WACKER NEUSON

Operator's Manual

Compact loaders

SW24/SW28
ST35/ST45

Machine type	**S04-01/S04-02/S04-03/S04-04**
Edition	**1.7**
Order no	**5200022252**
Language	**us**

Documentations	Language	Order no.	Documentations	Language	Order no.
Operator's Manual	[us]	5200022252			
Spare parts list	SW24 [de en fr]	1000323666	Spare parts list	ST35 [de en fr]	1000323692
	SW24 [it es en]	1000323669		ST35 [it es en]	1000323693
	SW28 [de en fr]	1000323670		ST45 [de en fr]	1000323865
	SW28 [it es en]	1000323691		ST45 [it es en]	1000323870

Legend	
Original Operator‘s Manual	x
Translation of original Operator‘s Manual	–
Edition	1.7
Date	05/2016
Document	5200022252_1_7

Wacker Neuson Linz GmbH keep abreast of the latest technical developments and constantly improve their products. For this reason, we may from time to time need to make changes to diagrams and descriptions in this documentation which do not reflect products which have already been delivered and which will not be implemented on these machines.

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

The cover features machines with possible optional equipment.

Pictures and graphics are symbolic representations and can differ from the actual product.

Wacker Neuson Linz GmbH

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EC Declaration of Conformity

Not available.

Notes:

1 Foreword

1.1 Operator’s Manual

Information on this Operator’s Manual

The document box for storing the Operator’s Manual is located on the right of the operator seat.

This Operator’s Manual contains important information on how to work safely, correctly and economically with the machine. Therefore, it aims not only at new personnel, but it also serves as a reference for experienced personnel.

Furthermore, the reliability and the service life of the machine will be increased by following the instructions in the Operator’s Manual. This is why the Operator’s Manual must be kept at hand in the machine.

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

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

This Operator’s Manual does not include special superstructures.

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

Explanation of symbols and abbreviations

Explanation of symbols

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

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

A Identifies an alphabetical list

B Continuation of an alphabetical list

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

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

Cross references: *fig. 3* (fig. no. 1)

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

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

Information

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

Environment

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

Abbreviations

Fig.	Figure
AUX	Auxiliary hydraulics
B	Width
o/h	Operating hours
approx.	approximately
PMC	Particulate Matter Catalyst
FOPS	Falling Objects Protective Structure
HSWS	Hydraulic quickhitch
max.	maximum
min.	minimum
NE	Nominal width
Pos.	Position
ROPS	Roll Over Protective Structure (without losing contact with the ground)
TOPS	Tip Over Protective Structure
e.g.	for example

Definitions

Attachment	All exchangeable equipment (buckets, for example) released by Wacker Neuson and developed for work with the machine.
Towing	The compact loader is towed out of an immediate danger zone (railroad crossing or job site, for example).
Operators	Person driving and/or working with the machine.
Machine	Unless otherwise specified, the term **"machine"** refers to the compact loaders described in this Operator's Manual.
Jog Dial	Control unit to change settings
Cabin	Unless otherwise specified, the term **"cabin"** refers both to the cabin (fully glazed and with front door) and to the canopy without door.
Visual aids	Visual aids are, for example, rearview mirrors, cameras, but also persons assisting the operator during machine operation.
American Tier III/Tier IV (exhaust-gas standards)	The machine can be equipped with an American Tier III or Tier IV engine, depending on the destination country. Both engine variants are described separately if there are engine-specific differences (regarding operation, for example).

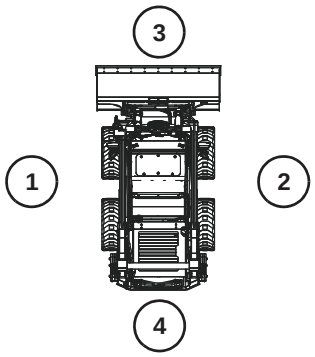


Fig. 1

Right/left/front/rear

These terms are used as seen by the operator in the cabin.

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

Information

A second control lever is shown if functions with different control levers (standard or option) can be performed.

Target-group definition

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

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

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

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

Operator qualification and requirements for safe operation

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

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

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

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

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

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

Follow the operationg procedures and instructions described for the machine.

Children and persons under the influence of alcohol, drugs or medicine are not allowed to access the machine or operate it.

Conversion table

The rounded imperial values are indicated in brackets, for example 1060 cm^3 (64.7 in^3).

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

1.2 Warranty and liability

Exemption from warranty and liability

Warranty

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

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

Exemption from liability

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

Notes:

2 Safety Information

2.1 Safety Symbols Found In This Manual

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

? Obey all safety messages that follow this symbol.

DANGER

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

Potential consequences of the hazard.

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

WARNING

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

Potential consequences of the hazard.

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

CAUTION

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

Potential consequences of the hazard.

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

Notice

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

Information

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 disposed of properly.

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, make sure 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 only be used for moving earth, gravel, coarse gravel or ballast and rubble. It may also be used for operating with the attachments approved in the chapter *– see chapter " Fields of application and use of attachments" on page 3-6*
2. No other applications are designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. The operator alone will bear the risk.
3. **Designated use** also includes following the instructions set forth in the Operator's Manual and following the maintenance schedule.
4. Machine safety can be negatively affected by performing machine modifications without proper authority and by using spare parts, equipment, attachments and optional equipment which have not been approved 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 follow the safety instructions on labels and in this Operator's Manual, and by not exercising due care, for example:
- transporting the machine
- operating the machine
- servicing the machine and performing maintenance work
- repairing the machine.

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 unless it is in compliance with applicable regulations.
8. Only use Wacker Neuson-approved lifting devices.
9. The attachment coupler is only used for locking an attachment.
– see chapter " Fields of application and use of attachments" on page 3-6
10. Hydraulic hammer operation is only allowed in specified areas.
– see chapter " Hydraulic hammer operation (option)" on page 5-37

2.5 Preparing To Use The Machine

Conditions for use

- The machine has been designed and built in accordance with state-of-the-art design features and the recognized safety regulations and standards. However, if instructions are not followed, it could result in injury to the operator or other persons.
- 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.
- Do not start, move or operate a damaged or malfunctioning machine. Any mechanical problems, especially those affecting the safety of the machine, must be repaired immediately. Only qualified technicians shall determine how to move a damaged or malfunctioning machine to a safe place for diagnoses and repair.
- The operator/machine owner is responsible to operate and keep the machine in serviceable condition and, if necessary or required by law, to require the operating or servicing persons to wear protective clothing and safety equipment.

Operator training and knowledge

- Know the rules for the job site.
- 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 includes persons working only occasionally on the machine, such as performing set-up or maintenance tasks.

- Follow legal and other mandatory regulations relevant to accident prevention and environmental protection. These may include handling hazardous substances, issuing and/or wearing personal protective equipment, or obeying traffic regulations.
- The operator/machine owner must regularly make sure that all persons, who operate or maintain 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).
- Wear protective equipment as required, for example hard hats, safety glasses, ear protection.

Information on visibility

- Before putting the machine into operation, perform a visual check to make sure 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.
- Before using the machine, before starting work or when changing operators, make sure that all visual aids (mirrors, if equipped) work correctly, that they are clean and adjusted in accordance with the instructions in this Operator's Manual. The operator must follow the local regulations.
- Do not make any changes or modifications that reduce visibility. Reduced visibility can cause personal injury or death both for operator and other persons.

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, as well as to welding work on load-bearing parts.
- Spare parts must comply with the technical requirements specified by Wacker Neuson. Contact your Wacker Neuson dealer for assistance.

2.6 Operator and Technician Qualifications and Basic Responsibilities

Operator/Machine Owner responsibility

- Only allow trained and experienced individuals to operate, maintain, or repair the machine. never let unauthorized or underaged persons operate the machine.
- Clearly 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 following applicable road regulations. Give the operator the authority to refuse instructions by other persons 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 combustible material around the engine, and reduces the risk of injury or operational accidents that can be caused by dirt build-up on the accelerator pedal, mirrors (if equipped) or foot rests and steps.
- Follow all safety, warning, and information signs and labels on the machine.

Operator Presence System

- This machine is equipped with an operator presence system that locks out machine travel and -operation when the operator is outside of the cab.
- Do not perform machine operation when the operator presence system or any safety device is malfunctioning. Contact a Wacker Neuson dealer.
- Make sure that all safety devices are properly installed and functional before starting machine operation.
- Never disconnect any safety device.
  – see chapter “ Functional check of seat bar/seat switch (canopy and cabin)” on page 4-11
- 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 (if equipped) are adjusted correctly before putting the machine into operation.
- Always adjust the seat position before starting work. Do not change the seat position during machine operation or machine travel.

- Make sure that all safety devices are properly installed and functional before starting work.
- Before putting the machine/attachment into operation (starting/moving), make sure that no one in the immediate vicinity will be at risk.

Starting and stopping

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

Work area awareness

- Familiarize yourself with the surroundings and circumstances of the work site before beginning work. Be aware of:
  - obstacles in the operating and traveling area
  - the soil bearing capacity
  - any necessary barriers separating the work site from public roads
- Always keep at a safe distance from the edges of building pits and slopes.
- Look out for the following when operating 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 (if equipped) to help 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 at risk due to the movements of the machine, work equipment, additional equipment or material.
- The danger zone also includes the area affected by falling material, equipment or constructions debris. The danger area must be extended in the immediate vicinity of buildings, scaffolds or other elements of construction.
- Seal off the danger area if it is not possible to keep a safe distance. Stop work immediately if persons do not leave the danger area in spite of warnings.

Machine operation

- Never operate the machine if you are standing on the ground.
- Start and 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 and the ground conditions. Always keep the attachments/ work equipment close to the ground. Keep the load low applies to all movements on slope - ud, down and across. When traveling or operating on 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 accelerator pedal and control levers require practice before a operator becomes familiar with the lever response. Therefore, adjust the travel speed to your abilities and the surroundings.
- Do not perform machine operation before the machine has reached it‘s operating temperature.

Emergency lowering

- Always perform emergency lowering of the liftarm when the liftarm is not on the ground before exiting the cab in an emergency situation.
– see chapter “5.12 Emergency lowering” on page 5-55

Emergency exits

Possible emergency exits:

- Cab and Canopy version:
  - Back window removal
- Cab version only:
  - Front door removal
  - Life hammer for breaking glass

– see chapter “ Emergency exit” on page 4-4

Carrying passengers

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

Mechanical integrity

- Take the necessary precautions to make sure the machine is used only when in a safe and serviceable condition.
- 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 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, turn off the machine immediately, remove the starting key, lock the front door (if equipped) and report the malfunction to a qualified technician or supervisor. Safety-relevant damage or malfunctions of the machine must be repaired immediately.

Traveling

- Before moving the machine always check whether the supplementary equipment and the attachments have been safely stowed away or attached.
- Make sure that nobody is within the danger area of the machine when changing the traveling direction.
- Look to the rear before reversing the machine.
- Use the rearview mirrors (if equipped) when reversing with the machine.
- Make sure back up alarm (if equipped) is working properly when reversing the machine.
- When traveling on or in public areas, follow all applicable regulations. Make sure beforehand that the machine is in compliance with these regulations.
- 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 curl it in until the bucket opening is in the upward horizontal position as a minimum before traveling on public roads.
- Other persons are not allowed to ride on the machine.

2.8 Special Instructions for Traveling on Public Roads

- The machine is subject to the applicable legal regulations of your country.
- Safety equipment in compliance with the applicable regulations must be on board, for example slow moving vehicle (SMV), sign, turn, signals, rotating beacon.
- Always adapt your travel speed to the road and ground conditions, machine handling and to the visibility conditions.
- Empty the bucket and curl it in.
- Perform a functional check of the lights (headlights, turn indicator lights etc.).
- Perform a functional check of the brake system.
- Make sure that the hydraulic system of the machine has no leaks.
- Close the door and the windows, if equipped.
- Fasten your seat belt.

2.9 Applications with Lifting Gear

General information

- Skid steer loaders are not approved for craning applications as defined below.
- 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). This applies, for example, to lifting and lowering pipes, shaft rings or containers.

2.10 Attachments

General information regarding attachments

- Use approved attachments only. See your local dealer.
- 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.
- Make sure 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.
- Secure the attachments against unintentional movement.
- Make sure bystanders are out of the danger zone before operating the machine/attachment.
- Carry the load low while traveling for better stability.
- Lower the attachment to the ground before leaving the cab.

Installation and Removal

- Follow attachment mounting instructions in this operator‘s manual.
- Before uncoupling or coupling hydraulic connections:
  - Stop the engine

Release the pressure in the hydraulic system.
– see chapter “ Releasing the pressure in the hydraulic system” on page 5-35

- 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.
- Especially when traveling or operating with machines equipped with a quickhitch for the attachments, make sure that the attachment is securely locked in the quickhitch.
  - for machine equipped with quickhitch:
    – see chapter “ Picking up an attachment” on page 5-46
  - for machine equipped with hydraulic quickhitch
    – see chapter “ Picking up an attachment with the hydraulic quick-hitch” on page 5-48
- Prior to fitting attachments to the boom, secure the control lever of the hydraulic control unit against unintentional movement.
- Keep others away from the machine when installing or removing an attachment.

2.11 Trailers

Information

Towing a trailer with this machine is prohibited.

2.12 Hydraulic hammer operation

• *– see chapter “ Hydraulic hammer operation (option)” on page 5-37*

Safety instructions

- If there is a risk of material coming off in fragments and splinters, a suitable protection, for example a protective Front Guard structure or another suitable protective facility must be installed on the machine.
- 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 become unstable and tip if a demolition 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.
- All windows and doors must be closed.

Operating with a hydraulic hammer

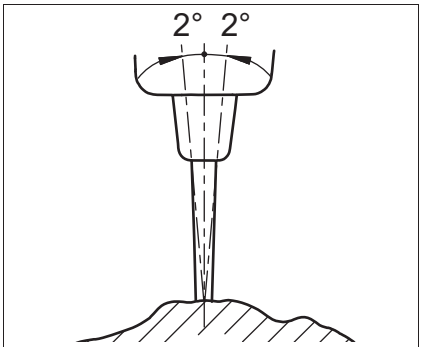


Fig. 2: Hydraulic hammer position

Notice

Always observe the following instructions:

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

2.13 Transport and Towing

Towing

- Do not tow a skid steer loader. Towing will damage a machine‘s hydrostatic transmission. Only tow a machine out of an immediate danger zone (for example a railroad crossing).
- The machine must be towed according to the procedures described within this Operator's Manual.
- Observe the prescribed transport position, admissible speed and itinerary *– see chapter “ Towing” on page 2-12*.
- Follow all applicable laws and regulations for transporting this machine on a road or highway.

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 safety transport the machine.
- Refer to Chapter **9 Technical Data** of this manual to determine the physical characteristic of the machine before loading and transporting.
- Use certified straps, chains or cables to securely fastened the machine to the surface of the transport vehicle.
- Use the tie down points provided on the load surface of the transport.
- Attach the tie down devices to the machine‘s designated tie-down points.

2.14 Lifting

- Only load the machine in accordance with this Operator’s Manual to avoid damage to the machine.
- Seal off the danger zone.
- The crane and the lifting gear must have suitable dimensions.
- Observe the machine’s overall weight – see chapter **9 Technical data**.
- Wear protective clothing and equipment when fastening, guiding and removing the machine (hard hat, safety glasses, safety shoes, for example).
- Use only lifting and fastening gear certified by a test/certification body (for example cables, belts, hooks, shackles), follow the inspection intervals.
- Do not use any lifting and fastening gear that is dirty, damaged or not of sufficient size.
- Perform a visual check to make sure that all slinging points are neither damaged nor worn (no widening, no sharp edges, no cracks).
- Have loads fastened and have crane operators guided by experienced persons only.
- The person guiding the crane operator must be within the operator‘s sight or sound.
- Observe all movements of the machine and lifting gear.
- Secure the machine against unintentional movement.
- Only raise the machine after it is safely attached and the person attaching the machine has given their approval.
- Use only the slinging points provided for fastening the lifting gear (for example cables or belts).

- Do not attach the machine by twining the lifting gear (cables, belts, for example) around it.
- Make sure an even load distribution (center of gravity) when fastening the lifting gear.
- Make sure that no one is in, on or under the machine when loading the machine.
- Follow applicable regulations.
- of the German employers' liability insurance association for construction engineering).
- Do not raise a machine that is stuck or frozen onto the ground.
- Consider the weather conditions (for example wind force, visibility conditions) when lifting the machine.

2.15 Safety Guidelines for Maintenance

General maintenance notes

- The manufacturer requires the machine owner to have maintenance performed under all circumstances. Otherwise warranty shall not be given in full.
- Follow to prescribed intervals or those specified in this Operator's Manual for routine checks/inspections and maintenance work.
- For inspection and maintenance work, make sure 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 (for example torque wrench, pressure gauge, ammeter).
- 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 At leasof the maintenance and repair work.

Personal safety measures

- Wear protective safety equipment as needed, for example safety glasses, safety shoes, gloves.
- Follow the specific safety instructions in the Maintenance section of this Operator's Manual.
- Block/support the machine parts that may move or fall prior to making repairs.
- 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.
- Retainer pins can fly out or splinter when struck with force. Use a brass hammer or a suitable material between the hammer and pin.
- Remove all jewelry and tie back long hair. Do not wear loose clothing that may catch on moving parts or on loader parts.

- Do not use starting fluid (for example, ether), especially in those cases in which a heater or glow plug (intake air pre-heating) is used at the same time – risk of explosions.

Preparing for maintenance and repair work

- Follow the starting and stopping procedures set forth in the Operator's Manual, and the information on maintenance work.
- All attachments must be removed from the machine when servicing requires a raised boom. Always secure the boom with the maintenance strut.
  – see chapter " Tilting the cab" on page 7-18
- The brake and steering systems are essential safety components. Maintenance work may be performed only by qualified technician and authorized service center.
- Prior to performing assembly work on the machine, make sure that no movable parts will roll away or start moving.
- Should maintenance with a tilted cab be required, always secure the cab with the cab strut.
  – see chapter " Tilting the cab" on page 7-18
- Perform service, maintenance and repair work only if:
  - machine is positioned on firm and level ground
  - all hydraulically movable attachments and operating equipment have been lowered to the ground
  - Apply the parking brake
  - Engine is stopped
  - The starting key has been removed and a warning tag (Do Not Operate) is attached.
  - Pressure accumulator is empty (if equipped)
  - Seat bar is folded up
  - Machine has been secured against unintentional movement
- Should maintenance or repair with the engine running be required:
  - Apply the parking brake
  - Make sure control levers are locked.
  - Lower the stabilizer legs/the stabilizer blade (option) 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
  - 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 assembly work on the machine, stabilize the area under repair and use proper lifting and support devices.
- If maintenance has to be performed under a raised boom, support boom with blocking or an approved boom support device on the machine.
- Special care must be taken with the electrical system when cleaning the machine with water/detergents.
- 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 certified lifting gear and suspension systems in a technically perfect state with adequate load-bearing capacity.
- Stay clear of suspended loads.

- Have loads fastened and lift 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

- Perform only the maintenance described in the operator‘s manual.
- After cleaning, examine all fuel, lubricant and hydraulic oil lines for leaks, chafe marks and damage. Repair all defects.
- Follow the adjustment, maintenance and inspection activities and intervals set forth in the Operator's Manual, including information on the replacement of parts/partial equipment.
  Disconnect the negative terminal of the battery if work needs to be performed on the electrical system.
- Make sure only authorized personnel are allowed to service, repair or test drive the machine.
- Always use specially designed or otherwise safety-oriented ladders and operating platforms to perform overhead assembly work. Never use machine parts or attachments/superstructures as a climbing aid.
- Wear a safety harness when performing elevated maintenance work. Keep all handles, steps, handrails, platforms, landings and ladders free from dirt, snow and ice.
- Do not use the attachment/work equipment as lifting platforms for persons.

2.16 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 or disconnecting the negative battery cable, and perform troubleshooting procedures.
- Work on the electrical system may only be performed by a technician with appropriate training.
- 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. Follow the safety instructions regarding the battery and the battery jump start procedure in the operator‘s manual.

Underground utilities

- Before starting any work, the machine operator must make sure that there are no lines in the work area.
- Always contact your local One-Call system and any utility companies which do not subscribe to One-Call before the start of your digging project.
- If there are lines, take the following safety measures:
  - Mark the position and path of the lines unambiguously.

- Fasten, support or secure exposed lines.
- Safely fasten lines if vibration or shocks to these lines must be avoided.

Overhead electric lines

DANGER

Electrical shock hazard.

Can cause severe injury or death due to electric shock.

► When operating with the machine, maintain a safe distance from overhead electric lines.

► If work must be performed close to overhead lines, the equipment/attachments must be kept well away from them. Request a signal person for guidance if needed.

- 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.
  - Travel 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, make sure that there is sufficient ventilation. Follow the regulations in force at the respective site.
- Welding, burning and grinding work on the machine may only be performed by a Wacker Neuson service center.
- Before performing welding, flame-cutting and grinding work, clean the machine and its surroundings from dust and other inflammable substances, and make sure that the premises are adequately ventilated – risk of explosions.
- In areas with special hazards (for example, toxic gases, caustic vapors, toxic environments), carry appropriate protective equipment (breathing filters, protective clothing).

Hydraulics

- Fluid leaks under pressure can penetrate skin and cause severe injury. Use cardboard or wood to find leaks. Do not use your hands.
- Fluid injected into the skin must be removed within a few hours by a knoledgeable doctor.
- Work on the hydraulic equipment of the machine must only be performed 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 lines must be laid and fitted properly. Make sure 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 equipped).
- Do not remove sound baffles on the machine.
- Replace damaged sound baffles.
- Attachments, such as hydraulic hammers and cold planers can be a source of increased noise levels. Wear ear protection if needed.
- Do not wear ear protectors while traveling on public roads/sites.
- Removing sound baffles on the machine during operation is prohibited.
- Wear ear protectors. This is especially important when performing hydraulic hammer operation or operating 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 – burn hazard.
- When using the machine in contaminated areas, take appropriate measures for the protection of the operator and the machine.

Battery

- When handling the battery observe the specific safety instructions and regulations relevant to accident prevention. Batteries contain caustic sulphuric acid.
- Keep the battery at full charge to prevent the battery electrolyte from freezing.
- 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. Properly 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.
- Starting the machine with jumper cables can be hazardous if not performed properly. Follow the instructions for jump starting the battery.
  – see chapter “ Jump-starting the engine” on page 4-38

Tires

WARNING

Special hazard during reinflation!

Can cause serious injury or death.

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

- Repair work and tire replacement must be performed by a qualified technician or by an authorized service center only.
- Always use specialized tools as recommended by tire suppliers for mounting and demounting of tires.
- Damaged tires and/or wrong tire pressures reduce the operational safety of the machine. Check the tires regularly for the prescribed tire pressure and for damage.
- Always clean and inspect rims.
- Always replace an approved tire with one having the same size and tread pattern as the other tires on the machine.
- Always inspect valve for proper air retention.
- Always use sealing valve caps to prevent loss of air or fluid.
- Do not inflate tires with inflammable gas - explosion hazard.
- Perform regular checks of the wheel nuts for tightness. Subsequent to changing tires check the wheel nuts after 10 service hours – tighten if necessary.

2.17 Safety Guidelines when using Internal Combustion Engines

Running the engine

When running the engine:

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

- Engine exhaust can kill you in minutes. Engine exhaust contains carbon monoxice. Never run the machine indoors or in an enclosed area such as a deep trench unless there is adequate ventilation.
- Do not run the engine near open flames. or in potentially explosive areas.
- Do not touch the engine or exhaust when 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.
- Do not fill fuel to the top. Allow for fuel expansion.
- Install the fuel tank cap after refueling. Replace a malfunctioning fuel cap.
- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near an open flame.

Notes:

3 Introduction

3.1 Machine overview

Fig. 3 (symbolic representations)

No.	Designation	No.	Designation
1	Front working lights	10	Tracks (ST35/45)
2	Rear working lights	11	Numberplate bracket (option)
3	Outside mirrors (option EU only)	12	Exhaust pipe
4	Lights/turn indicators (option)	13	Counterweight (option)
5	Handholds	14	Crane-handling bracket (option)
6	Bucket (option)	15	Type label
7	Loader unit	16	Engine cover
8	Radiator cover	17	Rear lights (option)
9	Tires (SW24/28)	18	Side cover

Overview of models and trade names

Machine model/machine designation	Trade name
S04-01	SW24
S04-02	SW28
S04-03	ST35
S04-04	ST45

3.2 Brief description of machine

The machine model S04 is a self-propelled work machine.

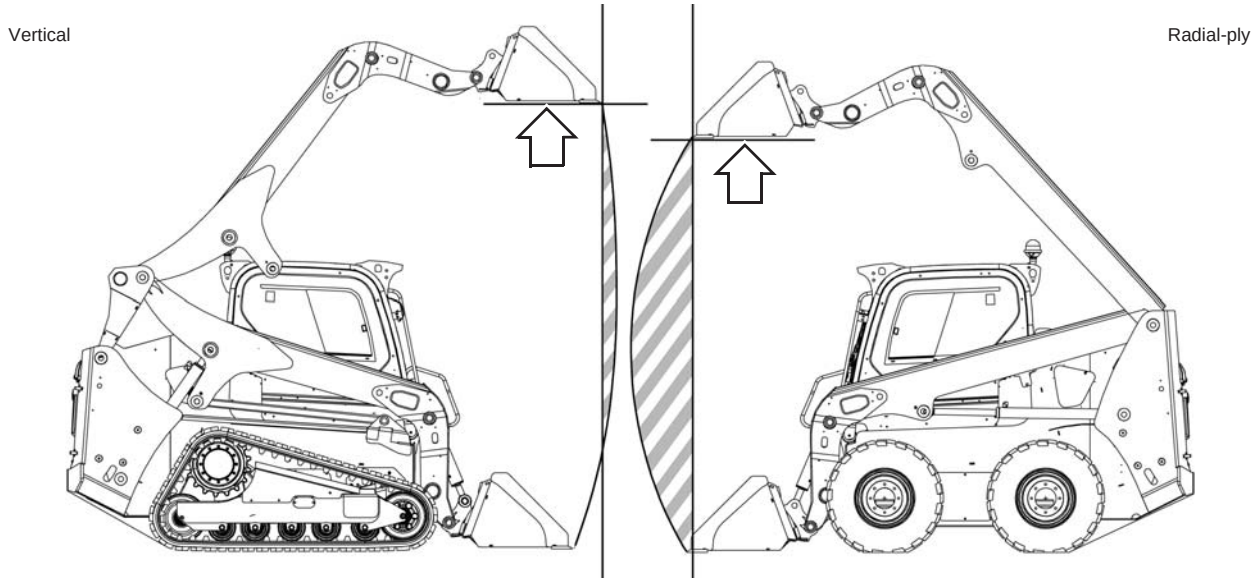
This machine is a versatile and powerful helper for moving earth, gravel and debris on construction sites and elsewhere. A wide range of attachments accounts for the numerous applications of the machine, among others hammer and grab applications. When using these attachments, observe the legal regulations of your country and equip the machine with all the safety equipment required. See chapter 1.4 – *see chapter " Fields of application and use of attachments" on page 3-6* for further applications.

Follow the relevant national and regional regulations.

The main components of the machine are:

- Chassis
- Canopy (standard equipment)
- Pressurized, fully glazed cabin (option) reducing outside influences (for example dust, odors, temperature)
- Water-cooled diesel engine:
  American tier III version: Perkins 1104
  American tier IV version: Perkins 854
- Hydraulic and electrical components
- Radial loader unit (SW24/ST35)
- Vertical loader unit (SW28/ST45)

Comparison of vertical and radial loader unit



Vertical loader unit (SW28/ST45)

- The attachment can be raised nearly vertically.
- The loader unit reaches higher up than conventional loader units.

Radial loader unit (SW24/ST35)

- Conventional loader unit kinematics.

Information

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

The diesel engine drives two axial-piston variable displacement pumps whose oil flow is sent to the right and left-hand hydraulic motors.

A secondary pressure-limiting valve in the main valve block compensates pressure peaks in the hydraulic system.

Cooling system

The coolant temperature is monitored with the multifunctional display on the machine’s instrument panel.

Cabin/canopy

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

- Level I ROPS/TOPS/FOPS tested canopy (open version).
- Level I ROPS/TOPS/FOPS tested cabin (closed version/option).
- Level II protective FOPS structure (option) for cabin/canopy; protective structure against falling objects.

Definition of FOPS categories

Category I:

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

Category II:

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

3.3 Information and regulations on use

Designated use

- The machine is intended for:
  - moving earth, gravel or rubble, for hammer operation as well as for
  - working only with the attachments indicated in chapter – *see chapter “ Fields of application and use of attachments” on page 3-6*.
  - Every other use is regarded as not designated for the use of the machine. Wacker Neuson will not be liable for damage resulting from use other than mentioned above. The user/operating company alone will bear the risk.
    Designated use also includes observing the instructions set forth in the Operator’s Manual and observing the maintenance and service conditions.
- Machine travel on public roads from one job site to another is only allowed if the national and regional regulations are complied with.
- The quickhitch may only be used with the released attachments.
- A restricted work range applies to work with attachments (hammer, for example) that can cause fragments to fly around.

Fields of application and use of attachments

NOTICE

Damage to machine due to unapproved attachments.

► Only use the attachments specified in the table.

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

Information

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

Item no.	Description	SW 24	SW 28	ST 35	ST 45
	Bradco - Low Profile SSL CTL Buckets				
5200016706	LP Bucket 72" (1830mm), 0.57yd³ (0.44m³), 473 lbs (215kg), pre-drilled	●	●	--	--
5200016707	LP Bucket 72" (1830mm), 0.57yd³ (0.44m³), 530 lbs (240kg), with teeth	●	●	--	--
5200017376	LP Bucket 75" (1900mm), 0.59yd³ (0.45m³), 492 lbs (224kg), pre-drilled	●	●	--	--
5200017377	LP Bucket 75* (1900mm), 0.59yd³ (0.45m³), 530 lbs (250kg), with teeth	●	●	--	--
5200016708	LP Bucket 78" (1980mm), 0.62yd³ (0.48m³), 543 lbs (246kg), pre-drilled	●	●	●	●
5200016709	LP Bucket 78" (1980mm), 0.62yd³ (0.48m³), 600 lbs (272kg), with teeth	●	●	●	●
5200017378	LP Bucket 80" (2030mm), 0.64yd³ (0.49m³), 560 lbs (254kg), pre-drilled	●	●	●	●
5200017379	LP Bucket 80" (2030mm), 0.64yd³ (0.49m³), 620 lbs (281kg), with teeth	●	●	●	●
5200016720	LP Bucket 82" (2080mm), 0.65yd³ (0.49m³), 566 lbs (257kg), pre-drilled	●	●	●	●
5200016721	LP Bucket 82" (2080mm), 0.65yd³ (0.49m³), 630 lbs (286kg), with teeth	●	●	●	●
5200016722	LP Bucket 84" (2130mm), 0.67yd³ (0.51m³), 576 lbs (261kg), pre-drilled	--	--	●	●
5200016723	LP Bucket 84" (2130mm), 0.67yd³ (0.51m³), 640 lbs (290kg), with teeth	--	--	●	●
	Bradco - Long Floor Low Profile SSL CTL Buckets				
5200016724	LPE Bucket 72" (1830mm), 0.71yd³ (0.54m³), 533 lbs (242kg), pre-drilled	●	●	--	--
5200016744	LPE Bucket 72" (1830mm), 0.71yd³ (0.54m³), 590 lbs (268kg), with teeth	●	●	--	--
5200017380	LPE Bucket 75" (1900mm), 0.74yd³ (0.56m³), 554 lbs (251kg), pre-drilled	●	●	--	--
5200017381	LPE Bucket 75" (1900mm), 0.74yd³ (0.56m³), 613 lbs (278kg), with teeth	●	●	--	--
5200016745	LPE Bucket 78" (1980mm), 0.77yd³ (0.59m³), 608 lbs (276kg), pre-drilled	●	●	●	●
5200016746	LPE Bucket 78" (1980mm), 0.77yd³ (0.59m³), 665 lbs (301kg), with teeth	●	●	●	●
5200017382	LP Bucket 80" (2030mm), 0.79yd³ (0.60m³), 620 lbs (281kg), pre-drilled	●	●	●	●
5200017383	LP Bucket 80" (2030mm), 0.79yd³ (0.60m³), 647 lbs (293kg), with teeth	●	●	●	●
5200016747	LPE Bucket 82" (2080mm), 0.81yd³ (0.62m³), 631 lbs (286kg), pre-drilled	●	●	●	●
5200016748	LPE Bucket 82" (2080mm), 0.81yd³ (0.62m³), 695 lbs (315kg), with teeth	●	●	●	●
5200016749	LPE Bucket 84" (2130mm), 0.84yd³ (0.64m³), 641 lbs (290kg), pre-drilled	--	--	●	●
5200016770	LPE Bucket 84" (2130mm), 0.84yd³ (0.64m³), 705 lbs (320kg), with teeth	--	--	●	●

	Bradco - High-Capacity SSL CTL Buckets				
5200016963	HC Bucket 75" (1900mm), 0.78yd³ (0.59m³), 633 lbs (297kg), pre-drilled	●	●	--	--
5200016964	HC Bucket 75" (1900mm), 0.78yd³ (0.59m³), 690 lbs (313kg), with teeth	●	●	--	--
5200016965	HC Bucket 80" (2030mm), 0.91yd³ (0.69m³), 746 lbs (338kg), pre-drilled	--	●	●	●
5200016966	HC Bucket 80" (2030mm), 0.91yd³ (0.69m³), 810 lbs (367kg), with teeth	--	●	●	●
5200016967	HC Bucket 84" (2134mm), 0.99yd³ (0.75m³), 749 lbs (340kg), pre-drilled	--	--	●	●
5200016968	HC Bucket 84" (2134mm), 0.99yd³ (0.75m³), 813 lbs (369kg), with teeth	--	--	●	●
	Bradco - High-Capacity Light Material SSL CTL Buckets				
5200016975	LM Bucket 84" (2134mm), 1.62yd³ (1.24m³), 740 lbs (335kg), pre-drilled	●	●	●	●
5200016976	LM Bucket 96" (2438mm), 2.00yd³ (1.53m³), 880 lbs (399kg), pre-drilled	--	--	●	●
	Bradco - 4-in-1 Multi Purpose Construction SSL CTL Buckets				
5200016981	4 in 1 Bucket 72" (1830mm),900 lbs (408kg), pre-drilled	●	●	--	--
5200016982	4 in 1 Bucket 72" (1830mm),958 lbs (434kg), with teeth	●	●	--	--
5200016983	4 in 1 Bucket 78" (1980mm),935 lbs (424kg), pre-drilled	●	●	●	●
5200016984	4 in 1 Bucket 78" (1980mm),993 lbs (450kg), with teeth	●	●	●	●
5200016985	4 in 1 Bucket 84" (2134mm),975 lbs (444kg), pre-drilled	●	●	●	●
5200016986	4 in 1 Bucket 84" (2134mm),1040 lbs (472kg), with teeth	●	●	●	●
5200016987	4 in 1 bucket hose kit w/1/2 couplers	●	●	●	●
	Bradco - Bucket Accessories (includes mounting hardware)				
5200017249	BOE (cutt"g edge),72" (1830mm), 120 lbs (54.4kg)	●	●	--	--
5200017250	BOE (cutt"g edge),75" (1905mm), 125 lbs (56.7kg)	●	●	--	--
5200017251	BOE (cutt"g edge),78" (1980mm), 130 lbs (58.9kg)	●	●	●	●
5200017252	BOE (cutt"g edge),80" (2030mm), 132 lbs (59.9kg)	●	●	●	●
5200017253	BOE (cutt"g edge),82" (2083mm), 136 lbs (61.7kg)	●	●	●	●
5200017254	BOE (cutt"g edge),84" (2133mm), 140 lbs (63.5kg)	●	●	●	●
5200017255	BOE (cutt"g edge),96" (2438mm), 160 lbs (75.6kg)	●	●	●	●
5200017256	Tooth Bar (fits over BOE), 72" (1830mm), 130 lbs(58.9kg)	●	●	--	--
5200017257	Tooth Bar (fits over BOE), 75" (1905mm), 132 lbs (59.9kg)	●	●	--	--
5200017258	Tooth Bar (fits over BOE),78" (1980mm), 133 lbs (59.9kg)	●	●	●	●
5200017259	Tooth Bar (fits over BOE), 80" (2030mm), 137 lbs (62.1kg)	●	●	●	●
5200017260	Tooth Bar (fits over BOE), 82" (2083mm), 146 lbs (66.2kg)	●	●	●	●
5200017261	Tooth Bar (fits over BOE),84" (2133mm), 147 lbs (66.7kg)	●	●	●	●
5200017262	Spill Guard (72" 4-in-1 bucket)	●	●	--	--
5200017263	Spill Guard (78" 4-in-1 bucket)	●	●	●	●
5200017264	Spill Guard (84" 4-in-1 bucket)	●	●	●	●
5200017265	Bolt on side cutters (sold in pairs)	●	●	●	●
	FFC Construction Brush Root Grapples, hoses included				
5200017267	HD brush root grapple, 72" (1830mm), 925 lbs (419kg)	●	●	--	--
5200017268	HD brush root grapple, 78" (1980mm), 999 lbs (453kg)	●	●	●	●
5200017269	HD brush root grapple, 84" (2133mm), 1054 lbs (478kg)	●	●	●	●
5200017280	HD brush root grapple, 90" (2286mm), 1105 lbs (501kg)	●	●	●	●
	BRADCO Heavy Duty Construction Root Rake Grapples, hoses included				
5200017866	ROOT-RAKE, W/CLAMP, 72in (1830 mm), 1140 lbs (517.1 kg)	●	●	--	--
5200017867	ROOT-RAKE, W/CLAMP, 78in (1980 mm), 1225 lbs (555.7 kg)	--	--	●	●
	FFC Construction Scrap Grapples, hoses included				

5200017372	HD scrap grapple, 76" (1930mm), 1081 lbs (490kg)	●	●	--	--
5200017373	HD scrap grapple, 82" (2983mm), 1133 lbs (514kg)	●	●	●	●
5200017374	HD scrap grapple, 88" (1930mm), 1180 lbs (535kg)	●	●	●	●
5200017282	FFC BOE (cuting edge), 76" (1930)	●	●		
5200017283	FFC BOE (cuting edge), 82" (2983mm)	●	●	●	●
5200017284	FFC BOE (cuting edge), 88" (1930mm)	●	●	●	●
Note:	BOE kits include mounting hardware				
	Bradco Signature Series SSL CTL Pallet Forks (right hand step)				
Note:	Pallet Fork Tines, sold separately, in pairs				
5200016988	Pallet Fork Frame, right hand step, 225lbs (102kg), without tines	●	●	●	●
5200018890	5500 lb (1814kg) @ 50%, Tines - 42" (1069mm), 260lbs (1182kg)	●	●	●	●
5200018891	5500 lb (1814kg) @ 50%, Tines - 48" (1219mm), 270lbs (1222kg)	●	●	●	●
5200016992	6000 lb (2721kg) @ 50%, Tines - 42" (1069mm), 225lbs (76.2kg)	●	●	●	●
5200016993	6000 lb (2812kg) @ 50%, Tines - 48" (1219mm), 250lbs (113kg)	●	●	●	●
5200016994	6200 lb (2742kg) @ 50%, Tines - 60" (1219mm), 300lbs (136kg)	●	●	●	●
5200016995	6200 lb (2742kg) @ 50%, Tines - 72" (1828mm), 380lbs (172kg)	●	●	●	●
	Utility Forks, 60" (1524 mm), Universal Mounting Style				
5000192862	9 teeth, 545 lbs (247 kg)	●	●	●	●
5000192863	9 teeth with grapple, 835 lbs (379 kg)	●	●	●	●
	Bale Spear, 48" (1219 mm), Universal Mounting Style				
5000192860	Round Bales, 1 main spear and 2 stabilizers, 230 lbs (104 kg)	●	●	●	●
5000192861	Square Bales, 1 main spear and 3 stabilizers, 260 lbs (118 kg)	●	●	●	●
	Roto Tillers, Universal Mounting Style, hoses and couplers included				
5000180975	Roto Tiller, 52 in (1321 mm), 600 lbs (272 kg), universal mounting style	●	●	●	●
	Tree Scoop Bucket, Universal Mounting Style				
5000173345	36" (914 mm), 258 lbs (117 kg)	●	●	●	●
5000173346	42" (1067 mm), 360 lbs (163 kg)	●	●	●	●
5000173347	48" (1219 mm), 425 lbs (193 kg)	●	●	●	●
	Auger Drives, 2" (51mm) Hex Drive Shaft, 2000-4200psi (138-290bar)				
Note:	Auger Drives (mounting adapters and hose kits sold separately)				
5200000763	A-220H - Auger Drive – Planetary,15-30 gpm (57-114 lpm)	●	●	●	●
5000179964	Auger Drive Mounting Adapter (needed for Auger Drive – 5200000763)	●	●	●	●
5000179963	Auger Drive Hose Kit	●	●	●	●
	Standard Auger Bits, 50" (1300mm) Length,				
	2" (51mm) Hex Drive Shaft, Standard Teeth				
5000173327	6" (152 mm), 2 teeth	●	●	●	●
5000173328	9" (229 mm), 4 teeth	●	●	●	●
5000173329	12" (305 mm), 4 teeth	●	●	●	●
5000173330	15" (381 mm), 5 teeth	●	●	●	●
5000173331	18" (457 mm), 6 teeth	●	●	●	●
5000173332	20" (508 mm), 7 teeth	●	●	●	●
5000173333	24" (610 mm), 9 teeth	●	●	●	●
5000173334	30" (762 mm), 11 teeth	●	●	●	●
5000173335	36" (914 mm), 13 teeth	●	●	●	●
	Tree and Shrub Auger Bits, 50" (1300mm) Length,				

	2" (51 mm) Hex Drive Shaft, Standard Teeth				
5000173336	18" (457 mm), 8 teeth	●	●	●	●
5000173337	24" (610 mm), 9 teeth	●	●	●	●
5000173338	30" (762 mm), 12 teeth	●	●	●	●
5000173339	36" (914 mm), 14 teeth	●	●	●	●
5000179798	Carbide Teeth (price per tooth, includes mounting hardware)	●	●	●	●
	Trencher, XR 21, Universal Mounting Style,				
	13-25 gpm (49-95 lpm) @ 2000-3000 psi (137-230 bar)				
5000181110	Trencher, 36x6 (914x152), ½ Rock & Frost Teeth	●	●	●	●
	Angle Broom, Universal Mounting Style				
Note:	Universal 8 pin controller sold separately, only required if machine not equipped with 14 pin attachment control				
5000193096	Universal controller, 8 pin	●	●	●	●
5000181578	Wire Harness, 8 pin to 14 pin adapter	●	●	●	●
5000173341	Angle Broom 72" (1829 mm), 860 lbs (390 kg)	●	●	●	●
5200019635	Angle Broom 84" (2134 mm), 953 lbs (432 kg)			●	●
5200019734	Kit- Sprinkler, 12v, 24 gal (91 ltr.) 47 lbs (21.3 kg)	●	●	●	●
	Heavy-Duty VRS Pick-Up Broom, Universal Mounting Style				
5200019637	HD VRS, Pick-Up Broom 72" (1829 mm), 1294 lbs (586 kg)	●	●	●	●
5200019638	HD Dump Box Broom 84" (2134 mm), 1385 lbs (628 kg)	--	--	●	●
5200019738	Kit - Gutter Brush Assembly, Poly, 90 lbs (41 kg)	●	●	●	●
5200019739	Kit - Gutter Brush Assembly, Wire, 90 lbs (41 kg)	●	●	●	●
Note:	VRS and sprinkler kits require 5000181578 adaptor to connect with 14 pin socket on machines				
5200019735	Kit - VRS 60", Vacuum Dust Suppression System, 150 lbs (68.0 kg)	●	●	●	●
5200019736	Kit - VRS 72", Vacuum Dust Suppression System, 160 lbs (72.6 kg)	●	●	●	●
5200019737	Kit - VRS 84", Vacuum Dust Suppression System, 170 lbs (77.1 kg)	--	--	●	●
5200019734	Kit- Sprinkler, 12v, 24 gal (91 ltr.) 47 lbs (21.3 kg)	●	●	●	●
	Power Rake, Universal Mounting Style				
Note:	Universal controller sold separately, only required if machine not equipped with 14 pin attachment control				
5000193096	Universal controller, 8 pin	●	●	●	●
5000173350	Power Rake, 72" (1829 mm), 1000 lbs (454 kg), with controller	●	●	--	--
5000181578	Wire Harness, 8 pin to 14 pin adapter	●	●	--	--
	Snow Push, Universal Mounting Style				
5000173354	Snow Push 84" (2134 mm), 966 lbs (438 kg), universal mounting style	●	--	--	--
5200008482	Snow Push 96" (2438 mm), 914 lbs (415 kg)	●	●	●	●
5200008483	Snow Push 120" (3048 mm), 966 lbs (438 kg)	--	--	●	●
	Hydraulic Snow Angle Blade, Universal Mounting Style				
5000173355	Angle Blade 72" (1829 mm), 715 lbs (324 kg)	●	●	●	●
5000173356	Angle Blade 84" (2134 mm), 750 lbs (340 kg)	●	●	●	●
	Hydraulic Snow V Blade, With Trip Edge, Universal Mounting Style				
	Hydraulic Sequencing Control (no controller required)				
5200009038	V-Blade 84" (2134 mm), 980 lbs (445 kg)	●	●	●	●
5200009039	V-Blade 96" (2438 mm), 1025 lbs (465 kg)	●	●	●	●
5200009050	V-Blade 108" (2743 mm), 1077 lbs (489 kg)	●	●	●	●

5200009051	V-Blade 120" (3048), 1115 lbs (506 kg)	--	--	●	●
	Bradco Ground Shark Brush Cutters				
5200017939	72" Standard Brush Cutter, (15-25 gpm)	●	●	--	--
5200017970	78" Standard Brush Cutter, (15-25 gpm)	--	--	●	●
5200017973	78" Standard Brush Cutter, (High Flow 30-45 gpm)	--	--	●	●
5200017971	72", Extreme Duty Brush Cutter, (High Flow 30-45 gpm)	●	●	●	●
	Bradco Ground Shark Brush Accessories				
5200018076	KIT-GAUGE, SIGHT-INDICATOR,(15-32 gpm brush cutters)	●	●	●	●
5200018077	KIT--INDICATOR,(33-40 gpm brush cutters)	●	●	●	●
5200018078	KIT-DUAL WHEEL, STANDARD BRUSH CUTTERS	●	●	●	●
5200018081	KIT-REPLACEMENT BLADE SET, (72in standard brush cutters)	●	●	--	--
5200018082	KIT-REPLACEMENT BLADE SET, (78in standard brush cutters)	●	●	●	●
5200018083	KIT-WEAR SHOE, PAIR, (standard brush cutters)	●	●	●	●
5200018084	KIT-REPLACEMENT BLADE SET, (72in extreme duty brush cutters)	●	●	●	●
5200018085	KIT-WEAR PLATE, (extreme duty brush cutters)	●	●	●	●
5200018086	KIT-CARBIDE TOOTH, 18 teeth (extreme duty brush cutters)	●	●	●	●

3.4 Labels

WARNING

Injury hazard due to missing or damaged labels!

