirty air filter	5-11
		Wrong valve clearance	--
Malfunctioning fuel injector		--	

Hydraulics

Problem	Possible causes	See
Jerky movements of operating hydraulics.	Check pilot control filter for dirt	5-38



4.1 Malfunctions of the Powertilt unit

Problem	Possible causes	See
Powertilt does not maintain its position.	If the excavator applies too much pressure against an obstacle, this can build up pressure in the Powertilt swivel device that activates the internal decompression valve.	
	Oil escapes from the control valve.	
	Malfunctioning decompression valve.	
	Oil escapes from the seals.	
Powertilt turns only in one direction.	Malfunctioning internal decompression valve.	
	Both lines are connected to either the P1 or P2 connections of the Powertilt swivel device.	
Inexact lateral Powertilt movements.	Air in Powertilt swivel device or hydraulic system.	
	Hose/pipe diameter/length is larger/longer than recommended.	
Reverse and forward movement of shaft in housing (axial play of shaft).	Worn or missing pressure disks.	
Lateral bucket movement.	A little play due to necessary spacing between teeth is normal.	
Grease cannot be applied to Powertilt grease zerks.	Malfunctioning grease decompression valve of lubrication system, or grease decompression valve has been replaced by a grease zerk or plug.	




NOTICE

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.

4.2 Engine warning lights (Tier IV only)

Engine warning	Engine stop	Description
Yellow	Red	
		
On	On	All warning and indicator lights illuminate for a few seconds if the starting key is turned to position 1.
Off	Off	No malfunction.
On	Off	The engine runs correctly, but there is an error in the electronic engine management. Contact a Wacker Neuson service center.
Flashes	Off	The engine runs correctly, but a diagnosis or error code is issued that reduces 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.

4.3 Engine and engine oil warning lights (Tier IV only)

Engine warning	Engine stop	Oil pressure	Description
Yellow	Red	Red	
			
On	On	On	All warning and indicator lights illuminate for a few seconds if the starting key is turned to position 1. If the engine stop or oil pressure light does not illuminate, stop machine operation immediately and contact a Wacker Neuson service center.
Off	Off	Off	No malfunction.
On	On	On	Low oil pressure (if the oil pressure indicator light illuminates during operation). Check the oil level and add oil if necessary – see chapter Adding engine oil on page 5-6. If the malfunction is still indicated, stop the engine and contact a Wacker Neuson service center.

4.4 Malfunions (display element/multifunctional display – Tier IV only)

Symbol		Description	See
Display element	Multifunctional display		
Red	--		
		Buzzer sounds. Replace the hydraulic oil filter. Contact a Wacker Neuson service center.	--
		Buzzer sounds. Dirty air filter. Contact a Wacker Neuson service center.	5-11
		The battery is no longer charged. Possible alternator or V-belt malfunction. Note: Increase the engine speed. The electrical system is in working order if the charge indicator light goes out after about one minute. If the malfunction is still indicated, stop the engine immediately and contact a Wacker Neuson service center.	--
		The battery is no longer charged Coolant temperature too high. Alternator or V-belt malfunction. Stop the engine immediately. Contact a Wacker Neuson service center.	--
		Buzzer sounds. Coolant temperature too high. Let the engine run at idling speed without any load. Wait until the temperature drops and the indicator light goes out. Stop the engine. Clean the radiator if necessary, or check the coolant level. If the malfunction is still indicated, stop the engine and contact a Wacker Neuson service center.	5-7, 5-8
--	SPN 97	Water in fuel system. Empty the water separator.	5-4

Engine error messages



Information!

The drive is throttled at cold oil temperatures. Warm up the machine to operating temperature.

Observe the following if an error is displayed in the multifunctional display:

- Machine travel or operation is prohibited in case of major errors
- Engine power is reduced.
- The traveling drive is disabled.
- Stop and park the machine.
- Contact a Wacker Neuson service center and have the malfunction rectified.

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

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



Information!

Possible errors are displayed in the multifunctional display for a few seconds when the machine is started.

Symbol		
	SPN XXXXXX SPN XXXXXX SPN XXXXXX SPN XXXXXX SPN XXXXXX	Engine error Indicates engine errors.
	SPN XXXXXX SPN XXXXXX SPN XXXXXX SPN XXXXXX SPN XXXXXX	Particulate matter catalyst data Indicates particulate matter catalyst errors.
		No error If there is no error, the marked symbol appears in the service tool "Engine error/machine status/particulate matter catalyst data". The corresponding symbol flashes and is displayed at the bottom in addition.



5 Maintenance

5.1 Introduction

Operational readiness and the service life of machines are heavily dependent on maintenance. It is therefore in the interest of the machine owner to perform the mandatory maintenance. Before performing servicing and maintenance, always read, understand and follow the instructions given in:

- Chapter 2 "SAFETY INSTRUCTIONS" of this Operator's Manual
- The Operator's Manuals of the attachments.

Perform the prescribed inspections and rectify any disorders before putting the machine into operation.

Secure open (engine) covers appropriately. Do not open (engine) covers on slopes or in strong wind.

Dirt can be blown away and cause serious injury when using compressed air. Always wear safety glasses, protective masks and clothing.

Daily servicing and maintenance, and maintenance according to maintenance plan "A" must be performed by a specifically trained operator. All other maintenance must be performed by trained and qualified personnel only.

The maintenance plans indicate when the maintenance mentioned below must be performed – see *Maintenance plan (overview)* on page 5-38.

5.2 Safety-relevant parts

Servicing and maintenance must be performed by a specifically trained driver.

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

The following maintenance plans indicate the maintenance to be performed. – see *Maintenance plan (overview)* on page 5-38.

This is necessary to ensure optimal functioning of the machine.



Information!

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

Parts	Interval
Hydraulic hoses	Replace hydraulic hoses every 6 years from the date of manufacture, even if they do not seem to be damaged.
Bladder type accumulator	Must be checked by a Wacker Neuson dealer every 2 years.
Seat belt	No replacement necessary. Replace the seat belt after an accident.

5.3 Fuel system



WARNING

Burn and poisoning hazard when handling fuel!

Can cause serious injury or death.

- Before refueling, stop the engine and remove the starting key!
- Never perform work on the fuel system near open flames or sparks
- Do not refuel in closed rooms
- No smoking, no fire!
- Do not smoke when working on the fuel system or when refueling!
- Wipe away fuel spills immediately!
- Keep the machine clean to reduce the fire hazard!

Refueling

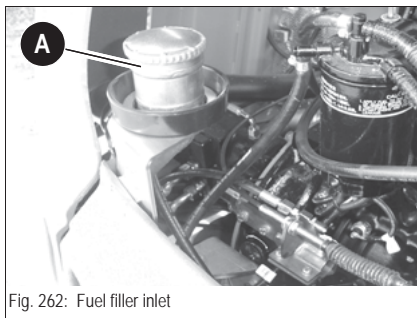


Fig. 262: Fuel filler inlet

Filler inlet **A** for the fuel tank is located behind the cabin, on the right in travel direction.



Environment!

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



Information!

Do not run the fuel tank completely dry. Otherwise, air is drawn into the fuel system. This requires bleeding the fuel system – see *Bleeding the fuel system* on page 5-4.



Information!

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

Stationary fuel pumps

General

Only refuel from stationary fuel pumps. Fuel from barrels or cans is usually dirty. Even the smallest particles of dirt can cause

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

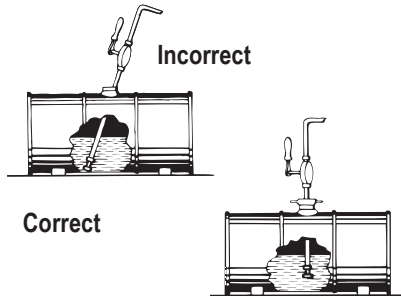


Fig. 263: Refueling from a barrel

Draining fuel

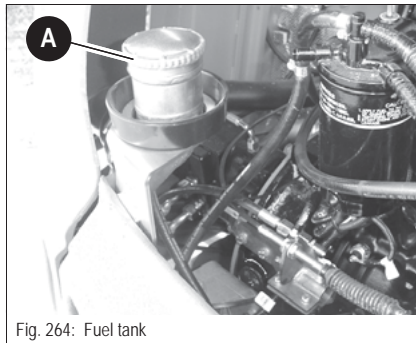


Fig. 264: Fuel tank

Diesel fuel specification

Refueling from barrels

If refueling from barrels cannot be avoided, note the following points (see fig. 263):

- Barrels must neither be rolled nor tilted before refueling
- Protect the suction pipe opening of the barrel pump with a fine-mesh screen
- Immerse it down to a max. 15 cm above the bottom of the barrel
- Only fill the tank using refueling aids (funnels or filler pipes) with integral microfilter
- Keep all refueling containers clean at all times



Environment!

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

Filler inlet **A** for the fuel tank is located in the valve compartment, on the left in travel direction.

Proceed as follows:

- Open filler inlet **A**
- Pump out the fuel with a suitable pump
- ➡ Collect the fuel in a suitable container

Use only high-grade fuels. In countries without regulations on exhaust gas emissions, diesel fuel with a sulfur content of up to 4000 ppm (0.4 %) can be used.

Grade	Use
<ul style="list-style-type: none"> • 2-D ASTM D975 – 94¹ • 1-D ASTM D975 – 94 	USA
<ul style="list-style-type: none"> • EN 590 : 96² 	EU
<ul style="list-style-type: none"> • ISO 8217 DMX 	International
<ul style="list-style-type: none"> • BS 2869 – A1 • BS 2869 – A2¹ 	England

1. Sulfur content up to 15 ppm (0.0015 %)

2. Sulfur content up to 10 ppm (0.001 %)

- Sulfur content below 0.05 %
- Cetane number over 45



Information!

Using biodegradable diesel fuel is prohibited.

Bleeding the fuel system

Bleed the fuel system in the following cases:

- After removing and fitting the fuel filter, prefilter or the fuel lines back on again
- After running the fuel tank empty
- After running the engine again, after it has been out of operation for a longer period of time

☞ *Bleed the fuel system as follows:*

- Fill the fuel tank
- Turn the starting key to the first position
- Wait about 5 minutes while the fuel system bleeds itself automatically
- Start the engine

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

- Stop the engine
- Bleed the fuel system again as described above
- Have this checked by authorized personnel if necessary

Water separator

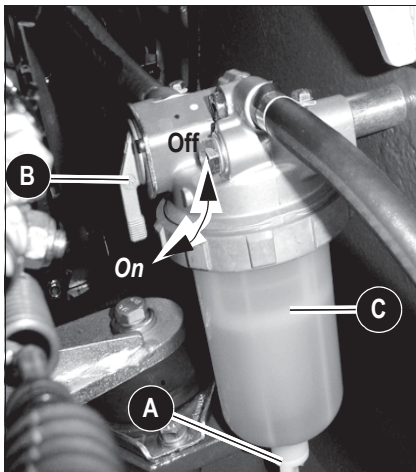


Fig. 265: Water separator

Interrupt fuel supply as follows:

- ☞ *Stop the engine.*
- ☞ *Turn ball-type cock **B** to the **OFF** mark*
 - ➔ Fuel supply is interrupted
- ☞ *Turn ball-type cock **B** to the **ON** mark*
 - ➔ Fuel supply is open again

Check the water separator as follows:

- If the red indicator ring has risen to position **C**:
 - ☞ *Stop the engine.*
 - ☞ *Interrupt fuel supply.*
 - ☞ *Unscrew thread **A***
 - ➔ The fuel/water mixture drains
 - ➔ Wait until the indicator ring returns to the bottom of the water separator
 - ☞ *Screw thread **A** back on again*



Environment!

Thread **A** is fitted with a hose. Collect the fuel/water mixture as it drains with a suitable container and dispose of it in an environmentally friendly manner.

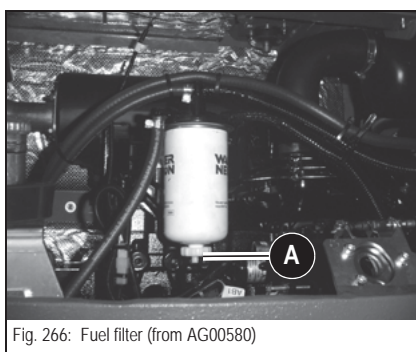


Fig. 266: Fuel filter (from AG00580)

2503 from AG00790:

3503 from AG00593:

The fuel/water mixture must be drained directly on the fuel filter in addition.

Perform this at regular intervals according to the maintenance plan.

Proceed as follows

- ☞ *Stop the engine.*
- ☞ *Place a suitable container underneath the filter.*
- ☞ *Unscrew screw **A**.*
 - ➔ The fuel/water mixture drains from the filter housing.
- ☞ *Drain about 10 ml (0.3 US fl. oz.) of the fuel/water mixture.*


Environment!

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

5.4 Engine lubrication system

NOTICE

If the engine oil level is too low or if an oil change is overdue, this can cause **Engine damage and loss of output!**

- Have the oil changed by a Wacker Neuson service center
– see [chapter 5.17 Maintenance plan \(overview\)](#) on page 5-38 (Tier III) or – see [chapter Maintenance plan \(Tier IV\)](#) on page 5-43 (Tier IV)

Checking the oil level


Information!

Check the oil level once a day.
We recommend checking it before starting the engine. After stopping a warm engine, wait at least 5 minutes before checking.

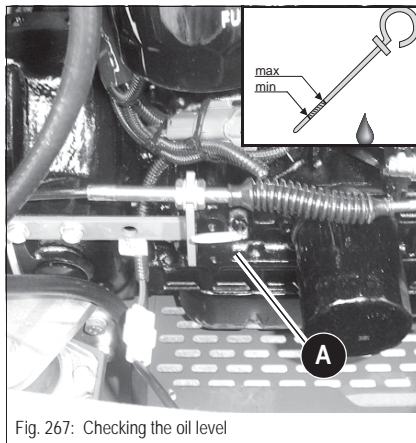


Fig. 267: Checking the oil level

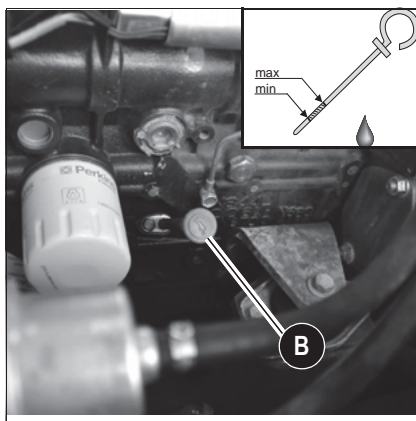


Fig. 268: Checking the oil level

☞ Proceed as follows:

- Park the machine on level ground
- Stop the engine!
- Raise the control lever base
- Let the engine cool down
- Open the engine cover
- Clean the area around the oil dipstick with a lint-free cloth
- Oil dipstick **A** (Tier III) or **B** (Tier IV)

- ☞ Pull it out
- ☞ Wipe it with a lint-free cloth
- ☞ Push it back in as far as possible
- ☞ Withdraw it and read off the oil level

☞ However if necessary, add oil at the latest when the oil reaches the MIN mark on the oil dipstick **A** or **B**

Adding engine oil

NOTICE

Too much or incorrect engine oil can cause engine damage! For this reason:

- Do not add engine oil above the MAX mark of oil dipstick 269/A
- Use only the specified engine oil



Environment!

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

NOTICE

Adding the engine oil too fast via filler inlet **B** in the valve cover can cause engine damage.

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

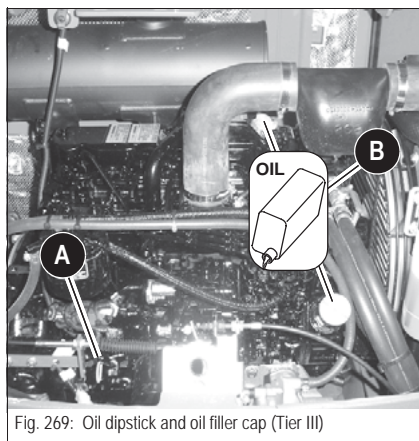


Fig. 269: Oil dipstick and oil filler cap (Tier III)

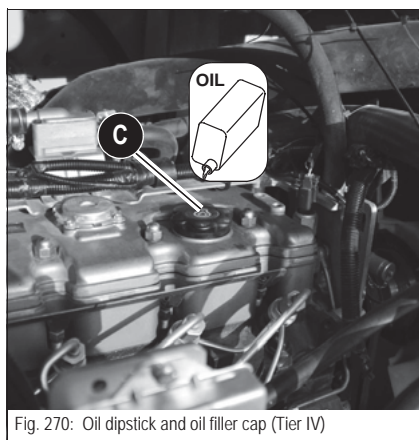


Fig. 270: Oil dipstick and oil filler cap (Tier IV)

Proceed as follows:

- Clean the area around oil filler cap **B** (Tier III) or **C** (Tier IV) with a lint-free cloth
- Open filler cap **B** (Tier III) or **C** (Tier IV)
- Raise oil dipstick **A** slightly to allow any trapped air to escape
- Add engine oil
- Wait about 3 minutes until all the oil has run into the oil sump
- Check the oil level
 - see *Checking the oil level* on page 5-5
- Add oil if necessary and check the oil level again
- Close filler cap **B** (Tier III) or **C** (Tier IV)
- Push oil dipstick **A** back in as far as possible
- Completely remove all oil spills from the engine

5.5 Engine and hydraulics cooling system

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

The coolant reservoir is also located in the engine compartment, in front of the oil cooler.

Specific safety instructions

- Dirt on the radiator fins reduces the radiator's cooling capacity! To avoid this:
 - ☞ Clean the outside of the radiator at regular intervals. Use oil-free compressed air (2 bar/29 psi max.) to clean. Maintain a certain distance from the radiator to avoid damage to the radiator fins. Refer to the maintenance plans in the appendix for the cleaning intervals
 - ☞ In dusty or dirty work conditions, clean more frequently than indicated in the maintenance plans
- An insufficient coolant level reduces the cooling capacity as well and can cause engine damage! Therefore:
 - ☞ Check the coolant level at regular intervals. Refer to the maintenance plans in the appendix for the intervals
 - ☞ If coolant must be added frequently, check the cooling system for leaks and/or contact your dealer!
 - ☞ Never add cold water/coolant if the engine is warm!
 - ☞ After filling the coolant reservoir, make a test run with the engine and check the coolant level again after stopping the engine
- The use of the wrong coolant can destroy the engine and the radiator. Therefore:
 - ☞ Add enough antifreeze compound to the coolant – but never more than 50 %. If possible use brand-name antifreeze agents since they already contain anticorrosion agents
 - ☞ Observe the coolant compound table
– see [chapter 6.7 Coolant compound table](#) on page 6-9
 - ☞ Do not use radiator cleaning compounds if an antifreeze compound has been added to the coolant – otherwise this causes sludge to form that can damage the engine
- Once you have filled the coolant reservoir:
 - ☞ Test run the engine
 - ☞ Stop the engine
 - ☞ Let the engine cool down
 - ☞ Check the coolant level again



Environment!

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

5.6 Checking the coolant level/adding coolant



WARNING

Burn hazard due to hot fluid.

Can cause serious injury or death.

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



WARNING

Injury hazard when handling flammable and toxic fluids!

Can cause serious injury or death.

- Keep away from flames
 - Avoid eye contact with antifreeze
 - If antifreeze comes into contact with the eyes
 - ➔ Immediately rinse with clean water and seek medical assistance
-

Checking the coolant level

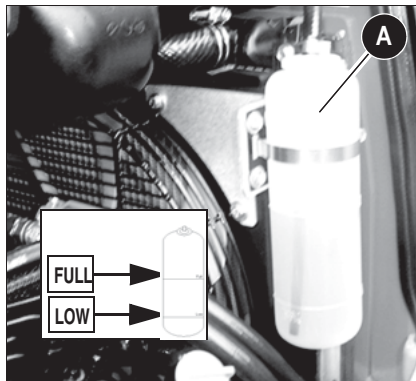


Fig. 271: Coolant reservoir

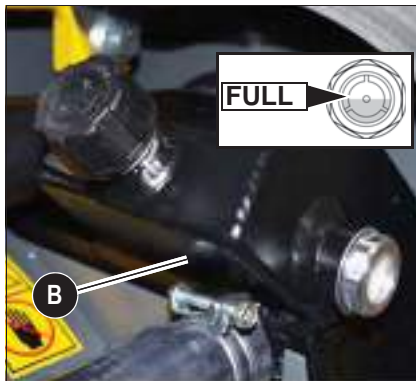


Fig. 272: Radiator

☞ Proceed as follows:

- Park the machine on level ground
- Stop the engine!
- Raise the control lever base
- Remove the key and carry it with you
- Let the engine and the coolant cool down
- Open the engine cover
- Tier III: Check the coolant level on the transparent coolant reservoir **A** and on the radiator

☞ If the coolant level is below the **LOW** seam or if there is no coolant at the radiator's filler inlet:

➔ Add coolant

- Tier IV: check the coolant level on sight glass **B**

☞ If the coolant level is below the **FULL** mark:

➔ Add coolant



Information!

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

NOTICE

Do not mix the coolant with other coolants.

- Use only the coolant prescribed by Wacker Neuson
– see [chapter 5.16 Fluids and lubricants](#) on page 5-35.

Adding coolant

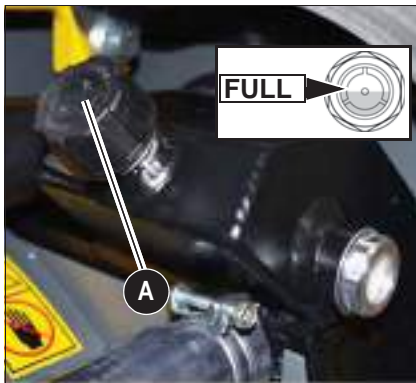


Fig. 273: Radiator

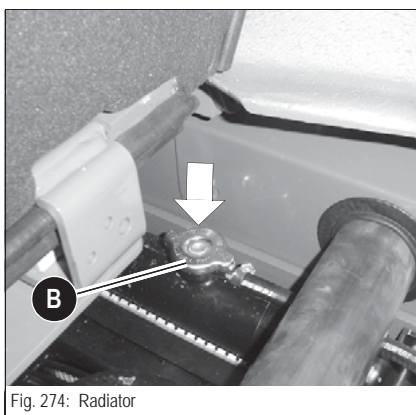


Fig. 274: Radiator

After the engine has cooled down:

- ☞ Release overpressure in the radiator
- ☞ Carefully open filler cap **A** (Tier IV) or **B** (Tier III) to the first notch and fully release the pressure
- ☞ Open filler cap **A** or **B**
- ☞ Tier IV: add coolant up to the middle of the sight glass
- ☞ Tier III: Add coolant up to the lower edge of the filler inlet (radiator)
- ☞ Close filler cap **A** or **B**
- ☞ Start the engine and let it warm up for about 5 – 10 minutes.
- ☞ Stop the engine
- ☞ Remove the key and carry it with you
- ☞ Let the engine cool down
- ☞ Check the coolant level again
 - ➔ The coolant level must be between the **Low and Full** reservoir seams
- ☞ If necessary, add coolant and repeat the procedure until the coolant level remains constant



Information!

Check the antifreeze every year before the cold season sets in

Draining coolant

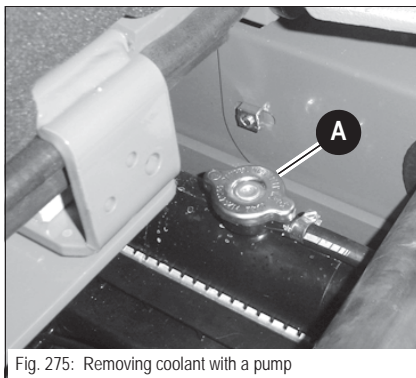


Fig. 275: Removing coolant with a pump



WARNING

Burn hazard due to hot fluid.

Can cause serious injury or death.

- Always use appropriate protective equipment, protective gloves, for example!
- No smoking, no fire!



Environment!

