Operator's manual Telehandler TH412





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

The cover features the machine with possible optional equipment.



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EIDEMANN

of Conformity Declaration С Ш

Declaration of conformity

Figure of EC declaration of conformity supplied with the machine

Manufacturer

Weidemann GmbH, Mühlhäuser Weg 45-49, 34519 Diemelsee, Germany Product

Vehicle designation	Telescopic Loader
Type/Version	T4512
Trade name	TH412
Chassis number	
Power kW at rated speed min ⁻¹	22.6/29.9 kW
Measured sound power level dB(A)	60.3
Guaranteed sound power level dB(A)	101

Conformity assessment procedure

In accordance with 2000/14/EC Annex VIII

Office named in the procedure

Europäisch notifzierte Stelle, Kenn-Nr. 0515 DGUV Test, Prüf- und Zertifizierungsstelle, Landsberger Straße 309, 80687 München, Germany Fachbereich Bauwesen

Directives and standards applied

We hereby declare that this product satisfies the relevant provisions of these Directives:

DIN EN 1459 2006/42/EG, 2000/14/EG, 2014/30/EU, DIN EN ISO 12100 and

Authorised representative for the compilation of the technical file

Jolanthe Wydra, secretary to the head of technology Weidemann GmbH Mühlhäuser Weg 45-49 34519 Diemelsee Germany

Diemelsee-Flechtdorf,

Bond

Bernd Apfelbeck Director

Klaus Pohl Director

Translation of the Original Declaration of Conformity



EG

Notes:





1 Preface

1.1 Operator's manual

Information on this Operator's Manual

This Operator's Manual describes how to operate and perform maintenance on the machine. It provides operating and maintenance personnel with the necessary knowledge of the machine's functional characteristics to ensure safe handling, correct maintenance, inspection and cleaning, and to ensure that the technical safety regulations for the machine are complied with.

Your own safety, as well as the safety of others, depends to a great extent on how the machine is moved and operated. Therefore, carefully read and understand this Operator's Manual prior to the first drive. By reading the Operator's Manual, the operator familiarizes himself more quickly with the machine, and uses it more safely and efficiently.

If required, the user/owner of the machine must supplement the Operator's Manual with instructions and regulations regarding environmental protection and national accident prevention regulations. Operational safety and readiness of the machine do not only depend on the operator's skill, but also on maintenance and servicing of the machine. This is why regular maintenance and servicing is absolutely necessary. An overview of the maintenance and service work can be found in chapter *Cleaning and maintenance on page 7-23*. An inspection booklet is also supplied with the machine.

i Information

The maintenance and repair work that is not specified in this Operator's Manual may only be performed by an authorized service center.



The Operator's Manual must be read and applied by all persons involved in work with or on the machine, for example, with regard to:

- Operation, including setting up, rectifying malfunctions during operation, maintenance, disposal of auxiliary and operating material, and disposal of the entire machine.
- Repairs (inspection, maintenance).
- Transportation.

Your dealer and the Wacker Neuson service team will be happy to answer any questions you may have on this Operator's Manual.

All technical indications in this Operator's Manual refer to series models tested under standard operating conditions for Central Europe and describe the standard functions of these series models. The equipment and its functional modes and accessories depend on the relevant model and the product options, as well as on the national requirements. Illustrations may show optional/additional equipment that is not mentioned in the text or not supplied as standard. The descriptions, illustrations, weight indications and technical data are not binding and correspond to the state of the art at the time of printing. We must reserve the right to make changes without prior notice with regard to design, equipment, appearance and technology on account of the ongoing further development of the products.

At the place of use, always observe all safety and warning instructions, information labels, legal regulations and regulations of the German social insurance against occupational accidents.

Please get in touch with the Wacker Neuson service department if you require any special functions that are only available using additional components and/or under special conditions.

We will be happy to answer questions and provide information on the conditions under which the product and the circumstances allow any special functions.

We recommend performing test work in safe conditions if the load capacity or mode of action of our products give rise to concern under specific circumstances. travel direction.

i

Explanation of symbols

WACKER

Information



This symbol identifies warning instructions and is used for alerting against potential personal hazards. Special attention must be paid to the warning instruction texts following this symbol.

The word "loader unit" is used in this Operator's Manual for the loader unit with an attachment installed on it.

"Left" and "right" are always used as seen in the forward

Symbol	Explanation
•	Identification of general activities
-	Identification of subdivision and order of activity
•	Identification of the results of an enu- meration
•	Identification of the results of an activity
1	Identification of descriptions referring to figures
1	Identification of control and display ele- ments. The numbering applies to the entire Operator's Manual



Abbreviations

Abbreviation	Explanation
poss.	possibly
if nec.	if necessary
etc.	et cetera
e.g.	for example
max.	maximum
min.	minimum
approx.	approximately
Fig.	Figure
ltem	Position number in figures
(option)	Optional/additional equipment on machine
and much more	And much more
incl.	including, inclusive

Conversion tables

Values in brackets are values converted according to the tables below. The units of measurement are American units. The values are rounded up or down on the basis of good commercial practice.

Volume unit	
1 cm ³	0.061 in ³
1 m ³	35.31 ft ³
1 ml	0.034 US fl.oz.
11	0.26 gal
1 l/min	0.26 gal/min

Unit of length	
1 mm	0.039 in
1 m	3.28 ft



Weight		Torque	
1 kg	2.2 lbs.	1 Nm	0.74 ft.lbs.
1 g	0.035 oz.		
		Speed	
Pressure		1 kph	0.62 mph
1 bar	14.5 psi		
1 kg/cm ³	14.22 lbs/in ³		
		Acceleration	
		1 m/s ²	3.28 ft/s²
Force/output			
1 kN	224.81 lbf.		
1 kW	1.34 hp		
1 PS	0.986 hp		

1 Preface



1.2 Warranty and liability

Information on warranty and liability



The CE mark shows that the machine has been manufactured in accordance with the applicable EC Directives.

i) Information

The manufacturer/supplier shall be not liable for damage resulting from use other than designated. Alone the user/ owner shall bear the risk. The Operator's Manual must always be on the machine or at the place of use. Store the Operator's Manual in the place provided for it on the machine (*Fig. 1*).



Exemption from warranty and liability

Despite taking great care, we cannot rule out the possibility of deviations from drawings or dimensions, calculation errors, printing errors or incompleteness in this Operator's Manual. Therefore, we shall accept no liability for the correctness and completeness of the information we have provided in this Operator's Manual. The options described in this Operator's Manual are not available in all countries. We warrant our products to be in perfect running condition within the framework of our General Terms and Conditions of Business. We basically do not offer any further guarantees. Any further liability beyond the scope of our General Terms and Conditions of Business is excluded.

Observe the following:

- Do not perform any modifications on the machine.
- Use only attachments approved by Wacker Neuson for the machine.
- The machine must only be put into operation, operated and serviced as described in the Operator's Manual.
- Use only the machine if all safety and protection devices are intact.
- Observe the monitoring systems during operation.
- Repairs may only be performed by authorized service centers.
- Follow the instructions given in the Operator's Manual carefully.

WACKER NEUSON

Notes:



2 Safety

2.1 Safety symbols and signal words

Explanation

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

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

Consequences in case of non-observance.

► Avoidance of injury or death.

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

Consequences in case of non-observance.

► Avoidance of injury or death.



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

Consequences in case of non-observance.

Avoidance of injury.

NOTICE

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

► Avoidance of damage to property.



2.2 Qualification of operating personnel

Owner's duties

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

Required knowledge of operator

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



Preparatory measures for the operator

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



2.3 Conduct

Prerequisites for operation

- The vehicle has been designed and built in accordance with state-of-the-art standards and the recognized safety regulations.
 Nevertheless its use can cause danger to the operator or other persons, or damage to the vehicle.
- Store this Operator's Manual in the place provided for this in or on the vehicle. Immediately replace a damaged or illegible Operator's Manual and any supplements to it.
- The vehicle must only be operated in accordance with its designated use and the instructions set forth in this Operator's Manual.
- The operator and owner are obligated not to put into operation or operate a damaged or malfunctioning vehicle.
 - If a damage or malfunction occurs during operation, put the vehicle out of operation immediately and secure it against restart.
 - Have all malfunctions jeopardizing the safety of the operator or other persons immediately repaired by an authorized service center.
- Do not put the vehicle into operation or operate it after an accident; have it inspected for damage by an authorized service center.

- Have the seat belt replaced by an authorized service center after an accident, even if there is no visible damage.
- Cabin and protective structures
- Remove all dirt, snow and ice from climbing aids (for example, handholds, footholds, handrails).
- The owner is responsible for requiring the operating and maintenance personnel to wear protective clothing and equipment as required by the circumstances.

2.4 Operating

Preparatory measures

WACKER

- Operation is only allowed with correctly installed and intact protective structures.
- Keep the vehicle clean. This reduces injury, accident and fire hazards.
- Safely store objects you carry with you in the places provided for this (for example, in the storage compartment, drinks holder).
- Do not carry objects with you that protrude into the operator's work space. They can create another danger in case of an accident.
- Observe all safety, warning and information labels.
- Start and operate the vehicle only with the seat belt fastened and only from the place provided for this.
- Check the condition and the fastening of the seat belt. Have malfunctioning seat belts and mounting hardware replaced by an authorized service center.
- Before starting work, adjust the seating position so that all control elements can be reached and fully operated.
- Perform the personal adjustment at machine standstill only (for example, of the operator's seat, steering column).
- Ensure that all safety devices are properly installed and functional before starting work.

- Before starting work or after interrupting work, ensure that the brake, steering, signaling and light systems are functional.
- Before putting the machine into operation, ensure that nobody is in the danger zone.

2 Safety



Job site

- The operator is responsible for other persons.
- Before starting work, familiarize yourself with the job site. This applies to, for example:
 - Obstacles in the job site and vehicle travel area
 - Any barriers separating the job site from public roads
 - Soil weight-bearing capacity
 - Existing overhead and underground lines
 - Special operating conditions (for example, dust, steam, smoke, asbestos)
- The operator must know the maximum dimensions of the machine and the attachment see "Technical data".
- Maintain a safe distance (for example, from buildings, edges of building pits).
- During work in buildings or in enclosed areas, look out for:
 - Height of the ceiling/clearances
 - Width of entries/passages
 - Maximum load of ceilings and floors
 - Sufficient room ventilation (for example, risk of carbon monoxide poisoning)
- Use existing visual aids to stay aware of the danger zone.

- In conditions of darkness and poor visibility, switch on existing work lights and ensure that motorists are not blinded by these lights.
- If the existing lights of the vehicle are not sufficient for performing work safely, ensure additional lighting of the job site.
- Due to hot machine parts, maintain a safe distance from easily flammable material (for example, from hay, dry leaves).



Danger zone

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

Carrying passengers

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

Mechanical integrity

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

Starting the engine of the machine

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



Machine operation

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

Machine travel on public roads/sites

- The specific national driving license is required.
- Observe the national regulations (for example, the road traffic regulations) during machine travel on public roads/sites.
- Ensure that the vehicle is in compliance with the national regulations.
- In order not to blind other motorists, using the existing work lights during vehicle travel on public roads/site is prohibited.
- When crossing for example, underpasses, bridges, tunnels, ensure that the clearance height and width is sufficient.
- The attachment fitted onto the machine must be certified for travel on public roads/sites (see for example, the registration documents).



- The attachment fitted onto the vehicle must be empty and in transport position.
- The attachment fitted onto the vehicle must be equipped with the mandatory lights and protective equipment.
- Take measures against unintentional operation of the operating hydraulics.
- If the vehicle has different steering modes, ensure that the mandatory steering mode is selected.

Stopping the engine of the machine

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

Stopping and securing the vehicle

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



2.5 Lifting gear applications

Requirements

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

Fastening, guiding and removing loads

- Follow the applicable specific regulations for fastening, guiding and removing a load.
- Wear protective clothing and equipment when fastening, guiding and removing loads (for example a hard hat, safety glasses, protective gloves, safety boots).
- Do not place lifting and fastening gear over sharp edges or rotating parts. Loads must be fastened so as to prevent them from slipping or falling.
- Move loads only on horizontal, level and firm ground.
- Move loads close to the ground.

- In order to avoid oscillating movements of loads:
 - Perform smooth, slow movements with the vehicle.
 - Use cables to guide the load (do not use hands to guide).
 - Bear in mind the weather conditions (for example, the wind force).
 - Keep a minimum safety distance from objects.
- The operator may allow the load to be fastened and removed only if the vehicle and its work equipment are not being moved.
- Danger zones must not overlap with the work zones of other vehicles.



Lifting gear applications

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



2.6 Trailer operation

Trailer operation

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

• Before starting vehicle travel, ensure that nobody is between the vehicle and the trailer.



2.7 Attachment operation

Attachments

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

Operating

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



Removing and fitting attachments

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



2.8 Towing, loading and transporting

Towing

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



Crane-lifting

- Seal off the danger zone.
- The crane and the lifting gear must have suitable dimensions.
- Observe the machine's overall weight see "Technical data".
- Wear protective clothing and equipment when fastening, guiding and removing the machine (for example a hard hat, safety glasses, safety boots).
- Use only lifting and fastening gear certified by a test/ certification body (for example, cables, belts, hooks, shackles), observe the inspection intervals.
- Do not use any lifting and fastening gear that is dirty, damaged or not of sufficient size.
- Perform a visual check to ensure that all slinging points are neither damaged nor worn (no widening, no sharp edges, no cracks).
- Have loads fastened and crane operators only guided by experienced persons.
- The person guiding the crane operator must be within sight or sound of him.
- Observe all movements of the machine and lifting gear.
- Secure the vehicle against unintentional movement.

- Raise the vehicle only after it is safely attached and the person attaching the vehicle has given his approval.
- Use only the slinging points provided for fastening the lifting gear (for example, cables, belts).
- Do not attach the machine by twining the lifting gear (for example, cables, belts) around it.
- Ensure an even load distribution (center of gravity!) when fastening the lifting gear.
- Ensure that no one is in, on or under the vehicle when loading the vehicle.
- Observe the national regulations (for example, "Merkheft Erdbaumaschinen", leaflet on earth moving machines of the German employers' liability insurance association for construction engineering).
- Load the vehicle only in accordance with this Operator's Manual to avoid damage to the vehicle.
- Do not raise a machine that is for example, stuck or frozen onto the ground.
- Bear in mind the weather conditions (for example, the wind force, visibility conditions).



Transportation

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



2.9 Maintenance

Maintenance

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

Personal safety measures

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


- Safely lock/support vehicle components before starting work.
- Apply special care when working on the fuel system due to the increased fire hazard.

Preparatory measures

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



Measures for performing maintenance

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

Modifications and spare parts

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

Protective structures

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



2.10 Measures for avoiding risks

Tires

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

Hydraulic and compressed-air system

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



Electrical system

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

Battery

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



Safety instructions regarding internal combustion engines

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

• The coolant is hot, under pressure and can cause serious burns.

Bleeding the fuel system and refueling

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



Handling oil, grease and other substances

- When handling oil, grease and other chemical substances (for example the battery acid, coolant), observe the safety data sheets.
- Wear appropriate protective equipment (for example protective gloves, safety glasses).
- Be careful when handling hot consumables burn hazard.
- In polluted environment (dust, vapors, smoke, asbestos), work only with appropriate personal protective equipment (for example with a breathing mask).

Fire hazard

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



Working near electric supply lines

- Before performing any work, the operator must check whether there are any electric supply lines in the job site.
- If there are electric supply lines, only a vehicle with cabin may be used (Faraday cage).
- Keep a safe distance from existing electric supply lines.
- If this is not possible, the operator must take other safety measures (for example, switching off the current) in agreement with the operating company or owner of the supply lines.
- If supply lines are exposed, they must be fastened, supported and secured accordingly.

- If live supply lines are touched nevertheless:
 - Do not leave/touch the cabin (Faraday cage)
 - If possible, drive the vehicle out of the danger zone
 - Warn others against approaching and touching the machine
 - Have the live wire de-energized
 - Do not leave the machine until the supply lines that have been touched or damaged have been safely de-energized.



Working near non-electric supply lines

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

Behavior during thunderstorm

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

Noise

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



Cleaning

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



Notes:



3.1 Machine overview

Models and trade names (overview)

The machine is identified by two designations.

- Model designation
 - Stamped on the type label
- Trade name
 - Glued on the machine

Model designation	Trade name
T4512	TH412



Machine overview



Fig. 2



Item	Designation
1	Attachment
2	Telescoping mast (telescopic boom)
3	Machine frame
4	Engine cover
5	Rear vehicle lighting (option)
6	ROPS/FOPS (cab or protective roof)
7	Front working light
8	Lift cylinder
9	Front vehicle lighting (option)
10	Fuel tank filler neck
11	Front wheels
12	Battery master switch
13	Connections for auxiliary hydraulics (3rd control circuit)
14	Rear working light
15	Safety prop for telescopic boom
16	Rear wheels



3.2 Brief description of the machine

Main components of machine

- · Sturdy steel sheet chassis
- Yanmar three-cylinder in-line engine; rubber mounted; Water-cooled
- ROPS/FOPS tested cabin
 - ROPS is the abbreviation for "Roll Over Protective Structure"
 - FOPS is the abbreviation for "Falling Object Protective Structure"
- Exhaust emissions according to Directive 2004/26/EC
- Drive via progressively adjustable hydraulic system
- Maximum speed 20 km/h (28 km/h option)
- Hydraulic power steering with emergency steering features (4 wheel steering)
- Front and rear planetary axles, rear axle with oscillation
- Service brake
- Telescopic loader unit

General

The machine is a self-propelled work machine according to German road traffic regulations. Observe the legal regulations of your country.

Refer to chapter *"Designated use" on page 8* for the different applications the machine can be used for.

The machine consists of the machine chassis, drive and axles. The machine chassis contains all drive and control units forming part of the standard equipment.



Travel drive

The machine is driven by a diesel engine that powers the steering, operating and machine-travel hydraulics.

The travel hydraulics are driven by the transfer gearbox, which transmits the power to the rear axle and, via the cardan shaft, to the front axle.

The axles are designed as steering axles with kingpin steering.

Brakes

The drive also has the function of a service brake with effect on the front and rear axles. The brake is activated via the braking-inching pedal. Furthermore, the disk brake on the differential is operated with the brake/inching pedal. The parking brake also has effect on this disk brake.

Steering system

The steering is designed as a kingpin steering system on the front and rear axles. It is hydraulically operated via double-acting cylinders.



Hydraulic system

The machine is equipped with two hydraulic systems and one single hydraulic oil reservoir:

- Hydrostatic drive
- Steering and operating hydraulics

The diesel engine permanently drives a hydraulic pump (variable displacement pump), the oil flow of which is sent to a hydraulic motor flanged on the gearbox. The force of the hydraulic motor is transmitted to the rear axle via the transfer gearbox. At the same time, the front axle is driven via the cardan shaft connection.

Adjustment is automatic and continuous, but depends on engine speed and load. The travel speed depends on the engine speed and machine load. The accelerator pedal controls machine travel, which starts at the rated engine speed and reaches full speed at maximum engine speed. Depending on machine load, the output of the variable displacement pump is automatically reduced to ensure the best possible torque. The higher the load on the machine (for example during loading work or uphill machine travel), the more the travel speed is reduced. This type of machine regulation makes the best possible use of the entire power range. By controlling the brakeinch pedal (inching = time-delayed; pedal on the left) it also has its effect on machine regulation by precisely slowing down the machine to a standstill at any engine speed.

The steering and operating hydraulics are supplied with hydraulic oil by hydraulic gear pumps. The gear pump is flanged onto the variable displacement pump of the drive.

The hydraulic system is equipped with pressure limiting valves, filters and an oil radiator.



Cooling system

WACKER

A combined water/hydraulic oil radiator (for the diesel engine and the hydraulic oil) is located in the engine compartment. The fan (coolant/hydraulic oil radiator) is hydraulically driven by the diesel engine.

The indicator lights on the instrument panel of the machine ensure constant monitoring of the engine and hydraulic oil temperature.

Electrical system

The electrical system operates at a voltage of 12 V. Consumers and their supply circuits are protected with fuses.

Equipment

The loader unit consists of the loading frame with integrated mechanical or hydraulic (optional) quick coupler system seating for the attachments, lift and tilt cylinders and the corresponding attachments. In addition to the normal lifting function, the loader unit can also be hydraulically extended in order to reach higher lift heights. The machine is equipped with a protective ROPS/FOPS structure.

- ROPS: "Roll Over Protective Structure" protecting the user when the machine tips over.
- FOPS: "Falling Object Protective Structure" protecting the user against falling objects.



3.3 Information and regulations on use

Designated use

The machine has been designed and built in accordance with state-of-the-art standards and the recognized safety regulations. Nevertheless, its use can pose a danger to life and limb of the user or of third parties, or cause damage to the machine and to other material property.

The machine may only be operated in technically perfect condition in accordance with its designated use and the instructions set forth in the Operator's Manual, and only by persons who are fully aware of the risks involved in operating the machine. Any malfunctions, especially those affecting safety, must therefore be rectified immediately!

The machine is used for picking up and loading material through a forward motion of the machine, taking into account the safety instructions/regulations and intervals specified by Wacker Neuson in the operator's manual. A work cycle consists of picking up, raising, transporting and unloading the material.

Machine applications for similar, related purposes with other attachments that do not affect the safety requirements for the machine but change the way in which it is used are only allowed with the attachments that have been expressly approved by the manufacturer for this purpose. Special conditions apply when using additional attachments from the manufacturer.

Designated use also includes observing the instructions of the Operator's Manual, and the maintenance, inspection and repair conditions.

Any other application of the machine is regarded as not designated for the use of the machine.



Unintended use

Improper use is, for example:

- Lifting or transporting persons.
- Use as a working platform
- Raising or transporting loads without an attachment required for this purpose.
- The use after incorrect repairs/rectification of malfunctions.
- Use after a substantial change to the vehicle.
- The use for demolition and forestry applications with a risk of falling objects.



Improper use

Use outside of the proper use is any use not intended by the manufacturer and thus constitutes a misapplication according to the machinery directive EC/2006/42. Alone the user shall be responsible for any damage resulting from this.

Such misapplications of the vehicle are, for example:

- Unintended use
- Use of surfaces and spaces that are not described as work or maintenance spaces in the Operator's Manual.
- Adjustment, cleaning and maintenance contrary to the instructions given in the Operator's Manual.
- Troubleshooting and maintenance with running drives and/or a running diesel engine.
- Ignoring safety and warning information on the vehicle and in the operator's manual.
- Maintenance and repair work by untrained personnel.
- Vehicle modifications without proper authority.
- Fastening/installation of additional equipment that has not been certified/released.
- Use of non-original spare parts.
- Use for spraying applications.
- Use as a carrier machine for equipment that has not been certified/released by the manufacturer.
- · Use for forestry applications

- Use in stretches of water or flood areas.
- Transportation of persons.
- Installation of work platforms.





Spatial limits

Use outside of the spatial limits is any use not intended by the manufacturer and thus constitutes a misapplication according to the machinery directive EC/2006/42. Alone the user shall be responsible for any damage resulting from this.

Specified applications:

- Agriculture
- Construction industry
- Industry
- · Local authorities
- Gardening and landscaping

The machine is not to be used in the following areas:

- Partial or complete operation under water
- Below-ground or mining applications
- Closed rooms
- · Potentially explosive areas
- · Contaminated areas

Fields of application and use of attachments

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

Note that not all the indicated attachments comply with local traffic regulations.

The attachments complying with German road traffic regulations and the applicable provisions are listed in the General Certification for Vehicles (Germany) or the Data Confirmation (Germany)!

Observe the legal regulations of your country.

i Information

In order to avoid damage to the machine, only the attachments listed in the table have been authorized for installation on the machine. Installing attachments that are not listed requires a release by the manufacturer of the machine, and an EBE (separate certification for vehicles, Germany) made out by the competent authority!



Permissible attachments

Description of attach-	Turne	Dimension		Capacity				
ment	туре	mm	(in)	m ³	(ft³)			
Buckets								
Earth buckot	1000369213	1600	62.99	0.50	17.66			
	1000367582	1600	62.99	0.50	17.66	Loosening, picking up, transporting and load-		
4-in-1 bucket	1000290949	1550	61.02	0.36	12.71	ing loose or solid material		
	1000290950	1550	61.02	0.36	12.71			
	1000227362	1500	59.06	0.77	27.19			
	1000227533	1600	62.99	0.82	28.96			
	1000287633	1650	64.96	0.62	21.90			
Light-weight materials	1000227581	1700	66.93	0.87	30.72	Loosening, picking up, transporting and load-		
	1000227673	1800	70.87	0.92	32.49			
	1000227794	1900	74.80	0.97	34.26			
	1000227884	2000	78.74	1.03	36.37			
1) not approved for machine travel on public roads! National regulations must be complied with!								



Description of attach-	Turne	Dimension		Capacity		llee
ment	туре	mm	(in)	m³	(ft³)	Use
	1000305539	1400	55.12	0.43	15.19	Loosening, picking up, transporting and load-
Multi purpasa buakat	1000364061	1600	62.99	0.49	17.30	ing loose and bulky material
Mulli-pulpose bucket	1000325329	1500	59.06	0.79	27.90	
	1000325928	1650	64.96	0.84	29.66	
Stone bucket	1000227579	1680	66.14	0.45	15.89	Loosening, picking up, transporting and load- ing loose stones and rubble
Side-tip bucket	1000325871	1600	62.99	0.80	28.25	Picking up, transporting and loading loose material, whereby the bucket can be tipped sideways also
Skeleton bucket	1000345617	1600	62.99	0.33	11.65	Picking up, transporting, sieving and loading loose material
Dozer bucket ¹⁾	1000351819	1700	66.93	0.64	22.60	Leveling areas, picking up, transporting and loading loose material
Fork-and-grab attachm	ent					
Fork & grab ¹⁾	1000239159	1500	59.06			Loosening, picking up, transporting and load-
FUIK & YIAD '	1000239165	1700	66.93			ing silage, hay, green fodder, manure, etc.