Missing or incomplete warning and information labels can lead to situations with serious injury or death.

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

Information

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

Type labels

Fig. 4 (symbolic representation)

Serial number

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

Fig. 5 (symbolic representation)

Type label

The type label is located at the right rear side of the chassis.

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

Fig. 6 (symbolic representation)

Cabin number

The type label is located inside the cabin on the wall on the right.

Fig. 7 (symbolic representation)

Engine number (American tier IV)

The type label is located behind the cover.

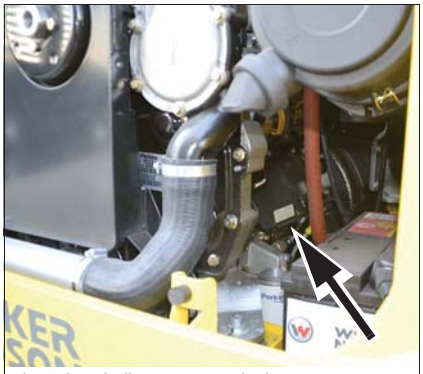


Fig. 8 (symbolic representation)

Engine number (American tier III)

The type label is located in the position shown in the figure.

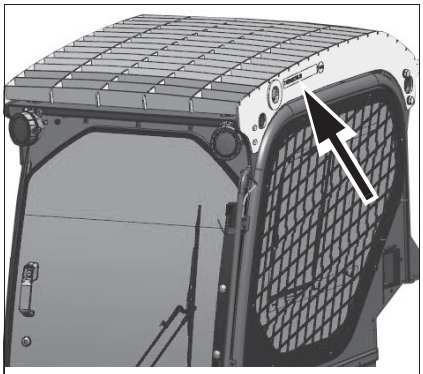


Fig. 9 (symbolic representation)

FOPS screen type label

The type label is located on the left on the screen.

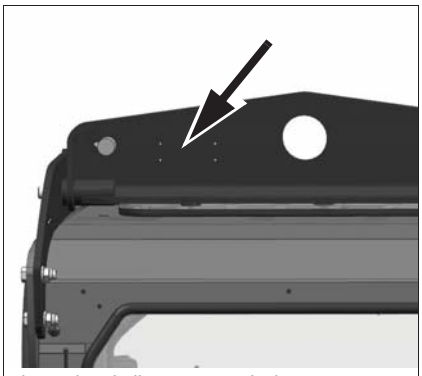


Fig. 10 (symbolic representation)

Type label of crane-handling bracket

The type label is located on the cross tie.

Warning labels

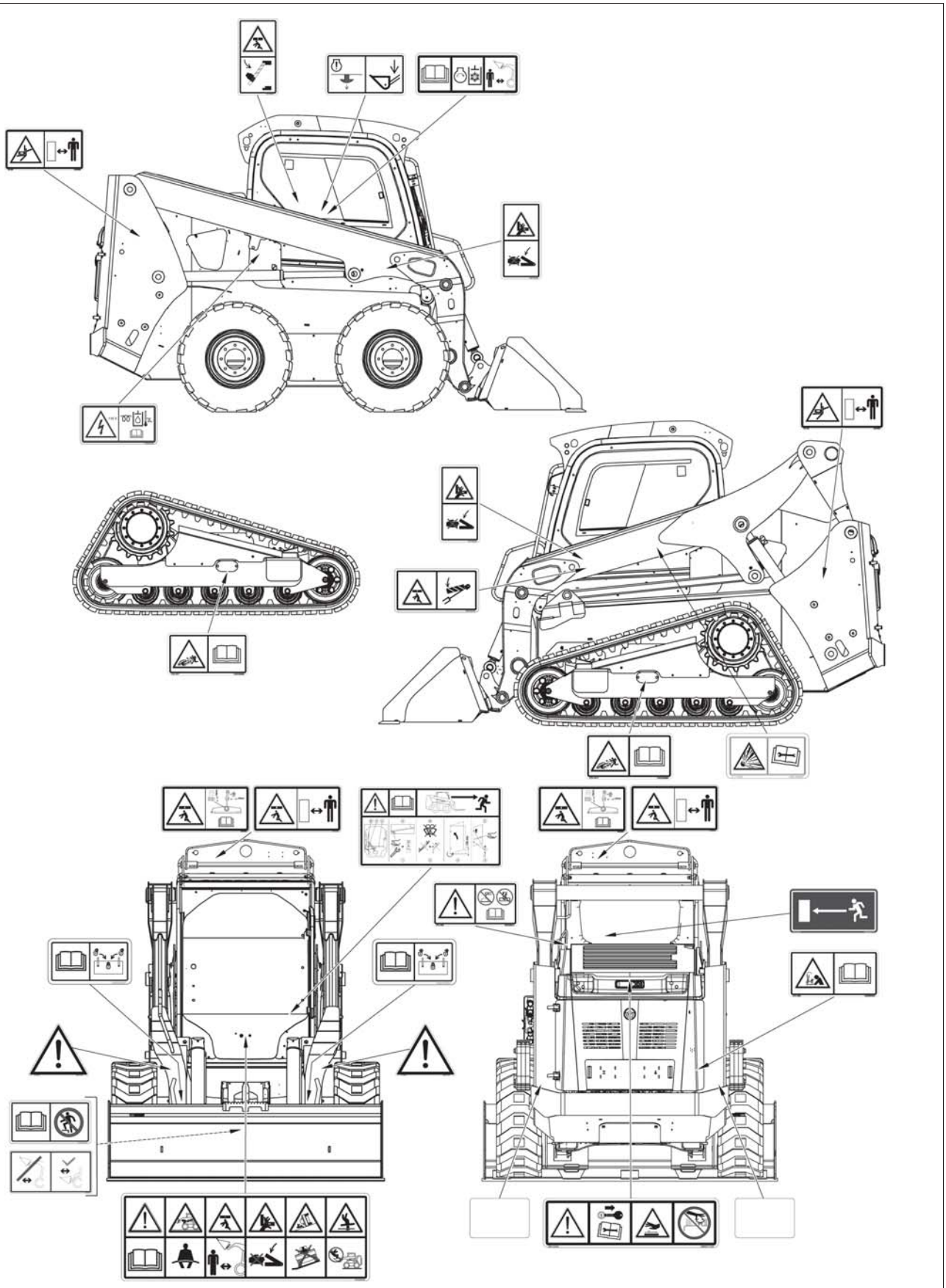


Fig. 11

Fig. 12

Meaning

Crushing hazard.

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

Support the loader unit.

Position

On the left side of the loader unit.

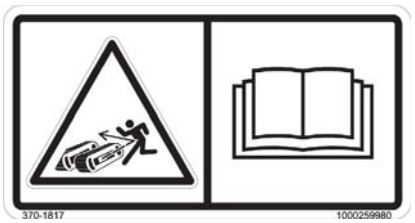


Fig. 13

Meaning

Injury hazard due to grease escaping under pressure.

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

Position

On the left and right side of the travel gear near the lubrication system (ST35/45).

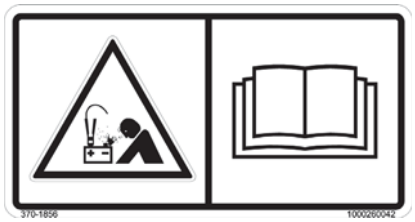


Fig. 14

Meaning

Explosion hazard due to wrong connection of battery jumper cables.

Position

Next to the battery.

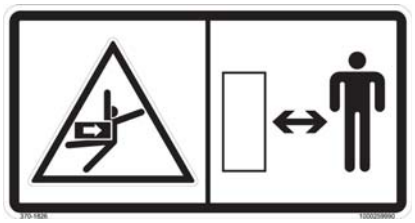


Fig. 15

Meaning

Crushing hazard.

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

Position

On the left and right side of the chassis.

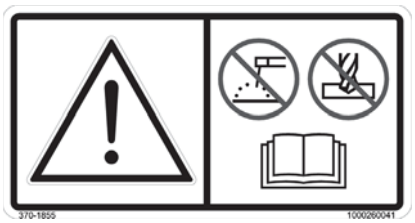


Fig. 16

Meaning

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

Position

At the rear left of the cabin.

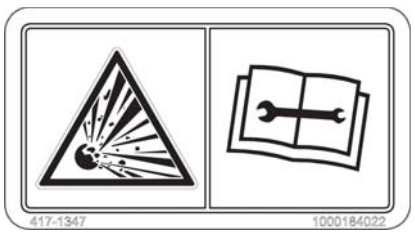


Fig. 17

Meaning

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

Position

On the left side of the chassis.

Fig. 18

Meaning

Read the Operator's Manual before starting the machine.

Fasten the seat belt during operation.

Stay clear of suspended loads.

Crushing hazard! Keep a safe distance from the machine.

Keep a safe distance from the loader unit.

Fig. 19

Crushing hazard near the loader unit.

When traveling on slopes, pay attention to the maximum gradient angle and maximum lateral angle of inclination. Do not drive in speed range 2.

Do not raise anyone with the loader unit.

Position

At the front on the seat console.

Fig. 20

Meaning

Read the Operator's Manual before starting the machine.

Remove the starting key and carry it with you.

Injury hazard due to rotating parts.

- Open the engine cover only at engine standstill.

Burn hazard due to hot parts.

- Let the engine cool down.

Burn hazard due to hot fluid.

Injury hazard due to fluid escaping under pressure.

- Let the engine cool down.
- Release the pressure in the hydraulic system and open the covers carefully.

Position

On the engine cover.

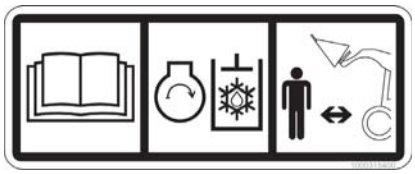


Fig. 21

Meaning

Operating temperature

Crushing hazard! Do not start machine operation before reaching the operating temperature. Cold hydraulic oil can cause uncontrolled machine movements.

Position

Above the starter

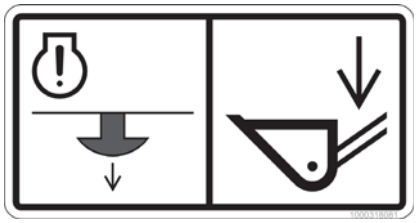


Fig. 22

Meaning

Loader unit emergency lowering

– see chapter “5.12 Emergency lowering” on page 5-55

Position

Below the emergency lowering button.

Fig. 23

Meaning (option)

Crushing hazard.

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

Position

At the front and rear on the crane-handling bracket.

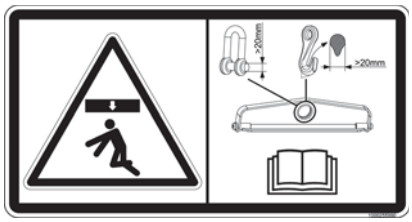


Fig. 24

Meaning (option)

Indicates the lifting point of the machine if equipped with the **crane-handling bracket** option.

Position

At the front and rear on the crane-handling bracket.

Fig. 25

Meaning

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

Position

At the front left and right of the loader unit.

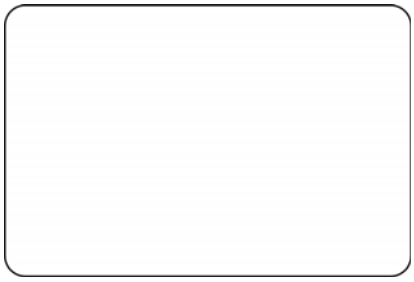


Fig. 26

Meaning

Reflectors at the rear.

Position

At the rear left and right.

Fig. 27

Meaning

Crushing hazard near the loader unit.

Position

On the left and right side of the loader unit.

Fig. 28

Meaning

Cabin maintenance prop

Secure the cabin before performing maintenance.

Position

On the cabin maintenance prop.

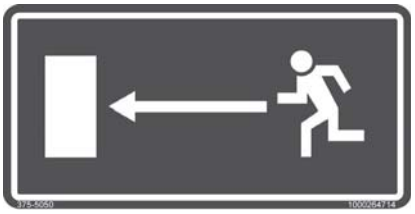


Fig. 29

Meaning

Rear window emergency exit

– see chapter “ Emergency exit” on page 4-4

Position

Inside the cabin on the rear window.

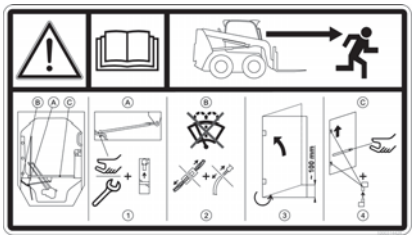


Fig. 30

Meaning

Front window emergency exit

– see chapter “ Emergency exit” on page 4-4

Position

Inside the cabin on the front window.

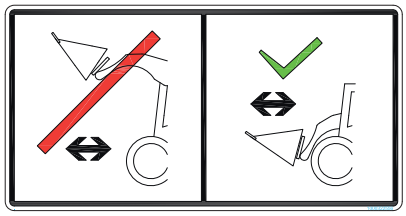


Abb. 31

Meaning

Only travel with lowered boom.

Position

On the quickhitch, within the operator‘s sight.

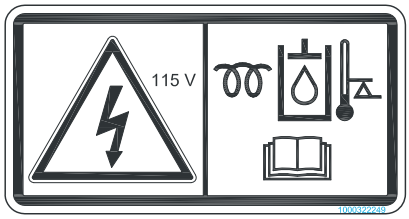


Abb. 32

Meaning

High voltage hazard. Read operator‘s manual.

Follow the instructions of „“Starting the engine at low ambient temperatures“.

– see chapter “ Warming up hydraulic oil” on page 4-37

Position

Near the outlet for engine pre-heating.

Information labels

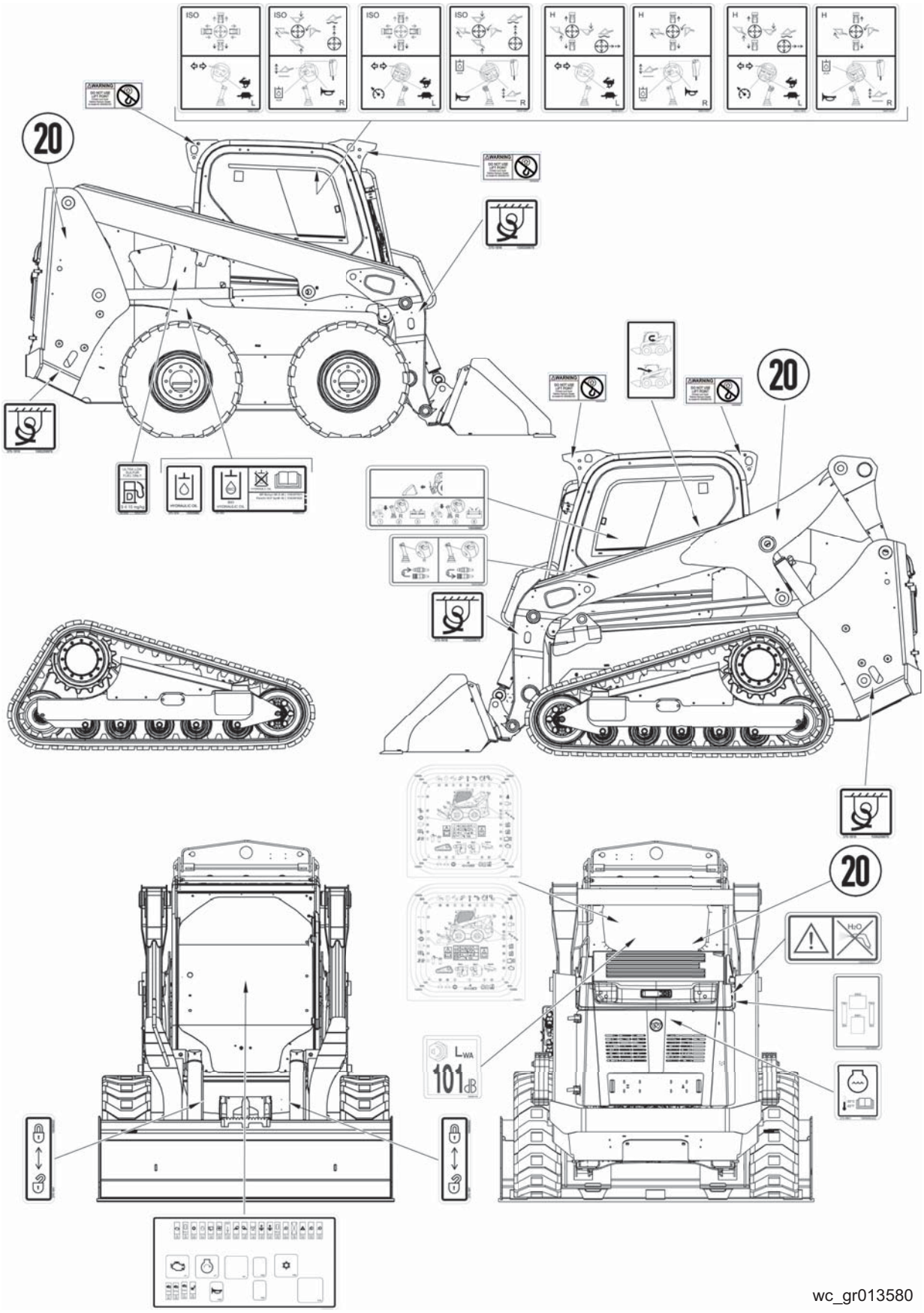


Fig. 33

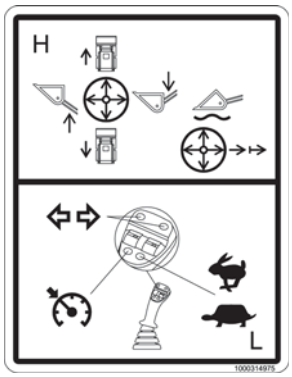


Fig. 34

Meaning

Describes the functions of the control lever on the left.

Position

On the headliner on the left.

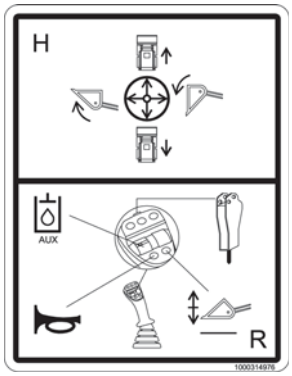


Fig. 35

Meaning

Describes the functions of the control lever on the right.

Position

On the headliner on the right.

Information

The function labels depend on machine equipment and destination country.

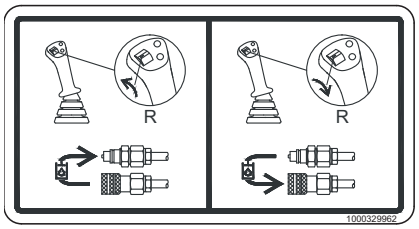


Fig. 36

Meaning

Describes the control lever functions of the auxiliary hydraulics.

Position

On the left of the loader unit near the auxiliary hydraulics couplings.

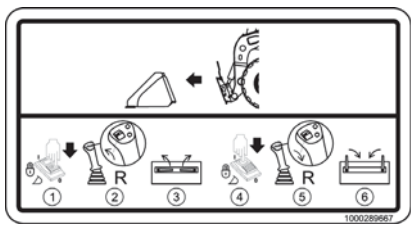


Fig. 37

Meaning

Describes the functions of the hydraulic quickhitch.

Position

On the left inside the cabin.

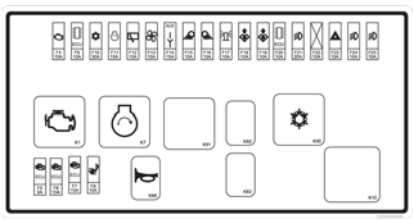


Fig. 38

Meaning

Fuses and relays.

Position

Inside the fuse cover.

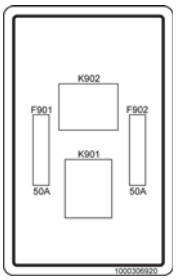


Fig. 39

Meaning

Main fuses and relays.

Position

Inside the main fuse cover.

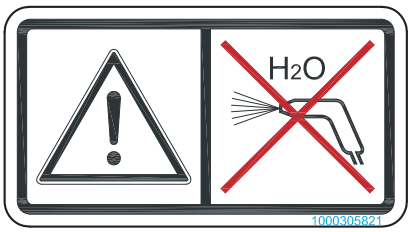


Fig. 40

Meaning

Do not clean electric parts with high-pressure water.

Position

Outside the main fuse cover.

Fig. 41

Meaning

Indicates the mounting points for the crane handling bracket.

Position

On the roof at all four upper corners of the cab.

NOTE: Before lifting the machine, contact your local Wacker Neuson dealer to install Kit 1000362060.

Fig. 42

Meaning

Indicates the tie-down points of the machine.

Position

On the left and right side of the loader unit.

On the left and right side of the chassis.

Fig. 43

Meaning

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

Position

Next to the fuel tank filler inlet.

Fig. 44

Meaning

The reservoir contains hydraulic oil.

Position

Next to the filler inlet of the hydraulic oil reservoir.

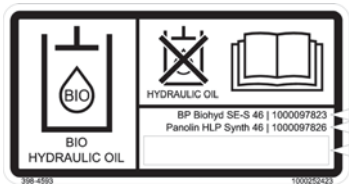


Fig. 45

Meaning (option)

The hydraulic-oil reservoir contains biodegradable Panolin HLP Synth 46 hydraulic oil.

Position

Next to the filler inlet of the hydraulic oil reservoir.

Fig. 46 (symbolic representation)

Meaning

Indication of sound power level produced by the machine.

L_{Wa} = sound power level.

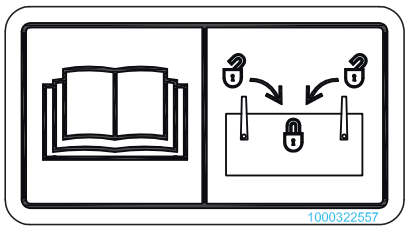
The sound power level depends on the machine.

Position

Inside the cabin on the framework on the left.

Meaning

Describes the position in which the control levers are locked.



Position

On the left and right side of the quickhitch lock levers, within the operator‘s sight.

Fig. 47

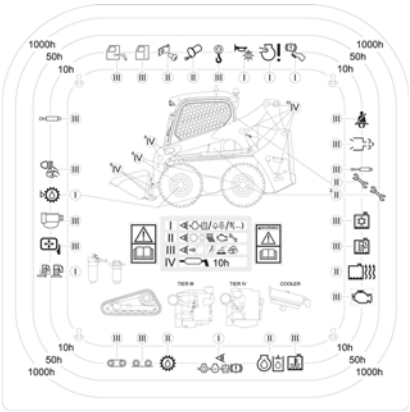


Fig. 48 (symbolic representation)

Meaning

Indication of maintenance intervals.

Position

On the roof window on the left in travel direction.

Information

The maintenance labels depend on machine equipment and destination country.

Fig. 49 (symbolic representation)

Meaning

Identifies the design-specific machine speed.

Position

At the rear of the cabin, and on the left and right side of the chassis.

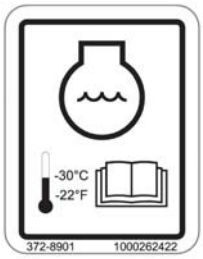


Fig. 50 (symbolic temperature representation)

Meaning

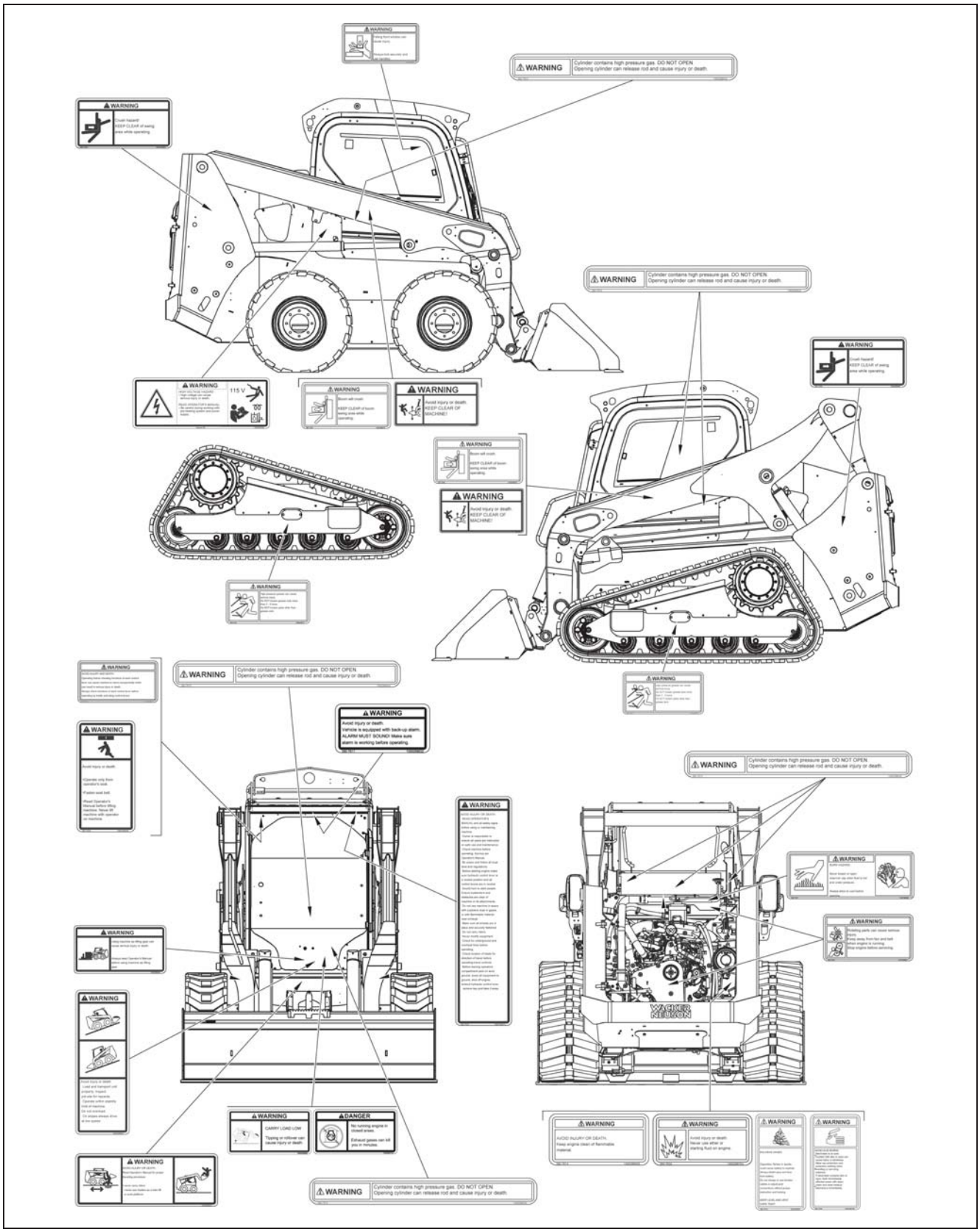
The engine coolant must be suitable up to -37° C (-34.6 °F).

Read Operator‘s Manual.

Position

Next to the coolant expansion reservoir in the engine compartment.

ANSI warning labels (option)



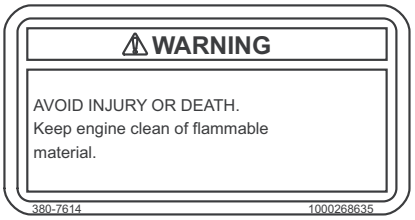


Abb. 51

Position

Right near the air filter.

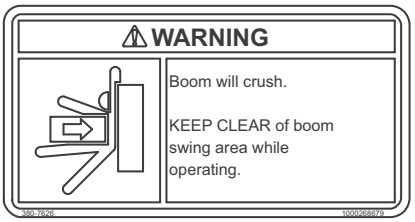


Abb. 52

Position

On the boom left and right.

Abb. 53

Position

On the engine cooler water tube.

On the v-belt cover.

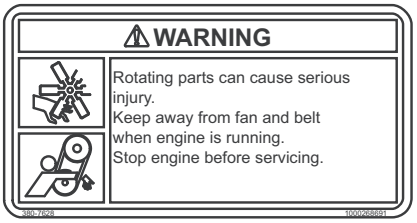


Abb. 54

Position

On the engine cooler frame.

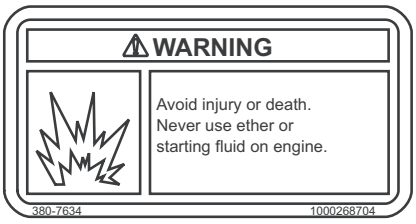


Abb. 55

Position

Right near the air filter.

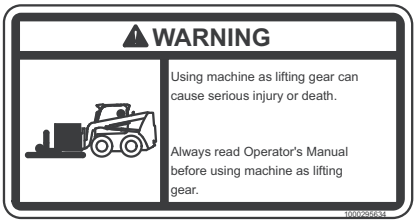


Abb. 56

Position

On the seat panel.

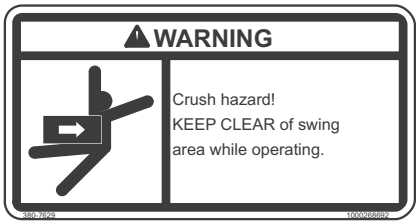


Abb. 57

Position

On the chassis left and right.

Abb. 58

Position

On the boom left and right.

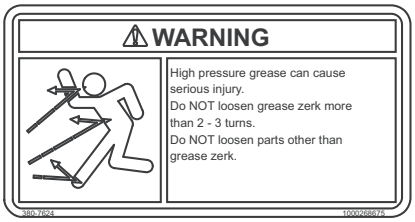


Abb. 59

Position

On the travel gear left and right (ST35/ST45).

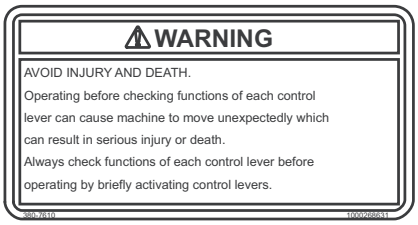


Abb. 60

Position

In the cab above the door/exit.

Abb. 61

Position

Inside on the cab roof.

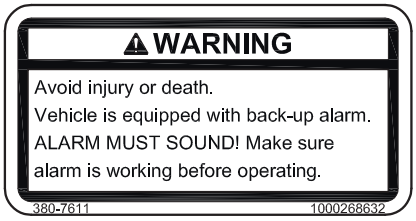


Abb. 62

Position

On the roof window.

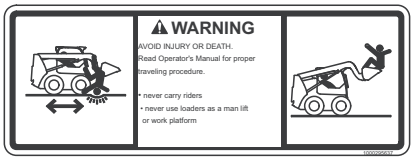


Abb. 63

Position

Inside the cab below the door/exit.

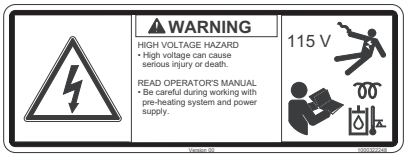


Abb. 64

Position

Near the motor pre-heating outlet.

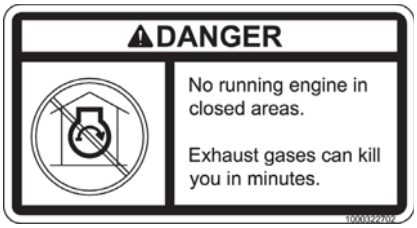


Abb. 65

Position

On the seat panel.

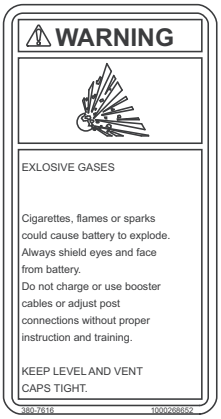


Abb. 66

Position

Near the battery.

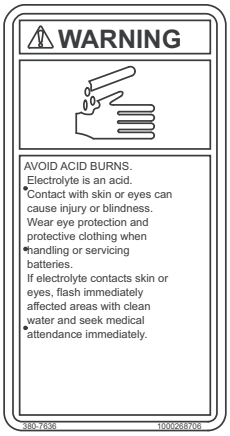


Abb. 67

Position

Near the battery.

Abb. 68

Position

On the seat panel.

Abb. 69

Position

Inside on the cab roof.

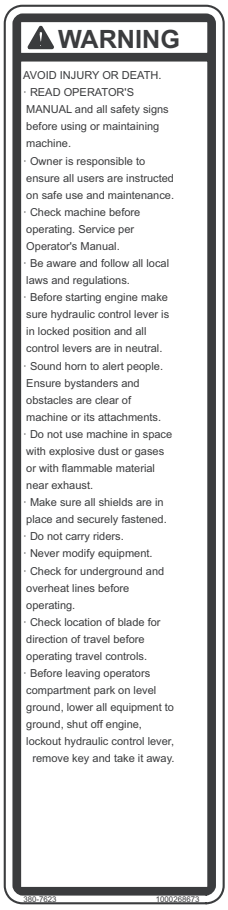


Abb. 70

Position

Inside on the cab roof.

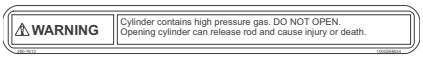


Abb. 71

Position

On the gas struts

- 3 x engine cooler
- 1 x seat bar
- 2 x canopy (for lifting)
- 1 x cab (for lifting/option)
- 1 x door (option)

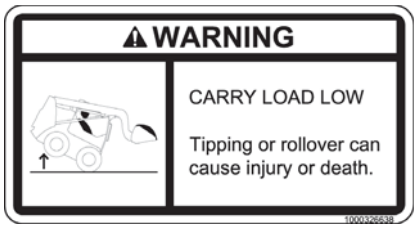


Abb. 72

Position

On the seat panel.

4 Putting into operation

4.1 Cabin/control stand

Safety instructions regarding entry and exit

CAUTION

Falling hazard when entering or exiting!

Entering or exiting incorrectly can cause injury.

- ► Keep the mandatory climbing aids **A** clean and use them for entering and exiting.
- ► Have damaged climbing aids replaced.

Fig. 73

Entry and exit

Use the climbing aids/handholds **A**.

Unlocking and locking the door (option)

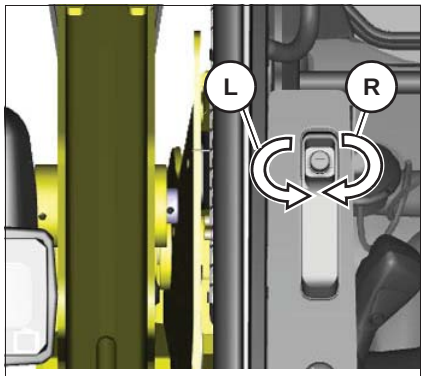


Fig. 74

Unlocking:

Insert the starting key in door lock **A**.

Turn lock **E** counterclockwise (**L**).

Locking:

Turn lock **E** clockwise (**R**).

Opening the door

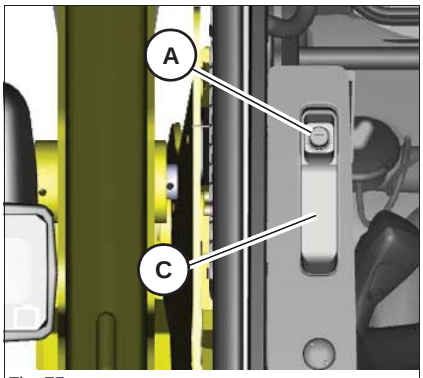


Fig. 75

Outside:

Press door lock **A** and pull handle **C**. The door opens automatically and is held in final position by a gas strut.

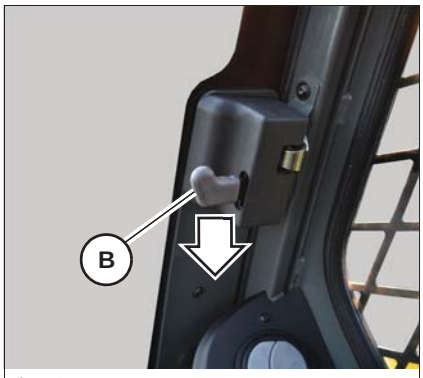


Fig. 76

Inside:

Press lever **B** downward. The door opens automatically and is held in final position by a gas strut.

Closing the door

Fig. 77

Outside:

Push the door with handle **C** until it locks into place.

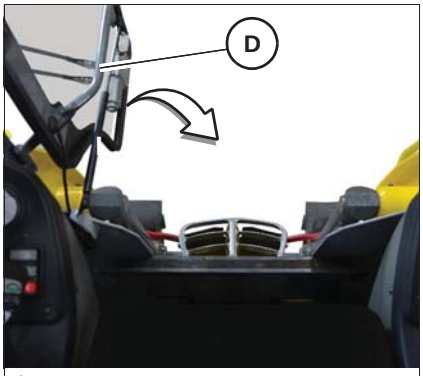


Fig. 78

Inside:

Pull the door with handle **D** until it locks into place.

Information

None of the hydraulic work functions is enabled unless the door is closed.

Opening/closing the side windows (option)

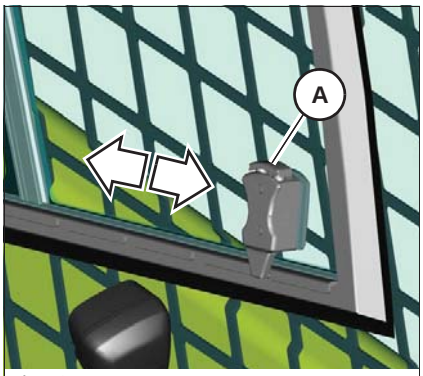


Fig. 79

Opening/closing

Press button **A** and let the side window lock into the required position.

Emergency exit

There are several possibilities for an emergency exit:

Canopy/cabin: remove the rear window.

Cabin: remove the rear window or unhitch the door. In addition, the front window can be smashed with the emergency hammer and used as an emergency exit.

WARNING

Burn hazard during an emergency exit!

The muffler and the radiator cover become hot during machine operation and can cause serious burns or death.

- ► Do not touch the muffler.
- ► Pay attention to the hot radiator cover.

WARNING

Injury hazard when leaving the cab in an emergency!

Can cause serious injury or death.

- ► The machine has neither footholds nor handles at the rear or on the sides for a safe exit.
- ► Protect your face and eyes from the glass splinters flying around.
- ► Pay attention to glass splinters during an emergency exit.

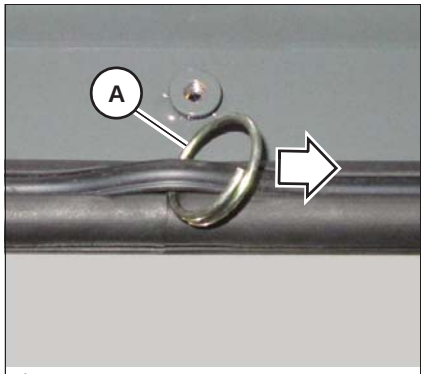


Fig. 80

Emergency exit by the rear window frame

1. Pull ring **A** with force clockwise around the window. The ring is located at the top of the rear window seal.
2. Push out the window pane with force.
   ? The window pane and the seal fall out of the rear-window frame.

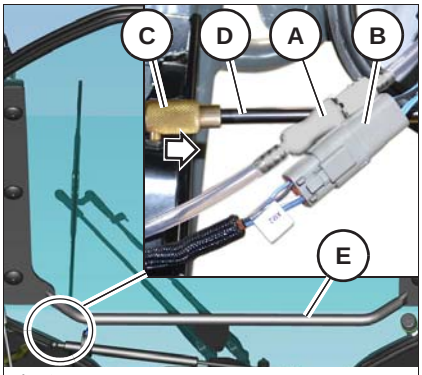


Fig. 81

Unhitching the door

1. Remove the couplings for the window wash fluid **A** and electrical system **B**.
2. Pull and hold quick fastener **C** in the direction of the arrow.
3. Raise and unhitch gas strut **D**.
4. Open the door at least 10 cm (4 in).
5. Raise the door with the inside handle **E** and unhitch it with an upward movement.
6. Get off the machine.

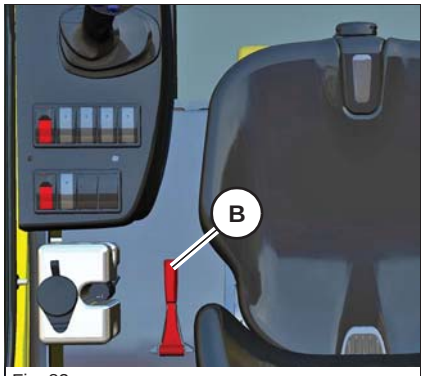


Fig. 82

Emergency hammer

If the door cannot be unhitched, the front window can be smashed with the emergency hammer (to the left of the operator seat).

Seat adjustment

WARNING

Accident hazard due to seat adjustment during machine operation!

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

- ► Adjust the operator seat before putting the machine into operation.
- ► Ensure that the levers for seat adjustment are locked into place.

WARNING

Spinal cord injury due to incorrect seat adjustment!

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

- ► Ensure that the seat is correctly adjusted to the operator's weight before machine travel or operation.
- ► Machine operation is prohibited for operators weighing less than 50 kg (110 lbs) or more than 150 kg (331 lbs).

Information

The comfort seat and the air-suspension seat (option) are equipped with a seat switch. As soon as the operator leaves the seat for more than 5 seconds, all hydraulic functions are locked and the service brake is automatically enabled.