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

Proceed as follows:

- ☞ Stop the engine
- ☞ Let the coolant cool down
- ☞ Open filler inlet **A**
- ☞ Pump out the coolant with a suitable pump
 - ➔ Collect the coolant in a suitable container

5.7 Air filter

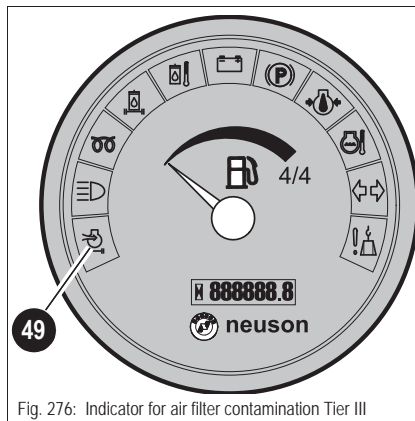


Fig. 276: Indicator for air filter contamination Tier III

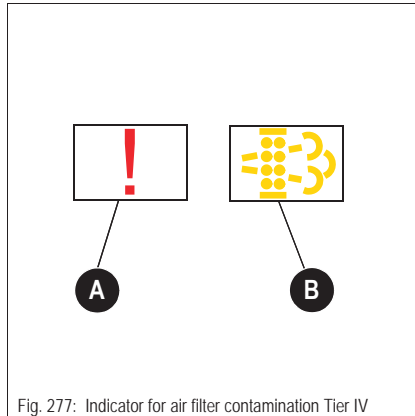


Fig. 277: Indicator for air filter contamination Tier IV

NOTICE

The filter cartridge will be damaged if it is washed or brushed out! Bear in mind the following to avoid premature engine wear!

- Do not clean the filter cartridge
- Replace the filter cartridge according to the maintenance plan
- Never reuse a damaged filter cartridge
- Ensure cleanliness when replacing the filter cartridge!

Replace the air filter as indicated in the maintenance plan or if dirt indicator **49** (Tier III) or indicator lights **A** and **B** on the multifunctional display (Tier IV) illuminate.



Information!

The air filter is fitted with an extra inside filter **C** to protect the engine in case the outside filter is damaged. In order to avoid engine damage, do not clean inside filter **C**, but replace it as indicated in the maintenance plan.

NOTICE

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

- Replace the air filter after 50 operating hours at the latest!

Air filter maintenance:

- Store filters in their original packaging and in a dry place
- Do not knock the filter against other objects as you install it
- Check air filter attachments, air intake hoses and air filters for damage, and immediately repair or replace if necessary
- Check the screws at the induction manifold and the clamps for tightness
- Check the function of the dust valve, replace if necessary

Replacing the filter

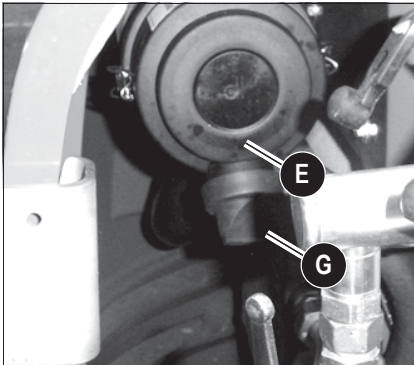


Fig. 278: Removing the lower housing section

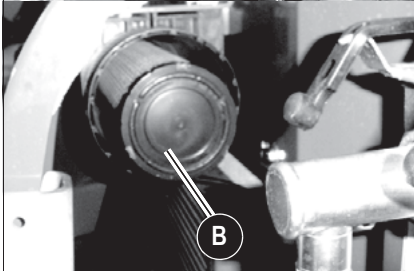


Fig. 279: Removing the filter element

- Replace outside filter *B* as follows:
 - ▣ Stop the engine
 - ▣ Remove the key and carry it with you
 - ▣ Let the engine cool down
 - ▣ Open the engine cover
 - ▣ Remove dirt and dust from the air filter and the area around the air filter
 - ▣ Turn the lower housing section *E* to the left
 - ▣ Remove lower housing section *E*
 - ▣ Carefully remove outside filter *B* with slightly turning movements
 - ▣ **Ensure that all dirt (dust) inside the upper and lower housing sections (*F* and *E*), including dust valve *G*, has been removed**
 - ▣ Clean the parts with a clean lint-free cloth, do not use compressed air
 - ▣ Check the air filter cartridges for damage, only install intact filters
 - ▣ Carefully insert the new outside filter *B* in the upper housing section *F*
 - ▣ Position lower housing section *E* (ensure that it is properly seated)
 - ▣ Turn the lower housing section *E* to the right

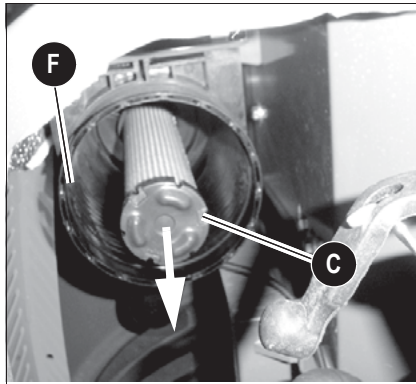


Fig. 278: Replacing the inside filter

- Replace inside filter **C** as follows:
 - ☞ Stop the engine
 - ☞ Remove the key and carry it with you
 - ☞ Let the engine cool down
 - ☞ Open the engine cover
 - ☞ Remove dirt and dust from the air filter and the area around the air filter
 - ☞ Turn the lower housing section **E** to the left
 - ☞ Remove lower housing section **E**
 - ☞ Carefully remove outside filter **B** with slightly turning movements
 - ☞ Carefully remove inside filter **C**
 - ☞ Cover the air supply at the end of the filter with a clean lint-free cloth to prevent dust from entering the engine
 - ☞ **Ensure that all dirt (dust) inside the upper and lower housing sections (F and E), including dust valve G, has been removed**
 - ☞ Clean the parts with a clean lint-free cloth, do not use compressed air
 - ☞ Remove the cloth from the air supply
 - ☞ Check the air filter cartridges for damage, only install intact filters
 - ☞ Carefully insert the new inside filter **C** in the inside housing section **F**
 - ☞ Carefully insert the outside filter **B** in the upper housing section **F**
 - ☞ Position lower housing section **E** (ensure that it is properly seated)
 - ☞ Turn the lower housing section **E** to the right



Information!

Ensure that dust valve **G** shows downward once it is installed!

5.8 V-belt

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

5.9 Hydraulic system

Specific safety instructions



- Release the pressure in all lines carrying hydraulic oil prior to any maintenance and repair work. To do this:
 - Lower all hydraulically controlled attachments to the ground
 - Move all control levers of the hydraulic control valves several times
- Raise the control lever base
- Hydraulic oil escaping under high pressure can penetrate the skin and cause serious injury. Always consult a doctor immediately even if the wound seems insignificant – otherwise serious infections could set in!
- If the hydraulic oil in the sight glass is cloudy, this indicates that water or air has penetrated the hydraulic system. This can cause damage to the hydraulic pump!
- Oil or fuel flowing out of high pressure lines can cause fire or malfunctions, and serious injury or damage to property. Interrupt work immediately if loose nuts or damaged hoses and lines are detected.
 - ☞ Contact your Wacker Neuson dealer immediately
- Replace the hose or line if one of the problems mentioned below is detected.
 - ☞ Damaged or leaky hydraulic seals.
 - ☞ Worn or torn shells or uncovered reinforcement branches.
 - ☞ Expanded shells in several positions.
 - ☞ Entangled or crushed movable parts.
 - ☞ Foreign bodies jammed or stuck in protective layers.

NOTICE

Dirty hydraulic oil, lack of oil or wrong hydraulic oil –

Risk of serious damage to the hydraulic system!

- Take care to avoid dirt when working!
- Always add hydraulic oil using the filling screen!
- Only use authorized oils of the same type
– see *chapter 5.16 Fluids and lubricants* on page 5-35
- Always add hydraulic oil before the level gets too low
– see *Adding hydraulic oil* on page 5-16
- If the hydraulic system is filled with biodegradable oil, then use only biodegradable oil of the same type for adding oil – observe the sticker on the hydraulic oil reservoir!
- Contact customer service if the hydraulic system filter is contaminated with metal chippings. Otherwise, follow-on damage can result!


Environment!

Collect drained hydraulic oil and biodegradable oil in a suitable container!
Dispose of drained oil and used filters by an ecologically safe method.
Always contact the relevant authorities or commercial establishments in charge of oil disposal before disposing of biodegradable oil.

Checking the hydraulic oil level
NOTICE

Do not add oil if the oil level is above the **MAX** mark, otherwise the hydraulic system can be damaged and escaping oil can cause serious injury.

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

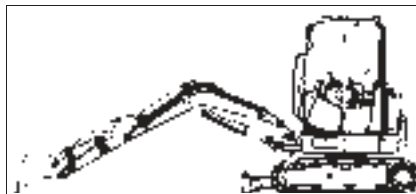


Fig. 279: Parking the excavator

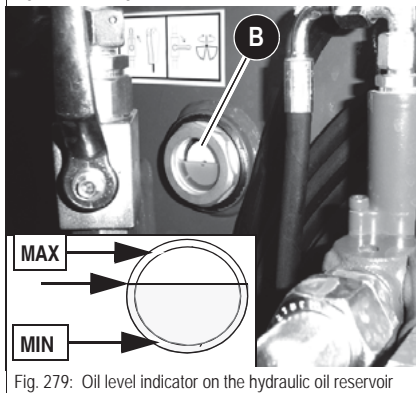


Fig. 279: Oil level indicator on the hydraulic oil reservoir

Proceed as follows:

- Park the machine on level ground
- Retract the bucket and boom cylinders, lower the boom and the bucket teeth to the ground
- Lower the stabilizer blade to the ground
- Set the boom straight (swiveling cylinder)
- Release the pressure in the operating hydraulics – see *chapter Releasing pressure* on page 3-88.
- Stop the engine, remove the starting key and carry it with you.
- Raise the control lever base
- Sight glass **B** is located in the rear left corner of the machine in the trim.
- Check the oil level on sight glass **B**
- The oil level must be about 1 cm (0.4 in) over the center, between positions **MIN** and **MAX**, as shown by the arrows in fig. 279.

➔ The **MIN** level is marked by the lower joint

➔ The **MAX** level is marked by the upper joint

If the oil level is lower

- Add hydraulic oil

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

Machine condition	Temperature	Oil level
• Before putting into operation	Between 10 and 30 °C (50 – 86 °F)	LOW mark
• Normal operation	Between 50 and 90 °C (122 – 194°F)	FULL mark


Information!

Measure the oil level of the hydraulic system only after the machine reaches its operating temperature.

Adding hydraulic oil



WARNING

Injury hazard when removing the filler plug!

Can cause serious injury or death.

- Carefully unscrew the plug to slowly reduce the pressure inside the reservoir.

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

Add as follows:

- Park the machine on level ground
- Retract the bucket and boom cylinders, lower the boom and the bucket teeth to the ground
- Lower the stabilizer blade to the ground
- Set the boom straight (swiveling cylinder)
- Release the pressure in the operating hydraulics – *see chapter Releasing pressure* on page 3-88.
- Stop the engine, remove the starting key and carry it with you
- Raise the control lever base
- Let the engine cool down
- Slowly open cap **C** of the hydraulic reservoir



Fig. 280: Parking the excavator

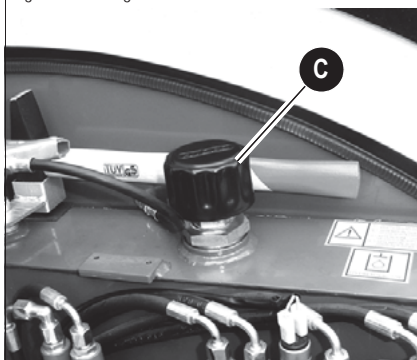


Fig. 280: Hydraulic oil reservoir

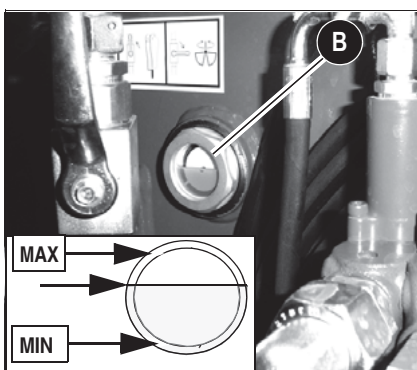


Fig. 281: Oil level indicator on the hydraulic oil reservoir

With the filter insert in place:

- Add hydraulic oil
- Check the hydraulic oil level on sight glass **B**
- Add if necessary and check again
- Close cap **C** of the hydraulic reservoir hand tight again



Important information on the use of biodegradable oil

- Use only the biodegradable hydraulic fluids which have been tested and approved by Wacker Neuson. Always contact Wacker Neuson for the use of other products that have not been recommended. In addition, ask the oil supplier for a written declaration of guarantee. This guarantee is applicable to damage occurring on the hydraulic components that can be proved to be due to the hydraulic fluid.
- Use only biodegradable oil of the same type for adding oil. In order to avoid misunderstandings, a label providing clear information is located on the hydraulic oil reservoir (next to the filler inlet) regarding the type of oil currently used! Replace missing labels! The joint use of two different biodegradable oils can affect the quality of one of the oil types. Therefore, ensure that the remaining amount of initial hydraulic fluid in the hydraulic system does not exceed 8 % when changing biodegradable oil (manufacturer indications).
- Do not add mineral oil – the content of mineral oil should not exceed 2 % by weight in order to avoid foaming problems and to ensure biological degradability.
- When running the machine with biodegradable oil, the same oil and filter replacement intervals are valid as for mineral oil – *see chapter 5.17 Maintenance plan (overview)* on page 5-38
- Always have the condensation water in the hydraulic oil reservoir drained by a Wacker Neuson service center before the cold season. The water content may not exceed 0.1 % by weight.
- The instructions in this Operator's Manual concerning environmental protection are also valid for the use of biodegradable oil.
- If additional hydraulic attachments are installed or operated, use the same type of biodegradable oil for these attachments to avoid mixtures in the hydraulic system.

Subsequent change from mineral oil to biodegradable oil must be performed by a Wacker Neuson service center or by your Wacker Neuson partner.

Checking hydraulic pressure lines

Specific safety instructions



WARNING

Danger of fluid escaping under high pressure when checking hydraulic pressure lines!

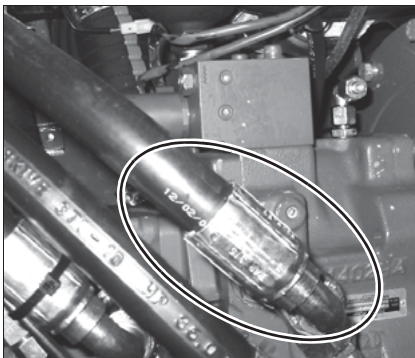
Can cause serious injury or death.

- Always consult a doctor immediately, even if the wound seems insignificant. Hydraulic oil causes blood poisoning.
- Do not search for hydraulic leaks with your bare hands. Always wear protective gloves and search for hydraulic leaks with a piece of cardboard.
- Always observe the following instructions:
 - Retighten leaking threaded fittings and hose connections only when the system is not under pressure. In other words, release the pressure before working on pressurized lines!
 - Never weld or solder damaged or leaking pressure lines and threaded fittings. Replace damaged parts with new ones!
 - Have damaged flexible lines replaced by a Wacker Neuson service center only!

- Leaks and damaged pressure lines must be immediately repaired or replaced by a Wacker Neuson service center or after-sales personnel. This not only increases the operating safety of your machine but also helps to protect the environment
- Replace hydraulic hoses every 6 years from the date of manufacture, even if they do not seem to be damaged

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

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



5.10 Tracks

Track wear can vary according to work and ground conditions.

☞ We recommend checking track wear and tension once a day.

Checking track tension

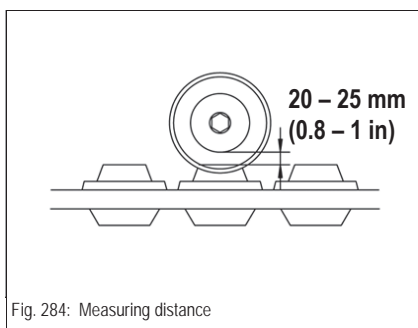
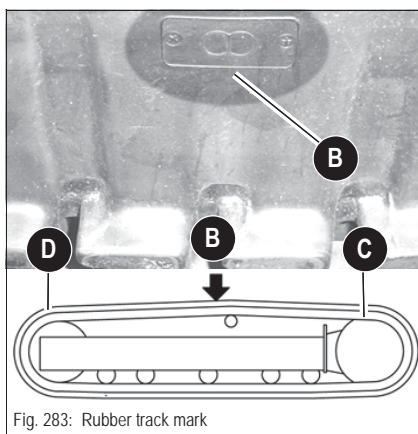
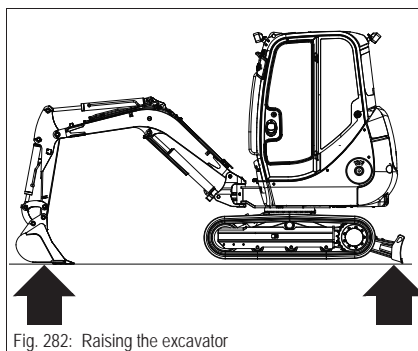


WARNING

Crushing hazard during work under the machine!

Can cause serious injury or death.

- Do not allow anyone to stay in the danger zone!
- Support the machine so as to allow the tracks to sag freely.



- Park the machine on firm, level and horizontal ground.
- Stop and park the machine. Stop the engine.
- Raise the machine evenly and horizontally by means of the boom and stabilizer blade.

Rubber track

- Position the machine so that mark **B** of the rubber track is in the middle between the drive pinion **C** and the track tension roller **D**.
- Stop the engine.
- Operate the control lever repeatedly to release the pressure in the hydraulic system.
- Raise the control lever base.
- Remove the starting key and carry it with you.

- Adjust the correct track tension if the play between the track roller and the track is not 20 – 25 mm (0.8 - 1 in).

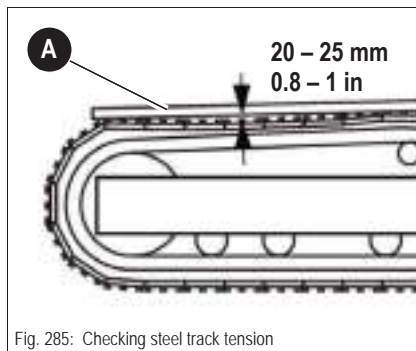


Fig. 285: Checking steel track tension

Steel track (option)

- Place a measuring rod **A** across the highest points of the track.
- Adjust the correct track tension if the play between the track roller and the track is not 20 – 25 mm (0.8 - 1 in).

Setting the tracks



WARNING

Risk of lubricant escaping under high pressure!

Can cause serious injury or death.

- Do not loosen and unscrew the lubricating valve by more than one turn.
- Only the lubricating valve may be loosened.
- Keep your face away from the lubricating valve connection.
 - ➔ Contact a Wacker Neuson service center if this does not reduce track tension.

NOTICE

Excessive tension of the tracks causes serious damage to the cylinder and the track.

- Tighten the tracks only up to the prescribed measuring distance

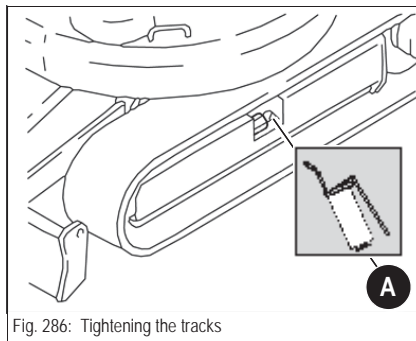


Fig. 286: Tightening the tracks

Tightening the tracks

- ➔ Inject grease with the pump through lubricating valve **A**
- ➔ Check the tension is correct by starting the engine, letting it run at idling speed and slowly performing forward and reverse machine travel and switching it off again
- ➔ Check the tension of the tracks again
 - ➔ If it is not correct:
 - ➔ Adjust again
- ➔ Should the track still be slack after injecting more grease, replace the track or the seal in the cylinder. Contact a Wacker Neuson dealer in this case.

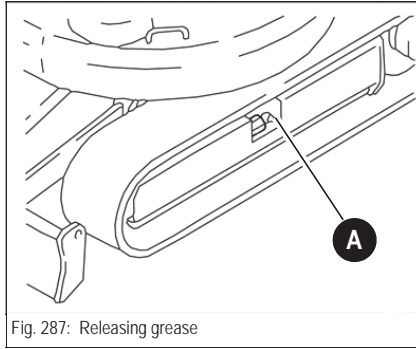


Fig. 287: Releasing grease

Reducing tension

- Draining grease in a way different from the one described below is very dangerous. Also bear in mind the safety instructions on this page.
- ☞ *Slowly open the lubricating valve A by 1 turn to allow the grease to flow out.*
 - ☞ Place a suitable container underneath to collect the grease
 - ➔ The grease flows out of the groove of the lubricating valve
- ☞ *Retighten lubricating valve A*
- ☞ *Check the tension is correct by starting the engine, letting it run at idling speed and slowly performing forward and reverse machine travel and switching it off again*
- ☞ *Check the tension of the tracks again*
 - ➔ If it is not correct:
 - ☞ Adjust again


Environment!

Use a suitable container to collect the grease as it flows out and dispose of it in an environmentally friendly manner.

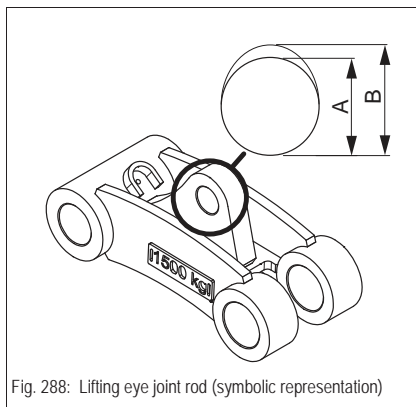
Maintenance of joint rod (lifting eye) and load hook


Fig. 288: Lifting eye joint rod (symbolic representation)

Wear of joint rod (lifting eye)

Immediately replace lifting eyes with inadmissible wear (for example if they are beyond the max. tolerance), damage, deformations, surface cracks and corrosion.

The nominal size must not be worn more than 5 % (max. tolerance). Measurement can be performed with the accuracy of a slide gage.

Welding is prohibited!

Joint rod (lifting eye)	Nominal size A	Max. tolerance B
2503	32 mm (1 1/4 in)	33.6 mm (1 3/8 in)
3503 up to WNCE0307JPAL00239	32 mm (1 1/4 in)	33.6 mm (1 3/8 in)
3503 from WNCE0307JPAL00240	30 mm (1 1/8 in)	31.5 mm (1 1/4 in)

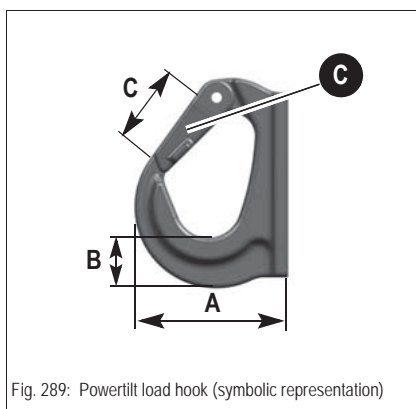


Fig. 289: Powertilt load hook (symbolic representation)

Load hook wear

Have load hooks (Powertilt, Powertilt for Easylock) with inadmissible wear (for example if they are beyond the max. tolerance), damage, deformations, surface cracks and corrosion immediately replaced by a Wacker Neuson service center.

The nominal size must not be worn more than 10 % (max. tolerance). Measurement can be performed with the accuracy of a slide gage.

Welding is prohibited!

If the spring mechanism of snap link C does not automatically close any more, stop working with the load hook and have the error repaired by a Wacker Neuson service center.