1) not approved for machine travel on public roads! National regulations must be complied with!



Description of attach-	Тура	Dimension		Capacity					
ment	туре	mm	(in)	m³	(ft³)	036			
Pallet fork arms									
	1000228378 ¹⁾	1000	39.37						
	1000227130 ¹⁾	1200	47.24						
	1000227287 ¹⁾	1400	55.12						
	1000253308 ¹⁾	2000	78.74						
Pallat forks	1000334435 ¹⁾	1200	47.24			Raising, transporting, setting down and			
Fallet IOIKS	1000302352	1000	39.37			stacking loads			
	1000302317	1200	47.24						
	1000335628	1200	47.24						
	1000228199 ¹⁾	1100	43.31						
	1000326434 ¹⁾	1200	4724						
Maintenance of green s	paces		•						
Double-blade mower ¹⁾	1000227475	1500	59.06			Mowing grass and vegetation on level sur- faces			
Fence mower ¹⁾	1000307033	1300	51.18			Mowing grass and vegetation on level sur- faces alongside fences			
Pruning saw ¹⁾	1000369209	1400	55.12						
Truning Saw	1000369210	1400	55.12						
1) not approved for machine travel on public roads! National regulations must be complied with!									



Description of attach-	Тура	Dimension		Capacity		
ment	Туре	mm	(in)	m³	(ft³)	
Bear shears ¹⁾	1000369361	1650	64.96			Pruning hedges
rical shears	1000369362	1650	64.96			
Cleaning						
Rotary broom	1000359396	1500	59.06			
	1000359397	2000	78.74			
	1000359398	2500	98.43			
	1000227524	1550	61.02			
	1000227785	1850	72.83			Sweeping different kinds of material on firr
	1000316292	1550	61.02			ground
Rotary sweeper ¹⁾	1000316294	1850	72.83			
	1000316263	1550	61.02			
	1000316265	1700	66.93			
	1000316290	1850	72.83			

1) not approved for machine travel on public roads! National regulations must be complied with!



Description of attach-	Type	Dimension		Capacity		llee	
ment	Туре	mm	(in)	m³	(ft³)	USE	
Winter service							
	1000227674	1800	70.87				
	1000227932	2050	80.71				
Snow plow	1000227675	1800	70.87			Clearing snow	
	1000227937	2050	80.71				
	1000301231	1860	73.23				
	1000228221			0.11	3.88	Winter service	
Salt spreader	1000249568			0.17	6.00		
	1000228222			0.3	10.59		
Special applications	•				I		
Waste container ¹⁾	1000228215	1000	39.37	1.00	35.32	Transporting and dumping shrub cuttings, waste, etc.	
Ground planer ¹⁾	1000324315	1600	62.99				
	1000324316	2000	78.74			Levening surfaces	
1) not approved for machine travel on public roads! National regulations must be complied with!							



Description of attach-	Turne	Dimension		Capacity		llee	
ment	туре	mm	(in)	m³	(ft³)	Use	
Auger drive unit ¹⁾	1000309264						
	1000199191	Ø 152	5.98				
Auger, length 1240 mm $(48.82 \text{ in})^{1}$	1000199192	Ø 229	9.02				
	1000199198	Ø 305	12.01			Drilling holes in the ground	
	1000199196	Ø 152	5.98				
Auger, length 1520 mm $(59.84 \text{ in})^{1}$	1000199197	Ø 229	9.02				
(33.0+ 11)	1000199207	Ø 305	12.01				
Pot grabber ¹⁾	1000299104					Grabbing, transporting and setting down large plant pots	
Tree-trunk gripper ¹⁾	1000326396	1450	57.09			Raising, transporting, setting down and	
	1000326398	1450	57.09			stacking tree trunks	
1) not approved for machine travel on public roads! National regulations must be complied with!							



3.4 Labels

Type labels

	Weldemann GmbH Mühlauser Weg 45-89 0-34519 Diemskes-Flechtdarf -
Radlader	2 3 Baulabr 4
Fahrzeug-Ident-Nr.	5
Тур	6
Motorleistung kW	Zul. Achslast vorn kg
Betriebsgewicht kg	zul. Achslast hinten kg
zul. Ges Gew. kg	zul. Anhängelast kg 12
HomNr	13
•	(و
Fig. 3	

A type label is permanently affixed to the machine. It contains the following information:

Item	Designation
1	Manufacturer
2	Machine designation
3	Article number
4	Year of construction
5	Machine identification number
6	Туре
7	Engine output kW
8	Permissible front axle load in kg
9	Operating weight in kg
10	Permissible rear axle load in kg
11	Permissible total weight in kg
12	Permissible trailer load in kg
13	Homologation number



Other type labels

The following machine components also have their own type labels:

- Diesel engine
- Axial-piston variable displacement pump (hydraulic pump)
- Oil motor (hydraulic motor)
- Axles
- Protective ROPS/FOPS structures

Information on warning and information labels

Injury hazard due to missing or damaged labels!

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

- ► Never remove warning and information labels.
- Immediately replace damaged warning and information labels.

A range of warning and information labels are affixed on the machine.

The warning labels are identified as follows:



The information labels are identified as follows:

New warning and information labels can be ordered from Wacker Neuson's Service Department.



Position of warning and information labels





Description of warning labels



Fig. 5

Warning label W1: General risk

Caution! All persons must stay clear of the danger zone of the machine.

Located on the left and right of the loader unit, and at the rear of machine.



Fig. 6

Warning label W2: Burn hazard! Caution! Do not touch!

• Wear protective gloves and clothing. Located near the muffler.





Warning label W3: Remove the starting key

Caution! Remove the starting key before performing inspection and maintenance on the machine.

- Read the service manual before performing maintenance.
- Have repair work only performed by authorized personnel.

Located on the engine cover.

Fig. 7



Warning label W4: Bin under pressure; Burn hazard!

Caution! Do not open, radiator is hot and under pressure.

- Open the radiator only after the coolant has cooled down.
- Open the cover carefully to the first stop notch to allow the pressure to escape.
- Wear protective gloves and clothing.

Located near the radiator expansion reservoir.







Warning label W5: Safe distance from machine

Caution! Keep a safe distance from the machine. Located on the machine frame under the loader unit.



Fig. 10

Warning label W6: Shearing hazard

Caution! Do not touch any turning parts!

Perform inspections and maintenance only at engine standstill!

Located under the engine cover in the area of the engine cooling.





Warning sign W7: fasten your seat belt; Ensure machine stability!

- Operate the machine only from the operator seat.
- Fasten your seat belt during machine operation.
- Ensure machine stability.

Located near the operator seat.



Fig. 12

Warning label W8: ROPS/FOPS protective structures

- Damaged protective ROPS/FOPS structures cannot serve their protective function.
- Never drill or weld protective ROPS/FOPS structures.
- Follow the Operator's Manual.

Located on the ROPS/FOPS structure.







Warning label W9: Accompanying persons

Caution! Additional persons riding on the machine can fall off and be injured.

• Never transport persons with the machine.

Located in the operator's compartment.



Fig. 14

Warning label W10: Loader unit lift cylinder prop

Caution! Install the prop before performing maintenance on the loader unit!

Located on the prop.





Warning label W11: Tipping hazard!

Caution! If the loader unit is lowered with the telescopic boom extended, the safe work load may be exceeded. This can cause the vehicle to tip forward!

- · Retract the telescopic boom first and then lower it.
- Observe the safe load indicator.

Located on the right window.



Fig. 16

Warning label W12: Injury hazard due to lowering of mast!

- If the right cabin window is damaged or missing, body parts may protrude and be crushed by the loader unit.
- If the right cabin window is damaged or missing, immediately park the machine and secure it.

Located on the right window.


Meaning of information labels

Fig. 17



Information label H1: Battery master switch

The battery disconnect switch is located here. Observe the description in the Operator's Manual. Located on the engine cover.



Information label H2: Lubrication

Fig. 18

Lubricate all lubrication points every 20 operating hours.

- see "Lubrication plan" on page 7-18

Located in the operator's compartment.





Information label H3: Risk of technical damage!

If the loader is equipped with a special quickhitch for attachments (for example a Euro mount) then the following must be observed:

During machine travel without attachments and with the boom fully retracted, the quickhitch must not be tilted out. Otherwise the front wheels touch the quickhitch when the machine is steered, and the tires are destroyed. Located in the operator's compartment.



4 Putting into operation

4.1 Cabin/control stand

Notes about the cabin (option)

Accident hazard due to restricted field of vision

Installing an optional protective screen can restrict the field of vision.

- Remove protective screens before performing machine travel on public roads.
- Slowly and carefully operate the machine during work operation.

- Keep the climbing aids (handholds and footholds) free from dirt, snow and ice.
- Keep windows (front, side and rear windows) free from dirt, snow and ice.
- Have a damaged cabin (for example one deformed in an accident) replaced by an authorized service center.
- Drilling, grinding, welding or removing parts from the cabin is prohibited since this negatively affects the protective effect of the cabin.
- An additional protective screen (option) restricts visibility.



Door



Opening the door

Crushing hazard due to incorrectly locked door!

The doors can cause crushing when closing.

- ► Always lock the cabin doors.
- ► Use the handholds for closing.

The cabin has one door on the left.

- Pull the door opener from outside.
 - ➡ Open the door.
- Move the unlocking lever toward 0 from inside.
 - ➡ Open the door.



Side window



Crushing hazard due to unlocked side window!

The side window can cause crushing when closing.

- Always lock the side window.
- ► Use the handholds for closing.

The side window can be locked in the open position. Open and lock the side window with the lever **1**.

- Press the side window against the locking mechanism.
 - ➡ The side window is safely locked.
- Operate lever 1.
 - The locking mechanism of side window is released.
 - ➡ The side window can be closed.

Do not drive with the door open. The door is then open at an angle of 90° and can be damaged.



Rear window



The rear window can be opened and closed with a lever.

- Turn the lever toward O.
 - ➡ The rear window is open.
- Turn the lever toward C.
 - ➡ The rear window is closed.

i Information

Always check whether the door and side window are closed before leaving the machine.



Emergency hammer

Injury hazard due to glass splinters!

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

- Protect your face and eyes from the glass splinters flying around.
- Only smash windows in an absolute emergency.
- ► Remove the glass splinters before leaving the cabin.



The emergency hammer is located in the cabin. In an accident it can be used for creating an exit if the door cannot be opened. Use it only in an emergency.



Entering the machine

Falling hazard when entering or exiting!

Entering or exiting incorrectly can cause injury.

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

Holding onto the steering wheel when getting on and off the machine can cause damage to the steering column. Use the provided climbing aids to get in.



Only enter the machine as shown in *Fig. 24*. The front cabin pillar has a climbing aid.



Adjusting the operator seat

Accident hazard when adjusting the operator seat during machine operation!

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

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

Adjust the operator seat to your individual requirements, for example to your body size and posture. This prevents muscle tensions and fatigue during work.

Adjust the operator seat ensuring that the control levers and pedals are within easy reach with your back against the backrest.

i) Information

The operator seat is equipped with an operator presence switch that prevents activating the drive if the operator is not seated on the operator seat!

If the load on the operator seat is removed with the starter switched on or the engine running, a warning signal sounds after 3 seconds, and the drive is switched to neutral after another 2 seconds.

This also applies to machine travel!





1. Horizontal adjustment:

Pull up the locking lever to change the horizontal adjustment of the operator seat. Once the adjustment is made the locking lever must engage in the required position. Once it is locked in place the operator seat must no longer move.

2. Weight adjustment:

Turn the twist knob to adjust the operator seat to the operator's weight. Turning it anticlockwise (toward "+") provides a firmer seat suspension; turning it clockwise (toward "-") provides a softer seat suspension. It is not necessary to take the load off the operator seat in order to adjust it, however it is easier to set a firmer suspension if the operator is not sitting on the operator seat. When the operator is sitting on the operator seat, the needle in the indicator must be in the green range.

3. Backrest adjustment:

Adjust the backrest by pushing down the locking lever. Backrest inclination is adjusted by leaning forward or backward. The locking lever must engage in the required position. Once it is locked in place the backrest must no longer move.



Air suspension seat (option)

NOTICE

Damage to compressor when operating the weight adjustment too long.

Do not operate the weight adjustment more than 1 minute.

1. Horizontal adjustment

Horizontal adjustment is performed by operating the locking lever upward.

Once the adjustment is made the locking lever must engage in the required position.

Moving the operator seat to another position must no longer be possible once it is locked.

Do not raise the locking lever with your leg or calf.

2. Weight adjustment

Sit down on the operator seat to adjust it to the specific weight by pulling or pressing the weight adjustment lever.

The operator seat is adjusted to the correct weight if the arrow is in the clear middle range of the window.

Within this visible range, the individual height can be adjusted up to the minimum suspension travel.

The minimum or maximum weight adjustment is indicated with the audible upper and lower limits.



3. Backrest adjustment

Pulling the locking lever upward releases the teeth of the backrest adjustment.

Once the adjustment is made the locking lever must engage in the required position.

Moving the backrest to another position must no longer be possible once it is locked.

For an ergonomic work posture, adjust the backrest angle (15 positions with 2.5 degrees each) between -5 and +30 degrees.

Adjusting the steering wheel (option)

Accident hazard when adjusting the steering wheel during machine operation!

Adjusting the steering wheel during machine operation can cause serious injury or death.

- Adjust the steering wheel before putting the machine into operation.
- Ensure that the steering wheel levers are locked into place.

The position of the steering wheel can be changed longitudinally and adapted to body size and posture according to individual requirements.





- 1. Press and hold lever 1 downward.
 - ➡ The steering wheel is unlocked.
- 2. Adjust the steering wheel.
- 3. Release the lever.
 - ➡ The steering wheel is locked.



Field of vision and rearview mirrors

Limited field of vision

Injury hazard due to restricted field of vision!

The operator may possibly fail to see persons entering the danger zone or who are already in it, and these persons can be injured.

- Check the field of vision before putting the machine into operation.
- Adjust the mirrors before putting the machine into operation.
- Remove attachments before performing machine travel on public roads.

The field of vision is the area the operator can see from the seat. Rearview mirrors or camera systems can be installed on the machine to support the operator. Limited field of vision during work operation

Accident hazard due to restricted field of vision!

The operator may fail to see persons and objects due to the limited field of vision.

- Check the field of vision before putting the machine into operation.
- Adjust the mirrors before putting the machine into operation.
- ► Remove obstacles within the job site.
- Set the loader unit to the lowest possible position before transporting material.
- Ensure the full field of vision with suitable measures (for example a camera or person guiding the operator).



Adjusting the mirrors

VACKER



- 1. Adjust the rearview mirrors as shown.
 - Turn the mirror bracket sufficiently forward (about 90°).
- 2. Adjust the rearview mirrors.
 - The outer edge of the machine must be visible on the inside X.
 - The horizon must be visible at the upper edge Y.
 - At the lower edge Z, the visible area must be as close as possible to the machine.



Information

Adjust the inside rearview mirror (if present) in the same way, so that the area directly behind the vehicle is visible.



Seat belt

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

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

- ► 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.

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.
- Check the seat belt and buckle for damage.
- Have a damaged seat belt and buckle immediately replaced by an authorized service center.
- Have the seat belt immediately replaced after every accident and the load-bearing capacity of the fastening points and seat fixtures checked by a Wacker Neuson service center.

The seat belt is for the operator's safety during machine operation.



Fastening the seat belt

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- 1. Sit down on the operator seat with your back fully touching the backrest.
- 2. Press unlocking lever 1 at the belt reel and put the seat belt over your hips.
 - Seat belt must not be twisted.
- 3. Insert buckle latch 2 into buckle 3, and release unlocking lever 1 at the belt reel.
 - ➡ The seat belt is locked.

Releasing the seat belt

- 1. Press the red button on the buckle.
 - ➡ The seat belt is released.
- 2. Press unlocking lever 1 at the belt reel.
 - ➡ The belt is reeled up.



Longer seat belt adjustment



Accident hazard when adjusting the seat belt during machine operation!

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

- Adjust the seat belt before putting the machine into operation.
- Ensure that the buckle is inserted (pull test).



- Pull the buckle latch.
 - ➡ The seat belt is extended to the required length.



Shorter seat belt adjustment



- With the seat belt fastened, pull on the free end of the seat belt.
 - Move the plastic clasp as required to secure the excess seat belt.
 - ➡ The seat belt is shortened to the required length.

Fire extinguisher



The fire extinguisher is not included in the machine's standard equipment.

Subsequent installation must be performed by an authorized service center.

See *Fig. 31* for the installation position of the fire extinguisher.

Operate the fire extinguisher according to the instructions on the fire extinguisher.



4.2 Overview of control elements

Description 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.



Information

The machine is not equipped with all options described in this operator's manual.

The options described in this Operator's Manual are not available in all countries.

Control and display elements



Fig. 32



Item	Designation
1	Indicating instrument
2	Parking brake control lever
3	Stability display
4	Mast control lever
5	Rocker switch panel 4
6	Control lever for auxiliary hydraulics
7	Starter
8	Fuse box
9	Accelerator pedal

10 Operator seat

Item	Designation
11	Brake/inching pedal
12	Rotary knob for manual inching (option)
13	Rocker switch panel 3
14	Power outlet
15	Rocker switch panel 1
16	Steering-column control lever (option)
17	Steering wheel
18	Rocker switch panel 2



Indicating instrument



Item	Indicating instrument	Page
19	Preheating indicator light (yellow)	4-26
20	Indicator light for "Direction indicators (blinkers)" (green) (optional)	4-26
21	"High beam" indicator light (blue) (option)	4-27
22	Not assigned	4-27
23	Engine temperature warning light (red)	4-27
24	Alternator charge function warning light (red)	4-27
25	Warning light "Engine oil pressure" (red)	4-28
26	Forward travel direction indicator light (green)	4-28
27	Reverse travel direction indicator light (green)	4-28
28	Crawler gear indicator light (yellow)	4-29
29	High speed indicator light (yellow)	4-29
30	Fuel gage	4-29
31	Hour meter	4-29

Fig. 33





Mast control lever



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Item	Control elements	Page
32	Forward-reverse control	5-8
33	High speed / crawler gear button	5-9
34	Button to extend telescopic boom	5-30
35	Button to retract telescopic boom	5-30
36	Comfort control button (optional)	5-87
37	Differential lock button (optional)	5-16



Overview of switch panels



The position of the switches can vary depending on the combination of different additional equipment.



Item	Rocker switch panel 1	Page
38	Overload protection rocker switch	4-30 5-35
	Rocker switch "VLS" (Vertical Lift System)	4-30 5-37
39	Rocker switch for "electric power outlet on the mast" (option)	4-31 5-84
40	"Hydraulic lock for attachments" rocker switch (option)	4-31 5-43







Item	Rocker switch panel 2	Page
41	"Horn" rocker switch	4-32 5-23
	"Hazard warning system" rocker switch (option)	4-32 5-21
42	"Working lights" rocker switch	4-32 5-17
43	Rocker switch for "working lights on the mast" (option)	4-33 5-18

Item	Rocker switch panel 3	Page
44	Rocker switch for "window wiper / washer system" (optional)	4-33 5-24
45	"Heating blower" rocker switch (option)	4-34 5-26
46	"Rotating beacon" rocker switch (option)	4-34 5-22





Item	Rocker switch panel 4	Page
47	Rocker switch for "additional hydraulic connections on the mast" (4th control circuit) (optional)	4-35 5-89
48	Rocker switch for "rear hydraulic connec- tions" (option)	4-35 5-93
	Rocker switch for "PTO shaft" (optional)	4-35 5-99
49	Rocker switch for "High Flow" hydraulic connections (optional)	4-36 5-90
50	Rocker switch "Three-point receptacle at the rear" (optional)	4-36 5-95



Stability display



The stability display **3** is located in the upper half of the right cabin/protective roof pillar.

i) Information

The safe load indicator only warns against a tipping hazard to the front. The sensor does not detect a lateral tipping hazard.

Color	Stability display	Page
Green	Slight risk of machine tipping over.	
Orange	Increased risk of machine tipping over.	5-34
Red	Imminent risk of machine tipping over!	



4.3 Indicator lights and warning lights (overview)

Description of indicator lights and warning lights

i Information

The indicator lights provide information to the operator.

The warning lights warn the operator of damage to the machine. If a warning light illuminates during operation, stop the machine immediately and get in touch with an authorized service center.

The indicator and warning lights illuminate for a self-test after engaging the starter.

Preheating indicator light (yellow)



Illuminates if the key in the starter is in position 1.

► Starting the engine on page 4-49

Indicator light for "Direction indicators (blinkers)" (green) (optional)



Flashes intermittently when the turn indicators are used.

 Operating the hazard warning system (optional) on page 5-21



"High beam" indicator light (blue) (option)



Illuminates if high beam is switched on, or during headlight flashing.

➡ Machine lights (option) on page 5-19

Parking brake warning light (red)



Not assigned!

Engine temperature warning light (red)



Illuminates if the maximum permissible engine temperature is reached.

Alternator charge function warning light (red)



Illuminates when the key in preheating start switch is in position 1, but goes out as soon as the engine runs. Indicates with the engine running:

- Malfunctioning V-belt or malfunction in charging circuit of the alternator. The battery is no longer charged
- ➡ V-belt/toothed belt on page 7-45



Warning light "Engine oil pressure" (red)



Illuminates when the key in preheating start switch is in position 1, but goes out as soon as the engine runs. Illuminates if the engine oil pressure is too low. In this case:

- 1. Stop the vehicle.
- 2. Stop the engine immediately and check the oil level.
 - ► Engine lubrication system on page 7-32

Forward travel direction indicator light (green)



Illuminates if forward machine travel is enabled.

← Changing the travel direction on page 5-11

Reverse travel direction indicator light (green)



Illuminates if reverse machine travel is enabled.

← Changing the travel direction on page 5-11



Crawler gear indicator light (yellow)



Illuminates if the crawler gear was enabled with the button **32**.

➡ Gear shifting on page 5-9

High speed indicator light (yellow)



Illuminates if the high speed gear was enabled with the button **32**.

➡ Gear shifting on page 5-9

Fuel gage



Indicates the current level in the fuel tank.

The indicator light illuminates as soon as the fuel level is down to low.

Hour meter



Indicates the current working hours since delivery of machine. Use the hour meter to schedule the maintenance intervals.



Description of the toggle switch



Information

The position of the switches can vary depending on the combination of different additional equipment.

Overload protection rocker switch / Rocker switch "VLS" (Vertical Lift System)





The rocker switch 38 is located in Rocker switch panel 1. The overload shutdown can be disabled and the working modes of the VLS can be chosen with the rocker switch.

- ➡ Disabling the overload cutoff on page 5-36
- Description of the Vertical Lift System (VLS) on ⇒ page 5-38

Information

The Vertical Lift System (VLS) is a safety feature that must always be checked for correct functioning before starting work.

 Functional check of the Vertical Lift System (VLS) on page 5-39



Rocker switch for "electric power outlet on the mast" (option)



The rocker switch **39** is located in Rocker switch panel 1. Pressing the rocker switch switches the power supply on and off for the electric power outlet on the mast.

 Electric power outlet on the loader unit on page 5-84 "Hydraulic lock for attachments" rocker switch (option)



40

The rocker switch **40** is located in Rocker switch panel 1. Pressing rocker switch activates the auxiliary hydraulics for attachments for unlocking the hydraulic lock. For more information on hydraulic lock operation

► Re-equipping attachments on page 5-46



"Horn" rocker switch / "Hazard warning system" rocker switch (option)



The rocker switch **41** is located in the Rocker switch panel 2. The rocker switch is used to actuate the horn or the hazard warning system depending on the outfitting of the vehicle.

- ➡ Horn (signal horn) on page 5-23
- Operating the hazard warning system (optional) on page 5-21

Information

When outfitting the vehicle with a lighting system (optional), the switch for actuating the hazard warning system is located in position **41**.

"Working lights" rocker switch



The rocker switch **42** is located in Rocker switch panel 2. The rocker switch has two positions. The front working lights are switched on in the first position. The rear working light is switched on in the second position.

➡ Operating the working lights on page 5-17



Rocker switch for "working lights on the mast" (option)



The rocker switch **43** is located in Rocker switch panel 2. Pressing the rocker switch switches the mast working light on and off.

Operating the mast working light (option) on page 5-18

Rocker switch for "window wiper / washer system" (optional)



44

The rocker switch **44** is located in Rocker switch panel 3. The rocker switch has two positions. The first position operates the front window wiper. The second position operates the front window washer system.

 Operating the window wiper / washer system on page 5-24



"Heating blower" rocker switch (option)



45

The rocker switch **45** is located in Rocker switch panel 3. Pressing the rocker switch switches the heater fan on and off.

➡ Operating the blower on page 5-26

"Rotating beacon" rocker switch (option)



The rocker switch **46** is located in Rocker switch panel 3. Pressing the rocker switch switches the rotating beacon on and off. Use the rotating beacon only in accordance with the legal regulations.

➡ Operating the rotating beacon on page 5-22


Rocker switch for "additional hydraulic connections on the mast" (4th control circuit) (optional)





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The rocker switch **47** is located in Rocker switch panel 4. Additional hydraulic connections on the mast can be operated with this function. This function is required if the standard hydraulic connections are not sufficient for certain attachments.

 Operate additional hydraulic connections on the mast (4th control circuit) on page 5-89 Rocker switch for "rear hydraulic connections" (option)/Rocker switch for "PTO shaft" (optional)



48

The rocker switch **48** is located in the Rocker switch panel 4. The rocker switch is used to actuate the hydraulic connections on the rear or the PTO shaft depending on the outfitting of the vehicle.