Comfort seat (standard for SW24/SW28)

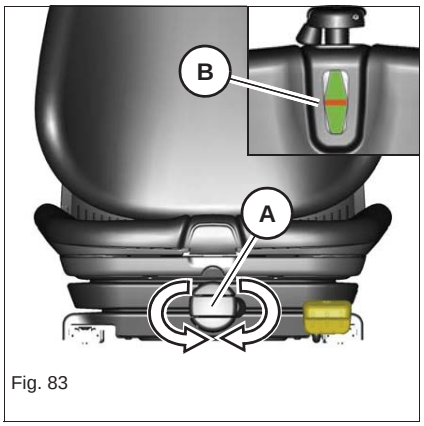


Fig. 83

Weight adjustment

1. Sit down on the operator seat.
2. Fold out and turn crank **A** until the red scale is in the middle of indicating instrument **B** (on the seat surface).

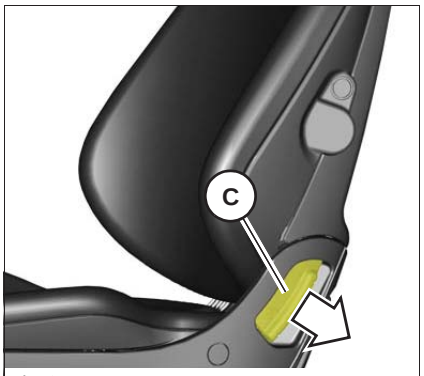


Fig. 84

Backrest adjustment

1. Sit down on the operator seat.
2. Push handle **C** in the direction of the arrow and move the backrest to the required position at the same tiem.
3. Release handle **C**.

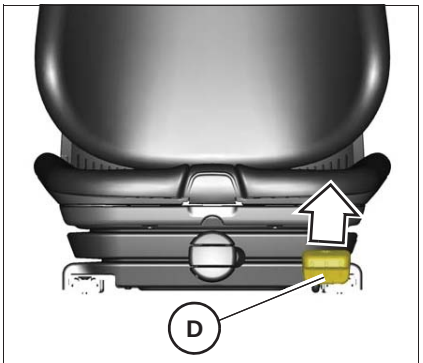


Fig. 85

Horizontal adjustment

1. Sit down on the operator seat.
2. Pull handle **D** up and move the operator seat to the required position at the same time.
3. Release handle **D**.

Air-suspension seat (standard for ST35/ST45; option for SW24/28)

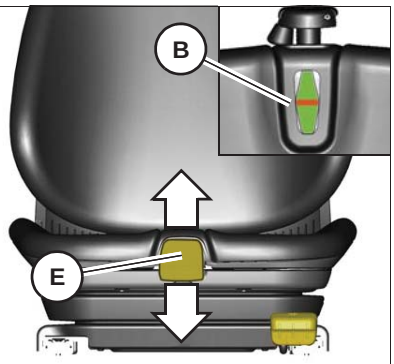


Fig. 86 (symbolic representation)

Weight adjustment

1. Sit down on the operator seat.
2. Turn the starting key to position **1**.
3. To adjust a higher weight: turn push button **E** downward to pump air into the operator seat.
4. To adjust a lower weight: pull button **E** upward to release air from the operator seat.
5. If the adjustment is correct, the red scale has to be in the middle of indicating instrument **B** (on the seat surface).

Information

The weight for the air-suspension seat can only be adjusted if the starter is switched on.

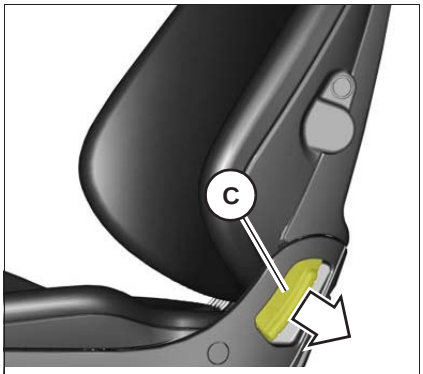


Fig. 87

Backrest adjustment

1. Sit down on the operator seat.
2. Push handle **C** in the direction of the arrow and move the backrest to the required position at the same tiem.
3. Release handle **C**.

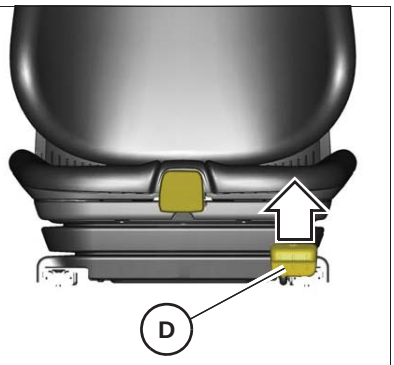


Fig. 88

Horizontal adjustment

1. Sit down on the operator seat.
2. Pull handle **D** up and move the operator seat to the required position at the same time.

Seat belt

DANGER

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

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

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

WARNING

Injury hazard due to damaged or dirty seat belt!

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

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

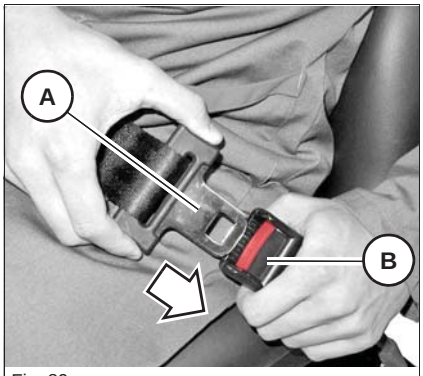


Fig. 89

Fastening the seat belt

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

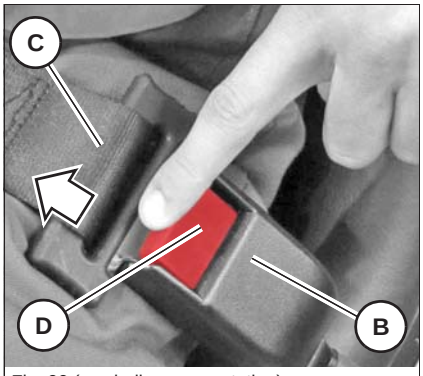


Fig. 90 (symbolic representation)

Unfastening the seat belt

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

Seat belt **C** is automatically retracted.

Seat bar

Among other things, the machine has the following safety mechanisms against incorrect operation:

- Seat bar
- Seat switch

The machine can be started with a raised or lowered seat bar.

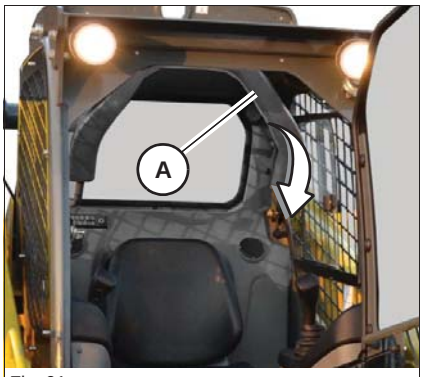


Fig. 91

Information

All hydraulic functions of the machine are locked if the seat bar is raised or the operator is not on the seat.

The parking brake is applied in addition.

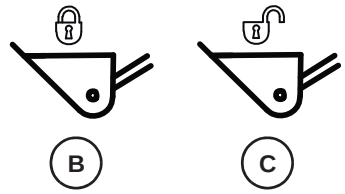


Fig. 92

If the seat bar is raised or lowered, the symbols on the left appear at the top in the multifunctional display and in the middle of the display for a few seconds:

- **B**: seat bar raised
- **C**: seat bar lowered

Information

Machine travel is possible with an open door (cabin option), however all hydraulic work functions are locked.

Functional check of seat bar/seat switch (canopy and cabin)

A functional check must be performed daily.

1. Start the machine.
2. Fasten your seat belt.
3. Lower the seat bar.
4. Drive on open and level terrain.
5. Secure the danger zone.
6. Stop the machine.
7. Raise the seat bar and get off the seat for at least 5 seconds.
8. Carefully move all control levers in all directions.
   - ? The machine must neither move, nor must it be possible to perform work functions. Work may be performed with the machine.
   - ? If the machine moves or work functions are performed, stop machine operation immediately and contact a Wacker Neuson service center werden.

Fire extinguisher

Fig. 93

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

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

Fasten a bracket under the console on the left.

Information

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

Wacker Neuson recommends fire extinguishers of the ABC category.

Protective structures

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

DANGER

Accident hazard due to modified cabin or protective structures!

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

- ► No drilling, cutting or grinding.
- ► Do not install any brackets.
- ► No welding, straightening or bending.
- ► Replace the complete protective structure if it is damaged, deformed or cracked.
- ► Contact a Wacker Neuson service center in case of doubt.
- ► Retrofit, assembly and repair work may only be performed by a Wacker Neuson service center.
- ► Do not re-use self-locking fasteners.
- ► Screws to which an adhesive has been applied must be cleaned with a suitable cleanser before they are re-used.

Information

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

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

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 operating company and depends on the specific work situation.

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

Level II protective FOPS structure (option)

DANGER

Crushing hazard due to 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 level II according to EN ISO 3449:2008

- ► The machine owner must ensure that the hazard situation is evaluated and that the national regulations are observed.
- ► The machine owner or operating company must ensure that only work is performed that does not require any higher protection.
- ► Accidents cannot be fully avoided despite equipping a machine with protective structures.
- ► The FOPS screen has to be installed by at least 2 persons.
- ► Screws to which an adhesive has been applied must be cleaned with a suitable cleanser before they are re-used.

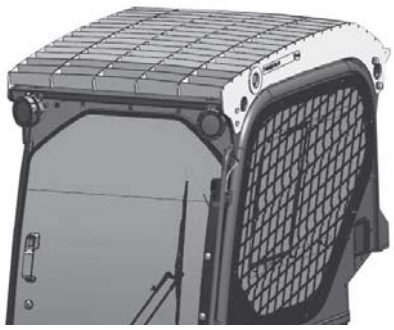


Fig. 94

Installing

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

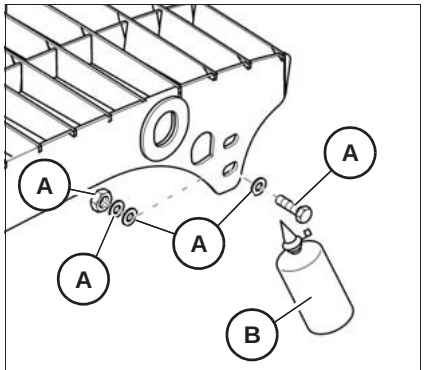


Fig. 95

2. Apply screw adhesive **B** to hexagon head bolt **A**.
3. Install hexagon head bolt **A**, schnorr lock **C**, washers **D** and hexagon nut **E** at the cabin fastening points **F** (front) and **G** (rear).

Fig. 96

4. Tighten hexagon head bolts **A** (M16/10.9) to 275 Nm (203 ft.lbs).

Information

Either a level II FOPS screen or a crane-handling bracket can be installed.

Socket

Fig. 97 (symbolic representation)

A 12 V socket (**A**) is located next to the right switch panel.
It can be used for a mobile working light, for example.

4.2 Overview of control elements

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

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

Cabin

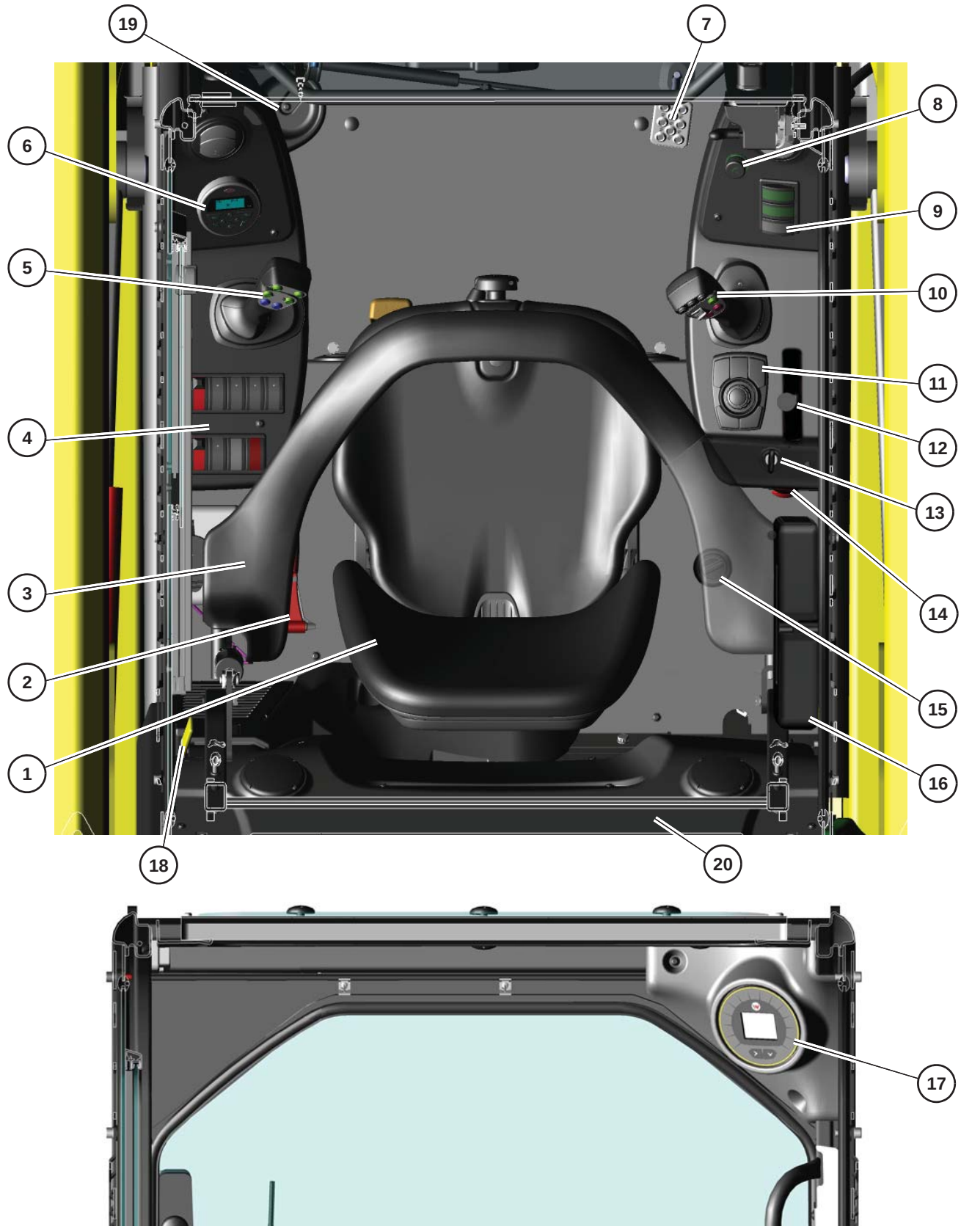
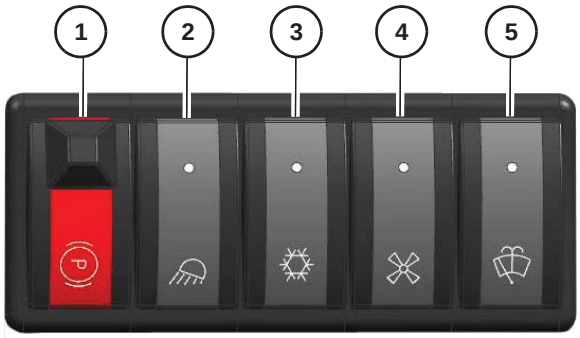


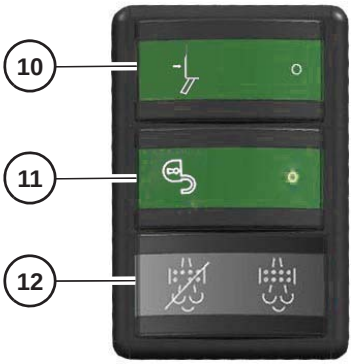
Fig. 98 Overview of control elements

Designation	See page
1 Operator seat and seat belt	*4-6*; *4-9*
2 Emergency hammer (option)	*4-4*
3 Seat bars	*4-10*
4 Switch panel on the left	*4-20*
5 Control lever on the left	*5-33*
6 Radio (option)	--
7 Accelerator pedal	*5-1*
8 12 V connection	*4-16*
9 Switch panel on the right	*4-20*
10 Control lever on the right	*5-33*
11 Jog dial (option)	*5-4*
12 Throttle	*5-1*
13 Starter	*4-34*
14 Emergency lowering	*5-55*
15 Heating controller (partly covered)	*5-24*
16 Document box	*1-1*
17 Display element with multifunctional display	*4-22*
18 Recirculated-air/fresh-air lever (option)	*5-24*
19 Drinks holder	--
20 Storage box	*7-43*

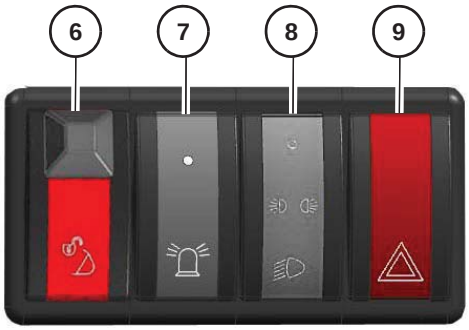
Control elements and switches



Switch panel on the left (front)



Switch panel on the right



Switch panel on the left (rear)

Fig. 99

Designation		See page
1	Parking brake	*5-3*
2	Working lights	*5-18*
3	Air conditioning (option)	*5-25*
4	Ventilation (option)	*5-24*
5	Wiper/wash system (option)	*5-23*
6	Hydraulic quickhitch (option)	*5-48*
7	Rotating beacon (option)	*5-20*
8	Road travel lights	*5-19*
9	Hazard warning system (option)	*5-22*
10	Parallel bucket lift (option)	*5-45*
11	Work/road-travel position changeover (option for EU only)	*4-33*
12	PMC (American tier IV engine only)	*5-26*
13	Push button for daily and total operating hours (American tier IV engine only)	*5-4*
14	Operation mode button	*5-5*
15	High Flow push button	*5-43*
16	Control button	*5-4*
17	ESC (return) push button	--
18	Push button for tools/operating mode/service tool	*5-6*

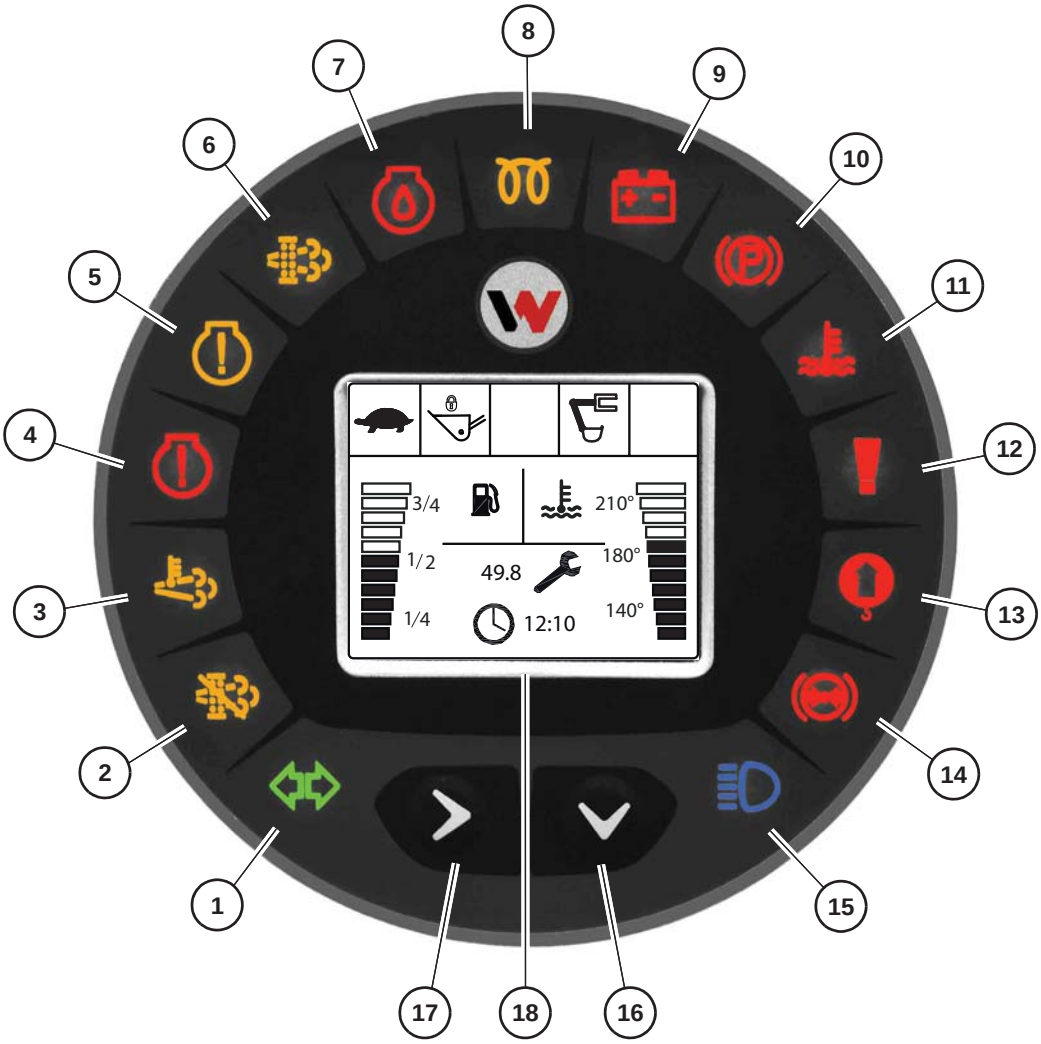
4.3 Indicator lights and warning lights (overview)

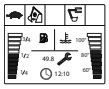
Display element

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

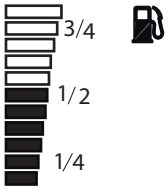
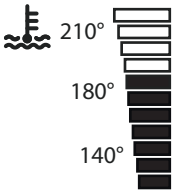
Information

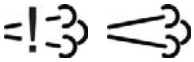
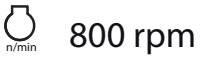
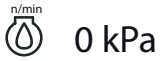
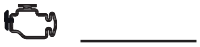
After switching on the starter, the indicator lights are checked during the first 2 seconds and the current reading of the maintenance meter is displayed. Then the operating hours are automatically displayed.



No.	Symbol	Color	Designation	See
1		Green	**Turn indicators** Flashes when the turn indicator push buttons are pressed (green)	*5-21* *5-22*
2		Yellow	**PMC regeneration disabled/interrupted (American tier IV engine only)**	*5-26*
3		Yellow	**High exhaust-gas temperatures (American tier IV engine only)**	*5-26*
4		Red	**Engine stop (American tier IV engine only)**	*8-1*; *8-2* *5-32*
5		Yellow	**Engine warning (American tier IV engine only)**	*8-1*; *8-2* *5-31*; *5-32*
6		Yellow	**PMC regeneration (American tier IV engine only)**	*5-26*
7		Red	**Engine oil pressure**	*8-2*
8		Yellow	**Preheating**	*4-34*
9		Red	**Charge indicator light**	*8-3*
10		Red	**Parking brake**	*5-3*
11		Red	**Coolant temperature**	*8-3* *8-4*
12		Red	**General malfunction**	*8-3*
13		Red	**(not assigned)**	--
14		Red	**(not assigned)**	--
15		Blue	**(not assigned)**	--
16		---	**Selector button (multifunctional display)**	*5-11*
17		---	**To next menu page/set (multifunctional display)**	*5-11*
18		---	**Multifunctional display**	--

Meaning of displays and symbols

Symbol	Designation	Page
	Speed range 1	5-2
	Speed range 2	
	Seat bar raised	4-10
	Seat bar lowered	
	Work position	4-33
	Road-travel position	
450.2 	Hour meter	4-26
49.8 	Operating hours to next maintenance	
 12:10	Time	5-11
800 rpm	Engine speed	
	Fuel tank capacity	4-27
	Coolant temperature	8-3; 8-4
	Engine error	8-5
	Machine error	
	Engine data	--

Symbol	Designation	Page
	Machine data	--
	PMC (without callsign from software version 3.3)	*5-26*; *8-5*
	No malfunction	--
	Detailed coolant temperatur	--
	Detailed engine speed	--
	Detailed engine oil pressure	--
	Engine number	--
	Setting of display brightness	*5-12*
	Setting of display contrast	
	Setting of time/date	
	Attachment 1 or 2	--
	Auger	--
	Asphalt miller	--
	Multipurpose bucket	--
	Tree stump cutter	--
	Auxiliary hydraulics (AUX I)	*5-39*
	High Flow	*5-43*

Symbol	Designation	Page
	Speed Control	*5-44*
	Load stabilizer	*5-45*
	Pilot control pressure	
	Replace the hydraulic oil filter	
	Dirty air filter	*8-3*
	Dirty hydraulic oil radiator	
	Charge indicator light	
	PMC: low soot load	
	PMC: moderate soot load	
	PMC: highest soot load	*5-28*
	Flashing symbol: PMC regeneration needed	
	Glowing symbol: PMC regeneration active	

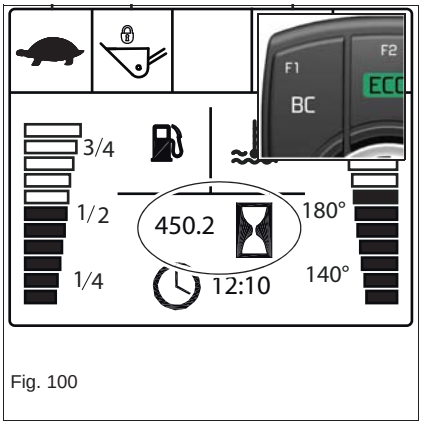


Fig. 100

Hour meter

– see chapter “ Jog dial (option)” on page 5-4

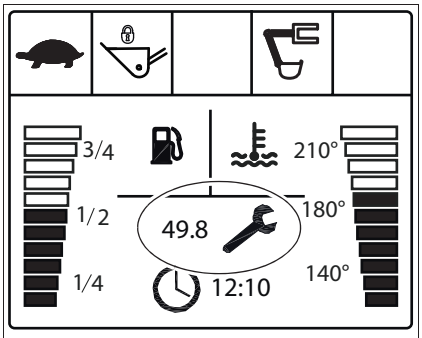


Fig. 101

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 performance of the Tier IV diesel engine is reduced.

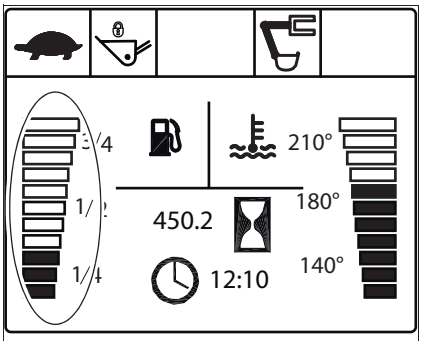


Fig. 102

Fuel level indicator

Indicates the remaining amount of fuel in the tank.

Refuel if the segments reach the low range.

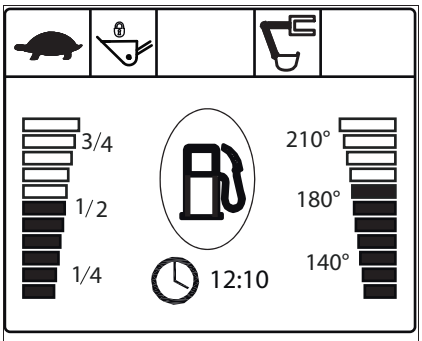


Fig. 103

If the marked symbol in the main menu appears, stop the engine immediately and refuel.

4.4 Preparatory work

Important information before putting the machine into operation

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

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

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

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

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

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

Before using the machine, before starting work or when changing operators, ensure that all visual aids (mirrors, for example) work correctly, that they are clean and adjusted in accordance with the instructions in this Operator's Manual. The operator must observe the local regulations.

Perform a functional check of the control lever base.

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

Follow the safety instructions in the safety chapter *– see chapter "2.4 Operation" on page 2-4*.

Requirements and information for the operating personnel

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

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

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

Perform daily maintenance according to the Lubrication and maintenance plan – *see chapter "7.2 Maintenance overview" on page 7-2*

Face the machine as you enter and leave it.

Keep the footholds and the handles clean to ensure a safe hold at all times. Immediately remove dirt, for example oil, grease, dirt, snow or ice.

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

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

Do not operate the machine with the standard safety devices removed (side screen, for example).

Ensure that no body parts protrude outside the machine during operation.

Check lists

The checklists below are intended to assist you in checking and monitoring the machine before, during and after operation. These checklists cannot claim to be exhaustive.

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

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

Start-up checklist

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

No.	Question	Page	?
1	Enough fuel in the tank?	*7-28*	
2	Correct engine oil level?	*7-34*	
3	Coolant level OK?	*7-36*	
4	Water separator level OK? (American tier III only)	*7-31*	
5	Hydraulic oil level correct?	*7-42*	
6	Glass cleaner in washer reservoir OK?	*7-47*	
7	Lubrication points greased?	*7-9*	
8	Tires and Tracks checked for cracks, cuts, etc.?	--	
9	Light system, signaling, warning and indicator lights operational?	--	
10	Windows, mirrors, lights, steps, all pedals and control levers clean and correctly adjusted?	--	
11	All control levers and pedals in neutral position?	--	
12	Seat bar raised?	*4-10*	
13	Attachment safely locked?	*5-46* *5-48*	
14	Engine cover locked? Filler cap closed tightly?	*7-14*	
15	Especially after cleaning, maintenance or repair work: Rags, tools and other loose objects removed?	--	
16	Seating position adjusted correctly?	*4-6*	
17	Seat belt fastened?	*4-9*	
18	Before putting the machine into operation, ensure that nobody is in the danger zone.	--	

Operation checklist

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

No.	Question	Page	?
1	Anyone in the danger zone of the machine?	--	
2	Indicator light for engine oil pressure and alternator charge function gone out after a few seconds?	*8-2*	
3	Coolant temperature of engine in normal range?	*8-3* *8-4*	
4	Indicator lights for hydraulic oil filter and air filter do not illuminate?	*8-3*	
5	Control levers working correctly?	*5-33*	
6	Performed functional check of control lever base?	*4-10*	

Parking checklist

Check and observe the following points when parking the machine:

No.	Question	Page	?
1	Attachment lowered to the ground?	--	
2	Seat bar raised?	*4-10*	
3	Cabin locked, especially if the machine cannot be supervised?	*4-1*	
When parking on public roads:			
4	Machine adequately secured? Machine additionally secured with chocks under the tracks to prevent it from rolling away?	*5-17*	
When parking on slopes:			
5	Machine additionally secured with chocks under the tracks to prevent it from rolling away?	*5-17*	

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

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

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

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

Handle the machine carefully during its first 50 operating hours.

- Do not load a cold engine.
- Warm up the machine at low engine speed and little load, do not warm it up at a standstill.
- Do not change engine speed abruptly.
- Avoid using the machine under heavy loads or at high speeds.
- Avoid abrupt acceleration, braking and changing travel direction.
- Do not run the engine at high speed for extended periods.
- Observe the maintenance plans and perform (or have performed) the mandatory maintenance *– see chapter “ Maintenance plan” on page 7-4*.

StVO accessories (option)

Information

Observe the national and regional regulations when traveling on public roads.

Scope of delivery of option **StVZO equipment (German road traffic regulations)**:

- Headlights and rear lights
- Turn indicators and clearance lights
- Rotating beacon
- Left and right outside mirrors
- Numberplate bracket and lights
- Work/road-travel position changeover

Traveling on public roads

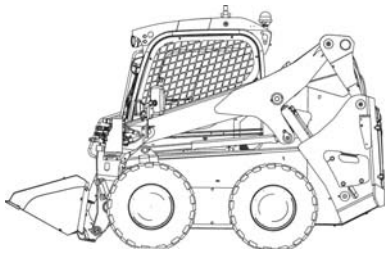


Fig. 104 (symbolic representation)

1. Lower the loader unit completely and tilt in the bucket.

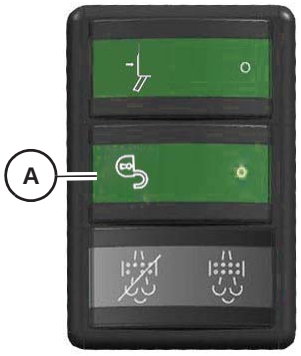


Fig. 105

2. Lock the loader unit (option EU only)

Function	Position
Locks the loader unit (road-travel position)	Press switch **A** to the right
Unlocks the loader unit (work position)	Press switch **A** to the left

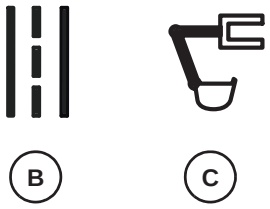


Fig. 106

If the loader unit is locked or unlocked, the symbols on the left appear at the top in the multifunctional display and in the middle of the display for a few seconds:

- **B**: loader unit (including attachments and auxiliary hydraulics) locked
- **C**: loader unit (including attachments and auxiliary hydraulics) unlocked

4.5 Starting and stopping the engine

Preparations for starting the engine

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

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

Information

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

Information

All controls must be within easy reach.

Starter

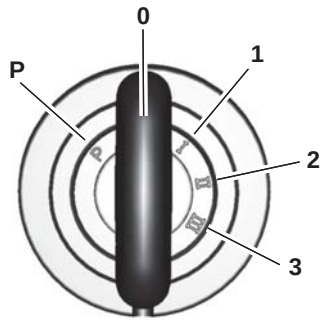


Fig. 107

Position	Function	
P	Park position	Insert or remove the starting key
0	Stop position	
1	Position for accessories	All electric functions are enabled
2	Preheats the engine	Preheater active
3	Starts the engine	Starter is actuated

Starting the engine

NOTICE

Possible damage if the start attempt takes too long.

► Do not run the starter for more than 30 seconds.

NOTICE

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

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

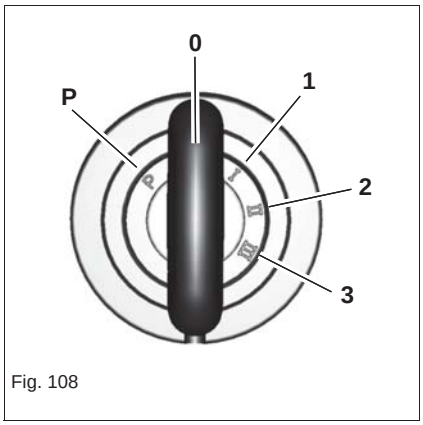


Fig. 108

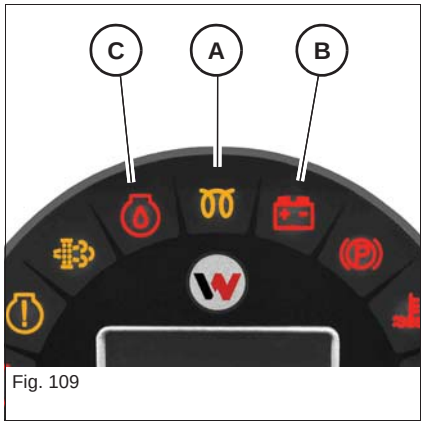


Fig. 109

1. Switch off all electric consumers.
2. Insert the starting key.
3. Turn the starting key to position **1**.
4. All indicator lights illuminate for 2 seconds.

? Have malfunctioning indicator lights immediately replaced.

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

? Indicator light **B** (alternator charge) illuminates.

? Indicator light **C** (engine oil pressure) illuminates.

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

? All indicator lights go out.

? If the engine does not start after 30 seconds:

  ? Interrupt the start procedure and repeat it after two minutes.

  ? If the engine still does not start after a few tries, contact a Wacker Neuson service center.

7. As soon as the engine runs:

  ? Release the starting key.

Warm-up phase

After starting the engine, let it warm up at slightly increased idling speed until it reaches its operating temperature.

During the warm-up phase, check for unusual noise, exhaust color, leaks, malfunctions or damage.

In case of a malfunction, damage or leaks, stop and secure the machine, and contact a Wacker Neuson service center.

Starting the engine at low ambient temperatures

Start the engine as described in chapter **Starting the engine**.

Warm-up phase at low ambient temperatures

1. Let the engine run at idling speed for three to five minutes, or until the coolant temperature indication starts to rise.
2. If the engine runs at idling speed at low ambient temperatures, increase the engine speed to about 1000 – 1200 revolutions. This enables the engine to warm up more quickly.
3. Let the engine run a low load until the coolant reaches its operating temperature.

During the warm-up phase, check for unusual noise, exhaust color, leaks, malfunctions or damage.

In case of a malfunction, damage or leaks, secure, stop and park the machine, and contact a Wacker Neuson service center.

Information on the warm-up phase

- After reaching the operating temperature, the engine can be operated under full load.
- The engine reaches its operating temperature faster at low engine speed and under load. This is more efficient than operation low engine speed and without any load.
- Avoid excess idling. Excessive idling causes carbon deposits or an increased soot load of the PMC, for example.

Warming up hydraulic oil

WARNING

Accident hazard when hydraulic oil is cold!

Cold hydraulic oil can lead to unpredictable machine movement, which can cause serious injury or death.

- ► Even when the engine has reached it‘s operating temperature, hydraulic oil can still be colder.
- ► If possible, warm up the machine on wide and open terrain.
- ► Operate the control levers with extreme care, when hydraulic oil is cold. The machine can for example show delayed reaction, when stopping it.

If there is no attachment or an attachment without permanent rotary function (for example bucket, grab) mounted:

- Apply the hydraulic hammer button for about 5 seconds.

If there is an attachment with permanent rotary function (for example trencher) mouted:

- Fully curl attachment and hold control lever in this posítion for about 5 minutes.

Jump-starting the engine

WARNING

Explosion hazard in case of incorrect handling of battery!

Incorrect battery handling can cause serious injury or death.

- ► Do not jump start the engine if the battery is malfunctioning or frozen.
- ► Fire, open flames and smoking is not allowed.
- ► Pay attention to the correct polarity.

WARNING

Burn hazard due to hot engine parts!

Can cause serious burns.

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

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

- ► Open the engine cover only at engine standstill.

NOTICE

Damage to machine due to electrical short-circuit or overvoltage.

- ► The positive terminal of the starting battery must not be brought into contact with electrically conductive vehicle parts.

NOTICE

Damage to machine due to higher battery voltage.

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

NOTICE

Damage to the electrical system of the machine.

- ► The vehicles must not touch each other during the starting aid.

NOTICE

Damage to consumers of vehicle with empty battery due to voltage peaks.

- ► Switch off all consumers.

NOTICE

Damage to battery jumper cables when placing them near rotating parts.

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

Use only authorized battery jumper cables complying with the national or regional safety requirements.

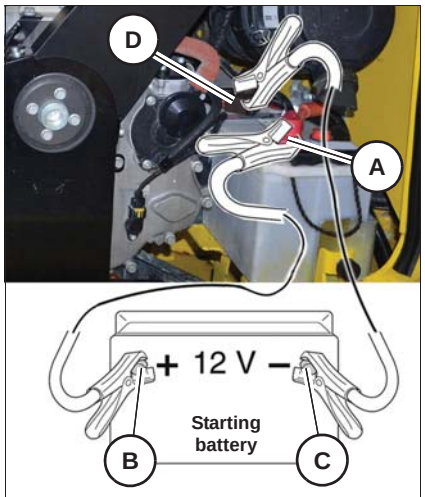


Fig. 110 (symbolic representation)

Terminals (standard battery)

1. Drive the jump-starting vehicle close enough to the machine with the empty battery so that the length of the battery jumper cables is sufficient.
2. Let the engine of the jump-starting vehicle run.
3. Open the engine cover of the machine with the empty battery.
4. First connect one end of the red battery jumper cable (**+**) to the positive terminal of the empty battery (**A**), then the other end to the positive terminal of the starting battery (**B**).
5. Connect one end of the black battery jumper cable (**–**) to the negative terminal of the starting battery (**C**), then the other end of the black battery jumper cable (**–**) to the negative terminal of the empty battery (**D**).
6. Wait at least 5 minutes for the empty battery to be charged a little.
7. Start the engine of the machine with the empty battery.

Once the engine has started:

In order to avoid sparks, disconnect both battery jumper cables in exactly the reverse order (D-C-B-A) with the engine running.

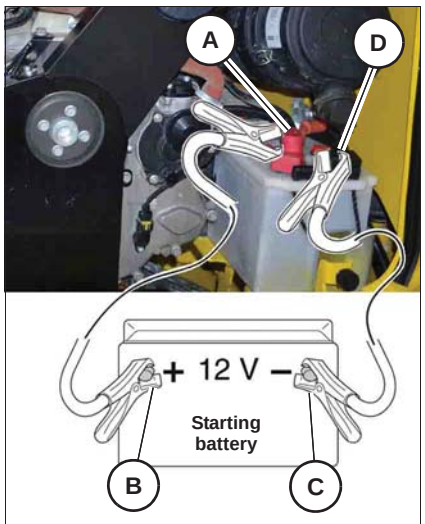


Fig. 111 (symbolic representation)

Terminals (winter package option)

Low-load operation

NOTICE

Possible engine damage due to low-load operation.

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

Possible consequences of low-load operation are:

- Increased engine oil consumption.
- Dirt in engine due to engine oil in exhaust system.
- Blue smoke in exhaust gas.
- Shorter PMC regeneration cycles (in case of American tier IV).

Stopping the engine

NOTICE

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

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

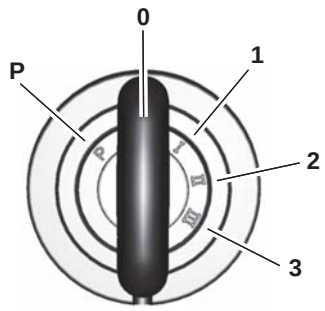


Fig. 112

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

Information

After stopping the engine, wait two minutes before disconnecting the battery in order to avoid damage to the control electronics.

5 Operation

5.1 Steering system

– see chapter “ Basic control lever functions (ISO and H controls)” on page 5-33

5.2 Accelerator actuation

Manual throttle

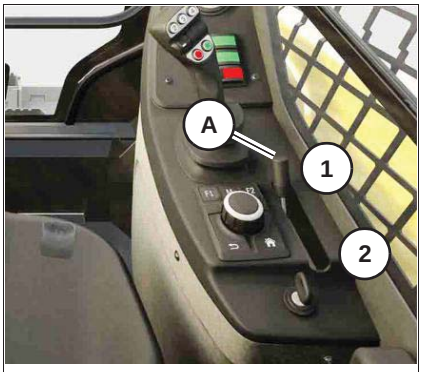


Fig. 113

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

- Position **1**: maximum engine speed
- Position **2**: idling speed

Accelerator pedal

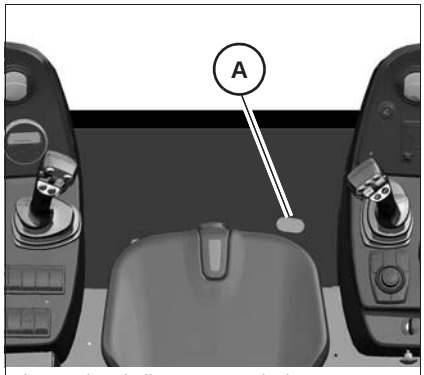


Fig. 114 (symbolic representation)

Speed can be set continuously with accelerator pedal **A**.

Information

The engine speed adjusted with the manual throttle lever cannot be reduced with the accelerator pedal.

Speed changeover

Fig. 115

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

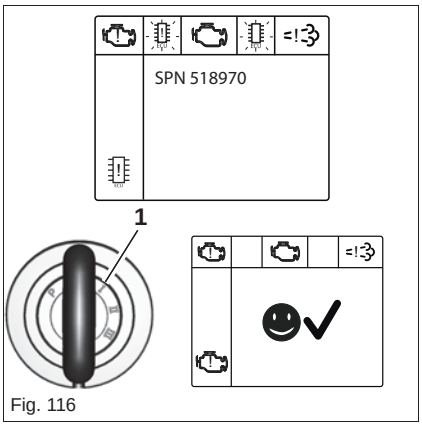


Fig. 116

Information

Do not press push button **A** for more than 3 seconds, when the engine is running.

If SPN-Code 518970 is displayed:

1. Turn off the engine.
2. Wait at least 30 seconds.
3. Turn the starter to position **1** until the smiley is displayed.
4. Start the engine.