Load hook	Nominal size A	Max. tolerance A	Nominal size B	Max. tolerance B	Nominal size C	Max. tolerance C
2503/3503	105 mm (4 1/8 in)	115.5 mm (4 1/2 in)	32 mm (1 1/4 in)	28.8 mm (1 1/8 in)	30 mm (1 1/8 in)	33 mm (1 1/4 in)

5.11 Traveling drive

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

5.12 Electrical system

Specific safety instructions



- The battery contains sulfuric acid! This acid must not be allowed to come into contact with the skin, the eyes, clothing or the machine
Therefore when recharging or working near the battery:
 - ☞ Always wear safety glasses and protective clothing with long sleeves
- If acid is spilled:
 - ☞ Thoroughly rinse all affected surfaces immediately with plenty of water
 - ☞ Thoroughly wash any part of the body touched by the acid immediately with plenty of water and seek medical attention at once!
- Especially when charging batteries, as well as during normal operation of batteries, an oxyhydrogen mixture is formed in the battery cells – explosion hazard!
- Do not attempt to jump-start the machine if the battery is frozen or if the acid level is low. The battery can burst or explode!
 - ☞ Replace the battery immediately
- Avoid open flames and sparks and do not smoke near open battery cells – otherwise the gas produced during normal battery operation can ignite!
- Use only 12 V power sources. Higher voltages will damage the electrical components
- When connecting the battery leads, ensure that the poles +/- are not inverted, otherwise sensitive electrical components will be damaged
- Do not interrupt voltage-carrying circuits at the battery terminals because of the sparking hazard!
- Never place tools or other conductive articles on the battery – risk of short circuit!
- Disconnect the negative (-) battery terminal from the battery before starting repair work on the electrical system
- Dispose of used batteries properly

Servicing and maintenance at regular intervals



Before performing machine travel

☞ Check every time before performing machine travel:

- Is the light system OK?
- Is the signaling and warning system OK?



Every week

☞ Check once a week:

- Electric fuses
– see chapter Fuse box in cabin on page 6-6
- Cable and grounding connections
- Battery state of charge – see Battery on page 5-24
- Condition of battery terminals



Instructions concerning specific components

Cables, bulbs and fuses

Always observe the following instructions:

- Malfunctioning components of the electrical system must always be replaced by a Wacker Neuson service center. Bulbs and fuses may be changed by unqualified persons
- When performing maintenance on the electrical system, pay particular attention to ensuring good contact in leads and fuses
- Blown fuses indicate overloading or short circuits. The electrical system must therefore be checked before installing the new fuse
- Only use fuses with the specified load capacity (amperage)
– *see chapter Fuse box in cabin* on page 6-6

Alternator

Always observe the following instructions:

- Only test run the engine with the battery connected
- When connecting the battery, ensure that the poles (+/-) are not inverted
- Always disconnect the battery before performing welding work or connecting a quick battery charger
- Have malfunctioning charge indicator lights immediately replaced
– *see chapter 35 Indicator light (red) – alternator charge function 3-12* on page 3-7

Battery



WARNING

Caustic injury hazard!

Can cause serious injury or death.

- Always wear safety glasses and protective clothing with long sleeves
- If acid is spilled:
- Thoroughly rinse all affected surfaces immediately with plenty of water
 - Thoroughly wash any part of the body touched by the acid immediately with plenty of water and seek medical attention at once!



WARNING

Explosion hazard when handling batteries!

Can cause serious injury or death.

- Avoid open lights and sparks near the battery and do not smoke!
- Do not attempt to jump-start the machine if the battery is frozen or if the acid level is low. The battery can burst or explode!
 - Replace the battery immediately
- Disconnect the negative terminal (-) from the battery before starting repair work on the electrical system.

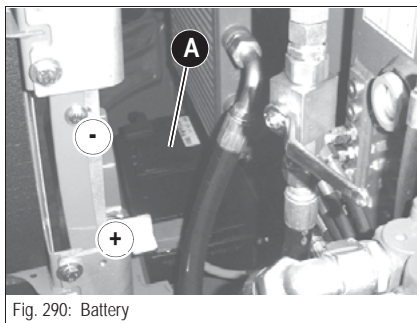


Fig. 290: Battery

Battery **A** is located under the cabin, in front of the fuel tank. The battery is "maintenance-free". However have the battery checked at regular intervals to ensure that the electrolyte level is between the MIN and MAX marks.

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

Always follow the specific battery safety instructions!



Information!

Do not disconnect the battery while the engine is running!

5.13 General maintenance

Cleaning

Cleaning the machine is divided into 3 separate areas:

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

The wrong choice of cleaning equipment and agents can impair the operating safety of the machine on the one hand, and on the other undermine the health of the persons in charge of cleaning the machine. Therefore always observe the following instructions.

General instructions for all areas of the machine

Cleaning with washing solvents

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

Cleaning with compressed air

- Work carefully
- Wear safety glasses and protective clothing
- Do not aim the compressed air at the skin or at other people
- Do not use compressed air for cleaning your clothing

Cleaning with a high-pressure cleaner or steam jet

- Electrical components and damping material must be covered and not directly exposed to the jet
- Cover the vent filter on the hydraulic oil reservoir and the filler caps for fuel, hydraulic oil, etc.
- Protect the following components from moisture:
 - Engine
 - Electrical components such as the alternator, etc.
 - Control devices and seals
 - Air intake filters, etc.

Cleaning with volatile and easily flammable anticorrosion agents and sprays:

- Ensure sufficient room ventilation
- Do not use unprotected lights or open flames
- Do not smoke!

Inside the cabin

NOTICE

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

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

We recommend using the following aids to clean the cabin:

- Broom
- Vacuum cleaner
- Damp cloth
- Bristle brush
- Water with mild soap solution

Cleaning the seat belt

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

Exterior of the machine

The following articles are generally suitable:

- High-pressure cleaner
- Steam jet

Engine compartment



WARNING

Injury hazard due to rotating parts!

Can cause serious injury or death.

- Stop the engine before cleaning it
 - Open the engine cover only if the engine is at a standstill.
-

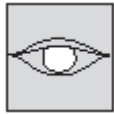
NOTICE

When cleaning the engine with a water or steam jet

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

The humidity penetrating any such sensors causes them to fail and leads to engine damage!

Threaded fittings and attachments



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

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

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

Pivots and hinges



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

5.14 Lubrication points

Lubricate the lubrication points with the green caps once a week.

Lubricate the lubrication points with the blue caps daily.




WARNING

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

Can cause serious injury or death.

- Do not rotate the upper carriage.
- Do not tilt the upper carriage if the machine is equipped with the **VDS** option.
- – see [chapter 3.23 Parking the machine](#) on page 3-34

NOTICE

Lubricate only over a pit.

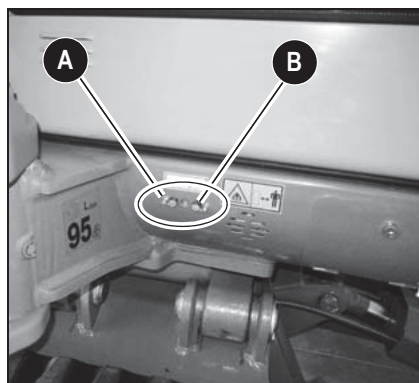
Lubrication points on slewing cylinder/ball bearing race of live ring


Fig. 291: Lubrication points on upper carriage

Lubrication points:

A (swiveling cylinder) lubricate once a day

B (ball bearing race of live ring) lubricate every 50 o/h or once a week.

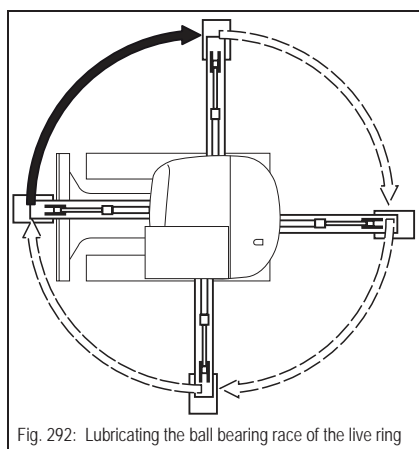


Fig. 292: Lubricating the ball bearing race of the live ring

Lubricating the ball bearing race of the live ring

- 1 Drive the machine over a pit.
- 2 Lower the stabilizer blade to the ground.
- 3 Lower and support the boom to prevent it from lowering into the pit.
- 4 Stop the engine, remove the starting key and carry it with you.
- 5 Apply grease to lubrication point **B** with one stroke of the grease gun.
- 6 Start the engine, raise the boom and the stabilizer blade.
- 7 Rotate the upper carriage by 90°.
- 8 Repeat steps 2 – 7 three times until the upper carriage is back in its initial position.
- 9 Rotate the upper carriage several times by 360°.

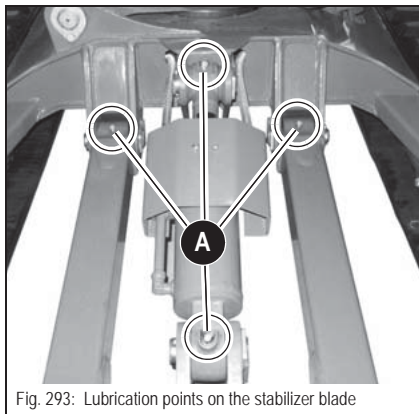
Lubrication points on the stabilizer blade

Fig. 293: Lubrication points on the stabilizer blade

Lubricate lubrication points **A** once a day.

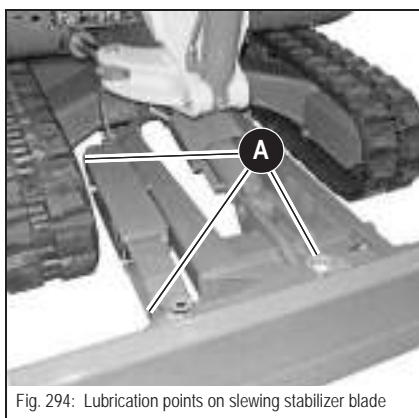
Additional lubrication points on slewing stabilizer blade (option 3503)

Fig. 294: Lubrication points on slewing stabilizer blade

Apply grease to lubrication points **A** every 50 o/h or once a week.

Lubricating the teeth of the live ring**WARNING**

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

Can cause serious injury or death.

- Do not rotate the upper carriage.
- Do not tilt the upper carriage if the machine is equipped with the **VDS** option.
- – see [chapter 3.23 Parking the machine](#) on page 3-34

NOTICE

Lubricate only over a pit.

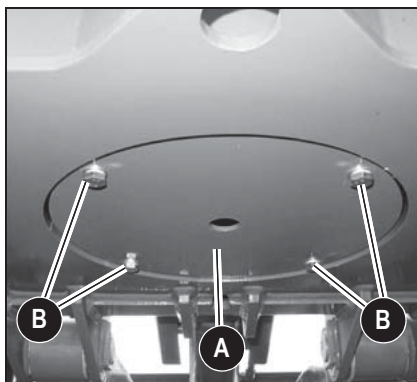


Fig. 295: Removing the cover

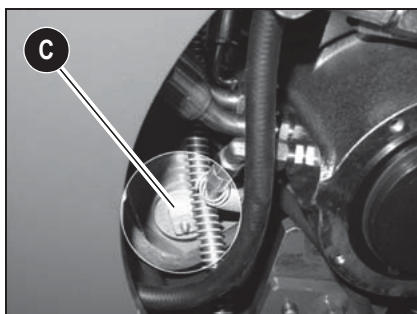


Fig. 296: Lubrication point of live ring teeth

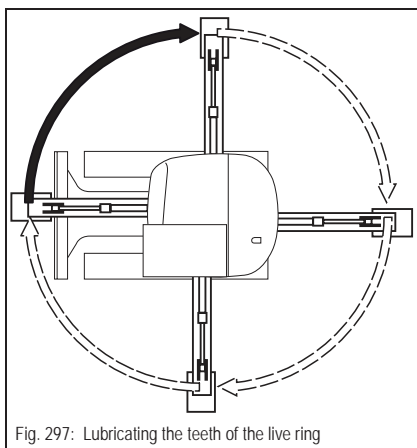


Fig. 297: Lubricating the teeth of the live ring

- 1 Drive the machine over a pit.
- 2 Lower the stabilizer blade to the ground.
- 3 Lower and support the boom to prevent it from lowering into the pit.
- 4 Stop the engine, remove the starting key and carry it with you.

The lubrication point is located on the lower side of the travel gear.
Remove cover **A** by means of screws **B** on the lower side.

- 5 Apply grease to lubrication point **C** with five strokes of the grease gun.
- 6 Start the engine, raise the boom and the stabilizer blade.

- 7 Rotate the upper carriage by 90°.
 - 8 Repeat steps 2 – 7 three times until the upper carriage is back in its initial position.
 - 9 Rotate the upper carriage several times by 360°.
- Install cover **A**.

Lubricating the teeth of the live ring VDS

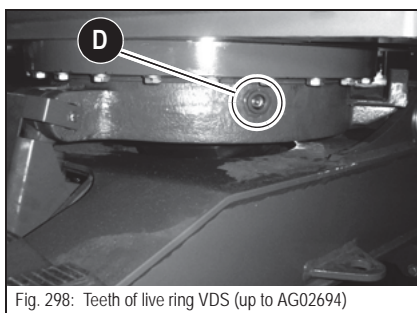


Fig. 298: Teeth of live ring VDS (up to AG02694)

Up to serial no. AG02694

- ☛ The lubrication point is located on one side of the VDS console.

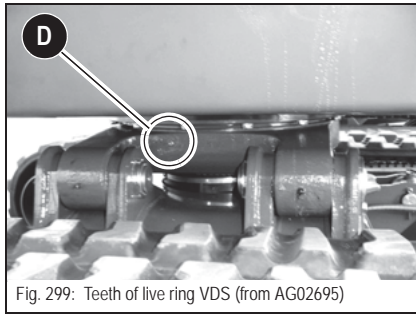


Fig. 299: Teeth of live ring VDS (from AG02695)

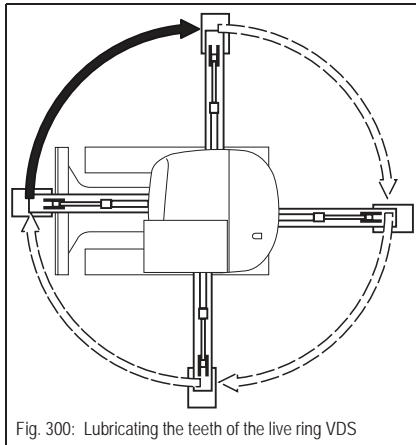


Fig. 300: Lubricating the teeth of the live ring VDS

From serial no. AG02695

☞ The lubrication point is located at the front of the VDS console.

- 1 Drive the machine over a pit.
- 2 Lower the stabilizer blade to the ground.
- 3 Lower and support the boom to prevent it from lowering into the pit.
- 4 Stop the engine, remove the starting key and carry it with you.
- 5 Apply grease to lubrication point **D** with five strokes of the grease gun.
- 6 Start the engine, raise the boom and the stabilizer blade.
- 7 Rotate the upper carriage by 90°.
- 8 Repeat steps 2 – 7 three times until the upper carriage is back in its initial position.
- 9 Rotate the upper carriage several times by 360°.

VDS lubrication points (option)

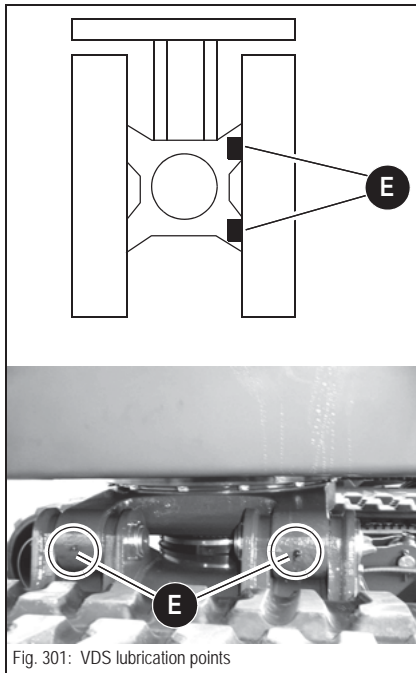


Fig. 301: VDS lubrication points

Apply grease to lubrication points **E** once a week.

– see *Tilting the upper carriage (option 3503)* on page 3-87

Powertilt (option 3503)

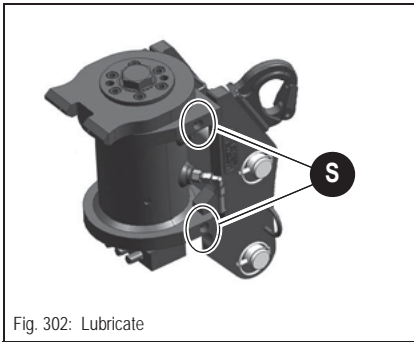


Fig. 302: Lubricate

Perform maintenance on the Powertilt unit once a day with the other maintenance for the machine.

Perform visual checks for possible malfunctions, damage or cracks.

Remove all dirt on and around moving parts.

Apply grease via grease zerks **S**.

Lubrication points of hydraulic quickhitch (option)

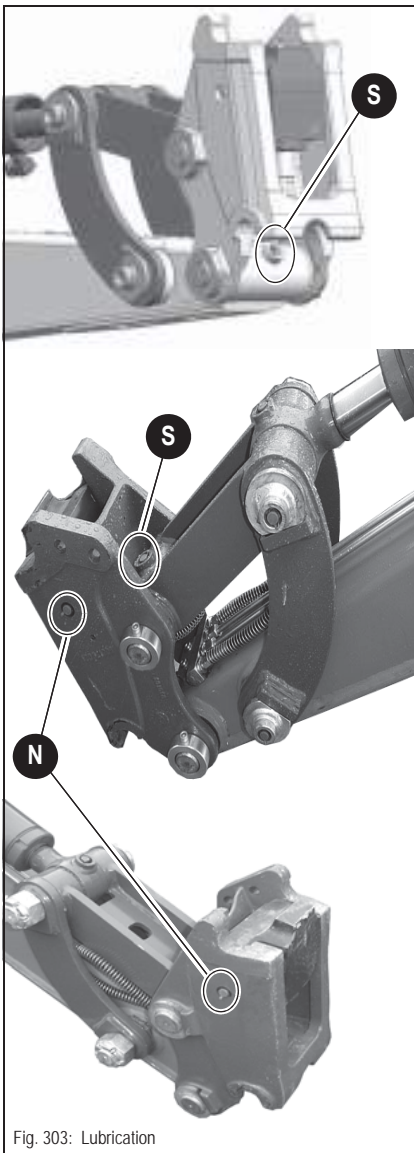


Fig. 303: Lubrication



Information!

Before picking up an attachment, the operator must ensure that it can be hitched correctly by removing all dirt on either claw of the quickhitch.

Perform maintenance on the quickhitch once a day with the other maintenance for the machine.

Perform visual checks for possible malfunctions, damage or cracks.

Remove all dirt on and around moving parts.

The claws must be clean and slightly greased.

Apply grease to the pins via grease zerks **S**.

Apply grease to the friction surfaces of the lock mechanism via 2 further grease zerks **N** on either side of the quickhitch (see [Fig. 303](#)).

Before starting work, check the acoustic signal, which must be audible when pressing switch **50**.

5.15 Maintenance when out of service for a longer period of time

NOTICE

If the machine is out of operation, run it once a month without load. Remove the grease from the piston rods first!

Preparatory work before taking out of service

- ☞ *Carefully clean and dry the entire machine.*
- ☞ *Apply grease to all lubrication points*
- ☞ *Change the engine oil*
- ☞ *Apply grease to the piston rods of the hydraulic cylinders*
- ☞ *Check and if necessary, fill up all oil levels such as in the gearbox and other units*
- ☞ *Check the hydraulic oil level and if necessary, add oil*
- ☞ *Fill up the fuel tank completely to avoid corrosion on the walls*
- ☞ *Check the antifreeze in the coolant, change as required*
- ☞ *Check the tire pressure for the prescribed value and protect the tires from direct sunlight*
- ☞ *Remove the grounding strap from the battery, or remove the battery and store it in a safe place. Charge the battery and perform battery maintenance at regular intervals.*
- ☞ *Close the exhaust pipe and the air intake opening of the air filter system*



Information!

Store the machine indoors if possible. If storing the machine outdoors cannot be avoided, place it on wooden boards and cover it with a tarp.

Permanently putting out of operation

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

Have disposal only performed by a Wacker Neuson service center.



Environment!

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

If the machine is no longer used according to its designated use, ensure that it is put out of operation and disposed of according to applicable regulations.

- ➔ Observe all applicable safety regulations during machine disposal.
- ➔ Machine disposal must be performed in accordance with state-of-the-art standards that apply at the time of disposal.



Putting into operation again

- ☞ Remove the grease from the piston rods.
- ☞ Install or connect the battery.
- ☞ Remove the seals from the exhaust pipe and the air filter intake.
- ☞ Check the condition of the air filter cartridges and replace them if necessary.
- ☞ If the machine was out of service for over 6 months, change the oil in the gearbox, engine and other units.
- ☞ Also replace hydraulic oil filters (return and breather filters) if the machine has been out of service for over 6 months.
- ☞ Lubricate the machine according to the lubrication plan.
- ☞ Add a little engine oil.
- ☞ Check the levels.
- ☞ Remove the cutoff solenoid from the engine.
- ☞ Let the engine run 10 seconds.
- ☞ Wait 1 minute.
- ☞ Let the engine run 10 seconds again.
- ☞ Fit the cutoff solenoid back on again.
- ☞ Start the engine and let it run without any load.

**5.16 Fluids and lubricants**

Component/application	Fluid/lubricant	Specification	Season/temperature	Capacities ¹
Diesel engine Tier III	Engine oil SAE 10W-40	API: CF, CF-4, CI-4	-20 °C (-4 °F) +40 °C (104 °F)	About 3.4 l (0.9 gal)
		ACEA: E3, E4, E5		
		JASO: DH-1		
Diesel engine Tier IV	Engine oil SAE 10W-40	API: CJ-4	-20 °C (-4 °F) +40 °C (104 °F)	About 10.6 l (2.8 gal)
		ACEA: E9		
		ECF-3		
Traveling drive	Gearbox oil SAE 80W-90	API: GL-4, GL-5	Year-round	About 0.6 l each (0.2 gal)
Hydraulic oil reservoir	Hydraulic oil	EUROLUB HVLP46 ²	Year-round ³	2503: 27 l (7 gal) 3503: 50 l (13 gal)
	Biodegradable oil ⁴	PANOLIN HLP Synth 46		
		BP BIOHYD SE-S 46		
Roller and friction bearings	Grease	KF2K-20 ⁵	Year-round	As required
Live ring: ball bearings				
Live ring gears				
Grease zerks				
Battery terminals	Acid-proof grease ⁶	FINA Marson L2	Year-round	As required
Fuel tank	Diesel fuel ⁷	2-D ASTM D975 – 94 (USA) ^{7,8}	Depending on outside temperature Summer or winter diesel fuel	2503: 41 l (11 gal) 3503: 52 l (14 gal)
		1-D ASTM D975 – 94 (USA)		
		EN 590 : 96 (EU) ^{7,9}		
		ISO 8217 DMX (International)		
		BS 2869 – A1 (GB)		
		BS 2869 – A2 (GB) ^{7,8}		
		JIS K2204 (Japan)		
		KSM-2610 (Korea)		
GB252 (China)				
Radiator	Coolant	Distilled water + antifreeze ASTM D4985 (reddish) ¹⁰	Year-round	About 4.5 l (1.2 gal)
		Distilled water + antifreeze ASTM D6210 (violet) ¹¹		
Washer system	Cleaning solution	Water + antifreeze	Year-round	1.2 l (0.3 gal)

1. The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level

Capacities indicated are no system fills

2. According to DIN 51524 section 3

3. Depending on local conditions – see *Hydraulics oil grade* on page 5-37

4. Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES

5. SKPF2K-20 lithium-saponified grease according to DIN 51502/ISO 6743-9

6. Standard acid-proof grease

7. In countries without regulations on exhaust gas emissions, diesel fuel with a sulfur content of up to 4000 ppm (0.4 %) can be used.

8. Sulfur content up to 15 ppm (0.0015 %)

9. Sulfur content up to 10 ppm (0.001 %)

10. 2503: up to serial no. WNCE0304PPAL00399; 3503: up to serial no. WNCE0307APAL00999

11. 2503: from serial no. WNCE0304HPAL00400; 3503: from serial no. WNCE0307PPAL01000

Oil grades for the diesel engine, depending on temperature.

Engine oil grade	Ambient temperature (°C)														
	°C	-20	-15	-10	-5	0	5	10	15	20	25	30	35	40	
	SAE 10W														
					SAE 20W										
	SAE 10W-30														
	SAE 10W-40														
	SAE 15W-40														
API CD, CF, CF-4, CI-4 ACEA E3, E4, E5						SAE 20									
								SAE 30							
							SAE 40								
	°F	-4	5	14	23	32	41	50	59	68	77	86	95	104	

Additional oil change and filter replacement (hydraulic system)

NOTICE

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

- Observe the following intervals

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



Information!