- Operating the rear hydraulic connections with a switch on page 5-93
- ➡ Operating the PTO shaft on page 5-99



Rocker switch for "High Flow" hydraulic connections (optional)



The rocker switch **49** is located in Rocker switch panel 4. The hydraulic "High-Flow" connections on the mast can be operated with this function. This function is required for constant-operation attachments requiring a higher oil flow rate. If the machine is equipped with the "High Flow" system then the "Detent mechanism for the control lever for the additional hydraulics" is fitted as standard.

 Operating "High Flow" hydraulic connections on page 5-91 Rocker switch "Three-point receptacle at the rear" (optional)



50

Switch **50** is located on the right beside the operator seat, behind the control lever for the auxiliary hydraulics. The 3-point mount can be raised and lowered with the switch.

➡ Operating the rear 3-point mount on page 5-95

49





Steering-column control lever (option)



The steering-column control lever **16** is located on the left of the steering column. The following functions can be operated with the steering-column control lever:

- Turning the lever operates the side marker lights and travel lights.
- Pressing the lever forward/backward operates high beam/low beam.
- Pressing the lever upward/downward operates the right/left turn indicators.
- Pressing the horn symbol operates the horn.
 - → Operating the vehicle lighting on page 5-19



4.4 Preparations

Information about putting the vehicle into operation

- Read and understand the Operator's Manual before putting the machine into operation!
- · Operate the machine only from the operator seat!
- Pay attention to all safety instructions.
- Have qualified personnel instruct you before using the machine for the first time. Perform test runs on open terrain.
- Check the condition of the machine before starting work.
- Have the machine checked by qualified personnel before putting it into operation again after it has been out of operation over a longer period of time.

Tips on how to achieve optimal output

- Do not put a cold diesel engine under load
 - ➡ Let the diesel engine warm up at low engine speed (1/4 throttle) for about 30 seconds.
- Avoid loading the diesel engine at idling speed.
 - ► Avoid low-load operation (less than 20% load).
- Do not run the diesel engine at high speed for extended periods.
- Strictly observe maintenance intervals and perform (or have performed) the mandatory maintenance.



Requirements and information for the operating personnel

- The machine may only be put into operation by authorized personnel that have been instructed.
- The operating personnel must have read and understood this Operator's Manual before putting the machine into operation.
- Use the steps and handholds when entering and leaving the cabin.
- Face the machine as you enter and leave it
- Never use the controls or movable lines and cables as handholds.
- Keep the footholds and the handholds clean to ensure a safe hold at all times. Immediately remove dirt, such as oil, grease, earth, snow or ice.
- The machine may only be put into operation when the operator is seated.
- Fasten the seat belt (lap belt).
- Never get on a moving machine. Never jump off the machine.
- Before leaving the machine, lower the loader unit, stop the diesel engine and apply the parking brake.
- Carrying or transporting accompanying persons in the cabin and/or on the machine is prohibited.

- The machine may only be used in technically perfect condition in accordance with its designated use and the instructions set forth in the Operator's Manual, and only by safety-conscious persons who are fully aware of the risks involved in operating the machine.
- Always observe the warning and information labels, and the load diagrams (for example pallet forks) of the loader unit.
- Immediately replace (or have replaced) damaged or illegible warning and information labels with new ones.



Checks before entering

- Check the condition and cleanliness of handholds and footholds.
- Check the condition and cleanliness of the cabin windows.
- Check all safety components for correct function.
- Check the linkage, cylinders, pivot pins and radiator for cleanliness.
- Check the bolts, joints and pivot pins for tightness.
- Check the labels for condition and completeness.
- Check the machine for oil, fuel and coolant leaks.
- Check the engine oil level. Add oil if necessary.
- Check the hydraulic oil level. Add oil if necessary.
- Check the coolant level. Add coolant if necessary.
- Check the fuel level. Add fuel if necessary.
- Check the tire pressure. Inflate the tires if necessary.
- Check the tire condition, for example for cuts and wear. Replace the tires if necessary.
- Check the engine covers and the fuel and hydraulic oil reservoir caps for completeness and tightness. Install or fasten covers or caps if necessary.



Machine travel on public roads

Accident hazard due to pallet fork arms!

Pallet fork arms can cause serious injury or death during machine travel on public roads.

- Remove pallet fork arms before performing machine travel on public roads and transport them separately.
- Install additional safety equipment (for example a front-edge protection for buckets with teeth) on other attachments.

A WARNING

Accident hazard due to blinded motorists!

During machine travel on public roads, the working lights can blind other motorists. This can cause serious injury or death.

- Always switch off the working lights during machine travel on public roads.
- Pay attention to national regulations on construction site lighting.



Preparations before performing machine travel on public roads

- 1. Secure the attachment.
 - Ensue that the bucket is empty and lowered to the transport position.
 - Install a front-edge protection on the bucket.
 - Secure other attachments in compliance with the regulations on machine travel on public roads.
- 2. Check the light system and the function of the rotating beacon if necessary.
- 3. Switch off the working lights.
- 4. Set all control levers to the zero position.
- 5. Switch on the lock for the loader unit control levers.
- 6. Fasten your seat belt.
- 7. Start machine travel ensuring safety.

Information

Before starting machine travel, ensure that the machine complies with the relevant local regulations and that it has a valid operation license/registration.

What to do if the machine tips over

Crushing hazard due to tipping over of machine!

A tipping vehicle can cause serious injury or death.

- ► Keep the loader unit lowered during machine travel.
- Adapt the travel speed to the prevailing conditions.
- Adapt the driving speed to the material loaded.
- Pay attention to persons and obstacles.
- Pay attention to the machine's tilting limit.
- Reduce travel speed before performing downhill machine travel.
- ► Always fasten your seat belt.
- Ensure that no parts of the body protrude outside the vehicle.
- Carefully steer the machine if the loader unit is raised.
- ► Do not exceed the permissible payloads.



NOTICE

Engine damage due to the machine tipping over.

- If the machine gets into an extreme slanting position or if it tips over, stop the engine immediately.
- ► Do not start the engine after setting the machine upright again.
- Get in touch with an authorized service center! The engine needs to be checked by gualified personnel before it can be released and put into operation again.

7 7)	Er

nvironment

Risk of damage to the environment.

- Set the machine upright again as quickly as possible to prevent oil and fuel from escaping.
- Absorb the escaping oil or fuel immediately with a binding agent, and dispose of it in an environmentally friendly manner and separately from other waste.



Precautionary measures for various weather conditions

The things you must bear in mind and the measures to be taken vary depending on the weather conditions.

Information about high outside temperatures

Take the following precautions to avoid damage at high temperatures:

- Check the cooling system regularly.
 - Keep the water and hydraulic oil radiator clean.
 - Always ensure the correct coolant level.
 - Use the correct coolant mixture.
 - Check the cooling system regularly for leaks.
 - Check the fan drive regularly.
- Use engine oil with the correct viscosity class.
- Check the engine air filter regularly.

) Information

The work is described in the maintenance chapter.

Information about low outside temperatures

Caution during machine travel on snow and ice!

Snow and/or ice on roads and traffic areas can cause accidents and injury.

Adapt your travel speed to the road conditions.

Injury hazard due to impaired visibility!

Frozen and/or dirty windows can cause impaired visibility and injury.

- Clean the windows before starting machine travel.
- Remove the ice from the window surfaces before starting vehicle travel.



NOTICE

Temperatures below –18 °C require an additional starting aid (for example fuel, engine oil or coolant heaters, additional batteries). Contact Wacker Neuson service for more information!

Do not connect two batteries in series to create a start voltage of 24 V!

Measures to be taken at low outside temperatures

Take the following measures in order to avoid damage and to start the machine more easily:

- Use the correct coolant mixture.
- Use engine oil of the correct viscosity class.
- Use diesel fuel for low temperatures.
- · Fill up the fuel tank at the end of the work shift.
- Ensure that the battery is always fully charged.
- Have a cold-starting aid installed.



4.5 Starting and stopping the engine

Information on starting the engine

Accident hazard due to persons in the danger zone!

Persons entering the danger zone or who are already in it can be injured by work movements.

- ► Always ensure that nobody is in the danger zone.
- Stop all work movements immediately if persons enter the danger zone.

Accident hazard due to jamming or slipping!

Loose object in the cabin or a dirty machine can cause accidents.

- ► Fasten or remove all loose objects in the cabin.
- ► Keep the control elements clean
- ▶ Pay attention to the daily maintenance plan.



Preparations for starting the engine

Injury hazard due to missing protective devices

Missing protective devices can cause serious injury.

- ► Install all protective devices.
- ► Remove all tools (after repairs).
- ► Close the engine cover.

Injury hazard due to impaired visibility!

Frozen and/or dirty windows can cause impaired visibility and injury.

► Clean the windows before starting machine travel.

Injury hazard

- Ensure that nobody is in the danger zone.
- Do not use any flammable starting aids (for example start pilot).
- Start the machine only from the operator seat.
- 1. Before putting the machine into operation, perform the checks described on page 4-40.
- 2. Switch on the battery master switch.
- 3. Adjust the operator seat.
- 4. Adjust the mirrors.
- 5. Fasten your seat belt.



NOTICE

Risk of technical damage!

Due to the higher viscosity in the hydraulic system and the engine oil circuit at temperatures below 0 °C, major technical damage can be caused if the engine speed is increased suddenly.

Do not start the engine under any circumstances by towing the machine. This can cause serious damage to the hydraulic system.

Stop the engine immediately if the warning lights do not go out or if they illuminate with the engine running. Ensure that the malfunction is rectified immediately. Do not put the machine into operation before rectifying the malfunction.

Do not suddenly stop the engine after running it under full load. Let the engine run at idling speed for about 3 minutes so that the temperature can stabilize, and then stop it.

i Information

The operator seat is equipped with an operator presence switch that prevents activating the drive if the operator is not seated on the operator seat!

If the load on the operator seat is removed with the starter switched on or the engine running, a warning signal sounds after 3 seconds, and the drive is switched to neutral after another 2 seconds.

This also applies to machine travel!

Starting the engine

VACKER



i Information

The forward-reverse control has to be in the neutral position before the machine can be put into operation.

Start the engine as follows:

- 1. Sit down on the operator seat
- 2. Insert the starting key.
 - Position 0 no operating voltage
- 3. Turn the starting key to position I.
 - ➡ The indicator lights illuminate.
 - Preheating is automatically enabled by turning the key to position I. The preheating indicator light **19** illuminates.
- 4. Turn the starting key to position III as soon as indicator light **19** goes out.
 - Turn against the spring pressure.
 - ➡ Position III the engine starts.
- 5. Release the starting key as soon as the engine starts.
 - The starting key returns to position I.
- 6. The indicator lights go out.



If the engine does not start

NOTICE

Damage to the machine when towing the machine.

- ► The engine cannot be started under any circumstances by towing the machine.
- Do not try to start the engine uninterruptedly for more than 20 seconds.
- Wait one minute.
- Repeat the start procedure.
- If the engine does not start after trying twice, search for the cause with the troubleshooting table or contact an authorized service center.

Avoiding low-load engine operation

The running performance of the engine can be negatively affected if the machine is operated at high engine speed and at less than 20% of the load. Possible consequences of low-load operation:

- Operating temperature is too low.
- Lube-oil consumption rises.
- Engine contamination due to lube oil in exhaust system (blue engine exhaust)
 - ➡ Operate the engine at loads of over 20%.



Stopping the engine

- 1. Lower the loader unit fully to the ground.
- 2. Apply the parking brake.
- 3. Let the engine run at idling speed for about 3 minutes
- 4. Stop the engine.
 - ➡ Turn the starting key to position 0.
- 5. Remove the starting key.

NOTICE

Stopping the engine after running it under full load can cause damage.

Let the engine run at idling speed for about 3 minutes so that the temperature can stabilize before stopping the engine.

NOTICE

Immediately starting the engine after stopping it can damage the starter.

► Wait at least 10 seconds before starting again.



Battery master switch

NOTICE

Risk of technical damage.

- Cover the opening with the protective cap to prevent humidity from penetrating into the switch.
- ▶ Never operate the battery master switch under load.
- Do not insert the starting key unless the battery master switch is operated.
- Do not operate the battery master switch unless the starting key is removed.

The complete electrical system can quickly separated from the battery in an emergency by means of the battery master switch. Switch off the battery overnight to avoid unloading the battery or to prevent other possible damage. The battery master switch can also be removed as an additional antitheft protection.

Operating the battery master switch



The battery master switch is located in position B on the control stand.

- · Turn the battery master switch to the left.
 - The battery is disconnected from the electrical system.
- Turn the battery master switch to the right.
 - ➡ The battery is connected to the electrical system.





5 Operation

5.1 Steering system

Steering modes

The steering is designed as a kingpin steering system on the front and rear axles. It is hydraulically operated via double-acting cylinders.

Synchronizing the steering system

Accident hazard due to asynchronous steering movements.

If the machine is in operation for long periods, the synchronization of the axles can shift out of position respective to each other.

- Stop machine operation immediately.
- Synchronize the steering system.

Synchronize the steering system as follows:

- 1. Stop the vehicle.
- 2. Turn the steering wheel as far as it will go to the left or right and then continue to turn the steering wheel for several seconds.
- 3. Turn the steering wheel as far as it will go in the opposite direction and then continue to turn the steering wheel for several seconds.
- 4. Check carefully whether the steering is now synchronized again.

If necessary, repeat points 1 - 4 until synchronization is restored.

➡ The axles are now synchronized again.

5 Operation



5.2 Accelerator actuation

Accelerator pedal



The engine speed is variably regulated with the drive pedal **9** (accelerator pedal). This affects the work movements of the loader unit and the attachments, the hydraulic functions of the attachments and the travel speed.

Dirt accumulation and objects in the area of the accelerator pedal can result in malfunctions.

Information

Maximum speed depends on the speed range selected!



Speed control



The machine has two speed ranges Press the button **33** to change the speed – *see "Gear shifting" on page 5-9*.

5 Operation



5.3 Brake

Parking brake



Applying the parking brake prevents the machine from rolling away unintentionally.

- Move the control lever **2** into position 1.
 - For support, pres the brake/inching pedal **11** (*Fig. 45*).
 - ➡ The parking brake is applied.
- Move the control lever **2** into position 0.
 - ➡ The parking brake is released.

i) Information

Pulling control lever **2** alone may not be enough to prevent the machine from rolling away. Also press pedal **11** for additional support.

The drive of the machine is switched off if the parking brake is applied (immobilizer).

In order to release the parking brake, slightly pull control lever **2** toward X and press button K with your thumb.



Service brake



Braking with the brake/inching pedal

- Press the brake/inching pedal 11.
 - A firm resistance can be felt after half the pedal travel at the latest.
 - The brake lights illuminate (on a machine equipped with lighting equipment).

Inching with the brake/inching pedal

NOTICE

During downhill machine travel, use the brake/inching pedal to support the braking effect of the drive. This avoids damage to the drive and/or the diesel engine!

- Reduce engine speed: remove your foot from the accelerator pedal.
- Reduce your travel speed with the brake/inching pedal.

In the inching range of the brake/inching pedal (pedal pressed lightly), the pedal can be used like a car's clutch. The drive is no longer supplied with hydraulic oil which means that the entire engine output is available to the operating hydraulics and that the loader unit can be operated more quickly.

5 Operation



5.4 Machine travel operation

Machine travel

Crushing hazard due to tipping over of machine!

A tipping vehicle can cause serious injury or death.

- ► Keep the loader unit lowered during machine travel.
- Adapt the travel speed to the prevailing conditions.
- Adapt the driving speed to the material loaded.
- Pay attention to persons and obstacles.
- ► Pay attention to the machine's tilting limit.
- Reduce travel speed before performing downhill machine travel.
- Always fasten your seat belt.
- Ensure that no parts of the body protrude outside the vehicle.
- Carefully steer the machine if the loader unit is raised.
- Do not exceed the permissible payloads.

Caution during machine travel on snow and ice!

Snow and/or ice on roads and traffic areas can cause accidents and injury.

Adapt your travel speed to the road conditions.

NOTICE

Damage to machine due to malfunctions.

- Stop machine operation immediately if a malfunction of the traveling drive, steering system and/or brakes is detected.
- Put the machine back into operation only after correcting the malfunction.



Travel direction selection

Accident hazard when changing travel direction during machine travel!

Changing the travel direction during machine travel can cause serious injury or death.

- Do not operate the travel switch during machine travel, otherwise the machine moves in the opposite direction immediately.
- Only select the other travel direction when the machine is at a standstill.

i Information

The operator seat is equipped with an operator presence switch that prevents activating the drive if the operator is not seated on the operator seat!

If the load on the operator seat is removed with the starter switched on or the engine running, a warning signal sounds after 3 seconds, and the drive is switched to neutral after another 2 seconds.

This also applies to machine travel!

(i) Information

The travel direction and speed is indicated with indicator lights.



Information

The drive of the machine is disabled if the parking brake is applied (immobilizer).



Selecting the travel direction



Forward-reverse control **32** operates the travel direction of the machine. After starting the engine, the travel direction is in neutral, self-contained of the position of the forward-reverse control. Re-enabling the travel direction is then necessary.

Select a travel direction:

- Forward-reverse control 32 in the middle position.
 - ➡ Indicator lights 26 and 27 do not illuminate.
 - ➡ No travel direction selected (zero position).
- Put the forward-reverse control 32 to position I.
 - ➡ Indicator light 26 illuminates.
 - ➡ Machine moves forward.
- Put the forward-reverse control 32 to position II.
 - ➡ Indicator light 27 illuminates.
 - Machine moves backward. A warning tone sounds (option).



Gear shifting



The machine has a fast gear and a crawler gear. The gear shifting of the vehicle is operated with button **33**.

- Press the button.
 - ➡ The machine shifts from fast gear to crawler gear.
 - ➡ Indicator light 28 illuminates.
- Press the button again.
 - ➡ The machine shifts from crawler gear to fast gear.
 - ➡ Indicator light 29 illuminates.

J Information

When starting the machine, the gear last selected is automatically switched on.

5 Operation



Machine travel

- 1. Release the parking brake control lever.
 - ➡ The machine is ready for travel operation.
- 2. Actuate forward-reverse control **33** to select the travel direction.
 - → Indicator lights 26 or 27 indicate the travel direction.
 - ➡ Machine travel is possible.
- 3. Press the accelerator pedal.
 - ➡ Machine travel starts.

The travel speed of the machine is proportional to the setting of the accelerator pedal. The more the pedal is pressed, the higher the travel speed.

- Low engine speed
 - ➡ Low travel speed
- High engine speed
 - ➡ High travel speed

Braking and stopping

Press brake/inching pedal **11** to change the travel speed independently of the engine speed. The first part of the pedal travel reduces the drive, and then the braking system is engaged. Pushing the brake/inching pedal allows you to reduce the pump flow rate progressively without any wear until the machine comes to a standstill. This makes it possible to travel very slowly even at high engine speeds.

- 1. Reduce the travel speed of the machine by decreasing the engine speed.
- 2. Press the brake/inching pedal to brake the machine.
- 3. Press brake/inching pedal to stop the vehicle.
- 4. Move the forward-reverse control **32** to the neutral.
- 5. Pull parking brake lever (- see "Parking brake" on page 5-4).



Changing the travel direction

Accident hazard when changing travel direction during machine travel!

Changing the travel direction during machine travel can cause serious injury or death.

- ▶ Press the accelerator pedal carefully.
- Do not operate the travel switch during machine travel, otherwise the machine moves in the opposite direction immediately.
- Only select the other travel direction when the machine is at a standstill.
- 1. Reduce the travel speed until the machine comes to a standstill.
- 2. Operate the forward-reverse control in the other direction.
- 3. Press the accelerator pedal.
 - ➡ The machine travels in the opposite direction.

It is not necessary to fully press the inching pedal every time you change direction.

Reverse warning system (option)

Accident hazard! Do not rely on the backup warning system when reversing with the machine!

Can cause serious injury or death.

Ensure that nobody is within the danger zone of the machine when changing the travel direction.

i Information

If the machine is equipped with an optional "Reverse warning system", a warning tone sounds whenever reverse gear is selected. During reverse travel, this tone warns persons near the machine.



Trailer operation

Requirements for trailer operation

Trailer operation is only allowed with a type-approved trailer coupling. Only agricultural and forestry trailers with agricultural and forestry goods and/or machine attachments may be coupled to the machine on public roads.

Transporting other trailers/goods is only allowed if the machine is registered as a tractor vehicle.

Refer to the operation license for the specific requirements on trailer operation.



Information

Trailer operation is only allowed with an attachment installed on the loader unit.

Safety precautions

- Check whether the towing gear of the trailer is coupled horizontally to the trailer coupling.
- Perform regular maintenance on the trailer coupling. ٠
- Pay attention to the trailer weights and drawbar loads before coupling a trailer.
 - Payload and axle load on page 9-12.
 - For operating the possible trailer couplings
 - → Trailer couplings on page 5-100.

Stopping and parking the machine

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Accident hazard due to persons in the danger zone

Persons entering the danger zone or who are already in it can be injured by work movements.

- ► Always ensure that nobody is in the danger zone.
- Stop all work movements immediately if persons enter the danger zone.

NOTICE

Fire hazard! In case of a malfunction in its electrical system, the parked machine can cause a fire.

- Stop and park the machine only in fire-protected areas.
- Do not operate the battery master switch unless the starting key is removed.

Stop the vehicle smoothly by releasing the accelerator pedal or pressing the brake/inching pedal. Secure it as described in section *Securing the vehicle on page 5-14*.



Securing the vehicle

- Park the machine on firm, level and dry ground.
- Lower the loader unit.
- Apply the parking brake.
- Stop the engine.
- Set all switches and control levers to the zero position.
- Release the pressure in the hydraulic system.
- Secure the machine with a wheel chock.
- Remove dirt from the machine.
- · Perform a visual check for leaks.
 - Hydraulic system
 - Cooling system
 - Fuel system
- Perform a visual check for machine damage, in particular of the tires, attachments and attachment locks.

- Add diesel fuel.
- Check all fluid levels, add fluid if necessary.
- Secure the machine against unauthorized use:
 - Remove the starting key.
 - Operate and remove the battery master switch.
 - Close the restraining bars.
 - Close the cabin windows.
 - Close the door, filler cap and engine cover.

i Information

The instructions mentioned before apply to stopping and parking the machine after daily operation, transporting the machine and all maintenance, inspection and repair work.



5.5 Differential lock (option)

Information about the differential lock

NOTICE

Gearbox damage due to locked differential.

- Only switch on the differential lock when the wheels are at a standstill.
- Only switch on the differential lock for loading work on loose or slippery ground.
- Turn the steering wheel slightly to the left and right, or change the travel direction to disengage the differential lock.

NOTICE

Gearbox damage due to locked differential.

- Only switch on the differential lock when the wheels are at a standstill.
- Only switch on the differential lock for loading work on loose or slippery ground.

The differential can still be locked in spite of having released the button **37**. The effect is a higher amount of force required for steering.

Turn the steering wheel slightly to the left and right, or change the travel direction to disengage the differential lock.



The differential is locked with the differential lock. This avoids uneven wheel spin. The differential lock neutralizes the compensating effect of the differentials. In other words, traction is evenly distributed to all wheels.

Information

If the vehicle is equipped with a differential lock, an optional control lever is used (as shown in *Fig. 48*).

Actuating the differential lock



Operate the differential lock with the button **37** on the control lever **4**.

- Press and hold button 37.
 - ➡ The differential lock is switched on.
- Release button 37.
 - ➡ The differential lock is switched off.



5.6 Lights/signaling system

Working lights

Accident hazard due to blinded motorists!

During machine travel on public roads, the working lights can blind other motorists. This can cause serious injury or death.

- Always switch off the working lights during machine travel on public roads.
- Pay attention to national regulations on construction site lighting.

The machine is equipped with front and rear working lights.

The working lights are operated with switch **42** in Rocker switch panel 2.

Operating the working lights



- Move the rocker switch **42** to position I.
 - ➡ The front working lights are switched on.
- Move the rocker switch 42 to position II.
 - ➡ The front and rear working lights are switched on.
- Press switch 42 to position 0.
 - ➡ The front and rear working lights are switched off.

5 Operation



Operating the mast working light (option)



Optionally, the vehicle can be outfitted with a working light on the mast.

The working lights on the mast are operated with the rocker switch **43** in Rocker switch panel 2.

- Move the rocker switch 43 to position I.
 - ➡ The telescopic boom working light is switched on.
- Move the rocker switch **43** to position 0.
 - ➡ The boom working light is switched off.
Machine lights (option)

VACKER



The lights, indicator lights and horn are operated with steering-column control lever **16**.

Operating the vehicle lighting

- Turn the steering column control lever forward (I).
 - ➡ The side marker lights are switched on.
- Continue to turn the steering column control lever forward (II).
 - ➡ The driving lights are switched on.
- Move the steering column control lever downward (III).
 - ➡ High beam is switched on.
 - ➡ Indicator light ID on the indicating instrument illuminates.
- Move the steering column control lever upward (IV).
 - ➡ Low beam is switched on.

In order to switch off the lights, turn the steering column control lever in the opposite direction.

i Information

Check the lights, turn indicators and horn every time before starting machine travel.



Direction indicator (blinkers) (option)



With the steering column control lever, **16** the direction indicators (blinkers) are operated.

Operating the direction indicators (blinkers)

- Move steering-column control lever forward (V).
 - The indicator light ⇐⇔ flashes.
 - ➡ The right turn indicator flashes.
- Move steering-column control lever backward (VI).
 - The control light ⇐⇔ flashes.
 - ➡ The left turn indicator flashes.
- Steering column control lever in the center position.
 - The control light ⇐⇔ does not flash.
 - ➡ The turn indicators are switched off.

i Information

٠

Check the lights, turn indicators and horn every time before starting machine travel.