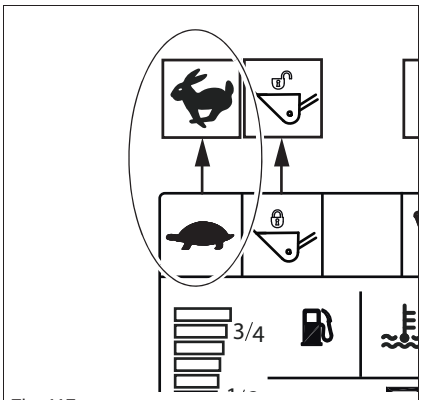


Fig. 117

Indication of speed ranges in multifunctional display

Speed range 1:

The **turtle** symbol is displayed.

Speed range 2:

The **hare** symbol is displayed.

5.3 Brakes

Hydraulic brake

Releasing the control levers brakes the machine.

Parking brake

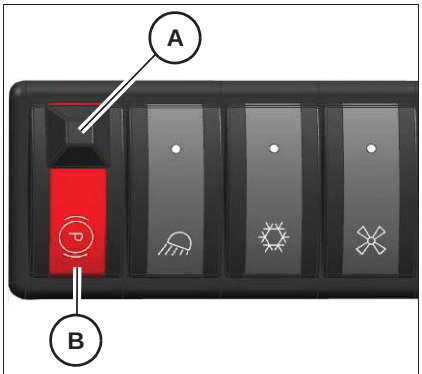


Fig. 118

The switch is located on the front left switch panel.

Function	Position
Apply the parking brake.	Release lock **A** and press switch **B** downward.
Release the parking brake.	Release lock **A** and press switch **B** upward.

Brake test

Information

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

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

Test the brakes once a day.

Service brake test

Perform the test on horizontal, firm and level ground.

1. Raise the bucket 20 – 30 cm (8 – 12 in) from the ground.
2. Start machine travel forward in the first speed range.
3. Push the control lever forward about 50 % of the lever travel (control lever on the left if the machine has ISO controls, both control levers if it has H controls).
4. Release the control lever(s).
   ? The machine must brake abruptly.

Parking brake test

Testing the parking brake is not possible for technical reasons.

Jog dial (option)

Fig. 119

Control button

Control button **F** is used for selecting (by turning) and confirming (by pressing) menu levels.

Fig. 120

Daily and total operating hours

Changeover between daily and total operating hours:

- Press push button **A**

To reset the daily operating hours:

- Press push button **A** longer.

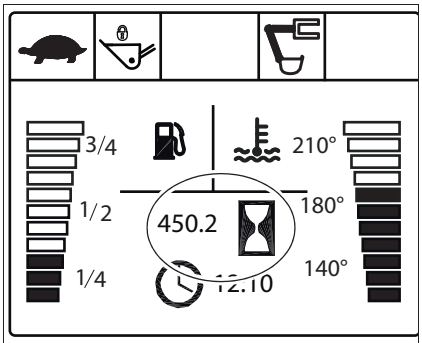


Fig. 121

Fig. 122

Operation mode

Normal mode is preset after starting the machine.

Press push button **B** to change over the mode directly:

- **Economy mode (ECO)**

For powerful and fuel-saving machine operation.

- **Normal mode**

For maximum performance.

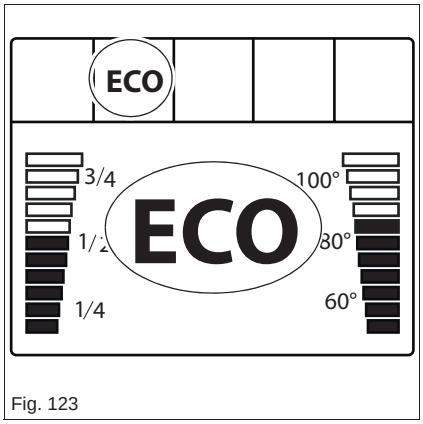


Fig. 123

After changing the operating mode, the corresponding symbol appears at the top and in the middle of the multifunctional display for a few seconds.

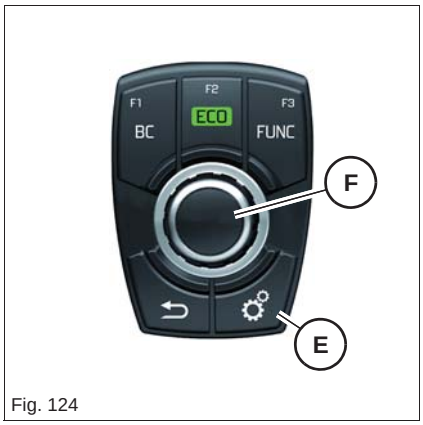


Fig. 124

Changing operating mode (menu settings)

1. Press push button **E**.

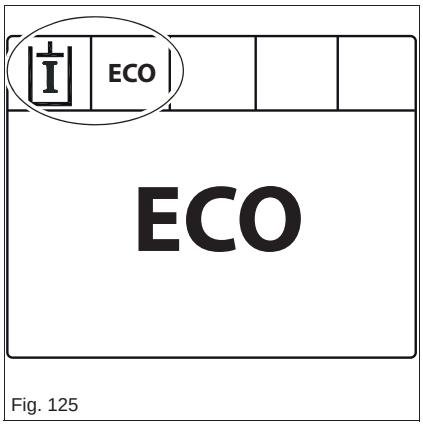


Fig. 125

2. Turn control button **F** until the menu page **Operating mode** appears.
3. Press control button **F**.
4. Turn control button **F** to select the required operating mode **(Normal/ ECO mode)**.
5. Press control button **F**.

Fig. 126

Attachments/operating mode

The following menu pages can be selected with push button **E**:

- **Attachments**
- **Operation mode**
- **Service tool**

The settings are explained in detail on the following pages.

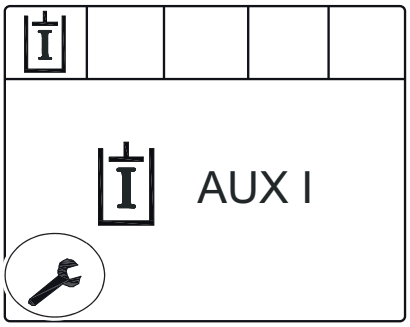


Fig. 127

Service tool

Press push button **E** until the tool symbol appears. Turn control button **D** to access the required menu page.

The following data is displayed:

- Engine error
- Machine error
- Engine data
- Machine data
- PMC data
- Settings for auxiliary hydraulics (AUX I)

Fig. 128

ESC push button

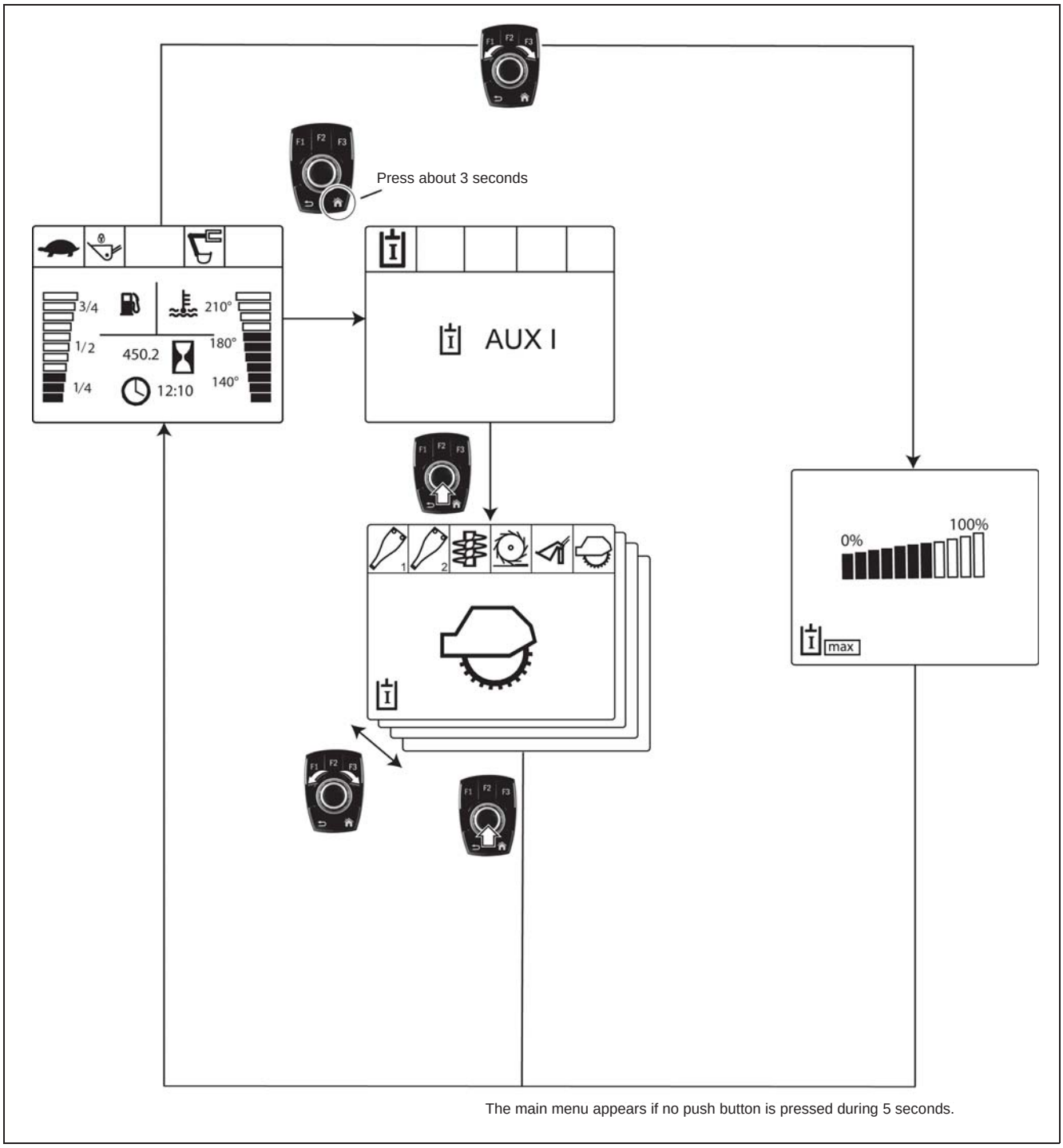
ESC push button **D** is used for exiting a submenu.

Fig. 129

Setting jog dial brightness

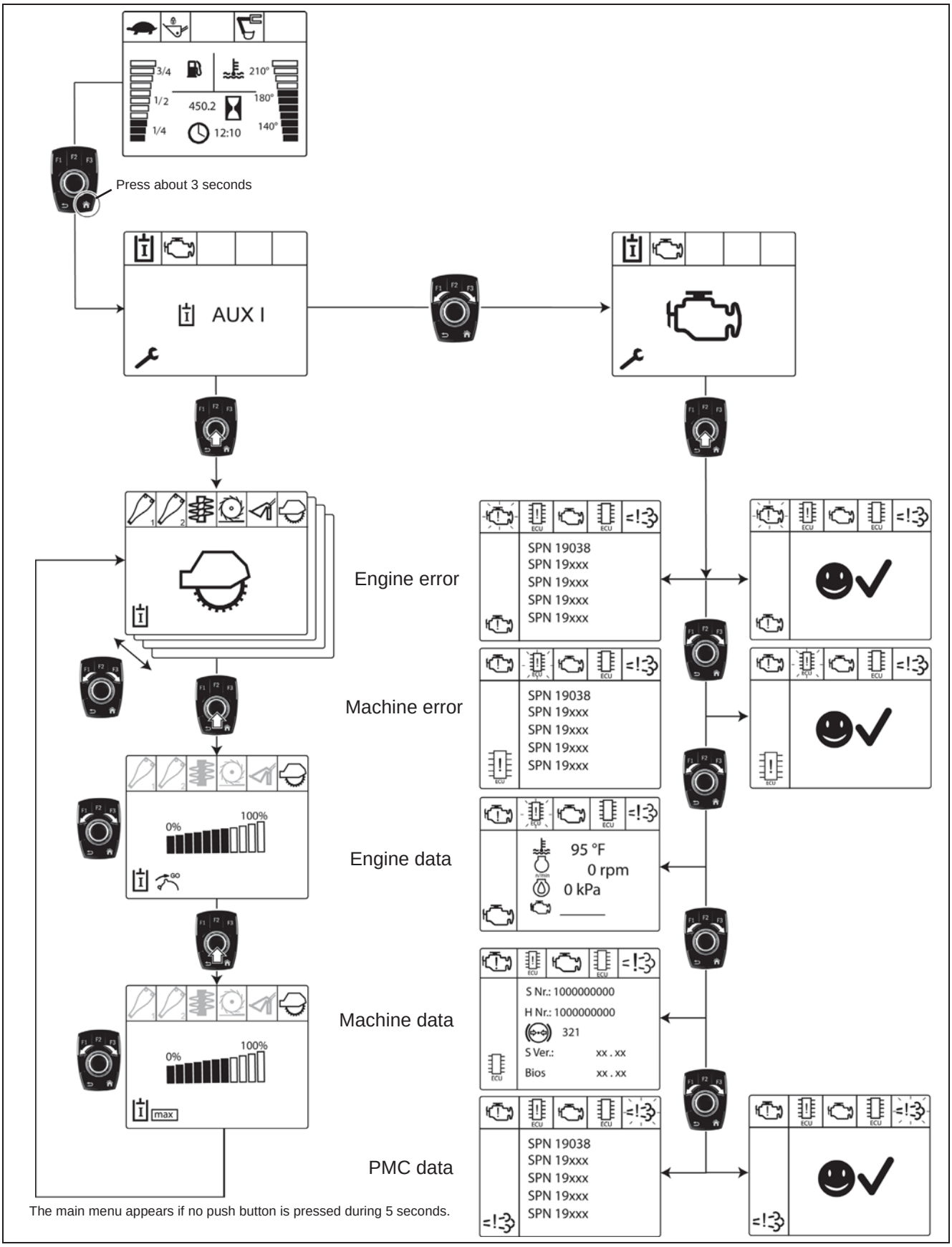
Keep control button **F** pressed and turn it.

Menu structure of proportional and attachment controls (jog dial operation)

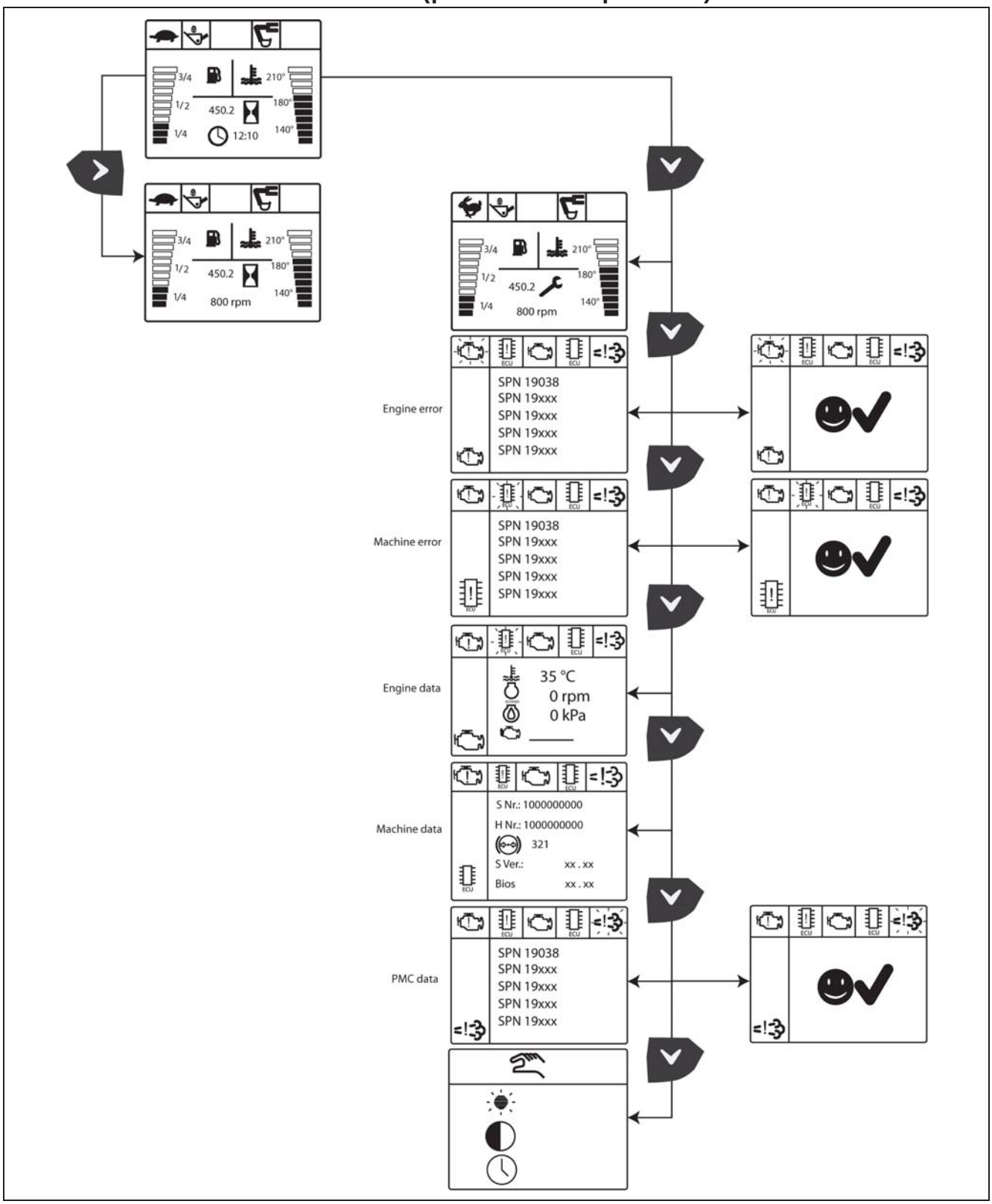


The main menu appears if no push button is pressed during 5 seconds.

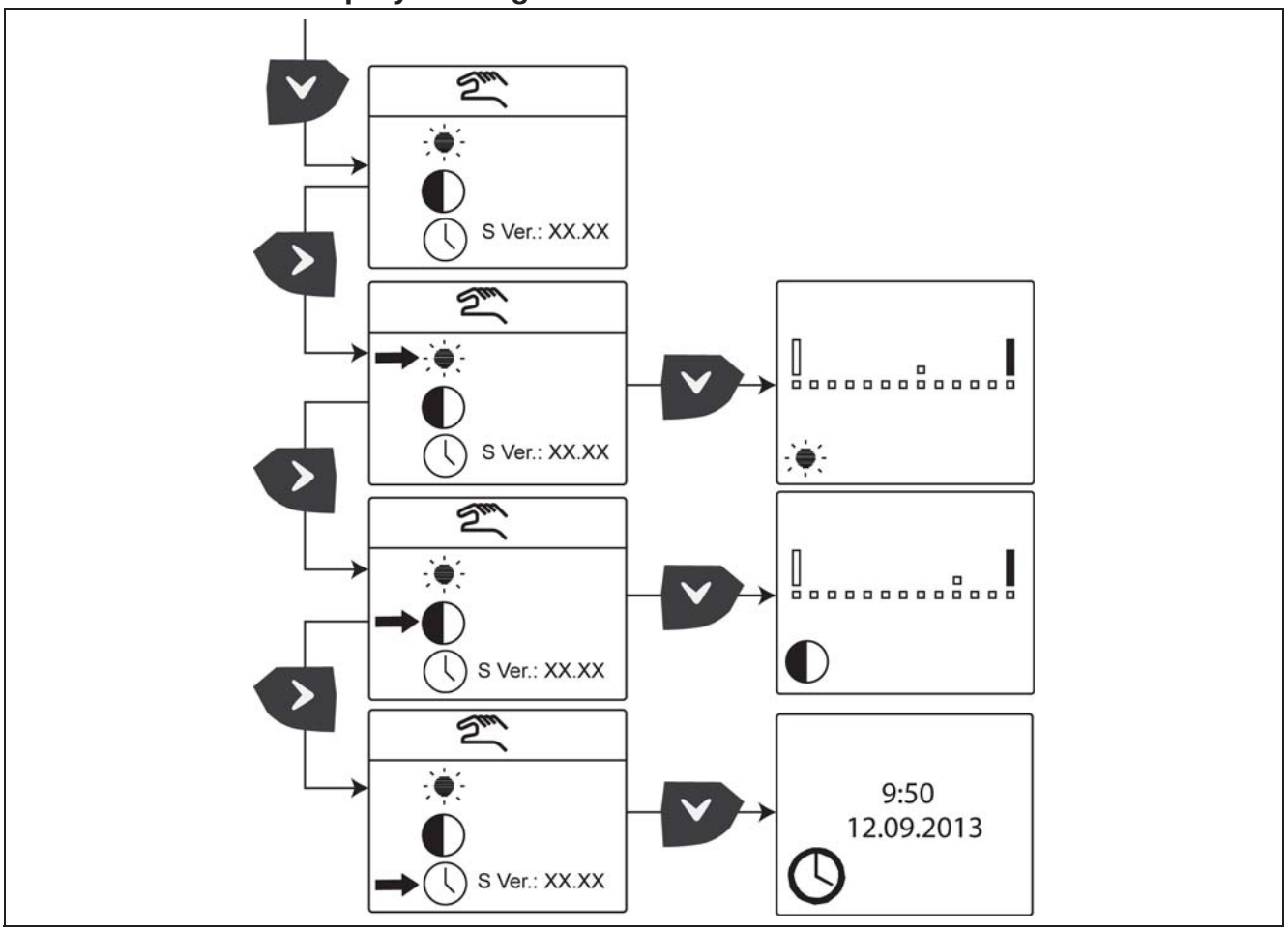
Menu structure of attachments/machine status (jog dial operation)



Menu structure of machine status (push button operation)



Menu structure of display setting



Information

Software version is shown from version 3.3

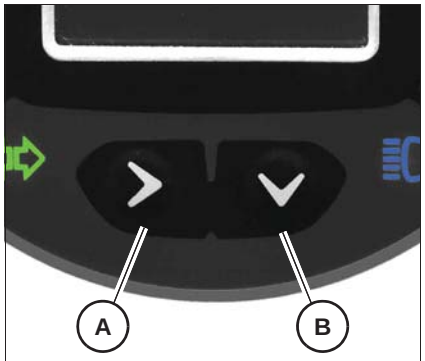


Fig. 130

Display element buttons

A: selection button

B: to next menu page/set

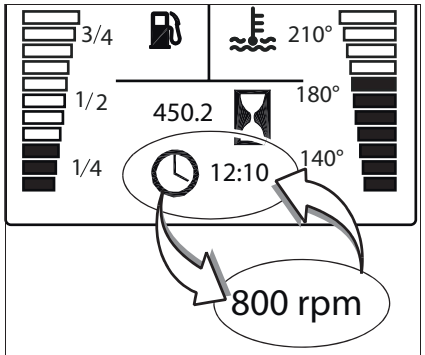


Fig. 131

Time/engine speed changeover (only for Tier IV)

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

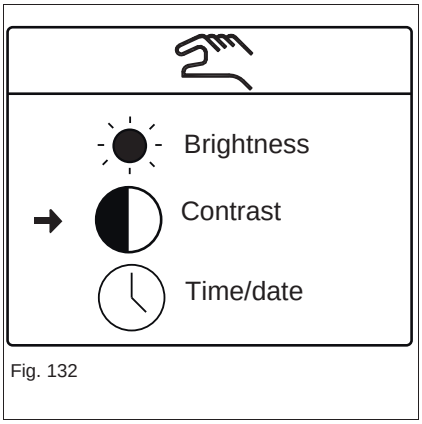


Fig. 132

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

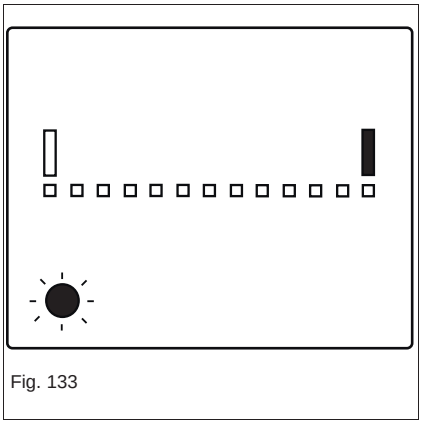


Fig. 133

Adjusting brightness

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

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

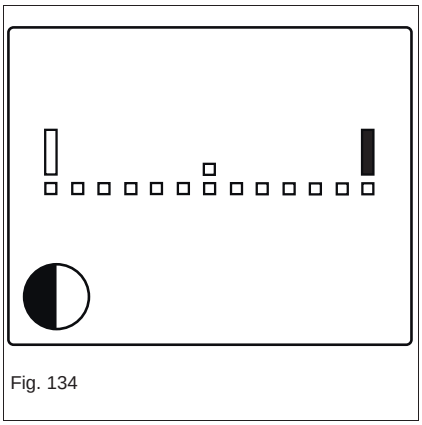


Fig. 134

Adjusting contrast

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

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

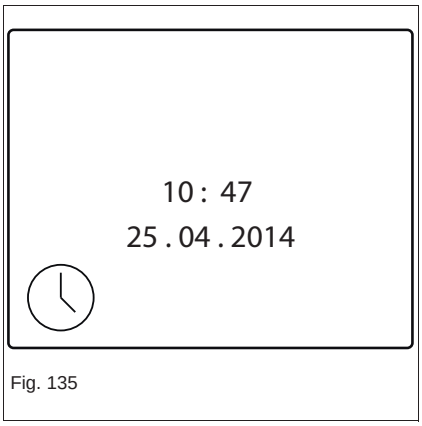


Fig. 135

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 adustment menu appears again. Otherwise the selected modifications are not saved.

5.4 Travel operation

Road-travel position

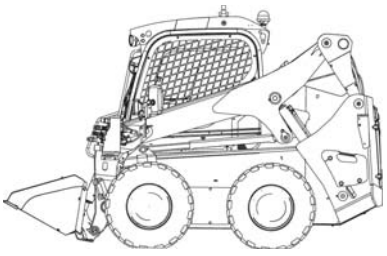


Fig. 136 (symbolic representation)

- Lower the loader unit completely and tilt in the bucket completely.

Starting machine travel and stopping

WARNING

Injury hazard! The machine stops abruptly if the seat bar is raised.

Raising the seat bar during machine travel can cause serious injury or death.

► Do not raise the seat bar during machine travel.

Starting machine travel

After starting the engine:

- Indicator lights **A** (charge indicator light) and **B** (engine oil pressure) go out.
- Actuate the control lever.
  ? Machine moves off.

Starting machine travel with ISO controls

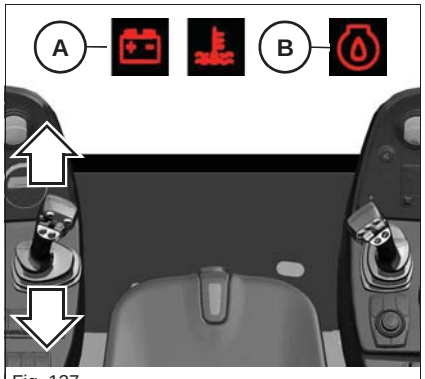


Fig. 137

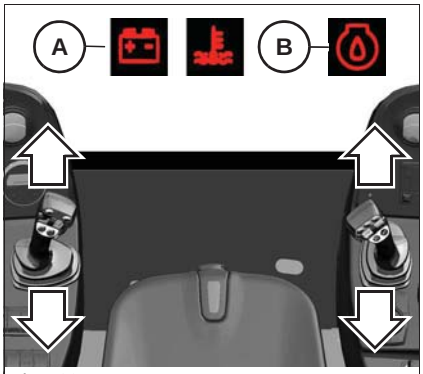


Fig. 138

Starting machine travel with H controls

Information

Machine travel is only possible with a lowered seat bar and a seated operator.

Stopping

The machine stops automatically if the control levers are moved to the middle position.

– see chapter " Hydraulic brake" on page 5-2

Operating temperature range

In order to ensure optimal output and a long service life of the machine, do not operate it at ambient temperatures below −26 °C (−15 °F) or above +45 °C (+113 °F).

Information

Wacker Neuson does not recommend to start a machine at ambient temperatures below -26 °C (-15 °F) without engine block heater being used.

Machine travel on slopes

WARNING

Crushing hazard due to tipping over of machine!

A tipping machine can cause serious injury or death.

- ► Keep the loader unit close to the ground.
- ► Travel on slopes only on firm and level ground.
- ► Adapt the travel speed to the prevailing conditions.
- ► Pay attention to persons and obstacles.
- ► Pay attention to the stability limits of the machine (maximum gradient angle 15°, maximum lateral angle of inclination 10°).
- ► Do not select speed range 2 during uphill or downhill machine travel.
- ► Do not travel downhill in reverse travel speed.
- ► Ensure that no parts of the body protrude outside the machine.
- ► Do not exceed the permissible payloads.
- ► Traveling 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 wheels or tracks can dig into the ground and increase the angle of the machine (maximum gradient angle and maximum lateral angle of inclination).

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

Observe under all circumstances during uphill or downhill travel:

- 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.

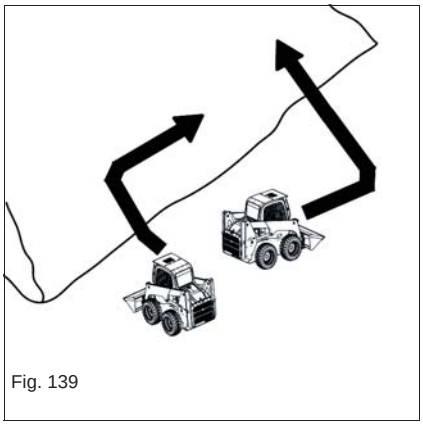


Fig. 139

Preparations for traveling on slopes

Always travel straight ahead on slopes.

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

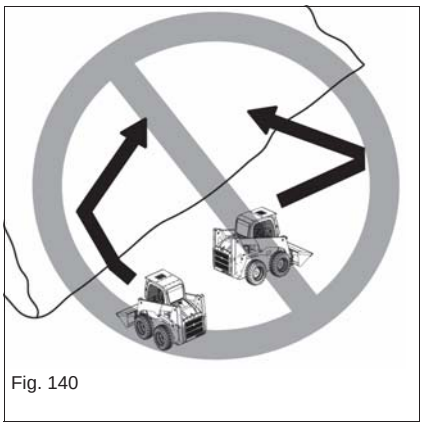


Fig. 140

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

Traveling diagonally is prohibited.

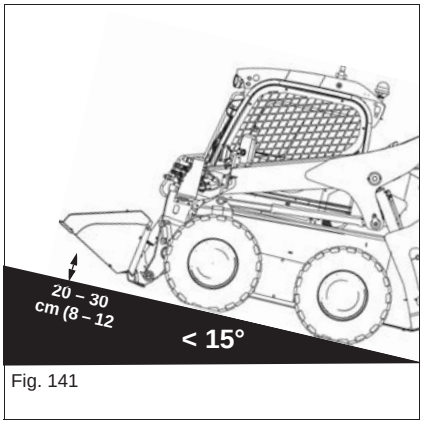


Fig. 141

Traveling uphill

When traveling uphill, the front side must face uphill.

Lower the loader unit.

Raise the bucket 20 – 30 cm (8 – 12 in) from the ground.

Do not exceed a maximum gradient angle of 15°.

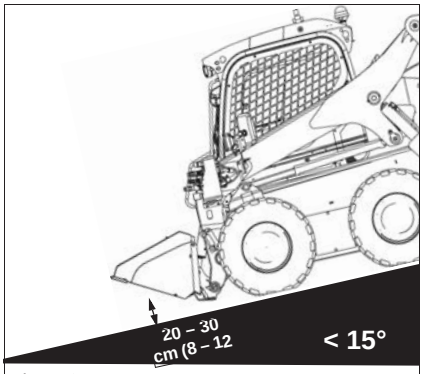


Fig. 142

Traveling downhill

When traveling downhill, the front side must face downhill.

Lower the loader unit.

Raise the bucket 20 – 30 cm (8 – 12 in) from the ground.

Do not exceed a maximum sloping angle of 15°.

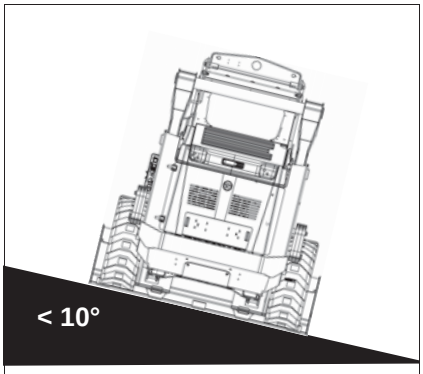


Fig. 143

Lateral angle of inclination

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

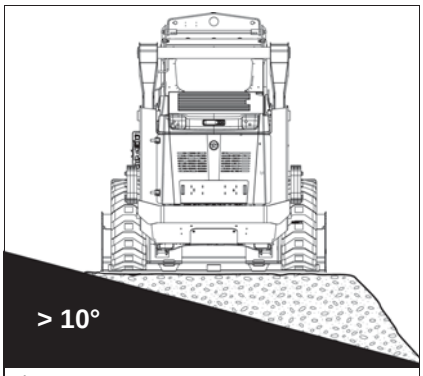


Fig. 144

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

Parking the machine

WARNING

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

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

► Lower the bucket to the ground.

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

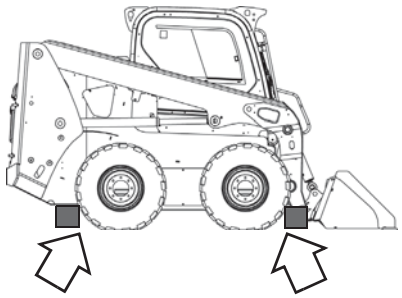


Fig. 145

1. Park the machine on firm, level, and horizontal ground.
2. Lower the bucket to the ground.
3. Stop the engine.
4. Apply the parking brake.
5. Release the pressure in the hydraulic system – *see chapter “ Releasing the pressure in the hydraulic system” on page 5-35*.
6. Remove the starting key and carry it with you.
7. Raise the seat bar.
8. Close and lock all covers and the door.
9. Secure the wheels or tracks accordingly (chocks, blocks, for example) as shown in the figures.

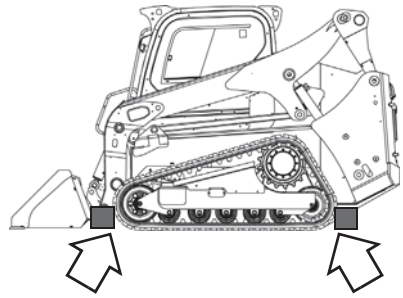


Fig. 146

Information

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

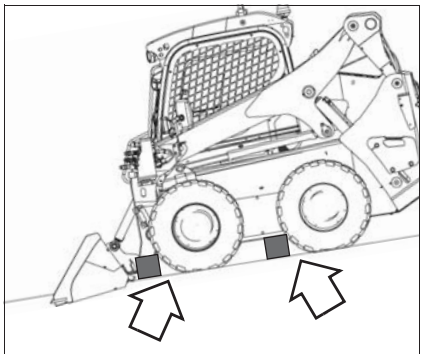


Fig. 147

Parking the machine on slopes

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

- Position the front side of the machine facing downhill and firmly press the bucket into the ground.
- Secure the wheels or tracks accordingly (chocks, blocks, for example).

5.5 Differential lock

Not available.

5.6 Lights/signaling system

Working lights

The switch is located on the front left switch panel.

WARNING

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

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

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

Fig. 148

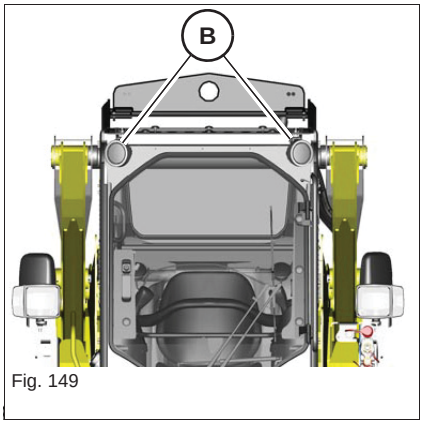


Fig. 149

Function	Position
Switch off the working lights.	Press switch **A** all the way up.
Switch on the front working lights (**B**).	Press switch **A** to the first position.
Switch on the front (**B**) and rear (**C**) working lights.	Press switch **A** to the second position.

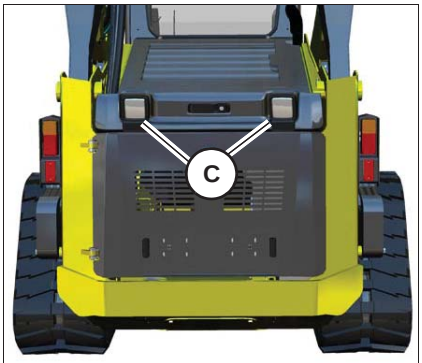


Fig. 150

Information

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

Road travel lights (option)

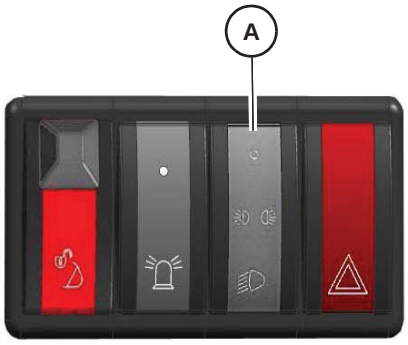


Fig. 151

The switch is located on the rear left switch panel.

Function	Position
Switches off the lights.	Press switch **A** all the way up.
Switches on clearance lights **(B)** and rear lights **(D)**.	Press switch **A** to the first position.
Switches on headlights **(C)**.	Press switch **A** to the second position.

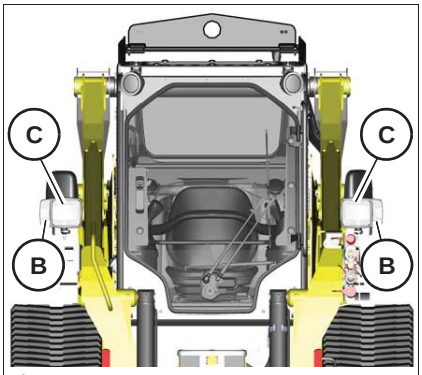


Fig. 152

Lights

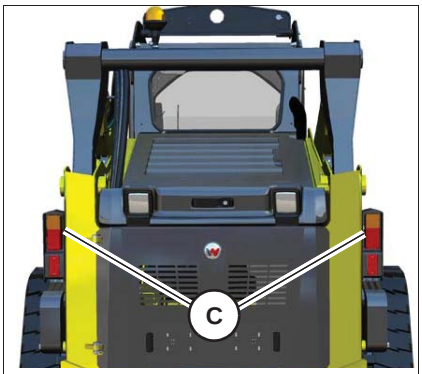


Fig. 153

Rear lights

Interior light

Fig. 154

Switched on:

Press the switch to the left.

Switched off:

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

Horn

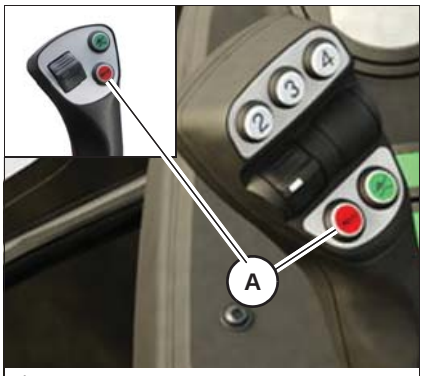


Fig. 155

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

Rotating beacon (option)

Fig. 156

The switch is located on the rear left switch panel.

Function	Position
Switch off the rotating beacon	Press switch **A** up.
Switch on the rotating beacon	Press switch **A** down.

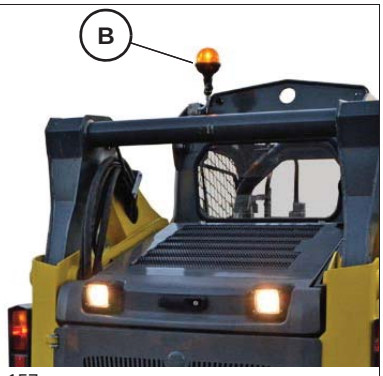


Fig. 157

Information

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

Turn indicators (option)

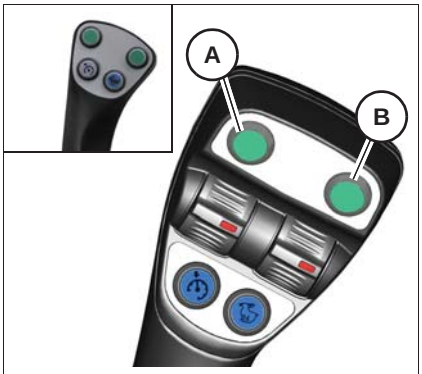


Fig. 158

The turn indicator switches are located on the control lever on the left.

Function	Position
Left-hand turn indicators flash.	Press push button **A**.
Right turn indicators flash.	Press push button **B**.

Information

The turn indicators flash several times if push buttons **A** or **B** are pressed once. Press and hold the corresponding push button for permanent flashing.

Hazard warning system (option)

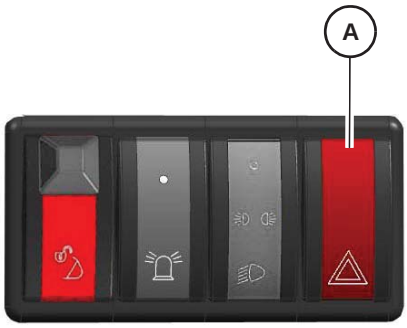


Fig. 159

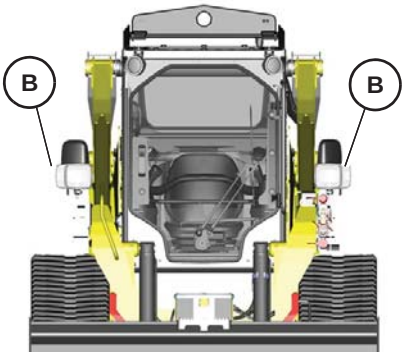


Fig. 160

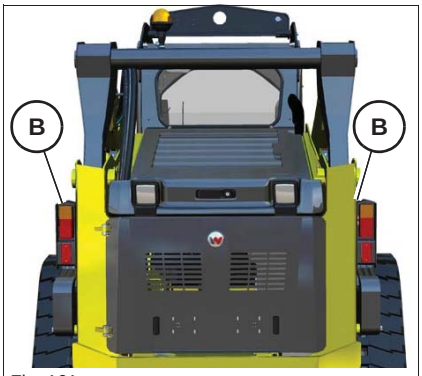


Fig. 161

The switch is located on the rear left switch panel.

Function	Position
Switch off the hazard warning system (**B**)	Press switch **A** up.
Switch on the hazard warning system (**B**)	Press switch **A** down.

Back up signal

The back up signal sounds during backward machine travel.

DANGER

Accident hazard when traveling forward/backward!

Serious crushing hazard causing death or serious injury.

- ► Do not allow anyone to stay in the danger zone.
- ► Do not rely on the back up signal under any circumstances.
- ► If the back up signal does not sound, stop machine operation immediately and get in touch with a Wacker Neuson service center. Follow the relevant national and regional regulations.

5.7 Wiper/wash system

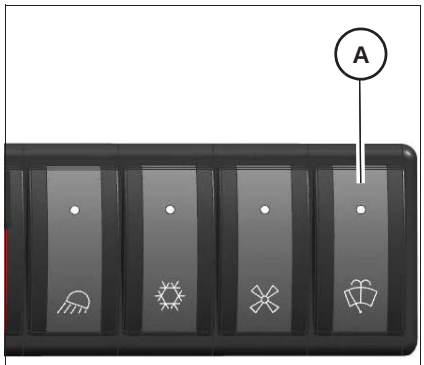


Fig. 162

The switch is located on the front left switch panel.

Function	Position
Switch off the wiper	Press switch **A** all the way up.
Wiper function	Press switch **A** to the first position.
Wiper and spraying function	Press and hold switch **A** in the second position.

NOTICE

Possible damage to the wiper if the door is open.

- ► Do not operate the wiper if the door is open.

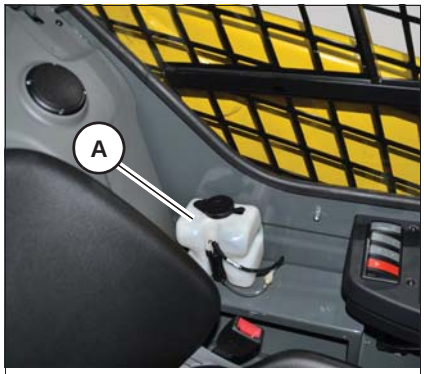


Fig. 163

The washer system reservoir is located on the left in the cabin.