Please refer to the maintenance plan on page 5-38 for additional maintenance.



Oil grades for the hydraulic system, depending on temperature.

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

¹ According to DIN 51524 section 3







5.17 Maintenance plan (overview) Work description For servicing and maintenance on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well. Fluid and filter changes (): Perform the following oil and filter changes (check oil levels after test run): •Engine oil ¹ •Engine oil filter ² •Fuel filter ³ •Air filter element (as indicated by the indicator light) •Coolant •Hydraulic oil filter insert ⁴ •Hydraulic oil ⁵ •Hydraulic oil reservoir breather •Gearbox oil ⁶	Maintenance plan/operating hours (o/h)							
	Authorized service center	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Customer				<input checked="" type="checkbox"/>			
	Every 2000 o/h							
	Every 1000 o/h once a year				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Every 500 o/h	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Every 250 o/h							
	Service 50 o/h	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Maintenance (once a day)							<input checked="" type="checkbox"/>	
Inspection work (): Check the following material. Refill if necessary: •Engine oil •Engine coolant •Fuel •Hydraulic oil •Gearbox oil Clean water ducts ⁷ Check radiator for engine and hydraulic oil for dirt. Clean if necessary Check cooling systems, heating and hoses for leaks (visual check) Air filter (visual check for damage) Check the pilot control filter for dirt, clean it if necessary Prefilter with water separator: drain water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



5.17 Maintenance plan (overview)	Maintenance plan/operating hours (o/h)							
	Maintenance (once a day)	Service 50 o/h	Every 250 o/h	Every 500 o/h	Every 1000 o/h once a year	Every 2000 o/h	Customer	Authorized service center
Work description For servicing and maintenance on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.								
Drain condensation water from the hydraulic oil reservoir (from serial no. AH02272)	●							●
Fuel filter: from AG00580: drain 10 ml (0.3 US fl.oz) of fuel/water mixture	●						●	
Check V-belt condition and tension				●				●
Replace the V-belt								
Check the exhaust system for damage and condition	●						●	
Check valve clearance. Adjust if necessary					●			●
Clean and adjust the fuel injection pump ⁸					●			●
Check and adjust the injection pressure of the injection nozzles, clean the injection needles/nozzles					●			●
Check and adjust injection time ⁹					●			●
Empty diesel fuel tank				●				●
Check battery electrolyte. Add distilled water if necessary		●		●			●	
Check alternator, starter and electric connections, bearing play and function				●				●
Check preheating system and electric connections				●				●
Check correct function of air filter contamination gage				●				●
Pressure check of primary pressure limiting valves		●		●				●
Check tracks for cracks and cuts	●						●	
Check the track tension and retension the tracks if necessary	●						●	
Check bearing play of tread rollers, track carrier rollers, front idlers				●				●
Check piston rods for damage	●						●	
Check screws for tightness		●		●				●
Check live-ring screws for tightness				●				●
Check pin lock	●						●	
Check wear on load hook and joint rod (lifting eye)					●			●
Check line fixtures	●							●



5.17 Maintenance plan (overview)	Maintenance plan/operating hours (o/h)							
	Maintenance (once a day)	Service 50 o/h	Every 250 o/h	Every 500 o/h	Every 1000 o/h once a year	Every 2000 o/h	Customer	Authorized service center
Work description For servicing and maintenance on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.								
Check indicator lights for correct function	●			●				●
Couplings, dirt pile-up on hydraulic system dust caps	●						●	
Check insulating mats in engine compartment for damage/condition		●						●
Ensure grease supply of central lubrication system (option)	●						●	
Check labels and Operator's Manual for completeness and condition		●						●
Check function of engine cover gas strut	●						●	
Check the hydraulic quickhitch for damage	●						●	
Check the Powerlift for damage	●						●	
Check Powerlift for axial play (must not be over 0.38 mm/0.015 in)			●					●
Actuate Powerlift swivel device in final position for 1 minute ¹⁰		●					●	
Lubrication service ():								
Lubricate the following assemblies/components:								
• Live ring (ball bearing)		●					●	
• Teeth of live ring					●		●	
• Stabilizer blade/swiveling stabilizer blade							●	
• Swiveling console		●					●	
• Swiveling cylinder		●					●	
• Boom		●					●	
• Stick		●					●	
• Attachments		●					●	
• Hydraulic Easy Lock quickhitch (option) – see <i>Hydraulic quickhitch (option)</i> on page 3-92 ¹¹		●					●	
• Powerlift/Powerlift with Easy Lock ¹¹		●					●	
• Filling the upper carriage (VDS)							●	
• Grease strip on chassis							●	

Authorized service center	Customer	Every 2000 o/h	Every 1000 o/h once a year	Every 500 o/h	Every 250 o/h	Service 50 o/h	Maintenance (once a day)	Maintenance plan/operating hours (o/h)	5.17 Maintenance plan (overview)	
									Work description	Functional check ():
										For servicing and maintenance on the attachment, please refer to the operation and maintenance manual of the attachment manufacturer as well.
										Functional check (): Check the function of the following assemblies/components. Rectify if necessary: <ul style="list-style-type: none"> • Lights, signaling system, acoustic warning system • Hydraulic quickhitch (lock) • Check the Powerlift
										Leakage check (): Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings of the following assemblies and components. Rectify if necessary: <ul style="list-style-type: none"> • Visual check • Engine and hydraulic system • Cooling and heating circuit • Traveling drive • Hydraulic quickhitch (hoses, valve)
										Visual check Correct function; deformations, damage, surface cracks, wear or corrosion <ul style="list-style-type: none"> • 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 cracks and cuts • Check the travel gear for damage (for example the track rollers, insert rolling bearings) • Check the piston rods of the cylinders for damage • Check all threaded fittings regularly for tightness • Check the seat belt for damage • Check the lifting gear (load hook, joint rod, lifting eyes) and slings (option) • Check the hydraulic quickhitch and/or Powerlift for damage (option)



1. Drain engine oil the first time after 50 o/h, then every 500 o/h
2. Replace the engine oil filter the first time after 50 o/h, then every 500 o/h
3. Replace the fuel filter the first time after 500 o/h, then every 500 o/h
4. Replace the hydraulic oil filter insert the first time after 50 o/h, then every 500 o/h
5. Replace the hydraulic oil the first time after 500 o/h, then every 1000 o/h
6. Drain the gearbox oil the first time after 50 o/h, then every 1000 o/h
7. Clean the water ducts every other 1000 o/h servicing
8. Adjust and clean the fuel injection pump every other 1000 o/h servicing
9. Check and adjust injection time every other 1000 o/h servicing
10. Rinse the system to remove dirt. Repeat the procedure in the opposite flow direction.
11. Twice daily when used in water — see [chapter 3.54 Powertilt \(option 3503\)](#) on page 3-97



5.18 Maintenance overview

Maintenance plan (Tier IV)

Daily maintenance (user)	
Inspection work (Check the following fluids and lubricants, check the oil levels after a test run and add oil if necessary)	Page
Check the fluids and lubricants (engine oil, engine coolant, hydraulic oil)	5-7, 5-8, 5-14
Check the radiator and hydraulic oil cooler for dirt, clean them if necessary	5-7
Lubricate the machine according to the lubrication plan	5-27
Check the water separator and fuel filter: drain water if necessary	5-4
Check the track tension and retension the tracks if necessary	5-19
Check the engine air intake	5-11
Check pin lock	--
Check line fixtures	--
Check the indicator lights and warning devices for correct function	3-14, 3-12
Check the swivel unit brake for correct function	3-84
Check the hydraulic couplings for dirt	--
Check the threaded fittings of the protective structures (for example the cabin) for tightness	--
Clean the lights/light system, signaling system	--
Option	
Check the acoustic warning device of the overload valve	--
Easy Lock: check the acoustic warning system	--
Lubricate the Powertilt according to the lubrication plan	5-32
Adjust the mirrors correctly, clean them and check them for damage, check the fastening screws and tighten them if necessary	--
Leakage check	
Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings of the following assemblies and components. Repair if necessary	Page
Engine and hydraulic system	5-18
Traveling drive	--
Cooling systems, heating and hoses (visual check)	--
Option	
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)	--

Daily maintenance (user)	
Check the piston rods of the cylinders for damage	--
Check the seat belt for damage	3-52
Check the hydraulic hose for damage	5-18
Option	
Check the load hook, joint rod, lifting eyes	5-21
Check the hydraulic quickhitch (Easy Lock) for damage	--
Check the Powertilt for damage	3-97
Weekly maintenance (every 50 operating hours) (user)	
	Page
Lubricate the machine according to the lubrication plan	5-27
Check the air filter element (clean or replace it if necessary) ¹	5-11
Option	
Actuate Powertilt swivel device in final position for 1 minute ²	--
All steps for maintenance intervals once a day	--

1. When in extensive use in dusty environment. Replace the filter if it shows signs of cracks, damage or clogging.
2. Rinse the system to remove dirt. Repeat the procedure in the opposite flow direction.



Information!

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

**Only once after the first 50 operating hours (Wacker Neuson service center)**

Replace the hydraulic oil filter insert	--
Replace the gearbox oil in the traveling drive, axles and transfer gearbox	--
Check V-belt condition and tension	--
Check the threaded fittings for tightness	--
Check labels and Operator's Manual for completeness and condition	--
Check the pressure of the primary pressure limiting valves of the operating hydraulics	--
All steps for maintenance once a day and once a week	

Every 500 operating hours (Wacker Neuson service center)

Change the engine oil	--
Replace the engine oil filter	--
Replacing the fuel filter	--
Replace the water separator (prefilter element)	--
Replace the hydraulic oil filter insert	--
Replace the V-belt	--
Drain the condensation water from the hydraulic oil reservoir	--
Check the gearbox oil in the traveling drive, axles and transfer gearbox	--
Clean the dust valve	--
Drain the condensation water (fuel tank)	--
Check bearing play of tread rollers, track carrier rollers, front idlers	--
Check the electric cables and connectors (cable and grounding connections, etc.)	--
Check the threaded fittings for tightness	--
Reset the maintenance meter	--
All steps for maintenance once a day and once a week	--
Option	
Check Powertilt for axial play (must not be over 0.38 mm/0.015 in)	--

Every 1000 operating hours or once a year (Wacker Neuson service center)

Change the hydraulic oil	--
Replace the breather filter of the hydraulic oil reservoir	--
Replace the gearbox oil in the traveling drive, axles and transfer gearbox	--
Replace the air filter element ¹	--
Replacing the crankcase breather filter	--
Check valve clearance, adjust if necessary ²	--
Check the pressure of the primary pressure limiting valves of the operating hydraulics	--
Check the antifreeze	--
Check the battery condition (charge condition, terminals, etc.)	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 operating hours)	--
Option	
Wear of load hook and joint rod (check at least once a year)	--

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

Every 2000 operating hours or every 2 years (Wacker Neuson service center)

Check the bladder type accumulator	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 and 1000 operating hours)	--

Every 3000 operating hours or every 3 years (Wacker Neuson service center)

Check the injection nozzles and clean them if necessary	--
Clean the particulate matter catalyst, replacement program	--
Check the exhaust gas recirculation and clean it if necessary	--
Draining coolant	
Replace the fuel-burner glow plug	
Check the water pump (visual check)	--
Replace the coolant thermostat	--
Replace the radiator cap	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 500 and 1000 operating hours)	--


Information!

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



Information!

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



6 Technical datac

6.1 Model 2503

Engine

Engine	Model 2503
Product	Yanmar diesel engine
Type	Yanmar 3TNV 88-BSNS
Design	Water-cooled diesel engine
Number of cylinders	3 cylinders
Displacement	1642 cm ³ (100 in ³)
Nominal bore and stroke	88 x 90 mm (5.4 x 5.5 in)
Power	19.4 kW (26.0 hp)
Max. torque	107 Nm at 1200 rpm (79 ft.lbs at 1,200 rpm)
Max. engine speed without load	2400 rpm
Idling speed	1100 rpm
Fuel injection system	Direct fuel injection
Starting aid	Sheathed-element heater plugs
Exhaust values according to	97/68/EC, EPA

Hydraulic system

Hydraulics	Model 2503
Pump	Double variable displacement + gear pump
Flow rate	28.8 + 28.8 + 19.2 l/min (7.6 gal + 7.6 gal + 5.0 gal/min)
Operating pressure for operating and travel hydraulics	240 bar (3,481 psi)
Swivel unit operating pressure	200 bar (2,901 psi)
Hydraulic oil radiator	Standard
Hydraulic tank capacity (system fill)	27.2 l (7.2 gal)

Stabilizer blade

Stabilizer blade	Model 2503
Width	1370 mm (54 in)
Height	340 mm (13 in)
Max. lift over subgrade	390 mm (15 in)
Scraping depth	415 mm (16 in)

Operating hydraulics

Operating hydraulics	Model 2503
Max. operating pressure	240 bar (3,481 psi)
Main pressure restriction for boom/bucket/stick	240 bar (3,481 psi)
Main pressure restriction for stabilizer blade	210 bar (3,046 psi)
Main pressure restriction for pilot control pressure	35 bar (508 psi)
Main pressure restriction for swivel drive (hydraulic motor pressure restriction)	200 bar (2,901 psi)
Filter	Return filter
Hydraulic reservoir capacity	27.2 l (7.2 gal)

Tracks

2503

Type	Width	Ground pressure	Ground clearance	Remarks
Rubber	250 mm (10 in)	0.34 kg/cm ² (4.8 lbs/in ²) ¹	270 mm (11 in)	Standard
Rubber	300 mm (12 in)	0.28 kg/cm ² (4 lbs/in ²) ¹	270 mm (11 in)	Option
Steel	250 mm (10 in)	0.36 kg/cm ² (5.1 lbs/in ²) ¹	267 mm (11 in)	Option

1. Ground pressure can be higher depending on the configuration chosen.

6.2 Model 3503

American Tier III engine

Engine	Model 3503
Product	Yanmar diesel engine
Type	Yanmar 4TNV 88-BWNS
Design	Water-cooled diesel engine
Number of cylinders	4 cylinders
Displacement	2190 cm ³ (134 in ³)
Nominal bore and stroke	88 x 90 mm (5.4 x 5.5 in)
Power	23.7 kW (31.8 hp)
Max. torque (intermittent)	143 Nm/1200 rpm (105 ft.lbs/1,200 rpm)
Max. engine speed without load	2025 rpm
Idling speed	1100 rpm
Fuel injection system	Direct fuel injection
Starting aid	Sheathed-element heater plugs
Exhaust values according to	97/68/EC/EPA

American Tier IV engine

Engine	Model 3503
Product	Perkins diesel engine
Type	Perkins 404F-22
Design	Water-cooled diesel engine
Number of cylinders	4 cylinders
Displacement	2216 cm ³ (135 in ³)
Nominal bore and stroke	84 x 100 mm (3.3 x 3.9 in)
Power	29.8 kW at 1975 rpm (40.0 hp at 1975 rpm)
Max. torque (intermittent)	143 Nm at 1800 rpm (105 ft.lbs at 1,800 rpm)
Max. engine speed without load	1975 rpm
Idling speed	800 rpm
Fuel injection system	Indirect injection
Starting aid	Sheathed-element heater plugs
Exhaust values according to	US EPA 40 CFR Part 1039 Tier 4 final

**Hydraulic system**

Hydraulics	Model 3503
Pump	Double variable displacement pump + gear pump + pilot control pump
Flow rate	43.5 + 43.5 + 24.1 + 8.9 l/min (11.5 + 11.5 + 6.4 + 2.4 gal/min)
Operating pressure for operating and travel hydraulics	240 bar (3,481 psi)
Swivel unit operating pressure	210 bar (3,046 psi)
Hydraulic oil radiator	Standard
Hydraulic tank capacity (system fill)	50 l (13.2 gal)

Stabilizer blade

Stabilizer blade	Model 3503	Model 3503 tiltable
Width	1620 mm (64 in)	
Height	370 mm (15 in)	350 mm (14 in)
Max. lift over subgrade	410 mm (16 in)	385 mm (15 in)
Scraping depth	480 mm (19 in)	529 mm (21 in)
Tilting angle	--	+/- 25°

Operating hydraulics

Operating hydraulics	Model 3503
Max. operating pressure	240 bar (3,481 psi)
Main pressure restriction for boom/bucket/stick	240 bar (3,481 psi)
Main pressure restriction for stabilizer blade	210 bar (3,046 psi)
Main pressure restriction for pilot control pressure	35 bar (508 psi)
Main pressure restriction for swivel drive (hydraulic motor pressure restriction)	200 bar (2,901 psi)
Filter	Return filter
Hydraulic reservoir capacity	50 l (13.2 gal)

Tracks

Type	Width	Ground pressure	Ground clearance	Remarks
Rubber	300 mm (12 in)	0.34 kg/cm ² (4.8 lbs/in ²) ¹	260 mm (10 in)	Standard
Steel	300 mm (12 in)	0.34 kg/cm ² (4.8 lbs/in ²) ¹	270 mm (11 in)	Option

1. Ground pressure can be higher depending on the configuration chosen.

6.3 Model 3503 VDS Engine Tier III (option)

Engine	Model 3503 VDS
Product	Yanmar diesel engine
Type	Yanmar 4TNV 88-BWNS
Design	Water-cooled diesel engine
Number of cylinders	4 cylinders
Displacement	2190 cm ³ (134 in ³)
Nominal bore and stroke	88 x 90 mm (3.4 x 3.5 in)
Power	23.7 kW (31.8 hp)
Max. torque (intermittent)	143 Nm/1200 (105 ft.lbs/1,200 rpm)
Max. engine speed without load	2025 rpm
Idling speed	1100 rpm
Fuel injection system	Direct fuel injection
Starting aid	Sheathed-element heater plugs
Exhaust values according to	97/68/EC/EPA

Engine Tier IV (option)

Engine	Model 3503 VDS
Product	Perkins diesel engine
Type	Perkins 404F-22
Design	Water-cooled diesel engine
Number of cylinders	4 cylinders
Displacement	2216 cm ³ (135 in ³)
Nominal bore and stroke	84 x 100 mm (3.3 x 3.9 in)
Power	29.8 kW at 1975 rpm (40.0 hp at 1975 rpm)
Max. torque (intermittent)	143 Nm at 1800 rpm (105 ft.lbs at 1,800 rpm)
Max. engine speed without load	1975 rpm
Idling speed	800 rpm
Fuel injection system	Indirect injection
Starting aid	Sheathed-element heater plugs
Exhaust values according to	US EPA 40 CFR Part 1039 Tier 4 final

Hydraulic system

Hydraulics	Model 3503 VDS
Pump	Double variable displacement pump + gear pump + pilot control pump
Flow rate	43.5 + 43.5 + 24.1 + 8.9 l/min (11.5 + 11.5 + 6.4 + 2.4 gal/min)
Operating pressure for operating and travel hydraulics	240 bar (3,481 psi)
Swivel unit operating pressure	210 bar (3,046 psi)
Operating pressure for auxiliary hydraulics	240 bar (3,481 psi)
Hydraulic oil radiator	Standard
Hydraulic tank capacity (system fill)	50 l (13.2 gal)

**Stabilizer blade**

Stabilizer blade	Model 3503	Model 3503 tiltable
Width	1620 mm (64 in)	
Height	370 mm (15 in)	350 mm (14 in)
Max. lift over subgrade	410 mm (16 in)	385 mm (15 in)
Scraping depth	480 mm (19 in)	529 mm (21 in)
Tilting angle	--	+/- 25°

Operating hydraulics

Operating hydraulics	Model 3503 VDS
Max. operating pressure	240 bar (3,481 psi)
Main pressure restriction for boom/bucket/stick	240 bar (3,481 psi)
Main pressure restriction for stabilizer blade	210 bar (3,046 psi)
Main pressure restriction for pilot control pressure	35 bar (508 psi)
Main pressure restriction for swivel drive (hydraulic motor pressure restriction)	200 bar (2,901 psi)
Filter	Return filter
Hydraulic reservoir capacity	50 l (13.2 gal)

Tracks**3503 VDS**

Type	Width	Ground pressure	Ground clearance	Remarks
Rubber	300 mm (12 in)	0.36 kg/cm ² (5.1 lbs/in ²) ¹	275 mm (11 in)	Standard
Steel	300 mm (12 in)	0.37 kg/cm ² (5.3 lbs/in ²) ¹	285 mm (11 in)	Option

1. Ground pressure can be higher depending on the configuration chosen.

Operating range (2503/3503/3503 VDS)

Operating range	°C	°F
Minimum operating temperature	-15	+5
Maximum operating temperature	+45	+113

Rotation speed of upper carriage (2503/3503/3503 VDS)

Rotation speed of upper carriage
2503/3503/3503 VDS
About 9 rpm

6.4 Electrical system

Fuse box in cabin

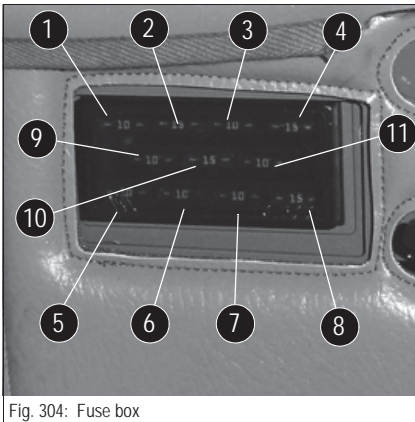


Fig. 304: Fuse box

Fuse no.	Rated current (A)	Protected circuit
1	10	Switch assignment, indicator lights and indicators, engine relays
2	15	Lights, boom, roof lights
3	10	12V/15 cabin
4	15	Heating, horn
5	10	Valves, travel signal
6	10	Window wiper, cabin
7	10	Alternator
8	15	Spare
9	10	Rotating beacon, radio, 12 V power outlet, anti theft protection
10	15	Socket
11	10	Spare

6.5 Noise levels

Sound power level	2503	3503
Sound power level (L_{WA}) ¹ up to AG02452	93 dB (A)	
Sound power level (L_{WA}) ¹ from AG02453	94 dB(A)	95 dB(A)
Uncertainty factor (K_{PA}) ²	0.8 dB(A)	0.8 dB(A)
Operator-perceived sound pressure level (L_{PA}) ³	≤ 75dB (A)	≤ 76dB (A)

1. ISO 6395 (EC Directives 2000/14/EC and 2005/88/EC)
2. EN ISO 4871 (EC Directives 2000/14/EC and 2005/88/EC)
3. ISO 6394 (EC Directives 84/532/EEC, 89/514/EEC, 95/27/EEC)



Information!

Measurements performed on asphalted surface.

6.6 Vibration

Vibration	
Effective acceleration value for the upper extremities of the body (hand-arm vibration)	< Trigger value < 2.5 m/s ²
Effective acceleration value for the body (whole-body vibration)	< 0.5 m/s ²

Vibration values indicated in m/s².

Directive 2002/44/EC of European Parliament and Council on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

Indications on hand-arm vibration

Hand-arm vibration is less than 2.5 m/s² during correct machine operation.

Indications on whole-body vibration

Whole-body vibration is less than 0.5 m/s² during correct machine operation.

Uncertainty of measurement K has been taken into account for the specified values.

The degree of vibration is influenced by various parameters.

Some of them are listed below:

- Operator: training, behavior, working method and strain.
- Job site: organization, preparation, surroundings, weather conditions and material.
- Machine: version, seat quality, quality of suspension system, attachments and condition of attachments.

Precise indications on the vibration degrees cannot be made for the machine.

Determination of vibration level for the three vibration axes.

- Under typical operating conditions, use the average vibration values measured.
- In order to obtain the estimated vibration value for an experienced operator on level ground, subtract the factors from the average vibration value.
- In case of an aggressive working method or difficult terrain, add the environmental factors to the average vibration level in order to obtain the estimated vibration level.

Note:

For further vibration indications, refer to the indications in ISO/TR 25398 Mechanical Vibrations – Directive on Estimation of whole-body vibration during operation of earth moving machines. This publication uses measuring values of international institutes, organizations and manufacturers. It contains information on whole-body vibration for operators in earth moving machines. For more information on the vibration values of the machine, refer to Directive 2002/44/EC of European Parliament and Council on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

It explains the values for vertical vibration under heavy operating conditions.