Operating the hazard warning system (optional)



The working lights on the mast are operated with the rocker switch **41** in Rocker switch panel 2.

- Move the rocker switch **41** to position I.
 - The control light ⇐⇔ flashes.
 - ➡ The turn indicators flash on either side.
- Move the rocker switch **41** to position 0.
 - The control light ⇐⇔ does not flash.
 - ➡ The turn indicators are switched off.

Information on the rotating beacon (option)



The rotating beacon is installed in the fixture provided for this.

i) Information

Use the rotating beacon is accordance with the legal regulations!



Operating the rotating beacon



The rocker switch **46** for switching on the rotating beacon is located in the Rocker switch panel 2.

- Move the rocker switch 46 to position I.
 - ➡ The rotating beacon is switched on.
- Move the rocker switch 46 to position 0.
 - ➡ The rotating beacon is switched off.

Folding down the rotating beacon



The rotating beacon can be folded down for low passages.

Horn (signal horn)

MACKER



Operating the horn

Vehicle without lighting

The horn is operated with switch **41** in Rocker switch panel 2.

- Press switch 41.
 - ➡ The horn sounds.
- Release switch 41.
 - ➡ The horn no longer sounds.

Machine with lights (option)

The horn is operated via the steering column control lever **16**.

- Press the switch in steering-column control lever.
 - ➡ The horn sounds.
- Release the switch in steering-column control lever.
 - ➡ The horn no longer sounds.

i) Information

If the machine is equipped with the lights option, the switch for the hazard warning system is located in position **41**.

5 Operation



5.7 Window wiper/washer system (option)

Operating the window wiper / washer system



The window wiper / washer system is operated via the rocker switch **44** in the Rocker switch panel 3.

- Press switch **44** to position 1:
 - ➡ The wiper is switched on.
- Move the rocker switch **44** to position 2.
 - In order to do this press slide switch a downward.
 - ➡ The washer system is switched on.
- Press switch 44 to position 0:
 - The front wiper and washer system are switched off.

Washer system reservoir – see chapter 7 " Filling up the washer system reservoir" on page 7-63.



5.8 Heating and ventilation (option)

Heating



Cabin heating can be switched on and off with a stop cock.

This stop cock is located in the engine compartment (*Fig. 59*).

Open the engine cover to switch the heating on and off – see "Opening the engine cover" on page 7-22.

Ventilation

With the heating switched off, the cabin can be ventilated with the fan or the windows. Always lock the windows in the open position (*Fig. 20* + *Fig. 21*).

i Information

An air conditioning system is not available for this machine.

5 Operation



Air vents



The air flow is directed in the cabin with the nozzles. In cold weather, warm air keeps the windows free of ice and warms up the cabin.

Washer system -

Operating the blower



The cabin is equipped with a heating system and fan. The blower is operated with the rocker switch **45** in Rocker switch panel 3. The blower speed can be set to two stages.

- Stage "0" = blower "OFF"
- Stage "I" = low rpm.
- Level "II" = High speed.



5.9 Work hydraulics

Safety instructions on the loader unit control lever

Accident hazard due to uncontrolled movements of the control lever!

Uncontrolled movements of the control lever can cause serious injury or death.

- Operate the machine only from the operator seat.
- ► Work calmly and carefully.
- Avoid fast and sudden movements of the control lever.
- Always lower the loader unit/loader unit to the ground during work interruptions or when finishing work.
- Secure the control lever before performing machine travel on public roads.
- ► Secure the control lever before leaving the machine.

A WARNING

Crushing hazard due to tipping over of machine!

A tipping vehicle can cause serious injury or death. There is a tipping hazard, in particular in curves.

- ► Keep the loader unit lowered during machine travel.
- Adapt the travel speed to the prevailing conditions.
- Adapt the driving speed to the material loaded.
- ► Pay attention to persons and obstacles.
- ▶ Pay attention to the machine's tilting limit.
- Reduce travel speed before performing downhill machine travel.
- Always fasten your seat belt.
- Ensure that no parts of the body protrude outside the vehicle.
- Carefully steer the machine if the loader unit is raised.
- ► Do not exceed the permissible payloads.



Falling objects

Injury hazard due to falling loads with a raised and extended loader unit!

Falling loads (for example, large bales or stacks of bales) can cause serious or fatal injury.

- Never transport several large bales or boxes at the same time!
- Stacking loads with machines that are not equipped with a protective roof or cabin is prohibited.
- Only work with a raised and extended loader unit when the machine is at a standstill.
- Do not tilt in the attachment to the limit with a raised and extended loader unit.





Loader unit control lever



The control lever **4** controls the work movements of the loader unit. Control lever is located on the right of the operator seat.

Loader unit

- Move the control lever 4 toward H:
 - The loader unit is raised. The telescopic boom is extended.
- Move the control lever 4 toward S:
 - The loader unit is lowered. The telescopic boom is retracted.

Attachment

- Move control lever 4 toward E.
 - ➡ The attachment tilts in.
- Move control lever 4 toward A.
 - ➡ The attachment tilts out.

i Information

The control lever automatically returns to the middle position as soon as it is released.



Operating the telescopic boom



The telescopic boom is operated with the buttons **34** and **35** in the Mast control lever **4**.

- Press the button 34.
 - ➡ The telescopic boom is extended.
- Press the button 35.
 - ➡ The telescopic boom is retracted.

NOTICE

Risk of technical damage.

Risk of bending the hydraulic cylinder that extends and retracts the telescopic boom. Avoid damage to the telescopic boom.

 Only perform leveling and digging work with the telescopic boom fully retracted. Safety instructions on the telescopic boom

A DANGER

WACKER

Electric shock due to overhead electric lines!

Caution, danger! Approaching overhead electric lines causes electric arcs to form.

- Keep away from overhead electric lines.
- Contact the energy supplier before working under overhead electric lines.

Safety distances from electric overhead lines

Rated voltage	Safety distance	
Up to 1000 V	1 m	3.3 ft.
Over 1 kV and up to 110 kV	3 m 9.8 ft.	
Over 110 kV and up to 220 kV	4 m 13.1 ft.	
Over 220 kV and up to 380 kV	5 m 16.4 ft	
Unknown rated voltage	5 m	16.4 ft.

Accident hazard due to tipping over of machine!

A tipping vehicle can cause serious injury or death.

- Extend the telescopic boom only if the machine is on firm and level ground.
- Always pay attention to the display of the safe load indicator.
- First raise the loader unit fully, then extend the telescopic boom.
- First retract the telescopic boom fully, then lower the loader unit.
- Travel only with a retracted telescopic boom on public roads.
- Keep the loader unit as close as possible to the ground during machine travel.

Safety prop for the telescopic boom

Crushing hazard due to maintenance on boom!

A boom suddenly falling down can cause serious injury or death.

 Install a safety prop if working on a raised boom cannot be avoided.

The safety prop is located at the rear of the machine. Installing the safety prop onto the lifting cylinder:

- 1. Park the machine on firm, level and dry ground.
- 2. Empty and tilt in the attachment.
- 3. Retract the boom completely.
- 4. Raise the telescopic boom.
- 5. Stop the engine.
- 6. Remove the safety prop at the rear of the machine.
- 7. Install the safety prop over the piston rod as shown.
- 8. Secure the safety prop with the pin B.

Installing the safety prop

Fig. 65









Safety information about the safe load indicator and overload protection

Functional check of safe load indicator: As soon as the starter of the machine is switched on (starting key in position 1), all the LEDs in the safe load indicator illuminate briefly and a signal sounds. The safe load indicator is malfunctioning if this is not the case, or if the LEDs illuminate continuously or the signal sounds continuously. Do not work with the machine in this case. The safe load indicator must be checked and adjusted or repaired by qualified personnel.

All repair and adjustment work on the safe load indicator and overload protection may only be performed by authorized personnel.

i Information

The safe load indicator only gives a warning in the event of insufficient stability in the longitudinal direction. Lateral loads are not indicated by the safe load indicator.

i Information

The safe load indicator and overload protection only work as intended if:

- ► The machine is at a standstill.
- ► The machine is on firm, solid and level ground.
- The machine performs the loading and lowering functions.
- ► The overload protection is not disabled.
- ► The telescopic arm is not fully retracted.

The safe load indicator and overload protection do not work as intended in the event of:

- Sudden overloading.
- Machine travel with a raised load.
- Off-road machine travel or on soft or uneven ground.
- Machine travel or maneuvering on a slope.
- Machine travel at too great a speed or turning too fast.



Monitoring the stability display



i Information

The safe load indicator only works after the charge indicator light has gone out.

Always pay attention to the stability display **3** at the upper right in the cabin while working. The display of the safe load indicator indicates machine stability as a function of the raised load. The safe load indicator gives visual and acoustic signals.

- 1. **Green** up to 40%: There is no risk of the machine tipping over, all travel and work movements can be continued.
- **Green** up to 85%: There is a slight risk of the machine tipping over, pay attention to the display of the safe load indicator for further travel and work movements.
- 2. **Orange**: There is an increased risk of the machine tipping over. Perform further travel and work movements with caution.
- 3. **Red**: There is an imminent risk of the machine tipping over!
 - With an extended boom: the overload protection is active.
 - With the telescopic boom retracted: **Immediately** stop the work movement currently being carried out. Retract the telescopic boom or lower the loader unit.



Load diagram



Pay attention to the indications on the load diagram. The load diagram is located in the operator's cab on the right side window. For a picture of the load diagram, see page – see "Load diagram" on page 9-13 in chapter Technical data.

Overload protection

Tipping hazard due to overloading!

The overload protection is enabled if the load is too heavy. Lowering quickly or unevenly can cause the machine to tip over.

► Slowly and carefully lower the boom.

The overload protection function is deactivated when the boom is retracted.

- Pay attention to the display of the safe load indicator.
- ► Reduce the load if necessary.

If the overload protection is enabled, reduce the load on the loader unit **immediately**. In order to do so, proceed as follows:

- 1. Retract the telescopic arm.
- 2. Reduce the load (for example tilt out some of the load, carefully lower and set down the load).



Disabling the overload cutoff

Accident hazard due to overload and sudden movements!

Overload and sudden movements can cause accidents and injury.

- Pay attention to the load diagram and payloads of the machine.
- Operate the control levers carefully.

In order to be able to position loads in the overload range, the overload protection can be temporarily bypassed by pressing the rocker switch **38** in the Rocker switch panel 1 and the control lever **4**.



If the overload protection has been triggered, proceed as follows.

- 1. Move the rocker switch 38 to position II.
- 2. With the switch pressed, reduce the load with the control lever (for example set down the load).

The overload protection is only disabled as long as the switch is pressed, however for a maximum 30 seconds.

Working modes

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Two different work modes can be selected:

- Bucket mode
 - (for example for loading bulk goods, manure, etc.)
- Stacking mode
 - (for example for stacking big bales, general cargo, etc.)

In **bucket mode** the boom always retracts in the lower range (*Fig. 70*). The boom cannot be lowered and extended at the same time. The boom does not extend automatically in the upper range.

In **forklift mode** the boom does not automatically retract in the lower range (*Fig. 70*). The boom can be lowered and extended at the same time. The boom extends automatically in the upper range.

The working modes are operated with the rocker switch **38** in Rocker switch panel 1.

Selecting the operating mode



Bucket mode:

- Press the rocker switch 38 to position "I" (forward).
 - ➡ Bucket mode is activated.

Forklift mode:

- Press the rocker switch **38** to position "0" (middle position).
 - ➡ Forklift mode is activated.



Description of the Vertical Lift System (VLS)

The "Vertical Lift System" (VLS) is an operator assistance system that makes operating the machine easier with a semi-automatic telescoping movement when raising or lowering loads. The almost vertical raising and lowering movement of the boom improves machine stability.

When it is raised, the boom only automatically extends in the upper range if forklift mode is switched on (*Fig. 70*). When it is lowered, the boom automatically retracts in the upper range if forklift or bucket mode is switched on. This ensures that the machine cannot suddenly reach the overload range and tip over to the front.

Information

The boom does not extend automatically in the case of loads over 700 kg.







Pressing and holding the button **35** with the stacking mode switched on (*Fig. 69*) can prevent the telescopic boom from automatically extending when it is raised. For safety reasons however, the boom cannot be lowered and extended at the same time in the upper range.

Functional check of the Vertical Lift System (VLS)

Before starting work, fully raise and lower the unloaded boom once with forklift mode switched on. The boom must extend automatically in the upper range. When lowered, the boom must retract automatically in the upper range. If this is not the case, the Vertical Lift System is malfunctioning. Do not work with the machine in this case. The Vertical Lift System must be checked, adjusted and repaired by qualified personnel.

i Information

The Vertical Lift System (VLS) is a safety feature that must always be checked for correct functioning before starting work.



Locking the loader unit

Accident hazard due to unintentional control lever operation during machine travel on roads!

Operating the loader unit control lever unintentionally can cause accidents and injury.

- ► Lock the lifting unit control lever during road travel.
- Lock the lifting unit control lever before leaving the machine.
- ► First sit down on the operator seat. Then unlock the lifting unit control lever.

The loader unit control lever can be secured against unintentional operation by means of a lock. The loader unit cannot be operated if the lock is engaged. A locked loader unit is not indicated by indicator lights, but by the position of the control lever (*Fig. 72*).

Operating the loader unit lock



The loader unit is locked by operating control lever 1.

- Move control lever 1 toward A:
 - ➡ The lock is engaged.
- Move control lever 1 away from A:
 - ➡ The lock is disengaged.



Hydraulic connections on loader unit

NOTICE

Damage to the hydraulic system due to dirt!

- Avoid dirt.
- ▶ Pay attention to the daily maintenance plan.
- Ensure that the hydraulic connections are clean.

Operating hydraulic connections on the loader unit

The hydraulic connections on the loader unit are operated with additional control lever **6**.

- Move the additional control lever 6 toward L.
 - Connection L = pressure side, connection R = return.
- Move control lever 6 toward R.
 - Connection L = return, connection R = pressure side.





5 Operation



Hydraulic lock for attachments (option)





Operating the hydraulic lock for attachments

The hydraulic lock for attachments is operated with the additional control lever **6**.

- 1. Move the additional control lever 6 toward R.
 - ➡ The quickhitch is locked.
- 2. Move the lock a in the rocker switch **40** (in Rocker switch panel 1) towards b and hold down the rocker switch **40**.
- 3. Move additional control lever 6 toward L.
 - ➡ The quickhitch is unlocked.

Continuous operation of hydraulic connections on the mast (option)



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Hydraulic connections on the mast can be operated continuously with this function. This function is required for specific attachments with a hydraulic motor requiring continuous power (for example a rotary broom). Holding control lever **6** permanently is then not required.

Continuous operation of hydraulic connections

NOTICE

Technical damage due to overheating of hydraulic system.

Always put the additional control lever 6 back to the zero position if continuous operation is not required.

Continuous operation of the hydraulic connections is switched on with the additional control lever **6**.

- Move the additional control lever **6** toward L, beyond the resistance, until it locks into place.
 - ➡ Continuous operation is switched on.
 - Continuous operation is assigned to the connection on the left, return is assigned to the connection on the right.
- Move back additional control lever **6** beyond the resistance.
 - ➡ Continuous operation is switched off.



5.10 Attachments

Information on exchanging attachments

Accident hazard due to incorrect attachments!

Using wrong or unauthorized attachments can cause accidents!

- Only authorized attachments ensure machine stability.
- Only authorized attachments avoid machine overload.

Accident hazard due to tipping over of machine

The weight ratios of the machine change with a loaded attachment. There is a tipping hazard, in particular in cornering.

- ► Travel with a lowered loader unit.
- Do not exceed the permissible payloads.
- Adapt the travel speed to the surrounding conditions and material to be loaded.



Accident hazard due to damaged attachments

Damaged attachments can have negative effects on the use of the machine.

- ► Do not put damaged attachments into operation.
- Before starting work, always check the attachments for damage, correct locking and firm installation.
- ► Never work with a damaged attachment mount or lock.
- ► Uncouple attachments before working on them.

i Information

Use only attachments authorized by the manufacturer of the machine. The manufacturer of the machine shall not be liable for damage, etc., if unauthorized attachments are used.

Avoid overloading the machine. When raising heavy loads, do not use buckets that are too big.

Contact an authorized service center if new hydraulic lines have to be installed for an attachment. Only an authorized service center is allowed to install new hydraulic hoses.

Different high-pressure hoses are used. Pay attention to the DIN specification on the hose or fittings when ordering spare parts.

Observe the safety instructions for exchanging attachments.



Re-equipping attachments

Risk of injury to persons in the danger zone!

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

- Adjust the existing visual aids (for example the rearview mirrors) correctly.
- Work particularly carefully when reversing the machine.
- Interrupt work immediately if persons enter the danger zone.



Accident hazard due to unintentional release of the hydraulic lock!

Incorrectly locked attachments can be unintentionally released and cause accidents.

► Always check the attachments for correct locking.



Injury hazard due to pressure

A thin jet of hydraulic oil escaping under high pressure can penetrate the skin

- Seek medical attention immediately if hydraulic oil penetrates the skin or eyes.
- Only open hydraulic systems after the pressure in them has been released
- Wear protective clothes

A WARNING

Injury hazard due to uncoupled attachments tipping over

Attachments that tip over can cause injury to persons.

- Ensure that no one is in the danger zone.
- Place attachments only on firm and level ground.
- Close attachments with movable parts (for example a fork-and-grab attachment).
- ► Ensure the safe and stable position of the attachment, if necessary use supports provided for this purpose.

NOTICE

Damage to the hydraulic system due to dirt!

- Avoid dirt.
- Ensure that the hydraulic connections are clean.

5 Operation



Fitting attachments on a mechanical quickhitch



The lock pins for the mechanical quickhitch are located at the front on the loader unit.

- 1. Retract the telescopic boom completely.
- 2. Lower the attachment until it is barely above the ground.
- 3. Remove lock pins 3.
- 4. Approach the machine to the attachment.
- 5. Position pin 1 under catch hooks 2.
- 6. Raise the loader unit and tilt in the attachment.
- 7. Insert lock pins 3.
- 8. Secure the lock pin with the safety pin 4 so that it cannot slip out.



Removing attachments from a mechanical quickhitch



Lower the attachment only to firm, level ground and secure it to prevent it from tipping over or rolling away.

- 1. Retract the telescopic boom completely.
- 2. Lower the attachment until it is barely above the ground.
- 3. Release lock pins 3 and pull them out.
- 4. Lower the loader unit and tilt out the attachment.
 - ➡ This removes the pins 1 from the catch hooks 2.
- 5. Reverse the machine away from the attachment as soon as the catch hooks are free.
- 6. Store lock pins 3 in position 5 when they are not used.

5 Operation



Fitting attachments on a hydraulic quickhitch (option)



The lock pins 3 must be retracted so that an attachment can be coupled – *see "Operating the hydraulic lock for attachments" on page 5-42.*

- 1. Retract the telescopic boom completely.
- 2. Lower the attachment until it is barely above the ground.
- 3. Approach the machine to the attachment.
- 4. Position pin 1 under catch hooks 2.
- 5. Raise the loader unit and tilt in the attachment.
- 6. Move control lever 6 toward R.
 - Lock pins 3 are extended.
 - ➡ The quickhitch is locked.
- 7. Check for correct locking.
- **Both** lock pins 3 must be visible in the bores on the attachment.



Removing attachments from a hydraulic quickhitch (option)





Lower the attachment only to firm, level ground and secure it to prevent it from tipping over or rolling away.

- 1. Retract the telescopic boom completely.
- 2. Lower the attachment until it is barely above the ground.
- 3. Move lock a in switch **40** toward b. Press and hold switch **40** and move control lever **6** toward L.
 - The lock pins 3 are retracted.
 - ➡ The quickhitch is unlocked.
- 4. Lower the loader unit and tilt out the attachment.
 - This removes the pins 1 from the catch hooks 2.
- 5. Reverse the machine away from the attachment as soon as the catch hooks are free.



Coupling/uncoupling hydraulic connections from the mast

Injury hazard due to thin jet of hydraulic oil!

A thin jet of hydraulic oil escaping under high pressure can penetrate the skin

- Seek medical attention immediately if hydraulic oil penetrates the skin or eyes.
- Only open hydraulic systems after the pressure in them has been released.
- ► Wear protective clothes.

Environment

Hydraulic oil is harmful to the environment!

- ► Hold a suitable container under the quickcouplers when coupling or uncoupling.
- Dispose of escaping hydraulic oil by an ecologically safe method.

NOTICE

Damage to the hydraulic system due to dirt!

- Avoid dirt.
- Ensure that the hydraulic connections are clean.



Coupling hydraulic connections



Preparations

The pressure on the hydraulic connections has to be released before they can be coupled.

- 1. Retract the telescopic boom completely.
- 2. Lower the attachment until it is barely above the ground.
- 3. Stop the engine.
- 4. Move the control lever **6** back and forth several times.
 - The pressure on the hydraulic connections on the loader unit is released.
- 5. Remove the protective caps from the loader unit connections.
 - To do this, press the connections forward together with the hydraulic hose.
- 6. Remove the protective caps from the hydraulic connections of the attachment.



Coupling

- 1. Press the hydraulic connections of the attachment into the openings of the hydraulic connections on the loader unit.
- 2. Check whether the hydraulic connections are engaged correctly.
 - To do this, pull on the hydraulic hoses of the attachment. The hydraulic connections must not be released as you do so.
- 3. Check the hydraulic system of the attachment and the hydraulic connections for leaks.
 - To do this, carefully actuate the hydraulic connections on the loader unit with control lever **6**.

Uncoupling

- 1. Retract the telescopic boom completely.
- 2. Lower the loader unit until it is barely above the ground.
- 3. Stop the engine.
- 4. Move the control lever 6 back and forth several times.
 - The pressure on the hydraulic connections on the loader unit is released.
- 5. Place a receptacle under the hydraulic connections to collect any oil as it drains.
- 6. Release the hydraulic connections.
 - To do this, press the connections on the loader unit forward together with the hydraulic hose. Pull on the hydraulic hose of the attachment at the same time.
- 7. Fit the protective caps onto the hydraulic connections.
- 8. Lay the hydraulic hoses over the attachment.


5.11 Work operation

Monitoring machine stability

Accident hazard due to tipping over of machine!

Shifting the center of gravity can affect the stability of the machine.

- Extend the telescopic boom only if the machine is on firm and level ground.
- Always pay attention to the display of the safe load indicator.
- First raise the loader unit fully, then extend the telescopic boom.
- First retract the telescopic boom fully, then lower the loader unit.
- Travel only with a retracted telescopic boom on public roads.
- Keep the loader unit as close as possible to the ground during machine travel.





Safe load indicator



Accident hazard due to tipping over of machine!

The safe load indicator only gives a warning in the event of insufficient stability in the longitudinal direction and toward the front. Lateral loads are not indicated by the safe load indicator. Always pay attention to the stability display **3** at the upper right in the cabin while working. The display of the safe load indicator indicates machine stability as a function of the raised load. The safe load indicator gives visual and acoustic signals.

- 1. **Green** up to 40%: There is no risk of the machine tipping over, all travel and work movements can be continued.
- **Green** up to 85%: There is a slight risk of the machine tipping over, pay attention to the display of the safe load indicator for further travel and work movements.
- 2. **Orange**: There is an increased risk of the machine tipping over. Perform further travel and work movements with caution.
- 3. **Red**: There is an imminent risk of the machine tipping over!
 - With an extended boom: the overload protection is active.
 - With the telescopic boom retracted: **Immediately** stop the work movement currently being carried out. Retract the telescopic boom or lower the loader unit.



Information on work operation

Crushing hazard due to tipping over of machine!

A tipping vehicle can cause serious injury or death.

- ► Keep the loader unit lowered during machine travel.
- ► Adapt the travel speed to the prevailing conditions.
- Adapt the driving speed to the material loaded.
- Pay attention to persons and obstacles.
- ► Pay attention to the machine's tilting limit.
- Reduce travel speed before performing downhill machine travel.
- ► Always fasten your seat belt.
- Ensure that no parts of the body protrude outside the vehicle.
- Carefully steer the machine if the loader unit is raised.
- ► Do not exceed the permissible payloads.

Accident hazard due to tipping over of machine!

Shifting the center of gravity can affect the stability of the machine.

- Extend the telescopic boom only if the machine is on firm and level ground.
- Always pay attention to the display of the safe load indicator.
- First raise the loader unit fully, then extend the telescopic boom.
- First retract the telescopic boom fully, then lower the loader unit.
- Travel only with a retracted telescopic boom on public roads.
- Keep the loader unit as close as possible to the ground during machine travel.



Accident hazard due to overload and sudden movements!

Overload and sudden movements can cause accidents and injury.

- Pay attention to the load diagram and payloads of the machine.
- ► Actuate the control lever carefully.

i Information

When driving into the material to be loaded, adapt the travel speed to the nature of the material and the given conditions.

Avoid too much wheel spin. Tire wear and fuel consumption is unnecessarily increased, and machine output cannot be fully used.

This Operator's Manual only describes the use of the following attachments:

- Light-weight materials bucket
- Earth bucket
- · Earth bucket with digging teeth
- 4-in-1 bucket
- Manure forks
- Fork-and-grab attachment
- Pallet forks

Observe the following if additional attachments are used for the machine:

If other attachments are to be used, always follow the Operator's Manuals of these attachments. Specific Operator's Manuals can be ordered from your Wacker Neuson dealer.



Information on working with a lightweight material/earth bucket

i Information

The lightweight material bucket is used for lightweight material, such as grain, corn and pellet feed.