NOTICE

Possible damage to the electric pump if the reservoir is empty.

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

5.8 Heating, ventilation and air conditioning system

Ventilation/heating (option)

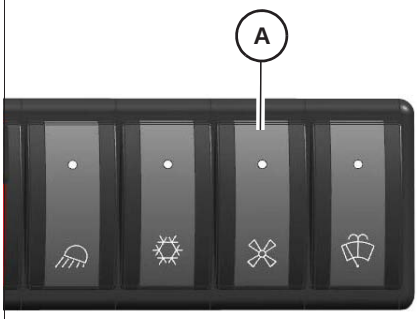


Fig. 164

The switch is located on the front left switch panel.

Function	Position
Switch off the fan	Press switch **A** all the way up.
Fan in 1st speed	Press switch **A** to the first position.
Fan in 2nd speed	Press switch **A** to the second position.

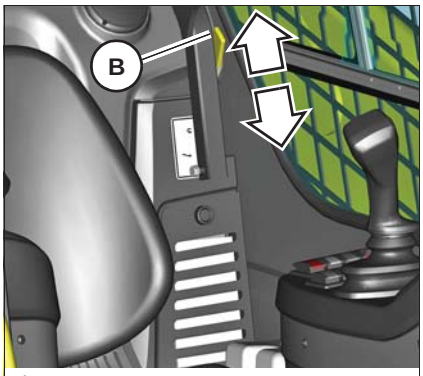


Fig. 165

Recirculated/fresh-air operation

The recirculated/fresh-air lever is located on the left beside the operator seat.

Function	Position
Recirculated air mode	Pull lever **B** upward.
Fresh-air mode	Press lever **B** downward.

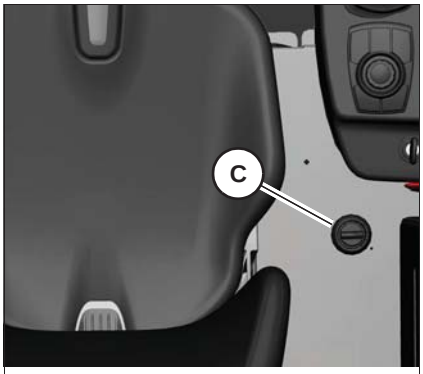


Fig. 166

Temperature setting

Temperature controller **C** is located to the right of the operator seat.

Ventilation

Turn temperature controller clockwise.

Heating

Turn temperature controller counterclockwise.

Air conditioning (option)

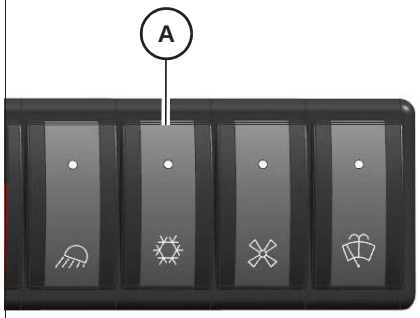


Fig. 167

Function	Position
Switch off the air conditioning	Press switch **A** up.
Switch on the air conditioning	Press switch **A** down.

Information

Let the air conditioning system run once a month for at least 10 – 15 minutes to ensure its full function and efficiency.

PMC (American tier IV only)

The machine is equipped with a particulate matter catalyst.

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

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

WARNING

Health hazard due to exhaust gases!

Can cause serious health hazards or death.

- ► Do not inhale exhaust gases.
- ► Only perform regeneration outdoors.
- ► If manual regeneration should be necessary in enclosed areas, use temperature-proof exhaust gas suction systems.
- ► Ensure sufficient ventilation during operation in enclosed areas.

WARNING

Burn hazard at the exhaust system!

During regeneration, the exhaust system can develop exhaust-gas temperatures of about 600 °C (1.112 °F), even if the engine is running at idling speed, which can cause serious burns or death.

- ► Keep a safe distance from the exhaust system.

WARNING

Fire hazard during regeneration!

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

- ► In surroundings with easily flammable material, disable the **automatic regeneration** mode.
- ► Do not perform manual regeneration in surroundings with easily flammable material.
- ► Use only exhaust gas suction systems that are suitable for the temperatures achieved during regeneration.

NOTICE

Possible irreparable damage to the PMC.

- ► Perform regeneration as soon as possible.
- ► Do not ignore the notification **highest soot level**.

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.

Information

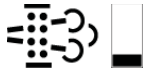
The soot load is the contamination level in the PMC. Among other things, this level depends on the load on the diesel engine:

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

Information

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

Soot load indication

Symbol[1]	Beschreibung	Auswirkung
	Low soot level	Full engine power Automatic regeneration
	Moderate soot level	Full engine power Automatic or manual regeneration
	Highest soot level	Limited engine power Manual regeneration only
	Flashing symbol: PMC regeneration needed	
	Glowing symbol: PMC regeneration	

1. The symbols are shown from software version 3.3. Previous software versions show SPN status notifications (SPN 3701-001/3701-010/3701-011 resp. 3700-010/SPN 3700-001) in the multifunctional display.

PMC 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 2 seconds.
Off	Off	Off	Off	Off	No malfunction.
Off	Off	Off	On	Off	Regeneration needed.
Off	Off	On	On	Off	Regeneration active. Increased exhaust-gas temperature.
Off	Off	On	Off	Off	Regeneration is completed. Increased exhaust-gas temperature. The system cools down.
Off	Off	Off	Off	On	Regeneration is disabled or interrupted.
Flashes	Off	Off	On	Off	The soot load has reached a specific value. The soot load reduces the engine output. Regeneration is required.
Flashes	On	Off	On	Off	The soot load has exceeded a specific value. The soot load reduces the engine output. Drive the machine out of the area with easily-flammable matter and stop the engine immediately. Contact a Wacker Neuson service center.

Regeneration push button

The push button is in the middle position and can be pressed in either direction, but does not lock into place.

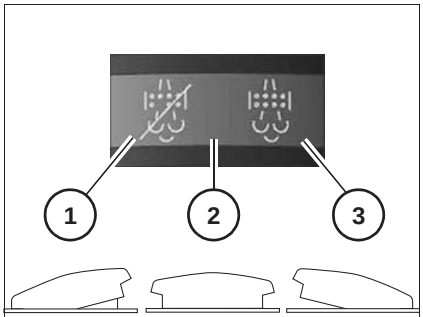


Fig. 168

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

Push button functions:

1: disable/interrupt/re-enable regeneration

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

3: start manual regeneration

Indicator lights

Three indicator lights indicate the regeneration status.

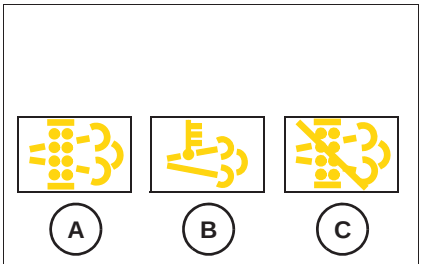


Fig. 169

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

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

C: Regeneration disabled**/**interrupted

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

Automatic regeneration mode

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

NOTICE

Fire hazard at the exhaust system.

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

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

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

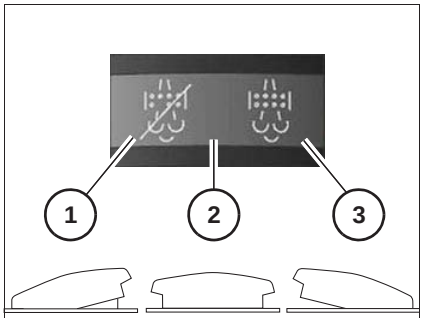


Fig. 170

Information

The machine can be operated as usual during regeneration.

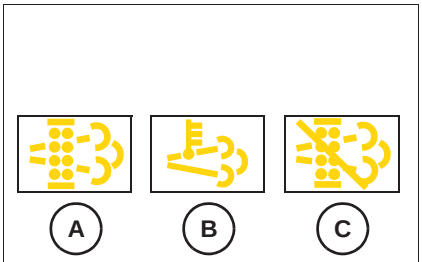


Fig. 171

To disable the **automatic regeneration** mode:

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

? Indicator light **C** illuminates.

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

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

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

To interrupt automatic regeneration:

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

? Indicator light **C** illuminates.

Information

Disabling regeneration increases the contamination level in the PMC.

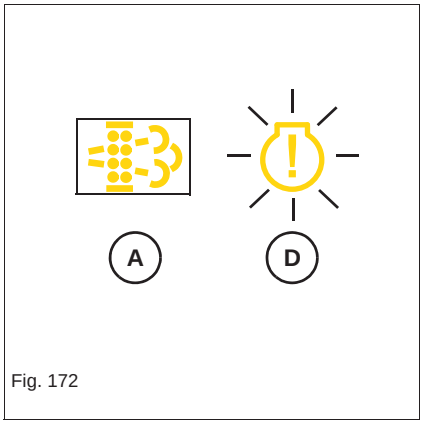


Fig. 172

Manual regeneration

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

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

NOTICE

Possible damage to the engine or the PMC.

NOTICE

Fire hazard at the exhaust system.

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

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

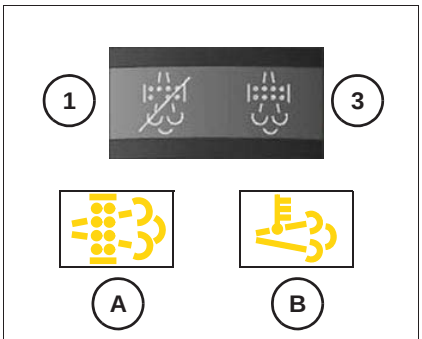


Fig. 173

Starting manual regeneration

1. Drive the machine out of the danger zone and into a safe area.
2. Apply the parking brake.
3. Press and hold the **Regeneration** push button at least 10 seconds in position **3**.

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

Interrupting manual regeneration

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

Information

Machine travel or operation is prohibited during manual regeneration.

► The operator may not leave the machine during regeneration.

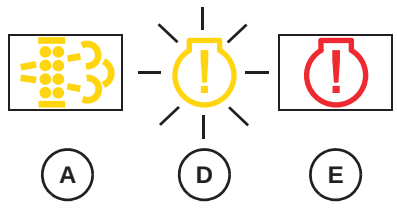


Fig. 174

Regeneration not performed – stopping the machine

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

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

NOTICE

Possible damage to the engine or the PMC.

5.9 Operating hydraulics

Basic control lever functions (ISO and H controls)

Control mode	ISO controls		H controls	
Required function	Control lever[1]		Control lever[1]	
	Left	Right	Left	Right
				
Travel forward		--		
Travel backward		--		
Front right turn		--		--
Front left turn		--	--	
Left turn		--		
Right turn		--		
Rear right turn		--		--
Rear left turn		--	--	
Raise loader unit	--			--
Lower loader unit	--			--
Tilt in the bucket	--		--	
Tilt out the bucket	--		--	
Float position	--			--

1. The control levers shown are symbolic representations.

Hydraulic connections

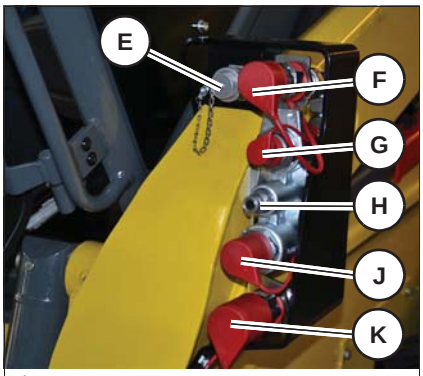


Fig. 175

Connection	Function
E	Electrical connections for attachment controls
F	High Flow (male)
G	Auxiliary hydraulics (male)
H	Leak oil line
J	Auxiliary hydraulics (female)
K	High Flow (female)

Releasing the pressure in the hydraulic system

WARNING

Injury hazard due to fluid escaping under pressure!

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

- ► Do not allow anyone to stay in the danger zone.
- ► Clean hydraulic couplings and sleeves before connecting them.
- ► Release the pressure before connecting or removing hydraulic attachments.
- ► Wear protective clothes.

Connecting and disconnecting hydraulic couplings

Preparations for releasing the pressure (auxiliary hydraulics):

1. Stop and park the machine.
2. Lower the loader unit completely.
3. Stop the engine.
4. Remove the starting key and carry it with you.

Releasing the pressure in the auxiliary hydraulics

Release the pressure in the auxiliary hydraulics before connecting or removing attachments.

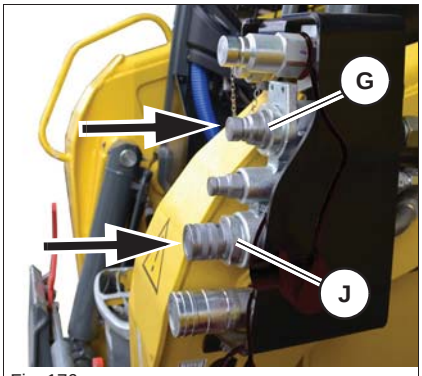


Fig. 176

Before connecting:

Press the auxiliary hydraulics connector **G**, and then the auxiliary hydraulics sleeve **J** in the direction of the arrow.

? This releases the pressure in the auxiliary hydraulics circuit.

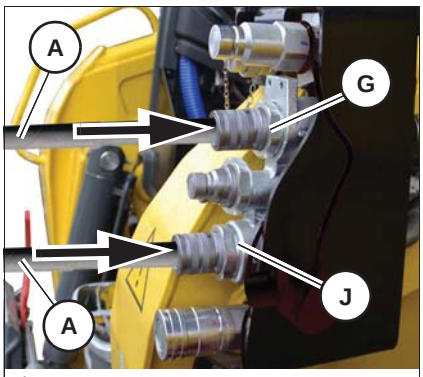


Fig. 177

Before removing:

Press the auxiliary hydraulics connector **G**, and then the auxiliary hydraulics sleeve **J** in the direction of the arrow with hoses **A** connected.

? This releases the pressure in the auxiliary hydraulics circuit.

Releasing the pressure (loader unit):

The pressure in the **loader unit** circuit has to be released after parking the machine.

1. Stop and park the machine.
2. Lower the loader unit completely.
3. Stop the engine.
4. Turn the starting key to position **1**.
5. Lower the seat bar and close the door (option).

Hydraulic hammer operation (option)

Important information regarding hammer operation

Hammer operation with a canopy-version machine is prohibited since the operator cannot be protected without a polycarbonate door.

WARNING

Danger of piercing/penetration by objects from the front!

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

- ► Do not perform hydraulic hammer operation without a polycarbonate door, which can be ordered from your Wacker Neuson dealer.
- ► 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.
- ► Only perform machine operation in the work area.

WARNING

Accident hazard due to tipping over of machine!

A tipping 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 suddenly raise or lower the loader unit.
- ► Do not use the impact force of the attachment to perform demolition work. Broken or falling pieces can cause serious injury.
- ► Machine travel is not allowed during hammer operation.

Working with a hydraulic hammer

NOTICE

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

- ► Observe the Operator's Manual of the hydraulic hammer.
- ► Do not hammer horizontally or upward.
- ► Do not use the hammer to raise loads.
- ► Do not hit the hammer against rocks, concrete, etc.
- ► Do not hammer in the same spot uninterruptedly for more than 15 seconds.
- ► Do not raise the machine with the loader unit.
- ► Working with the cylinders or the loader unit fully retracted or extended is not allowed.
- ► Stop machine operation immediately if a hydraulic hose moves back and forth in an unusual manner. 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.

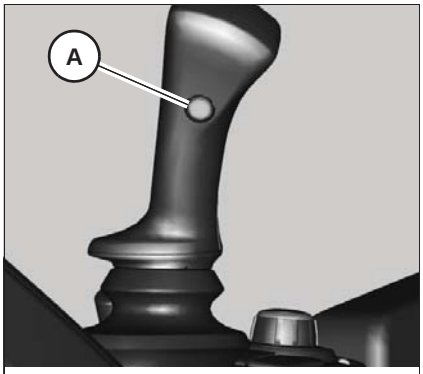


Fig. 178

Press switch **A** at the rear of the control lever on the right. The full flow rate is available.

Press the button again after 15 seconds at the latest to interrupt hammering. In order to avoid damage, wait a few seconds before hammering again.

Proportional controls

The proportional controls make it possible to directly transmit to the attachment the speed with which a slide switch is operated.

Applications:

- Auxiliary hydraulics
- Attachment controls

Auxiliary hydraulics (proportionally controlled)

The flow rate can be adjusted progressively.

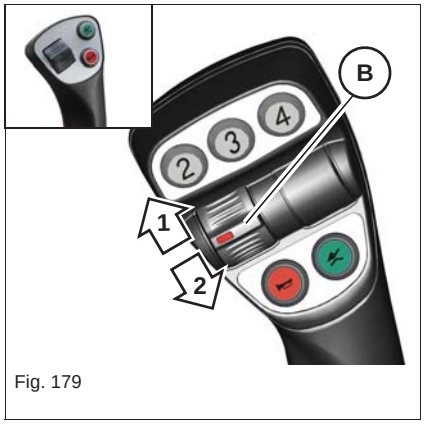


Fig. 179

Function	Operation
Oil-flow connector (**G**)	Move slide switch **B** upward (1)
Oil-flow sleeve (**J**)	Move slide switch **B** downward (2)

The full flow rate is automatically available if switch **A** at the rear of the control lever on the right is pressed during proportionally-controlled operation.

Proportionally-controlled operation is automatically enabled if slide switch **B** is moved during operation at full flow rate.

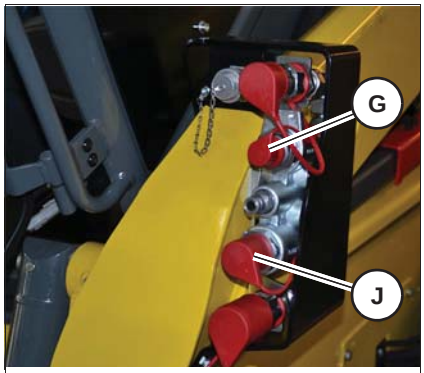


Fig. 180

For continuous reverse oil-flow move slide switch **B** downward (2) and at the same time press button **A**.

To stop, move slide switch **B** in any direction.

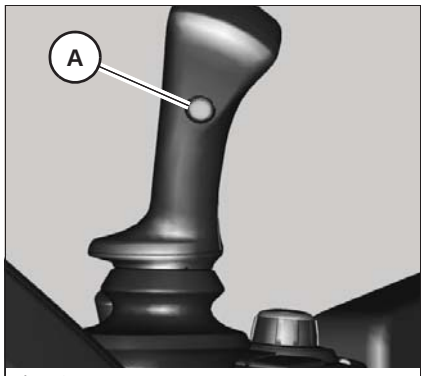


Fig. 181

The matching values are preset at the factory for each attachment. Should it be necessary to modify the presettings, the response range and flow rate can be adapted as required.

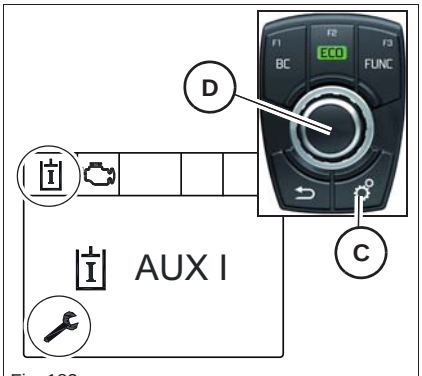


Fig. 182

Selecting an auxiliary hydraulics circuit (AUX I)

1. Press push button **C** 3 seconds.
   ? The menu page shown on the left appears.
2. Press control button **D** to confirm AUX I.

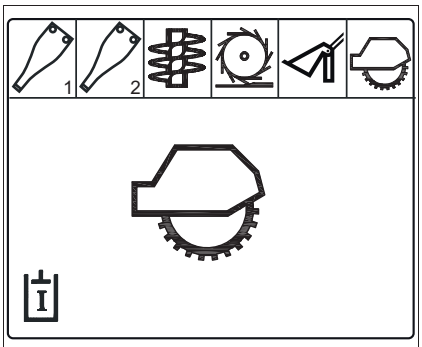


Fig. 183

3. Turn control button **D** to select the required attachment.

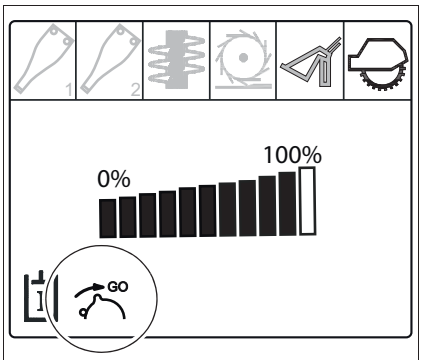


Fig. 184

4. Press control button **D**.
   ? The menu page for selecting the response range appears.

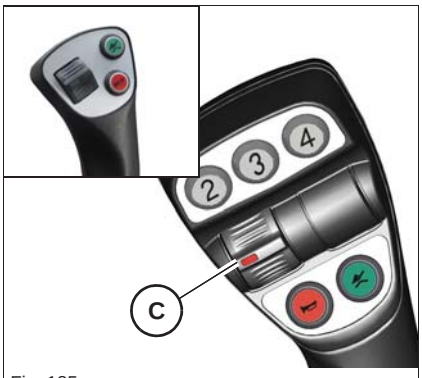


Fig. 185

Response range (starting point)

1. Move slide switch **C** on the control lever on the right up to the position from which the attachment is supposed to move.
2. Hold slide switch **C** and turn control button **D** at the same time until the attachment moves.
3. Press control button **D** to save the setting.

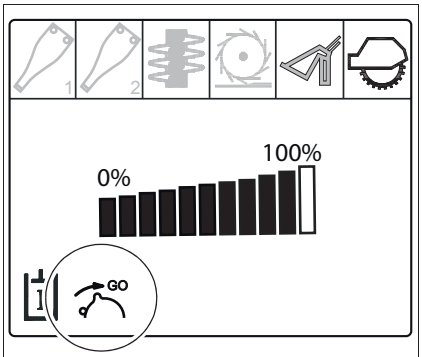


Fig. 186

Response range (end point)

4. Move slide switch **C** as far as it will go, hold it and turn control button **D** to the required maximum flow rate at the same time.
5. Press control button **D** to save the setting.

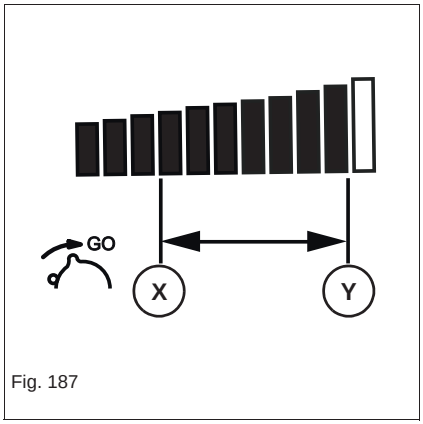


Fig. 187

Example for a selected response range:

X: starting point

Y: maximum defined flow rate

Attachment controls

A range of attachment functions can be controlled separately with slide switch **D** on the control lever on the left and the three number keys on the control lever (2/3/4) on the right.

Both basic functions can be controlled with slide switch **D**.

1. Operate the functions with slide switch **D** (control lever on the left).
2. Adjust the oil flow with slide switch **B** (control lever on the right).

Fig. 188

Up to six additional functions can be controlled with the three number keys.

1. Select the required function with one of the three number keys on the control lever on the right. The selected push button illuminates. The basic functions are preselected if none of the three push buttons on the right illuminates.
2. Operate the functions with slide switch **D** (control lever on the left).
3. Adjust the oil flow with slide switch **B** (control lever on the right).

Fig. 189

High Flow (option)

With high flow option the flow rate is increased to a maximum 135 l/min.

Press push button **M** on the jog dial control unit.

The marked symbol appears In the multifunctional display for a few seconds.

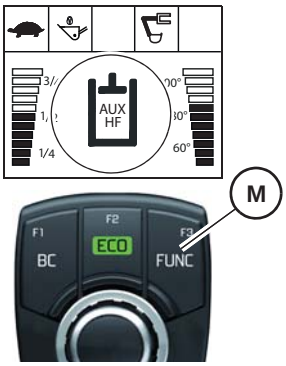


Fig. 190

The maximum oil flow is selected on the control lever on the right with slide switch **B**.

Fig. 191

Speed control (option)

The speed control option make it possible to set a constant and reduced machine speed. The operator can thereby fully concentrate on the actual work (asphalt milling, for example).

Operation is ensured with slide switch **C** on the control lever on the left.

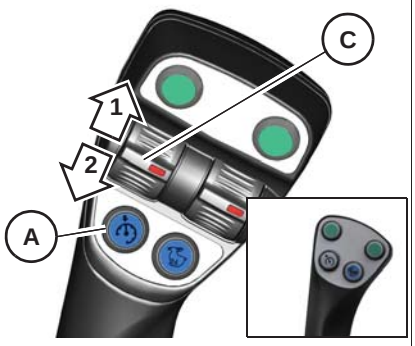


Fig. 192

Function	Operation
Enabling	Press push button **A** (push button illuminates)
Faster machine travel	Move slide switch **C** upward (1)
Slower machine travel	Move slide switch **C** downward (2)
Disabling	Press push button **A** (push button does not illuminate)

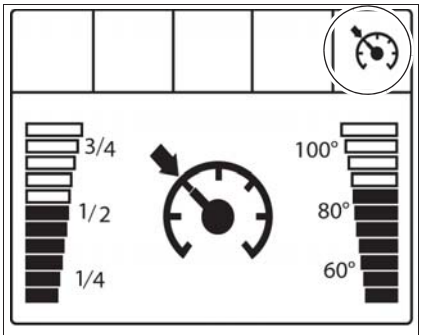


Fig. 193

If the Speed control function is enabled, the marked symbol appears at the top of the multifunctional display and in the middle of the display for a few seconds.

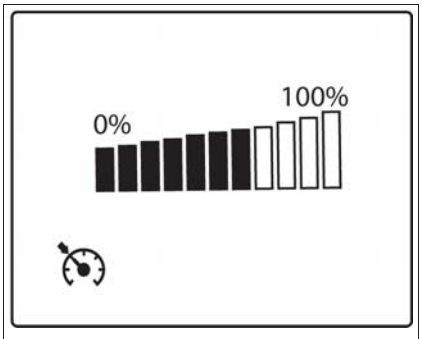


Fig. 194

If slide switch **C** on the control lever on the left is moved, the bars for modifying the speed appear in the multifunctional display.

Powerride load stabilizer (option)

Fig. 195

The load stabilizer can be enabled when traveling with a loaded bucket.

This causes the loader unit to make less pitching movements, and reduces the loss of material.

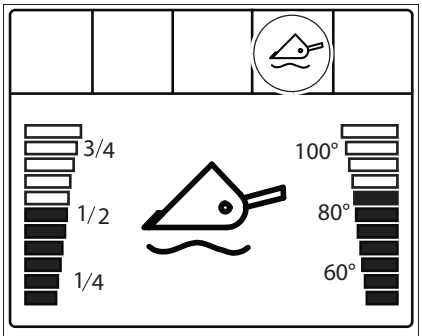


Fig. 196

The load stabilizer is switched on and off with push button **A** on the right control lever. If the load stabilizer is switched on, the marked symbol appears at the top of the multifunctional display and in the middle of the display for a few seconds.

Parallel bucket lift (option)

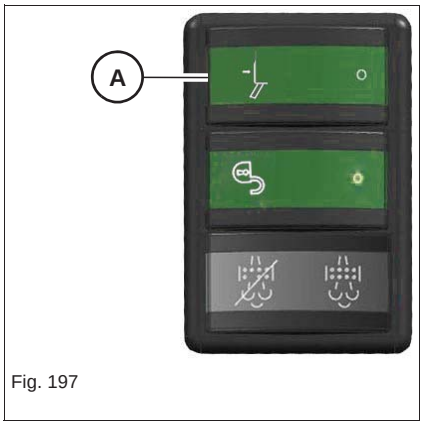


Fig. 197

With parallel bucket lift enabled, the attachment (for example a bucket or pallet forks) always remain horizontal as the loader unit is raised.

Function	Position
Enable parallel lift	Press switch **B** to the left.
Disable parallel lift	Press switch **B** to the right.

Information

Parallel bucket lift can only be used when the loader unit is raised. The setting must be performed manually during lowering.

5.10 Attachments

WARNING

Injury hazard when picking up or setting down attachments!

Incorrect handling of attachments can cause serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► Use only undamaged and clean attachments.
- ► Lower the loader unit.
- ► Release the pressure before picking up or setting down hydraulic attachments
  – see chapter “ Releasing the pressure in the hydraulic system” on page 5-35.
- ► Reload pressure after setting down an attachment.
- ► The attachment must be in a stable position on firm and horizontal ground before it is picked up or after it is set down.
- ► After picking up the attachment or before starting work, ensure that the attachment is correctly connected with the mount.
- ► After picking up the attachment, ensure that it is locked correctly with a short and rapid succession of attachment movements just above the ground.

Picking up an attachment

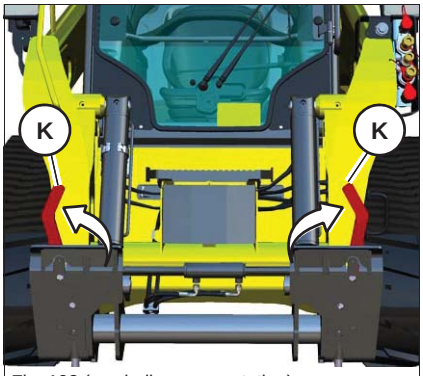


Fig. 198 (symbolic representation)

1. Lower the loader unit completely.
2. Stop the engine, remove the starting key and carry it with you.
3. Get off the machine.
4. Open lock levers **K** if they are in the closed position.

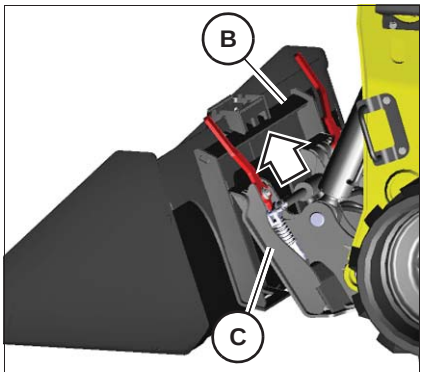


Fig. 199 (symbolic representation)

5. The attachment must be in a stable position on level and horizontal ground or on a pallet, for example.
6. Enter the cab and start the engine.
7. Position quickhitch guide **C** under the attachment mount **B**.

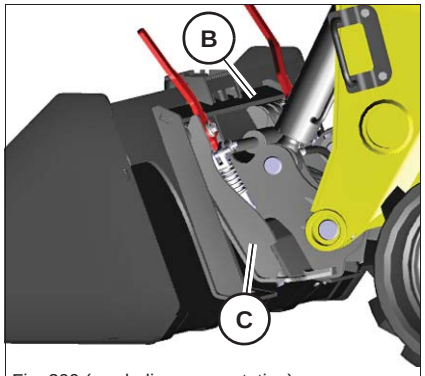


Fig. 200 (symbolic representation)

8. Hitch quickhitch guides **C** under attachment mount **B** and slightly raise the attachment.

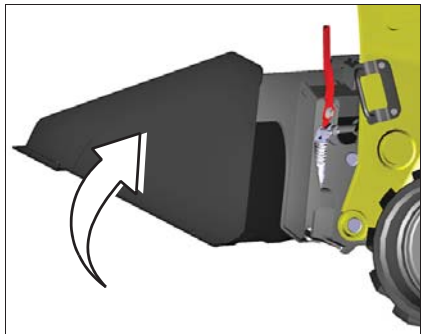
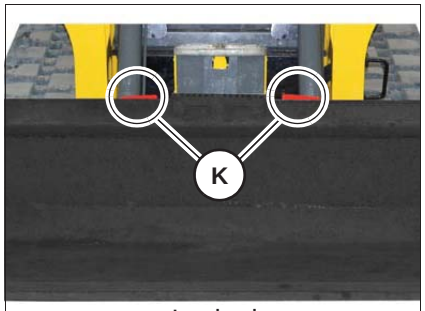


Fig. 201 (symbolic representation)

9. Turn the attachment inward.
10. Stop the engine, remove the starting key and carry it with you.
11. Get off the machine.



Locked

Fig. 202 (symbolic representation)

12. Close lock levers **K**
    ? Lock levers **K** must be in the horizontal position.

Setting down an attachment

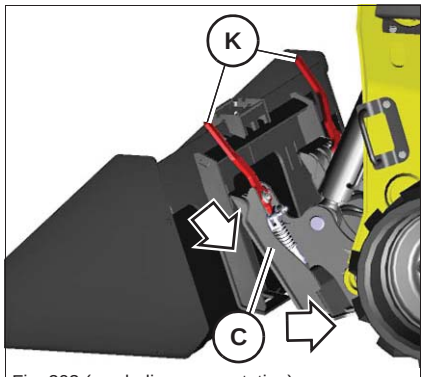


Fig. 203 (symbolic representation)

1. Lower the attachment to level and firm ground ensuring stability.
2. Stop the engine, remove the starting key and carry it with you.
3. Get off the machine.
4. Open lock levers **K**
   ? Lock levers **K** must be in the vertical position.
5. Enter the cab and start the engine.
6. Turn out quickhitch guide **C** and move the machine backward.

Hydraulic quickhitch (option)

The hydraulic quickhitch is used for picking up and setting down attachments. It is operated from the cabin.

The operator must receive special training by an authorized technician before using the hydraulic quickhitch. The operator must understand the instructions given during training before he may use the hydraulic quickhitch.

Picking up an attachment with the hydraulic quickhitch

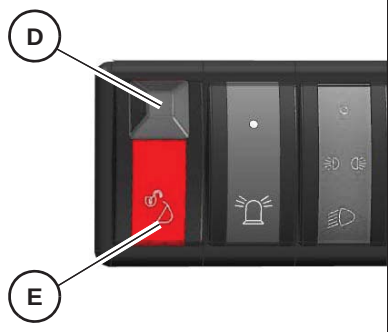


Fig. 204 (symbolic representation)

1. Open lock **D**.
2. Press and hold push button **E**.
   ? A signal sounds.

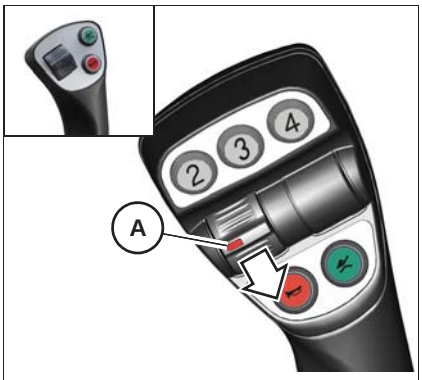
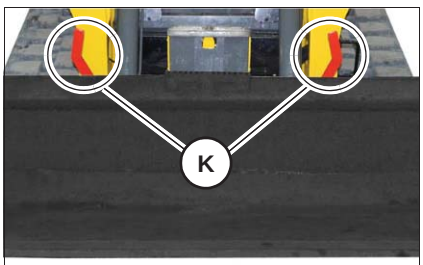


Fig. 205

1. Slightly move slide switch **A** downward on the control lever on the right or activate any loader function to the end of its control stroke to open lock levers **K**.

? Lock levers **K** must be in the vertical position.



Not locked

Fig. 206 (symbolic representation)

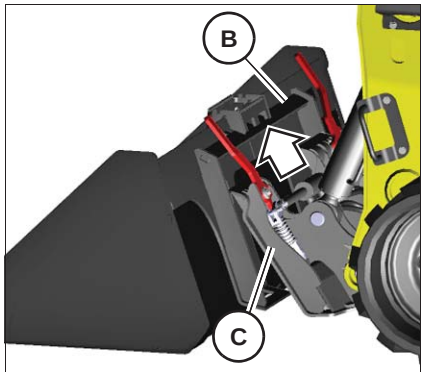


Fig. 207 (symbolic representation)

2. Release push button **E**.
3. The attachment must be in a stable position on level and horizontal ground.
4. Position quickhitch guides **C** under the attachment mount **B**.

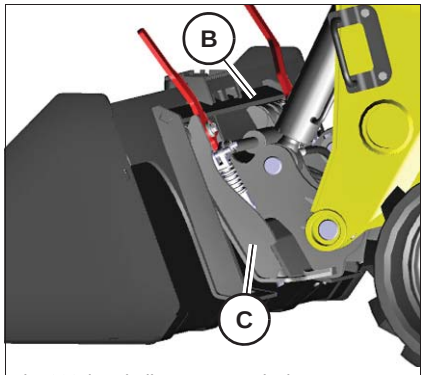


Fig. 208 (symbolic representation)

5. Hitch quickhitch guide **C** under attachment mount **B** and slightly raise the attachment.

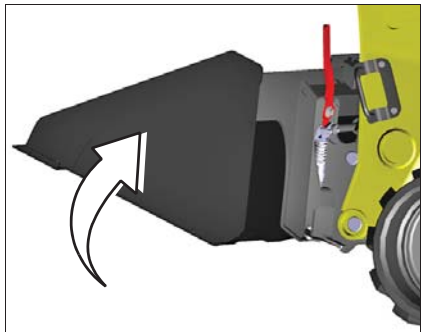
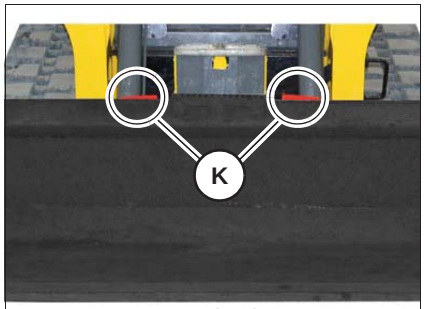


Fig. 209 (symbolic representation)

6. Turn the attachment inward.



Locked

Fig. 210 (symbolic representation)

7. Slightly move slide switch **A** downward on the control lever on the right.
   ? Lock levers **K** are locked and must be in the horizontal position.

Information

Repeat this procedure if lock levers **K** are not in the horizontal position.

Setting down an attachment with the hydraulic quickhitch

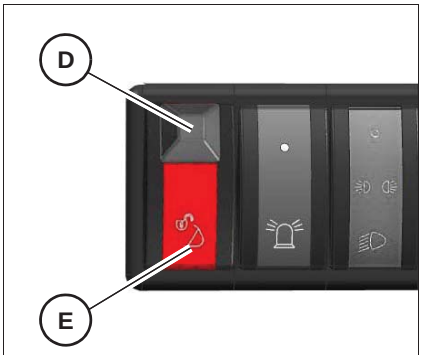


Fig. 211 (symbolic representation)

1. Lower the attachment to level and firm ground ensuring stability.
2. Open lock **D**.
3. Press and hold push button **E**.
   ? A signal sounds.
4. Move slide switch **A** downward on the control lever or activate any loader function to the end of its control stroke on the right.
   ? Lock levers **K** are opened and must be in the vertical position.

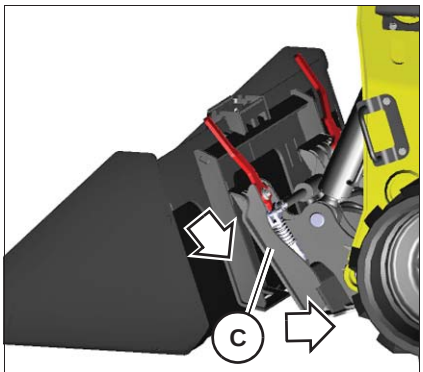


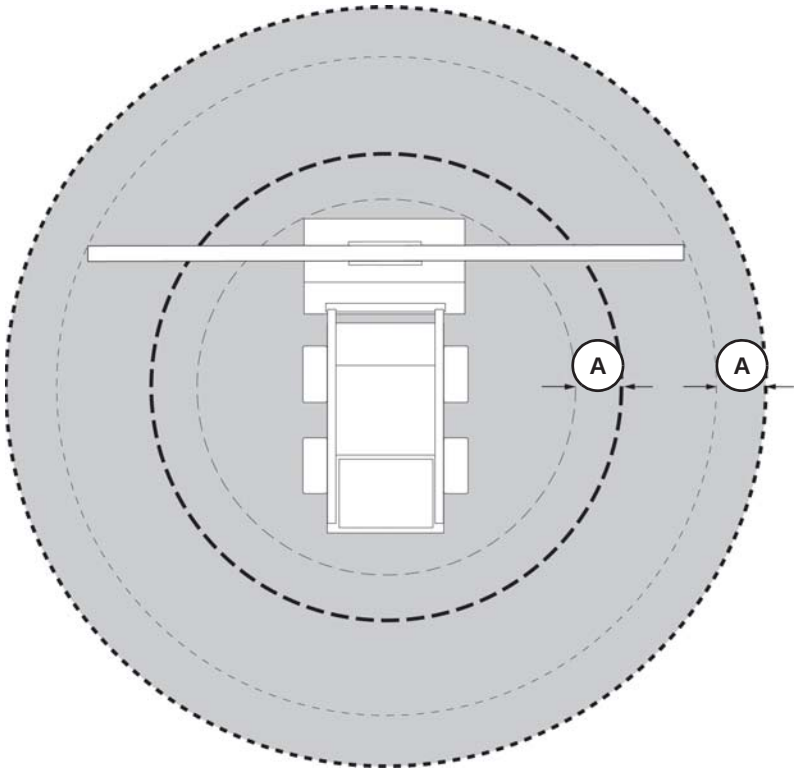
Fig. 212 (symbolic representation)

5. Turn out quickhitch guide **C** and move the machine backward.

5.11 Work operation

Danger zone

- The danger zone is the area in which persons are in danger due to the movements of the machine, attachment or load.
- The danger zone also includes the area that can be affected by falling material, equipment or by parts that are thrown out.
- The danger zone on a slope is different from the one on a level surface (secure the load). Stop machine operation immediately as soon as someone enters the danger zone *– see chapter " Machine travel on slopes" on page 5-14*.
- Seal off the danger zone should it not be possible to keep a sufficient safety distance.
- Extend the danger zone sufficiently in the immediate vicinity of buildings, scaffolds or other elements of construction.



Danger zone with a bucket

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

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

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

Safety distance of 1.5 m (59 in)

A

Fig. 213 (symbolic representation)

Do not drive up to the edge of an unsecured pit – danger of cave-in.

Do not undermine the foundations of walls – danger of collapse.

Do not load under projecting earth. Stones or the projecting earth can fall onto the machine.

Do not excavate deeply under the front side of the machine. The earth underneath the machine could collapse – danger of tipping over.

Do not perform demolition work underneath the machine – danger of tipping over.

- When working on roofs or similar structures, check the resistance and the structure itself before starting work. The building can collapse, causing serious injury and damage.
- Do not place the machine directly under the workplace during demolition. Parts can fall onto the machine or the building can collapse, causing serious injury or damage.
- Do not use the impact force of the attachment to perform demolition work. This can cause serious injury or damage.

- The machine can lose its balance and tip over if heavy attachments (demolition hammers, for example) are used. Proceed as follows when performing such work:
  - Never lower, turn or set down the attachment abruptly.
  - Do not extend or retract the bucket cylinder abruptly, otherwise the machine can tip over.
- Do not raise the loader unit and the attachment over the heads of other workers or over the seats of trucks or of other means of transport. The material can tip over, or the attachment can knock against the truck and cause serious injury or damage.
- Unauthorized persons are not allowed to operate the machine.
- Look out for high-voltage lines, underground cables, gas and water pipes, etc., during excavation work.
- The hydraulic system of the machine is still pressurized even when the engine is not running.
  Before starting setup or repair work (for example installing/removing a hydraulic attachment), release the pressure in the sections of the system and pressure lines that are to be opened *– see chapter “ Releasing the pressure in the hydraulic system” on page 5-35*.

Transporting with a full bucket

WARNING

Accident hazard when transporting with a full bucket!

Can cause serious injury or death.

► Before traveling with a full bucket, set the loader unit to transport position and tilt in the bucket completely.

► Observe the national and regional regulations when transporting with a full bucket.

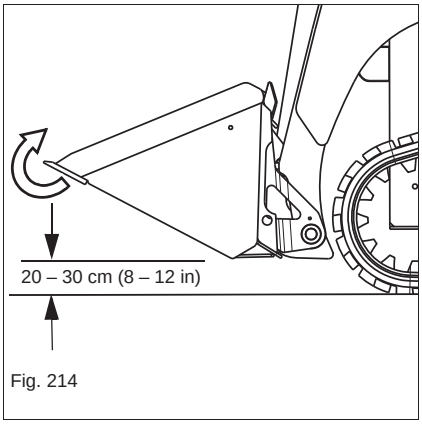


Fig. 214

Transport position

Lower the loader unit and tilt in the bucket completely.