Directives on reduction of vibration values in earth moving machines:

- Perform correct adjustments and maintenance on the machine.
- Avoid jerky movements during machine operation.
- Keep slopes in a perfect condition.

Whole-body vibration can be reduced with the following guidelines:

- Use a machine and equipment of correct type and size.
- Follow the manufacturer's recommendations for maintenance.
 - Tire pressure.
 - Brake and steering systems.
 - Control elements, hydraulic system and linkage.
- Keep the job site in good condition:
 - Remove large rocks or obstacles.

- Fill up ditches and holes.
- Provide a machine and enough time to keep the job site in good condition.
- Use an operator seat according to the ISO 7096 requirements. Keep the operator seat in good condition and adjust it correctly:
 - Adjust the operator seat and suspension to the operator's weight and size.
 - Check and maintain the seat adjustment and suspension.
- Perform the following activities smoothly without any jerks.
 - Steering
 - Braking
 - Acceleration
 - Shifting gears
- Move attachments without any jerks.
- Adapt your speed and the itinerary to minimize vibration:
 - Travel around obstacles and uneven ground.
 - Reduce your speed during machine travel across rough terrain.
- Reduce vibration to a minimum during long work cycles or during machine operation over long distances:
 - Use a machine with a suspension system (for example on the operator seat).
 - Enable the hydraulic oscillation damping if the machine is equipped with tracks.
 - If the machine is not equipped with hydraulic oscillation damping, reduce your speed to avoid bumps and jolts.
 - Load the machine on a truck or trailer to move between job sites.
- Other risk factors can affect drive comfort negatively. The following measures can improve drive comfort:
 - Adjust the operator seat and the control elements to a relaxed body posture.
 - Adjust the rearview mirrors to ensure optimal visibility so you can adopt an upright seating position.
 - Provide breaks to avoid sitting for long periods.
 - Do not jump off the cabin.
 - Picking up and raising loads repeatedly must be limited to a minimum.

Reference:

The vibration values and calculations are based on the indications made in ISO/TR 25398 Mechanical Vibrations – Guidelines for assessment of exposure to whole-body vibration during operation of earth moving machines.

The harmonized data comply with measurements made by international institutes, organizations and manufacturers. This publication offers information on the calculation of whole-body vibrations for operators of earth moving machines. This method is based on vibration measurements under real operating conditions for all machines. Read the original guidelines. This chapter summarizes part of the legal regulations. However, its aim is not to replace the original references. Other parts of this document are based on information of the United Kingdom Health and Safety Executive.

For more information on vibration, refer to Directive 2002/44/EC of European Parliament and Council on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

Your Wacker Neuson dealer provides information on other machine functions reducing vibration and on safe operation.

6.7 Coolant compound table

Outside temperature ¹	Distilled water	Coolant ²
Up to °C (°F)	% by volume	% by volume
-37 (-34.6)	50	50

1. Use the 1:1 concentration for warm outside temperatures, too, to ensure protection against corrosion, cavitation and deposits.
2. Do not mix the coolant with other coolants.

6.8 Powertilt (option 3503)

Powertilt	Model 3503
Model size	6
Piston stroke	525 cm ³ (32 in ³)
Required oil flow	3 – 6 l/min (0.8 – 1.6 gal/min)
Connections	1/4 in
Swiveling range	180°
Weight	65 kg (143.3 lbs)
Drive torque – at 210 bar (3045 psi)	2990 Nm (2,205 ft.lbs)
Holding torque – at 225 bar (3263 psi)	7270 Nm (5,362 ft.lbs)
Minimum hose/pipe size	10 mm (0.4 in)
Connecting hose size	6 mm (0.25 in)

6.9 Weights

Type	Transport weight ¹ kg (lbs)	Operating weight ² kg (lbs)
2503 canopy	2483 (5,474)	2639 (5,818)
2503 cabin	2592 (5,714)	2747 (6,056)
3503 canopy	3424 (7,549)	3602 (7,941)
3503 cabin	3551 (7,829)	3728 (8,219)
3503 VDS canopy	3689 (8131)	3866 (8,523)
3503 VDS cabin	3815 (8,411)	3993 (8,803)
3503 Vario canopy	3699 (8,155)	3877 (8,547)
3503 Vario cabin	3826 (8,435)	4003 (8,825)

1. Transport weight: basic machine + 10 % fuel capacity

2. Operating weight: basic machine + full fuel tank + backhoe bucket (400 mm) + user (75 kg/165 lbs)



Information!

The actual machine weight depends on the selected options and must be read off the type label.

Add the weight of all subsequently installed equipment to the weight of the machine.

Weight indications can vary by +/- 2 %.

6.10 Dimensions model 2503

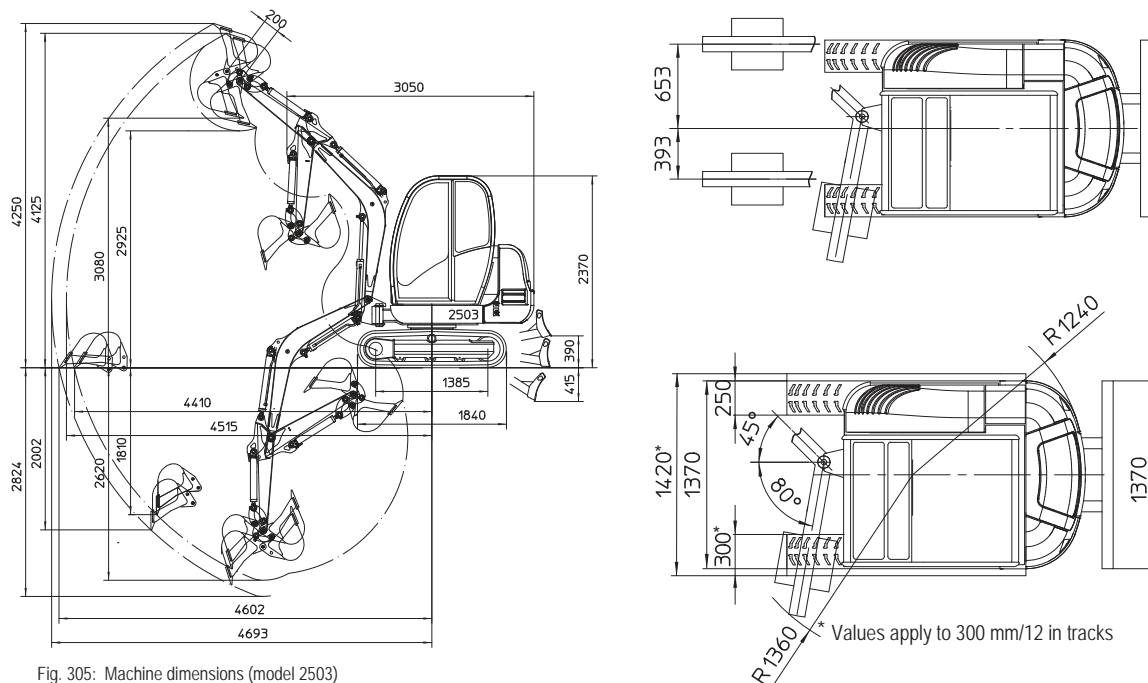


Fig. 305: Machine dimensions (model 2503)

Main data	Model 2503
Height	2370 mm (93 in)
Width 250 mm (10 in) tracks (standard)/300 mm (12 in) tracks (option)	1370 mm/1420 mm (54 in/56 in)
Transport length	4410 mm (14'-6")
Max. digging depth	2620 mm (8'-7")
Stick length (standard/long version)	1150 mm/1350 mm (45 in/53 in)
Max. digging depth for long stick (+ 300 mm)	2825 mm (9'-3")
Max. vertical digging depth	1810 mm (71 in)
Max. vertical digging depth (long stick)	2000 mm (79 in)
Max. digging height	4125 mm (13'-6")
Max. digging height (long stick)	4250 mm (13'-11")
Max. tilt-out height	2925 mm (9'-7")
Max. tilt-out height (long stick)	3080 mm (10'-1")
Max. digging radius	4515 mm (14'-10")
Max. digging radius (long stick)	4693 mm (15'-5")
Max. reach at ground level	4410 mm (14'-6")
Max. reach at ground level (long stick)	4602 mm (15'-1")
Max. breakout force at bucket tooth	20 kN (4,496 lbf)
Max. tearout force (standard stick)	13 kN (2,923 lbf)
Max. tearout force (long stick)	11 kN (2,473 lbf)
Min. tail end slewing radius	1240 mm (49 in)
Max. tail end lateral projection (90° rotation of upper carriage) (250/300 tracks)	555 mm/530 mm (22 in/21 in)
Max. boom displacement to bucket center (right side)	653 mm (26 in)
Max. boom displacement to bucket center (left side)	393 mm (15 in)

6.11 Dimensions model 3503

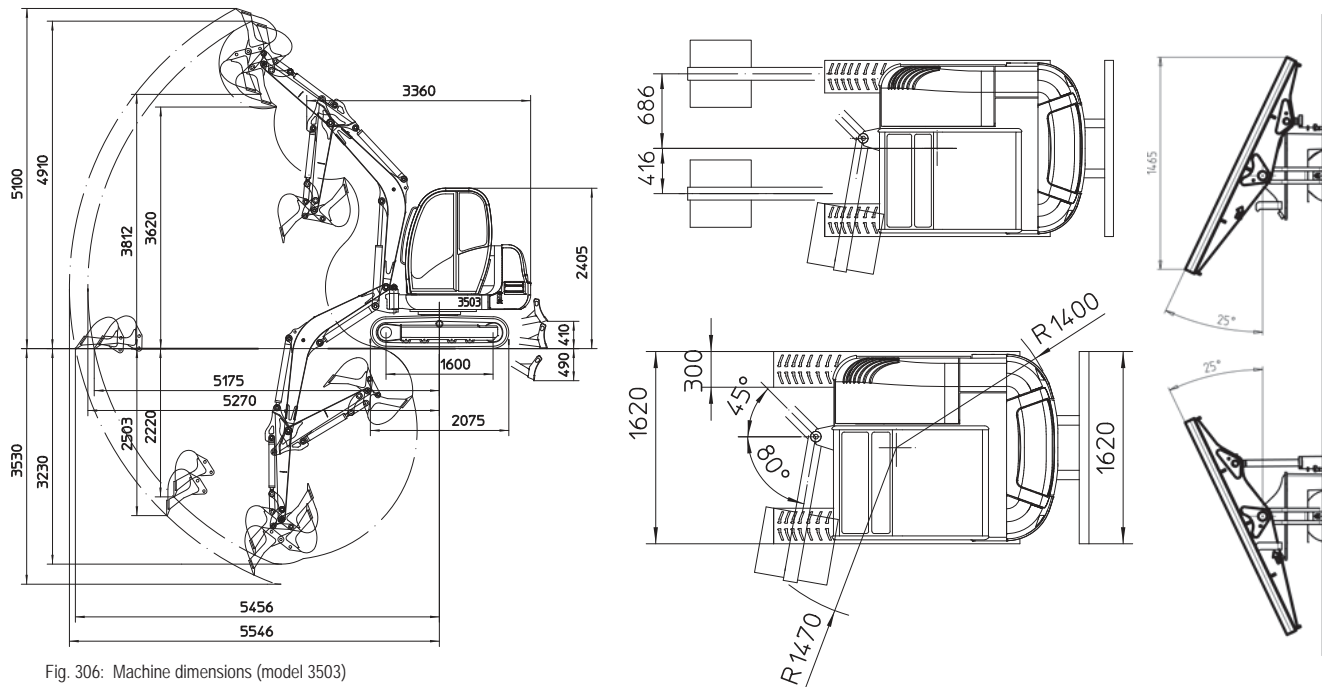


Fig. 306: Machine dimensions (model 3503)

Main data	Model 3503	Vario 3503
Height/width	2405 mm/1620 mm (95 in/64 in)	2508 mm/1620 mm (99 in/64 in)
Transport length	5170 mm (16'-12")	5170 mm (16'-12")
Max. digging depth	3230 mm (10'-7")	3127 mm (10'-3")
Stick length (standard/long version)	1335 mm/1635 mm (53 in/64 in)	1335 mm/1635 mm (53 in/64 in)
Max. digging depth for long stick (+ 300 mm)	3530 mm (11'-7")	3427 mm (11'-3")
Max. vertical digging depth	2220 mm (87 in)	2117 mm (83 in)
Max. vertical digging depth (long stick)	2500 mm (98 in)	2396 mm (94 in)
Max. digging height	4910 mm (16'-1")	5013 mm (16'-5")
Max. digging height (long stick)	5100 mm (16'-9")	5211 mm (17'-1")
Max. tilt-out height	3620 mm (11'-11")	3723 mm (12'-3")
Max. dump height with long stick	3810 mm (12'-6")	3923 mm (12'-10")
Max. digging radius	5270 mm (17'-3")	5100 mm/5440 mm (16'-9"/17'-10")
Max. digging radius with long stick	5546 mm (18'-2")	5296 mm/5796 mm (17'-5"/19'-0")
Max. reach at ground level	5175 mm (16'-12")	5005 mm/5345 mm (16'-5"/17'-6")
Max. reach at ground level (long stick)	5456 mm (17'-11")	5206 mm/5706 mm (17'-1"/18'-9")
Max. breakout force at bucket tooth	30.3 kN (6,811 lbf)	30.3 kN (6,811 lbf)
Max. tearout force (standard stick)	20.6 kN (4,631 lbf)	20.6 kN (4,631 lbf)
Max. tearout force (long stick)	16.8 kN (3,777 lbf)	16.8 kN (3,777 lbf)
Min. tail end slewing radius	1400 mm (55 in)	1400 mm (55 in)
Max. tail end lateral projection (90° rotation of upper carriage)	590 mm (23 in)	420/760** mm (17 in/30 in)
Max. boom displacement to bucket center (right side)	685 mm (27 in)	855 mm (34 in)
Max. boom displacement to bucket center (left side)	415 mm (16 in)	585 mm (23 in)
Stabilizer blade tilting angle	+/- 25°	

6.12 Dimensions model 3503 VDS

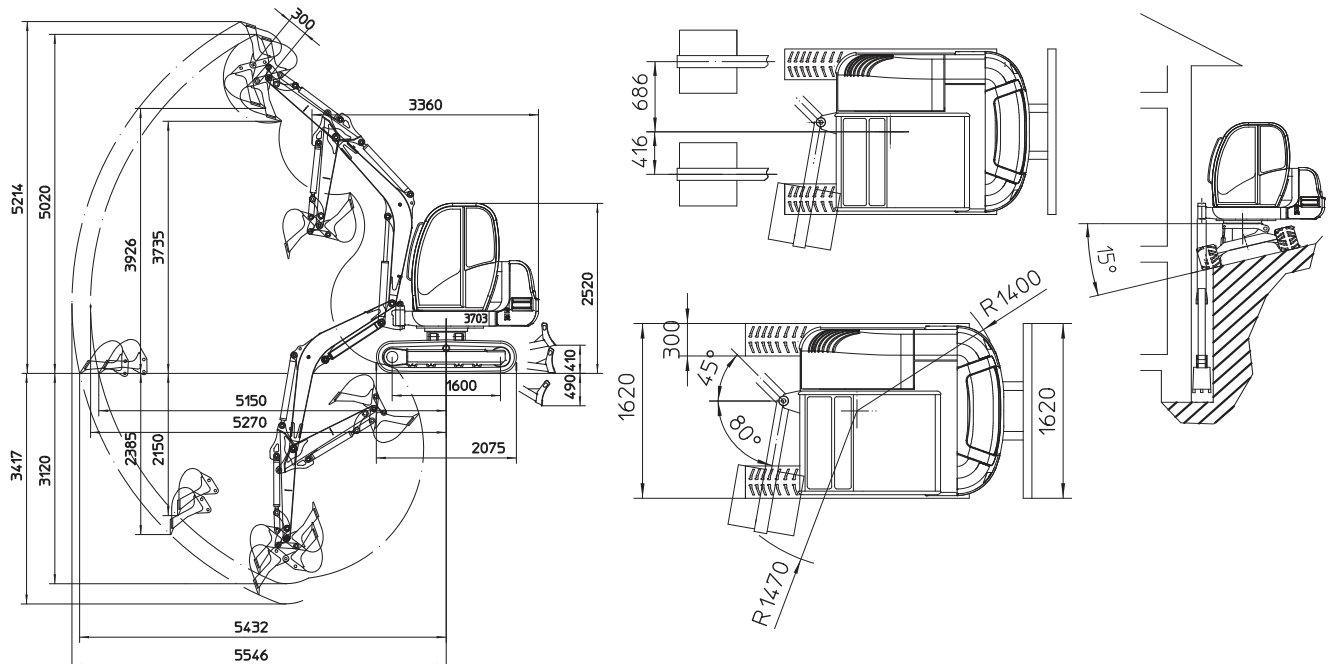


Fig. 307: Machine dimensions (model 3503 VDS)

Main data	Model 3503 VDS
Height/width	2520 mm/1620 mm (99 in/64 in)
Transport length	5170 mm (16'-12")
Max. digging depth	3120 mm (10'-3")
Stick length (standard)	1335 mm (52 in)
Stick length (long version)	1635 mm (64 in)
Max. digging depth for long stick (+ 300 mm)	3417 mm (11'-3")
Max. vertical digging depth	2105 mm (83 in)
Max. vertical digging depth (long stick)	2385 mm (94 in)
Max. digging height	5020 mm (16'-6")
Max. digging height (long stick)	5220 mm (17'-2")
Max. tilt-out height	3735 mm (12'-3")
Max. tilt-out height (long stick)	3935 mm (12'-11")
Max. digging radius	5270 mm (17'-3")
Max. digging radius (long stick)	5546 mm (18'-2")
Max. reach at ground level	5150 mm (16'-11")
Max. reach at ground level (long stick)	5432 mm (17'-10")
Max. breakout force at bucket tooth	30.4 kN (6834 lbf)
Max. tearout force (standard stick)	20.6 kN (4631 lbf)
Max. tearout force (long stick)	16.8 kN (3777 lbf)
Min. tail end slewing radius	1400 mm (55 in)
Max. tail end lateral projection (90° rotation of upper carriage)	590 mm (23 in)
Max. boom displacement to bucket center (right side)	686 mm (27 in)
Max. boom displacement to bucket center (left side)	416 mm (16 in)
Max. tilt angle for VDS	15°
Stabilizer blade tilting angle	+/- 25°

6.13 Lift capacity table 2503

All table indications in kg and horizontal position on firm ground without bucket.

A			3.5 m (11'-5")		3.0 m (9'-8")		2.5 m (8'-2")		2.0 m (6'-6")	
B										
3.0 m (9'-8")	415* (915*)	415* (915)			400* (882*)	400* (882*)				
2.0 m (6'-6")	410* (904*)	350 (772)	410* (904*)	380 (838)	420* (926*)	420* (926*)	460* (1,014*)	460* (1,014*)		
1.0 m (3'-3")	425* (937*)	310 (683)	460* (1,014*)	365 (805)	540* (1,190*)	460 (1,014)	670* (1,477*)	595 (1,312)	1000* (2,205*)	815 (1,797)
0.0 m (0'-0")	450* (992*)	315 (694)	505* (1,113*)	355 (783)	635* (1,400*)	440 (970)	835* (1,841*)	560 (1,235)	1210* (2,668*)	770 (1,698)
-1.0 m (-3'-3")	475* (1,047*)	380 (838)			580* (1,279*)	435 (959)	790* (1,742*)	560 (1,235)	1030* (2,271*)	775 (1,709)
-2.0 m (-6'-6")	445* (981*)	445* (981*)							435* (959*)	435* (959*)

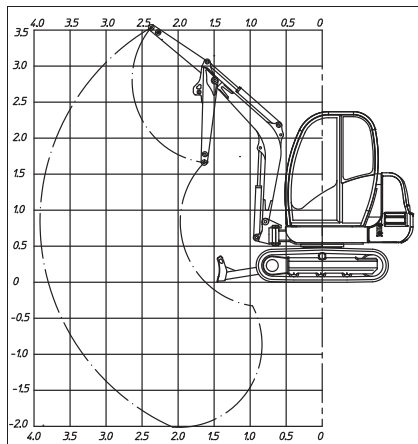


Fig. 308: Lift capacity table (model 2503)

max	Permissible load on extended stick
A	Reach from live ring center
B	Load hook height
*	Lift capacity limited by hydraulic system

	With the stabilizer blade in travel direction
	Without the stabilizer blade, 90° to travel direction

If equipped with a bucket or other attachments, lift capacity or tilt load is reduced by bucket or attachment dead weight.

Calculation basis: according to ISO 10567

The compact excavator's lift capacity is restricted by the settings of the pressure limiting valves and the hydraulic system's stabilizing features.

Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

6.14 Lift capacity table 3503

All table indications in kg and horizontal position on firm ground without bucket.

A			4.5 m (14'-8")		3.5 m (11'-5")		2.5 m (8'-2")		1.5 m (4'-9")	
B										
3.0 m (9'-8")	800* (1,764*)	545 (1,202)			745* (1,642*)	685 (1,510)				
2.0 m (6'-6")	840* (1,852*)	480 (1,058)			870* (1,918*)	660 (1,455)	1110* (2,447*)	1105 (2,436)		
1.0 m (3'-3")	890* (1,962*)	415 (915)	900* (1984*)		1100* (2,425*)	620 (1,367)	1795* (3,957*)	1000 (2,205)		
0.0 m (0'-0")	955* (2,105*)	420 (926)	955* (2105*)		1300* (2,866*)	595 (1,312)	2130* (4,696*)	930 (2,050)		
-1.0 m (-3'-3")	1045* (2,304*)	475 (1,047)			1310* (2,888*)	590 (1,301)	2100* (4,630*)	950 (2,094)	4200* (9,259*)	2295 (5,060)
-2.0 m (-6'-6")	1150* (2,533*)	675 (1,488)					1700* (3,748*)	975 (21,50)	3300* (7,275*)	2345 (5,170)

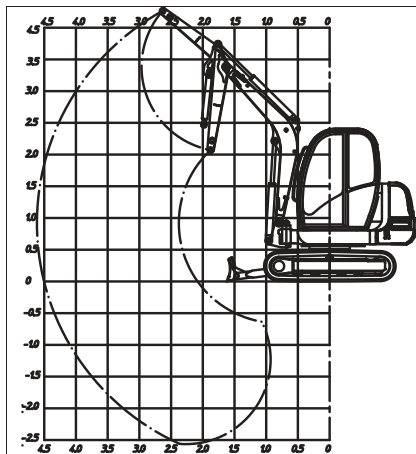


Fig. 309: Lift capacity table (model 3503)

max	Permissible load on extended stick
A	Reach from live ring center
B	Load hook height
*	Lift capacity limited by hydraulic system

	With the stabilizer blade in travel direction
	Without the stabilizer blade, 90° to travel direction

If equipped with a bucket or other attachments, lift capacity or tilt load is reduced by bucket or attachment dead weight.

Calculation basis: according to ISO 10567

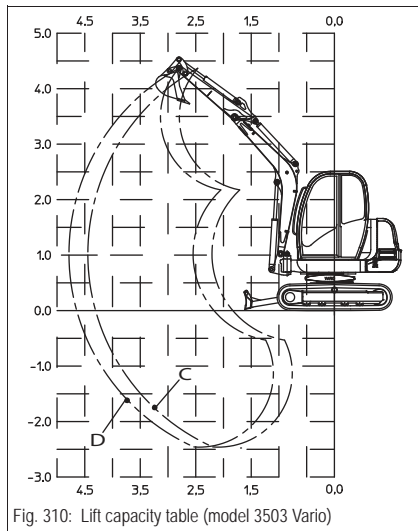
The compact excavator's lift capacity is restricted by the settings of the pressure limiting valves and the hydraulic system's stabilizing features.

Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

6.15 Lift capacity table 3503 Vario

All table indications in kg and horizontal position on firm ground without bucket.