The earth bucket is used for heavy material, such as gravel, sand, soil and rock.

Designated use

The designated use of the lightweight material/earth bucket is loosening, picking up, transporting and dumping material.

Transporting persons in the bucket is not in compliance with the designated use.

Installing the lightweight material/earth bucket

➡ Re-equipping attachments on page 5-46

Control elements

Operate the lightweight materials / earth bucket with the control lever **4**.

► Loader unit control lever on page 5-29

Operating mode

Select bucket mode.

► - see "Working modes" on page 5-37



Operation





When tilting out the lightweight material/earth bucket and when loading vehicles, two work movements can be performed at the same time if required, for example "Raising" and "Tilting out" or "Lowering" and "Tilting in". To do this, the movements must be superimposed on the control lever **4**.

- H = raise
- S = lower
- E = tilt in
- A = tilt out

i Information

Practice using the lightweight material/earth bucket before working with it for the first time.



Working with the lightweight material/earth bucket

Loading work



In order to pick up loose material, lower the lightweight material/earth bucket parallel to the ground. Travel into the material. Pay attention to the travel speed.



Raise the loader unit slightly to apply some load to the front axle of the machine. Wheel spin can also be reduced manually by inching. Tilt in the lightweight material/earth bucket as it is filled. Travel to the unloading position with the full lightweight material/earth bucket.





Excavation work



If you want to load material the lightweight materials/earth bucket cannot penetrate into easily, an up-and-down movement of the cutting edge can be performed with control lever **4**. This makes it easier for the lightweight material bucket/earth bucket to penetrate into the material.

Soft ground

Lower the lightweight material bucket/earth bucket to the ground for digging in soft material. Tilt out the lightweight material bucket/earth bucket to the front until reaching an appropriate digging angle. Travel forward. The lightweight material bucket/earth bucket penetrates into the ground. Set the tilting angle flatter to remove an even layer and avoid wheel spin.



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Hard ground

Lower the lightweight material bucket/earth bucket to the ground for digging in hard material. Tilt out the lightweight material bucket/earth bucket to the front until reaching an appropriate digging angle. Press the lightweight material bucket/earth bucket slightly downward as you travel forward so that the bucket can penetrate into the ground. Set the digging angle flatter as soon as the cutting edge penetrates into the ground. Use the control lever 4 to generate a back and forth movement to support the process.



Working with a load hook



When working with the load hook, the safety instructions for operating lifting gear are to be observed – see chapter 2 "2.5 Lifting gear applications" on page 2-10.

Raise loads only with a retracted telescopic boom!

Use chains for raising and transporting loads with a load hook. The load must be freely suspended on the load hook. The chain must not rub against the cutting edge.

Refer to the bucket's type label for the load hook payloads of a specific bucket.

- 1. Hitch the chain onto the load hook.
- 2. Raise the loader unit to the required height and tilt out the bucket.
- 3. With the bucket tilted out, travel over the load to be raised.
- 4. Safely hitch the chain onto the load.
 - ➡ The load can be raised and transported.



Information about working with the 4-in-1 bucket

i Information

The 4-in-1 bucket is used for heavy material, such as gravel, sand, soil and rock.

Designated use

The designated use of the 4-in-1 bucket attachment is loading, trench applications, grabbing, grading, scraping and spreading material.

Attach 4-in-1 bucket

- ► Re-equipping attachments on page 5-46
- Coupling/uncoupling hydraulic connections from the mast on page 5-52

Control elements

Operate the 4-in-1 bucket with the control4 lever.

- ➡ Loader unit control lever on page 5-29
- Operating hydraulic connections on the loader unit on page 5-41.

Operating mode

Select bucket mode.

► - see "Working modes" on page 5-37

Operation

➡ – see "Operation" on page 5-65

i

Information

Practice using the 4-in-1 bucket before working with it for the first time.

Working with the 4-in-1 bucket

Loading and excavation work

The closed 4-in-1 bucket can be used like a light materials/digging bucket. The 4-in-1 bucket is opened, and not emptied, for unloading at higher heights.

5 Operation



Grab operation

Grabbing large objects



- 1. Open the 4-in-1 bucket.
- 2. Position the 4-in-1 bucket over the object to be grabbed.
- 3. Lower the loader unit.
- 4. Close the 4-in-1 bucket.
 - ➡ The object can be transported.

Grabbing bulky material



Bulky or large objects can be grabbed and safely transported with the 4-in-1 bucket.



Pulling out and replacing posts



- 1. Open the universal bucket and lower it over the post. Close the bucket to grip the post firmly.
- 2. Loosen the post with careful up-and-down movements.
- 3. Raise the loader unit to pull out the post.



Grading and scraping

WARNING

Injury hazard to persons in the danger zone

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

- Adjust the existing visual aids (for example the rearview mirrors) correctly.
- Work particularly carefully when reversing the machine.
- Interrupt work immediately if persons enter the danger zone.



Information

During dozer blade work in the reverse direction, the telescopic boom can pull out if the stacking mode is switched on.

Switch on the bucket mode during dozer blade work.

NOTICE

Risk of technical damage.

Risk of bending the hydraulic cylinder that extends and retracts the telescopic boom. Avoid damage to the telescopic boom.

Only perform leveling and digging work with the telescopic boom fully retracted.



Grading



- 1. Fold up the front half of the bucket.
- 2. Lower the universal bucket to the ground.
- 3. Set the depth of the layer you want to remove with the lift hydraulics.
- 4. Set the angle of the rear cutting edge.
- 5. Grade the surface by performing forward machine travel.

Drawing material backward



- 1. Fold up the front half of the bucket.
- 2. Lower the universal bucket to the ground.
- 3. Set the angle of the front cutting edge.
- 4. Select bucket mode see "Selecting the operating mode" on page 5-37
- 5. Machine travel in reverse slowly fills the universal bucket.



Scraping work



- 1. Set a flat digging angle.
- 2. Fold up the front half of the bucket by about 10 to 15 cm.
- 3. Lower the universal bucket to the ground.
- 4. Set the depth of the layer you want to remove with the lift hydraulics.
- 5. Pick up material by performing forward machine travel. The material rolls into the bucket and is picked up at the same time. This position makes it possible to strip material down to a thickness of about 8 cm (3 in.).

Spreading material in thin layers



- 1. Fill the universal bucket with the material to be spread.
- 2. Open the universal bucket according to the material and flow rate.
- 3. Spread the material evenly on the surface.



Information about working with the dung fork

i Information

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The dung fork is used for materials, such as manure in stables, silage, hay, green fodder, large bales, etc.

Designated use

The manure fork attachment is used for loosening, picking up, transporting and loading materials such as silage, hay, round bales, green fodder and manure.

Installing the manure forks

► Re-equipping attachments on page 5-46

Control elements

Operate the dung fork with the control lever 4.

► Loader unit control lever on page 5-29.

Operating mode

Select stacking mode when loading large bales. Select bucket mode for all other work.

► - see "Working modes" on page 5-37

Operation

➡ – see "Operation" on page 5-65

i) Information

Practice using the manure forks before working with them for the first time.



Working with the manure forks



- 1. Lower the manure forks until the tines are parallel to the ground.
- 2. Travel into the material.
 - Pay attention to the travel speed.
- 3. Slightly raise the loader unit.
 - ► A load is applied to the front axle of the machine.

If the material is solid, such as compacted manure, the manure forks can be tilted in to loosen the load.

- 1. Travel to the unloading position in a straight line.
- 2. Raise the manure forks to the required height only shortly before reaching the unloading position.
- 3. Travel forward as far as possible and tilt out the manure forks.
 - The load falls out.



Information about working with the fork and grab

i Information

The fork and grab is used for materials, such as manure in stables, silage, hay, green fodder, large bales, shrub cuttings, etc.

Designated use

The fork-and-grab attachment is used for picking up, transporting, loading and spreading loose material such as silage, hay, straw, green fodder and manure.

Transporting tree trunks, stones and similar material is not in accordance with its designated use.

Installing the fork-and-grab

- Re-equipping attachments on page 5-46
- Coupling/uncoupling hydraulic connections from the mast on page 5-52

Control elements

Operate the fork and grab with the control lever 4.

- ► Loader unit control lever on page 5-29
- Operating hydraulic connections on the loader unit on page 5-41.

Operating mode

Select bucket mode.

► - see "Working modes" on page 5-37

Operation

➡ – see "Operation" on page 5-65

i) Information

Practice using the fork-and-grab attachment before working with it for the first time.



Working with the fork-and-grab attachment



- 1. Open the fork-and-grab attachment.
- 2. Lower the fork-and-grab attachment until the tines are parallel to the ground.
- 3. Travel into the material.
 - Pay attention to the travel speed.
- 4. Slightly raise the loader unit.
 - ➡ A load is applied to the front axle of the machine.
- 5. Close the fork-and-grab attachment.

If the material is solid, such as compacted manure, the fork-and-grab attachment can be tilted in to loosen the load.

- 1. Travel to the unloading position in a straight line.
- 2. Raise the fork-and-grab attachment to the required height only shortly before reaching the unloading position.
- 3. Travel forward as far as possible and tilt out the forkand-grab attachment.
- 4. Open the fork-and-grab attachment.
 - ➡ The load falls out.



Information on working with the pallet forks

Injury hazard due to falling loads with a raised and extended loader unit!

Falling loads (for example, large bales or stacks of bales) can cause serious or fatal injury.

- Stacking loads with machines that are not equipped with a protective roof or cabin is prohibited.
- Only work with a raised and extended loader unit when the machine is at a standstill.
- Do not tilt in the attachment to the limit with a raised and extended loader unit.

Accident hazard due to tipping over of machine!

Shifting the center of gravity can affect the stability of the machine.

- Extend the telescopic boom only if the machine is on firm and level ground
- Always pay attention to the display of the safe load indicator.
- First raise the loader unit fully, then extend the telescopic boom.
- First retract the telescopic boom fully, then lower the loader unit.
- Travel only with a retracted telescopic boom on public roads.
- Keep the loader unit as close as possible to the ground during machine travel.



Designated use

The pallet forks are used for raising, transporting and setting down loads. Any other use of the pallet forks is not in accordance with its designated use. The pallet forks consist of the fork frame and forks. The forks must always be used in pairs as delivered. The operator must receive special training for using the pallet forks.

Installing the pallet forks

→ Re-equipping attachments on page 5-46.

Control elements

Operate the pallet fork with the control lever 4.

→ Operation on page 5-60.

Operation

Select forklift mode.

➡ – see "Selecting the operating mode" on page 5-37

i) Information

Practice using the pallet forks before working with them for the first time.

Adjusting the fork spacing



🛕 WARNING

Tipping hazard due to incorrect adjustment of fork arms

A tipping vehicle can cause serious injury or death.

- Adjust the spacing of the fork arms so that they are symmetrical to the center line of the machine.
- Adjust the spacing of the fork arms so that they are as far apart as possible.



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Crushing hazard when shifting the fork arms!

Fingers and hands can be crushed between the fork frame and fork arms.

- Do not touch the sliding surface of the fork frame when shifting the fork arms.
- ► Wear protective equipment.
- 1. Raise the pallet forks 10 30 cm above the ground.
- 2. Set the fork lock to position 1.
 - ➡ The lock is released.
- 3. Move the forks to the required position.
 - Hold the forks as shown.
- 4. Set the fork lock to position 3.
- 5. Shift the forks until the lock engages.
 - Hold the forks as shown.
 - ➡ The lock is engaged.



Working with the pallet forks



Picking up a load

- 1. Check whether the permissible load-carrying capacity of the machine and pallet forks is appropriate for the weight of the load.
- 2. Adjust the fork spacing and lock the forks.
- 3. Approach the material in a straight line.
- 4. Set the pallet forks to the required height in a horizontal position.
- 5. Travel forward until the load touches the fork frame.
- 6. Slightly raise and tilt back the pallet forks.
- 7. Set the load to transport height.



Transporting a load

- 1. Transport the load as close a possible to the ground.
 - Adjust a transport height that allows moving the pallet forks across uneven ground without touching it.
 - Adjust the height during transportation if necessary.
- 2. During machine travel up or down a slope the load must always be on the uphill side.
 - Secure the load with ratchet straps if necessary.
- 3. If necessary, transport large, bulky loads in reverse to ensure sufficient visibility.



5.12 Emergency lowering

Information on emergency lowering

WARNING

Accident hazard due to uncontrolled movements of the loader unit!

Uncontrolled movements of the loader unit can cause accidents.

- Immediately and carefully lower the loader unit to the ground in the event of power loss of the machine.
- Release the residual pressure in separate control circuits of the operating hydraulics by moving the control lever.



Information

As described in chapter "Releasing residual pressure", the loader unit may only be lowered and the residual pressure released by trained technical personnel!



Failure of the power supply

The loader unit cannot be lowered any more in case of power failure (for example engine damage, hydraulic system breakdown, malfunction of electrical system, etc.). Immediately secure the telehandler as follows:

- 1. Keep all persons away from the area around the telehandler.
- 2. Apply the parking brake.
- 3. Set all control levers, buttons and switches to the zero position.
- 4. Switch on the hazard warning system.
- 5. Prevent the machine from rolling away with wheel chocks.
- 6. Seal off a large area around the machine with lines, straps or barrier tape.
- 7. Prevent persons from entering this area.
- 8. Immediately ask an authorized service center to tow away the machine.



Releasing residual pressure in the hydraulic system

Injury hazard due to pressure

A thin jet of hydraulic oil escaping under high pressure can penetrate the skin.

- Seek medical attention immediately if hydraulic oil penetrates the skin or eyes.
- Only open hydraulic systems after the pressure in them has been released.
- ► Wear protective clothes.

Proceed as follows to the release residual pressure in the hydraulic system (observe the order of the work steps!):

- 1. Fully lower the loader unit.
- 2. Stop the engine.
- 3. Immediately after stopping the engine, move the control levers and pedals of the hydraulic system repeatedly in all directions.
- 4. Release the pressure in the hydraulic oil reservoir by opening the filler inlet.
- 5. Release the initial stress in the hydraulic system of the drive by opening the return filter.
 - ➡ The pressure in all hydraulic systems is released.



i Information

If a hydraulic system has to be opened immediately after shutting down the machine, release the pressure in the hydraulic system first!

The loader unit can be operated during a limited period of time in case of engine malfunction.

Immediately after identifying engine or hydraulic malfunction, fully lower the loader unit and release the residual pressure in the hydraulic system.

5 Operation



5.13 Options

Electric power outlet on the loader unit



The electric power outlet on the mast is required for the connection of attachments on which certain functions are operated with an electric changeover valve.

The electric power outlet on the mast is switched with the rocker switch **39** in Rocker switch panel 1.

- Move the rocker switch **39** to position "I".
 - ► The electric power outlet is switched on.
- Press switch **39** to position 0.
 - ➡ The electric power outlet is switched off.



7-pole electric power outlet at the rear



This power outlet is used for connecting lights, turn indicators and electrical devices on the trailer or attachment. Always install additional lights on an attachment if the rear lights and other lights are covered by the attachment.



Return without pressure



Some attachments require a return without pressure. The connection for the reverse travel without pressure is located at the front left on the mast. The design of the connection makes it impossible to confuse it with the normal connections of the additional hydraulics.

Comfort operation of hydraulic connections on loader unit

For this function, the vehicle is equipped with another control lever for the mast.

This function allows you to change over the operation of the hydraulic connections to control lever **4**. Control lever **4** does not need to be released to operate the hydraulic connections.

This function is operated with button **36** on the control lever **4**.

Press button 36:

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- The function "Tilt in" operates the hydraulic connection on the left (with the button pressed).
- The function "Tilt out" operates the hydraulic connection on the right (with the button pressed).
- Release button 36:
 - ➡ The function "Tilt in" tilts in the attachment.
 - ➡ The function "Tilt out" tilts out the attachment.





Additional hydraulic connections on the mast (4th control circuit)

Additional hydraulic connections on the loader unit can be operated with this function. This function is required if the standard hydraulic connections are not sufficient for certain attachments. The rocker switch **47** makes it possible to change over between the standard hydraulic connections and the additional hydraulic connections. The additional hydraulic connections can then also be operated with control lever **6**.

Coupling the additional hydraulic connections requires releasing the pressure on them first. Proceed as follows for this:

- 1. Stop the engine.
- 2. Switch on the starter (position I).
- 3. Move the rocker switch to 47 "position I".
- 4. Operate the control lever **6** repeatedly in both directions.
 - The pressure on the additional hydraulic connections is released.
- 5. Connect the hydraulic connections of the attachment
 - Coupling/uncoupling hydraulic connections from the mast on page 5-52



Once the attachment is connected, the rocker switch **47** makes it possible to change over between the hydraulic connections as required.



Operate additional hydraulic connections on the mast (4th control circuit)

- Move the rocker switch 47 to "position 0".
 - The standard hydraulic connections are in operation.
- Move the rocker switch 47 to "position I."
 - The additional hydraulic connections are in operation.

If the additional hydraulic connections are switched on:

• Move control lever 6 toward (L):

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- The rear connection is the pressure side, the front connection is the return.
- Move control lever 6 toward (R):
 - The front connection is the pressure side, the rear connection is the return.





"High Flow" hydraulic connections

NOTICE

Damage to hydraulic hoses of attachment during extension or retraction of the telescopic boom.

Do not extend the telescopic boom if the hydraulic hoses of the attachment are connected to the hydraulic "High Flow" connections. The connections are firmly fastened on the outside section and cannot be extended with the telescopic boom.

 Fig. 108

The "High Flow" hydraulic connections are located on the right of the loader unit. Red connection (F) = feed. Blue connection (R) = return.

i) Information

This connection is required for the operation of constantrunning attachments requiring a higher oil flow rate.

- Proceed as described in chapter Coupling/uncoupling hydraulic connections from the mast on page 5-52 for coupling and uncoupling.
- Only connect the hydraulic "High Flow" connections if the telescopic boom is to be operated when it is retracted.


Operating "High Flow" hydraulic connections

NOTICE

Technical damage due to overheating of hydraulic system.

 Always put switch 49 in the zero position if "High Flow" is not required.

The "High Flow" hydraulic connections are operated with switch **49** in Rocker switch panel 4.

Switch on the "High Flow" hydraulic connection:

• Press switch 49 to position I.

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- Move the control lever 6 toward L until it locks into place.
 - ➡ "High Flow" is switched on.

Switch off the "High Flow" hydraulic connection:

- Move the control lever 6 back into the middle position.
- Move the rocker switch 49 to position 0.
 - ➡ "High Flow" is switched off.



5 Operation



Rear hydraulic connection

Operating the rear hydraulic connection with a control lever



The rear hydraulic connections can be operated with the control lever **6** for the auxiliary hydraulics.

i) Information

With this type of connection the hydraulic connections on the loader unit and at the rear of the machine are operated at the same time.

Before coupling/uncoupling, release the pressure in the hydraulic circuit as described in section Coupling/ uncoupling hydraulic connections from the mast on page 5-52.



Operating the rear hydraulic connections with a switch

With this type of connection, the hydraulic connections on the loader unit and at the rear of the machine can be operated separately.

This function is operated with the rocker switch 48.

Coupling the rear hydraulic connections requires releasing the pressure on them first. Proceed as follows:

- 1. Stop the engine.
- 2. Switch on the starter (position I).
- 3. Press the rocker switch 48 in both directions.
 - The pressure on the rear hydraulic connections is released.
- 4. Connect the hydraulic connections.



- Press the rocker switch 48 to "position I:"
 - ➡ The upper hydraulic connection is the pressure side.
- Press the rocker switch 48 to "position II:"
 - The lower hydraulic connection is the pressure side.
- Press switch 48 to position 0:
 - There is no pressure on any of the hydraulic connections.



Rear 3-point mount



Risk of injury to persons in the danger zone!

If attachments are used on the rear 3-point mount, there must be no one in the danger zone of this mount.

NOTICE

Technical damage due to overloading!

The max. authorized mounting weight max. for the rear 3-point mount is 500 kg.

 Only use attachments approved by Wacker Neuson. Wacker Neuson shall not be liable for the use of other attachments.

NOTICE

If the machine is equipped with the automatic trailer coupling option, the upper linkage can collide with the trailer coupling and be damaged when the 3-point mount is lowered.

Removing the trailer coupling on page 5-103 if the rear 3-point mount is used.



Operating the rear 3-point mount



The rear 3-point mount is operated with switch **50**. Position I automatically lowers the rear 3-point mount to the lowest position. Position II raises the 3-point mount as long as switch **50** is pressed.

- Move the rocker switch **50** to position I.
 - The switch remains in position I.
 - ➡ The loaded rear 3-point mount is lowered.
- Move the rocker switch **50** to position II.
 - The rear 3-point mount is raised as long as the switch is pressed.



Lifting and lowering throttle



Lifting and lowering the rear 3-point mount is performed more quickly or slowly with this throttle. This makes it possible to reduce the lowering speed of the rear 3-point mount by closing the throttle if heavy attachments are installed, so that the load is not abruptly lowered.

- Turn the throttle toward S.
 - ➡ Lifting and lowering is performed more quickly.
- Turn the throttle toward L
 - ► Lifting and lowering is performed more slowly.



Putting the rear 3-point mount to transport position

NOTICE

The rear 3-point mount can be folded to transport position when it is not in use. *Fig. 115* shows the holes in which the pin has to be inserted for a specific position.

1. Lower the rear 3-point mount.

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- 2. Raise the upper linkage of the rear 3-point mount, fasten it with the pin (B) and secure the pin.
- 3. Remove both pin locks from the lower-linkage pins (U) and pull out the pins (U).
- 4. Raise the lower linkage of the rear 3-point mount and insert the lower-linkage pins (U).
 - 1 Work position
 - 2 Transport position
- 5. Put the pin locks back in again.

To move the three-point rear end mounting into the working position follow the steps in reverse order.



5 Operation



PTO shaft



Injury hazard due to rotating parts!

Clothes and limbs can get caught on rotating parts.

- For PTO shaft operation, only use cardan shafts with working protective devices. Check before use whether the protective devices are installed and functional. Replace damaged or missing protective devices.
- Check before use whether the cardan shaft and protective devices are fastened correctly.

NOTICE

The maximum articulation angle of cardan shafts depends on the design, shape and size of the protective devices.



Operating the PTO shaft



The PTO shaft is operated with switch 48 in Rocker switch panel 4.

- Press switch 48 to position I: ٠
 - → The PTO shaft is switched on.
- Press switch 48 to position 0: ٠
 - ➡ The PTO shaft is switched off.



Information

The PTO shaft turns with 540 rpm at the rated engine speed.



Trailer couplings

Safety instructions for trailer operation

Note the safety instructions on page 2-12 "Trailer operation".

- Trailer operation is only allowed with a type-approved and certified trailer coupling.
- Trailer operation with the towing gear of the machine is prohibited.
- Observe the national regulations for trailer operation.
- The specific national driving license is required.
- Carrying passengers on trailers is prohibited.
- Observe the maximum permissible vertical and trailer load.
- Do not exceed the permissible trailer speed.
- Before coupling and uncoupling a trailer, secure it with the parking brake and suitable wheel chocks to prevent it from rolling away.
- There must be nobody between the vehicle and the trailer when hitching a trailer.
- Hitch the trailer onto the vehicle correctly.
- Check whether the brakes and lights work correctly.
- Before starting vehicle travel, ensure that nobody is between the vehicle and the trailer.

- Trailer operation changes the machine's operating behavior, the operator must be familiar with this and act accordingly.
- Bear in mind the machine's steering mode and the trailer's turning circle.
- Before downhill machine travel, reduce travel speed or adapt it to the circumstances.

Operating the trailer couplings

Risk of injury to persons in the danger zone!

When coupling or uncoupling a trailer, the operator can fail to see and therefore cause injury to persons between the tractor vehicle and trailer.

Ensure that nobody is in the danger zone between the tractor vehicle and the trailer.

This Operator's Manual describes how to use and operate the following trailer couplings:

- Maneuvering coupling
- Automatic trailer coupling
- Autohitch coupling

See chapter *Trailer operation on page 5-12* for the requirements for trailer coupling operation.

The permissible usage and trailer weights are to be observed and can be found in chapter *Payload and axle load on page 9-12*.



Hitch a trailer as follows:

- 1. Release the pin.
- 2. Pull out the pins.
- 3. Slowly reverse the machine toward the trailer drawbar.
- 4. Insert the pin.





Maneuvering coupling with automatic lock



Hitch a trailer as follows:

- 1. Press retaining spring 1 to release the pin.
- 2. Turn the pin 90° with lever 2.
- 3. Pull out the pins.
- 4. Slowly reverse the machine toward the trailer drawbar.
- 5. Insert the pin and turn it 90° with the lever.

Automatic trailer coupling

Danger of crushing due to unintentional actuation of the trailer coupling!

The trailer pin closes abruptly and can cause serious injury.

- Keep all parts of the body away from the range of action of the automatic trailer coupling.
- Alway keep the trailer coupling closed when it is not in use.

NOTICE

If the machine is equipped with the rear 3-point mount option, the upper linkage can collide with the trailer coupling and be damaged when the 3-point mount is lowered.

Removing the trailer coupling on page 5-103 if the rear 3-point mount is used.



Removing the trailer coupling

- 1. Remove both pin locks.
- 2. Pull out the pins.
- 3. Remove the trailer coupling.

Assembly is performed in the reverse order.





In order to ensure the required swivel angle when coupled, use the trailer coupling only in connection with lugs in compliance with DIN 11026, DIN 74053 (ISO 1102) or DIN 74054 (ISO 8755).

 The permissible lugs are listed on the type label on the trailer coupling.