There must be a distance of 20 – 30 cm (8 – 12 in) between the bucket and ground.

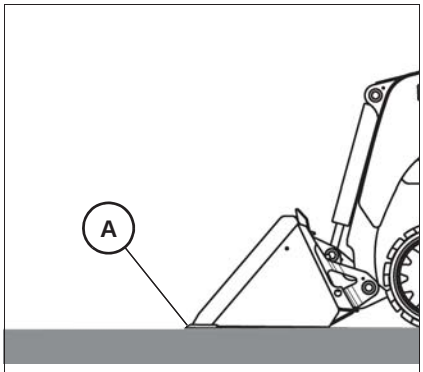


Fig. 215

Loading material

1. Align blade **A** parallel with the ground.
2. Lower the bucket to the ground.

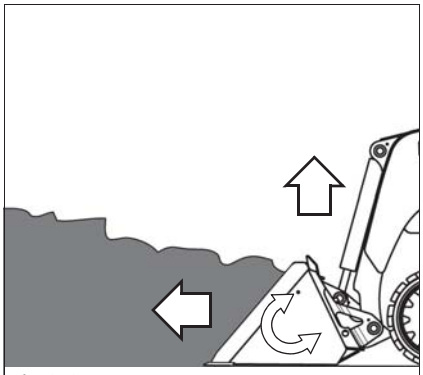


Fig. 216

3. Travel forward into the material.
4. If the resistance is too high, raise the loader unit a little and slightly tilt the bucket in and out if necessary.

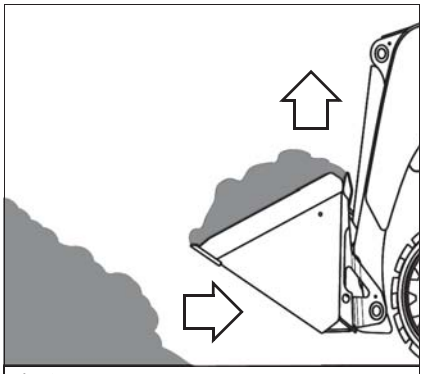


Fig. 217

5. Tilt in the bucket completely.
6. Reverse out of the material.
7. Raise the loader unit to transport position (see *Fig. 214*).

Removing material

WARNING

Injury hazard when removing material!

Can cause serious injury or death.

► Do not undermine foundations or walls.

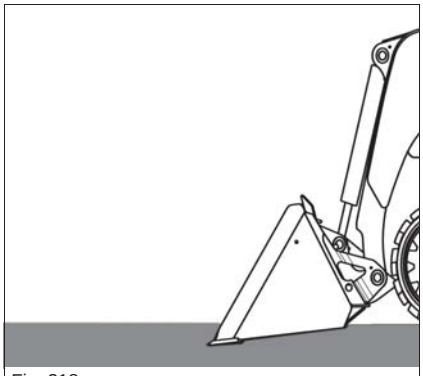


Fig. 218

1. Position the bucket as shown.
2. Travel forward.
3. Remove a layer as evenly as possible.

If the wheels or tracks spin, set a flatter digging angle, travel backward if necessary and repeat the procedure.

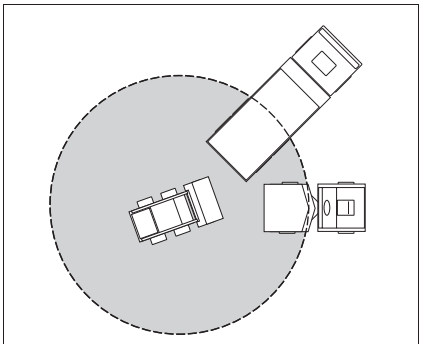


Fig. 219

Loading transport vehicles (trucks, dumpers, for example)

- The cabins and operator compartments of the transport vehicles must be outside the danger zone (gray marking).
- Raise the full bucket to the tilt-out height only shortly before reaching the transport vehicle.
- If possible dump with the wind behind you to keep any dust away from your eyes, air filters and fans.

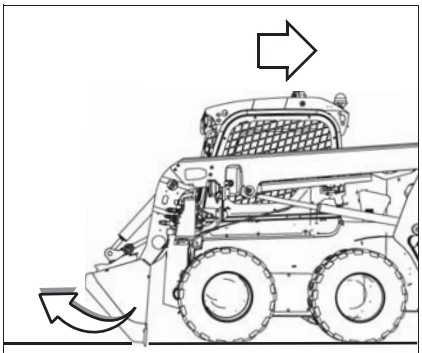


Fig. 220 (symbolic representation)

Freeing the machine

1. Tilt out the bucket until the blade is vertical above the ground.
2. Lower the loader unit.
3. Tilt in the bucket slowly
   ? The machine is pushed backward.
4. Reverse slowly.
5. Repeat this procedure until the wheels or tracks reach firm ground.
6. Reverse the machine away.

General information regarding work operation

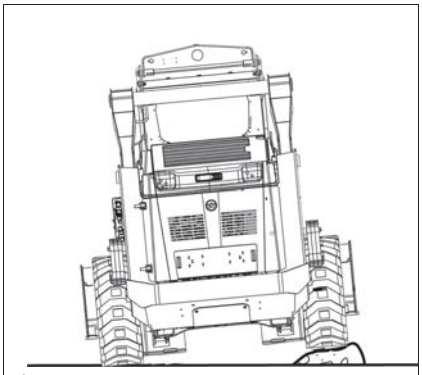


Fig. 221

Travel operation

Traveling over obstacles (rocks, tree stumps, etc.) can put a heavy load on the chassis, and cause damage. Avoid traveling over obstacles if possible.

If it cannot be avoided, lower the loader unit to ground level and travel over the obstacle at low speed.

Travel operation in second speed range

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

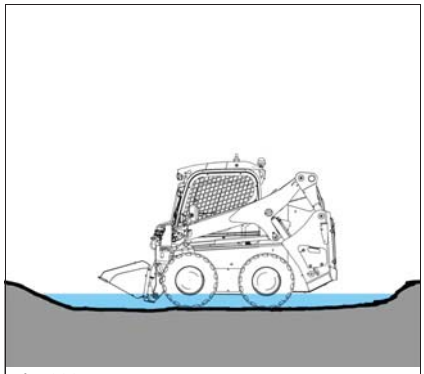


Fig. 222

Operation in water

Machine travel in water is possible up to a maximum depth of 20 cm (8 in).

Do not immerse the rear end of the machine in water. Bear this in mind in particular when leaving water, in order not to damage the machine. The maximum departure angle for crossing water is 25°.

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

Information

Operation in salt water is not allowed.

5.12 Emergency lowering

DANGER

Danger of crushing when lowering the loader unit!

Causes serious crushing or injury resulting in death.

- ► Do not allow anyone to stay in the danger zone.
- ► Stop all work movements immediately if someone enters the danger zone.

Lower the loader unit in case of an engine or hydraulics malfunction.

1. Lower the seat bar and close the door (option).
2. Pull and hold button **A** until the loader unit is completely lowered.

Fig. 223

5.13 Options

Perform a functional check of the seat bar and seat switch.

– see chapter " Functional check of seat bar/seat switch (canopy and cabin)" on page 4-11

Drive interlock (option)

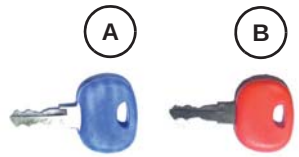


Fig. 224

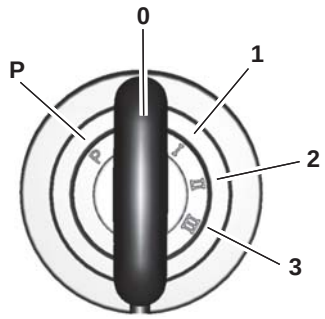


Fig. 225

A = starting key (blue)

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

B = master key (red)

Information

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

A new drive interlock must be installed if the master key is lost.

The machine can be started without performing any further settings.

Coding a new key

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

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

Deleting coded keys

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

The master key code is not deleted during deletion.

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

Winter package (option)

We recommend preheating the diesel engine to ensure full performance when taking up work at low ambient temperatures.

Recommended preheating time					
Temperature °C	−20	−10	−5	0	+10
Temperature °F	−4	14	23	32	50
Hours	3	2	1.5	1	1

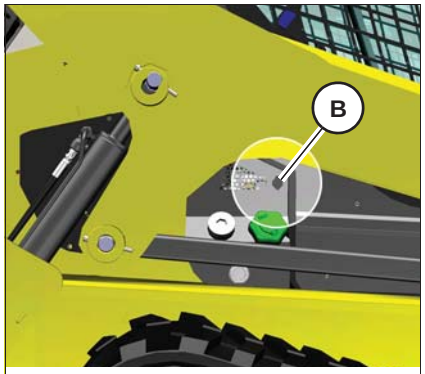


Fig. 226

1. Ensure that the starting key is removed and safely stored, and that no one has access to the machine during the preheating phase.
2. Connect connector **A** to socket **B**.
3. Connect connector **C** to an external power source.
4. Remove connectors **A** and **C** and store them safely.

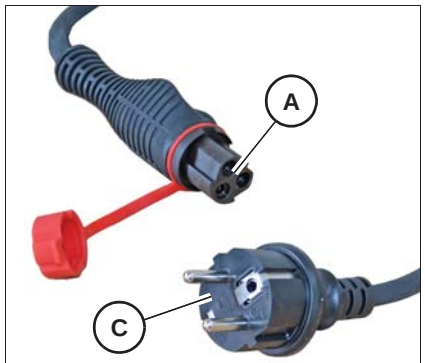


Fig. 227 (Symbolic representation)

Information

In order to avoid damage to the machine, do not exceed the recommended preheating times.

Trailer operation

The machine is not certified for trailer operation.

5.14 Putting out of operation/back into operation

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

Putting out of operation temporarily

Store the machine indoors if possible.

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

1. Park the machine – *see “Parking the machine” on page 5-17*.
2. Clean the engine with a high-pressure cleaner in a suitable place – *see chapter “7.5 Cleaning and maintenance” on page 7-24*.
3. Check the machine for leaks and loose nuts, screws and connections.
4. Carefully clean and dry the entire machine.
5. Spray an anticorrosion agent onto bare metal parts of the machine (piston rods of hydraulic cylinders, for example).
6. Apply grease to all lubrication points.
7. Fill the fuel tank completely.
8. Check the hydraulic oil and coolant levels, and add hydraulic oil and coolant if necessary.
9. Change engine oil.
10. Remove the battery and store it in a safe place.
11. Close the air-intake openings of the air filter system and exhaust pipe.

Putting back into operation

Information

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

1. Remove anticorrosion agents from bare metal parts.
2. Have a Wacker Neuson service center check the charge condition of the battery.
3. Open the air-intake openings of the air filter system and exhaust pipe.
4. Check the condition of the air filter and have it replaced by a Wacker Neuson service center if necessary.
5. Check the dust valve.
6. Bleed the fuel system *– see chapter “ Bleeding the fuel system” on page 7-29*.
7. Check the machine for leaks.
8. Lubricate the machine according to the lubrication plan.
9. Check all engine/machine fluids in the units or reservoirs, and add fluids if necessary.
10. If the machine was out of service for over 6 months, change the oil in the gearbox, engine, hydraulic oil reservoir and other units.
11. Have the hydraulic oil filters (return and breather filters) replaced by a Wacker Neuson service center if the machine was out of service for over 6 months.
12. Start the engine.
13. Let the engine run at idling speed at least 15 minutes without load.
14. Stop the engine.
15. Check the oil levels in all units and add oil if necessary.
16. Check the machine for leaks.
17. Start the machine and ensure that all functions and warning systems work correctly.

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

5.15 Permanently putting out of operation

Disposal

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

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

Environment

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

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

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

Notes:

6 Transportation

6.1 Towing the machine

Do not tow a Skid Steer Loader, except out of an immediate danger zone. Do not tow another machine with a Skid Steer Loader.

Information on towing

WARNING

Accident hazard due to wheels or tracks blocked by malfunctioning traveling drive!

Blocking wheels or tracks can cause accidents and serious injury or death.

- ► The machine may only be towed in an emergency (for example if it breaks down or gets stuck on a railroad crossing), and only out of the immediate danger zone.
- ► There must be no one between the vehicles or near the towing gear.
- ► Only use the tie-down points **A** for towing and not the cabin lifting eyes.
- ► The traveling drive is hot during and after towing.
- ► Wear protective clothing if possible.

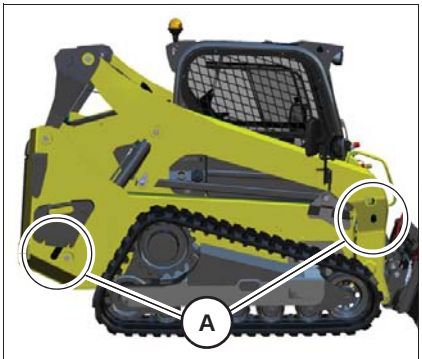


Fig. 228

NOTICE

Possible damage to the machine or drive during towing.

- ► The hydrostatic traveling drive can be damaged when towing the machine.
- ► The machine may only be towed out of the immediate danger zone. Then load it on a means of transportation.
- ► Do not tow the machine if it is stuck or on a slope. It must then be loaded or repaired at the job site.

Information

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

Towing the machine

Do not tow other vehicles with the compact loader, nor must the compact loader be towed with another vehicle.

6.2 Loading the machine

WARNING

Accident hazard due to incorrect loading!

Incorrect loading can cause accidents and serious injury or death.

- ► Do not allow anyone to stay in the danger zone.
- ► Read the transport weight off the type label. Add the weight of subsequently installed equipment to the weight of the machine.
- ► Drive the machine off the transport vehicle only with the help of a guide.

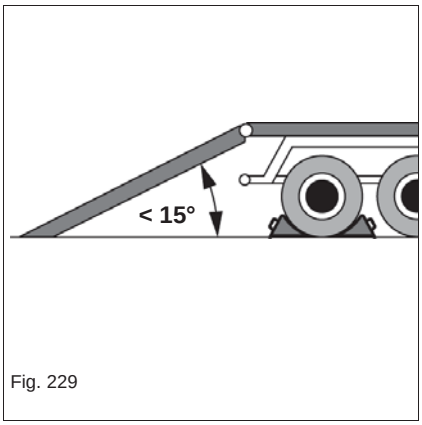


Fig. 229

Preparations

1. *– see chapter “ Transportation” on page 2-13*
2. Secure the transport vehicle with chocks to prevent it from rolling.
3. Position the ramps at the smallest possible angle. Ensure that the grade does not exceed 15° (27 %).
4. Use access ramps with an antiskid surface only.
5. Ensure that the loading area is clear and that access to it is not obstructed.

Driving onto transport vehicles

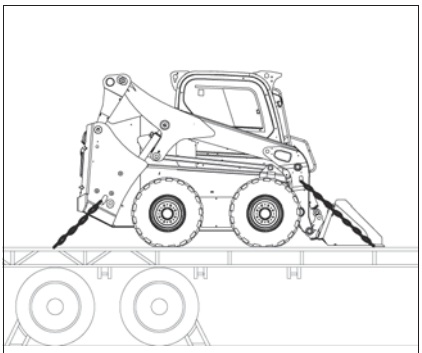


Fig. 230

1. Start the engine.
2. Raise the loader unit slightly so that the attachment does not touch the access ramp.
3. Carefully drive the machine onto the middle of the transport vehicle.
4. Move the machine to transport position.
5. Stop the engine.
6. Raise the seat bar.
7. Remove the starting key and carry it with you.
8. Leave the cabin, and close and lock the door, windows and covers.
9. Secure and tie down the machine *– see chapter “ Tying down” on page 6-4*.

Driving off transport vehicles

1. Ensure that the area behind the access ramp is clear and that access to it is not obstructed.
2. Start the engine.
3. Raise the loader unit slightly so that the attachment does not touch the access ramp.
4. Drive the machine off the transport vehicle slowly and only with the help of a guide.

6.3 Lifting the machine

WARNING

Accident hazard due to incorrect loading!

Incorrect loading can cause accidents and serious injury or death.

- ► Do not attempt to lift the machine without first installing a 4-point crane lifting bracket. Contact your local Wacker Neuson dealer to install Crane Lifting Bracket Kit 1000362102.
- ► Do not allow anyone to stay in the danger zone.
- ► Read the transport weight off the type label. Add the weight of subsequently installed equipment to the weight of the machine.

1. Fit an empty bucket and lock it safely.
2. Remove all dirt from the machine.
3. Park the machine on firm, level and horizontal ground.
4. Lower the loader unit.
5. Stop the engine.
6. Release the pressure in the hydraulic system
7. Raise the seat bar.
8. Remove the starting key and carry it with you.
9. Remove all loose objects inside the machine, or store them safely.
10. Leave the cabin, and close and lock the door, windows and covers.
11. ..Connect the crane to the crane lifting bracket as shown.
12. Slowly raise the machine until there is no more contact with the ground.
13. Wait until the machine does not swing any more.
14. If the machine balance and the condition and position of the slings is correct, slowly raise the machine to the required height and load it.

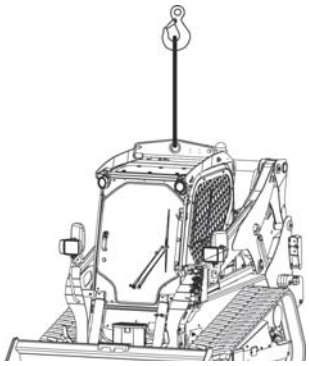


Fig. 231 Craning operation with crane lifting bracket (option)

Information

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

6.4 Transporting the machine

Tying down

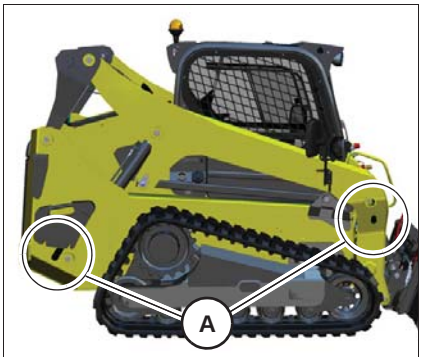


Fig. 232

1. Ensure that the authorized maximum height is not exceeded.
2. Lower the loader unit.
3. Firmly fasten the machine on the loading area with tie-down points **A** with slings **B** of adequate size.
   Observe the legal regulations.
4. Before transporting the machine through heavy rain:
   close the outlet of the exhaust pipe with a cap or suitable adhesive tape.

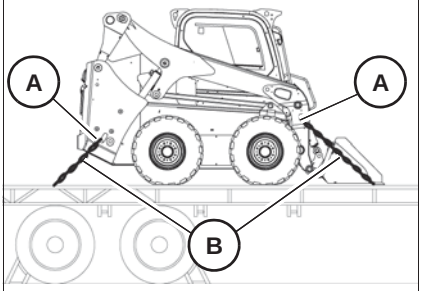


Fig. 233

5. Ensure that the driver of the transport vehicle knows the overall height, width and weight of his transport vehicle (including the machine to be transported) before starting machine travel, and the legal transport regulations of the countries where transport is taking place.

7 Maintenance

7.1 Information on maintenance

Responsibilities and prerequisites

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

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

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

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

This ensures optimal machine operation. Immediately repair or replace parts that are already damaged or not working properly before they are due for replacement.

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

Use only original spare parts for repairs.

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

Important safety instructions on maintenance

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

7.2 Maintenance overview

Maintenance label

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

SW24/ST35

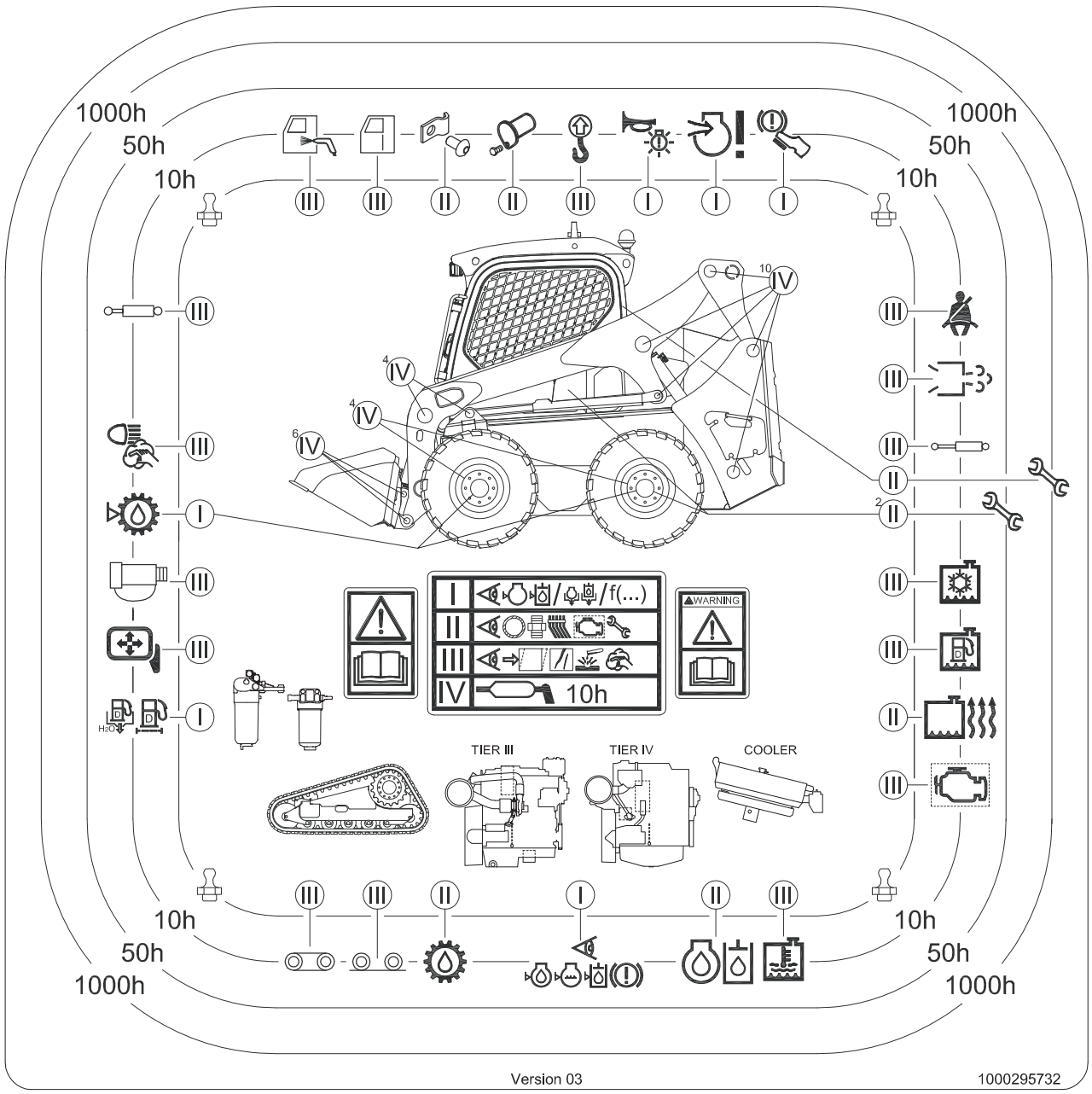


Fig. 234

I Checking functions and levels, filling up and draining.

II Checking wear parts, seals, hoses and threaded fittings.

III Checking for damage, corrosion, dirt.

IV Lubricate daily after the work shift.

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

SW28/ST45

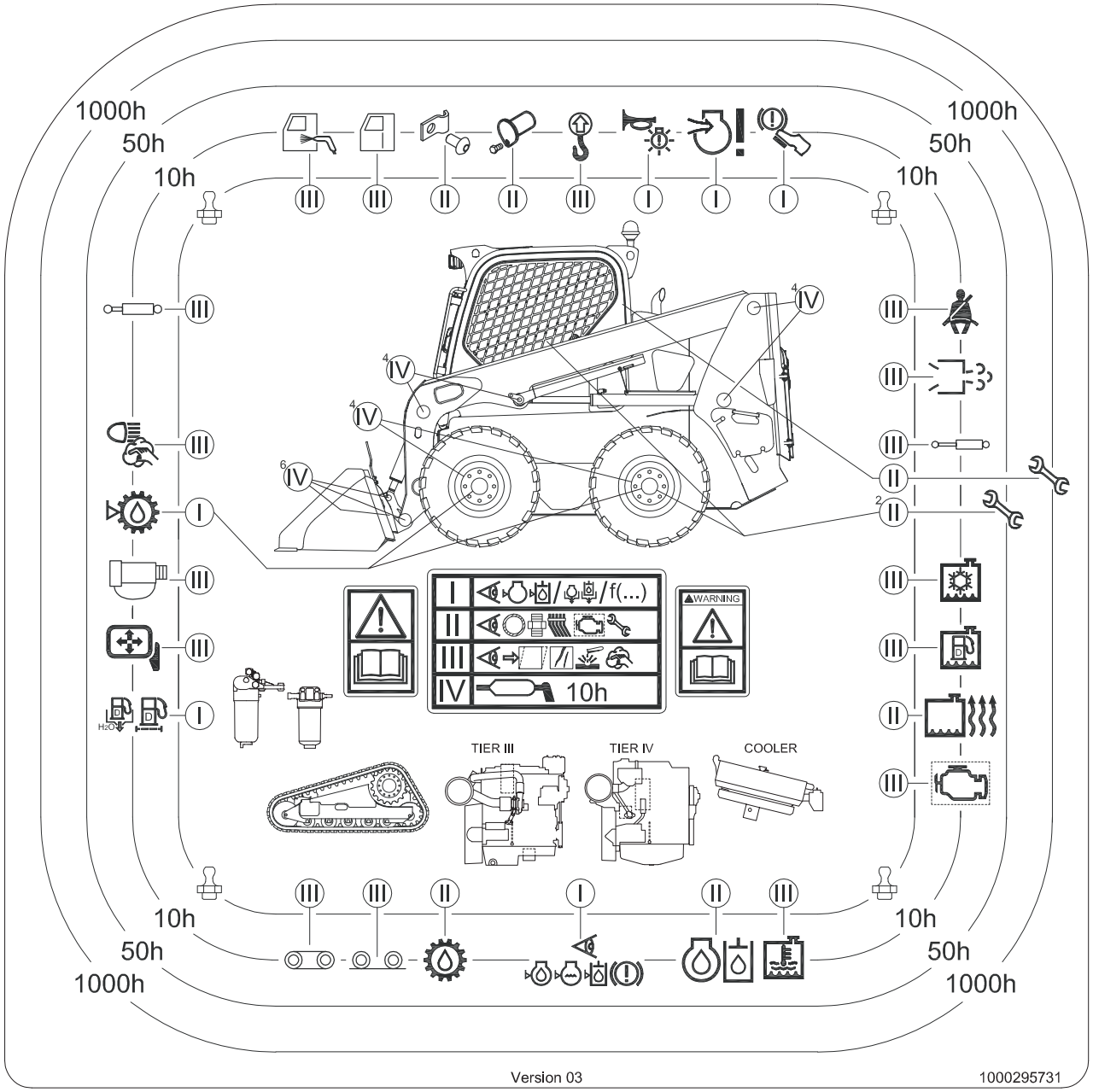


Fig. 235

I Checking functions and levels, filling up and draining.

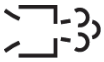
II Checking wear parts, seals, hoses and threaded fittings.

III Checking for damage, corrosion, dirt.

IV Lubricate daily after the work shift.

Maintenance plan

Daily maintenance (operator)		
Symbol	**Inspection work** (Check the following engine/machine fluids. Check the oil levels after a test run and add oil if necessary)	Page
	Check the fluids and lubricants (engine oil, engine coolant, hydraulic oil)	*7-34*, *7-36*
	Check the radiators (for example water, hydraulic oil) for dirt, clean them if necessary	*7-37*
	Check the fuel radiator for dirt, clean it if necessary	*7-37*
	Lubricate the machine according to the lubrication plan	*7-9*
	Check the water separator (prefilter) and fuel filter: drain water if necessary	*7-31*
	Check the wheels (damage, air pressure, tread depth)	*7-48*
	Check the tracks (damage, tension, profile)	*7-50*, *7-48*
	Check the engine air intake	*7-39*
	Check pin lock	--
	Check line fixtures	--
	Check the indicator lights and acoustic warning devices	*4-22*
	Check the service and parking brake function	*5-3*
	Check the hydraulic couplings for dirt	--
	Clean the lights/light system, signaling systems	--
	Check the condenser for dirt, clean it if necessary	*7-37*
	Check labels and Operator's Manual for completeness and condition	--

Daily maintenance (operator)		
Leakage check		
Check for tightness, leaks and chafing: pipes, flexible lines and threaded fittings of the following assemblies and components. Have them repaired if necessary		
	Engine and hydraulic system	--
	Traveling drive, axles and transfer gearbox	--
	Cooling systems, heating and hoses (visual check)	--
Visual check		
Correct function; deformations, damage, surface cracks, wear and corrosion		Page
	Check the exhaust system for damage	--
	Check the insulating mats in the engine compartment for damage	--
	Check the cabin and protective structures for damage (FOPS, for example)	--
	Check the piston rods of the cylinders for damage	--
	Check the seat belt for damage	*7-26*
	Check function of radiator cover gas strut	--
	Check the mounting holes for the lifting brackets	--
	Check accesses and exits for dirt	--

Weekly maintenance (every 50 operating hours) (operator)		Page
All steps for previous maintenance intervals		--
	Lubricate the machine according to the lubrication plan	*7-27*
	Visual check of axle mountings (SW24/28 only)	--
	Check the wheel nuts for tightness (SW24/28 only)	*7-48*

Only once after the first 50 operating hours (Wacker Neuson service center)	
Hydraulic oil filter replacement (pressure and return filter)	--
Check V-belt condition and tension (American tier III only)	--
Check the threaded fittings for tightness	--
Pressure check of primary pressure limiting valves	--
Check drive gearbox oil level (SW24/28 only)	--
Check drive gearbox track tension (SW24/28 only)	--
Reset the maintenance meter	--

Every 250 operating hours or once a year (Wacker Neuson service center)	
Replace the hydraulic motor gearbox oil (ST35/ST45 only)	--
All steps for maintenance once a day and once a week	--

Every 500 operating hours or once a year (Wacker Neuson service center)	
Engine oil replacement[1]	--
Engine-oil filter replacement[1]	--
Fuel filter replacement	--
Replace the water-separator prefilter element	--
Hydraulic oil filter replacement (pressure and return filter)	--
Replace the V-belt (American tier III only)	--
Replace the crankshaft housing filter (American tier III only)	--
Replace the gearbox oil of the traveling drive (SW24/28/ST35/45)	--
Clean the dust valve	--
Check the electric cables and connectors (cable and grounding connections, etc.)	--
Check the threaded fittings for tightness	--
Clean the cabin air filter (replace it if necessary)	--
Check track tension (SW24/28)	--
Reset the maintenance meter	--
Option	
Check the oil level in the air conditioning compressor and the threaded fittings for tightness	--
Check the dehumidifier of the air conditioning system (visual check)	--
All steps for maintenance once a day, once a week (and all steps for maintenance at 250 operating hours)	--

1. American Tier IV engine: flexible interval; replacement can be necessary before 500 o/h depending on engine load. Diesel engine ouput is reduced after 500 o/h.

Every 1000 operating hours (Wacker Neuson service center)	
Hydraulic oil replacement	--
Replacement of hydraulic oil reservoir breather filter	--
Air filter replacement[1]	--
Check valve clearance, adjust if necessary (American tier III only)	--
Check the water pump (visual check/American tier IV only)	--
Replace the cabin air filter	--
Pressure check of primary pressure limiting valves	--
Check the battery condition (charge condition, terminals, etc.)	--
Lifting eye wear (check at least once a year)	--
Check the threaded fittings of the cabin (check at least once a year)	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 250 and 500 operating hours)	--

1. Air filter replacement according to the indicator light, 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 indicator light)

Every 1500 operating hours (Wacker Neuson service center)	
Replace the crankshaft housing filter	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 250 and 500 operating hours)	--

Every 2000 operating hours or every 2 years (Wacker Neuson service center)	
Coolant replacement	--
Check the exhaust-gas turbocharger	--
Check the water pump (visual check/American tier III only)	--
Check the bladder type accumulator	--
Option	
Replace the dehumidifier of the air conditioning system	--
Replace the air conditioning refrigerant	--
Replace the air conditioning compressor oil	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 250, 500 and 1000 operating hours)	--

Every 3000 operating hours or every 3 years (Wacker Neuson service center)	
Check the injection nozzles, clean them if necessary	--
Check the radiator cap	--
Replace the V-belt of the water pump/alternator/fan (American tier IV only)	--
Replace the oxygen sensor (American tier IV only)	--
Option	
Replace the V-belt of the air-conditioning compressor (American tier IV only)	--
All steps for maintenance once a day and once a week (and all steps for maintenance at 250, 500, 1000 and 1500 operating hours)	--

Information

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

Information

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

Lubrication plan

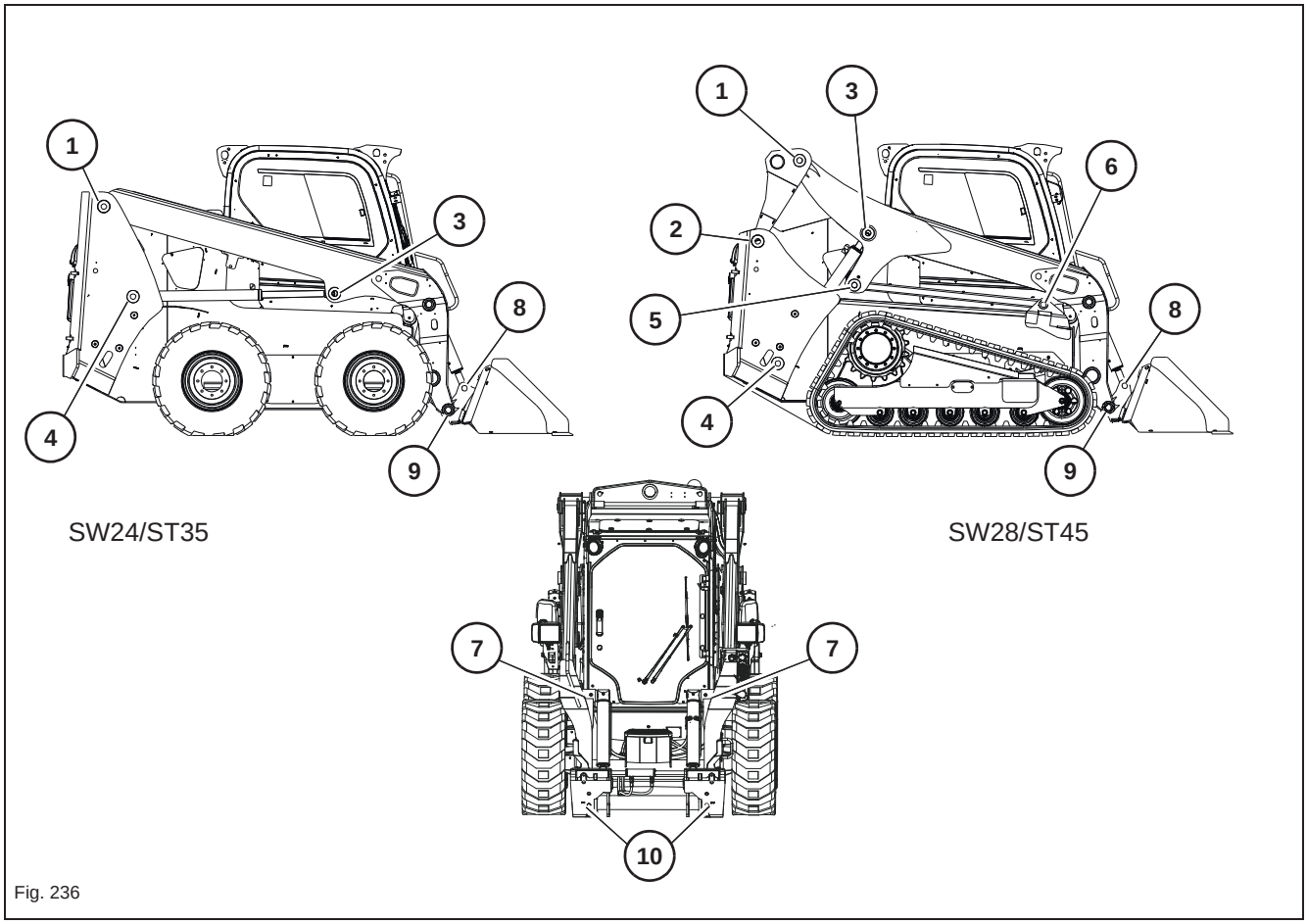


Fig. 236

Lubricate the specified lubrication points once a day.

Position	Lubrication point	SW24	SW28	ST35	ST45	Quantity
1	Loader unit	l	l	l	l	2
2	Loader unit swingarm	--	l	--	l	2
3	Loader-unit cylinder (front)	l	l	l	l	2
4	Loader-unit cylinder (rear)	l	l	l	l	2
5	Rear joint rod	--	l	--	l	2
6	Front joint rod	--	l	--	l	2
7	Upper bucket cylinder	l	l	l	l	2
8	Lower bucket cylinder	l	l	l	l	2
9	Quickhitch pin	l	l	l	l	2
10	Quickhitch cylinder pin	l	l	l	l	2

7.3 Fluids and lubricants

Application	Fluid/lubricant	Specification	Season/temperature	Capacities [1]
Diesel engine (American tier III)	Engine oil[2]	API CH-4	−20 to +40 °C (−4 to 104 °F)	8 l (2.1 gal)
		ACEA E5		
		EMA-DHD-1		
Diesel engine (American tier IV)	Engine oil[2]	API CJ-4		
		ACEA E9		
		ECF-3		
Diesel engine (American Tier III/Tier IV)[3]	Diesel fuel[4]	ASTM D975 grade 2D S15 (USA)[5]	Summer or winter diesel depending on outside temperatures	92 l (24.3 gal)
		EN 590 (EU)[6]		
		BS 2869:2010 class A2 (GB)[5]		
Engine cooling system	Coolant	Distilled Water and ASTM D6210 Ethylene Glycol Long Life Coolant	Year-round	22 l (5.8 gal)
Hydraulic oil reservoir	Hydraulic oil	Eurolub HVLP 46[7]	Year-round[8]	72 l (19 gal)
	Biodegradable hydraulic oil[9]	Panolin HLP Synth 46		
Gearbox ST35/45	Gearbox oil	SAE 75W-90	Year-round	1,3 l (0.3 gal) on either side
Chain tank SW24/28	Engine oil	SAE 10W-40	Year-round	18 l (4.8 gal) on either side
Grease nipples	Grease	KPF 2 K-25[10]	Year-round	According to the maintenance plan
Battery terminals	Acid-proof grease [11]	FINA Marson L2	Year-round	As required
Washer system	Cleaning agent	Glass cleaner and anti-freeze	Year-round	1.2 l (73 in^3)

1. The capacities indicated are approximate values; the oil level check alone is relevant for the correct oil level. Capacities indicated are no system fills
2. According to DIN 51511 (API CF, CF-4, CI-4; ACEA E3, E4, E5; JASO DH-1)
3. Using biodegradable diesel fuel is prohibited.
4. American Tier III diesel engine: In countries without regulations on exhaust-gas emissions, diesel fuel with a sulfur content of up to 4000 ppm (0.4 %) can be used.
5. Sulfur content up to 15 ppm (0.0015 %)
6. Sulfur content up to 10 ppm (0.001 %)
7. According to DIN 51524 section 3, ISO-VG 46
8. Depending on local conditions – *see "Engine oil types (temperature-dependent)" on page 7-11*
9. Biodegradable hydraulic oil based on saturated synthetic esters with an iodine value of < 10, according to DIN 51524, section 3, HVLP, HEES
10. KPF 2 K-25 according to DIN 51502 multipurpose lithium grease with MoS^2 additive
11. Standard acid-proof grease NGLI category 2

Engine oil types (temperature-dependent)

American Tier III engine		
Viscosity grade	**Ambient temperature**	
EMA LRG-1; API CH-4	**min.**	**max.**
SAE 5W30	−30 °C (−22 °F)	30 °C (86 °F)
SAE 5W40	−30 °C (−22 °F)	40 °C (104 °F)
SAE 10W30	−20 °C (−4 °F)	40 °C (104 °F)
SAE 15W40	−10 °C (14 °F)	50 °C (122 °F)

American Tier IV engine		
Viscosity grade	**Ambient temperature**	
API CJ-4; ACEA E9; ECF-3	**min.**	**max.**
SAE 0W30	−30 °C (−22 °F)	30 °C (86 °F)
SAE 0W40	−30 °C (−22 °F)	40 °C (104 °F)
SAE 5W30	−25 °C (−13 °F)	30 °C (86 °F)
SAE 5W40	−25 °C (−13 °F)	50 °C (122 °F)
SAE 10W30	−18 °C (0 °F)	40 °C (104 °F)
SAE 10W40	−18 °C (0 °F)	50 °C (122 °F)
SAE 15W40	−10 °C (14 °F)	50 °C (122 °F)

Hydraulic oil types (depending on temperature)

Hydraulic oil types		
Viscosity grade	**Ambient temperature**	
HVLP 46[1]	**min.**	**max.**
ISO VG32	−20 °C (−4 °F)	30 °C (86 °F)
ISO VG46	−5 °C (23 °F)	40 °C (104 °F)
ISO VG68	5 °C (41 °F)	50 °C (122 °F)

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

Additional hydraulic-oil and filter replacement

NOTICE

An additional hydraulic-oil 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
Normal operation		Every 1000 o/h	Replace the first time after 50 o/h, then every 500 o/h
Share of hammer operation	20 %	Every 800 o/h	300 o/h
	40 %	Every 400 o/h	
	60 %	Every 300 o/h	100 o/h
	Over 80 %	Every 200 o/h	

Important information regarding operation with biodegradable hydraulic oil

- Use only the biodegradable oils that have been tested and released by Wacker Neuson. Contact a Wacker Neuson dealer for the use of other products that have not been released. In addition, ask the oil supplier for a written declaration of guarantee. This guarantee is applicable to damage occurring on the hydraulic components that can be proved to be due to the hydraulic oil.
- 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 (follow the manufacturer's indications).
- Do not add mineral oil – the content of mineral oil should not exceed 2 % in order to avoid foaming problems and to ensure biological degradability.
- When running the machine with biodegradable oil, the same oil and filter replacement intervals are valid as for mineral oil.
- Always have the condensation water in the hydraulic oil reservoir drained by a Wacker Neuson service center before the cold season. The water content may not exceed 0.1 % by weight.
- The instructions in this Operator's Manual concerning environmental protection are also valid for the use of biodegradable oil.
- If additional hydraulic attachments are installed or operated, use the same type of biodegradable oil for these attachments to avoid mixtures in the hydraulic system.
- Subsequent change from mineral oil to biodegradable oil must be performed by a Wacker Neuson service center.

7.4 Maintenance accesses

Radiator cover

WARNING

Burn hazard due to hot engine parts!

Can cause serious burns.

► Stop the engine and let it cool down.

► Wear protective equipment.

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

► Open the engine cover only at engine standstill.

CAUTION

Injury hazard due to open radiator cover and/or tilted radiator!

Can cause injury.

► Make sure not to hit your head on the open radiator cover or tilted radiator.

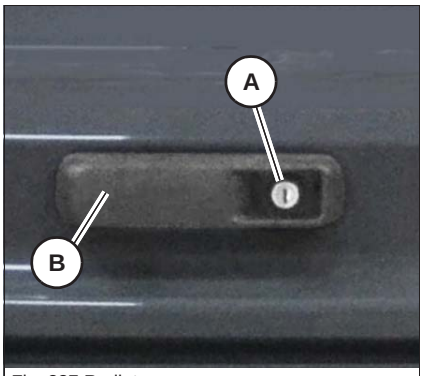


Fig. 237 Radiator cover

Unlocking and locking:

Unlock and lock the radiator cover with the starting key.

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

? The radiator cover is locked.

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

? The radiator cover is unlocked.