A				4.5 m (14'-8")			3.5 m (11'-5")			2.5 m (8'-2")			1.5 m (4'-9")		
B															
3.0 m (9'-8")	800* (1,764)*	760 (1,676)	435 (959)				745* (1,642*)	745* (1,642*)	545 (1,202)						
2.0 m (6'-6")	840* (1,852*)	670 (1,477)	385 (849)				870* (1,918*)	870* (1,918*)	530 (1,168)	1110* (2,447*)	1110* (2,447*)	885 (1,951)			
1.0 m (3'-3")	890* (1,962*)	580 (1,279)	335 (739)	900* (1,984*)	600 (1,323)	345 (761)	1100* (2,425*)	870 (1,918)	500 (1,102)	1795* (3,957*)	1395 (3,075)	800 (1,764)			
0.0 m (0'-0")	955* (2,105*)	590 (1,301)	335 (739)	955* (2,105*)	590 (1,301)	335 (739)	1300* (2,866*)	835 (1,841)	475 (1,047)	2130* (4,696*)	1330 (2,932)	760 (1,675)			
-1.0 m (-3'-3")	1,045* (2,304*)	670 (1,477)	380 (838)				1310* (2,888*)	825 (1,819)	470 (1,036)	2100* (4,630*)	1330 (2,932)	520 (1,146)	4200* (9,259*)	3215 (7,088)	1835 (4,045)
-2.0 m (-6'-6")	1150* (2,533*)	940 (2,072)	540 (1,190)							1700* (3,748*)	1365 (3,009)	780 (1,720)	3300* (7,275*)	3280 (7,231)	1875 (4,134)



max	Permissible load on extended stick
A	Reach from live ring center
B	Load hook height
*	Lift capacity limited by hydraulic system

	With the stabilizer blade in travel direction
	Without the stabilizer blade 90° in travel direction Upper carriage shifted to the rear with Vario option Characteristic curve C
	Without the stabilizer blade 90° in travel direction Upper carriage shifted to the front with Vario option Characteristic curve D

If equipped with a bucket or other attachments, lift capacity or tilt load is reduced by bucket or attachment dead weight.

Calculation basis: according to ISO 10567

The compact excavator's lift capacity is restricted by the settings of the pressure limiting valves and the hydraulic system's stabilizing features.

Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

6.16 Lift capacity table 3503 VDS

All table indications in kg and horizontal position on firm ground without bucket.

A			4.5 m (14'-8")		3.5 m (11'-5")		2.5 m (8'-2")		1.5 m (4'-9")	
B										
3.0 m (9'-8")	800* (1,764*)	650 (1,433)			750* (1,653*)	550* (1,213*)				
2.0 m (6'-6")	845* (1,863*)	350 (772)			900* (1,984*)	530 (1,168)	1210* (2,668*)	890 (1,962)		
1.0 m (3'-3")	900* (1,984*)	340 (750)	900* (1,984*)	340 (750)	1125* (2,480*)	500 (1,102)	1850* (4,079*)	800 (1,764)		
0.0 m (0'-0")	955* (2,105*)	340 (750)	955* (2,105*)	340 (750)	1300* (2,866*)	460 (1,014)	2150* (4,740*)	750 (1,653)		
-1.0 m (-3'-3")	1050* (2,315*)	395 (871)			1300* (2,866*)	450 (992)	2080* (4,586*)	750 (1,653)	4200* (9,259*)	1855 (4,090)
-2.0 m (-6'-6")	1150* (2,536*)	575 (1,268)					1650* (3,638*)	790 (1,742)	3150* (6,945*)	1910 (4,211)

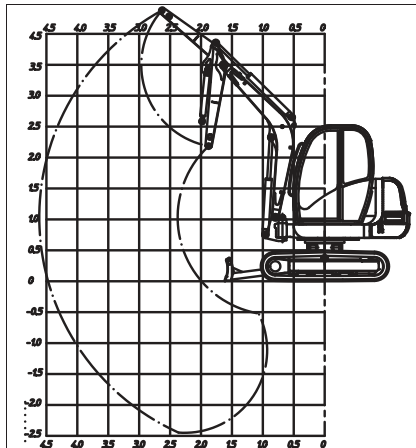


Fig. 311: Lift capacity table (model 3503 VDS)

max	Permissible load on extended stick
A	Reach from live ring center
B	Load hook height
*	Lift capacity limited by hydraulic system

	With the stabilizer blade in travel direction
	Without the stabilizer blade, 90° to travel direction

If equipped with a bucket or other attachments, lift capacity or tilt load is reduced by bucket or attachment dead weight.

Calculation basis: according to ISO 10567

The compact excavator's lift capacity is restricted by the settings of the pressure limiting valves and the hydraulic system's stabilizing features.

Neither 75 % of the static tilt load nor 87 % of the hydraulic lift capacity is exceeded.

Safety instructions stability tables

The values of the stability table (load diagram) apply to lifting gear applications.



DANGER

Crushing hazard due to tipping over of machine!

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

- Never exceed the weight and mass values specified in the stability table.
- If a joint rod or Powertilt unit with load hook is installed, the weight of the attachment must be subtracted from the weight or mass value specified in the table.
- Use the machine for lifting gear applications only if the mandatory lifting gear and safety equipment is installed, functional and enabled.
- Lock the oscillating axle in work position.



Information!

If the weight or mass value is exceeded, there is a risk of damage to property if the machine tips over.

- Never exceed the weight and mass values specified in the stability table.



Information!

The indications are only approximate values. Attachments, uneven ground and soft or bad ground conditions affect stability, and the weight and mass values. The operator must take these influences into account.

**Legend**

Designation	Explanation
X	Reach from live ring center
Z	Load hook height in the respective range
max	Authorized lift capacity with horizontal boom
L	Stick short/long

Authorized lift capacity applies to entire swiveling range of 360°.

All table indications in kg (lbs) and horizontal position on firm and level ground without bucket or exchangeable attachment.

The machine's lift capacity is restricted by the settings of the pressure limiting valves, 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.

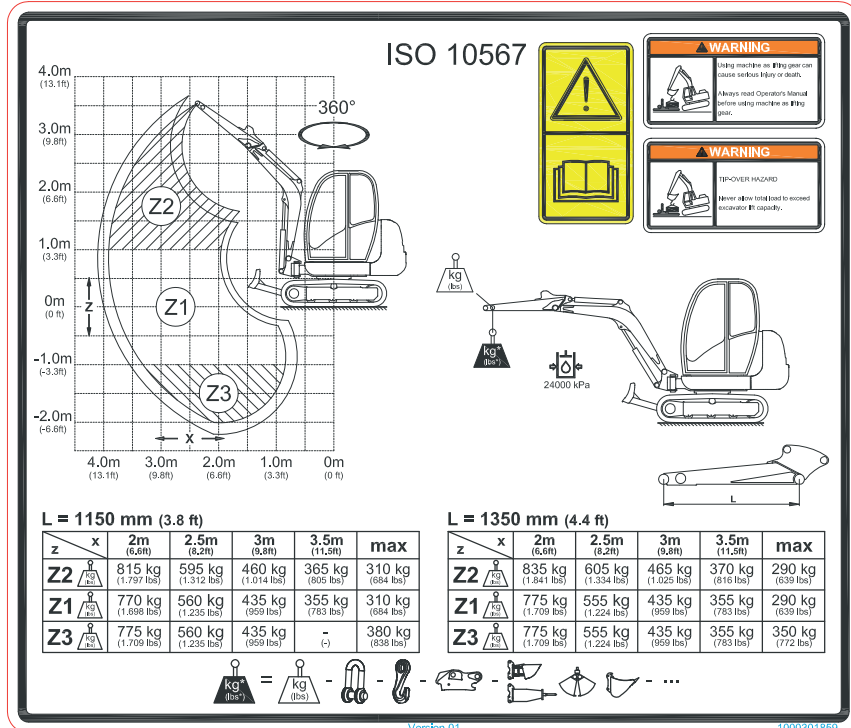
Calculation basis: according to ISO 10567.

Setting pressure on boom cylinder: 24,000 kPa (3,481 psi).

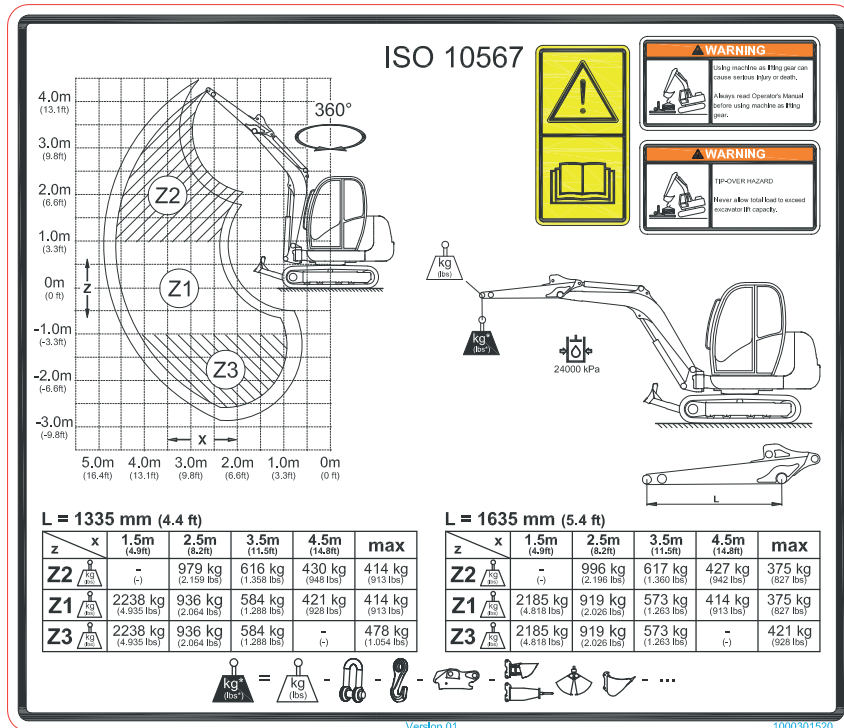
Lift capacities apply to machines under the following conditions:

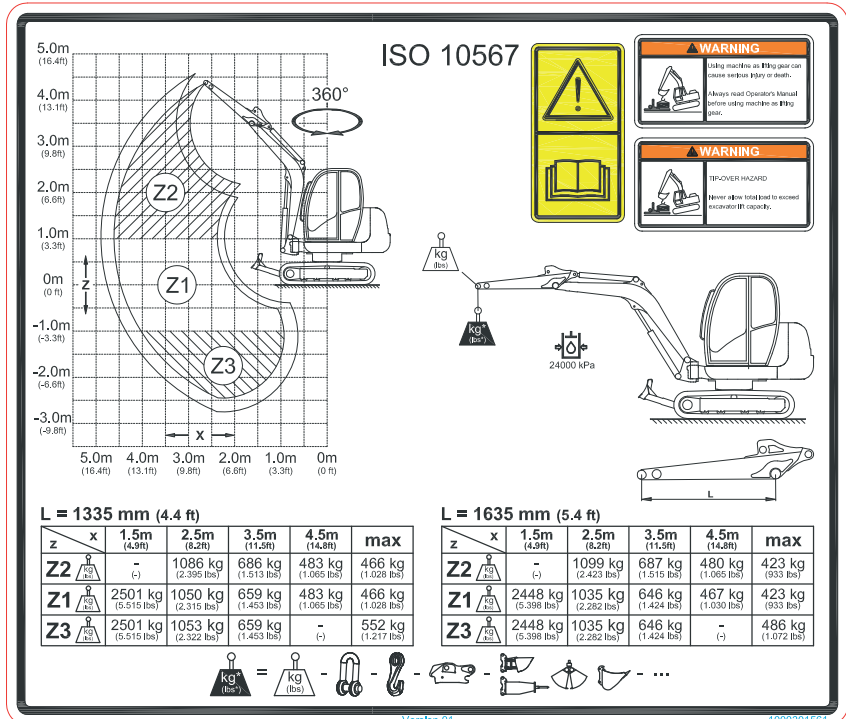
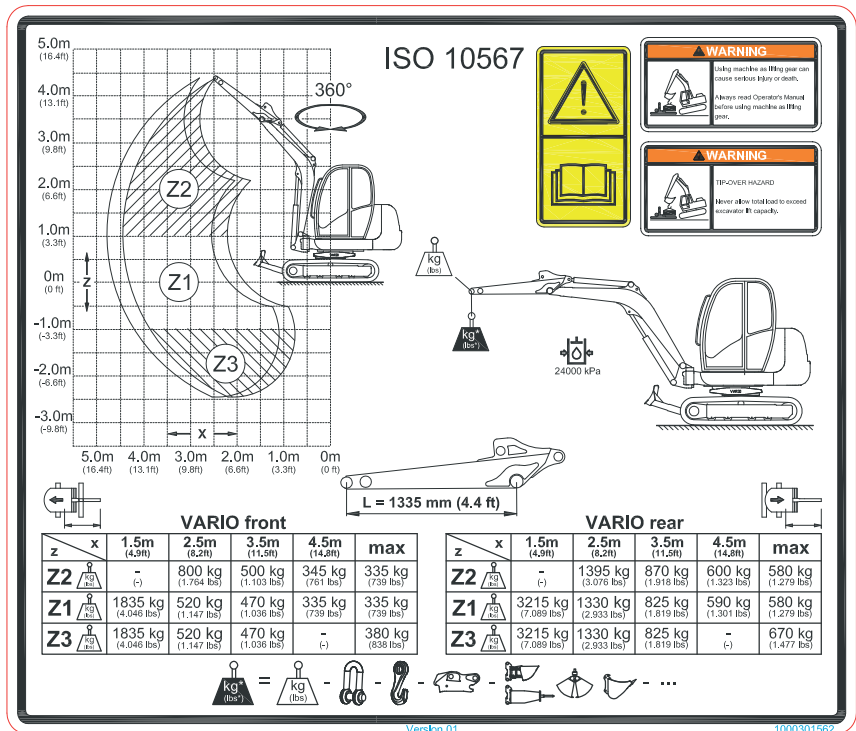
- Lubricants and engine/machine fluids at the mandatory levels
- Full fuel tank
- Canopy/cabin
- Machine at operating temperature
- Operator weight 75 kg (165 lbs)

2503



3503 long/short stick



3503 long/short stick, VDS

3503 long/short stick, Vario






SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL



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Acknowledgment

We wish to acknowledge the contributions of the members of AEM's Compact Loader/Compact Excavator Council to the preparation of this Safety Manual.

NOTICE OF COPYRIGHT PROTECTION

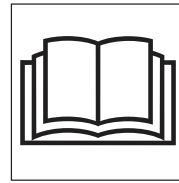
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Foreword

This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of the machine and to suggest possible ways of dealing with these conditions. This manual is **NOT** a substitute for the compact excavator manufacturer's operator manual(s).

Additional precautions may be necessary, or some instructions may not apply, depending on equipment, attachments and conditions at the worksite or in the service area. The manufacturer has no direct control over equipment application, operation, inspection or maintenance. Therefore, it is **YOUR** responsibility to use safe work practices in these areas.

The information provided in this manual supplements the specific information about the machine that is contained in the manufacturer's manual(s). Other information that may affect the safe operation of the machine may be contained on safety signs or in insurance requirements, employer's safety and training programs, safety codes, local, state/provincial and federal laws, rules and regulations.



**Read And
Understand
Manuals Before
Operating**

IMPORTANT! Before you operate the compact excavator, make sure you have the manufacturer's manual(s) for this machine and all attachments. If the manufacturer's manuals are missing, obtain replacement manuals from your employer, equipment dealer or directly from the manufacturer. Keep this safety manual and the manufacturer's manuals with the machine at all times. Read and understand all manuals.

Safety videos and other training resources are available from some manufacturers. Operators are encouraged to periodically review the safety video.

3

Safety Alerts

Symbol

This Safety Alert Symbol means: **“ATTENTION!
STAY ALERT! YOUR SAFETY IS INVOLVED!”**



The Safety Alert Symbol identifies important safety messages on equipment, safety signs, in manuals or elsewhere. When you see this symbol, be alert to the possibility of death or personal injury. Carefully read the message that follows and inform other operators. Follow instructions in the safety message.

Signal Words

Signal words are distinctive words that will typically be found on safety signs on the compact excavator and other worksite equipment. These words may also be found in this manual and the manufacturer's manuals. These words are intended to alert the operator to a hazard and the degree of severity of the hazard.



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



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



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



NOTICE indicates a property damage message.

One-Call First



**Call Before You Dig
Dial 811 (USA only)**



**888-258-0808
(USA and Canada)**

Call

Before starting any digging project, contact the local One-Call service by dialing 811 (USA only) to have underground utilities located. A One-Call referral number, **1-888-258-0808**, is also available for both USA and Canada.

One-Call will notify participating utility companies that you intend to dig. You must also call utility companies that do not participate in the One-Call service.

Always inspect the jobsite for evidence of unmarked utilities and contact others if necessary.

Plan The Work

Be aware of the lead time for marking the work area. This time may vary from state to state and county to county. If you do not locate utilities, you may have an accident or suffer injuries, cause service interruptions, damage the environment or experience job delays.

Dig

Most utilities mark their underground facilities using American Public Works Association (APWA) underground color codes. Verify marks before digging.

In the United States, OSHA Standard 29 CFR 1926.651 requires that the estimated location of underground utilities be determined before beginning an excavation. When actual excavation approaches an estimated utility location, the exact location of the underground installation must be determined by a safe, acceptable and dependable method. Other OSHA regulations may also apply to the jobsite.

5

A Word To The User/Operator

It is **YOUR** responsibility to read and understand the safety manual and the manufacturer's manuals before operating this machine. This safety manual takes you step by step through the working day.

Graphics have been provided to help you understand the text.

IMPORTANT: This manual covers safe practices for Compact Excavators. If the machine is equipped with special attachments, read the manufacturer's operator and safety manuals pertaining to those attachments before using them.

Remember that **YOU** are the key to safety. Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's manuals for the specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written only for compact excavators.

Contact the manufacturer of the equipment to answer any questions about safe operation that remain after studying the manufacturer's manual(s) and this safety manual.



**Read And
Understand All
Safety Signs**

Practice all other usual and customary safe working precautions and remember:

SAFE OPERATION IS UP TO YOU!

**YOU CAN PREVENT DEATH OR SERIOUS INJURY
CAUSED BY UNSAFE WORK PRACTICES!**

Follow A Safety Program

Be Alert!

Know where to get assistance. Know where to find and how to use a first aid kit and fire extinguisher/fire suppression system.

Be Aware!

Take advantage of training programs offered.

Be Careful!

Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, unfamiliarity of the operator with the machine or attachment, drugs, and alcohol to name a few. You can prevent death or serious injury caused by unsafe work practices.

For your safety and the safety of others, encourage fellow workers to act safely.



Never Operate
While Impaired By
Alcohol Or Drugs

For Safe Operation

You must be a qualified and authorized operator for safe operation of this machine. You must clearly understand the written instructions supplied by the manufacturer, be trained—including actual operation of the compact excavator—and know the safety rules and regulations for the worksite. It is a good safety practice to point out and explain safety signs and practices and ensure others understand the importance of following these instructions.

WARNING! Drugs and alcohol affect an operator's alertness and coordination and the operator's ability to safely operate the equipment. **Never operate the compact excavator while impaired by use of alcohol or drugs. Never knowingly allow the operation of this machine when operator alertness or coordination is impaired.** An operator taking prescription or over-the-counter medication must consult a medical professional regarding any side effects of the medication that would hinder the ability to safely operate this equipment.

Follow A Safety Program

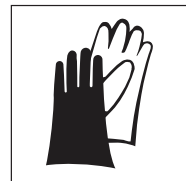
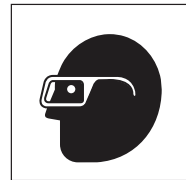
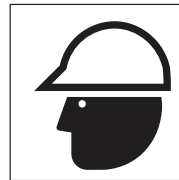
Protect Yourself

Wear personal protective clothing and Personal Protective Equipment (PPE) issued to you or called for by job conditions.

You may need:

- Hard hat
- Safety boots with non-slip soles
- Safety glasses, goggles or face shield
- Heavy-duty gloves
- Hearing protection
- Reflective or high-visibility clothing
- Wet weather gear
- Respirator or filter mask

Wear whatever is needed to protect yourself—do not take chances.



Avoid
Entanglement

WARNING! Prevent death or serious injury from entanglement. **Do not wear loose clothing or accessories. Restrain long hair. Stay away from all rotating components when the engine is running.** Contact, wrapping or entanglement with rotating or moving parts could result in death or serious injury.

Follow A Safety Program

Know The Rules

Most employers have rules governing operation and maintenance of equipment. Before you start work at a new location, check with your supervisor or the safety coordinator. Ask about the rules you will be expected to obey.

The Occupational Safety and Health Administration (OSHA) enforces federal laws within the United States that apply to the safe operation, application and maintenance of equipment on a worksite. It is the employer's responsibility to comply with these laws. A federal representative may periodically inspect a worksite to see that these laws are being followed.

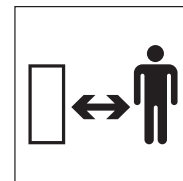
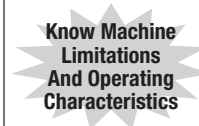
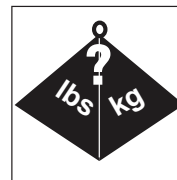
There may also be local, state/provincial, federal laws or international regulations that apply to this equipment and its use, along with specific worksite or employer rules. It is important that you know and comply with all applicable laws and rules, including those requiring operator training and certification.



Follow A Safety Program

Some Rules You Must Work By

- Know the limitations and operating characteristics of the compact excavator. Do not overload it.
- Always wear the seat belt, if equipped. If the compact excavator is equipped with a foldable TOPS/ROPS, do not fasten the seat belt when the TOPS/ROPS is in the down position.
- Always have all shields and guards properly installed before operating the machine.
- Inspect the machine and all attachments before each use as specified by the manufacturer and your employer. Ensure the attachment is properly installed. (See page 17, **Quick-coupling Device Safety**.)
- Only use parts and attachments that are approved by the original equipment manufacturer.
- Never modify or remove any part of the equipment (except for service—then make sure it is replaced).
- Read and understand all safety signs installed on the machine.
- Know the location of other personnel and machines and make sure they are a safe distance from the machine.
- Know the worksite. Be aware of possible hazards that you may encounter.



Follow A Safety Program

- Always look in the direction of machine or boom movement. Drive facing the travel direction whenever possible.
- Make sure you understand the rules covering traffic at the worksite. Know what all signs, flags and markings mean.
- Understand hand, flag, horn, whistle, siren and bell signals, if used at the worksite.
- Know when to use lights, turn signals, flashers and horns, if equipped.
- Do not allow riders.
- Keep hands and feet on controls when operating.
- Never lift or swing a load or attachment over anyone.
- Whenever you leave the machine, lower the excavator blade, bucket or other attachments to the ground. Stop the engine. Cycle the hydraulic controls, including auxiliary hydraulic control, to relieve trapped pressure. Engage control lock if equipped, and remove the ignition key. (See page 39, **Machine Shutdown.**)
- When transporting the compact excavator on a trailer, follow the manufacturer's instructions for loading, tying down and unloading the compact excavator.



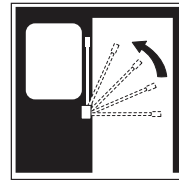
Understand
Worksite Signals



No Riders



Never Lift Or
Swing A Load Or
Attachment
Over Anyone



Engage
Control Lock

11

Follow A Safety Program

Know The Equipment

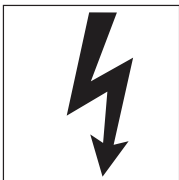
Read and understand the DANGER, WARNING, CAUTION and NOTICE safety signs and other informational signs found on the compact excavator and in the manufacturer's operator manual. Ask your supervisor to explain any information you do not understand. Failure to obey safety instructions could result in death or serious injury.

Make sure all the manufacturer's protective structures, guards, shields, screens and panels are in good repair, in place and securely fastened. Damaged, missing or

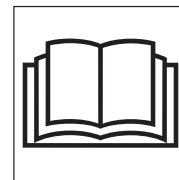
weakened safety components can create a hazardous situation for you as the operator. **Never** remove or modify any safety components on the compact excavator. The excavator can be operated temporarily with a foldable TOPS/ROPS lowered for access through height-restricted openings. Do not fasten the seat belt when the TOPS/ROPS is in the down position.