Coupling the trailer to the machine

- 1. Press lever C all the way up.
- 2. Adjust the trailer drawbar to the correct height.
- 3. Slowly reverse the machine toward the trailer drawbar until the drawbar eye touches and sets off the trigger mechanism.
- 4. Check the correct locking.
- 5. Remove the equipment (chocks, support wheel) used for securing the trailer.
- 6. Connect the trailer supply lines to the machine.

Uncoupling the trailer from the machine

- 1. Park the trailer on firm, level and dry ground.
- 2. Apply the parking brake and secure the trailer (chocks, support wheel, etc.).
- 3. Remove the trailer supply lines from the machine.
- 4. Press lever C all the way up.
- 5. Slowly move the machine away from the trailer.
 - ➡ Close the trailer coupling by pressing lever D.



Manual speed control adjustment



This function makes it possible to adjust engine speed (from idling to full speed) individually with no need to press the accelerator pedal all the time.

This function is operated with lever (Fig. 122).

- Move the lever backward:
 - ➡ Engine speed is reduced.
- Move the lever forward:
 - ➡ Engine speed increases.

Manual inching



This function makes it possible to adapt travel speed individually with no need to press the brake/inching pedal all the time.

This function is operated with rotary swith (Fig. 123).

- Turn the rotary switch toward (R):
 - ➡ Travel speed of the machine is reduced.
- Turn the rotary switch toward (L):
 - ➡ Travel speed of the machine is increased.



Central lubrication system

The central lubrication system automatically lubricates the lubrication points of the machine.

The LED of the central lubrication system illuminates for 1.5 seconds after switching on the starter to indicate functional readiness of the controls. It stays lit during the entire lubrication procedure.

The integrated electronic control unit has a data memory for saving the times that have been set or that have elapsed. The time is taken and saved if the starter is switched off during lubrication or during a break. The remaining lubrication time or break time is read from the memory upon switching the starter on again, and lubrication is resumed where it was interrupted.

NOTICE

Vehicle damage if lubrication points are not lubricated.

▶ Note the notice on page 7-71.

Lubrication time control



Break and lubrication times can be set with the timedependent control of the central lubrication system. Break times are the periods between two lubrication times.



NOTICE

Water penetrating into the controls of the central lubrication system can destroy them.

Always close the cover correctly, otherwise water can penetrate into the controls and destroy them.

i Information

Pressing button **A** on the side of the pump starts intermediate lubrication at any given time if the ignition is switched on. This also serves as a functional check.

- The pump then immediately starts with the lubrication cycle. The lubrication or break time that has elapsed so far or that has been saved is reset and starts over again.
- A lubrication system malfunction can also be reset by pressing the intermediate lubrication switch, and the pump restarts lubrication.

Setting lubrication and break times





J Information

Observe the original Operator's Manual of the central lubrication system!



Break times and lubrication times are set with the notched switches (S and P) in the window of the controls.

- To set the time, remove the red frame (*Fig. 125*) on the motor protective housing of the pump with a flat screw-driver.
- Loosen the four cross-slotted screws.
 - ➡ Remove the cover.
- Set the break time P and lubrication time S with a flat screwdriver.

Install the cover once setting is over.

Setting lubrication times (S)

➡ 1 to 16 minutes (16 notches, 1 minute each)

Setting break times (P)

➡ 0.5 to 8 h (16 notches, 0.5 h each)

LED (L)

The LEDs signal various operating states of the central lubrication system.

When switching on the ignition:

- Both LEDs light up for 1.5 seconds for a self-test. During the entire lubrication process:
- The red LED does not light up.
- The green LED lights up continuously.

Should errors occur on the lubrication system:

• The red LED flashes.

The green LED does not light up.



Engine oil and hydraulic oil preheating

Risk of electric shock

The mains plug is operated with 230 volts.

 Run the engine and hydraulic oil preheating only in a dry place.

The machine can be fitted with an engine and hydraulic oil preheating. It preheats the coolant/hydraulic oil. The following operating times are recommended depending on outside temperatures:

Temperature (°C/°F)	Operating time in hours (h)
–20 °C/–4 °F	3 h
-10 °C/14 °F	2 h
-5 °C/23 °F	1.5 h
0 °C/32 °F	1 h
+10°C/50 °F	1 h



NOTICE

Damage to engine preheating due to misuse!

- Use only the preheating for cold starts for the duration of the operating times specified above (overheating protection)!
- Check the coolant and hydraulic oil level every time before using the preheating, otherwise the heating cartridge can burn out!
- Check for leaks, including on a warm machine.
- The coolant must always have a sufficient amount of antifreeze.
- Check cables regularly for damage or aging. Immediately replace a damaged cable.

Requirements for connecting the engine/hydraulic oil preheating:

- 230 V mains supply
- Maximum 16 ampere fuse protection
- Residual current circuit breaker (FI switch)
- Power outlet with grounding contact
- The machine body and the protective conductor of the power outlet must be conductively connected together under all circumstances.

Connecting the engine oil and hydraulic oil preheating:

- 1. Park the machine near a 230 V mains power outlet with a residual current circuit breaker.
- 2. Open the engine cover.

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- 3. Connect special cable (A) supplied with the machine with machine power outlet (B).
- 4. Connect the plug to a 230 V mains power outlet.
 - → The engine and hydraulic oil is being preheated.

Before starting the engine:

- 1. Remove the plug from the 230 V mains power outlet.
- 2. Unplug special cable (A) from machine power outlet (B).
- 3. Close the engine cover.





Telematics



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

28 kph version

i Information

Operators/owners of machines with a design-specific maximum speed over 20 kph must comply with special driving license and insurance requirements.

The machine may also be subject to registration and identification requirements for travel operation on public roads!

The machine owner alone is responsible for complying with these requirements/obligations!

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5.14 Putting out of operation/back into operation

Putting the machine out of operation

The measures indicated below refer to putting the machine out of operation and back into operation again after a longer period of time.

- 1. Parking the vehicle
 - ► Securing the vehicle on page 5-14.
- 2. Jack up the machine so that the tires do not touch the ground any more.
- 3. Release the parking brake.
- 4. Fully lower the loader unit.
- 5. Reduce the residual pressure in the hydraulic system as described in chapter *Releasing residual pressure in the hydraulic system on page 5-82* and move all control levers and rocker switches to neutral.
- 6. Spray an anticorrosion agent onto bare metal parts of the machine (for example piston rods of hydraulic cylinders if they are not retracted).
- 7. Preserve the engine.

Preserving the engine

- 1. Clean the engine with a high-pressure cleaner in a suitable place.
- 2. Bring engine up to operating temperature.
- 3. Drain the engine oil and dispose of it in an environmentally friendly manner.
- 4. Fill anti-corrosion oil into the engine.
- 5. Drain the fuel from the tank.
- 6. Create a mixture of 90 % fuel and 10 % anti-corrosion oil and fill it into the fuel tank.
- 7. Run the engine at idling speed for 10 minutes and then stop it.
- 8. Crank the engine several times by hand to preserve the cylinders and combustion chambers.
- 9. Remove the fan belt and wrap it airtight und light-proof for storage.
- 10.Spray an anticorrosion agent onto the running surfaces of the pulleys.
- 11.Close the intake and exhaust openings of the engine.



Storing the battery

- 1. Remove the battery.
- 2. Clean the battery.
- 3. Charge the battery.
- 4. Store the battery in a dry and well-ventilated room at around 20 °C.
- 5. Check the acid level once a month.
- 6. Charge the battery again before installing it.

Removing engine preservation

- 1. Remove the covers from the intake and exhaust openings of the engine.
- 2. Remove the anti-corrosion agent from the pulleys.
- 3. Install the fan belt.
- 4. Drain the preservation oil and add engine oil.
- 5. Start up the engine.
- 6. Check the V-belt tension after running the engine for two hours.

Putting the machine back into operation

- 1. Remove engine preservation.
- 2. Install the battery.
- 3. Check tire inflation pressure.
- 4. Remove the preservation from the piston rods of the hydraulic cylinders.
- 5. Remove the machine from the jacks.
- 6. Check the operation of the electrical system.
- 7. Bleed the hydraulic system.
- 8. Check the operation of the steering and brakes.



5.15 Permanently putting out of operation

Information on permanently putting the machine out of operation

Environment

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

Dispose of the different kinds of material, fluids and consumables separately and 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.

Prior to disposal

- Observe all applicable safety regulations regarding putting the machine out of operation!
- Ensure that the machine cannot be operated between putting it out of operation and disposing of it!
- Ensure that there is no leakage of environmentally hazardous fluids and consumables, and that the machine presents no other hazards at its storage place!
- Secure the machine against unauthorized use! Close all openings (doors, windows, engine cover) and secure the vehicle as described in chapter *Securing the vehicle on page 5-14*.
- Install all protective devices!
- Rectify any leaks on the engine, reservoirs and hydraulic system.
- Remove the battery!
- Store the machine in a place that is secured against access by unauthorized persons!



Disposing of the machine

- Further recycling of the machine must be made in accordance with state-of-the-art standards applicable at the time of recycling, and in compliance with the safety regulations regarding accident prevention!
- All parts must be disposed of in the correct waste disposal sites for the different materials.
- · Ensure that the materials are sorted for recycling.
- Ensure environmentally compatible disposal of fluids and consumables!



6 Transportation

6.1 Towing the machine

Information on towing

Accident hazard due to towing of machine!

Towing the machine can cause accidents in certain situations, and serious injury or death.

- Only tow the machine if the steering and braking systems are fully functional.
- Only tow the machine with towing gear of sufficient dimensions.
- No persons are allowed to stay in the range of action of the towing gear during towing.
- Secure the machine against unintentional movement and unauthorized use once towing is over.

Accident hazard when pulling trailer loads!

Pulling trailer loads can cause accidents, and serious

injury or death.

- Do not use the towing gear to tow trailer loads.
- Only hitch trailer loads if the machine is equipped with special towing gear.



Bypassing the drive

NOTICE

Damage to hydraulic system due to overheating.

- Only tow the machine as far as required, and only a maximum 500 meters.
- Do not exceed a maximum speed of **5 kph**.
- Use a transport vehicle for longer stretches, or perform an on-site repair of the machine.

NOTICE

Damage to the hydraulic system when towing the machine.

The engine cannot be started under any circumstances by towing the machine.

NOTICE

Risk of damage to the hydraulic system!

- Do not screw in the threaded bolts 1 any further than described, as otherwise important parts of the valves of the axial-piston variable displacement pump will be destroyed!
- After towing, unscrew the threaded bolts again as far as the stopper and secure them with the hexagon nuts
 Otherwise machine operation is not possible.



Towing the machine requires bypassing the drive. In this case the drivetrain is switched from power transmission to freewheeling. For this purpose the variable displacement pump is equipped with high-pressure limiting valves with bypass function. The axial-piston variable displacement pump can be accessed from the lower side of the machine.

Before towing the machine

- 1. Unscrew the lower cover plate.
- 2. Loosen hexagon nuts **2** of the high-pressure limiting valves.
- 3. Screw in threaded bolts **1** until they are flush with the hexagon nuts.
 - ➡ The machine can be towed.

Once towing is over:

- 1. Unscrew threaded bolts **1** as far as they will go.
- 2. Tighten hexagon nut 2 to 22 Nm torque.
- 3. Screw on the lower cover plate.

High-pressure limiting valves





Towing gear

Accident hazard when pulling trailer loads!

Towing trailer loads can cause accidents.

- ► Do not use the towing gear to tow trailer loads.
- Only hitch trailer loads if the machine is equipped with special towing gear.





6.2 Loading the vehicle

Information on loading the machine

Accident hazard due to incorrect loading!

Incorrect loading can cause accidents and serious injury or death.

- ► Clean the machine before loading or transporting it.
- Use transport equipment with corresponding loadcarrying capacity.
- ▶ Pay attention to the machine's operating weight.
- Proceed with special care when loading the machine in conditions of snow and ice.

i Information

Do not load or transport the machine unless all safety requirements have been met.

Loading and transportation of the machine may only be performed by experienced and trained personnel. The transporter is always responsible for loading and transportation.

6 Transportation



In order to avoid injury or accidents, observe the following instructions when loading the machine:

- The transport vehicle must be of sufficient size.
 - Refer to chapter "Technical data" for the weight and dimensions of the machine to be loaded:
 - ➡ Vehicle weight on page 9-12
 - ► Dimensions of 29.9 kW machine on page 9-14
- Remove any mud, snow or ice from the tires so that the machine can be safely driven onto the ramps.
- Secure the transport vehicle against unintentional movement.
- When positioning the machine on the platform, ensure that the center of gravity of the load is as low as possible and in the longitudinal center line of the transport vehicle if possible.
- The permissible maximum weight or the permissible axle load of the transport vehicle must not be exceeded during loading or transportation.
- Ensure that the load does not fall short of the minimum axle load of the transport vehicle, otherwise the steering behavior is strongly affected.
- Place partial loads so as to ensure an even load on all axles of the transport vehicle.
- Secure the machine so that it cannot slip, slide, roll, tip over or fall, or cause the vehicle to tip over under usual transportation conditions.

- Usual transportation conditions are conditions in the which the brakes are slammed on, evasive maneuvers are performed with the vehicle or in which uneven roadways are traveled on.
- Auxiliary means are, for example, anti-slip bases and linings, ratchet straps and chains, clamping beams, protective paddings, nets, edge protectors, etc.
- Always use the existing tie-down points when using ratchet straps and chains.
- Adapt the travel speed to the load, road and traffic conditions, and handling of the transport vehicle.



Loading the vehicle

Load as follows:

Preparations

- 1. Secure the transport vehicle with wheel chocks to prevent it from rolling away.
- 2. Place the access ramps at the smallest possible angle.
 - ➡ Do not exceed an angle of 25°.
 - → Use access ramps only with an antiskid surface.
- 3. Ensure that the loading area is clear and access to it is not obstructed, by superstructures for example.
- 4. Ensure that the access ramps and the wheels of the machine are free of snow, ice, oil or grease.
- 5. Check the engine oil level of the machine to be loaded.
 - ➡ The oil level must be visible at the MAX mark of the oil dipstick.

Loading

- 1. Start the vehicle.
- 2. Raise the loader unit enough so that it will not touch the access ramps.
- 3. Ensure that the attachment is securely locked.
- 4. Carefully drive the vehicle onto the middle of the transport vehicle.
- 5. Switch the drive to the zero position.
- 6. Apply the parking brake.
- 7. Lower the loader unit to the loading area.
- 8. Stop the engine.
- 9. Remove the starting key.
- 10.Leave the cabin, close and lock the doors and engine cover.
- 11.Ensure that the permissible maximum height of the transport vehicle is not exceeded.



Crane-lifting the machine

Safety instructions regarding crane-lifting

In order to avoid injury or accidents, observe the following instructions when loading the machine!

- Seal off the danger zone.
- The crane and the lifting gear must have suitable dimensions.
- Take into account the machine's overall weight.
- Use only tested ropes, belts, hooks, shackles (screw and socket pins with lockable brackets) for fastening the machine.
- Have loads fastened and crane operators only guided by experienced persons.
- The person guiding the crane operator must be within sight or sound of him.
- The crane operator must observe all movements of the load and the lifting gear. Secure the vehicle against unintentional movement.
- The crane operator may move a load only after making sure that the load is safely fastened and nobody is within the danger zone, or after receiving a signal from the persons attaching or securing loads.
- The load must not be fastened by winding the lifting rope or chain around it.

- Bear in mind the load distribution (center of gravity) when fastening the lifting gear.
- Load the machine only with an empty attachment in transport position.
- Ensure that no one is in or on the machine.
- Stay clear of a raised load.
- Pay attention under all circumstances to the safety instructions *Crane-lifting on page 2-16* and to the information in the "Earth moving machinery" leaflet of the German Employers' Liability Insurance Association for construction engineering.



Crane eyelets



For hitching the lifting gear, use only the slinging points identified with the labels (*Fig. 129*) (*Fig. 130*).



6 Transportation



Crane-lift as follows:

- 1. Fasten and safely lock the attachment
 - → Re-equipping attachments on page 5-46.
- 2. Empty, tilt in and lower the attachment to transport position.
- 3. Set all control levers and switches to the zero position.
- 4. Stop the engine and remove the starting key.
- 5. Apply the parking brake.
- 6. Leave the cabin, close and lock the doors and engine cover.
- 7. Fasten the vehicle at the crane eyelets with lifting gear.
- 8. Carefully raise the machine with the crane.




6.3 Transporting the vehicle

Tie-down points on machine



For tying down the machine, use only the slinging points identified with the labels (*Fig. 132*) (*Fig. 133*).



6 Transportation



Tying down

Tie down the machine as follows:

- 1. Secure all wheels of the machine at the front, rear and at the sides with wheel chocks.
- 2. Secure the machine at the tie-down hooks.
- 3. Close the outlet of the muffler with a suitable cap or adhesive tape.
- 4. Ensure that the driver of the transport vehicle knows the overall height, width and weight of his vehicle (incl. machine) before departure, as well as the legal transportation regulations of the country or countries where transportation is to take place.





7.1 Information on maintenance

Responsibilities and prerequisites

- The maintenance and inspection personnel must have specialized knowledge about the maintenance and inspection work on the machine.
 - The necessary expertise can be obtained at training sessions from Wacker Neuson Service.
- Perform maintenance and inspection work only with suitable protective equipment.
 - ➡ Wear ear protectors in case of high noise levels.

Safety instructions

Information on maintenance

- Only perform maintenance and inspection work after having read and understood the Operator's Manual.
- Pay attention to the basic safety instructions and to all the warning labels affixed on the machine.
- The Operator's Manual describes the work to be performed.
 - However, the descriptions of the work processes provide the required information only to experienced personnel having appropriate knowledge.
- Always store the Operator's Manual in the place provided for it on the machine.
- The work that is not specified in this manual may only be performed by an authorized service center.



Information on the machine and the attachment

- Only perform maintenance and inspection work if the machine is secured as described in chapter *Securing the vehicle on page 5-14*.
- A raised loader unit can fall suddenly and cause serious injury.
 - A raised loader unit must be secured with a suitable support if it is absolutely necessary to work underneath it – see "Safety instructions on the telescopic boom" on page 5-31.
- Lower attachments on the ground ensuring that no movements can occur when releasing mechanical or hydraulic connections.
- Secure equipment or components that are to be attached or removed, or whose installation position is to be changed, with the aid of suitable lifting gear or with mounting or support devices to prevent unintentional movement, slipping or falling.
- Remove dirt from steps and handholds to keep them safe and ready for use.

Information on tools

• Only work with suitable and functional tools.

Information on cleaning work

- Clean units in the working area before starting work. The choice of the cleaning agents depends on the material of the parts to be cleaned.
- Rubber parts and electrical components must not be cleaned with solvents or steam. Water can cause short circuits in the electrical system and cause new hazards.
- Do not use solvents that give off harmful or flammable vapors.
- Avoid skin contact with cleaning agents.
 - ➡ Wear protective equipment.



Information on handling flammable liquids

- Do not smoke and avoid open fire when handling flammable liquids
- Do not use water to extinguish fires on the machine or burning liquids.
 - Use suitable extinguishing agents, such as powder, carbon dioxide or foam extinguishers
- Always call the fire department in the event of a fire

Information on handling fuels, oils and greases

- · Burn hazard due to hot lubricating oil or hydraulic oil
- Avoid skin and eye contact with oil and grease
 - ➡ Wear protective equipment
- Do not use fuel or solvents to clean your skin
- Rectify any oil or fuel leaks immediately
- Do not allow the oil and oily wastes to get into the ground or stretches of water
- Absorb the escaping oil or fuel immediately with a binding agent, and dispose of it in an environmentally friendly manner and separately from other waste
- Even biodegradable, "environmentally friendly" oil must be disposed of separately, just like every other type of oil.



Information on residual pressure in the hydraulic system

- A fine jet of hydraulic oil under high pressure can penetrate through the skin.
 - Seek medical attention immediately if oil penetrates the skin or eyes.
- Only open hydraulic systems after the pressure in them has been released.
- Even if the machine is parked on level ground with its loader unit fully lowered and its engine stopped, there can still be considerable residual pressure in parts of the hydraulic system.
- Residual pressure is only slow to ease.
 - If the hydraulic system has to be opened immediately after shutting down the machine, release the pressure in the hydraulic system first.
- On machines equipped with hose burst valves on the lift and/or tilt cylinder, open the valves in order to lower the loader unit see "Releasing residual pressure in the hydraulic system" on page 5-82.

Information on hardware, pipeline, hydraulic hoses

- Replace hydraulic hoses after a maximum six years.
- Have any leaks in the line system rectified immediately.
- A fine jet of hydraulic oil under high pressure can penetrate through the skin.
 - Seek medical attention immediately if oil penetrates the skin or eyes.
- Do not search for leaks with your hands.
 - Search for leaks using cardboard or paper on which the escaping oil can been seen.
- Do not repair damaged pipe lines and hydraulic hoses, but replace them immediately by new ones.

Information on engine exhaust

- Engine exhaust is hazardous to your health.
 - ➡ Do not breathe in engine exhaust.
- If maintenance and inspection work has to be performed in enclosed spaces with a running engine, extract the exhaust gases with an extraction system and ensure that the space is well ventilated.

Information on batteries

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- Batteries give off explosive gases.
 - Avoid smoking, fire or open flames near batteries.
- Do not place any tools on batteries. Short-circuiting the terminals produces sparks that ignite escaping battery acid vapors.
- Battery acid is caustic. Avoid contact with the skin, eyes, mouth and clothing.
 - ➡ Wear protective equipment.
 - In case of contact, immediately rinse the contaminated part of the body with plenty of water and seek medical attention.
- Always take off metal jewelry and watches before performing work on the battery or the electrical system.
- Dispose of old batteries in an environmentally friendly manner and separately from other waste.

Information on the electrical system

- Always follow the correct sequence when disconnecting the battery.
 - To disconnect: First the negative terminal, and then the positive terminal.
 - To connect: First the positive terminal, and then the negative terminal.
- Always operate and disconnect the battery master switch before performing work on the electrical system in which tools, spare parts, etc. can touch electrical components or contacts.
- Operate and remove the battery master switch before performing welding work.

After maintenance

- Once maintenance and inspection work is over, install all protections again correctly.
- Only start the engine if no more work is performed on the machine and there are no more persons in the danger zone.
- Start the machine only from the operator seat.
- Once maintenance and inspection work is over, perform a functional check of the machine.



7.2 Maintenance overview

Daily/weekly maintenance

Work to be performed by the operator	Daily	Every week
Clean the machine	•	
Clean the air filter	•	
Check the machine for general damage	•	
Check the coolant level	•	
Checking the engine-oil level	•	
Check the engine for leaks		•
Check the hydraulic oil level	•	
Check the tire condition and pressure		•
Check all bolts for tightness		•
Check the wheel bolts		•
Check the braking system for correct function	•	
Check the brake fluid		•
Check the washer system and wiper water level	•	
Check the seat belt	•	
Check the instruments and indicator lights, and the acoustic warning devices for correct function	•	
Check the electrical system and lights for correct function	•	



Work to be performed by the operator	Daily	Every week
Check the brake/inching pedal for correct function	•	
Check the steering system	•	
Check control levers and switches for correct function	•	
Check the attachments	•	
Check the exhaust for malfunctions and excessive smoke		•
Perform grease lubrication according to the lubrication plan, including of the attachments		•
Check the protective ROPS/FOPS structure		•
Clean the preliminary separator of the fuel filter		•
Check the machine axles for leaks		•
Check the hydraulic oil and water radiator for leaks and dirt, clean it if necessary		•
Check the attachments for safety and correct function		•
Check the routing of the hoses, pipe lines and electric lines		•
Check the air filter and intake hose		•
Check the engine mounting and axle mounting		•
Check the pad tracks of the mast for damage.		•
Perform a general safety check, see page 7-25		•



Inspection schedules

Inspection after 30 operating hours

NOTICE

The maintenance and inspection personnel must have specialized knowledge about the maintenance and inspection work on the machine.

• Observe the Operator's Manual of the engine.

Work to be performed by an authorized service center after 30 operating hours

Check the gearbox, engine and hydraulic system for leaks

Check the hydraulic, water and engine oil radiator for dirt

Check the coolant level and antifreeze

Check the tension and condition of the V-belt

Check the hoses and pipes for secure seating

Check the routing of the hoses and pipes

Check the piston rods of the hydraulic cylinders

Check the routing of Bowden cables and electric cables

Retighten all bolts; pay particular attention to the engine mounting, axle mountings and cardan shaft

Check the instruments and acoustic warning devices



Work to be performed by an authorized service center after 30 operating hours

Check the electrical system

Check the brake/inching pedal and parking brake, adjust if necessary

Check the steering system

Check the light system (if equipped)

Check the idling speed

Check the door and engine cover locking mechanism for correct operation

Check the protective ROPS structure

Check the tire condition

Replace the engine oil and engine oil filter

Clean the air filter, replace it if necessary

Replace the hydraulic oil return filter

Perform grease lubrication according to the lubrication plan

Lubricate the cardan shaft

Lubricate with oil: all levers, Bowden cables and hinges

Check all oil levels, add oil if necessary



Inspection after 500 operating hours

NOTICE

The maintenance and inspection personnel must have specialized knowledge about the maintenance and inspection work on the machine.

Observe the Operator's Manual of the engine.



This inspection is performed once after the first 500 operating hours. If the machine does not reach 500 operating hours during its first year of operation, perform this inspection once 12 months after putting the machine into operation.