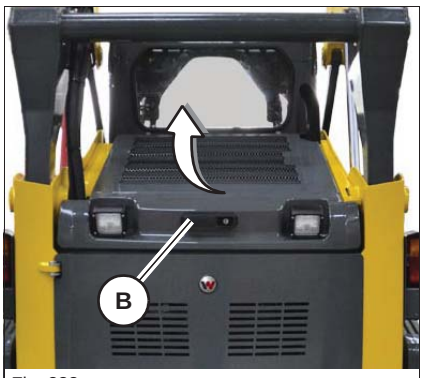


Fig. 238

1. Opening:

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Press button **A** and pull handle **B** upward.

The radiator cover is held open with a gas strut.

Fig. 239

Closing:

Press the radiator cover down until it locks into place.

Engine cover

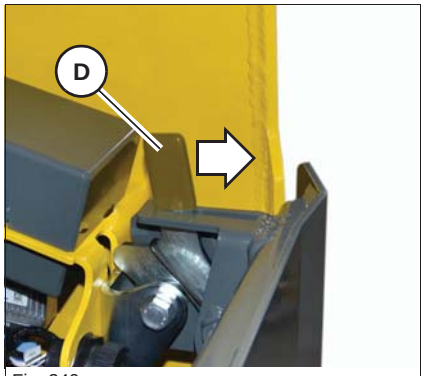


Fig. 240

Opening:

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the engine cover.
3. Unlock lever **D** near the main fuse box and fully open the engine cover toward the left. This locks it in its final position.

Fig. 241

Information

The engine cover can only be opened if the radiator cover is open.

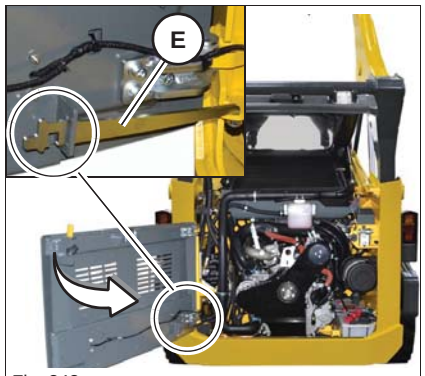


Fig. 242

Closing:

1. Move the engine cover slightly to the right and raise lock **E** at the same time.
2. Completely close the engine cover and let it lock into place.

Information

Close the engine cover only if the radiator cover is open.

Tilting the radiator

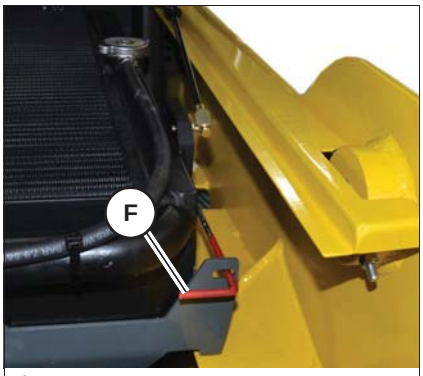


Fig. 243

Unlocking the radiator

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the radiator and engine cover.
3. Pull lock **F**. This unlocks the radiator.


Fig. 244

Raising the radiator (SW24/ST35)

1. Raise the radiator on the right side.
   ? A gas strut holds the radiator in its final position.


Fig. 245

Raising the radiator (SW28/ST45)

1. Lower the radiator cover onto the radiator.
2. Raise the radiator cover and radiator together on the right side.
   ? A gas strut holds the radiator in its final position.

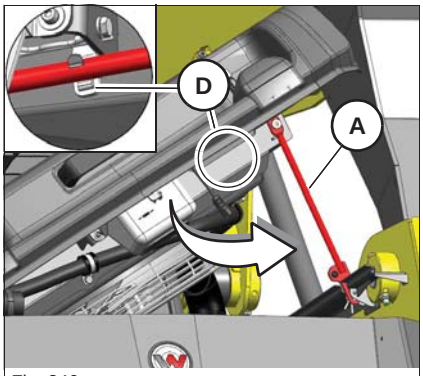


Fig. 246

Securing the radiator (SW24/SW28/ST35/ST45)

1. Release and lower radiator prop **A** from clip **D**.

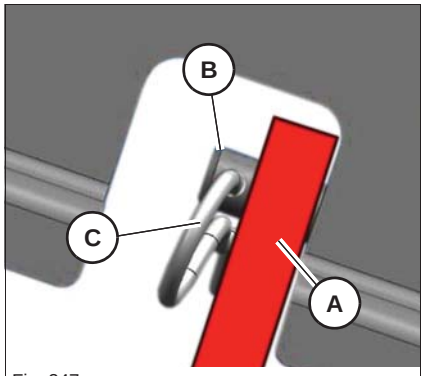


Fig. 247

2. Slide radiator prop **A** over pin **B** and secure it with split pin **C**.

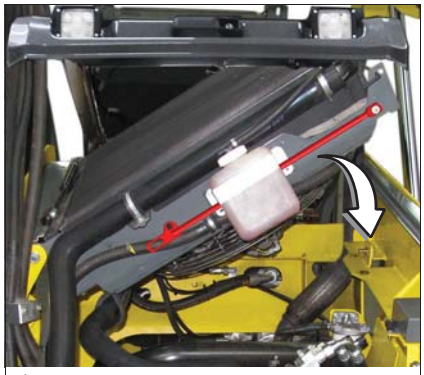


Fig. 248

Lowering the radiator (SW24/ST35)

Release radiator prop **A** from pin **B** and split pin **C**, raise it and fasten it with clip **D**.

Lower the radiator and lock it into place.

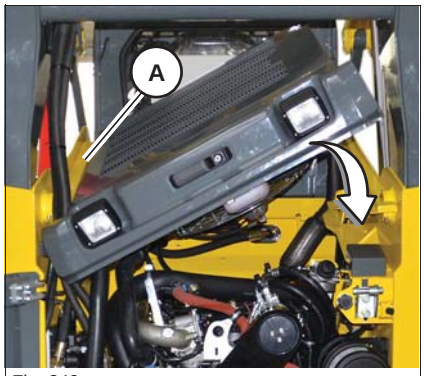


Fig. 249

Lowering the radiator (SW28/ST45)

Release radiator prop **A** from pin **B** and split pin **C**, raise it and fasten it with clip **D**.

Lower the radiator cover and the radiator, and lock them into place.

Side cover


Fig. 250

The side cover is located on the left side of the machine. The condenser is located behind it – *see chapter " Cleaning the radiator" on page 7-37*.

Tilting the cab

Should maintenance with a tilted cab be required, tilt the cab.

The cab can be tilted to 2 different positions

- Position 1: half tilted, lift arm lowered

Fig. 251

- Position 2: fully tilted, lift arm raised

Fig. 252

WARNING

Crushing hazard by raising or lowering the cabin!

Raising or lowering the cabin can cause serious injury or death.

► All persons must stay clear of the cabin as you lower it.

► Remove all loose objects inside the machine, or store them safely.

► Always close and lock the door before raising the cabin.

Raising/lowering the cab (Position 1)

Fig. 253

1. Remove cab fastening nuts **G** on the left and right and store them safely.
2. Tilt the cab into position**1** (half tilted).

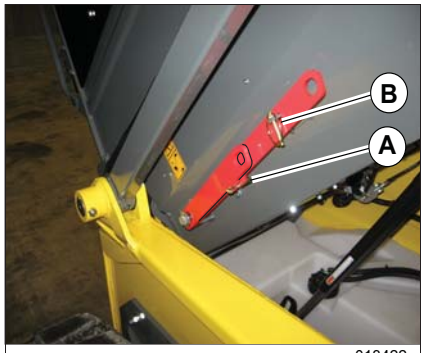


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Fig. 254

3. Remove split pin **A** on the left side of the cab leave split pin **B** in place.

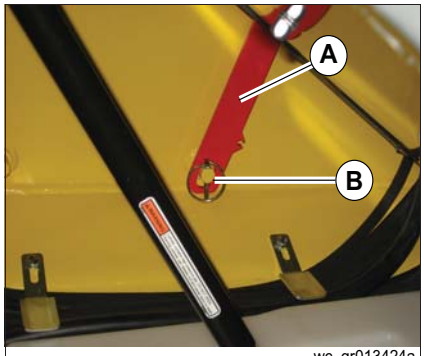

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Fig. 255

4. Swing the short support **A** down, slide it over the front stud **B** and secure it with the split pin.
5. The rear stud, if present, is no longer used.

Information

Lower the cab by following the cab raising procedure in reverse order.

Fig. 256

6. Tighten cabin fastening nuts **G** on the left and right with 39 Nm (29 ft.lbs).

Raising/lowering the cab (Position 2)

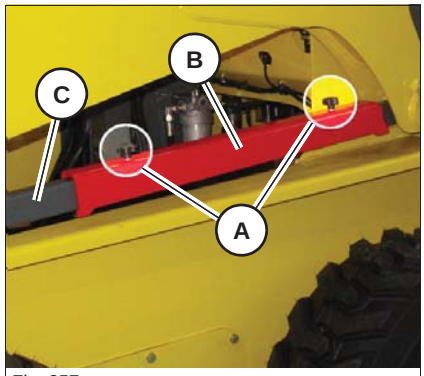

Fig. 257

Removing the loader unit prop (vertical loader unit system)

1. Remove screws **A** from joint rod **C** on the left and remove loader unit prop **B**.
2. Fasten screws **A** back onto joint rod **C**.

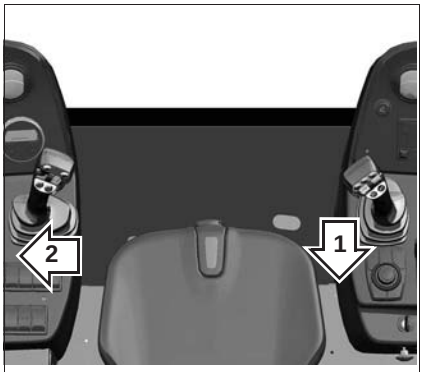

Fig. 258

Raising the loader unit completely (ISO controls)

Pull the control lever on the right backward **(1)**.

Raising the loader unit completely (H controls)

Push the control lever on the left **(2)** to the left.

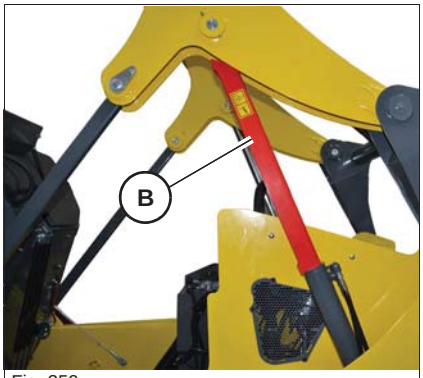

Fig. 259

Securing the loader unit (vertical loader unit system)

Secure the loader unit with loader unit prop **B**.

Information

Lower the loader unit completely, so that all the weight is on the prop. Use emergency lowering button.

– see chapter “5.12 Emergency lowering” on page 5-55

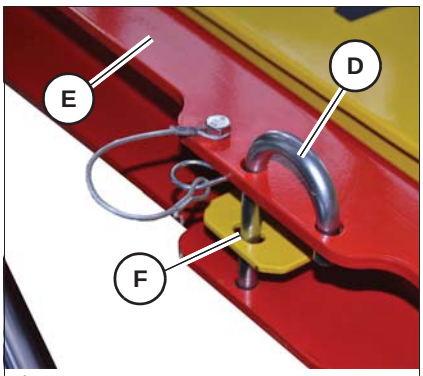

Fig. 260

Securing the loader unit (radial loader unit system)

1. Remove split pin **D** on the left side of the loader unit and fold down loader unit prop **E**.

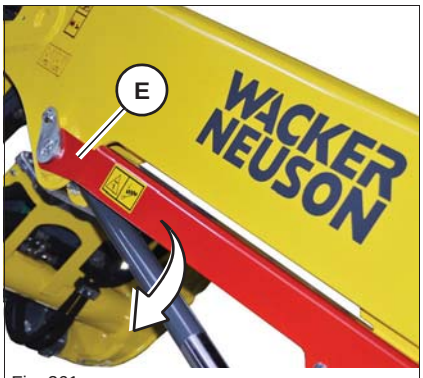

Fig. 261

2. Fold down loader unit prop **E**.
3. Insert split pin **D** back into guide **F**.

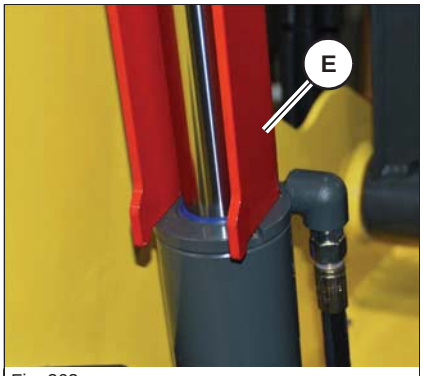

Fig. 262

4. Secure the loader unit as shown with loader unit prop **E**.

Information

Lower the loader unit completely, so that all the weight is on the prop. Use emergency lowering button.

– see chapter “5.12 Emergency lowering” on page 5-55

Fig. 263

5. Remove cabin fastening nuts **G** on the left and right and store them safely.

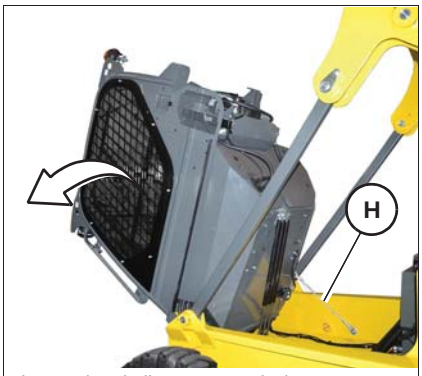

Fig. 264 (symbolic representation)

6. Tilt the cab fully forward.
   ? Safety cable **H** must be tight.

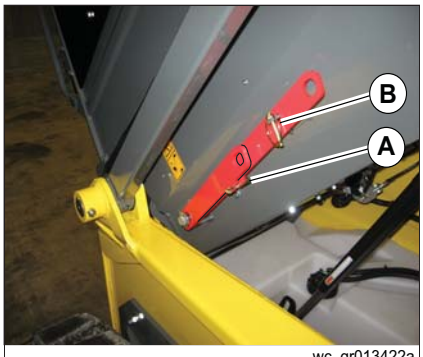

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Fig. 265

7. Remove split pin **B** on the left side of the cab. Leave split pin **A** in place.

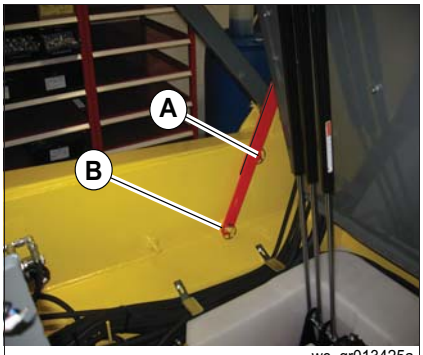

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Fig. 266

8. Fold down both parts of the support **A** together. Slide the long part of the support over the front stud **B** and secure it with the split pin.
9. The rear stud (if present) is no longer used.

Information

Lower the cab by following the cab raising procedure in reverse order.

Fig. 267

Tighten cabin fastening nuts **G** on the left and right with 39 Nm (29 ft.lbs).

Cabin fuse box

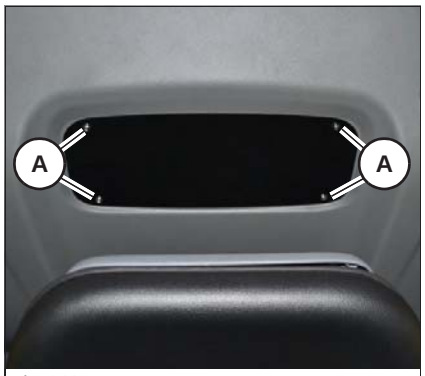


Fig. 268

The fuse box is located behind the backrest.

Opening:

Remove screws **A** and the cover.

Closing:

Fit the cover and tighten screws **A**.

– see chapter “ Fuse box” on page 9-6

Main fuse box in engine compartment

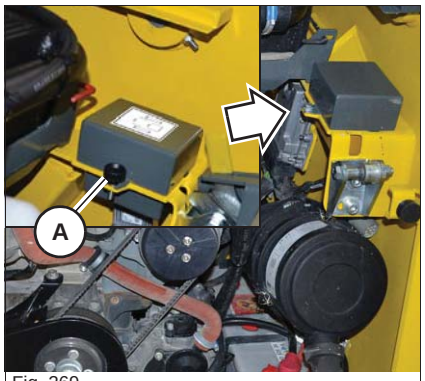


Fig. 269

The main fuse box is located on the right in the engine compartment.

Opening:

Remove screw **A** and the cover.

Closing:

Fit the cover and tighten screw **A**.

7.5 Cleaning and maintenance

Important information on cleaning and maintenance

Cleaning the machine is divided into 3 separate areas:

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

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

Cleaning with washing solvents

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

Cleaning with compressed air

- Work carefully.
- Wear safety glasses and protective clothing.
- Do not aim the compressed air at the skin or at other people.
- Do not use compressed air for cleaning your clothing.

Cleaning with a high-pressure cleaner or steam jet

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

Cleaning with volatile and easily flammable anticorrosion agents and sprays:

- Ensure adequate room ventilation.
- Fire, open flames and smoking is not allowed.

Environment

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

Use of solvents

NOTICE

Damage to rubber and electrical parts when cleaning with solvents.

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

Cleaning inside the cabin

NOTICE

Machine damage due to cleaning.

► Do not clean the inside with high-pressure cleaners, steam jets or high-pressure water. Water can penetrate into the electrical system and cause short circuits, and damage seals and disable the controls.

We recommend using the following aids to clean the cabin:

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

Cleaning the outside of the machine

We recommend using the following aids to clean the machine:

- High-pressure cleaner
- Steam jet

Cleaning the engine compartment

WARNING

Burn hazard due to hot engine parts!

Can cause serious burns.

► Stop the engine and let it cool down.

► Wear protective equipment.

WARNING

Injury hazard due to rotating parts!

Rotating parts can cause serious injury or death.

► Open the engine cover only at engine standstill.

NOTICE

Damage due to water or steam jet.

► Do not point the water jet directly at any of the electric sensors such as temperature and oil pressure switches or control valves, etc.

► Protect all electric parts, such as the alternator, connectors, relays, etc. from humidity.

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

► Lubricate the lubrication points after washing the machine.

Clean the engine compartment as follows:

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

Cleaning the seat belt

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

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

Threaded fittings and attachments

Have loose connections checked immediately by a Wacker Neuson service center.

7.6 Lubrication work

Preparing lubrication

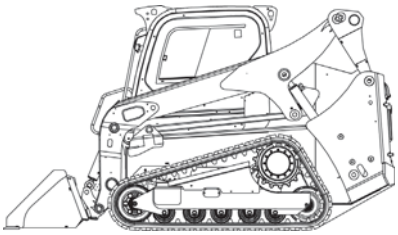


Fig. 270

1. Stop the machine on firm, level and horizontal ground.
2. Lower the loader unit to the ground.
3. Stop the engine.
4. Release the pressure in the hydraulic system – *see chapter “ Releasing the pressure in the hydraulic system” on page 5-35*.
5. Raise the seat bar.
6. Remove the starting key and carry it with you.
7. Remove all loose objects inside the machine, or store them safely.
8. Close the windows and the door.
9. Close and lock all covers.
10. Attach a warning label to the control elements (for example “Machine being serviced, do not start”).
11. Wait at least 10 minutes after stopping the engine!

7.7 Fuel system

Important information regarding the fuel system

Information

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

Information

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

Diesel fuel specification

NOTICE

Engine damage due to incorrect or dirty diesel fuel.

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

– see chapter “7.3 Fluids and lubricants” on page 7-10

Refueling

WARNING

Burn hazard when refueling!

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

- ► Fire, open flames and smoking is not allowed.
- ► Keep the maintenance area clean.
- ► Do not refuel in closed rooms.
- ► Do not add gasoline to the diesel fuel.
- ► Let the engine cool down.

CAUTION

Health hazard due to diesel fuel!

Diesel fuel and fuel vapors are harmful to health!

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

CAUTION

Fire hazard due to diesel fuel!

Diesel fuel gives off flammable vapors.

- ► Fire, open flames and smoking is not allowed.
- ► Adding gasoline is not allowed.

NOTICE

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

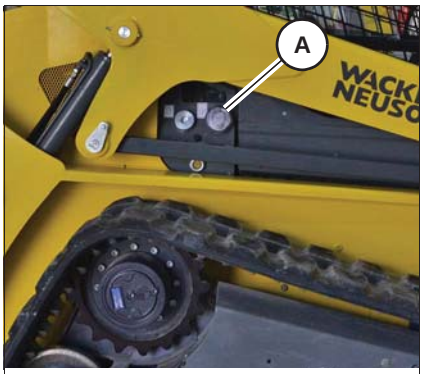


Fig. 271

Filler inlet **A** of the fuel tank is located on the right of the machine.

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

1. Unlock and remove filler cap **A**.
2. Refuel.
3. Close and lock filler cap **A**.

Stationary fuel pumps

Even the smallest particles of dirt can cause increased engine wear, malfunctions in the fuel system and reduced effectiveness of the fuel filters.

Refueling from barrels

If refueling from barrels cannot be avoided, note the following points:

- Barrels must neither be rolled nor tilted before refueling
- Protect the suction pipe opening of the barrel pump with a fine-mesh screen.
- Immerse the suction pipe opening down to a max. 15 cm (5.9 in) above the bottom of the barrel.
- Only fill the tank using refueling aids (funnels or filler pipes) with integral microfilter.
- Keep all refueling containers clean.

Bleeding the fuel system

WARNING

Burn hazard due to hot engine components!

Can cause serious burns.

► Stop the engine and let it cool down.

► Wear protective equipment.

Bleed the fuel system in the following cases:

- After removing and fitting the fuel filter, prefilter or the fuel lines back on again.
- If the fuel tank is run empty.
- If the machine is put into operation after having been out of operation for more than 30 days.

Bleeding the fuel system (American tier III)

Bleed the fuel system as follows:

1. Raise the seat bar.
2. Remove the starting key and carry it with you.
3. Fill up and close the fuel tank.
4. Turn the starting key to the first position.
5. Wait about 5 minutes while the fuel system bleeds itself automatically.
6. Start the engine.

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

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

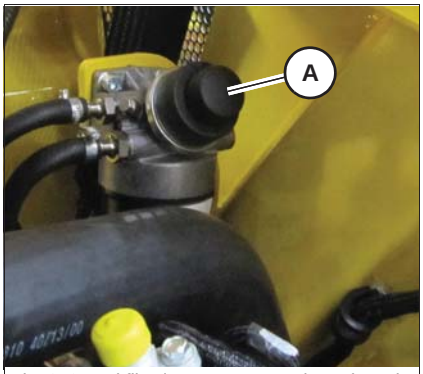


Fig. 272 Fuel filter/water separator (American tier IV)

Bleeding the fuel system (American tier IV)

1. Raise the seat bar.
2. Remove the starting key and carry it with you.
3. Fill up and close the fuel tank.
4. Open the radiator and engine cover.

– see chapter “ Radiator cover” on page 7-14

5. Raise the radiator cover and radiator together.

– see chapter “ Tilting the radiator” on page 7-16

6. Press pump **A** several times until a firmer resistance can be felt.
7. Press pump **A** 5 x.
8. Start the engine.

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

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

Information

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

Water separator

A water/fuel mixture is collected in the water separator during operation.

Position

Fig. 273 (symbolic representation)

The water separator is located on the right in the engine compartment.

Environment

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

Emptying the water separator

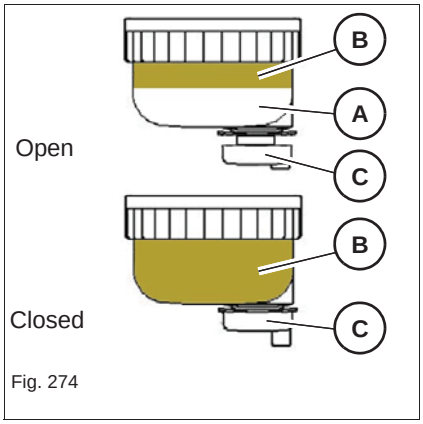


Fig. 274

If the error message **SPN 97** (American tier IV only) appears in the multifunctional display, drain the water/fuel mixture **(A)**.

The American tier III engine must be checked daily.

Close drain valve **C** if there is only fuel **(B)** in the sight glass.

Perform the following points before emptying the water separator:

1. Park the machine on firm, level and horizontal ground.
2. Lower the loader unit to the ground.
3. Stop the engine.
4. Remove the starting key and carry it with you.
5. Allow the engine to cool down.
6. Open the radiator and engine cover *– see chapter “7.4 Maintenance accesses” on page 7-14*.
7. Place a suitable container under the water separator.

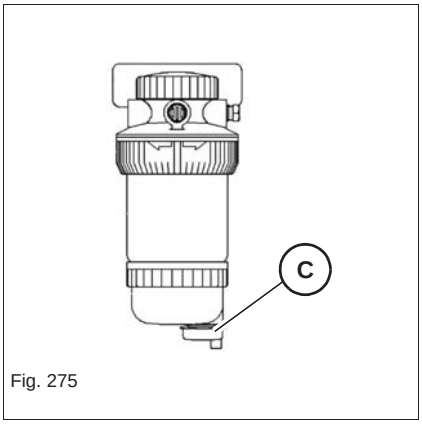


Fig. 275

American Tier III

1. Open drain valve **C**.
2. Drain the fuel/water mixture into the receptacle.
3. Close drain valve **C**.
4. Close the engine and radiator cover.

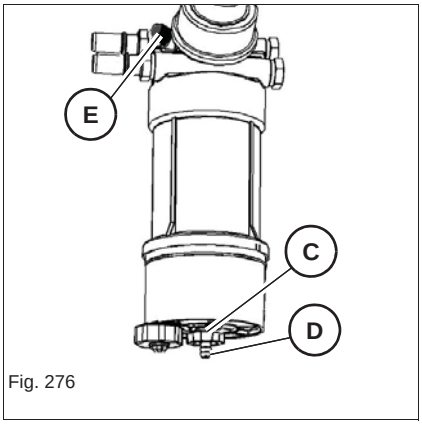


Fig. 276

American tier IV

1. Connect a suitable hose to the drain device **D**.
2. Open drain valve **C**.
3. Loosen bleed screw **E** with a suitable tool.
   ? Drain the fuel/water mixture into the receptacle.
4. Tighten bleed screw **E** with a suitable tool.
5. Close drain valve **C**.
6. Remove the hose.
7. Close the engine and radiator cover.

7.8 Engine lubrication system

Important information regarding the engine lubrication system

NOTICE

Engine damage due to incorrect engine oil level.

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

NOTICE

Damage due to wrong engine oil.

► Use engine oil according to the **Fluids and lubricants** list.

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

NOTICE

Damage due to adding engine oil too quickly.

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

Information

Check the oil level once a day. We recommend checking it before starting the engine. After stopping a warm engine, wait at least 5 minutes before checking.

Checking the engine oil level

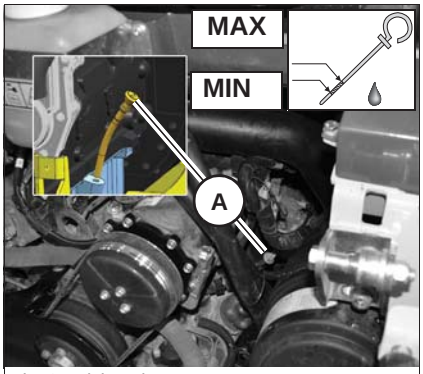


Fig. 277 (Tier III)

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

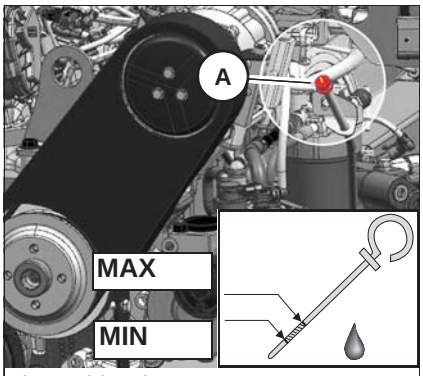


Fig. 278 (Tier IV)

9. Close the engine and radiator cover.
10. Lock the radiator cover.

Adding engine oil

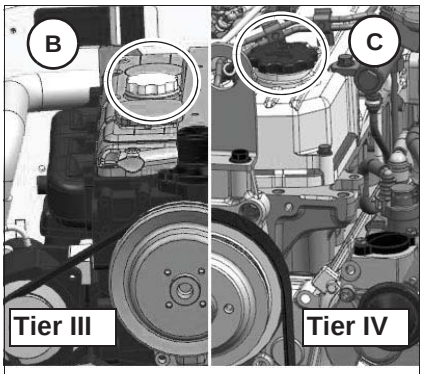


Fig. 279

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

Environment

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

7.9 Cooling system

Important information regarding the cooling system

WARNING

Poisoning hazard due to hazardous substances!

Contact with dangerous substances can cause serious injury or death.

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

WARNING

Burn hazard due to coolant or antifreeze!

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

- ► Only perform maintenance on an engine that has cooled down.
- ► Do not smoke, avoid fire and open flames.

WARNING

Burn hazard due to hot coolant!

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

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

NOTICE

Possible engine damage due to wrong coolant.

- ► Pay attention to the operation and lubrication chart or the coolant compound table.

NOTICE

Possible engine damage due to low coolant level.

- ► Check the coolant level once a day.

Checking the coolant level

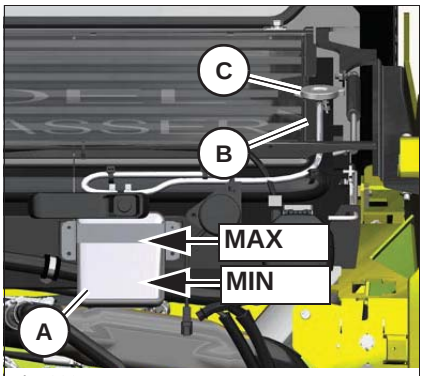


Fig. 280

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Let the engine and the coolant cool down.
3. Open the radiator and engine cover.
4. Check the coolant level on coolant reservoir **A** and filler inlet **B**.
5. Add coolant if the coolant level is below the MIN mark or if there is no coolant at the radiator’s filler inlet.
6. Close the engine and radiator cover.
7. Lock the radiator cover.

Information

Check the coolant level once a day before starting the engine.

Adding coolant

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

Cleaning the radiator

CAUTION

Burn hazard during maintenance on radiators!

Hot radiators can cause burns.

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

NOTICE

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

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

NOTICE

Damage to radiator fins during cleaning.

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

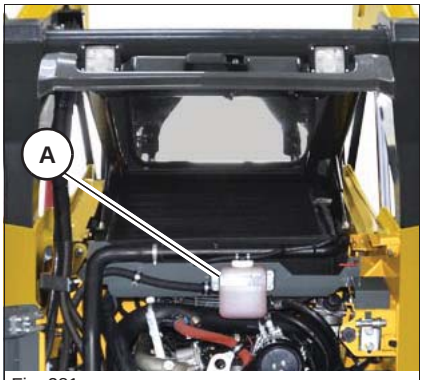


Fig. 281

The water/hydraulic-oil radiator **A** is located underneath the radiator cover.

The diesel-fuel radiator **B** is located on the right in the engine compartment.

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Open the radiator and engine cover
– see chapter “7.4 Maintenance accesses” on page 7-14.

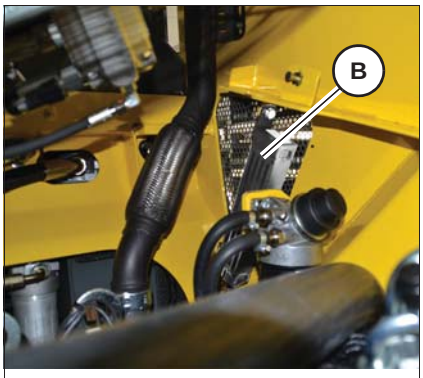


Fig. 282

3. Remove dust and other foreign bodies from the fins with compressed air.
4. Close the engine and radiator cover.
5. Lock the radiator cover.

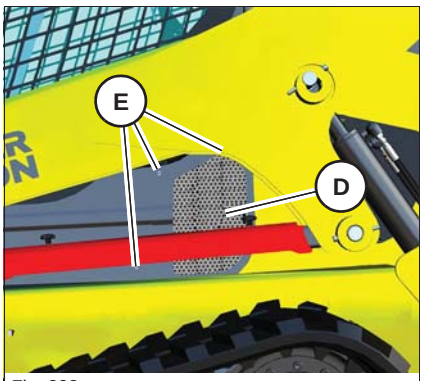


Fig. 283

The condenser (option) is located behind side cover **D**.

1. Remove screws **E** and cover **D**.

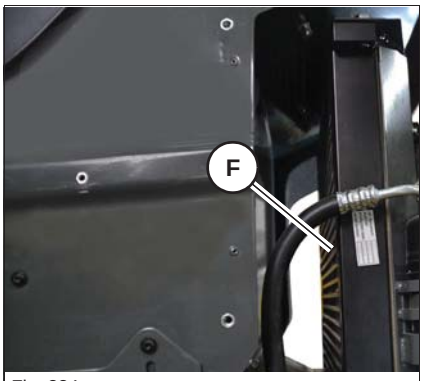


Fig. 284

2. Remove dust and other foreign bodies from the fins of condenser **F** with compressed air.
3. Install cover **D**.

7.10 Air filter

Maintenance may be performed only by an authorized service center.

Checking the air intake

NOTICE

In order to avoid engine damage:

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

Fig. 285

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Remove the starting key and carry it with you.
3. Open the radiator and engine cover.
4. Check and, if necessary, clean the air intake.
5. Close the engine and radiator cover.
6. Lock the radiator cover.

7.11 V-belt

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

7.12 Hydraulic system

Important information on the hydraulic system

WARNING

Burn hazard due to hot hydraulic oil!

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

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

WARNING

Injury hazard due to fluid escaping under pressure!

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

- ► Do not operate the machine with leaking or damaged hydraulic system components.
- ► Open the breather filter carefully to slowly release the pressure inside the reservoir.
- ► Wear protective equipment. If oil contacts the eye flush immediately with clean water and seek medical treatment.
- ► Malfunctioning or leaking threaded fittings, hose connections and pressure lines must be immediately repaired by a Wacker Neuson service center (search for hydraulic leaks with a piece of cardboard).

NOTICE

Damage due to wrong hydraulic oil.

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

NOTICE

Damage to hydraulic system due to incorrect hydraulic oil level.

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

NOTICE

Damage to hydraulic system due to dirty hydraulic oil.

- ► Always add hydraulic oil using the filling screen.
- ► If the hydraulic oil in the sight glass is cloudy, this indicates that water or air has penetrated the hydraulic system. Contact a Wacker Neuson service center.
- ► Contact a Wacker Neuson service center if the filter of the hydraulic system is dirty.

Checking the hydraulic oil level

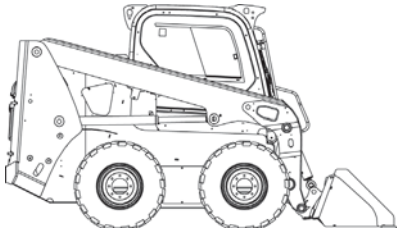


Fig. 286

1. Park the machine on firm, level and horizontal ground.
2. Position the loader unit and the bucket as shown.
3. Stop the engine.
4. Release the pressure in the hydraulic system *– see chapter “ Releasing the pressure in the hydraulic system” on page 5-35*.
5. Remove the starting key and carry it with you.

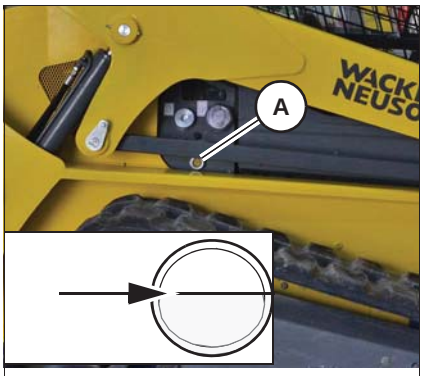


Fig. 287

6. Sight glass **A** is located on the right side of the machine.
7. Check the oil level on sight glass **A**.
   ? With a warm engine, the oil level must be about at the middle of the sight glass.

Add hydraulic oil if the oil level is below this mark.

Adding hydraulic oil

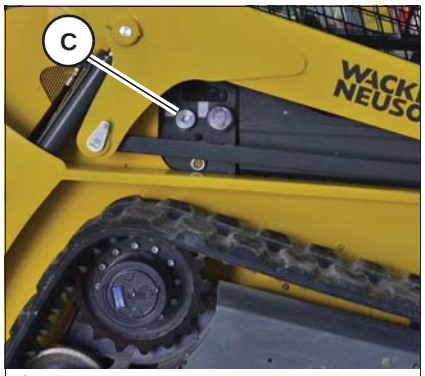


Fig. 288

Hydraulic oil reservoir (version 1):

1. Open filler plug **C** with hex tool slowly.
   ? The hex tool is located in the cab storage box.
2. Add hydraulic oil up to the corresponding mark.
3. Check the hydraulic oil level on sight glass **A**.
4. Add if necessary and check again.
5. Screw in filler plug **C** with hex tool tightly.

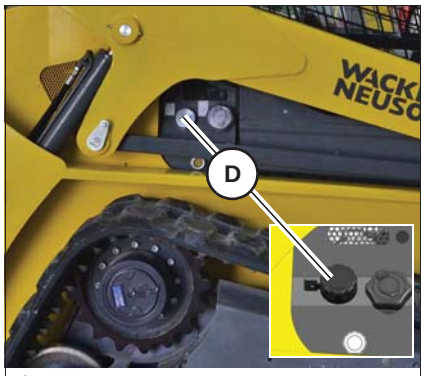


Fig. 289

Hydraulic oil reservoir (version 2):

1. Open filler plug **D**.
2. Add hydraulic oil up to the corresponding mark.
3. Check the hydraulic oil level on sight glass **A**.
4. Add if necessary and check again.
5. Screw in filler plug **D** tightly.

Environment

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

Checking the hydraulic system for leaks

NOTICE

Leaks and damaged pressure lines must be immediately repaired or replaced by a Wacker Neuson service center. This not only increases the operating safety of the machine but also helps to protect the environment.

► Leaks and damaged pressure lines must be immediately repaired or replaced by a Wacker Neuson service center.

► Have hydraulic hoses replaced every 6 years from the date of manufacture, even if they do not seem to be damaged.

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

Checking the condition and age of hydraulic hoses

NOTICE

Leaks and damaged pressure lines must be immediately repaired or replaced by a Wacker Neuson service center. This not only increases the operating safety of the machine but also helps to protect the environment.

► Damaged or leaky pressure lines must be immediately repaired or replaced by a Wacker Neuson service center.

► Have hydraulic hoses replaced every 6 years from the date of manufacture, even if they do not seem to be damaged.

In this respect, we recommend that you observe all the relevant safety regulations for hydraulic lines, as well as the safety regulations regarding accident prevention and occupational health and safety in your country. Also observe DIN 20 066, part 5.

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

Have a line replaced if one of the following problems is detected:

- Damaged or leaky hydraulic seals.
- Worn or torn shells or uncovered reinforcement branches.
- Expanded shells in several positions.
- Entangled or crushed movable parts.
- Foreign bodies jammed or stuck in protective layers.

7.13 Electrical system

Important information regarding the electrical system

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

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

Alternator

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

WARNING

Injury hazard due to malfunctioning batteries!

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

► Fire, open flames and smoking is not allowed.

► Do not place any tools on the battery.

► Wear protective gloves and safety glasses.

► Do not attempt to jump-start the machine if the battery is frozen or if the acid level is low.

► Disconnect the grounding strap of the battery before starting repair work on the electrical system.

NOTICE

Damage to electrical components or the engine electronics.

► When connecting the battery leads, ensure that the poles are not inverted.

► Do not place tools or other conductive articles on the battery – risk of short circuit.

► Do not interrupt voltage-carrying circuits at the battery terminals because of the sparking hazard.

► Do not disconnect the battery while the engine is running.

Environment

Dispose of old batteries in an environmentally friendly manner.

Fuses and relays

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

– *see chapter “ Fuse box” on page 9-6*

Battery charge condition

May only be checked by a Wacker Neuson service center.

Charging the battery

May only be performed by a Wacker Neuson service center.

Replacing the battery

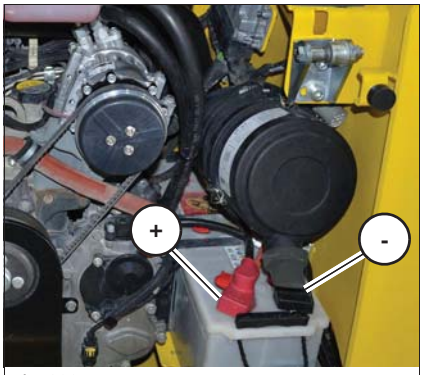


Fig. 290

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

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

Always follow the specific battery safety instructions.

NOTICE

In order to avoid damage to the engine electronics, do not disconnect the battery while the engine is running.

7.14 Heating, ventilation and air conditioning system

Checking/changing the cabin air filter

Have maintenance only performed by a Wacker Neuson service center.

7.15 Washer system

Important information regarding the washer system

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

Checking the fluid level and adding fluid

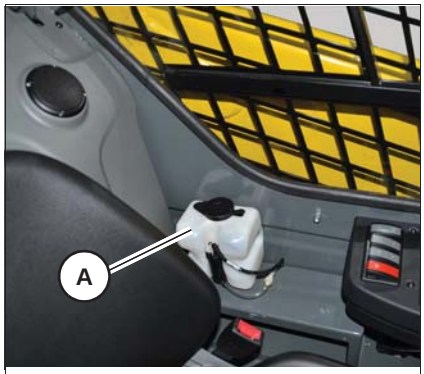


Fig. 291

The tank filler inlet is located on the left in the cabin.

1. Stop and park the machine. Stop the engine. See “Preparing lubrication”.
2. Check the fluid level in tank **A** and add fluid if necessary.

7.16 Axles/traveling drive

Have maintenance only performed by a Wacker Neuson service center.

7.17 Brake system

Have maintenance only performed by a Wacker Neuson service center.

7.18 Tires/tracks

Tire or track wear can vary according to work and ground conditions.

WARNING

Accident hazard due to incorrect repair of the travel gear!

Can cause serious injury or death.

► All repair work on the wheels, tires and tracks may only be performed by a Wacker Neuson service center.

Inspection work

Perform the following maintenance once a day:

- Visual check of the tire condition,.
- Check the tire pressure.
- Check the tires, rims or tracks (outside and inside) for damage and wear.
- Remove foreign bodies from the tire tread.
- Remove dirt, debris, dust, etc. from the tires.

Tires

Fig. 292 (symbolic representation)

Checking the tires at regular intervals increases operational safety and the service life of the tires, and reduces machine downtimes.

For the permissible tire types and pressures *– see chapter “9.5 Tires/tracks” on page 9-3*

Information

Replace the tires after 6 years and dispose of them correctly since the properties of the rubber mixture degrade with increasing age.

Check tire wear and the tightness of the wheel nuts daily. The machine must be parked on horizontal, firm and level ground.

Information

The wheels can damage the threads on the wheel studs if they are handled incorrectly.

► Use suitable assembly tools, such as covering sleeves for the studs, a jack, etc.

Information

Use only tires and rims that are authorized for the machine.

– *see chapter " Tires" on page 9-3*

Wheel change

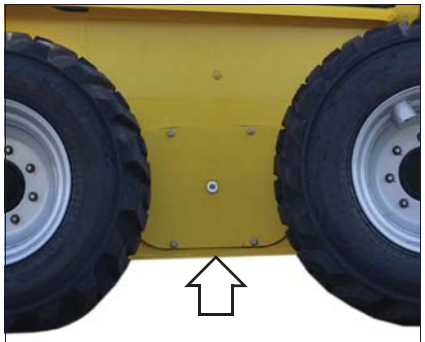


Fig. 293 (symbolic representation)

1. Park the machine on firm, level and horizontal ground.
2. Use wheel chocks to prevent the machine from rolling away.
3. Loosen the wheel nuts of the wheel you want to remove.
4. Safely place a jack with a lift capacity of 5,000 kg (11,023 lbs) under the chassis near the track case.
5. Apply the parking brake.
6. Raise the machine on the side where you want to change a wheel.
7. Check the machine is standing firmly.
8. Secure the machine with jack stands or blocks in appropriate places.