Know the following about this compact excavator and all attachments.

- Function, purpose and use of controls
- The functions of all gauges, lights, dials, switches
- Slope and uneven terrain capabilities and proper operation – never operate on a slope with a foldable TOPS/ROPS in the down position.
- Braking and steering characteristics
- Turning radius and clearances
- How to quickly stop equipment in an emergency



Read And
Understand All
Safety Signs



Read And
Understand
Manuals Before
Operating

12

Prepare For Safe Operation

Check And Use All Available Protective And Safety Devices

Keep all protective devices in place and tightly fastened. Make certain all guards, screens and panels, manufacturer's operator manuals, and safety signs are installed on the machine and legible as supplied by the manufacturer. See that each item is securely in place and in operating condition.

The machine may be equipped with:

- A seat belt or other type of restraint
- Control locking device
- Safety signs
- Access and egress system (i.e., grab handles, handrails) and protective covers
- Travel alarm and back-up alarm
- Falling object guard structure (FOGS), falling object protective structure (FOPS), roll-over protective structure (ROPS)/tip-over protective structure (TOPS)
- Guards
- Special enclosures or accessories required for task or worksite conditions
- Operator protective structure (OPS) – side, front and rear shields, screens and doors

- Warning lights and devices
- Alternate exits
- Mirrors
- Fire extinguisher
- First aid kit
- Windshield wipers and washers
- Window defroster
- Operating lights
- Horn

Know which devices are required for protection during your specific operation and use them. The excavator can be operated temporarily with the TOPS/ROPS lowered for access through height restricted openings. Do not fasten the seat belt when the TOPS/ROPS is in the down position.

WARNING! NEVER remove or modify safety equipment. Operating a machine without a protective structure (TOPS/ROPS, FOGS/FOPS or OPS) could result in death or serious injury. (See page 44, **Protective Structure Safety.**)

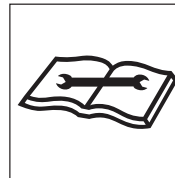


Prepare For Safe Operation

Check The Machine

Before you begin the workday, inspect the machine and have all systems in good operational condition. Do not operate the machine until all problems are corrected.

- Perform daily and periodic service procedures as instructed by the equipment manufacturer.
- Check that no safety switches or interlocks have been bypassed and that no warning tags have been placed on the machine.
- Check that safety signs, special instructions, lift capacity charts and operator manuals are legible and in the proper location.
- Check condition and operation of the seat belt and its mounts, if equipped.
- Make sure that the foldable TOPS/ROPS, if equipped, is properly secured in the raised position.
- Check condition and operation of the attachment quick-coupling device, if equipped. Perform daily cleaning and maintenance following the manufacturer's instructions. (See page 17, **Quick-coupling Device Safety.**)
- Inspect steps, guardrails, platforms and handholds for damage or loose parts.



Prepare For Safe Operation

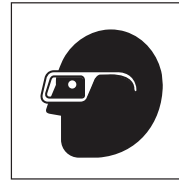
- Check the fuel and hydraulic systems. Have leaks repaired and fill to proper level.
- Check all exposed hydraulic components for leaks, routing problems or damage. Report worn or damaged components.

WARNING! Diesel fuel and hydraulic fluid under pressure can penetrate the skin or eyes and cause serious injury, blindness or death. Fluid leaks under pressure may not be visible. **Use a piece of cardboard or wood to find leaks, not your hand. Wear a face shield or safety goggles for eye protection.** If fluid is injected into the skin, it must be removed within a few hours by medical personnel familiar with this type of injury. (See page 46, **Hydraulic System Hazards.**)

- Check the cooling system.

WARNING! Prevent possible injury from explosive release of hot fluids. **Allow the radiator to cool before checking the fluid level.** (See page 45, **Cooling System Hazards.**)

- Keep radiators and coolers clean and free of oil, grease, dirt, debris and moisture.
- Make sure all doors, guards and covers are in place and secured properly.



**Wear
Eye Protection**



**High Pressure
Fluid Can Inject
Into The Body**



**Do Not
Loosen Cap
Until Cool**



**Check
The Radiator
And Engine**

15

Prepare For Safe Operation

Check The Machine (continued)

- Check the tracks for broken or damaged pins, bushings, and other parts.
- Check the tracks for proper tension adjustment according to manufacturer's instructions.
- Check the tracks for damage or wear. Replace badly worn or damaged tracks.
- Check the slew/swing brake for proper operation.
- Inspect working and other lights for proper operation.
- Inspect boom, arm and attachment for wear and damage.
- Make sure fire extinguishers are fully charged and in good working order.

Check Attachment And Coupler Installation

When changing buckets or installing attachments, follow the manufacturer's instructions for proper maintenance and coupling. Make sure all connectors are securely fastened. Tighten all bolts, nuts and screws to torques recommended.

Check the attachment coupler and the attachment for wear and hydraulic leaks before coupling the attachment.

Before operating, ensure that quick-coupler pins or wedges are fully engaged and visibly locked to the attachment.

WARNING! Avoid possible crushing injury. **Failure to properly secure the attachment to the machine coupler can allow the attachment to come off and could result in death or serious injury.** (See page 17, **Quick-coupling Device Safety.**)

Prepare For Safe Operation

Quick-coupling Device Safety

Before using a quick-coupling device you must know and understand proper installation, maintenance and operation.

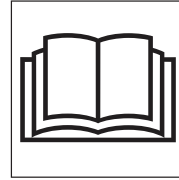
WARNING! Failure to read and follow manufacturer's instructions for the correct operation and maintenance of the quick-coupler can allow the attachment to come off and cause death or serious injury.

Protect yourself from injury:

- Install and maintain equipment, attachments and their operating systems according to manufacturers' instructions.
- Securely latch attachments before work begins.
- Follow the manufacturer's instructions for using positive locks on quick-coupling equipment.
- Make frequent visual inspections of quick-coupling systems—especially after changing attachments.
- Always check for interference limits of the coupler or tool with the carrier before operating.

Do not operate the machine if:

- there exists an incompatibility among components.
- there are broken, damaged or badly worn components.
- the lock/secure feature of the quick-coupler is impaired.
- the engaging lever or device is not fully engaged in a lock/secure condition.



Read And Understand Manuals Before Operating

WARNING! A quick-coupler that is not properly locked/secured could result in death or serious injury.

Perform all steps to lock/secure the device. The steps to confirm that the device is properly locked/secured may include any or all of the following:

- Manually installing a locking pin, actuating a lever or other device.
- Movement of the attached work tool to confirm its engaged lock/secure condition.
- A visual check of the components as instructed by the quick-coupler manufacturer.

WARNING! A quick-coupler that is disengaged when the attachment is in an unstable position could result in death or serious injury. **Place the attachment in a stable position, as instructed by the manufacturer, whenever coupling or uncoupling the attachment.**

17

Prepare For Safe Operation

Clean Up

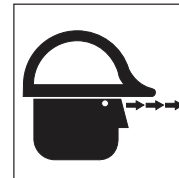
Clean windshields, mirrors and all lights. Use water and a clean cloth. Know and follow the manufacturer's recommendations for using cleaning agents other than clean water on polycarbonate glazing.

Clean out the operator's area. Steps and handholds must be clean and functional. Oil, grass, leaves, needles, snow, ice or mud in these areas can cause you to slip and fall.

Clean your boots before getting on the machine.

Clean out trash and debris buildup promptly, especially in the engine compartment, the battery box, around exhaust components, under the machine and around rotating components.

Remove all loose personal items or other objects from the operator's compartment. Secure these items in a fixed tool box or remove them from the machine. Do not store any flammable material such as ether/cold-start fluid or oily rags in the operator's compartment.



Maintain Vision – Clean Up



Avoid Falls – Clean Slippery Surfaces



Avoid Fire – Clean Out Debris



Put Away Tools And Loose Items

18

Prepare For Safe Operation

Check The Work Area

Know—beforehand—as much about the worksite as possible. Locate all ground workers near the worksite and make sure clothing worn is easily seen. Be aware of weather conditions that can affect visibility, ground stability and traction.

Check for:

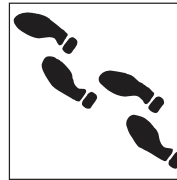
- Location of steep slopes, slide areas, drop-offs and overhangs
- Adequate traction on slopes
- Traffic locations and movement
- Thick dust, smoke and fog
- Soil conditions—look for signs of instability such as cracks or settlement
- Standing water and marshy areas
- Rocks and stumps
- Holes, obstructions, mud or ice
- Location of open trenches
- Exact location of any buried and/or overhead electrical, gas, telephone, water, sewer or other utility lines

Have the utility company mark, shut off or relocate the utility before you begin working.

Know the location and work plan for other machines on the worksite.

Correct unsafe conditions. Avoid operating in problem areas that cannot be corrected.

When operating the machine inside a building, know what clearances you will encounter—overhead, doorway, aisles, etc. Also, know the weight limitations of floors and ramps. Make sure there is sufficient ventilation for inside operation.



Walk Around
The Worksite



Be Seen –
Wear Visible
Clothing

19

Prepare For Safe Operation

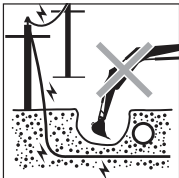
Check The Work Area (continued)

Know the exact location of electrical, telephone, gas or other utility lines. (See page 5, **One-Call First.**)

DANGER! Death or serious injury will result from touching or being near a machine that is in contact with or near an energized electrical source. **Never approach power lines with any part of the machine or load unless all local, state/provincial and federal (OSHA) required safety precautions have been taken.** Use extreme caution because high voltage sources can arc without contact.

When working near power lines, you must assume all lines are energized.

Maintain a safe distance from all utilities. (See page 31, **Utilities—Overhead And Underground.**)



Locate All
Utilities, Maintain
A Safe Distance

Use Caution When Fueling

IMPORTANT! Always use approved fuel containers and dispensing equipment.

Fuels are flammable, so observe these practices to reduce the possibility of a serious accident.

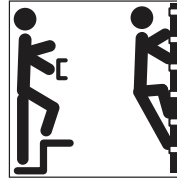
- Shut off engine and ignition during refueling.
- Always ground the fuel nozzle against the filler neck to avoid sparks.
- Keep sparks and open flames away from fuel.
- Do not use a cell phone or two-way radio while fueling or handling fuel—they could cause sparks.
- Do not smoke while refueling or when handling fuel containers.
- Do not overfill the tank or spill fuel. Clean up spilled fuel immediately.

Prepare For Safe Operation

Mount And Dismount Properly

When you enter or leave the machine:

- Maintain a three-point contact with the machine. Three-point contact is defined as maintaining contact with at least one hand and two feet, or two hands and one foot, at all times.
- Face the machine when either mounting or dismounting.
- Use handholds, handrails, ladders or steps (as provided).
- The upperstructure and undercarriage must be oriented to align the access system.
- Never use control levers as handholds.
- Never step on foot controls when entering or leaving.
- Clean your boots and wipe your hands before mounting or dismounting.
- Never jump on or off the machine.
- Never attempt to mount or dismount a moving machine.
- Never mount or dismount while carrying tools or objects that prevent three-point contact.



Maintain
Three-Point Contact –
Face Machine



Do Not Jump Off
Machine



Do Not
Use Controls As
Handholds

21

Start Safely

Look Out For Others

Before starting, walk completely around the machine operating area. Make sure no one is under it, on it or close to it. Do not start the engine until everyone is clear of the operating area.

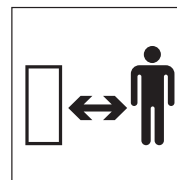
Starting The Engine

Do not start the engine or move any of the controls if there is a “DO NOT OPERATE” or similar warning tag attached to the start switch or controls. Check with your supervisor.

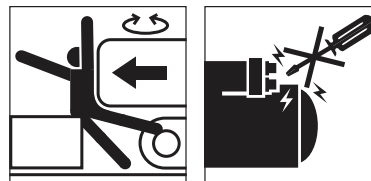
WARNING! Start the engine only from the operator's seat. Never attempt to start the engine by shorting across starter terminals or reaching for the key from outside the cab. This could result in the machine moving suddenly and unexpectedly and cause death or serious injury.



Walk-
Around
Inspection



Keep
Bystanders
Away



Start Only
From Operator's
Position

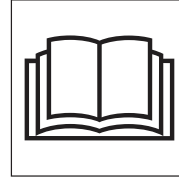
Start Safely

Know the exact starting procedures for this machine. See the manufacturer's manual(s) for starting procedures.

- Clear the area of all persons.
- Sit in the operator's seat and adjust the seat so you can operate all the controls properly.
- Familiarize yourself with warning devices, gauges and operating controls.
- Close or secure the cab door, if equipped.
- Fasten the seat belt, if equipped. If the compact excavator is equipped with a foldable TOPS/ROPS, do not fasten the seat belt when the TOPS/ROPS is in the down position.
- Put all controls, including those for auxiliary equipment, in the neutral/park position.
- Activate controls by releasing the control lock, if equipped.
- Start the engine following the instructions in the manufacturer's manual(s).

If it is necessary to run the engine or operate the machine within an enclosed area, be sure there is adequate ventilation.

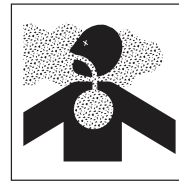
WARNING! Never operate any type of engine without proper ventilation—exhaust fumes can kill.



Know Starting Procedure, Read Manual



Fasten Seat Belt, Use TOPS/ROPS



Ventilate Work Area

Start Safely

Starting Aids

Do not use ether/cold-start fluid if the engine is equipped with glow plugs or intake manifold preheater.

Ether/cold-start fluid is **HIGHLY FLAMMABLE**. Before using it, always read the instructions on the ether/cold-start fluid container and the instructions in the manufacturer's manual(s). **Do not** carry loose cans of starting fluid on the machine while operating.

If booster cables are used, follow the instructions in the manufacturer's manual(s). The operator must be in the operator's seat when boost-starting the engine so that the machine will be under control when the engine starts. Boost-starting is a two-person operation. A battery explosion or a run-away machine could result from improper starting procedures.

Never boost-start a frozen battery. (See page 48, **Avoid Battery Explosion.**)

After Starting The Engine

Observe gauges, instruments, and warning lights to ensure that they are functioning and their readings are within the operating range.

With the control levers or joysticks in neutral, test engine speed control.

Run An Operating Check

Do not use a machine that is not in proper operating condition. It is the **operator's responsibility** to check the condition of all systems, and to run the check in a safe area.

WARNING! Do not allow anyone to stand within the operating work radius of the machine and load.

Contact with moving parts of the compact excavator or load can cause death or serious injury.



Keep Bystanders Away

Start Safely

Test All Controls

Follow the manufacturer's recommended warm-up procedures and bring all machine systems to operating temperature.

Machines come equipped with various control configurations, patterns and operating modes. Some have selectable or configurable controls that allow operation to suit personal preferences or specific applications. Make sure that you know which control pattern has been selected and understand how the machine will operate.

Make sure the engine is operating correctly. Operate each machine control to check all functions.

Check for possible interference between the attachment and the cab and operate appropriately.

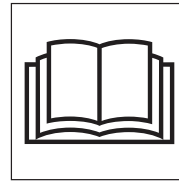
Make sure the attachment quick-coupling device (if equipped) is operating properly, fully engaged and visibly locked. (See page 17, **Quick-coupling Device Safety**.)

Check the blade location before traveling. When the blade is in the rear, operate the steering levers in the opposite direction as when the blade is in the front. See the machine manufacturer's manual.

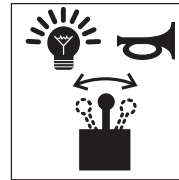
Operate the control(s) to ensure correct operation in forward, neutral and reverse.

Test steering—right and left—while moving slowly.

WARNING! Prevent possible injury from loss of control. **Know and understand the selected control pattern and operating mode before operating. Be certain you can control speed, direction, braking and boom motion before operating the machine.**



Read And Understand Manuals Before Operating



Check Instruments And Controls

25

Operate Safely

Remember

- Stay in the operator's seat, with the seat belt fastened, if equipped. If the compact excavator is equipped with a foldable TOPS/ROPS, do not fasten the seat belt when the TOPS/ROPS is in the down position.
- Understand the machine's limitations. Be in control of the machine at all times.
- Assure yourself that the work area is clear of all bystanders and other machines. Stop the machine immediately if anyone approaches.
- If a failure that causes loss of control occurs, stop all machine motion as quickly as possible. Shut the machine down and remove the key. Correct or report the problem immediately.

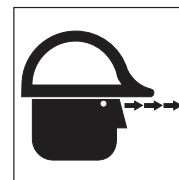
Remember The Other Person

WARNING! Never allow an untrained or unqualified person to operate this machine. Handled improperly, this machine could cause death or serious injury.

Do not allow anyone within the operating work radius of the compact excavator.



Fasten Seat Belt, Use TOPS/ROPS



Look Before Moving The Machine Or Boom

Never use a bucket or other attachment as a work platform or personnel carrier.

WARNING! Prevent possible injury from fall or runover. The compact excavator is a one-person machine. **NEVER PERMIT RIDERS.**

Always look around before you travel or move the boom. Look in the direction of machine movement.

Awareness on your part can prevent accidents.

Operate Safely

Traveling On The Worksite

Know and understand the worksite traffic flow patterns and obey signalmen, road signs and flagmen.

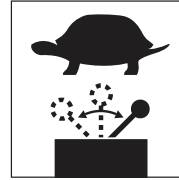
Check blade location before traveling. When blade is positioned to the rear, operate the steering levers in the opposite direction as when the blade is in the front.

The retractable track frame, if equipped, should be extended for traveling on the worksite. The track frame can be retracted to access narrow areas. Read and know manufacturer's instructions before operation.

Know the maximum height and width of the machine. Do not obstruct your vision when traveling. Always look in the direction of travel. Drive facing the travel direction when possible.

Operate the controls smoothly and slowly. Rapid and jerky movement of the controls can cause loss of both machine stability and control of the load.

When moving the machine, watch that enough clearance is available on both sides and above the boom and cab. Be especially careful to allow extra clearance on uneven ground.



Operate Controls Smoothly And Slowly



Know Weight Limits

Check for hazards or obstructions before entering an underpass or other area with restricted clearance. Check height and side clearances.

WARNING! Avoid possible injury. The weight of the machine may cause the ground, dock, ramp or floor to give way, causing loss of control, fall or tipover. **Know weight limits and stay clear of the edges of excavations and drop-offs.** Failure to know and observe weight limits and use caution could result in death or serious injury.

27

Operate Safely

Traveling On The Worksite (continued)

Make sure all surfaces will support the weight of the machine.

Do not cross ditches, creeks or wet draws without an adequate fill or bridge crossing.

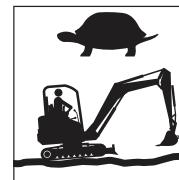
Match travel speed to the traffic, weather and ground conditions. Take it slow and easy when traveling. Travel cautiously over rough or slippery ground and on slopes. Reduce speed when travelling over a rise.

Always give the right of way to loaded machines. Maintain a safe distance from other machines.

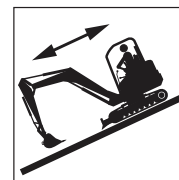
If you encounter a blind corner, stop and then proceed with caution.

Avoid traveling over obstacles (logs, tree stumps, rough terrain, ditches, curbs, railroad tracks) whenever possible. If you must cross an obstacle, do so slowly and with caution.

Avoid steep slopes or unstable surfaces. If it is necessary to travel on a slope, follow manufacturer's specific instructions. When on a slope, keep the boom centered and attachment as low and as close to the



Travel Slowly Over Rough, Hazardous Terrain



Drive Straight Up And Down – NOT ACROSS – Steep Slopes

machine as possible. Proceed with extreme caution. Do not drive **ACROSS** a steep slope under any circumstances. Drive straight up and down a slope.

Avoid turning on a slope. If it is necessary, use extreme caution and make the turn **WIDE and SLOW** with the boom centered and attachment as low and as close to the machine as possible.

Avoid sudden movement of the travel controls.

28

Operate Safely

Safety Precautions

Never reach into the compact excavator and attempt to operate the controls from outside the cab.

Before starting to excavate, set up safety barriers to the sides and rear area of the swing pattern to prevent anyone from walking into the working area.

Read and know manufacturer's instructions before operation.

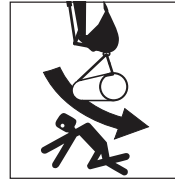
Make sure you are aware of personnel or machines that may be hidden in blind spots on the worksite, such as piles or stacks of material.

Make sure the machine has sufficient clearance from other machines or material on the worksite to prevent contact during machine or attachment movement.

WARNING! Prevent death or serious injury. **Never lift, move or swing a load over any person or any machine cab.**



Check Clearance,
Look Out For
Others



Do Not Lift
Or Swing A Load
Or Attachment
Over Anyone

Know and use the hand signals required for particular jobs. Know who has the responsibility for signaling. Take signals from one person only.

Do not operate during storms with high winds or lightning strikes. Do not mount or dismount during a period of lightning strikes. If you are on the machine, stay on it. Warn others to stay clear of the machine in case of a lightning strike.

29

Operate Safely

Load Lifting

Consult the rated lift capacity chart. Do not overload this machine. Know the exact lifting capacity of the machine as equipped. Make sure you have and know how to use a current lift capacity chart for the machine. Changing conditions such as slopes, wind, ice, mud, soft ground, type of load or the weight of attachments will affect the capacity and operating characteristics of the machine.

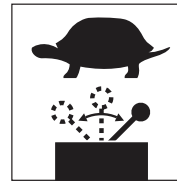
Consult your lift chart. Lifting and handling loads over the end of the machine, rather than over either side, will improve the lifting performance of the machine.

The retractable track frame, if equipped, should be fully extended for increased lifting performance.

Attach loads only to the manufacturer's designated lifting points, if equipped.

If equipped, keep blade lowered for increased lifting performance. If ground is soft, place pads or timbers under the blade.

Operate the controls smoothly and slowly. Rapid and jerky movement of the controls can cause loss of both machine stability and control of the load.



Operate
Controls Smoothly
And Slowly

When lifting, be sure the load is properly balanced. Move slowly so the load does not sway or swing around. Use a tag line for control.

If tracks or blade leave the ground, slowly lower the load to return the machine to the ground. Do not drop the load suddenly, because this can lead to loss of control.

Do not exceed rated lift capacity. Excessive load can cause tipping or loss of control.

Carry the load/attachment low and as close to the machine as possible. You must allow for movement in all directions. Be careful to maintain clearance of the attachment and load from the cab.

Keep all guards in place and windows closed or locked open. Keep cab doors closed or otherwise secured, if equipped.

Never leave the operator's seat with a load suspended. (See page 39, **Machine Shutdown.**)

Operate Safely

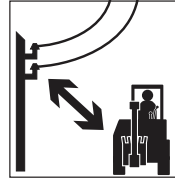
Utilities – Overhead And Underground

DANGER! Electrocutation or serious injury will result from **CONTACTING** or **APPROACHING** power lines or apparatus. **Maintain Minimum Approach Distance.** (See chart.)

DANGER! Death or serious injury will result from touching or being near a machine that is in contact with or near an energized electrical source. **Never approach power lines with any part of the machine or load unless all local, state/provincial and federal (OSHA) required safety precautions have been taken.** Use extreme caution because high voltage sources can arc without contact.

REQUIRED CLEARANCE FOR OPERATION NEAR HIGH VOLTAGE POWER LINES		
Normal Voltage, kV (Phase to Phase)	Minimum Approach Distance [Note (1)]	
	ft	(m)
to 50	10	(3.0)
Over 50 to 200	15	(4.6)
Over 200 to 350	20	(6.1)
Over 350 to 500	25	(7.6)
Over 500 to 750	35	(10.7)
Over 750 to 1,000	45	(13.7)

NOTE: (1) Environmental conditions such as fog, smoke or precipitation may require increased clearances.



**Maintain
Minimum Approach
Distance**



**Stay Clear
Of Energized
Equipment**

Check overhead clearances. If possible, have power to the lines de-energized and visibly grounded. If not possible, request a signal person for guidance to maintain at least the Minimum Approach Distance. (See chart.)