Work to be performed by an authorized service center after 500 operating hours

Check the gearbox, engine and hydraulic system for leaks

Check the engine and hydraulic oil radiator for dirt

Check the coolant level and antifreeze

Check the tension and condition of the V-belt

Check the routing of the hoses and pipes

Check the piston rods of the hydraulic cylinders

Check the air filter hose

Check the routing of Bowden cables and electric cables

Retighten all bolts; pay particular attention to the engine mountings, axle mountings and cardan shaft

Check the rubber buffers on the engine mountings

Check the battery acid level



Work to be performed by an authorized service center after 500 operating hours

Check the instruments, indicator lights and acoustic warning devices

Check the electrical system

Check the brake/inching pedal and parking brake, adjust if necessary

Check the steering system

Check the light system (if equipped)

Check the exhaust system

Check the pivot pins and joint bushes

Check the pin bearing of the center joint

Check the idling speed

Check the engine cover and door locking mechanisms for correct function, adjust them if necessary

Check the tire condition and tire pressure

Replace the engine oil and engine oil filter

Replace the fuel filter, clean the fuel prefilter

Clean the air filter, replace it if necessary

Set the valve clearance

Replace the hydraulic oil

Hydraulic oil return filter

Replace the hydraulic oil pressure filter



Work to be performed by an authorized service center after 500 operating hours

Replace the oil in the transfer gearbox

Replace the oil in the axles

Perform grease lubrication according to the lubrication plan

Lubricate the cardan shaft

Lubricate with oil: all levers, Bowden cables and hinges

Check all oil/fluid levels

The following inspection intervals apply after this inspection:



Inspection intervals

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NOTICE

The maintenance and inspection personnel must have specialized knowledge about the maintenance and inspection work on the machine!

i Information

The maintenance specified in the inspection schedule must be performed according to whichever interval is reached first, in other words, depending on whether the operating hours are reached or the time interval specified in the schedule is reached.

Work to be performed by an authorized service center	Operating hours: 250, 750, 1000, 1250, 1750, 2000, 2250, 2750, 3000, etc.	Operating hours: 1500, 2500, 3500, 4500, etc.	Once a month	Once a year
Check the gearbox, engine and hydraulic system for leaks	•	•	•	•
Check the hydraulic and water radiators for dirt	•	•	•	•
Check the coolant and antifreeze levels	•	•	•	•
Check the tension and condition of the V-belt	•	•	•	•
Check the routing of the hoses and pipes		•		•
Check the piston rods of the hydraulic cylinders		•		•
Check the air filter hose	•	•	•	•
Examine the intake muffler for damage or exceptional wear		•		



Work to be performed by an authorized service center	Operating hours: 250, 750, 1000, 1250, 1750, 2000, 2250, 2750, 3000, etc.	Operating hours: 1500, 2500, 3500, 4500, etc.	Once a month	Once a year
Check the routing of Bowden cables and electric cables		•		•
Retighten all bolts; pay particular attention to the engine mountings, axle mountings and cardan shaft		•		•
Check the battery acid level	•	•	•	•
Clean the battery terminals and check the acid density		•		•
Check the instruments, indicator lights + acoustic warning devices	•	•	•	•
Check the electrical system	•	•	•	•
Check the service brake and parking brake, adjust them if necessary	•	•	•	•
Check the hydraulic steering	•	•	•	•
Check the light system (if equipped)	•	•	•	•
Check the exhaust system		•		•
Check the pivot pins and joint bushes		•		•
Check the center pivot bolts and bearings		•		•
Check the pressure limiting valves of the hydraulic system		•		•
Check the idling speed	•	•	•	٠
Check the speed under load and without load		•		٠



Work to be performed by an authorized service center	Operating hours: 250, 750, 1000, 1250, 1750, 2000, 2250, 2750, 3000, etc.	Operating hours: 1500, 2500, 3500, 4500, etc.	Once a month	Once a year
Check the starter and alternator (engine manual)		•		•
Check the glow plugs and injectors (engine manual)		•		•
Check the valve clearance, adjust it if necessary		•		
Check the injectors (every 3000 operating hours)		•		•
Check the engine cover lock for correct function, adjust it if necessary	•	•	•	•
Check the protective ROPS/FOPS structure		•		•
Check the tire condition and tire pressure	•	•	•	•
Replace the engine oil and engine oil filter (Yanmar engines: every 250 operating hours)	•	•		
Replace the fuel filter – clean the pre-filter		•		•
Clean the air filter, replace it if necessary	•	•	•	•
Replace the hydraulic oil		•		•
Replace the breather filter of the hydraulic oil reservoir		•		
Replace the hydraulic oil return filter		•		•
Pressure filter (initial replacement after 500 operating hours, further replacement as required*)				



Work to be performed by an authorized service center	Operating hours: 250, 750, 1000, 1250, 1750, 2000, 2250, 2750, 3000, etc.	Operating hours: 1500, 2500, 3500, 4500, etc.	Once a month	Once a year
Replace the oil in the transfer gearbox		•		•
Replace the oil in the axles		•		•
Replace the coolant – every 2 years				
Replace the brake fluid – every 2 years				
All grease zerks lubricated? Lubricate if necessary	•	•	•	•
Lubricate the cardan shafts (universal joint and sliding joint)	•	•	•	•
Lubricate with oil: all levers, Bowden cables and hinges	•	•	•	•
Check all oil/fluid levels	•		•	
Clean the cabin breather filter, replace it if necessary				•
Check according to the Ordinance on Industrial Safety and Health		•		•

* Required if there is damage in the hydraulic system that is supposed to be caused by strong abrasive wear





Lubrication plan

Preparation for lubricating. See page 7-26.



Fig. 135

Item	Lubrication point	Num- ber of zerks
1	Pivot point of quickhitch	[2]
2	Bearing for reversing lever	[1]
3	Rear tilt cylinder	[1]
4	Front lift cylinder	[1]
5	Rear compensating cylinder	[1]
6	Loader unit bearing	[1]
7	Lift cylinder (remote lubrication)	[1]
8	Rear center axis pin (remote lubrication)	[1]

ltem	Lubrication point	Num- ber of zerks
9	Rear kingpin	[4]
10	Front kingpin	[4]
11	Traction bar	[2]
12	Front tilt cylinder	[1]
13	Front compensating cylinder (remote lubrication)	[1]
W	Angle sensor for Vertical Lift System (VLS) see page 7-20	
11 12 13 W	Front tilt cylinder Front compensating cylinder (remote lubrication) Angle sensor for Vertical Lift System (VLS) see page 7-20	[2] [1] [1]

Lubricate all lubrication points every 20 operating hours with water resistant multi-purpose grease! Lubricate all other moving parts such as the parking-brake lever, pedals, Bowden cables, etc. with an oil can!







Special lubrication points for the Vertical Lift System (VLS)

In order to ensure trouble-free operation of the Vertical Lift System (VLS), the ball hitches of angle sensor K on the loader unit must be lubricated with an oil can (*Fig. 136*).





7.3 Fluids and lubricants

Fluids and lubricants (overview)

Position	Capacity	Fluid	Specification	
Fuel tank	25.0 liters (6.60 gal.)	Diesel fuel	DIN 51601 commercially avail- able, see engine manual	
Engine oil with filter TH412cc40 TH412cc35	6.7 liters (1.76 gal.) 5.5 liters (1.45 gal.)	Engine oil SAE 15W40 ambient temperature –20 to +40 °C	API CG-4/API CH-4 see engine manual	
Cooling system contents TH412cc40 TH412cc35	8.5 liters (2.24 gal.) 8.3 liters (2.19 gal.)	Water with commercially available HD coolant/antifreeze	HD coolant/antifreeze: ASTM D 4985	
Front axle Rear axle Transfer gearbox Per wheel gear reduction	2.5 liters (0.66 gal.) 2.5 liters (0.66 gal.) 0.3 liters (0.08 gal.) 0.5 liters (0.13 gal.)	Gearbox oil SAE 90 GL 5	API GL 5	
Complete hydraulic sys- tem Hydraulic oil reservoir	45.0 liters (11.88 gal.) 40.0 liters (10.57 gal.)	Hydraulic oil HLP	ISO VG 46	
Grease lubrication points		Multi-purpose grease	Water-resistant	
When filling oil, the oil level must reach the marks on the dipsticks or control screws.				



7.4 Maintenance accesses

Opening the engine cover

Risk of injury due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ▶ Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- ► Wear protective equipment.

NOTICE

Engine damage due to loose objects in the engine compartment.

Remove all tools and objects from the engine compartment before closing the engine cover.



Open the engine cover with the handle (*Fig. 137*). The handle is lockable.

i) Information

The engine cover can be removed completely for maintenance. To do this, open the engine hood, release the retaining rope and pull the engine hood out of the hinges.



7.5 Cleaning and maintenance

Information on cleaning and maintenance

Injury hazard due to a dirty machine!

A dirty machine can cause injury.

- ► Follow the daily maintenance plan.
- Remove dirt in particular from the handholds, footholds and control elements.

NOTICE

Damage to machine due to cleaning work.

- Pay attention to the lower side in particular when cleaning the machine. Do not allow dirt to collect on the engine or gearbox.
- Ensure that the spaces between the radiator fins are clean and not blocked.
- ► Do not damage the radiator fins when cleaning with a high-pressure cleaner.
- Always cover the intake connection of the air filter before washing the engine.
- Do not clean sensitive electrical components (instrument panel, alternator, compact connectors, control levers, etc.) with a high-pressure cleaner.





Environment

Avoid environmental damage

- Clean the machine in a suitable place where the dirty waste water can be collected in an environmentally friendly manner.
- Collect contaminated water and dispose of it in an environmentally friendly manner.

Information on cleaning



Information

Clean a new machine only with a sponge (for the first three months). As the bottom layers of the paintwork are not fully hardened yet, the paintwork can be damaged if cleaned with a high-pressure cleaner.

Observe the following when cleaning the machine with a high-pressure cleaner:

- Max. water pressure 130 bar.
- Max. water temperature 80 °C

In order to avoid damage to labels and other sensitive parts, do not hold the nozzle of the high-pressure cleaner too close to the machine.



General safety check

Check the following points:

- Check all steel parts for damage and loose threaded fittings, in particular the protective ROPS/FOPS structure.
- Check the condition of the seat belt.
- · Check the quickhitch for the attachments.
- Check whether all pivot pins are in their correct positions and secured with their locks.
- Check the climbing aids and handholds for correct position.
- · Check the cabin windows for cracks or stone impacts.
- · Check the condition of the lights and working lights.
- Check the tires for damage and penetration of sharpedged objects.
- Check the condition of all warning and information labels.



7.6 Lubrication work

Preparing lubrication

- Park the machine on firm, level and dry ground.
- Secure the machine with the parking brake and wheel chocks.
- Extend and lower the (telescopic) loader unit until all lubrication points can be accessed from the ground.
- Stop the engine and remove the starting key.
- Operate and remove the battery master switch.



Lubricate the lubrication points every 20 operating hours with water-resistant multi-purpose grease. Lubricate all other moving parts such as the parking-brake lever, pedals, Bowden cables, etc. with an oil can.

Lubrication plan on page 7-18



7.7 Fuel system

Information on the fuel system

Risk of injury due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ► Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- ► Wear protective equipment.

A WARNING

Burn hazard due to deflagrations!

Fuels develop explosive and flammable mixtures with air that can cause deflagrations.

- ► Do not smoke, avoid fire and open flames.
- Do not add gasoline to the diesel fuel.



NOTICE

Damage to machine due to diesel fuel

- Perform maintenance on the fuel system in accordance with the intervals specified in this Operator's Manual.
- ► Use only clean and high-quality diesel fuel.
- Do not add gasoline.
- After working on the fuel system, clean the engine and the engine mountings of any adhering fuel.
- ► Use a fine filter in the fueling line of the diesel fuel.

Fuel system



An electric feed pump (F) pumps the fuel through a main filter and water separator (1) to the fuel injection pump (*Fig. 138*).

The filter and the feed pump are located in the engine compartment. They are accessed by opening the engine cover.



Refueling with diesel fuel

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.

Diesel fuel is harmful to the environment

- Avoid releasing it into the environment.
- Immediately absorb diesel fuel leaks, spills or overflowing diesel fuel with a binding agent.
- Dispose of fuel or binding agent in an environmentally friendly manner and separately from other waste.
- If larger amounts of diesel fuel are released, inform the competent organizations (for example, environment agency, fire department).

Fire hazard due to diesel fuel!

Diesel fuel gives off flammable vapors.

- ► Do not smoke, avoid fire and open flames.
- ► Adding gasoline is prohibited.





The filler inlet is located in position D on the machine (*Fig. 139*). The tank cap is lockable.

- 1. Lower the loader unit to the ground.
- 2. Stop the engine.
- 3. Unlock and unscrew the filler cap of the filler inlet.
- 4. Refuel the vehicle.
- 5. Carefully close the filler inlet after refueling.
- 6. Lock the filler cap.



Water separator maintenance

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- 1. Place a container under water separator 1 (*Fig. 140*).
- 2. Remove the drain plug from the filter.
 - ➡ The collected water now drains.
- 3. Firmly re-tighten the drain plug.
- 4. Bleed the fuel system.

Bleeding the fuel system



- 1. Add fuel to the fuel tank.
- 2. Turn the starting key to position I so that the electric fuel-feed pump works.
- 3. Wait one minute.
 - ➡ The system bleeds itself automatically.
- 4. The engine is then ready to be started.



7.8 Engine lubrication system

Information on the engine lubrication system

Risk of injury due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ► Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- ► Wear protective equipment.

Checking the engine oil level

NOTICE

Damage due to incorrect engine oil level.

- ► The oil level must not drop below the "Min" mark on the engine oil dipstick.
- ► The oil level must not rise above the "Max" mark on the engine oil dipstick.



Preparations:

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Lower the loader unit to the ground.
- 4. Stop the engine.
 - ➡ Wait one minute.
- 5. Open the engine cover.

Checking the engine oil level:

- 1. Pull out the engine oil dipstick 1 (*Fig. 142*).
- 2. Wipe the engine oil dipstick with a clean and lint-free cleaning cloth.
- 3. Re-insert the engine oil dipstick.
- 4. Pull the engine oil dipstick back out again.
- 5. Check the engine oil level.
 - The engine oil level must be between the "Min" and "Max" marks.
- 6. Re-insert the engine oil dipstick.





Adding engine oil

NOTICE

Damage due to wrong engine oil.

Engine oil type – see "Fluids and lubricants" on page 7-21.

Add engine oil if the oil level is below the "Max" mark:

- 1. Open the engine oil filler inlet 2 (*Fig. 143*).
- 2. Add engine oil.
- 3. Check the engine oil level.
 - If necessary, continue adding engine oil until reaching the "Max" mark.
- 4. Close the engine oil filler inlet.




7.9 Cooling system

Information on the cooling system

Risk of injury due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ▶ Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- ► Wear protective equipment.

The combined radiator is located in the engine compartment *Fig. 144*. It consists of two parts. One part cools the hydraulic oil, the other part the engine.

Check the following if the machine overheats during longer work operation or at high outside temperatures:



- Is there enough coolant in the radiator, and is the coolant mixture correct?
- Is the V-belt of the fan tightened and in good condition?
- Are the radiators and the spaces between the radiator fins clean and not blocked?
- Are all seals fitted around the radiator? (Hot air must not flow around the radiator and be drawn back in again).



Information on checking/adding coolant

Burn hazard due to hot coolant!

Hot coolant can cause burns to the skin.

- Do not open the coolant reservoir if the engine is hot or if the cooling system is under pressure.
- ► Let the engine cool down.
- ► Wear protective equipment.

NOTICE

Damage to the engine and cooling system.

- The coolant should be made up to equal parts of water and antifreeze. This mixture ensures the best possible ratio between cooling performance, antifreeze and anti-corrosion protection.
- Do not add the coolant too quickly if the full capacity has to be added, for example, when replacing the coolant. Fill a maximum 5 l/min. If the coolant is added too quickly to the cooling system, air bubbles can be trapped in the cooling system and cause engine overheating.





Possible environmental damage

- ► Avoid releasing antifreeze and coolant.
- Collect antifreeze and coolant, and dispose of them in an environmentally friendly manner.

i Information

Adapt the water/coolant mixture to the local conditions and to the work site of the machine.

► See chapter on page 9-9 "Coolant" for this.



Checking/adding coolant



Check the coolant level regularly. The check marks "FULL" and "LOW" are located on the side of the reservoir (*Fig. 145*).

Ensure that a sufficient amount of antifreeze is always added to the coolant. In summer, the antifreeze protects against internal corrosion in the engine and radiator.

Ensure a sufficient amount of coolant in the cooling circuit at all times.

Checking the antifreeze mixture



The antifreeze prevents the coolant from freezing at temperatures below the freezing point and protects the engine block and radiator against internal corrosion. Under normal conditions, an antifreeze concentration that offers protection for temperatures down to -20 to -30 °C is sufficient. The antifreeze concentration can be checked with an antifreeze tester (*Fig. 146*).



Cleaning the cooling system

ACKE

NOTICE

Damage due to dirty oil radiator.

- The higher the airborne dust load is, the more often do all radiators have to be checked and cleaned.
- Always cover up the intake connection of the air filter before cleaning.
- Do not damage the radiator fins when cleaning the radiator.
- Carefully straighten any bent cooling fins.



Environment

Risk of damage to the environment

- Only clean the machine in a suitable place where the waste water can be collected in an environmentally friendly manner.
- Collect contaminated waste water and dispose of it in an environmentally friendly manner.

Clean dirty radiators with compressed air (*Fig. 147*). Very dirty radiators can also be cleaned with water and high pressure.

- Clean the engine radiator.
- Clean the hydraulic oil radiator.
- Clean the alternator only with compressed air.



7.10 Air filter

Information on the engine air filter system

Risk of injury due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ► Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- Wear protective equipment.

NOTICE

Engine damage due to dirty air intake system.

- Engine damage can occur if the engine draws in unfiltered air.
- Do not let the engine run if parts of the air intake system are removed.
- Immediately replace damaged air filters.

The machine is equipped with an engine air filter for filtering the engine intake air. The engine air filter consists of a main engine air filter and a safety engine air filter. The engine air filter is accessed by opening the engine cover.





Environment

Avoid environmental damage!

Replace the main air filter element in time. If it is allowed to get too dirty, exhaust gas emissions will increase.



Engine air filter dust valve



Check the discharge slot on the air filter dust valve (*Fig. 148*) for dirt. Remove dust deposits by pressing the air filter dust valve together.

Engine air filter

Checking/cleaning/replacing the main engine air filter

Information

Technical damage due to dirty engine air filter.

 Clean or replace the engine air filter according to the maintenance intervals specified in this Operator's Manual.

Preparations

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.
- 5. Wait one minute.
- 6. Open the engine cover.



Removing the engine air filter

WACKER

- 1. Remove the fasteners on the cover.
 - ➡ Remove the cover.
- 2. Pull out main engine air filter H. The safety engine air filter S is not removed.
- 3. Check the intake line between the engine air filter and the engine.
 - Check for leaks
 - Check for tightness
- 4. Clean the main engine air filter H by knocking it gently and blowing compressed air from inside toward outside.
- 5. Replace the main engine air filter H if it is very dirty.

i) Information

Install a new or cleaned main filter element in the reverse order.





Checking/replacing the safety engine air filter

NOTICE

Technical damage due to dirty engine air filter.

Replace the safety engine air filter as required, however after cleaning the main engine air filter for the fifth time under all circumstances!

If engine air filter maintenance shows that there is a maintenance error, or that the main engine air filter is damaged, replace the safety engine air filter.

- 1. Remove the fasteners on the cover.
 - ➡ Remove the cover.
- 2. Pull out the main engine air filter.
 - ► The safety engine air filter can be seen.
- 3. Pull out the safety engine air filter.
- 4. Insert a new safety engine air filter.

Assemble the engine air filter in the reverse order.



7.11 V-belt/toothed belt

Information on the V-belt

Risk of injury due to hot and moving engine parts!

Hot and moving engine parts can cause injury.

- ► Do not open the engine cover if the engine is running.
- ► Let the engine cool down.
- ► Wear protective equipment.

NOTICE

Risk of technical damage

Cracked and stretched V-belts cause engine damage!

- Perform maintenance on the V-belt according to the maintenance intervals specified in this Operator's Manual.
- Observe the Operator's Manual of the engine!
- Have the V-belt only replaced by an authorized service center!

7 Maintenance



Preparations

- 1. Park the machine on firm, level and dry ground
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.
- 5. Wait one minute.
- 6. Open the engine cover.
- 7. Remove the cover.



Checking V-belt tension

WACKER



Press with your thumb to check whether the V-belt can be deflected between the pulleys by no more than about 10 mm (*Fig. 151*).

Tensioning the V-belt



- 1. Loosen fastening screws 2 of the alternator and set screw 1 (*Fig. 152*).
- 2. Apply pressure to the alternator with a suitable tool until reaching the correct V-belt tension (*Fig. 152*).
- 3. Hold the alternator in this position and tighten bolts 1 and 2.



7.12 Hydraulic system

Information on the hydraulic system

Burn hazard due to hot hydraulic oil!

Hot hydraulic oil can cause burns to the skin.

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

Hydraulic oil radiator

The hydraulic oil radiator is located in a combined radiator. The radiator is installed in the engine compartment (*Fig. 153*).

One part cools the hydraulic oil, the other part the engine. If the hydraulic system overheats during extended machine travel on the road or under high outside temperatures, check whether the fan drive works. Also check whether the spaces between the radiator fins are clean and not blocked.





Breather filter/hydraulic oil filler neck

The breather filter is located on the hydraulic oil tank (*Fig. 154*). It ensures the ventilation of the hydraulic oil reservoir when the hydraulic oil level varies. The breather filter contains a filter element that prevents dust and dirt from entering and squirts of oil from escaping. The breather filter contains a valve that keeps the pressure in the reservoir at around 0.2 bar. This pressure escapes when the hydraulic oil filler neck is opened.

i Information

Replace the breather filter after 1000 operating hours!





Information on checking the hydraulic oil level

NOTICE

Damage to hydraulic system due to incorrect hydraulic oil level.

► The hydraulic oil level must be visible in inspection window with the mast lowered.

NOTICE

Damage to hydraulic system due to incorrect or dirty hydraulic oil.

- ► Use hydraulic oil as specified in *Fluids and lubricants* (overview) on page 7-21.
- If the oil is cloudy this means that either water or air has entered the system; this can damage the hydraulic oil pump. Have the problem only rectified by an authorized service center. Do not use the machine unless the problem has been rectified.





Check the hydraulic oil level

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.
- 5. Check the hydraulic oil level in the inspection window on the side of the cabin.
 - The hydraulic oil level must be in the middle of the inspection window!

Adding hydraulic oil

NOTICE

Risk of technical damage

- ► Use the proper oil type. See chapter *Fluids and lubricants (overview) on page 7-21.*
- Carefully open the hydraulic oil filler neck to release the pressure in the hydraulic oil reservoir.

Add hydraulic oil if there is no or not enough hydraulic oil to be seen in the inspection window.



- 1. Open the hydraulic oil filler neck (Fig. 154).
 - The residual pressure in the hydraulic oil reservoir is released.
- 2. Add hydraulic oil (*Fig. 156*).
- 3. Check the hydraulic oil level.
 - If there is no or not enough hydraulic oil to be seen in the inspection window, add hydraulic oil until the hydraulic oil level in the inspection window is correct.
- 4. Close the hydraulic oil filler neck.



Bleeding the hydraulic system

Injury hazard due to uncontrolled movements of the loader unit!

Air inclusions in the hydraulic system can cause uncontrolled movements of the loader unit due to pressure loss.

- Bleed the hydraulic system after replacing the hydraulic oil, in the event of malfunctions in the hydraulic system, after repairs or after extended periods in which the machine and the hydraulic system are not used.
- Perform bleeding only when seated on the operator seat.
- Ensure that no one is in the danger zone of the machine.

- 1. Check the hydraulic oil level in the hydraulic oil reservoir.
 - If necessary, add hydraulic oil until the oil level is visible in the middle of the inspection window *Fig. 155*.
- 2. Start the engine.
 - \blacktriangleright Let the machine run at idling speed a few minutes.
- 3. Fully extend and retract the piston rods of all hydraulic cylinders several times.
- Turn the steering wheel repeatedly to either side until the steering system works correctly and without any sounds.
- 5. Check the hydraulic oil level in the hydraulic oil reservoir.
 - ➡ If necessary, add hydraulic oil again until the oil level is visible in the middle of the inspection window *Fig. 155*.



7.13 Electrical system

Information on the electrical system

NOTICE

Damage to the electrical system due to short circuit.

- Always disconnect the battery before performing work on the electrical system in which tools, spare parts, etc. can touch electrical components or contacts.
- Do not clean very sensitive electrical components with a high-pressure cleaner.
- Do not touch light bulbs or headlight reflectors with your fingers.

i Information

Have all problems in the electrical system rectified by a qualified technician.

Information on fuses

Two main fuses are located in the engine compartment (*Fig. 157*). One is the main fuse for the engine, the other one the main fuse for the cabin, lights and instruments.

Contact an authorized service center if one of these fuses is blown!



7 Maintenance



Fuses



The different electrical circuits are protected with fuses with different current ratings. The fuses are located in the fuse boxes (*Fig. 158*).

See chapter *Fuse assignment on page 9-5* for the fuse assignment.

Information on the battery

Injury hazard due to malfunctioning batteries

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

- ► Do not smoke, avoid fire and open flames.
- ► Do not place any tools on the battery.

Risk of injury due to chemicals!

Battery acid can cause serious burns in case of skin contact.

- Avoid contact of the battery acid with the skin, eyes and mouth.
- In case of contact with battery acid, immediately flush the affected parts of the body with plenty of clear water and seek medical attention at once.
- ► Wear protective equipment.



Battery

The battery has a rated voltage of 12 V and a capacity of 77 Ah.



Environment

Avoid environmental damage

 Dispose of old batteries in an environmentally friendly manner and separately from other waste.

Removing the battery

NOTICE

Short circuit due to wrong order when disconnecting the battery.

- To disconnect: First the negative terminal, and then the positive terminal.
- ► To connect: First the positive terminal, and then the negative terminal.