Information

Jack stands/blocks must be positioned so as to avoid machine damage.

9. Loosen and remove the wheel nuts.
10. Remove the wheel.
11. Place the new wheel onto the wheel bolts.
    ? Bear in mind the correct direction of rotation of the tires.
12. Tighten the wheel nuts.
    - Tighten opposite wheel nuts alternately.
13. Remove the jack stands/blocks.
14. Lower the raised side of the machine.
15. Tighten the wheel nuts to:
    - 135 Nm (100 ft.lbs) - up to Q2/2015 (M14x1,5/8.8)
    - 310 Nm (229 ft.lbs) - from Q2/2015 (M 16x1,5/10.9)
    - Tighten opposite wheel nuts alternately.

Information

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

Information

There is more wear on the rear tires than on the front tires. Therefore exchange the front and rear wheels regularly to ensure even wear on all tires.

Checking track tension (ST35/ST45)

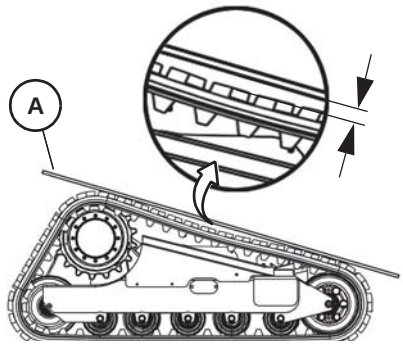


Fig. 294

1. Park the machine on firm, level and horizontal ground.
2. Lower the loader unit to the ground.
3. Stop the engine.
4. Remove the starting key and carry it with you.
5. Place a straight measuring rod **(A)** on the tracks.
6. Adjust the correct track tension if the distance between the upper side of the tracks and the measuring rod is not 20 – 25 mm (0.8 – 1 in).

Correcting track tension (ST35/ST45)

WARNING

Injury hazard due to grease escaping under pressure!

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

- ► Open the lubricating valve only very carefully and do not unscrew it more than a revolution.
- ► Wear protective gloves and safety glasses.
- ► Release grease only as described below.
- ► Contact a Wacker Neuson service center if this does not reduce track tension.

NOTICE

Possible damage to tracks due to overtightening. This causes serious damage to the cylinder and the track.

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

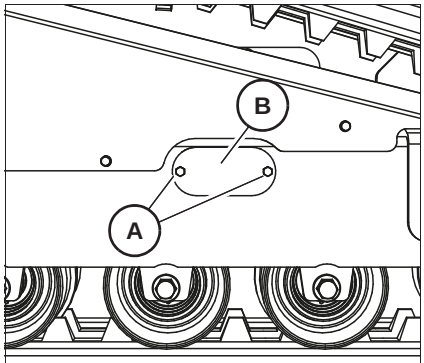


Fig. 295

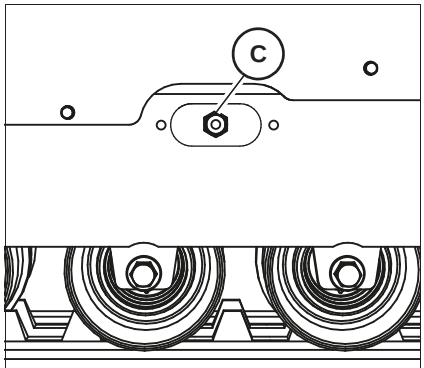


Fig. 296

Increasing tension

1. Park the machine on firm, level and horizontal ground.
2. Raise the machine at the front with the bucket so that only the rear ends of the tracks touch the ground.
3. Stop the engine. Remove the starting key and carry it with you.

Remove screws **A** and cover **B**.

4. Pump the grease into lubricating valve **C** with a grease gun.
5. Lower the machine to the ground.
6. Check the tension is correct by:
   - starting the engine,
   - letting it run at idling speed without any load
   - slowly moving the machine forward and reverse and switching it off again.
7. Check the track tension again.
   ? If it is not correct:
8. Repeat steps 2 – 7. If a track still does not have enough tension after pumping grease again, do not put the machine into operation and get in touch with a Wacker Neuson service center.

Install cover **B**.

Reducing tension

1. Park the machine on firm, level and horizontal ground.
2. Raise the machine at the front with the bucket so that only the rear ends of the tracks touch the ground.
3. Stop the engine. Remove the starting key and carry it with you.
4. Slowly turn lubricating valve **C** a maximum one revolution counterclockwise to release the grease into a suitable container.
   ? The grease flows out of the groove of the lubricating valve.
5. Retighten lubricating valve **C**.
6. Check the tension is correct by:
   - starting the engine,
   - letting it run at idling speed without any load
   - slowly moving the machine forward and reverse and switching it off again.
7. Check the track tension again.
   ? If it is not correct:
8. Repeat steps 2 – 7. If a track still does not have enough tension after pumping grease again, do not put the machine into operation and get in touch with a Wacker Neuson service center.

Install cover **B**.

Environment

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

Checking drive chain tension (SW24/SW28 only)

WARNING

Injury hazard when checking drive chain tension!

Can cause serious injury or death.

► Support the machine with suitable means (wheel chocks, for example).

NOTICE

Possible damage to the drive chain due to wrong chain tension.

► Have the drive chain tension checked every 500 o/h by a Wacker Neuson service center.

1. Park the machine on firm, level and horizontal ground.
2. Lower the loader unit to the ground.
3. Stop the engine.
4. Release the pressure in the hydraulic system *– see chapter " Releasing the pressure in the hydraulic system" on page 5-35*.
5. Remove the starting key and carry it with you.

Front drive chains

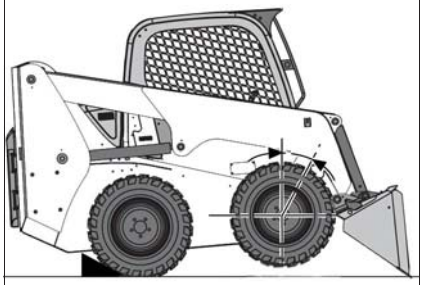


Fig. 297 (symbolic representation)

6. Raise the front wheels with the bucket.
7. Make a mark on the rim.
8. Turn the wheels on the left and right.
9. The wheels may move a maximum 7.5 mm to the left and right.

Information

Use jacks and jack stands.

Rear drive chains

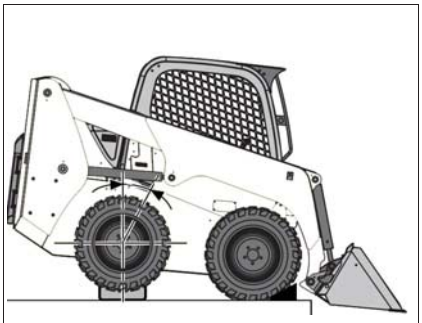


Fig. 298 (symbolic representation)

10. Raise the rear wheels with a crane or jack.
11. Make a mark on the rim.
12. Turn the wheels on the left and right.
13. The wheels may move a maximum 7.5 mm to the left and right.

Information

Use jacks and jack stands.

Information

If the wheels move more than 15 mm, stop machine operation and have the track tension corrected by a Wacker Neuson service center.

7.19 Maintenance of attachments

Important information regarding maintenance of attachments

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for an increased service life of the attachments. Please observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments.

7.20 Maintenance of options

– see chapter "7.2 Maintenance overview" on page 7-2

7.21 Exhaust gas treatment

– see chapter " PMC (American tier IV only)" on page 5-26

7.22 Machine preservation

Machines are partly preserved at the factory (for example in the engine compartment). Operation in an aggressive environment (for example salt deposits) is not allowed.

Notes:

8 Malfunctions

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.

8.1 Engine warning lights (American tier IV)

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 causing a reduction of engine output. Contact a Wacker Neuson service center.
Flashes	On	Engine is about to be shut down, or is already shut down. Stop the engine immediately and contact a Wacker Neuson service center.
Flashes	Flashes	The engine runs but specific engine parameters are outside the permissible range. Stop the engine immediately and contact a Wacker Neuson service center.
On	On	Engine is about to be shut down, or is already shut down. Stop the engine immediately and contact a Wacker Neuson service center.

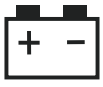
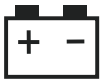
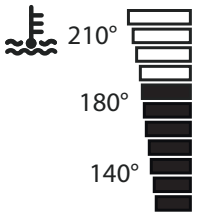
8.2 Engine and engine-oil warning lights (American tier IV)

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 7-34*. If the indicator light still indicates the malfunction, stop the engine and contact a Wacker Neuson service center.
Off	Off	Flashes	The engine oil and engine oil filter replacements are due within the next 20 operating hours.
On	Off	Flashes	The engine oil has reached the total operation time.
Flashes	On	Flashes	The engine oil has exceeded the total operation time. Contact a Wacker Neuson service center. The engine performance is reduced since the maintenance interval is exceeded.

Oil pressure warning light (American tier III)

Oil pressure	Description
Red	
	
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	No malfunction.
On	Low oil pressure (if the oil pressure indicator light illuminates during operation). Check the oil level and add oil if necessary *– see chapter " Adding engine oil" on page 7-34*. If the indicator light still indicates the malfunction, stop the engine and contact a Wacker Neuson service center.

8.3 Malfunctions (display element/multifunctional display)

Symbol		Description	See
Display element	Multifunc-tional display		
Red	--		
!		Wrong pilot control pressure. The work and drive hydraulics are disabled. Stop the engine immediately and contact a Wacker Neuson service center.	--
!		Buzzer sounds. Replace the hydraulic oil filter. Contact a Wacker Neuson service center.	--
!		Buzzer sounds. Dirty air filter. Contact a Wacker Neuson service center.	*7-39*
!		Buzzer sounds. Dirty hydraulic oil radiator. Clean the hydraulic oil radiator.	*7-37*
!		Buzzer sounds. Hydraulic oil too hot. **Note**: If the malfunction is still indicated despite having cleaned hydraulic-oil radiator and added oil, stop the engine and contact a Wacker Neuson service center.	*7-42*
		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.	--
		**American tier IV**: 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.	*7-36* *7-37*
--	SPN 97	Water in fuel system (American tier IV only). Empty the water separator.	*7-31*
--	SPN 107	Air filter polluted (American tier IV only). Stop the machine and contact a Wacker Neuson service center.	--
--	SPN 518970	Speed changeover malfunction.	*5-2*

8.4 General malfunctions

Malfunction	Possible cause	Remedy	See
Engine does not start or is not easy to start	Empty fuel tank	Refueling	*7-28* *7-29*
	Malfunctioning or empty battery	Replace the battery	*7-46*
	Malfunctioning fuse	Check the fuse	*9-6*
Engine starts, but does not run smoothly or dies	Air in fuel system	American tier III: let the engine run	*7-29*
		American tier IV: bleed the fuel system	*7-30*
Black engine smoke	Dirty air filter	Contact a Wacker Neuson service center	*7-39*
Blue engine smoke	Oil level too high	Contact a Wacker Neuson service center	--
Machine pulls to the right or left	Wrong track tension	Tighten tracks correctly	*7-50*
	Foreign bodies stuck in track	Remove foreign bodies	--
	Uneven wear of tracks	Contact a Wacker Neuson service center	--
None of the hydraulic functions can be operated	Seat bar raised	Lower the seat bar	--
Speed ranges cannot be changed	Malfunctioning fuse	Check the fuse	*9-6*
Electrical components do not work			
Fan does not run	Malfunctioning fuse	Check the fuse	*9-6*
	Electrical error	Contact a Wacker Neuson service center	--
Reduced or no heat dissipation capacity	Very dirty condenser	Contact a Wacker Neuson service center	--
	Not enough refrigerant in the system		
	Malfunctioning or insufficiently tightened V-belt		
	Dirty condenser	Clean the condenser	*7-37*
	Temperature controller set to heating	Set temperature controller to ventilation	*5-24*
Reduced heating output or none at all	Very dirty condenser	Contact a Wacker Neuson service center	--
	Malfunctioning thermostat		
	Temperature controller set to ventilation	Set temperature controller to heating	*5-24*
Loss of refrigerant	Loose hose connection	Contact a Wacker Neuson service center	----
	Leak in system		
Very loud system	Malfunctioning or insufficiently tightened V-belt	Contact a Wacker Neuson service center	--
	Damaged air conditioning compressor		
	Damaged fan motor		

Engine error messages

Observe the following if an error is displayed in the multifunctional display:

Machine travel or operation is prohibited in case of major errors

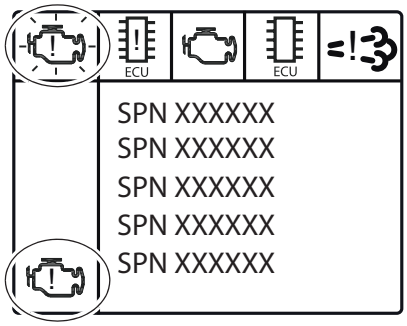
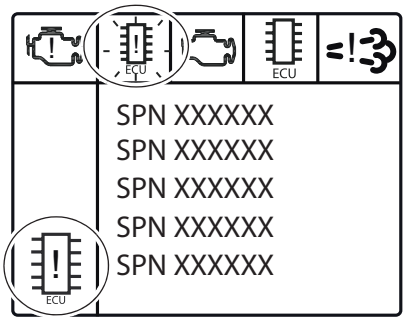
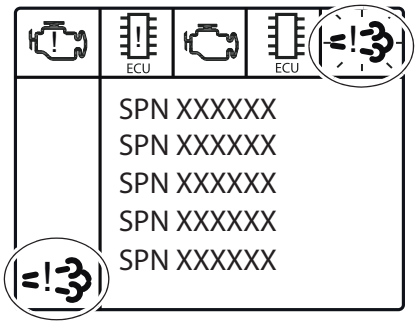
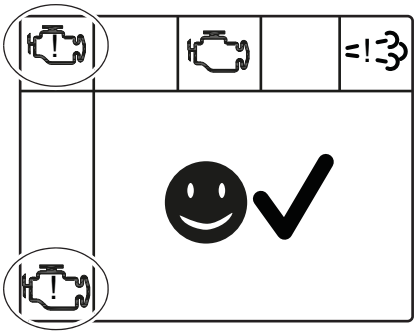
- Engine performance is reduced.
- Stop and park the machine.
- Contact a Wacker Neuson service center and have the malfunction rectified.

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

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

Information

Possible errors are displayed in the multifunctional display for a few seconds when the machine is started.

Symbol	
	**Engine error** Indicates engine errors.
	**Machine error** Indicates machine errors.
	**PMC data** Indicates PMC errors.
	**No error** If there is no error, the marked symbol appears in the service tool “Engine error/machine status/PMC data”. The corresponding symbol flashes and is displayed at the bottom in addition.

Notes:

9 Technical data

9.1 Model designations and trade names

Machine model/machine designation	Trade name
S04-01	SW24
S04-02	ST35
S04-03	SW28
S04-04	ST45

9.2 Engine

Engine	American Tier III	American Tier IV
Product	Perkins	
Type	1104D-44T	854F-E34TTF
Design	Water-cooled 4 stroke turbodiesel engine	
Number of cylinders	4	
Displacement	4399 cm³ (289 in^3)	3387 cm³ (207 in^3)
Nominal bore and stroke	105 x 127 mm (4.1 x 5 in)	99 x 100 mm (3.9 x 3.9 in)
Output	62.5 kW at 2400 rpm (83.8 hp at 2,400 rpm)	55 kW at 2500 rpm (73.8 hp at 2,500 rpm)
Max. torque	354 Nm (261 ft.lbs) @ 1,400 rpm	291 Nm (215 ft.lbs) at 1600 rpm
Max. engine speed without load	2520 +/− 50 rpm	2625 +/− 50 rpm
Idling speed	1000 +/− 50 rpm	
Fuel injection system	Direct injection	
Starting aid	Glow plugs (preheating time 15 seconds)	
Exhaust values according to	EU NRMM 97/68/EC European Tier 3A US EPA 40 CFR Part 89 American Tier III UN/ECE-R120	EU NRMM 97/68/EC European Tier 4 US EPA 40 CFR Part 89 American Tier IV final UN/ECE-R120

9.3 Traveling drive/axles

Traveling drive	SW24/28	ST35/45
Design	Infinitely variable axial piston pump with speed-sensitive control	
Flow rate	2 x 115 l/min (2 x 30 gal/min)	
Max. operating pressure	407 bar (5,903 psi)	365 bar (5,294 psi)
Starting speed	1000 rpm	
Boost pump	**SW24/28**	**ST35/45**
Design	Gear	
Oil flow	19 cm^3/min^{-1} (1.16 in^3/rpm)	
Charging/boost pressure	27 bar (392 psi)	
Hydraulic motor	**SW24/28**	**ST35/45**
Design	Radial piston motor with integrated parking brake	Axial piston motor with swash plate
Max. capacity in 1st speed	680 cm^3/rpm (41.5 in^3/rpm)	50.9 cm^3/rpm (3.1 in^3/rpm)
Max. capacity in 2nd speed	410 cm^3/rpm (25 in^3/rpm)	30.3 cm^3/rpm (1.8 in^3/rpm)
Flushed with flush valve	10 l/min at 27 bar (2.6 gal/min at 392 psi)	15 l/min at 27 bar (4 gal/min at 392 psi)
Transmission ratio	1.66	27

9.4 Brakes

Service brake	SW24/28/ST35/45
Design	Hydrostatic
Location	Traveling drive
Effect	Service brake via hydrostatic closed circuit by means of neutral position of pump
Parking brake	**SW24/28/ST35/45**
Design	Manual, negative-action electrohydraulic multi-disc brake
Location	On either side of hydraulic motor
Effect	Hydraulic release; braked if no pressure

9.5 Tires/tracks

Tires

Tire type	Tire size	Tire pressure	Load-bearing capacity
Standard	12-16.5	4.50 bar (65 psi)	10 PR
Option	12-16.5	4.48 bar (65 psi)	10 PR
Severe Duty Option	12-16.5	5.6 bar (81 psi)	12 PR
Solid Boss Option	xxx	xxx bar (xxx psi)	xxx

Tracks

Rubber track	
Track width (standard)	450 mm (17.8 in)
Track width (narrow track option)	320 mm (12.6 in)
Number of tread rollers	5

9.6 Steering system

– see chapter “ Basic control lever functions (ISO and H controls)” on page 5-33

9.7 Operating hydraulics

Operating hydraulics	SW24/28/ST35/45
Pump design	Gear
Flow rate	85 l/min at 2500 rpm (22.5 gal/min at 2,500 rpm)
Control valve	3 sections
Max. operating pressure	230 bar (3,336 psi)
Secondary protection bucket cylinder	275 bar (3,989 psi) (base/rod)
Secondary protection for loader unit cylinder	260 bar (3,771 psi) (base)
Filter	Return and pressure filter

Speed

Maximum speed	SW24/28	ST35/45
Speed range 1/2	11/18 kph (7/11 mph)	7/12 kph (4/7 mph)

High Flow (option)

Auxiliary hydraulics	SW24/28/ST35/45
Hydraulic pump flow rate	85 l/min at 2500 rpm (22.5 gal/min at 2,500 rpm)
Max. operating pressure	230 bar (3,336 psi)
Operation	Electroproportionally/hydraulically controlled spool valve on control lever
High Flow version	**SW24/28/ST35/45**
Hydraulic pump flow rate	135 l/min at 2500 rpm (35.7 gal/min at 2,500 rpm)
Max. operating pressure	230 bar (3,336 psi)

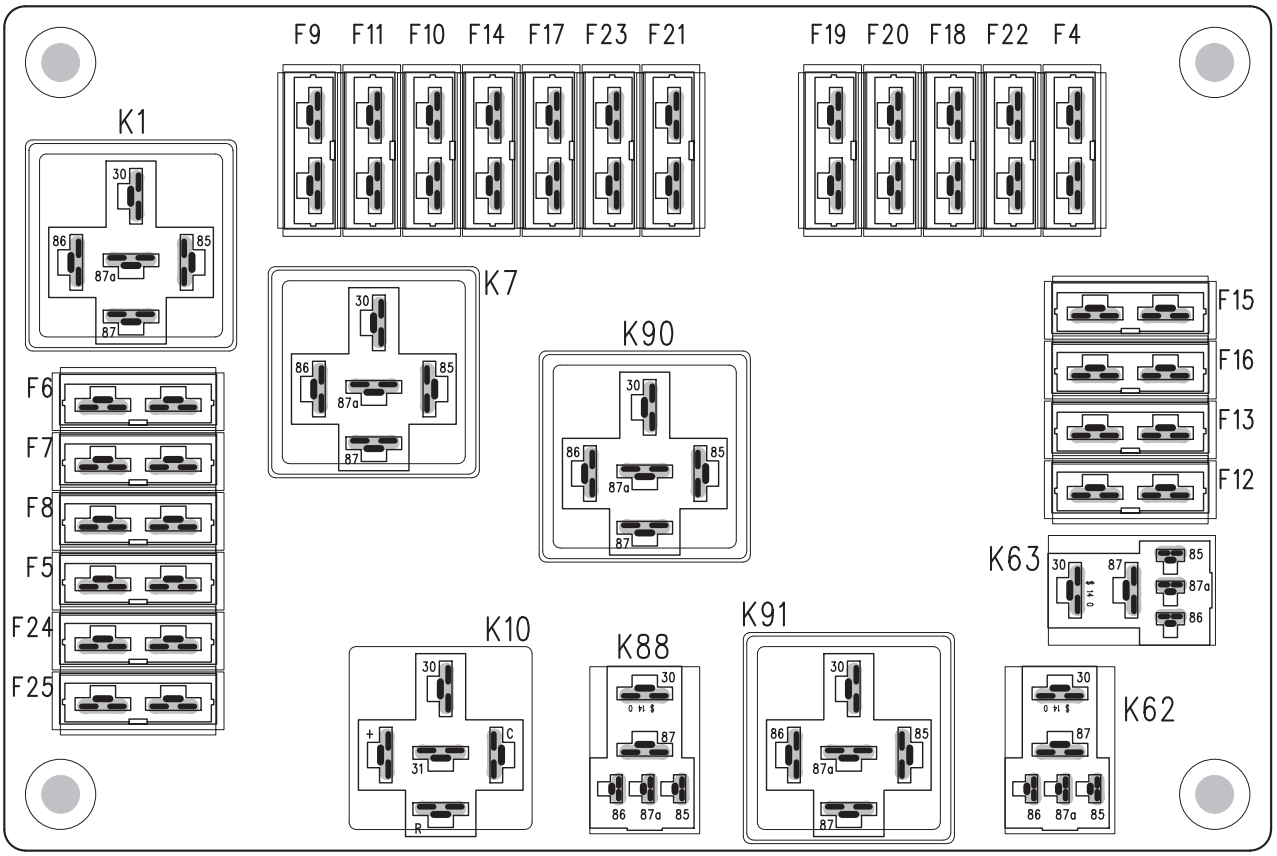
9.8 Electrical system

Electrical components	American Tier III	American Tier IV
Alternator	12 V/100 A	12 V/120 A
Starter	12 V/3.2 kW	
Battery[1]	12 V/100 Ah	
Battery[1] (winter package option)	12 V/120 Ah	
12 V socket	15 A max.	

1. According to DIN EN 50342, DIN IEC 60095-2

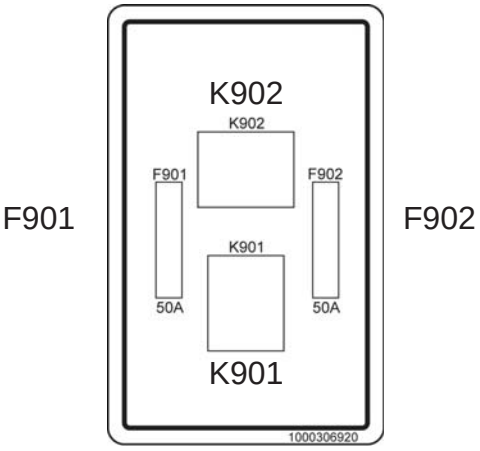
Fuse box

The fuse box is located behind the operator seat.



Main fuse box

The main fuse box is located at the upper right in the engine compartment.



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Fuses/ relays	Rated current	Protected circuits
F901	50A	Main engine fuse
F902	50A	Main starter fuse
F4	10A	Controller, control lever inputs, back up signal
F5	5A	ECU supply
F6	15A	ECU supply
F7	15A	ECU supply
F8	10A	Preheater
F9	10A	Main ECU relay, internal controller, Telematic, drive interlock, alarm
F10	30A	Air conditioning
F11	15A	Starter
F12	15A	Wiper
F13	15A	Heating
F14	15A	12 V socket
F15	15A	Working lights
F16	15A	Working lights
F17	10A	Rotating beacon
F18	10A	ECU engine
F19	10A	Not assigned
F20	10A	Display element, controller 15, controller inputs
F21	20A	Controller
F22	10A	Not assigned
F23	10A	Hazard warning system
F24	10A	Parking light
F25	10A	Low beam
K901	Relay for starter plus	
K902	Preheating relay (American tier III only)	
K1	Main engine relay	
K7	Start high-current relay	
K88	Horn relay	
K90	Air conditioning relay	

Bulbs

	SW24/28/ST35/45
Working lights/roof lights	H3 12 V/55 W
Interior light	Festoon lamp 12 V/5 W
Rotating beacon	H1 12 V/55 W

9.9 Tightening torques

General tightening torques

Property class	8.8	10.9	12.9	8.8	10.9
Screw dimensions	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)
M5	5.5 (4)	8 (6)	10 (7)	5 (4)	7 (5)
M6	10 (7)	14 (10)	17 (13)	8.5 (6)	12 (9)
M8	25 (18)	35 (26)	42 (31)	20 (15)	30 (22)
M10	45 (33)	65 (48)	80 (59)	40 (30)	59 (44)
M12	87 (64)	110 (81)	147 (108)	69 (51)	100 (74)
M14	135 (100)	180 (133)	230 (170)	110 (81)	160 (118)
M16	210 (155)	275 (203)	350 (258)	170 (125)	250 (184)
M18	280 (207)	410 (302)	480 (354)	245 (181)	345 (254)
M20	410 (302)	570 (420)	690 (509)	340 (251)	490 (361)
M22	550 (406)	780 (575)	930 (686)	460 (339)	660 (487)
M24	710 (524)	1000 (738)	1190 (878)	590 (435)	840 (620)
M27	1040 (767)	1480 (1092)	1770 (1305)	870 (642)	1250 (922)
M30	1420 (1047)	2010 (1482)	2400 (1770)	1200 (885)	1700 (1254)

Tightening torques/fine-pitch thread					
Property class	8.8	10.9	12.9	8.8	10.9
Screw dimensions	Screws according to DIN 912, DIN 931, DIN 933, etc.			Screws according to DIN 7984	
	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)	Nm (ft.lbs.)
M8X1.0	25 (18)	37 (28)	43 (32)	22 (16)	32 (24)
M10X1.0	50 (37)	75 (55)	88 (65)	43 (32)	65 (48)
M10X1.25	49 (36)	71 (52)	83 (61)	42 (31)	62 (46)
M12X1.25	87 (64)	130 (96)	150 (111)	75 (55)	110 (81)
M12X1.5	83 (61)	125 (92)	145 (107)	72 (53)	105 (77)
M14X1.5	135 (100)	200 (148)	235 (173)	120 (89)	175 (129)
M16X1.5	210 (155)	310 (229)	360 (266)	180 (133)	265 (195)
M18X1.5	315 (232)	450 (332)	530 (391)	270 (199)	385 (284)
M20X1.5	440 (325)	630 (465)	730 (538)	375 (277)	530 (391)
M22X1.5	590 (435)	840 (620)	980 (723)	500 (369)	710 (524)
M24X2.0	740 (546)	1070 (789)	1250 (922)	630 (465)	900 (664)
M27X2.0	1100 (811)	1550 (1143)	1800 (1328)	920 (679)	1300 (959)
M30X2.0	1500 (1106)	2150 (1586)	2500 (1844)	1300 (959)	1850 (1364)

9.10 Coolant

Compound table

Outside temperature[1]	Distilled Water	Coolant[2]
Up to °C (°F)	% by volume	% by volume
−37 (−34.6)	50	50

1. Use the 1:1 concentration for warm outside temperatures, too, to ensure protection against corrosion, cavitation and deposits.
2. Do not mix the coolant with other coolants.

9.11 Sound pressure level

Canopy: 89 dB(A)

Cabin with closed front door: 82 dB(A)

9.12 Vibration

Vibration	
Effective acceleration value for the upper extremities of the body (hand-arm vibration)	< Trigger value < 2.5 m/s^2
Effective acceleration value for the body (whole-body vibration)	< 0.5 m/s^2

Vibration values indicated in m/s^2.

Directive 2002/44/EC of European Parliament and Coucil on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

Indications on hand-arm vibration

Hand-arm vibration is less than 2.5 m/s^2 during correct machine operation.

Indications on whole-body vibration

Whole-body vibration is less than 0.5 m/s^2 during correct machine operation.

Uncertainty of measurement K has been taken into account for the specified values.

The degree of vibration is influenced by various parameters.

Some of them are listed below:

- Operator: training, behavior, working method and strain.
- Work site: organization, preparation, surroundings, weather conditions and material.
- Machine: version, seat quality, quality of suspension system, attachments and condition of attachments.

Precise indications on the vibration degrees cannot be made for the machine.

Determination of vibration level for the three vibration axes.

- Under typical operating conditions, use the average vibration values measured.
- In order to obtain the estimated vibration value for an experienced operator on level ground, subtract the factors from the average vibration value.
- In case of an aggressive working method or difficult terrain, add the environmental factors to the average vibration level in order to obtain the estimated vibration level.

Note:

For further vibration indications, refer to the indications in ISO/TR 25398 Mechanical Vibrations – Directive on Estimation of whole-body vibration when driving earth moving machines. This publication uses measuring values of international institutes, organizations and manufacturers. It contains information on whole-body vibration for operators in earth moving machines. For more information on the vibration values of the machine, refer to Directive 2002/44/EC of European Parliament and Coucil on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

It explains the values for vertical vibration under heavy operating conditions.

Directives on reduction of vibration values in earth moving machines:

- Perform correct adjustments and maintenance 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 when traveling across rough terrain.
- Reduce vibration to a minimum during long work cycles or when traveling over long distances:
  - Use a machine with a suspension system (operator seat, for example).
  - Enable the hydraulic oscillation damping if the machine is equipped with tracks.
  - If the machine is not equipped with hydraulic oscillation damping, reduce your speed to avoid bumps and jolts.
  - Load the machine on a truck or trailer to move between work sites.
- Other risk factors can affect 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 (if equipped) to ensure optimal visibility so you can adopt an upright seating position.
  - Provide breaks to avoid sitting for long periods.
  - Do not jump off the cabin.
  - Picking up and raising loads repeatedly must be limited to a minimum.

Reference:

The vibration values and calculations are based on the indications made in ISO/TR 25398 Mechanical Vibrations – Guidelines for assessment of exposure to whole-body vibration when operating earth moving machines.

The harmonized data comply with measurements made by international institutes, organizations and manufacturers. This publication offers information on the calculation of whole-body vibrations for operators of earth moving machines. This method is based on vibration measurements under real operating conditions for all machines. Read the original guidelines. This chapter summarizes part of the legal regulations. However, its aim is not to replace the original references. Other parts of this document are based on information of the United Kingdom Health and Safety Executive.

For more information on vibration, refer to Directive 2002/44/EC of European Parliament and Coucil on minimum health and safety requirements regarding exposure of workers to risks arising from physical agents (vibration).

Your Wacker Neuson dealer provides information on other machine functions reducing vibration and on safe operation.

9.13 Weight

Machine weights

Weight		
Transport weight[1]	SW24 American Tier III	3247 kg (7,157 lbs)
	SW24 American Tier IV	3200 kg (7,054 lbs)
	SW28 American Tier III	3568 kg (7,866 lbs)
	SW28 American Tier IV	3521 kg (7,762 lbs)
	ST35 American Tier III	4228 kg (9,322 lbs)
	ST35 American Tier IV	4181 kg (9,218 lbs)
	ST45 American Tier III	4552 kg (10,035 lbs)
	ST45 American Tier IV	4505 kg (9,932 lbs)
Operating weight	SW24 American Tier III[2]	3615 kg (7,971 lbs)
	SW24 American Tier IV[2]	3568 kg (7,867 lbs)
	SW28 American Tier III[2]	3937 kg (8,679 lbs)
	SW28 American Tier IV[2]	3890 kg (8,575 lbs)
	ST35 American Tier III[3]	4606 kg (10,155 lbs)
	ST35 American Tier IV[3]	4560 kg (10,051 lbs)
	ST45 American Tier III[3]	4930 kg (10,869 lbs)
	ST45 American Tier IV[3]	4883 kg (10,765 lbs)

1. Transport weight: machine + 10 % fuel capacity.
2. Operating weight: machine + full fuel tank + 1900 mm bucket + operator (75 kg/165 lbs).
3. Operating weight: machine + full fuel tank + 2030 mm bucket + operator (75 kg/165 lbs).

Information

The actual machine weight depends on the selected options and must be read off the type label.
Add the weight of all subsequently installed equipment to the weight of the machine.
Weight indications can vary by +/− 2 %.

Weight of attachments

– see “Fields of application and use of attachments” on page 3-6

Breakout forces

According to ISO 6015

	Max. breakout force at bucket tooth
SW24/SW28/ST35/ST45	31,1 kN (7,000 lbf)

Ground clearance/ground pressure

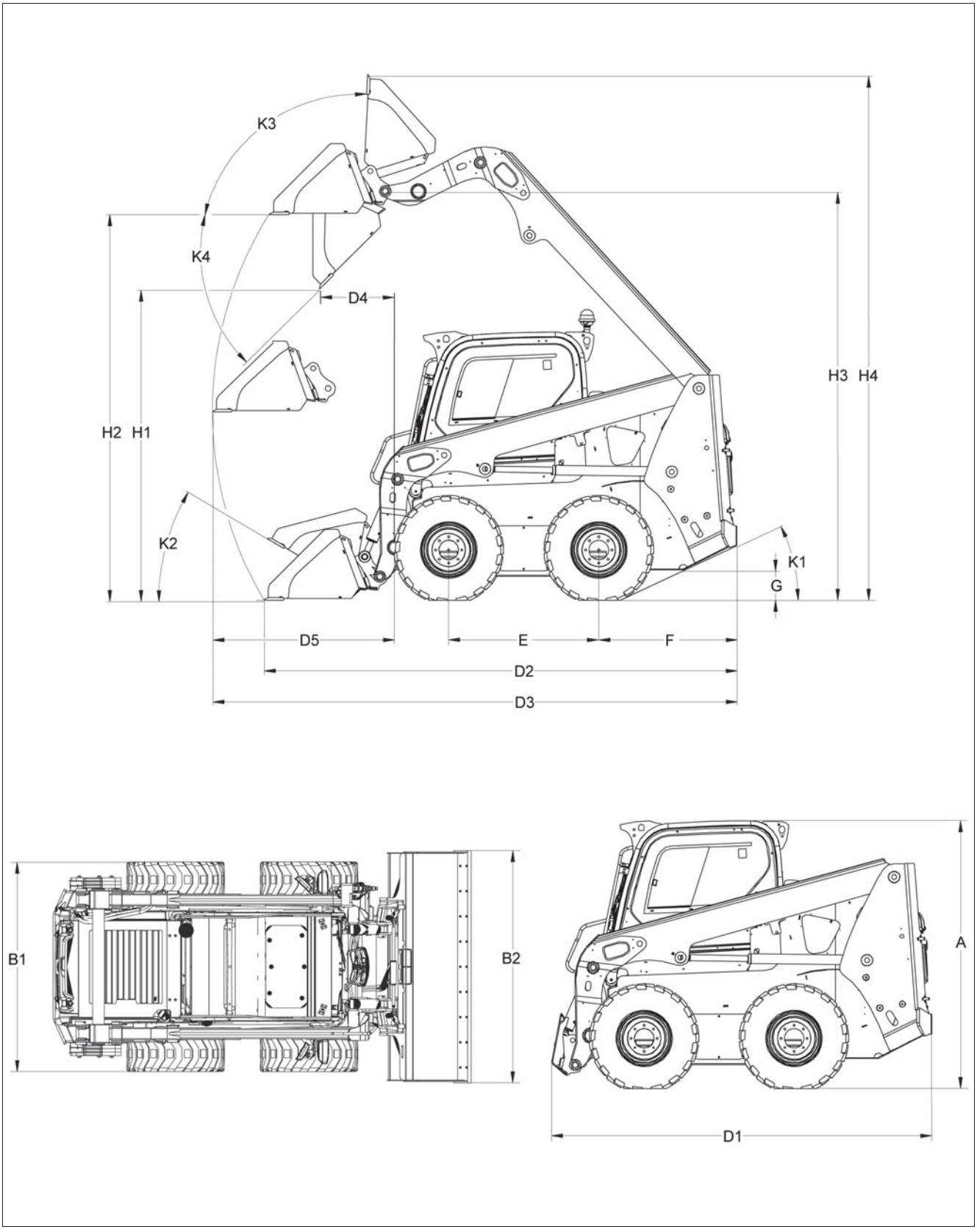
Ground clearance/ground pressure		
Ground clearance	SW24	235 mm (9.3 in)
	SW28	230 mm (9.1 in)
	ST35	255 mm (10 in)
	ST45	250 mm (10 in)
Ground pressure	SW24	--
	SW28	--
	ST35	0,31 kg/cm^2 (4.4 lbs/in^2)
	ST 35 Narrow tracks	0,44 kg/cm^2 (6.25 lbs/in^2)
	ST45	0,32 kg/cm^2 (4.4 lbs/in^2)
	ST45 Narrow tracks	0,45 kg/cm^2 (6.4 lbs/in^2)

9.14 Payload/stability

Not available.

Dimensions

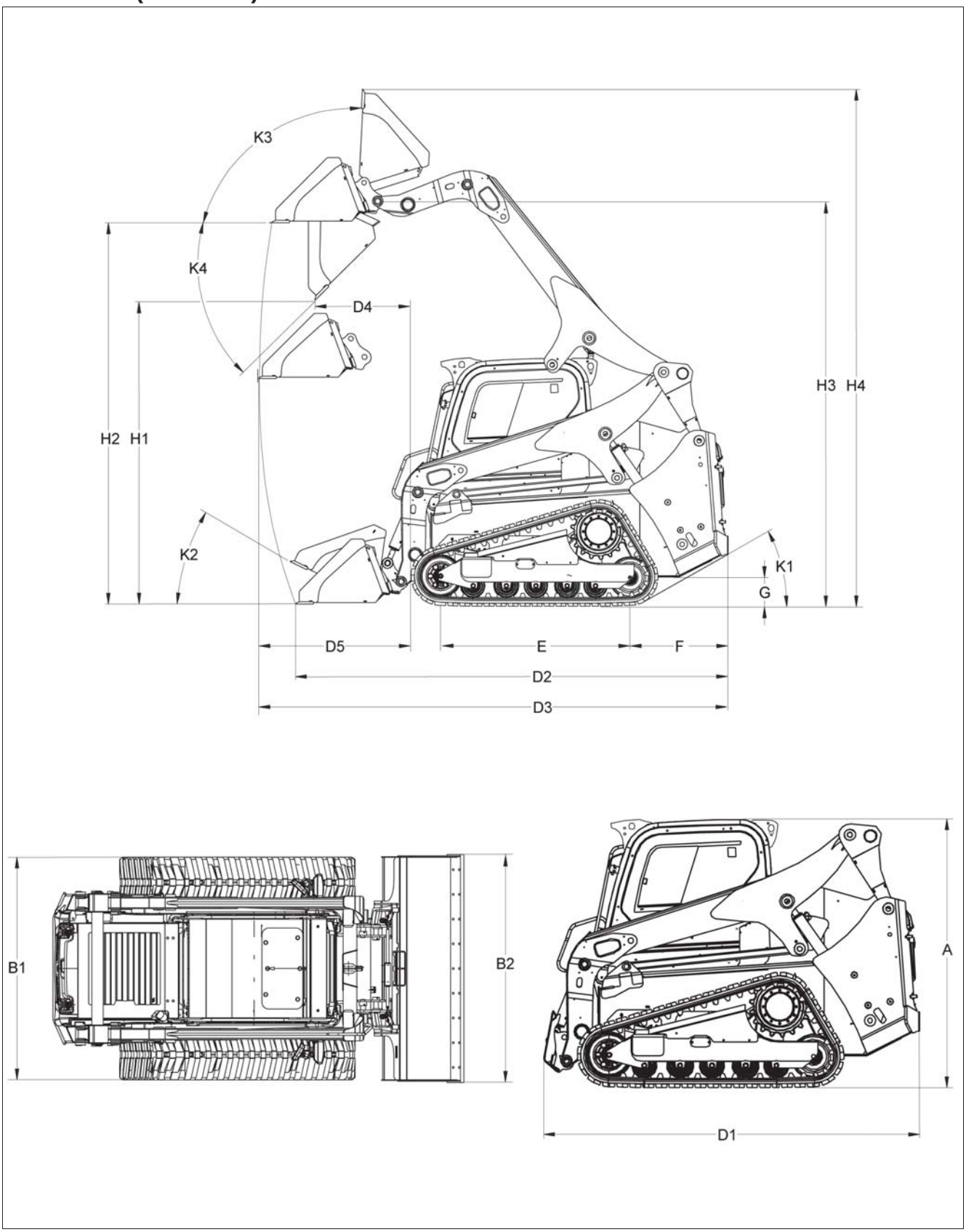
SW24/28 (overview)



	Values with bucket 1900 mm (75 in)	SW24 mm (in/ft'-in")	SW28[1] mm (in/ft'-in")
A1	Height	2088 (82)	
B1	Width incl. wheels (for tires 12x16.5)	1830 (72)	
B2	Bucket width	1900 (75)	
D1	Length without attachment	2945 (9'-8")	2945 (9'-8")
D2	Length	3660 (12')	3660 (12')
D3	Maximum length	4062 (13'-4")	3968 (13')
D4	Reach	585 (23)	900 (35)
D5	Maximum reach	1405 (55)	1311 (52)
E	Wheelbase	1164 (46)	
F	Rear overhang	1069 (42)	
G	Ground clearance	240 (9)	235 (9)
H1	Maximum tilt-out height	2420 (95)	2720 (8'-11")
H2	Topmost bucket position	3000 (9'-10")	3240 (10'-8")
H3	Maximum height up to bucket joint	3180 (10'-5")	3420 (11'-3")
H4	Maximum height	4083 (13'-5")	4331 (14'-3")
K1	Departure angle	25°	
K2	Tilt-in angle on the ground	31°	30°
K3	Tilt-in angle	93°	100°
K4	Tilt-out angle	45°	40°

1. Symbolic SW28 figure : machine is equipped with a vertical loader unit system.

ST35/ST45 (overview)



	Values with bucket 2030 mm (80 in)	ST35[1] mm (in/ft'-in")	ST45 mm (in/ft'-in")
A1	Height	2088 (82)	2108 (83)
B1	Width incl. tracks	1982 (78)	
B1	Width incl. narrow tracks	1851 (72.9)	
B2	Bucket width	2030 (80)	
D1	Length without attachment	2940 (9'-8")	2940 (9'-8")
D2	Length	3660 (12')	3660 (12')
D3	Maximum length	4062 (13'-4")	3968 (13')
D4	Reach	585 (23)	900 (35)
D5	Maximum reach	1382 (54)	1289 (51)
E	Wheelbase	1600 (63)	
F	Rear overhang	830 (33)	
G	Ground clearance	240 (9)	250 (10)
H1	Maximum tilt-out height	2420 (95)	2720 (8'-11")
H2	Topmost bucket position	3000 (9'-10")	3240 (10'-8")
H3	Maximum height up to bucket joint	3200 (10'-6")	3440 (11'-3")
H4	Maximum height	4103 (13'-6")	4351 (14'-3")
K1	Departure angle	30°	
K2	Tilt-in angle on the ground	31°	30°
K3	Tilt-in angle	93°	100°
K4	Tilt-out angle	45°	40°

1. Symbolic ST35 figure : machine is equipped with a radial loader unit system.

Notes:

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Wacker Neuson Linz GmbH keep abreast of the latest technical developments and constantly improve their products. For this reason, we may from time to time need to make changes to diagrams and descriptions in this documentation which do not reflect products that have already been delivered and that will not be implemented on these machines.

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

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