If the machine or load contacts an energized line, stay in the machine and attempt to break contact. Warn others to stay away from the machine. If machine catches fire and you are forced to leave, jump clear of the machine with both feet together and hop or shuffle away. **DO NOT** touch machine and ground at the same time.

Operate Safely

Locate All Underground Utilities

Confirm that One-Call has been contacted. Confirm that any utilities not subscribing to One-Call have been contacted. Confirm that the site has been marked or cleared. (See page 5, **One-Call First.**)

Obtain all information pertaining to the locate request, including the One-Call confirmation code or ticket number. If the facility owner has provided a locate sketch, obtain a copy. Review any engineering drawings provided by utilities. This information should be retained.

Personally verify One-Call utility marks. There are variations from state to state.

Take a copy of the locate sketch to the job site. Confirm all of the locates. Review the site for signs of unmarked utilities. These signs may include pedestals, pole risers, meters, trench lines, manhole covers, sewer drain outlets, etc. Review not only the immediate area, but also the perimeter of the area for utility markers.

Additionally, the area should be swept by an experienced operator using a device to locate utilities and large metal objects.

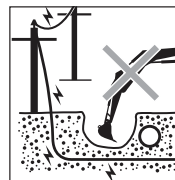
Any inconsistencies with line locations or any inaccurate locates must be resolved.

When excavating near underground services, expose the service by hand-digging or by using soft excavation, such as vacuum excavation, if permitted by local utilities.

When gas lines are present on the site, do not smoke or do anything to cause a spark in the vicinity of a gas line.

Make plans to restrict working area access—with cones and tape, barriers, warning signs, fences, etc.—until the job is complete.

Make certain that you are in compliance with all local, state/provincial, national and other requirements and regulations, including those regarding open excavations, or “potholes.”



**Locate All
Utilities, Maintain
A Safe Distance**

Operate Safely

Trenching Safety Precautions

Follow the worksite plan for proper construction of the trench. Check with your supervisor if you are unsure of correct trench construction or if operating conditions change.

Stay alert to changes in soil conditions. Trench collapse is hazardous to all workers in the area and could cause the machine to slide into the trench.

Keep heavy loads and equipment as far from the trench as possible.

Keep spoil and stored materials such as pipe at least two feet from the edge of the trench.

Keep personnel away from the equipment and attachments.

Never swing a load or attachment over anyone.

Do not undercut the machine.

WARNING! Do not dig under the machine or blade. A resulting cave-in could cause death or serious injury.

WARNING! Avoid possible death or serious injury from trench wall collapse. **Before backfilling, see the manufacturer's manual for any specific instructions.** **Do not get too close to the edge of the cut.** The weight of the machine plus the fill could cause the trench wall to collapse.



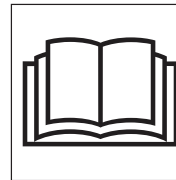
Keep
Personnel Away
From Equipment
And Attachments

Operate Safely

Slope And Uneven Terrain Operation

Compact excavator stability and load capacity are greatly reduced on slopes. Ensure the operation can be done safely. Prevent overturns and maintain stability control:

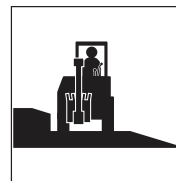
- Use machines equipped with TOPS/ROPS and a seat belt. Make sure folding TOPS/ROPS is raised and locked in place—always use the seat belt.
- The retractable track frame, if equipped, should be extended for operating on slopes or uneven terrain. Read and know manufacturer's instructions before operation.
- Review the manufacturer's manual for specific instructions and limitations, including those for proper operation of alternate/emergency exits.
- Avoid extremely steep slope operation.
- Keep machine movements slow and smooth.
- Level the working area and machine as much as possible.
- Avoid working with the tracks across a slope. This will reduce stability and increase the tendency of the machine to slide. Position the machine with the tracks running up and down the slope—blade downhill and lowered.
- Avoid slippery ground conditions.



Always Check
Manuals For Specific
Instructions



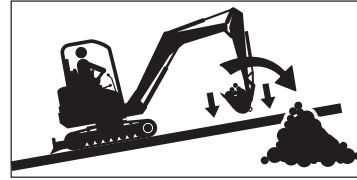
Fasten Seat Belt,
Use TOPS/ROPS



Level The
Work Area
If Possible

Operate Safely

- Travel straight up and down the slope with the attachment low and close to the machine. Do not move the boom while travelling.
- Avoid swinging to the downhill side of a slope. Always keep the boom and attachment as low and close to the machine as possible.



Swing Load Uphill When On A Slope

If the machine begins to tip, roll or slide, stay in the machine with the seat belt securely fastened. Lower the attachment immediately. Hold on firmly and brace your feet on the floor. Lean away from the point of impact.

When operating the compact excavator on a slope, swing to the uphill side to dump load, if possible. If downhill dumping is necessary, swing only as far as required to dump the bucket. Use extreme caution. Always drop spoil a sufficient distance from a trench to prevent cave-ins.

If possible, avoid working with the tracks across a slope.

Before moving the machine, raise the blade sufficiently to clear the ground, and then drive the machine forward or backward as required. Lower the blade to level the machine.

35

Operate Safely

Hazardous Conditions

When working in hazardous areas, be extremely alert.

Always consult the manufacturer's operator manual for specific instructions.

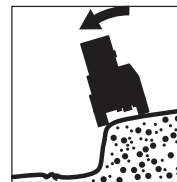
Extreme caution is required when working near the edge of an excavation. Keep the machine a safe distance away from the edge. Avoid undercutting.

WARNING! Never undercut a high bank. The edges could collapse or a slide could occur, resulting in death or serious injury.

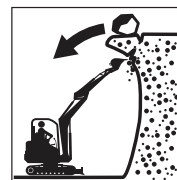
Work the jobsite in a manner that avoids creating overhangs or the need to be on top of banks or slopes. Never operate the machine close to the edge of an overhang or stockpile.

Extreme caution should be used when working along the top of banks and slopes. Keep as far back from the edge as possible. Level the area if possible. Keep the machine tracks perpendicular to the edge so that if part of the edge collapses, the machine can be moved back.

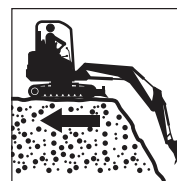
Immediately move the machine back at any indication the edge may be unstable.



Use Caution – Stay Safely Away From Bank Or Excavation Edge



Never Undercut A High Bank



Operate Perpendicular To Banks – Stay Back From The Edge

Operate Safely

WARNING! Do not dig under the machine. A cave-in could result and the machine could fall into the excavation, resulting in death or serious injury.

Avoid Silica Dust

Cutting or drilling concrete or rock containing quartz may result in exposure to silica dust. **Do not exceed Permissible Exposure Limits (PEL) to silica dust as determined by OSHA or other worksite rules and regulations.** Use a respirator, water spray or other means to control dust. Silica dust can cause lung disease and is known to cause cancer.

Operation In Flammable/Explosive Atmosphere

WARNING! Avoid possible death or serious injury. **Never operate an excavator in these areas. Use of these excavators in explosive atmospheres can result in fires and explosions, causing death or serious injury.**



Use Caution Near Excavation Edge – Do Not Undercut Machine



Avoid Silica Dust



Do Not Operate In Explosive/Flammable Atmosphere

37

Operate Safely

Towing

Many compact excavators may not be towed. Refer to the manufacturer's manual(s) for specific towing instructions.

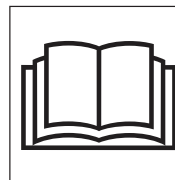
Never straddle a tow line or stand near a tow line under tension.

Parking

Park the machine in a designated area out of traffic, preferably on level ground. (See page 39, **Machine Shutdown.**)

If freezing conditions are expected, the tracks should be first cleared of mud and dirt and the machine parked on planks or suitable debris.

Public roads are not suitable for parking. If the machine is disabled or you must park on a public road, barricade and mark the machine according to local and worksite regulations.



Consult Manufacturer's Manual Before Towing

Shut Down Safely

Machine Shutdown

Properly shutting down a compact excavator can help prevent accidents when the machine is left unattended. Shut down the excavator following the specific procedures in the manufacturer's operator manual.

A typical list includes:

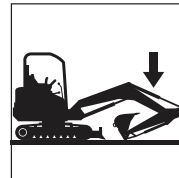
- Stop the machine.
- Make sure the area around the machine is clear of personnel.
- Slew the machine to align the upperstructure with the undercarriage, if possible.
- Return controls to neutral, including the auxiliary hydraulic controls.
- Lower the attachment and blade to the ground with slight down-pressure.
- Idle engine for a short cool-down period.
- Stop the engine.
- Cycle all hydraulic controls to relieve system pressure.
- Engage the control locking device, if equipped.
- Remove ignition key.
- Block the tracks if on a slope or incline.

- Check for and clean out trash build-up, especially in the engine compartment, battery box, around exhaust components, in confined spaces, under the machine and around rotating components.

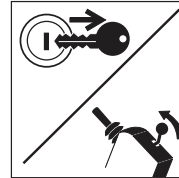
Safe Dismounting

Never dismount from moving equipment. Observe proper shutdown practices before dismounting. Check for slippery steps and handholds.

Dismount carefully using three-point contact facing the machine. (See page 21, **Mount And Dismount Properly.**)



Lower Attachment



**Shut Off Engine,
Remove Key, Engage
Control Lock**

39

Load And Unload The Machine Safely

Loading And Unloading For Transport

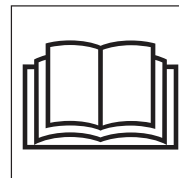
All machines are not loaded in the same way, and the procedures given in the manufacturer's manual(s) should always be followed.

Some precautions apply to all machines:

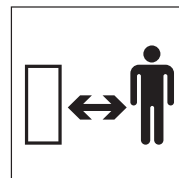
- Keep bystanders away.
- Wear the seat belt, if equipped.
- If the compact excavator is equipped with a foldable TOPS/ROPS, make sure it is properly secured in the raised position.
- Place transport vehicle on a firm, level surface.
- Block or support the rear of the trailer.
- Secure the parking brake and block transport vehicle so it cannot move.
- Use ramps with slip-resistant surfaces, adequate size and strength, low angle (15 degrees or less) and proper height.
- Keep trailer bed and ramps clear of mud, oil, ice, snow, leaves and other debris.
- Position the attachment to the front of the machine.
- Drive forward up the ramps, raising the blade high enough for clearance.
- Cover or remove any SMV (Slow-Moving Vehicle) emblem.

- Secure the cab door, attachment and accessories in the transport position.
- Engage upperstructure slew lock, if equipped.
- Chain and block the excavator securely for transport. Refer to the manufacturer's operator manual for tie-down procedures.

Measure the transport height and width of the loaded machine to avoid overhead and width obstructions. Make sure clearance flags, all lights and warning signs are in place and visible.



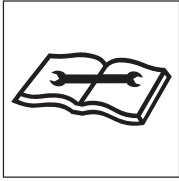
Read Operator Manual



**Keep Bystanders
Away**

Perform Maintenance Safely

Maintain Equipment



Be sure to maintain equipment according to manufacturer's instructions. Regularly check the operation of the protective and safety devices.

Do not perform any work on the compact excavator unless you are authorized and qualified to do so.

If you have been authorized to maintain the equipment, **read the operator, maintenance and service manuals.** Study the instructions, check the lubrication charts and examine all the instruction messages on the machine. Maintenance can be dangerous unless performed properly. Be sure you have the necessary skill, information, tools and equipment to do the job correctly.

If adjustments must be made with the engine running, always work as a 2-person team with one person sitting in the operator's seat while the other works on the machine.

IMPORTANT! Do not modify equipment or add components not approved by the manufacturer. Use parts, lubricants and service techniques recommended by the manufacturer.

Protect Yourself

Wear personal protective clothing and Personal Protective Equipment (PPE) issued to you or called for by job conditions.

You may need:

- Hard hat
- Safety boots with non-slip soles
- Safety glasses, goggles or face shield
- Apron and heavy-duty gloves
- Hearing protection
- Welding helmet or goggles
- Respirator or filter mask

Wear whatever is needed to protect yourself—do not take chances.

Perform Maintenance Safely

WARNING! Prevent death or serious injury from entanglement. **Do not wear loose clothing or accessories. Restrain long hair. Stay away from all rotating components when the engine is running.** Contact with or entanglement in rotating or moving parts could result in death or serious injury.

Wear a rubber apron and rubber gloves when working with corrosives. Wear gloves and safety shoes when handling wooden blocks, wire rope or sharp-edged metal.

Always use safety glasses, goggles or a face shield. They provide eye protection from fluids under pressure, during grinding and while servicing batteries. Protection is also needed from flying debris, liquids and loose material produced by equipment, tools and pressurized air/water/oil/fuel.

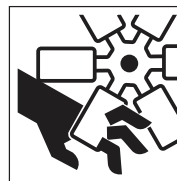
Wear a face shield when you disassemble spring-loaded components or work with battery acids. Wear a welding helmet or goggles with a shaded filter when you weld or cut with a torch.

Do not sand, grind, flame-cut, braze or weld without an approved respirator or appropriate ventilation. If welding

is required on the machine, refer to the manufacturer's manuals or consult the equipment dealer for proper procedures. Make sure all flammable material is cleared from the area.

Keep pockets free of all objects that could fall out and drop into machinery.

Handle tools and heavy parts sensibly, with regard for yourself and other persons. Lower items—do not drop them.



Perform Maintenance Safely

Prepare The Work Area

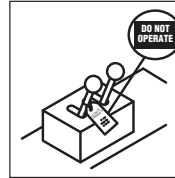
- Position the compact excavator in a level area out of the way of other working equipment.
- Make sure there is adequate light, ventilation and clearance.
- Remove oil, grease, ice and snow or water to eliminate any slippery surfaces.
- Clean around the machine and work area to minimize contamination. Clean up oil or fuel spills promptly and dispose of the material properly.

Prepare The Machine

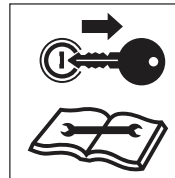
- Attach a “DO NOT OPERATE” warning tag to the control levers and remove the ignition key if the machine should not be started.
- Block the tracks.
- Release all hydraulic, water and air pressure. Lower, lock or block all hydraulically supported components.

WARNING! Disconnecting or loosening any hydraulic component or a part failure can cause unsupported equipment to drop. **Do not go under or near raised equipment unless supported by a manufacturer-approved support device(s).** Death or serious injury could result from falling equipment.

- Remove only guards or covers that provide access to the area being serviced. Replace all guards and covers when work is complete.



Use
Warning Tags



Remove
Key And Read
Maintenance
Manual



Use
Approved
Support Device

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Perform Maintenance Safely

Use Approved Ventilation

If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

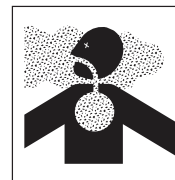
WARNING! Prevent possible injury. **Never work on machinery with the engine running unless instructed by the manufacturer's manuals for specific service.**

WARNING! **Never operate any type of engine without approved ventilation—EXHAUST FUMES CAN KILL.**

Use Jacks And Hoists Carefully

If you must work beneath raised equipment, use solid wood blocks, jack-stands or other rigid and stable supports. Never use concrete blocks. When using jacks or hoists, always be sure they are adequately supported and of adequate capacity.

Make sure the hoists or jacks you use are in good repair. Never use jacks with cracked, bent or twisted parts. Never use frayed, twisted or pinched cables. Never use bent, worn or distorted hooks.



Ventilate
Work Area

Protective Structure Safety

Do not remove or modify a protective structure (TOPS/ROPS, FOGS/FOPS OPS) except for service. Reinstall with manufacturer-approved fasteners before further machine operation.

Replace a damaged protective structure. Refer to the manufacturer's manual for specific instructions and inspection requirements.

Perform Maintenance Safely

Common Maintenance Safety Practices

Fuel Hazards

IMPORTANT! Always use approved fuel containers and dispensing equipment.

Fuels are flammable, so observe these practices to reduce the possibility of a serious accident.

- Shut off engine and ignition before refueling.
- Always ground the fuel nozzle against the filler neck to avoid sparks.
- Keep sparks and open flames away from fuel.
- Do not use a cell phone or two-way radio while fueling or handling fuel—they could cause sparks.
- Do not smoke while refueling or when handling fuel containers.
- Do not cut or weld on or near fuel lines, tanks or containers.
- Do not overfill the tank or spill fuel. Clean up spilled fuel immediately.

Always use a nonflammable solvent when you clean parts. Do not use gasoline, diesel fuel or other flammable fluids.

Store all flammable fluids and materials away from work areas in suitable containers, per local regulations.

Cooling System Hazards

Liquid cooling systems build up pressure as the liquid gets hot, so **use extreme caution** before removing the radiator or tank cap. Be sure to:

- Stop the engine and wait for the system to cool.
- Wear protective clothing and safety glasses.
- Turn the radiator or tank cap slowly to the first stop to allow the pressure to escape before removing the cap completely.



**Do Not
Loosen Cap
Until Cool**

45

Perform Maintenance Safely

Hydraulic System Hazards

The hydraulic system is under pressure whenever the engine is running and may hold pressure even after the engine is shut off. Cycle all hydraulic controls, including auxiliary controls, after the engine is shut down to relieve trapped pressure in the lines.

During inspection of the hydraulic system:

- Wait for fluid to cool before disconnecting the lines. Hot hydraulic fluid can cause SEVERE BURNS.
- **Do not** use your hand to check for leaks.
- Wear appropriate eye protection. Hydraulic fluid can cause permanent eye injury.

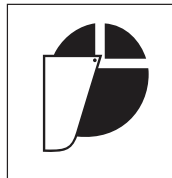
WARNING! Diesel fuel and hydraulic fluid under pressure can penetrate the skin or eyes and cause serious injury, blindness or death. Fluid leaks under pressure may not be visible. **Use a piece of cardboard or wood to find leaks, not your hand. Wear a face shield or safety goggles for eye protection.** If fluid is injected into the skin, it must be removed within a few hours by medical personnel familiar with this type of injury.

When venting or filling the hydraulic system, loosen the filler cap slowly and remove it gradually.

Never reset any relief valve in the hydraulic system to a pressure higher than recommended by the manufacturer.

Follow manufacturer's instructions when taking oil samples.

Do not permit an open flame around the hydraulic system.



**Wear
Eye Protection**



**High Pressure
Fluid Can Inject
Into The Body**



**Do Not Exceed
Factory Pressure
Settings**

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Perform Maintenance Safely

Electrical System Hazards

Before working on the electrical system, disconnect the battery cable(s).

- Remove the battery negative (-) cable(s) first.
- When reconnecting the battery, connect the battery negative (-) cable(s) last.

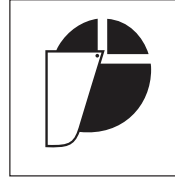
Battery electrolyte contains acid, which is a POISON and can cause SEVERE CHEMICAL BURNS.

Avoid Injury

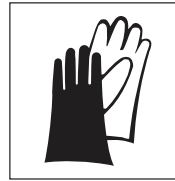
- Wear a face shield to prevent electrolyte contact with your eyes.
- Wear chemical-resistant gloves and clothing to keep electrolyte off your skin and regular clothing.

WARNING! Electrolyte will damage eyes or skin on contact. **Always wear a face shield to avoid getting electrolyte in eyes.** If electrolyte contacts eyes, flush immediately with clean water and get medical attention. **Wear rubber gloves and protective clothing to keep electrolyte off skin.** If electrolyte contacts exposed skin or clothing, wash off immediately with clean water.

If electrolyte is ingested, seek MEDICAL ATTENTION IMMEDIATELY. NEVER give fluids that would induce vomiting.



Wear
Face Protection



Wear
Protective
Clothing

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Perform Maintenance Safely

Avoid Battery Explosion

WARNING! Avoid possible death or serious injury from explosion. Lead-acid batteries produce extremely explosive gases, especially when being charged. **Keep arcs, sparks, flames and lighted tobacco away.**

- **Do not** smoke near batteries.
- Check battery cables for worn or damaged insulation.
- Keep arcs, sparks and open flames away from batteries.
- Provide adequate ventilation.

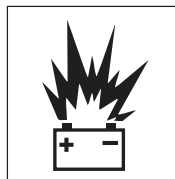
Never check the battery by placing a metal object across the battery posts; the resulting spark could cause an explosion.

WARNING! Avoid possible death or serious injury from battery explosion. **Do not charge a battery or boost-start the engine if the battery is frozen. Warm to 60°F (15.5°C) or the battery may explode.**

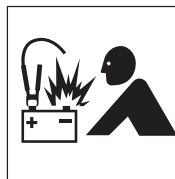
Safety rules during battery boost-starting:

- Follow the instructions for proper “battery boost-starting” as specified in the manufacturer’s manual.
- Be sure the machines are not touching.

- Observe the polarity of the batteries and connections.
- Make the final cable connection to the engine or the ground point farthest from the battery and away from fuel lines. Never make the final connection at the starter or dead battery—sparks may ignite the explosive gases present at the battery.
- When disconnecting cables after boost-starting, remove the cables in reverse order of connection (i.e., final connection first).



Avoid Sparks
And Open Flames
Near Batteries



Observe
Polarity – Make
Final Connection At
Ground Point

48

Perform Maintenance Safely

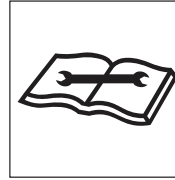
Track Maintenance And Adjustment

Check the tracks daily because the stability of the compact excavator can be dramatically affected by damage to tracks.

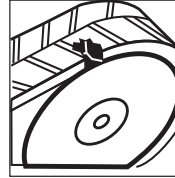
Check for:

- Damage or wear
- Correct tension according to manufacturer's instructions
- Proper lubrication of track rollers and idlers—refer to the manufacturer's manuals.

Track tension is important for good performance, reducing excessive track wear and preventing the tracks from coming off. Track and roller wear varies with working conditions and soil conditions. Special tools and procedures may be needed to check or adjust track tension. Follow manufacturer's specific service procedure(s) when removing and installing tracks.



Follow
Maintenance
Instructions



Check For
Track Damage

WARNING! Track tensioning systems have compressed springs or pressurized fluid (oil or grease). Improperly releasing track tension forces can result in death or serious injury. **Always follow the manufacturer's warnings and instructions for track adjustment and other maintenance and servicing procedures.**

WARNING! Avoid possible death or serious injury. **Never strike or pound on track tension springs.** They may be under very high compression and could shatter explosively.

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Perform Maintenance Safely

Complete Service And Repairs Before Machine Is Released

Tighten all bolts, fittings and connections to torques specified by the manufacturer.

Clean or replace all damaged, missing or painted-over signs, plates and decals that cannot be read.

Inspect and install all guards, covers and shields after servicing. Replace or repair any damaged parts. Refill and recharge pressure systems only with manufacturer-approved or recommended fluids.

Check readiness of fire extinguishers, if so equipped. Do not paint over or otherwise interfere with fire detectors or fire extinguisher access points.

Follow the instructions in the manufacturer's manual(s) for proper service of any fire suppression equipment on the machine.

Air conditioning service is limited to approved service personnel. Refer to the manufacturer's manual(s).



Verify
Service Work
When
Completed

Start the engine and check for leaks. (See page 46, **Hydraulic System Hazards.**) Operate all controls to make sure the machine is functioning properly. Test the machine if necessary. After testing, shut down and check the work you performed. Are there any missing cotter pins, washers, locknuts, etc.? Recheck all fluid levels before releasing the compact excavator for operation.

All parts should be inspected during repair and replaced if worn, cracked or damaged. Excessively worn or damaged parts can fail and cause death or injury.

Final Word To The User

You have just finished reading the AEM Compact Excavator Safety Manual. It is impossible for this manual to cover every safety situation you may encounter on a daily basis. Knowledge of these safety precautions and your application to the basic rules of

safety will help to build good judgment in all situations. Our objective is to help you develop, establish and maintain good safety habits to make operating a Compact Excavator easier and safer for you.

This manual is another in a series on the safe operation of machinery published by AEM. Many pictorials in this safety manual can be found and downloaded at <http://pictorials.aem.org>. For additional publications visit our website at www.safetymaterials.org.



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WACKER NEUSON

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