Preparations:

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.
- 5. Set all control levers and switches to the zero position.
- 6. Switch off all electrical consumers and the battery master switch.
- 7. Remove the starting key.

Way of proceeding:

- 1. Open the engine cover.
- 2. Unscrew the line from the negative terminal (–).
- 3. Put a jack under the battery plate.
- 4. Unscrew the 4 screws (WS 17) of the battery plate and lower the battery with a suitable jack.
- 5. Unscrew the line from the positive terminal (+).
- 6. Unscrew battery holder (WS 13).
- 7. Take out the battery with handle 1.





i) Information

Install the battery in the reverse order.

Battery maintenance

Observe the Operator's Manual of the battery. The Operator's Manual of the battery is fastened on one side of the battery 1.

- Always keep the terminals on the battery and connecting cables clean and lubricate them with anti-corrosion grease.
- Ensure that the cover of the positive terminal 2 is always in place and closed.
- Observe the monitoring device of the battery located in position 3.
 - Green = battery charge condition OK.
 - Black = charge the battery.
 - White = replace the battery by a new one.





Emergency starting/jump-starting

Injury hazard due to malfunctioning batteries

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

- ► Do not smoke, avoid fire and open flames.
- ► Do not place any tools on the battery.

NOTICE

Short circuit when jump-starting the machine.

- Ensure that the vehicle giving a jump start and the machine do not touch.
- Do not jump-start the machine if the battery is malfunctioning or frozen.
- Do not connect two batteries in series.
- Use only batteries with the same voltage for jumpstarting.
- ► Use only tested battery jumper cables with insulated terminal clamps and a sufficient cable cross-section.
- Route the battery jumper cables so that they cannot catch on rotating engine parts.
- ► After jump-starting the machine, fit the cover of the positive terminal of the machine back on again.



Before jump-starting, check whether the battery of the machine is still functional.

- 1. Set all control levers and switches to the zero position.
- 2. Turn the starting key to position I.
 - → The indicator lights must illuminate.
- 3. The indicator lights do not illuminate.
 - Malfunctioning battery.
 - ➡ Do not start the machine in this case.
 - ➡ Install a functional battery.

Preparations

- 1. Set all control levers and switches to the zero position.
- 2. Turn the starting key to position 0.
 - ➡ The electrical system is de-energized.
- 3. Drive the vehicle giving a jump start (charged battery) up to the machine (battery to be charged) so that the batteries can be connected by means of the battery jumper cables, but without the vehicles touching.
- 4. Set all control levers and switches to the zero position on the machine giving a jump start.



Connecting the battery jumper cables

Follow the order of the activity!

- 1. Remove the cover of the positive terminal L of the machine.
- First connect one end of the red battery jumper cable

 (+) to the positive terminal of the discharged battery L, then connect the other end to the positive terminal of the starting battery V.
- 3. Connect one end of the black battery jumper cable (–) to the negative terminal of the starting battery V.
- 4. Connect the other end of the black battery jumper cable to a bare spot on the engine block.
 - Do not connect it to the negative terminal of the discharged battery, otherwise explosive vapors can ignite if sparks are formed.
 - Maintain a minimum distance of 30 cm from the battery.





Jump start: starting the engine

- 1. Do not start the engine of the vehicle giving a jump start, otherwise the on-board electronics can be damaged by voltage peaks.
- 2. Start the engine of the machine being given a jump start.
 - If the engine of the machine does not start after 15 seconds, wait one minute and repeat the procedure.

Disconnecting the battery jumper cables

Follow the order of the activity.

- 1. First disconnect the black battery jumper cable from the engine block, then from the negative terminal of the vehicle giving a jump start.
- 2. First disconnect the red battery jumper cable from the positive terminal of the vehicle giving a jump start, then from the positive terminal of the machine.



7.14 Heating, ventilation and air conditioning system

Maintenance

i Information

This option does not require any special maintenance. An air conditioning system is not available for this machine.



7.15 Washer system

Filling up the washer system reservoir

The washer system container is located in position 1 (Fig. 162) on the machine.





Information

Ensure that there is always enough water in the washer system reservoir. Add antifreeze to the water in winter.



7.16 Axles/traveling drive

Description of traveling drive

The axial-piston variable displacement motor of the machine travel hydraulics is installed on the transfer gearbox. The transfer gearbox is connected to the rear axle of the machine. The front axle is driven via the cardan shaft. The wheels are driven via two reduction gears on each axle.

The axle (differential, axle tubes) shares a common oil supply. The transfer gearbox and wheel reduction gears have their own oil supply.

The oil level can be checked on the differential housing and on the wheel reduction gears!

i Information

Check plugs are located in the same positions on the front and rear axles.

Perform maintenance on the gearbox and axles according to the inspection intervals specified in this Operator's Manual.

Checking the axle oil level

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.
- 5. Raise the wheels at the reduction gears with a jack and turn them as shown in *Fig. 164*.
- 6. Unscrew hexagon socket screws a and b (*Fig. 163*) and c (*Fig. 164*).
 - The gearbox oil must be up to the bottom edge of the filler opening.
- 7. Add gearbox oil if necessary.
- 8. Screw Allen screws a, b and c back in again.









7.17 Brake system

Information on the braking system

The brakes are a safety part of the first level; improper maintenance can cause the brakes to fail.

All repair work on the braking system must be performed by the trained personnel of a qualified service center.



7.18 Tires

Information on tires

Crushing hazard if the machine slips off the jack during a wheel change!

Getting squeezed under the machine causes serious injury or death.

- ▶ Park the vehicle on firm, level, and horizontal ground.
- Use only a safe and suitable jack with sufficient lift capacity.
- Secure the machine with trestles.

A DANGER

Risk of death due to incorrect assembly work!

Incorrect assembly work of tires and rims causes serious injury or death.

- Have assembly work performed by an authorized service center only.
- ► Welding and cutting the rims is prohibited.
- Replace damaged rims by new ones.

NOTICE

Damage to differentials due to different-sized wheels and tires

Only install wheels or tires on the machine from the same manufacturer, of the same size and that have the same wear condition.



Information on inflating the tires

Injury hazard due to bursting tires!

Inflating the wheels can cause accidents resulting in serious injury or death.

- Use only filling devices with calibrated pressure gages to inflate the tires.
- When inflating the tires, ensure that no one is in the danger zone.

i Information

These instructions relate to inflating tires after loss of pressure. Observe the prescribed inflation pressure for the tire size of the machine – *see chapter 9 " Tire pressure table" on page 9-4*.

This work may only be performed by an authorized service center in case of a complete pressure loss.

Inflating the tires

Preparations:

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.

Way of proceeding:

- 1. Unscrew the protective cap from the tire valve.
- 2. Position the valve connection of the filling device on the tire valve so that it securely remains in place.
- 3. Pump up the tire to the prescribed pressure.
- 4. Remove the valve connection of the filling device from the tire valve.
- 5. Screw the protective cap onto the tire valve.

Tire pressure table

Refer to chapter *Tire pressure table on page 9-4* for the tire pressures.



Wheel change

For the tightening torques – see chapter 9 " Specific tightening torques" on page 9-8.

Preparations:

- 1. Park the machine on firm, level and dry ground.
- 2. Apply the parking brake.
- 3. Fully lower the loading frame to the ground.
- 4. Stop the engine.

Way of proceeding:

- 1. Position the jack underneath the axle, next to the wheel to be changed.
 - Ensure that the machine cannot slip off the jack.
 - Secure the machine with additional supports if necessary.
- 2. Loosen the wheel bolts.
- 3. Raise the jack until the wheel is barely off the ground.
- 4. Unscrew the wheel bolts.
 - ➡ The wheel can be removed.
- 5. Position a new wheel.
 - ➡ Tighten the wheel bolts hand-tight.
- 6. Lower the jack.
- 7. Tighten the wheel bolts alternately on the opposite sides to the prescribed torque.
 - After a wheel change, re-tighten the wheel bolts after 2 operating hours.
 - If necessary, repeat until the tightening torque remains constant.



7.19 Maintenance and servicing work on attachments

Information on attachments

Correct maintenance and service is absolutely necessary for smooth and continuous operation, and for a long service life of the attachments. Observe the lubrication and maintenance instructions in the Operator's Manuals of the attachments.

Lubrication plan for fork-and-grab attachment



Lubrication schedule for 4-in-1 bucket




7.20 Maintenance of options

Central lubrication system

Repair work

Repair work on the central lubrication system may only be performed by authorized service centers!

Filling up the central lubrication system



NOTICE

Vehicle damage if lubrication points are not lubricated.

If lubricant escapes at position 1 on the central lubrication system, one or more lubrication points will not be lubricated.

Get in touch with an authorized service center in this case.

NOTICE

Damage to central lubrication system due to wrong multipurpose grease.

In order to avoid damage to the central lubrication system or lubrication points, use only commercially available multipurpose grease.

The central lubrication system is filled via conical grease zerks or a fill coupling with a manual or pneumatic grease gun.



Automatic trailer coupling



NOTICE

In order to ensure the correct function of the trailer coupling, coupling pin A must be closed before cleaning with a high-pressure cleaner.

- 1. Close the trailer coupling.
- 2. Apply tough, water-proof grease to coupling pin A and base ring B once cleaning is over.
- 3. Apply grease to grease zerk C on the joint.



8 Malfunctions

8.1 Malfunctions, causes, remedies

Important information on troubleshooting

The information given in this chapter is provided for the fast and reliable detection of malfunctions and their appropriate repair.

Please contact your dealer if the malfunction cannot be remedied.

Repairs may only be performed by authorized service centers and trained personnel.



Fault at the diesel engine

Error/malfunction	Possible cause	Remedy
Engine does not start	Malfunctioning fuse	Have the fuse replaced
	Battery master switch not switched on	Switch on the battery master switch
	Continuous operation of the hydraulic connec- tions is switched on and operates against pressure	Switch off continuous operation of hydraulic connections
	Operator not sitting in the operator's seat, mal- functioning operator presence switch	Sit down on the operator seat, have the opera- tor presence switch replaced
	Empty fuel tank	Fill up the tank and bleed the fuel system if necessary
	Fuel filter clogged, paraffin separation in win- ter	Replace the fuel filter, use winter diesel
	Release solenoid on the engine does not pick up	Check the fuses
	Leaking fuel line	Re-tighten all threaded fittings and clamps
	Starting speed too low	Check and charge the battery, check that the battery terminals are securely connected



Error/malfunction	Possible cause	Remedy
Engine overheats	Engine radiator is dirty	Cleaning
	Coolant level too low	Add coolant
	Malfunctioning thermostat	Take the machine to a service center
	Insufficient V-belt tension	Tensioning the V-belt
	Malfunctioning fan blade drive	Take the machine to a service center
	Oil level too low or too high	Adjust the oil level
	Air in the cooling system	Bleed the cooling system
Engine does not have enough output	Continuous operation of the hydraulic connec- tions is switched on and operates against pressure	Switch off continuous operation of hydraulic connections
	Dirty air filter	Replacing the air filter
	Incorrect type of fuel	Change the fuel
	Engine speed too low	Have it adjusted



Fault at the drive

Error/malfunction	Possible cause	Remedy
Engine is running but machine will not travel	Operator not seated on the operator seat	Sit down on the operator seat
	Manual inching (option) is actuated	Switch off manual inching
	Malfunctioning operator presence switch	Have the operator presence switch replaced
	Malfunctioning parking brake switch	Have the parking brake switch replaced
	Parking brake is applied	Release the parking brake
	The inching cartridge is not in the 0-position	Check and if necessary have the inching car- tridge repaired
	Malfunctioning electronics control box	Have the electronics control box replaced
	The solenoids on the hydraulic pump are not receiving any electrical power	Check the fuses, have the loader unit control levers and the electronics checked in a ser- vice center
Drive does not have enough output	Inching is stuck	Have checked and repaired
	Manual inching (option) is actuated	Switch off manual inching
	Continuous operation of the hydraulic connec- tions is switched on and operates against pressure	Switch off continuous operation of hydraulic connections



Fault at the hydraulic system

Error/malfunction	Possible cause	Remedy
Hydraulic system overheats	Continuous operation of the hydraulic connec- tions is switched on and operates against pressure	Switch off continuous operation of hydraulic connections
	Dirty hydraulic oil radiator	Cleaning
	Insufficient V-belt tension	Tensioning the V-belt
	Malfunctioning fan blade drive	Take the machine to a service center
	Incorrect hydraulic oil level	Correct the hydraulic oil level
	Load too high	Reduce the load on the machine, take breaks

Notes:





9.1 Models and trade names

Overview

Models	Trade name
T4512	TH412



9.2 Engine

Diesel engine 22.6 kW

Engine	
Manufacturer	Yanmar
Design	3-cylinder diesel engine
Туре	3 TNV82A-BDWM
Displacement	1331 cm ³ (81.22 in ³)
Cooling	Water-cooled
Rpm	3000 rpm
Power	22.6 kW (30.30 hp) / 30 hp

Diesel engine 29.9 kW

Engine	
Manufacturer	Yanmar
Design	3-cylinder diesel engine
Туре	3 TNV84T-BKWM
Displacement	1496 cm ³ (91.29 in ³)
Cooling	Water-cooled
Rpm	2800 rpm
Power	29.9 kW (40.09 hp) / 40 hp

Permissible inclination

Max. uphill/downhill slope the machine can travel on: 25° Max. lateral inclination the machine can travel on: 7° (with a raised loader unit)



9.3 Axles/travel drive

Machine-travel hydraulics

Machine-travel hydraulics

Flow rate	84 l/min (22.19 gal/min)
operating pressure	360 bar (5221.35 psi)

9.4 Brakes

Service brake

Service brake	
Design	Foot-operated mechanical disk brake via linkage with the brake/inching pedal
Location	Front axle via cardan shaft

Parking brake

Parking brake	
Design	Mechanical disk brake via Bowden cable with parking brake lever.



9.5 Tyres

Tire pressure table

NOTICE

An incorrect tire pressure can cause damage to the tires!

► Observe the indications of the tire manufacturer!

Tires	Air pressure bar (psi)
10.0/75-15.3AS	3.1 (45)
10-16.5 EM	3.6 (61)
31 x 15.50-15AS	3.1 (45)
31 x 13.50-15RP	3.1 (45)

9.6 Steering system

Overview

Steering system

Fully hydraulic kingpin steering on front and rear axles with double-acting cylinders.

Flow rate	42 l/min (11.09 gal/min)
operating pressure	170 bar (2465.64 psi)

9.7 Work hydraulics

Overview

Work hydraulics	
Flow rate	42 l/min (11.09 gal/min)
operating pressure	220 bar (3190.83 psi)
Travel speed	20 kph (12.42 mph)



9.8 Electrical system

Electrical system

Battery

·	
Voltage	12 V
Capacity	77 Ah

Fuse assignment

The fuse box is located in the instrument panel next to the ignition lock. See *on page 7-54 "Fuses"* in the chapter "Maintenance."





Pos.	Protected function Rating	J (A)
F1	Control unit, machine travel, telescopic extension/retraction, tool locking, change- over valve for shifting tilt in/out function to additional hydraulics	10
F2	Instruments, relays, interior cabin light, switch illumination, horn	7.5
F3	Front working lights	15
F4	Rear working lights, loader unit working light	15
F5	Vertical Lift System, overload protection	15
F6	Engine	7.5
F7	Options: rotating beacon, electrical connec- tion of loader unit, additional control circuits	15

Pos.	Protected function Rating	g (A)
F8	Instrument panel power outlet	10
F9	Windshield wiper, heater blower	15
F10	Options: additional control circuits, high flow	15
F11	Clearance lights (right), instrument lighting, license plate lighting	5
F12	Clearance light (left)	5
F13	Low beam	15
F14	High beam	15
F15	Brake lights	7.5
F16	Turn indicators	10



9.9 Tightening torques

General tightening torques

Scrow dimonsions	Tightening torques in Nm (ft.lbs.)			
Screw dimensions	8.8	10.9	12.9	
M4	3 (2.21)	4 (2.95)	5 (3.68)	
M5	5.5 (4.06)	8 (5.90)	10 (7.37)	
M6	10 (7.37)	14 (10.32)	16 (11.80)	
M8	23 (16.96)	34 (25.07)	40 (29.50)	
M10	46 (33.92)	67 (49.41)	79 (58.26)	
M12	79 (58.26)	115 (84.81)	135 (99.57)	
M14	125 (92.19)	185 (136.44)	220 (162.26)	
M16	195 (143.82)	290 (213.89)	340 (250.77)	
M18	280 (206.51)	400 (295.02)	470 (346.65)	
M20	395 (291.33)	560 (413.03)	660 (486.79)	
M22	540 (398.28)	760 (560.54)	890 (656.43)	
M24	680 (501.54)	970 (715.43)	1150 (848.19)	
M27	1000 (737.56)	1450 (1069.46)	1700 (1253.85)	
M30	1350 (995.70)	1950 (1438.24)	2300 (1696.39)	



Specific tightening torques

Designation		Tightening torques in Nm (ft.lbs.)
Wheel nut	M18x1.5	285 (210.02)
Nuts of high-pressure limit- ing valves	M8	22 (16.21)



9.10 Coolant

Information on coolants

Check the coolant level regularly. The coolant must cover the radiator fins. Ensure that enough antifreeze is always added to the coolant, even in summer. The antifreeze also prevents internal corrosion of the radiator and the engine.

The coolant should be made up to equal parts of water and antifreeze. This mixture ensures the best possible ratio between cooling performance, antifreeze and anticorrosion protection.

Coolant compound table

External temperature ¹	Water	Coolant ²	
Up to °C (°F)	% by vol- ume	% by volume	
-37 (-34.6)	50	50	

1. Use the 1:1 concentration for warm outside temperatures too in order to ensure protection against corrosion, cavitation and deposits.

2. Do not mix the coolant with other coolants.



9.11 Noise emissions

Overview

Noise values	dB(A)
Average sound power level LwA	99.3
Guaranteed sound power level LwA	101
Specified sound pressure level LpA	84

9.12 Vibration

Hand/arm vibrations:

Hand-arm vibrations do not exceed 2.5 m/s² (98.42 in/s²).

Full-body vibrations:

This machine is equipped with an operator's seat that complies with EN ISO 7096:2000 requirements.

When the machine is used in accordance with its designated use, full-body vibrations vary from less than 0.5 m/s^2 (19.69 in/s²) up to a momentary maximum value.

When calculating the vibration values in accordance with ISO/TR 25398:2006, you are advised to use the values specified in the table. Here the actual conditions of use must be taken into account.

Wheel loaders and teleloaders are classified according to their operating weight.



Machina actorony	Typical operating condi-	Average value			Standard deviation (s)		
Machine category	tions	1.4*aw,eqx	1.4*aw,eqy	aw,eqz	1.4*sx	1.4*sy	sz
Compact loader operating weight < 4500 kg (9920.8 lbs.)	Load & carry (load- ing and transporta- tion work)	0.94 m/s² (3.08 ft/s²)	0.86 m/s² (2.82 ft/s²)	0.65 m/s² (2.13 ft/s²)	0.27 m/s² (0.89 ft/s²)	0.29 m/s² (0.95 ft/s²)	0.13 m/s² (0.43 ft/s²)
	Load & carry (load- ing and transporta- tion work)	0.84 m/s² (2.76 ft/s²)	0.81 m/s² (2.66 ft/s²)	0.52 m/s² (1.71 ft/s²)	0.23 m/s² (0.76 ft/s²)	0.20 m/s² (0.66 ft/s²)	0.14 m/s² (0.46 ft/s²)
Wheel loader operat- ing weight > 4500 kg	Use in extraction (harsh conditions of use)	1.27 m/s² (4.17 ft/s²)	0.97 m/s² (3.18 ft/s²)	0.81 m/s² (2.66 ft/s²)	0.47 m/s² (1.54 ft/s²)	0.31 m/s² (1.02 ft/s²)	0.47 m/s² (1.54 ft/s²)
(3520.0 103.)	Transfer travel	0.76 m/s² (2.49 ft/s²)	0.91 m/s² (2.99 ft/s²)	0.49 m/s² (1.61 ft/s²)	0.33 m/s² (1.08 ft/s²)	0.35 m/s² (1.15 ft/s²)	0.17 m/s² (0.56 ft/s²)
	V-shape operation (loading)	0.99 m/s ² (3.25 ft/s ²)	0.84 m/s ² (2.76 ft/s ²)	0.54 m/s² (1.77 ft/s²)	0.29 m/s ² (0.95 ft/s ²)	0.32 m/s ² (1.05 ft/s ²)	0.14 m/s ² (0.46 ft/s ²)



9.13 Weights

Vehicle weight

Weight indications	Diesel engine 22.6KW	Diesel engine 29.9 kW
Operating weight	2530 kg (5578 lbs)	2572 kg (5670 lbs)
Permissible maximum weight	3100 kg (6834 lbs)	3100 kg (6834 lbs)

Payload/axle load/bearing load

Payload and axle load

Weight indications	
Permissible axle loads per axle	2000 kg (4409 lbs)
Permissible payload with pallet fork 1000227130 according to EN 1459 Annex B, telescopic boom retracted	1200 kg (2645 lbs)
Permissible payload with pallet fork 1000227130 according to EN 1459 Annex B, telescopic boom extended	440 kg (970 lbs)
Permissible trailer loads with a braked trailer and a maximum incline of 10 $\%$	4000 kg (8818 lbs)
Permissible trailer loads with an unbraked trailer and a maximum incline of 10%	750 kg (1653 lbs)
Permissible drawbar load on trailer coupling	75 kg (165 lbs)



Load diagram





9.14 Dimensions

Dimensions of 29.9 kW machine





ltem	Designation	mm	(in)
Δ	Overall length with standard bucket	3911	193.98
~	Overall length with pallet forks	4038	158.98
В	Length incl. quickhitch	2941	115.79
С	Center of axle to attachment pivot	450	17.72
D	Wheelbase	1920	75.59
Е	Rear overhang	391	15.39
F*	Height above cabin/protective roof for operator	1961	77.20
H*	Seat height	973	38.31
1*	Total work height (bucket)	5238	206.22
J	Total work height (pallet forks)	5010	197.24
K*	Max. height of attachment pivot	4551	179.17
1*	Load-over height with extended boom (bucket)	4171	164.21
LI	Pallet height with extended boom (pallet forks)	4306	169.53
L2*	Load-over height with retracted boom (bucket)	2957	116.42
	Pallet height with retracted boom (pallet forks)	3092	121.73

Dimensions with tires 10.0/75-15.3 AS

All height dimensions refer to the static radius of the wheels.

*Dimensions differ if other tires or reversed wheel rims are used



Vehicle dimensions 29.9 KW (part 2)





ltem	Designation	mm	(in)
M1*	Max. tilt-out height with extended boom (bucket)	3631	142.95
M2*	Max. tilt-out height with retracted boom (bucket)	2417	95.28
Ν	Max. reach with M1	542	21.34
N1	Max. reach with extended boom (pallet forks)	2279	89.72
N2	Max. reach with retracted boom (pallet forks)	920	36.22
O*	Scraping depth	94	3.70
P*	Overall width	1560	61.42
Q*	Track	1296	51.02
S*	Ground clearance	306	12.05
Т	Max. radius (bucket)	3517	138.46
T1	Max. radius (pallet forks)	3409	134.21
U*	Radius at outer edge	2722	107.17
V	Inner radius	951	37.44
Х	Roll back angle at max. lift height	0	52
Y	Max. tilt-out angle	0	31
Z	Roll back angle at ground	0	44

Dimensions with tires 10.0/75-15.3 AS

All height dimensions refer to the static radius of the wheels.

*Dimensions differ if other tires or reversed wheel rims are used



Dimensions of 22.6 kW machine





ltem	Designation	mm	(in)
٨	Overall length with standard bucket	3911	153.98
~	Overall length with pallet forks	4038	158.98
В	Length incl. quickhitch	2941	115.79
С	Center of axle to attachment pivot	450	17.72
D	Wheelbase	1920	75.59
Е	Rear overhang	391	15.39
F*	Height above cabin/protective roof for operator	1941	76.42
H*	Seat height	953	37.52
1*	Total work height (bucket)	5218	205.43
J	Total work height (pallet forks)	4990	196.46
K*	Max. height of attachment pivot	4531	178.39
1*	Load-over height with extended boom (bucket)	4151	163.43
L I	Pallet height with extended boom (pallet forks)	4386	172.68
1.0*	Load-over height with retracted boom (bucket)	2937	115.63
L	Pallet height with retracted boom (pallet forks)	3072	120.95

Dimensions with tires 10.0/75-15.3 AS

All height dimensions refer to the static radius of the wheels.

*Dimensions differ if other tires or reversed wheel rims are used



Vehicle dimensions 22.6KW (part 2)





ltem	Designation	mm	(in)
M1*	Max. tilt-out height with extended boom (bucket)	3611	142.17
M2*	Max. tilt-out height with retracted boom (bucket)	2397	94.37
Ν	Max. reach with M1	542	21.34
N1	Max. reach with extended boom (pallet forks)	2279	89.72
N2	Max. reach with retracted boom (pallet forks)	920	36.22
O*	Scraping depth	94	3.70
P*	Overall width	1560	61.42
Q*	Track	1296	51.02
S*	Ground clearance	286	11.26
Т	Max. radius (bucket)	3517	138.46
T1	Max. radius (pallet forks)	3409	134.21
U*	Radius at outer edge	2722	107.17
V	Inner radius	951	37.44
Х	Roll back angle at max. lift height	0	52
Y	Max. tilt-out angle	0	31
Z	Roll back angle at ground	0	44

Dimensions with tires 10.0/75-15.3 AS

All height dimensions refer to the static radius of the wheels.

*Dimensions differ if other tires or reversed wheel rims are used

Notes:







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